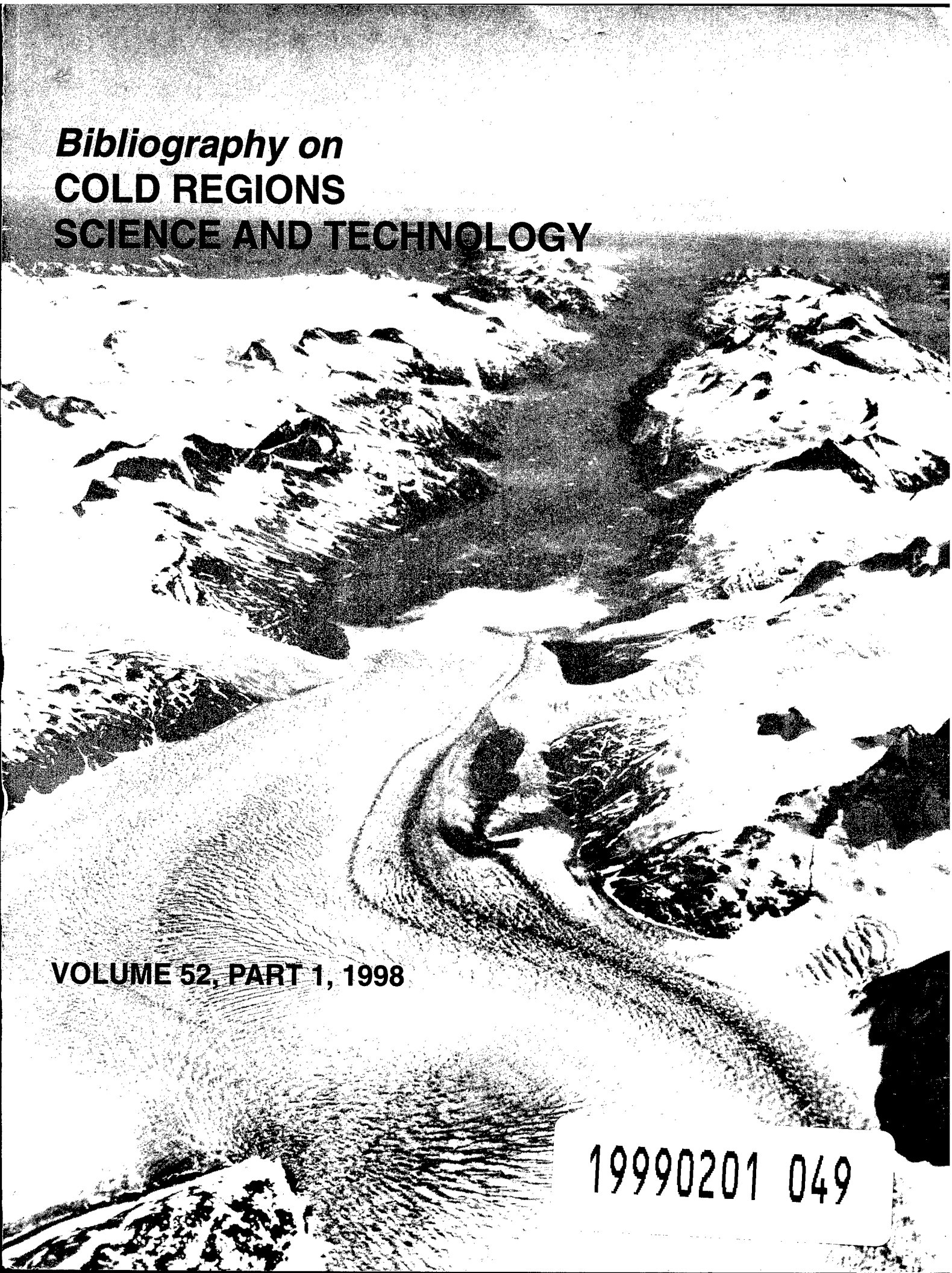
Bibliography on
COLD REGIONS SCIENCE AND TECHNOLOGY



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Bibliography on
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VOLUME 52, PART 1

R.W. Goldblatt, C. Minkus, and O.K. Radford, Editors

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BIBLIOGRAPHY ON COLD REGIONS SCIENCE AND TECHNOLOGY
Volume 52, Part 1

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The present volume contains material accessioned between October 1997 and September 1998. It contains full citations of 6734 items, in many cases with abstracts. Indexing for the volume is issued as Volume 52, Part 2.

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Roberta W. Goldblatt, Acting Head
Carl Minkus, Acting Head
Olivia K. Radford, Acting Head
Cold Regions Bibliography Project
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52-1
Proceedings of the NIPR Symposium on Polar Biology, No.10.
Ohyama, Y., ed, Watanabe, K., ed, NIPR Symposium on Polar Biology, 18th, Tokyo, Dec. 6-7, 1995, Tokyo, National Institute of Polar Research, Feb. 1997, 209p., Refs. passim. For selected papers see B-57905 through B-57915 or 52-2 through 52-5.
Marine biology, Ecology, Sea ice, Ice cover effect, Algae
This volume is a compilation of 17 full length papers, 11 of which are pertinent to Antarctica, presented at the 18th Symposium on Polar Biology held in Tokyo on Dec. 6-7, 1995. The aim of the Symposium was to introduce new results obtained in the polar and subpolar regions covering marine and terrestrial biology, including the effects of snow- and ice-covers on antarctic phytoplankton. The program of the Symposium and an author index conclude the volume.

52-2
Potential role of melted "brown ice" as sources of chelators and ammonia to the surface waters of the Weddell Sea, Antarctica.
Brandini, F.P., Baumann, M.E.M., NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.1-13, Refs. p.12-13.
Sea ice, Meltwater, Biomass, Algae, Sea water, Water chemistry, Antarctica—Weddell Sea
The effect of melted brown ice on the development of surface phytoplankton in the Weddell Sea was tested experimentally using natural surface populations and cultured diatoms. The growth of natural and cultured diatoms was enhanced after various additions of melted brown ice. EDTA was also used as a standard chelator in order to compare the chelating capacities of surface water and melted ice. It was demonstrated that surface waters are not limited by lack of chelating compounds, which may originate from ice communities. The role of melted brown ice as a potential source of either ammonium or chelators affecting phytoplankton development in marginal ice zones is discussed. (Auth. mod.)

52-3
Sporadic increase of particle sedimentation at the ice edge of the Antarctic Ocean during the austral summer 1994-1995.
Sasaki, H., et al, NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.50-55, 18 refs.
Marine biology, Sedimentation, Biomass, Ice edge
Time-series sediment traps were deployed at depths of 537, 796, 1259, 1722 and 2727 m at the ice edge of the antarctic ocean (64°42'S, 139°58'E) from Dec. 26, 1994 to Jan. 20, 1995. During a short period from Jan. 7 to 9, a sporadic flux increase within a few days in terms of total dry weight of 774 mg/m^2/d at 537 m was observed. The mass of sinking particles forming the flux maximum sank down to the deepest trap (2727 m) within 7-11 days, indicating that about 5% of these particles were transported downward to the bottom with the sinking rate of 199-313 m/d (mean 243 m/d). The considerable particle loss rate (13% [100/m]) below the mesopelagic layers in a short period suggests the occurrence of consumption processes induced by the sporadic supply of freshly produced particles from above. (Auth.)

52-4
Vertical flux of ice algal cells during the ice melting and breaking periods in Saroma Ko lagoon, Hokkaido, Japan.
Taguchi, S., Saito, H., Hattori, H., Shirasawa, K., NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.56-65, Refs. p.64-65.
Sea ice, Algae, Ice melting, Ice breaking, Profiles, Seasonal variations, Water temperature

52-5
Activity of lichens under the influence of snow and ice.
Kappen, L., Schroeter, B., NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.163-168, 16 refs.
Lichens, Ice cover effect, Snow cover effect, Acclimatization, Photosynthesis, Antarctica—King George Island, Antarctica—Victoria Land
A major aim of the investigations is to explain the adaptation of vegetation to the peculiar environmental conditions in polar regions. The concept describes the main limiting and favorable factors influencing photosynthetic production of cryptogams, mainly lichens. Snow and ice—usually stress factors to the activity of plants—can be effectively used by lichens because of their poikilohydrous nature. In the continental antarctic as well as in the high arctic regions the favorable light and temperature conditions during the summer may not be as profitable to the productivity of lichens as expected because water is deficient. The authors established measuring systems that automatically recorded micro-environmental parameters and lichen activity over the whole annual period, and investigated physiological responses of lichens to the environmental conditions with experiments mainly carried out in the field. (Auth. mod.)

52-6
Denitrification and nitrous oxide emissions from a black chernozemic soil during spring thaw in Alberta.
Nyborg, M., Laidlaw, J.W., Solberg, E.D., Malhi, S.S., *Canadian journal of soil science,* May 1997, 77(2), p.153-160, With French summary. 41 refs.
Chernozem, Soil tests, Frozen ground chemistry, Ground thawing, Soil air interface, Snowmelt, Saturation, Vapor transfer, Degradation, Mass balance, Isotope analysis, Greenhouse effect, Canada—Alberta

52-7
Uni-directional freezing of waste activated sludges: vertical freezing versus radial freezing.
Hung, W.T., Feng, W.H., Tsai, I.H., Lee, D.J., Hong, S.G., *Water research,* Sep. 1997, 31(9), p.2219-2228, 44 refs.
Sludges, Waste treatment, Freeze thaw cycles, Freezing rate, Colloids, Sediments, Capillarity, Migration, Simulation, Design criteria

52-8
Two circulation regimes of the wind-driven Arctic Ocean.
Proshutinskiĭ, A.IU., Johnson, M.A., *Journal of geophysical research,* June 15, 1997, 102(C6), p.12,493-12,514, Refs. p.12,512-12,514.
Oceanography, Sea level, Ocean currents, Sea ice distribution, Drift, Atmospheric circulation, Air ice water interaction, Wind factors, Turbulent boundary layer, Hydrography, Seasonal variations, Mathematical models, Arctic Ocean

52-9
Nutrient, salinity, and stable oxygen isotope composition of Bering and Chukchi Seas waters in and near the Bering Strait.
Cooper, L.W., Whitledge, T.E., Grebmeier, J.M., Weingartner, T., *Journal of geophysical research,* June 15, 1997, 102(C6), p.12,563-12,573, 44 refs.
Oceanography, Subpolar regions, Ocean currents, Water chemistry, Brines, Sedimentation, Profiles, Sampling, Oxygen isotopes, Isotope analysis, Nutrient cycle, Bering Sea, Chukchi Sea

52-10
Reconstructing the origin and trajectory of drifting arctic sea ice.
Pfirman, S.L., Colony, R., Nürnberg, D., Eicken, H., Rigor, I., *Journal of geophysical research,* June 15, 1997, 102(C6), p.12,575-12,586, 54 refs.
Oceanography, Sea ice distribution, Ice floes, Origin, Drift, Seasonal variations, Sediment transport, Clay minerals, Mineralogy, Air ice water interaction, Wind factors, Arctic Ocean

52-11
Study of the evolution of the under-ice water layer during summer melt phase in an arctic bay.
Rajan, S.D., Laible, H., Tucker, W.B., MP 5004, *Journal of geophysical research,* June 15, 1997, 102(C6), p.12,587-12,592, 2 refs.
Oceanography, Ice acoustics, Acoustic measurement, Sound waves, Velocity measurement, Attenuation, Ice water interface, Meltwater, Stratification, Ice cover effect
An acoustic ice tomography experiment which extended over a 12-month period was conducted in the Sabine Bay area of the Canadian Archipelago. Acoustic transmitter and receiver arrays were deployed in the ice for this experiment. The vertical arrays penetrated through the ice and extended into the water column. The acoustic data collected from the transmitter/receiver pairs in the water column are analyzed to investigate the changes in the sound speed structure of the water column. Analysis of the acoustic data shows significant changes in the sound speed structure in the upper 2 m of the water column during the summer melt phase. These changes in sound speed with the influx of fresh water are caused by the melting of ice cover, snow, and runoff from rivers. The analysis presented is a demonstration of the usefulness of this technique to monitor the changes that take place in the region beneath the ice cover.

52-12
ERS 1 radar and field-observed characteristics of autumn freeze-up in the Weddell Sea.
Drinkwater, M.R., Lytle, V.I., *Journal of geophysical research,* June 15, 1997, 102(C6), p.12,593-12,608, 42 refs.
Oceanography, Sea ice distribution, Freezeup, Slush, Snow ice, Ice formation, Snow ice interface, Regelation, Synthetic aperture radar, Backscattering, Spaceborne photography, Snow cover effect, Antarctica—Weddell Sea
ERS 1 satellite microwave radar data are analyzed to investigate changes in sea ice characteristics during a period when a drifting ice camp was deployed in the Weddell Sea. Synthetic aperture radar and scatterometer data are calibrated and geolocated to derive a time series of C band backscatter coefficient corresponding with simultaneous surface measurements during the austral autumn freeze-up. Thermistor strings were implanted in the snow and ice at a number of local and regional sites. Results show that the microwave radar backscatter characteristics of this perennial ice region responded sensitively to changes in air temperature and corresponding changes in turbulent flux of heat at the surface of the sea ice. The backscatter coefficient time series measured by each radar indicated that backscatter coefficient fell by several decibels during the freezing and transformation of the layer of saturated, saline basal snow into snow ice. These results suggest the possibility of monitoring the timing and autumn freeze-up transition of regional ice signatures as a means of quantifying the proportion of flooded perennial sea ice. (Auth. mod.)

52-13
Sensitivity of a global sea ice model to the treatment of ice thermodynamics and dynamics.
Fichefet, T., Morales Maqueda, M.A., *Journal of geophysical research,* June 15, 1997, 102(C6), p.12,609-12,646, Refs. p.12,644-12,646.
Oceanography, Sea ice distribution, Ice heat flux, Ice growth, Ice cover thickness, Ice cover effect, Snow ice, Snow cover effect, Thermodynamics, Ice models, Mathematical models, Seasonal variations
The sensitivity of a global thermodynamic-dynamic sea ice model coupled to a one-dimensional upper ocean model to degradations of the model physics is investigated. The thermodynamic component of the sea ice model takes into consideration the presence of snow on top of sea ice, the storage of sensible and latent heat inside the snow-ice system, the influence of the subgrid-scale snow and ice thickness distributions on sea ice thermodynamics, the transformation of snow into snow ice when snow depth increases to the point where the snow-ice interface sinks below the waterline, and the existence of leads and polynyas (areas of open water) within the ice cover. It is very important to note that a single set of parameter values is employed to simultaneously simulate the arctic and antarctic ice regimes. A total of 9 sensitivity experiments show that the thermal inertia of the snow-ice system is negligible in the Antarctic but not in the Arctic. Results suggest that the thermodynamic effect of the subgrid-scale snow and ice thickness distributions, the existence of open water areas within the ice cover, and the ice motion play a crucial role in determining the seasonal behavior of both ice packs. (Auth. mod.)

52-14
Marginal ice zone rheology: comparison of results from continuum-plastic models and discrete-particle simulations.
Gutfraind, R., Savage, S.B., *Journal of geophysical research,* June 15, 1997, 102(C6), p.12,647-12,661, 36 refs.
Sea ice, Ice edge, Ice floes, Drift, Sea ice distribution, Air ice water interaction, Wind factors, Shear strength, Rheology, Ice models, Computerized simulation, Hydrodynamics, Ice forecasting

52-15
Formation of injection frost mounds over winter 1995-1996 at Barrow, Alaska.
Hinkel, K.M., et al, *Polar geography,* Oct.-Dec. 1996, 20(4), p.235-248, Refs. p.245-248.
Geomorphology, Stratigraphy, Drill core analysis, Continuous permafrost, Frost mounds, Permafrost hydrology, Soil water migration, Seepage, Water pressure, Frozen ground mechanics, Ice lenses, Ice formation, United States—Alaska—Barrow

52-16
Geographic perspective on sustainable development in the Russian Arctic.
Vil'chek, G.E., Serebriannyĭ, L.R., Tishkov, A.A., *Polar geography,* Oct.-Dec. 1996, 20(4), p.249-266, Translated from Izvestiia Akademii Nauk. Seriia geograficheskaia, 1997, No.1. Refs. p.264-266.
Economic development, Natural resources, Human factors, Ecosystems, Environmental protection, Environmental impact, Russia

52-17
Permafrost age and thickness near Adventfjorden, Spitsbergen.
Harada, K., Yoshikawa, K., *Polar geography,* Oct.-Dec. 1996, 20(4), p.267-281, 18 refs.
Permafrost origin, Permafrost thickness, Permafrost dating, Subsea permafrost, Frozen ground temperature, Permafrost transformation, Soil tests, Electrical resistivity, Sounding, Profiles, Correlation, Permafrost thermal properties, Norway—Spitsbergen

52-18
Mercury levels in the natural environment in the ecosystem of the Kureyka Reservoir.
Sorokovikova, L.M., Andulaĭtis, L.D., Domysheva, V.M., *Polar geography,* Oct.-Dec. 1996, 20(4), p.282-288, Translated from Geografiia i prirodnye resursy, 1997, No.1. 15 refs.
Reservoirs, Limnology, Arctic landscapes, Ecosystems, Organic soils, Decomposition, Sampling, Water pollution, Environmental impact, Hydrogeochemistry, Russia—Kureyka Reservoir

52-19
Quaternary volcanic ash in landscapes of the northern Okhotsk seaboard.
Galanin, A.A., Galanina, O.P., *Polar geography,* Oct.-Dec. 1996, 20(4), p.289-293, Translated from Geografiia i prirodnye resursy, 1997, No.1. 30 refs.
Pleistocene, Quaternary deposits, Classifications, Terraces, Soil formation, Volcanic ash, Aerosols, Sedimentation, Soil tests, Okhotsk Sea

52-20
Assessment of sea-ice conditions using two-channel active and passive microwave systems.
Bel'chanskiĭ, G.I., Douglas, D.C., Kozlenko, N.N., *Polar geography,* Oct.-Dec. 1996, 20(4), p.294-305, 30 refs.
Sea ice distribution, Ice surveys, Ice conditions, Classifications, Sensor mapping, Radiometry, Side looking radar, Spaceborne photography, Data processing, Scattering, Brightness, Performance

52-21
Climatic severity and the response of temperature elevation of arctic aphids.
Strathdee, A.T., et al, *Global change biology,* Feb. 1995, 1(1), p.23-28, 12 refs.
Ecosystems, Subpolar regions, Global change, Global warming, Temperature effects, Biomass, Phenology, Environmental impact, Sampling, Microclimatology

52-22
Modelling temporal variability in the carbon balance of a spruce/moss boreal forest.
Frolking, S., et al, *Global change biology,* Aug. 1996, 2(4), p.343-366, Refs. p.363-366.
Forest ecosystems, Carbon dioxide, Global change, Photosynthesis, Forest soils, Mosses, Soil temperature, Decomposition, Geochemical cycles, Climatic factors, Models, Seasonal variations, Snow cover effect

52-23
Marine zooplanktonic and benthic community respiration rates at Resolute, Canadian high Arctic.
Welch, H.E., Siferd, T.D., Bruecker, P., *Canadian journal of fisheries and aquatic sciences,* May 1997, 54(5), p.999-1005, With French summary. 28 refs.
Marine biology, Subpolar regions, Ecosystems, Ocean bottom, Plankton, Biomass, Sampling, Seasonal variations, Ice cover effect, Canada—Northwest Territories—Resolute

52-24
Rain-generated overland flow as a factor in the development of some stratified slope deposits: a case study from the Pays du Buëch (Préalpes, France).
Van Steijn, H., Hétu, B., *Géographie physique et Quaternaire,* 1997, 51(1), p.3-15, With French and German summaries. 35 refs.
Geomorphology, Alpine landscapes, Talus, Landscape development, Rain, Rheology, Lithology, Sedimentation, Slope processes, Stratification, France—Veynes

52-25
Allochthonous sediment in till near a lithological boundary in central Ontario.
Cogley, J.G., Aikman, M., Stokes, D.J.A., *Géographie physique et Quaternaire,* 1997, 51(1), p.17-27, With French and German summaries. 33 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacier flow, Glacier beds, Moraines, Lithology, Sediment transport, Origin, Sampling, Canada—Ontario

52-26
Inferences on glacial flow from till clast dispersal, Waterford area, New Brunswick.
Broster, B.E., Munn, M.D., Pronk, A.G., *Géographie physique et Quaternaire,* 1997, 51(1), p.29-39, With French and German summaries. 33 refs.
Pleistocene, Quaternary deposits, Glacial geology, Bedrock, Glacial erosion, Sediment transport, Lithology, Striations, Orientation, Sampling, Statistical analysis, Canada—New Brunswick

52-27
Glaciolacustrine sediments and neoglacial history of the Chephren Lake Basin, Banff National Park, Alberta.
Dirszowsky, R.W., Desloges, J.R., *Géographie physique et Quaternaire,* 1997, 51(1), p.41-53, With French and German summaries. 43 refs.
Quaternary deposits, Glacial geology, Lacustrine deposits, Sedimentation, Lithology, Geochemical cycles, Glacier oscillation, Drill core analysis, Geochronology, Canada—Alberta—Chephren Lake

52-28
Glaciolacustrine environment of part of the Oak Ridges Moraine, southern Ontario.
Gilbert, R., *Géographie physique et Quaternaire,* 1997, 51(1), p.55-66, With French and German summaries. 46 refs.
Glacial geology, Quaternary deposits, Lacustrine deposits, Glacial lakes, Moraines, Sedimentation, Stratigraphy, Meltwater, Drill core analysis, Canada—Ontario—Oak Ridges Moraine

52-29
Forest edge dynamics on talus in a cold temperate climate (Québec). [Dynamique d'un front forestier sur un talus d'éboulis actif en climat tempéré froid (Gaspésie, Québec)]
Lafortune, M., Filion, L., Hétu, B., *Géographie physique et Quaternaire,* 1997, 51(1), p.67-80, In French with English and German summaries. 24 refs.
Talus, Frost action, Slope processes, Sedimentation, Forest lines, Vegetation patterns, Growth, Stratigraphy, Age determination, Canada—Quebec—Gaspé Peninsula

52-30
Pollen evidence of Late Holocene treeline fluctuation from the southern Coast Mountains, British Columbia.
Evans, M., *Géographie physique et Quaternaire,* 1997, 51(1), p.81-92, With French and German summaries. 36 refs.
Paleoclimatology, Climatic changes, Glacier oscillation, Quaternary deposits, Lacustrine deposits, Forest lines, Vegetation patterns, Palynology, Stratigraphy, Geochronology, Statistical analysis, Geomorphology, Canada—British Columbia—Coast Mountains

52-31
Modifications of fluvial systems at the Pleniglacial Lateglacial transition and during the Holocene: the example of the Somme River basin (northern France). [Modifications des systèmes fluviatiles à la transition Pléniglaciaire-Tardiglaciaire et à l'Holocène: l'exemple du bassin de la Somme (nord de la France)]
Antoine, P., *Géographie physique et Quaternaire,* 1997, 51(1), p.93-106, In French with English and German summaries. 63 refs.
Pleistocene, Paleoclimatology, Geomorphology, Floodplains, River basins, Sedimentation, Water erosion, Channels (waterways), Quaternary deposits, Stratigraphy, Drill core analysis, France—Bassin de la Somme

52-32
Effect of the substrate morphology on the structure of adsorbed ice.
Trakhtenberg, S., Naaman, R., Cohen, S.R., Benjamin, I., *Journal of physical chemistry B,* June 26, 1997, 101(26), p.5172-5176, 26 refs.
Ice physics, Ice spectroscopy, Adsorption, Ice solid interface, Ice surface, Substrates, Surface roughness, Spectra, Molecular energy levels, Simulation

52-33
Seasonal distribution of sympagic amphipods near Chesterfield Inlet, N.W.T., Canada.
Siferd, T.D., Welch, H.E., Bergmann, M.A., Curtis, M.F., *Polar biology,* July 1997, 18(1), p.16-22, 18 refs.
Marine biology, Subpolar regions, Biomass, Subglacial observations, Algae, Sea ice, Ice floes, Ocean bottom, Ecosystems, Distribution, Seasonal variations, Snow cover effect, Sampling, Canada—Northwest Territories—Chesterfield Inlet

52-34
Intertidal zone of Svalbard 3. Littoral of a subarctic, oceanic island: Bjornoya.
Węsławski, J.M., Zajączkowski, M., Wiktor, J., Szymelfenig, M., *Polar biology,* July 1997, 18(1), p.45-52, 32 refs.
Marine biology, Oceanographic surveys, Subpolar regions, Littoral zone, Biomass, Algae, Classifications, Sampling, Ecosystems, Biogeography, Norway—Svalbard

52-35
Lipids in arctic benthos: does the fatty acid and alcohol composition reflect feeding and trophic interactions?
Graeve, M., Kattner, G., Piepenburg, D., *Polar biology,* July 1997, 18(1), p.53-61, Refs. p.60-61.
Marine biology, Subpolar regions, Biomass, Plankton, Classifications, Ecology, Sedimentation, Organic nuclei, Nutrient cycle, Ocean bottom, Sampling, Arctic Ocean

52-36
Note on sea-ice nematodes (Monhysteroidea) from Resolute Passage, Canadian High Arctic.
Riemann, F., Sime-Ngando, T., *Polar biology,* July 1997, 18(1), p.70-75, 28 refs.
Marine biology, Subpolar regions, Biomass, Microbiology, Ecosystems, Sea ice, Ice bottom surface, Ice cores, Sampling, Classifications, Canada—Northwest Territories—Resolute Passage

52-37
Modelling the hydrological behaviour of a mountain catchment using TOPMODEL.
Holko, L., Lepistö, A., *Journal of hydrology,* Sep. 1997, 196(1-4), p.361-377, 16 refs.
Snow hydrology, Watersheds, Snowmelt, Snow water equivalent, Surface drainage, Topographic effects, Runoff forecasting, Simulation, Models, Accuracy

52-38
Physics of the spatially averaged snowmelt process.
Horne, F.E., Levent Kavvas, M., *Journal of hydrology,* Apr. 1997, 191(1-4), p.179-207, 24 refs.
Snow hydrology, Snow cover distribution, Snowmelt, Snow physics, Snow temperature, Snow density, Mathematical models, Statistical analysis, Runoff forecasting

52-39
Sensitivity of flood events to global climate change.
Panagoulia, D., Dimou, G., *Journal of hydrology,* Apr. 1997, 191(1-4), p.208-222, 41 refs.
Snow hydrology, Climatology, Precipitation (meteorology), Global warming, Climatic changes, Snowmelt, River basins, Stream flow, Flood forecasting, Runoff forecasting, Simulation, Statistical analysis

52-40
Climatic change at high elevation sites: an overview.
Beniston, M., Diaz, H.F., Bradley, R.S., *Climatic change,* July-Aug. 1997, 36(3-4), p.233-251, Refs. p.247-251.
Climatology, Global change, Climatic changes, Surface temperature, Mountains, Alpine landscapes, Hydrologic cycle, Wind factors, Ice cores, Seasonal variations

52-41
Temperature variations during the last century at high elevation sites.
Diaz, H.F., Bradley, R.S., *Climatic change,* July-Aug. 1997, 36(3-4), p.253-279, Refs. p.277-279.
Climatology, Climatic changes, Global change, Mountains, Air temperature, Temperature variations, Statistical analysis, Correlation, Altitude

52-42
Variations of snow depth and duration in the Swiss Alps over the last 50 years: links to changes in large-scale climatic forcings.
Beniston, M., *Climatic change,* July-Aug. 1997, 36(3-4), p.281-300, 30 refs.
Climatology, Climatic changes, Alpine landscapes, Snow cover distribution, Snow depth, Altitude, Seasonal variations, Atmospheric pressure, Atmospheric circulation, Statistical analysis, Correlation, Switzerland—Alps

52-43
Climatic change and debris flows in high mountain regions: the case study of the Ritigraben torrent (Swiss Alps).
Rebetez, M., Lugon, R., Baeriswyl, P.A., *Climatic change,* July-Aug. 1997, 36(3-4), p.371-389, Refs. p.386-389.
Climatology, Climatic changes, Precipitation (meteorology), Alpine landscapes, Discontinuous permafrost, Ground thawing, Permafrost hydrology, Mass flow, Seasonal variations, Statistical analysis, Switzerland—Alps

52-44
Glacial varve thickness and 127 years of instrumental climate data: a comparison.
Ohlendorf, C., Niessen, F., Weissert, H., *Climatic change,* July-Aug. 1997, 36(3-4), p.391-411, Refs. p.409-411.
Climatology, Climatic changes, Alpine landscapes, Lacustrine deposits, Glacial deposits, Glacier oscillation, Snow accumulation, Glacier melting, Meltwater, Sedimentation, Seasonal variations, Statistical analysis

52-45
Regional snowfall patterns in the high, arid Andes.
Vuille, M., Ammann, C., *Climatic change,* July-Aug. 1997, 36(3-4), p.413-423, 31 refs.
Climatology, Climatic changes, Mountains, Synoptic meteorology, Precipitation (meteorology), Snow accumulation, Snow cover distribution, Snow surveys, Statistical analysis, Periodic variations, Andes

52-46
Developing a proxy climate record for the last 300 years in the Canadian Rockies—some problems and opportunities.
Luckman, B.H., *Climatic change,* July-Aug. 1997, 36(3-4), p.455-476, Refs. p.474-476.
Climatology, Climatic changes, Meteorological data, Glacier oscillation, Mountain glaciers, Paleoecology, Age determination, Statistical analysis, Correlation, Canada—Rocky Mountains

52-47
Research strategies in dendroecology and dendroclimatology in mountain environments.
Tessier, L., Guibal, F., Schweingruber, F.H., *Climatic change,* July-Aug. 1997, 36(3-4), p.499-517, Refs. p.514-517.
Climatology, Climatic changes, Forest lines, Vegetation patterns, Trees (plants), Growth, Plant ecology, Age determination

52-47
Recent progress in the analysis of iced airfoils and wings.
Cebeci, T., Chen, H.H., Kaups, K., Schimke, S., Symposium on Numerical and Physical Aspects of Aerodynamic Flows, 5th, California State University, Long Beach, CA, Jan. 13-15, 1992. Edited by T. Cebeci, Research Triangle Park, NC, U.S. Army Research Office, 1993, 10p., ADA-266 941, 18 refs.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Mathematical models, Computerized simulation

52-48
Isotope records from Mongolian and alpine ice cores as climate indicators.
Schotterer, U., Fröhlich, K., Gäggeler, H.W., Sandjordj, S., Stichler, W., *Climatic change,* July-Aug. 1997, 36(3-4), p.519-530, 24 refs.
Climatology, Climatic changes, Precipitation (meteorology), Mountain glaciers, Ice cores, Sampling, Oxygen isotopes, Isotope analysis, Seasonal variations, Air temperature, Correlation

52-49
Tectonic significance of the South Iceland Seismic Transform Zone.
Luxey, P., Blondel, P., Parson, L.M., *Journal of geophysical research,* Aug. 10, 1997, 102(B8), p.17,967-17,980, Refs. p.17,979-17,980.
Tectonics, Geological surveys, Subpolar regions, Volcanoes, Shear stress, Stress concentration, Fracture zones, Earthquakes, Spaceborne photography, Iceland

52-50
Structural relaxation rates near the ice surface: basis for separation of the surface and subsurface spectra.
Delzeit, L., Devlin, J.P., Buch, V., *Journal of chemical physics,* Sep. 1, 1997, 107(9), p.3726-3729, 8 refs.
Ice physics, Ice structure, Ice surface, Ice relaxation, Vibration, Spectra, Adsorption, Molecular energy levels, Ice spectroscopy, Phase transformations

52-51
11-year solar cycle dependence of stratospheric temperature and total ozone content over Syowa Station, Antarctica.
Watanabe, T., Kandori, T., NIPR Symposium on Upper Atmosphere Physics, Proceedings. No.10, Tokyo, National Institute of Polar Research, Jan. 1997, p.81-90, 8 refs.
Ozone, Stratosphere, Air temperature, Solar activity, Antarctica—Showa Station
Analysis of radiosonde observations over Showa Station was performed to determine influences of 11-year solar activity on the stratosphere in the high-latitude region. For antarctic winter seasons of 1967-1993 relatively high temperatures were observed on the 30 hPa level, during the solar maximum phase, for the westerly QBO. A positive correlation between the total ozone content over Showa Station and the 11-year solar activity is found for early spring (Oct.) during the easterly QBO years. High stratospheric temperatures at the 30 hPa level were associated with an increase in the ozone content. The global circulation of the stratospheric ozone in early spring is suggested to be enhanced in the easterly QBO phase, during the interval of a high solar activity. (Auth. mod.)

52-52
Lichenological research in the Russian arctic: a review.
Andreev, M.P., *University of Lapland. Arctic Centre Reports,* 1996, No.13, Lichenological and mycological research in the Russian arctic: review and bibliography. Guide to Russian arctic science. Edited by M.P. Andreev, O.G. Golubeva, I.V. Karatygin, IU.V. Kotlov, I.I. Makarova, and IU.K. Novozhilov, p.5-9.
Lichens, Plants (botany), History, Organizations, Research projects, Russia

52-53
Bibliography on lichens of the Russian arctic.
Andreev, M.P., Kotlov, IU.V., Makarova, I.I., *University of Lapland. Arctic Centre Reports,* 1996, No.13, Lichenological and mycological research in the Russian arctic: review and bibliography. Guide to Russian arctic science. Edited by M.P. Andreev, O.G. Golubeva, I.V. Karatygin, IU.V. Kotlov, I.I. Makarova and IU.K. Novozhilov, p.11-40.
Lichens, Plants (botany), Bibliographies, Site surveys, Tundra vegetation, Russia

52-54
Selected bibliography on fungi of the Russian arctic.
Karatygin, I.V., Golubeva, O.G., Novozhilov, IU.K., *University of Lapland. Arctic Centre Reports,* 1996, No.13, Lichenological and mycological research in the Russian arctic: review and bibliography. Guide to Russian arctic science. Edited by M.P. Andreev, O.G. Golubeva, I.V. Karatygin, IU.V. Kotlov, I.I. Makarova and IU.K. Novozhilov, p.41-48.
Fungi, Plants (botany), Bibliographies, Site surveys, Russia

52-55
Biogenic sulphur emissions and inferred non-sea-salt-sulphate cloud condensation nuclei in and around Antarctica.
O'Dowd, C.D., Lowe, J.A., Smith, M.H., Davison, B., Hewitt, C.N., Harrison, R.M., *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,839-12,854, Refs. p.12,853-12,854.
Climatology, Polar atmospheres, Marine atmospheres, Atmospheric composition, Chemical properties, Cloud physics, Condensation nuclei, Aerosols, Oceanographic surveys, Sampling, Origin, Antarctica—Weddell Sea
Accumulation mode aerosol properties and biogenic sulphur emissions over the South Atlantic and antarctic oceans are examined. Two contrasting air masses, polar and maritime, each possessing distinct aerosol properties, were encountered during the summer months. By examining aerosol volatile properties, polar air masses arriving from the antarctic continent were shown to consist primarily of H_2SO_4 in the accumulation mode size range. These results suggest a deficit of ammonia in polar air masses compared with that in maritime air masses. Dimethyl sulphide (DMS) exhibited no correlation with its putative aerosol oxidation products. During the austral summer of 1992-93, a period of strong biological productivity in the Weddell Sea and subantarctic ocean, particularly during ice-melt, the cruise-average DMS flux corresponded to a very modest average nss-sCCN concentration. Events of new particle formation were identified in the Weddell Sea and occurred under conditions of high DMS flux and low aerosol surface area. (Auth. mod.)

52-56
Seasonal variations of atmospheric trace gases in the high Arctic at 79°N.
Notholt, J., et al, *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,855-12,861, 24 refs.
Climatology, Polar atmospheres, Aerosols, Gases, Atmospheric composition, Seasonal variations, Turbulent diffusion, Spectroscopy, Photometry, Photochemical reactions, Spectra

52-57
Comparison of arctic and antarctic trace gas column abundances from ground-based Fourier transform infrared spectrometry.
Notholt, J., Toon, G.C., Lehmann, R., Sen, B., Blavier, J.F., *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,863-12,869, 30 refs.
Climatology, Cloud physics, Polar stratospheric clouds, Degradation, Ozone, Aerosols, Spectroscopy, Spectra, Correlation
Column abundances of several atmospheric trace gases have been derived from solar absorption spectra measured from McMurdo Station in 1986, and from solar and lunar absorption spectra recorded in Ny Ålesund, Spitsbergen during winter and spring 1992-95. The results clearly show that denitrification in the antarctic lower stratosphere results in much smaller column abundances of HNO_3 than in the Arctic. The springtime recovery of HCl in the Antarctic showed a stronger increase than in the Arctic. The $ClONO_2$ peak occurred about 1 month later in the Antarctic and was found to be less pronounced than in the Arctic. The model runs imply that in the Antarctic the reconversion of $ClONO_2$ to HCl occurs about 1 month later than in the Arctic. Furthermore, the results imply that any differences in the O_3 depletion are caused mainly by differences in the stratospheric temperatures and dynamics and only to a small extent by the increased chlorine loading. The total column abundances of the short-lived tropospheric trace gases are found to be up to 10 times higher in the Arctic compared with the Antarctic, reflecting the hemispheric imbalance in production. (Auth. mod.)

52-58

On the use of HF as a reference for the comparison of stratospheric observations and models.

Chipperfield, M.P., et al, *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,901-12,919, Refs. p.12,918-12,919.

Climatology, Stratosphere, Polar atmospheres, Degradation, Atmospheric composition, Aerosols, Spectroscopy, Photochemical reactions, Turbulent diffusion, Correlation, Models

52-59

Production of stratospheric HNO_3 by different ion-molecule reaction mechanisms.

Aikin, A.C., *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,921-12,925, 16 refs.

Climatology, Stratosphere, Polar atmospheres, Atmospheric composition, Chemical composition, Ionization, Ion density (concentration), Aerosols, Models

52-60

Ab initio study of $XOClO_3$ (X=Cl, F, and H): implications for formation of $ClOClO_3$ in the stratosphere.

Parthiban, S., Raghunandan, B.N., Sumathi, R., *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,927-12,935, 32 refs.

Climatology, Polar atmospheres, Stratosphere, Ozone, Aerosols, Chemical composition, Degradation, Molecular energy levels, Photochemical reactions, Computerized simulation

The primary photochemistry of OClO remains controversial. The present study investigates the equilibrium structures and harmonic vibrational frequencies of chlorine species at Hartree-Fock levels. The paper draws attention to the possible role of Cl_2O_4 formation in the antarctic polar stratosphere with relevance to ozone layer depletion. (Auth. mod.)

52-61

Lidar observations of polar stratospheric clouds at the South Pole. 1. Stratospheric unperturbed conditions, 1990.

Cacciani, M., Fiocco, G., Colagrande, P., Di Girolamo, P., Di Sarra, A., Fuà, D., *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,937-12,943, 12 refs.

Climatology, Polar atmospheres, Polar stratospheric clouds, Detection, Air temperature, Turbulent diffusion, Sounding, Lidar, Backscattering, Aerosols, Volcanic ash, Antarctica—Amundsen-Scott Station

Observations of polar stratospheric clouds (PSCs) carried out at the Amundsen-Scott Station by lidar in the winter of 1990 are reported. Echoes attributable to PSCs began to appear in late May, were a persistent feature till early Sep., and from that time until the end of Oct. were sporadically observed. Analyses based on the sensitivity of the backscattering to temperature confirm that the attribution of the echoes to PSC type I or II is possible in some cases. Those that could be ascribed to type II were observed mostly during July and Aug., while those attributable to type I appeared only at the beginning of the winter. The comparison of water vapor mixing ratios derived from PSC type II occurrence temperatures and frost point hygrometer measurements indicates a fast dehydration in the beginning of the winter. (Auth. mod.)

52-62

Lidar observations of polar stratospheric clouds at the South Pole. 2. Stratospheric perturbed conditions, 1992 and 1993.

Cacciani, M., Colagrande, P., Di Sarra, A., Fuà, D., Di Girolamo, P., Fiocco, G., *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,945-12,955, 15 refs.

Climatology, Polar atmospheres, Polar stratospheric clouds, Degradation, Aerosols, Volcanic ash, Lidar, Backscattering, Profiles, Antarctica—Amundsen-Scott Station

Observations of polar stratospheric clouds (PSCs), carried out at the Amundsen-Scott Station by lidar from May 1992 through Oct. 1993, are reported and compared with previously obtained results. At that time the antarctic stratosphere was loaded with sulfuric acid aerosol due to the eruptions of Mount Pinatubo. The seasonal evolution of the backscatter profiles has been investigated in relation to the presence of the volcanic aerosol and to the processes of PSC formation, particle sedimentation, and dehydration. It is concluded that only a small fraction of the aerosol particles, probably those with the largest radii, were involved in the nucleation of PSC particles. (Auth. mod.)

52-63

Five years of NO_2 vertical column measurements at Faraday (65°S): evidence for the hydrolysis of $BrONO_2$ on Pinatubo aerosols.

Slusser, J.R., Fish, D.J., Strong, E.K., Jones, R.L., Roscoe, H.K., Sarkissian, A., *Journal of geophysical research,* June 20, 1997, 102(D11), p.12,987-12,993, 23 refs.

Climatology, Aerosols, Polar atmospheres, Stratosphere, Profiles, Volcanic ash, Ozone, Photochemical reactions, Degradation, Heterogeneous nucleation, Models, Antarctica—Faraday Station

Summertime measurements of NO_2 vertical column amounts over a 5 year period from May 1990 until Feb. 1995 from Faraday Station show a marked reduction following the arrival of the Mount Pinatubo volcanic aerosol in Dec. 1991. Model calculations show that this reduction can be explained by $BrONO_2$ and N_2O_5 hydrolysis on the volcanically enhanced aerosol. Over the time span of the measurements the known increases in chlorine and bromine loadings have an effect of less than 2% on midsummer NO_2 columns. The total ozone loss increases by 38% at 16 km as a result of heavy aerosol loading. (Auth. mod.)

52-64

Mixing of polar vortex air into middle latitudes as revealed by tracer-tracer scatterplots.

Waugh, D.W., et al, *Journal of geophysical research,* June 20, 1997, 102(D11), p.13,119-13,134, Refs. p.13,133-13,134.

Climatology, Polar atmospheres, Atmospheric circulation, Atmospheric composition, Turbulent diffusion, Aerosols, Aerial surveys, Sampling, Statistical analysis

52-65

Re-formation of chlorine reservoirs in southern hemisphere polar spring.

Grooss, J.U., Pierce, R.B., Crutzen, P.J., Grose, W.L., Russell, J.M., III, *Journal of geophysical research,* June 20, 1997, 102(D11), p.13,141-13,152, Refs. p.13,151-13,152.

Climatology, Polar atmospheres, Polar stratospheric clouds, Aerosols, Turbulent diffusion, Ozone, Degradation, Seasonal variations, Models

This paper focuses on the recovery of chlorine reservoir species in the lower stratosphere in late antarctic spring. The investigations are based on measurements from the Halogen Occultation Experiment (HALOE) on board the Upper Atmosphere Research Satellite (UARS) and the Mainz photochemical box model and the NASA Langley Research Center trajectory model. During late antarctic spring 1994, HALOE observed high HCl mixing ratios in the ozone-depleted air inside the polar vortex. These values correspond approximately to the sum of all available inorganic chlorine species. In the preceding period of chlorine activation on polar stratospheric clouds (PSCs), the observed HCl mixing ratios in some cases were below 0.3 ppbv. Box model calculations are presented that assess the rate of HCl increase in late spring when heterogeneous chemistry on polar stratospheric clouds becomes insignificant. (Auth. mod.)

52-66

Evolution and stoichiometry of heterogeneous processing in the antarctic stratosphere.

Jaeglé, L., et al, *Journal of geophysical research,* June 20, 1997, 102(D11), p.13,235-13,253, Refs. p.13,251-13,253.

Climatology, Polar atmospheres, Polar stratospheric clouds, Aerosols, Cloud physics, Degradation, Heterogeneous nucleation, Ozone, Photochemical reactions, Models

Simultaneous *in situ* measurements of HCl and ClO have been made for the first time in the Southern Hemisphere, allowing a systematic study of the processes governing chlorine activation between 15 and 20 km in the 1994 antarctic winter. The wintertime loss of HCl in air recently exposed to extreme temperatures is found to be correlated with high levels of reactive chlorine expected from the stoichiometry of the heterogeneous reaction of hydrochloric acid with chlorine nitrate on polar stratospheric clouds (PSCs). To constrain the role of different heterogeneous reactions and PSC types, a photochemical trajectory model is used which includes sulfate and PSC chemistry. This analysis implies that in the edge region of the antarctic vortex, the observed near-total removal of HCl can result from latitudinal excursions of air parcels in and out of sunlight during the winter, which photochemically resupply HOCl and $ClONO_2$ as oxidation partners for HCl. (Auth. mod.)

52-67

Evaluating the role of NAT, NAD, and liquid $H_2SO_4/H_2O/HNO_3$ solutions in antarctic polar stratospheric cloud aerosol: observations and implications.

Del Negro, L.A., et al, *Journal of geophysical research,* June 20, 1997, 102(D11), p.13,255-13,282, Refs. p.13,280-13,282.

Climatology, Polar atmospheres, Aerial surveys, Air pollution, Aerosols, Hydrates, Turbulent diffusion, Polar stratospheric clouds, Degradation

Airborne measurements of total reactive nitrogen (NO_y) and polar stratospheric cloud (PSC) aerosol particles were made in the Antarctic as part of the NASA Airborne Southern Hemisphere Ozone Experiment/Measurements for Assessing the Effects of Stratospheric Aircraft (ASHOE/MAESA) campaign in late July 1994. As found in both polar regions during previous studies, substantial PSC aerosol volume containing NO_y was observed at temperatures above the frost point, confirming the presence of particles other than water ice. Throughout the PSC region, a comparison of the number of particles between 0.4 and 4.0 μm diameter with the number of available nuclei indicates that a significant fraction of the background aerosol number participates in PSC growth. The results improve the understanding of PSC aerosol formation in polar regions while strengthening the requirement to include STS aerosols in studies of polar ozone loss and the effects of aircraft emissions. (Auth. mod.)

52-68

Mathematical modelling of the primary and secondary drying stages of bulk solution freeze-drying in trays: parameter estimation and model discrimination by comparison of theoretical results with experimental data.

Sadikoglu, H., Liapis, A.I., *Drying technology,* 1997, 15(3-4), p.791-810, 17 refs.

Ice physics, Freeze drying, Frozen liquids, Ice sublimation, Ice solid interface, Mass transfer, Vapor diffusion, Hygroscopic water, Mathematical models, Theories

52-69

Frozen water content in maize at low temperatures and its effect on dryer performance.

Liu, Q., Montross, M.D., Bakker-Arkema, F.W., Hines, R.E., *Drying technology,* 1997, 15(3-4), p.939-948, 4 refs.

Ice physics, Freeze drying, Frozen liquids, Admixtures, Phase transformations, Unfrozen water content, Heat balance, Ice air interface, Mathematical models, Temperature effects

52-70

Storage of ectomycorrhizal fungi by freezing.

Corbery, Y., Le Tacon, F., *Annales des Sciences Forestières,* Mar. 1997, 54(2), p.211-217, With French summary. 31 refs.

Trees (plants), Soil microbiology, Roots, Cryobiology, Cold storage, Preserving, Fungi, Cooling rate, Low temperature tests, Viability

52-71

Chemical composition of aerosol and snow in the high Himalaya during the summer monsoon season.

Shrestha, A.B., Wake, C.P., Dibb, J.E., *Atmospheric environment,* Sep. 1997, 31(17), p.2815-2826, 33 refs.

Climatology, Mountains, Precipitation (meteorology), Atmospheric composition, Atmospheric circulation, Snow cover, Snow composition, Aerosols, Sampling, Ion density (concentration), Himalaya Mountains

52-72

Sliding temperatures of ice skates.

Colbeck, S.C., Najarian, L., Smith, H.B., MP 5005, *American journal of physics,* June 1997, 65(6), p.488-492, 5 refs.

Ice physics, Ice solid interface, Sliding, Metal ice friction, Heat transfer, Thermocouples, Temperature measurement, Temperature variations, Mechanical tests, Theories, Thermal insulation, Thermal analysis

The two theories developed to explain the low friction of ice, pressure melting and frictional heating, require opposite temperature shifts at the ice-skate interface. The arguments against pressure melting are strong, but only theoretical. A set of direct temperature measurements shows that frictional heating is the dominant mechanism because temperature behaves in the manner predicted by the theory of frictional heating. Ice skates are warmed by sliding and then cool when the sliding stops. The temperature increases with speed and with thermal insulation. The sliding leaves a warm track on the ice surface behind the skate and the skate sprays warm ejecta.

52-73

Petrography and isotope geochemistry of diagenetic carbonates in the lower Cape Phillips Formation, Cornwallis Island, Arctic Archipelago, Canada.

Coniglio, M., Melchin, M.J., *Bulletin of Canadian petroleum geology,* Sep. 1995, 43(3), p.251-266, With French summary. Refs. p.265-266.

Pleistocene, Geological surveys, Hydrocarbons, Subpolar regions, Geochemistry, Minerals, Diagenesis, Stratigraphy, Isotope analysis, Lithology, Fluid dynamics, Canada—Northwest Territories—Cornwallis Island

52-74

Tertiary structural evolution of the Beaufort Sea-Mackenzie Delta region, arctic Canada.

Lane, L.S., Dietrich, J.R., *Bulletin of Canadian petroleum geology,* Sep. 1995, 43(3), p.293-314, With French summary. Refs. p. 312-314.

Pleistocene, Marine geology, Subpolar regions, Geologic processes, Geologic structures, Tectonics, Sedimentation, Deformation, Fracture zones, Seismic surveys, Profiles, Canada—Northwest Territories—Mackenzie Delta, Beaufort Sea

52-75

Kilometre-scale microbial buildups in a rimmed carbonate platform succession, arctic Canada: new insight on Lower Ordovician reef facies.

De Freitas, T., Mayr, U., *Bulletin of Canadian petroleum geology,* Dec. 1995, 43(4), p.407-432, With French summary. Refs. p.430-432.

Pleistocene, Marine geology, Subpolar regions, Microbiology, Fossils, Sedimentation, Geologic structures, Geological maps, Rock properties, Stratigraphy, Sampling, Canada—Northwest Territories—Ellesmere Island

52-76

Matched-field evaluation of acoustic scattering from arctic ice.

Kapoor, T.K., Schmidt, H., *Acoustical Society of America. Journal,* Aug. 1997, 102(2)pt.1, p.865-876, 18 refs.

Oceanography, Sea ice, Ice acoustics, Underwater acoustics, Sound waves, Low frequencies, Scattering, Ice water interface, Ice bottom surface, Surface roughness, Ice cover effect, Mathematical models, Topographic effects

52-77

Reverse action of ribonuclease T1 in frozen aqueous systems.

Haensler, M., Hahn, U., Jakubke, H.D., *Biological chemistry,* Feb. 1997, 378(2), p.115-118, 16 refs.

Cryobiology, Frozen liquids, Laboratory techniques, Solutions, Freezing, Molecular structure, Chemical composition, Low temperature tests, Temperature effects

52-78

Analytical study of icing similitude for aircraft engine testing.

Bartlett, C.S., *U.S. Air Force Arnold Engineering Development Center, Arnold Air Force Station, Tennessee. Report,* Oct. 1986, AEDC-TR-86-26, 107p., ADA-173 713, 16 refs. Also published as U.S. Federal Aviation Administration, Technical Center, Report, DOT/FAA/CT-86/35 (ADA-180 863).

Jet engines, Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Environmental tests, Cold weather tests

52-79

Determination of the local heat transfer characteristics on glaze ice accretions on a cylinder and a NACA airfoil.

Pais, M.R., Singh, S.N., *U.S. Air Force Wright Aeronautical Laboratories. Flight Dynamics Laboratory, Wright-Patterson AFB, OH. Report,* Apr. 1987, AFWAL-TR-87-3001, 66p., ADA-179 931, 54 refs. For Ph.D. thesis of same title see 43-345.

Aircraft icing, Ice accretion, Ice forecasting, Glaze, Ice heat flux, Heat transfer

52-80

Summary of artificial and natural icing tests conducted on U.S. Army aircraft from 1974 to 1985.

Chambers, H.W., Adams, J.Y., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Report,* July 1986, DOT/FAA/CT-85/26, 115p. + appends., ADA-173 764, 38 refs. Also published as U.S. Army Aviation Systems Command (USAAVSCOM), Report, TR-85-F-11.

Helicopters, Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Environmental tests, Cold weather tests

52-81

Assessment of data quality and quantity from airborne cloud physics projects from 1974 through 1984.

Jeck, R.K., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Report,* Dec. 1985, DOT/FAA/CT-85/37, 28p. + appends., ADA-168 282, Refs. p.21-28.

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Water content, Research projects, Meteorological data, Data processing

52-82

Analysis and verification of the icing scaling equations. Vol.I. Analysis and verification.

Ruff, G.A., *U.S. Air Force Arnold Engineering Development Center, Arnold Air Force Station, Tennessee. Report,* Nov. 1985, AEDC-TR-85-30, 77p., ADA-162 226, 20 refs.

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Environmental tests, Mathematical models

52-83

Study of aerospace materials, coatings, adhesions and processes: aircraft icing processes. 2nd volume: secondary aim.

Montiel Rodriguez, E., *European Office of Aerospace Research and Development, London, England. Report,* Sep. 1984, EOARD-TR-85-09(B), 38p. + appends., ADA-160 414, Some appendices in Spanish.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Cloud physics, Cloud droplets, Particle size distribution, Computer programs, Wind tunnels

52-84

Study of aerospace materials, coatings, adhesions and processes: aircraft icing processes. 1st volume: primary aim.

Montiel Rodriguez, E., *European Office of Aerospace Research and Development, London, England. Report,* Sep. 1984, EOARD-TR-85-09(A), 137p., ADA-160 413.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Cloud physics, Cloud droplets, Particle size distribution, Mathematical models, Computer programs

52-85

Some microphysical processes affecting aircraft icing—final report.

Sweeney, H.J., Cohen, I.D., *U.S. Air Force Geophysics Laboratory, Hanscom AFB, MA. Report,* May 1985, AFGL-TR-85-0100, 37p., ADA-160 375, 23 refs.

Aircraft icing, Ice accretion, Icing rate, Ice forecasting, Cloud physics, Cloud droplets, Particle size distribution

52-86

Limited artificial and natural icing tests of the External Stores Support System (ESSS) installed on a UH-60A aircraft.

Hanks, M.L., Woratschek, R., *U.S. Army Aviation Engineering Flight Activity, Edwards AFB, CA. USAAEFA Project,* June 1984, No.83-22, 56p., ADA-156 263, 9 refs.

Helicopters, Military equipment, Aircraft icing, Ice accretion, Ice loads, Cold weather tests

52-87

Artificial and natural icing tests: YEH-60A Quick Fix Helicopter.

Tavares, E.J., Hanks, M.L., Sullivan, P.G., Woratschek, R., *U.S. Army Aviation Engineering Flight Activity, Edwards AFB, CA. USAAEFA Project,* June 1984, No.83-21, 82p., ADA-155 147, 10 refs.

Helicopters, Military equipment, Aircraft icing, Ice accretion, Ice loads, Cold weather tests

52-88

Comparison of icing cloud instruments for 1982-1983 icing season flight program.

Ide, R.F., Richter, G.P., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1984, NASA-TM-83569, 13p. + tables and figs., ADA-147 882, 7 refs. Prepared for the 22nd Aerospace Sciences Meeting, Reno, NV, Jan. 9-12, 1984, sponsored by the American Institute of Aeronautics and Astronautics.

Aircraft icing, Ice detection, Ice forecasting, Cloud physics, Cloud droplets, Particle size distribution, Water content, Moisture detection

52-89

Initial feasibility ground test of a proposed photogrammetric system for measuring the shapes of ice accretions on helicopter rotor blades during foreward flight.

Palko, R.L., Cassady, P.L., McKnight, R.C., Freedman, R.J., *U.S. Air Force Arnold Engineering Development Center. Arnold Air Force Station, Tennessee. Report,* Aug. 1984, AEDC-TR-84-10, 43p., ADA-146 051, 1 ref.

Helicopters, Aircraft icing, Ice accretion, Ice detection, Photogrammetry

52-90

Model cloud relationships.

Cotton, W.R., et al, *U.S. Air force Geophysics Laboratory, Hanscom AFB, MA. Report,* Oct. 1983, AFGL-TR-84-0028, 148p., ADA-142 690, 45 refs.

Aircraft icing, Ice detection, Ice forecasting, Cloud physics, Water content, Moisture detection, Precipitation (meteorology), Snow pellets, Weather forecasting, Mathematical models, Computerized simulation

52-91

Study of aerospace materials, coatings, adhesions and processes: aircraft icing processes.

Montiel Rodriguez, E., *European Office of Aerospace Research and Development, London, England. Report,* Sep. 1983, EOARD-TR-84-11, 178p., ADA-139 743, 33 refs. Some appendices are in Spanish.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Cloud physics, Cloud droplets, Particle size distribution, Mathematical models, Computer programs

52-92

New data base of supercooled cloud variables for altitudes up to 10,000 feet AGL and the implications for low altitude aircraft icing.

Jeck, R.K., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Report,* Aug. 1983, DOT/FAA/CT-83/21, 66p. + appends., ADA-137 589, 21 refs.

Helicopters, Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Unfrozen water content, Cloud droplets, Particle size distribution, Meteorological data, Data processing, Safety

52-93

Comparison of liquid water content measurements obtained from a Johnson-Williams liquid water content probe and a PMS axial scattering spectrometer probe.

Glass, M., *U.S. Air Force Geophysics Laboratory, Hanscom AFB, MA. Report,* Jan. 1984, AFGL-TR-84-0002, p.92-96, ADA-137 276, 7 refs. Presented at the Cloud Particle Measurement Symposium, Boulder, CO, May 4-7, 1982.

Aircraft icing, Ice forecasting, Cloud physics, Water content, Moisture detection, Meteorological instruments

52-94

Review and assessment of USAF and U.S. Army (HISS) artificial icing cloud studies. Final report.

Ji, H.C., Mirkhani, M.R., Shapouri, S., Schwartz, S.H., *U.S. Air Force Flight Test Center, Edwards AFB, CA. Report,* Mar. 1983, AFFTC-TIM-83-2, 62p., ADA-135 717, 6 refs.

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Environmental tests

52-95

Preliminary study for the modeling of an artificial icing cloud. Final report.

Epstein, M., Moini, S., Thielman, G., Vilja, J., *U.S. Air Force Flight Test Center, Edwards AFB, CA. Report,* Aug. 1983, AFFTC-TIM-83-4, 48p., ADA-135 717, 10 refs.

Aircraft icing, Ice accretion, Ice forecasting, Supercooled clouds, Cloud physics, Cloud droplets, Particle size distribution, Environmental tests, Mathematical models

52-96

Steady-state thermal model for analysis of incipient icing on an airfoil leading edge.

Fergus, J.L., Jr., *U.S. Air Force Systems Command. Arnold Air Force Station, Tennessee. Arnold Engineering Development Center. Report,* July 1983, AEDC-TR-83-2, 67p., ADA-131 207, 13 refs.

Aircraft icing, Ice formation, Ice accretion, Ice forecasting, Cloud physics, Water content, Thermal analysis, Computerized simulation

52-97

Cloud liquid water content measuring equipment for the Nomad N24 aircraft flight icing trials of 1978-1979.

Skidmore, F.W., Pearce, G.F., *Australia. Department of Defence Support. Defence Science and Technology Organization. Aeronautical Research Laboratories, Melbourne. ARL mechanical engineering note,* Sep. 1981, No.391, 16p., ADA-130 970, 10 refs.

Aircraft icing, Ice detection, Ice forecasting, Cloud physics, Water content, Moisture detection, Meteorological instruments, Cold weather tests

52-98

New characterization of supercooled clouds below 10,000 feet AGL. Final report.

Masters, C.O., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Report,* June 1983, DOT/FAA/CT-83/22, 21p. + appends., ADA-130 946, 8 refs.

Helicopters, Aircraft icing, Ice forecasting, Cold weather performance, Design criteria, Supercooled clouds, Unfrozen water content, Meteorological data, Data processing, Weather forecasting

52-99

Preliminary results of the AFGL icing study.

Cohen, I.D., *U.S. Air Force Geophysics Laboratory, Hanscom AFB, MA. Report,* June 1983, AFGL-TR-83-0147, p.79-84, ADA-129 843, 11 refs. Reprinted from the preprint volume of extended abstracts of the 9th Conference on Aerospace and Aeronautical Meteorology, Omaha, NE, June 6-9, 1983, published by the American Meteorological Society, Boston, MA.

Aircraft icing, Ice detection, Ice forecasting, Cloud physics, Weather forecasting

52-100

Limited artificial and natural icing test of the OV-1D (re-evaluation).

Carpenter, R.B., Ward, R.N., Robbins, R.D., *U.S. Army Aviation Engineering Flight Activity. USAAEFA Project,* June 1982, No.81-21, 70p., ADA-127 191, 4 refs.

Jet engines, Propellers, Military equipment, Aircraft icing, Ice accretion, Ice loads, Ice prevention, Cold weather tests

52-101

Artificial and natural icing test of the YCH-47D.

Adam, C.F., Bowers, F.J., III, Abbott, W.Y., *U.S. Army Aviation Engineering Flight Activity. USAAEFA Project,* July 1981, No.79-07, 84p., ADA-122 964, 9 refs.

Helicopters, Military equipment, Aircraft icing, Ice loads, Cold weather tests, Safety

52-102

UH-60A light icing envelope evaluation with the blade deicing kit installed but inoperative.

Robbins, R.D., Dieckmann, V.L., *U.S. Army Aviation Engineering Flight Activity. USAAEFA Project,* June 1982, No.81-18, 49p., ADA-125 630, 9 refs.

Helicopters, Military equipment, Aircraft icing, Ice loads, Cold weather tests, Safety

52-103

Manufacture of a hot wire target element for a cloud liquid water content meter.

Repacholi, N.J., *Australia. Department of Defence. Defence Science and Technology Organisation. Aeronautical Research Laboratories. Mechanical engineering technical memorandum,* Mar. 1982, No.412, 19p., ADA-122 111, 4 refs.

Aircraft icing, Ice formation indicators, Ice detection, Ice forecasting, Cloud physics, Water content, Meteorological instruments, Moisture detection, Anemometers

52-104

Isolation and characterization of a marine ice-nucleating bacterium, *Pseudomonas* sp. KUIN-5, which produces cellulose and secretes it in the culture broth.

Kawahara, H., Ikugawa, H., Obata, H., *Bioscience, biotechnology, and biochemistry,* Sep. 1996, 60(9), p.1474-1478, 15 refs.

Microbiology, Marine biology, Bacteria, Growth, Cold tolerance, Classifications, Ice formation, Heterogeneous nucleation, Polymers, Solutions, Salt water, Low temperature tests

52-105

Ice nucleus production of *Fusarium moniliforme* var. *subglutinans* in relation to its growth characteristics.

Yanai, H., Tsumuki, H., Konno, H., Maeda, T., *Bioscience, biotechnology, and biochemistry,* Sep. 1996, 60(9), p.1516-1518, 17 refs.

Ice physics, Bacteria, Microbiology, Growth, Solutions, Heterogeneous nucleation, Ice nuclei, Ice formation, Artificial nucleation, Chemical analysis, Temperature effects

52-106

Production of low-salt soy sauce with enriched flavor by freeze concentration using bacterial ice nucleation activity.

Watanabe, M., Tesaki, S., Arai, S., *Bioscience, biotechnology, and biochemistry,* Sep. 1996, 60(9), p.1519-1521, 10 refs.

Microbiology, Bacteria, Frozen liquids, Ice water interface, Ice crystal growth, Heterogeneous nucleation, Salinity, Diffusion, Hygroscopic water, Chemical analysis, Low temperature tests

52-107

No evidence for interspecific interactions between plants in the first stage of succession on coastal dunes in subarctic Quebec, Canada.

Houle, G., *Canadian journal of botany,* June 1997, 75(6), p.902-915, With French summary. 54 refs.

Plant ecology, Revegetation, Subarctic landscapes, Shores, Biomass, Grasses, Vegetation patterns, Soil chemistry, Sands, Substrates, Sampling, Statistical analysis, Canada—Quebec

52-108

Classification of meteorological conditions to assess the potential for concrete frost formation in boreal forest floors.

Proulx, S., Stein, J., *Canadian journal of forest research,* June 1997, 27(6), p.953-958, With French summary. 35 refs.

Forest soils, Organic soils, Soil freezing, Snow hydrology, Snowmelt, Seepage, Frost action, Classifications, Meteorological factors, Seasonal variations

52-109

Temperature effects on the creep and dynamic behaviors of Kevlar prestressing cables.

Kaci, S., Khennane, A., *Canadian journal of civil engineering,* June 1997, 24(3), p.431-437, With French summary. 9 refs.

Cables (ropes), Construction materials, Reinforced concretes, Synthetic materials, Composite materials, Creep, Low temperature tests, Temperature effects, Strain tests, Tensile properties

52-110

FT-IR spectroscopic monitoring of alkali metal disulfite and hydrogensulfite in freeze-concentrated and glassy aqueous solution. Implications for atmospheric chemistry.

Pichler, A., Fleissner, G., Hallbrucker, A., Mayer, E., *Journal of molecular structure,* June 1, 1997, Vol.408-409, European Congress on Molecular Spectroscopy, 23rd, Balatonfüred, Hungary, Aug. 25-30, 1996. Proceedings. Molecular spectroscopy and molecular structure 1996, p.521-525, 11 refs.

Solutions, Frozen liquids, Liquid cooling, Ice spectroscopy, Aerosols, Ice formation, Condensation, Chemical properties, Atmospheric composition, Simulation, Temperature effects

52-111

CO-water interactions in argon matrices and in porous ices.

Loewenschuss, A., Givan, A., Nielsen, C.J., *Journal of molecular structure,* June 1, 1997, Vol.408-409, European Congress on Molecular Spectroscopy, 23rd, Balatonfüred, Hungary, Aug. 25-30, 1996. Proceedings. Molecular spectroscopy and molecular structure 1996, p.533-537, 9 refs.

Ice physics, Solutions, Ice vapor interface, Porosity, Ice spectroscopy, Infrared spectroscopy, Spectra, Ice structure, Molecular structure

52-112

Chronology of speleothem deposition in northern Yukon and its relationships to permafrost.

Lauriol, B., Ford, D.C., Cinq-Mars, J., Morris, W.A., *Canadian journal of earth sciences,* July 1997, 34(7), p.902-911, With French summary. Refs. p.910-911.

Pleistocene, Geochronology, Caves, Karst, Geologic processes, Sedimentation, Permafrost indicators, Permafrost origin, Palynology, Isotope analysis, Canada—Yukon Territory

52-113

Cryostratigraphy, paleogeography, and climate change during the early Holocene warm interval, western arctic coast, Canada.

Burn, C.R., *Canadian journal of earth sciences,* July 1997, 34(7), p.912-925, With French summary. Refs. p.923-925.

Paleobotany, Paleoecology, Paleoclimatology, Climatic changes, Forest lines, Permafrost transformation, Thermokarst development, Active layer, Stratigraphy, Shoreline modification, Radioactive age determination, Geochronology, Canada—Northwest Territories—Mackenzie Delta

52-114

Late-glacial climate and ecology of a kettle section at Brampton, Ontario, Canada, as determined from fossil Coleoptera.

Motz, J.E., Morgan, A.V., *Canadian journal of earth sciences,* July 1997, 34(7), p.926-934, With French summary. 38 refs.

Paleoclimatology, Paleoecology, Glacial geology, Glacial deposits, Lacustrine deposits, Stratigraphy, Profiles, Radioactive age determination, Fossils, Classifications, Canada—Ontario—Brampton

52-115

Numerical simulation of permafrost evolution as a part of sedimentary basin modeling: permafrost in the Pliocene-Holocene climate history of the Urengoy field in the West Siberian basin.

Galushkin, Y., *Canadian journal of earth sciences,* July 1997, 34(7), p.935-948, With French summary. 59 refs.

Pleistocene, Permafrost origin, Permafrost transformation, Paleoclimatology, Frozen rock temperature, Lithology, Thermal regime, Sedimentation, Correlation, Permafrost thermal properties, Computerized simulation, Russia—Siberia

52-116

Style, controls, and timing of fold-and-thrust deformation of the Jago stock, northeastern Brooks Range, Alaska.

Peapples, P.R., Wallace, W.K., Hanks, C.L., O'Sullivan, P.B., Layer, P.W., *Canadian journal of earth sciences,* July 1997, 34(7), p.992-1007, With French summary. 38 refs.

Pleistocene, Tectonics, Subpolar regions, Deformation, Sedimentation, Stratigraphy, Shear strain, Geochronology, Isotope analysis, United States—Alaska—Brooks Range

52-117

Sedimentological responses to basin initiation in the Devonian of East Greenland.

Marshall, J.E.A., Stephenson, B.J., *Sedimentology,* June 1997, 44(3), p.407-419, 25 refs.

Pleistocene, Subpolar regions, Tectonics, Sedimentation, Stratigraphy, Lacustrine deposits, Water level, Greenland

52-118

Early Cambrian braid-delta deposits, MacKenzie Mountains, north-western Canada.

MacNaughton, R.B., Dalrymple, R.W., Narbonne, G.M., *Sedimentology,* Aug. 1997, 44(4), p.587-609, Refs. p.607-609.

Pleistocene, Subarctic landscapes, Geological surveys, Sedimentation, Stratigraphy, Lithology, Classifications, Deltas, Geomorphology, Canada—Northwest Territories—Mackenzie Mountains

52-119

Study of wave-iceberg load combination factors.

Foschi, R., Isaacson, M., International Offshore and Polar Engineering Conference, 6th, Los Angeles, CA, May 26-31, 1996. Proceedings. Vol.3. Edited by J.S. Chung, M. Olagnon and C.H. Kim, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1996, p.278-285, 19 refs.

DLC TC1665.I5793a 6th v.3 1996

Hydrodynamics, Icebergs, Offshore structures, Loads (forces), Computer programs, Ice solid interface, Water waves, Models

52-120

Model for the propagation of waves through the MIZ from a single floe solution.

Meylan, M.H., Fox, C., International Offshore and Polar Engineering Conference, 6th, Los Angeles, CA, May 26-31, 1996. Proceedings. Vol.3. Edited by J.S. Chung, M. Olagnon and C.H. Kim, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1996, p.321-327, 17 refs.

DLC TC1665.I5793a 6th v.3 1996

Sea ice, Wave propagation, Ice edge, Ice cover, Mathematical models, Spectra, Scattering

52-121

Proceedings of the Sixth (1996) International Offshore and Polar Engineering Conference. Vol.4.

International Offshore and Polar Engineering Conference, 6th, Los Angeles, CA, May 26-31, 1996, Dos Santos, J.F., ed, Langen, I., ed, Ueda, Y., ed, Puthli, R.S., ed, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1996, 587p., For selected papers see 52-122 through 52-125.

DLC TC1665.I5793a 6th v.4 1996

Construction materials, Reinforced concretes, Cold weather performance, Polymers, Steels, Fatigue (materials), Joints (junctions)

52-122

Fatigue life estimation of tubular joint of offshore fixed platform under ice loads.

Xu, F.Y., Fang, H.C., International Offshore and Polar Engineering Conference, 6th, Los Angeles, CA, May 26-31, 1996. Proceedings. Vol.4. Edited by J.F. Dos Santos, I. Langen, Y. Ueda and R.S. Puthli, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1996, p.86-89, 4 refs.

DLC TC1665.I5793a 6th v.4 1996

Ice loads, Fatigue (materials), Joints (junctions), Vibration, Ice solid interface, Crack propagation, Ice cover thickness, Offshore structures

52-123

Low temperature fracture behaviour of a super-duplex stainless steel (Zeron 100).

Humphreys, A.O., Li, X., Strangwood, M., Bowen, P., Spence, M.A., Warburton, G.R., International Offshore and Polar Engineering Conference, 6th, Los Angeles, CA, May 26-31, 1996. Proceedings. Vol.4. Edited by J.F. Dos Santos, I. Langen, Y. Ueda and R.S. Puthli, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1996, p.263-268, 11 refs.

DLC TC1665.I5793a 6th v.4 1996

Steels, Low temperature tests, Pipes (tubes), Microstructure, Fracturing, Cold weather performance

52-124

Use of recycled high density polyethylene fibers as secondary reinforcement in concrete subjected to severe environment.

Auchey, F.L., Dutta, P.K., MP 5006, International Offshore and Polar Engineering Conference, 6th, Los Angeles, CA, May 26-31, 1996. Proceedings. Vol.4. Edited by J.F. Dos Santos, I. Langen, Y. Ueda and R.S. Puthli, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1996, p.287-291, 9 refs.

DLC TC1665.I5793a 6th v.4 1996

Polymers, Construction materials, Concrete structures, Cold weather performance, Freeze thaw cycles, Cold weather tests, Reinforced concretes

52-125

Retrofitting and structural repair with advanced polymer matrix composite materials.

Arockiasamy, M., Dutta, P.K., MP 5007, International Offshore and Polar Engineering Conference, 6th, Los Angeles, CA, May 26-31, 1996. Proceedings. Vol.4. Edited by J.F. Dos Santos, I. Langen, Y. Ueda and R.S. Puthli, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1996, p.336-340, 28 refs.

DLC TC1665.I5793a 6th v.4 1996

Composite materials, Polymers, Construction materials, Flexural strength, Reinforced concretes

52-126

Relationships between IWC and polarimetric radar measurands at 94 and 220 GHz for hexagonal columns and plates.

Aydin, K., Tang, C.X., *Journal of atmospheric and oceanic technology,* Oct. 1997, 14(5), p.1055-1063, 31 refs.

Climatology, Cloud physics, Optical properties, Ice crystal optics, Ice crystal size, Radar echoes, Scattering, Water content, Polarization (waves), Simulation, Statistical analysis

52-127

Tracking of ice edges and ice floes by wavelet analysis of SAR images.

Liu, A.K., Martin, S., Kwok, R., *Journal of atmospheric and oceanic technology,* Oct. 1997, 14(5), p.1187-1198, 12 refs.

Remote sensing, Ice surveys, Sea ice distribution, Polynyas, Synthetic aperture radar, Backscattering, Radar tracking, Ice growth, Ice floes, Ice edge, Ice detection, Image processing

52-128

Transient climate change in the CSIRO coupled model with dynamic sea ice.

Gordon, H.B., O'Farrell, S.P., *Monthly weather review,* May 1997, 125(5), p.875-907, Refs. p.905-907.

Climatology, Climatic changes, Sea ice distribution, Greenhouse effect, Carbon dioxide, Ice cover effect, Mathematical models, Ice models, Air ice water interaction

The CSIRO coupled model has been used in a "transient" greenhouse experiment. This model contains atmospheric, oceanic, comprehensive sea-ice, and biospheric submodels. The model control run employed flux corrections and displayed only a small amount of cooling, mainly at high latitudes. The warming in the transient run had an asymmetrical response as seen in other coupled models, with the Northern Hemisphere (NH) warming more than the Southern Hemisphere (SH). In the control run the ice model gave realistic ice distributions at both poles, with the NH ice in particular displaying considerable interdecadal variability. In the transient run the ice amount decreased more in the NH than the SH. During the transient run there is a freshening of the surface salinity in the oceans at high latitudes. In the SH this is caused mainly by increases in precipitation over evaporation. (Auth. mod.)

52-129

Exploratory analysis of crop hail insurance data for evidence of cloud seeding effects in South Dakota.

Smith, P.L., Johnson, L.R., Priegnitz, D.L., Boe, B.A., Mielke, P.W., Jr., *Journal of applied meteorology,* May 1997, 36(5), p.463-473, 38 refs.

Climatology, Weather modification, Cloud seeding, Performance, Hail prevention, Damage, Statistical analysis, Correlation, Cost analysis, United States—South Dakota

52-130

Numerical simulation of dispersal of inert seeding material in Israel using a three-dimensional mesoscale model.

Levin, A., Krichak, S.O., Reisin, T., *Journal of applied meteorology,* May 1997, 36(5), p.474-484, 14 refs.

Climatology, Weather modification, Cloud seeding, Dispersions, Performance, Silver iodide, Ice nuclei, Artificial nucleation, Mathematical models, Simulation

52-131

Comments on "A reexamination of the formation of exhaust condensation trails by jet aircraft".

Schrader, M.L., Meyer, W.D., Weaver, C.L., *Journal of applied meteorology,* May 1997, 36(5), p.623-626, 8 refs. For pertinent paper see 50-1248.

Atmospheric physics, Condensation trails, Cloud physics, Water vapor, Jet engines, Models, Forecasting, Temperature effects, Accuracy

52-132

Theoretical and laboratory studies on the interaction of cosmic-ray particles with interstellar ices. II. Formation of atomic and molecular hydrogen in frozen organic molecules.

Kaiser, R.I., Eich, G., Gabrysch, A., Roessler, K., *Astrophysical journal,* July 20, 1997, 484(1)pt.1, p.487-498, 27 refs.

Ice physics, Extraterrestrial ice, Hydrocarbons, Gamma irradiation, Phase transformations, Ionization, Explosion effects, Molecular energy levels, Computerized simulation, Geochemistry, Ice spectroscopy

52-133

Temperate glacimarine varves: an example from Disenchantment Bay, southern Alaska.

Cowan, E.A., Cai, J.K., Powell, R.D., Clark, J.D., Pitcher, J.N., *Journal of sedimentary research A,* May 1997, 67(3), p.536-549, Refs. p.548-549.

Glacial geology, Marine deposits, Glacial deposits, Meltwater, Calving, Ice rafting, Estuaries, Ocean bottom, Sedimentation, Drill core analysis, Lithology, Radioactive age determination, United States—Alaska—Disenchantment Bay

52-134

Modification of clast shape in high-arctic glacial environments.

Bennett, M.R., Hambrey, M.J, Huddart, D., *Journal of sedimentary research A,* May 1997, 67(3), p.550-559, 40 refs.

Glacial geology, Subarctic landscapes, Valleys, Glacial deposits, Sediment transport, Lithology, Physical properties, Classifications, Sampling, Statistical analysis

52-135

Chemical and physical weathering of fluvial sands in an arctic environment: sands of the Sagavanirktok River, North Slope, Alaska.

Robinson, R.S., Johnsson, M.J., *Journal of sedimentary research A,* May 1997, 67(3), p.560-570, Refs. p.569-570.

River basins, Floodplains, Arctic landscapes, Sedimentation, Sands, Weathering, Sampling, Lithology, Chemical composition, Classifications, Statistical analysis, United States—Alaska—Sagavanirktok River

52-136

Lidar effective multiple-scattering coefficients in cirrus clouds.

Nicolas, F., Bissonnette, L.R., Flamant, P.H., *Applied optics,* May 20, 1997, 36(15), p.3458-3468, 29 refs.

Remote sensing, Probes, Cloud cover, Cloud physics, Optical properties, Lidar, Refractivity, Backscattering, Ice crystal optics, Statistical analysis, Models

52-137

Methods of calculating transport across the polar vortex edge.

Sobel, A.H., Plumb, R.A., Waugh, D.W., *Journal of the atmospheric sciences,* Sep. 15, 1997, 54(18), p.2241-2260, 43 refs.

Climatology, Polar atmospheres, Stratosphere, Air flow, Mass transfer, Atmospheric circulation, Advection, Atmospheric density, Meteorological data, Statistical analysis, Accuracy

52-138

Numerical simulation of three-dimensional unsteady flow past ice crystals.

Wang, P.K., Ji, W.S., *Journal of the atmospheric sciences,* Sep. 15, 1997, 54(18), p.2261-2274, 36 refs.

Cloud physics, Air flow, Hydrodynamics, Unsteady flow, Viscous flow, Friction, Ice vapor interface, Particles, Vapor diffusion, Ice crystal growth, Computerized simulation, Mathematical models

52-139

Interannual variability of the antarctic ozone hole in a GCM. Part I: the influence of tropospheric wave variability.

Shindell, D.T., Wong, S., Rind, D., *Journal of the atmospheric sciences,* Sep. 15, 1997, 54(18), p.2308-2319, 18 refs.

Climatology, Climatic changes, Polar atmospheres, Stratosphere, Air temperature, Chemical composition, Ozone, Degradation, Atmospheric circulation, Gravity waves, Seasonal variations, Models

To study the interannual variability of the antarctic ozone hole, a physically realistic parameterization of the chemistry responsible for severe polar ozone loss has been included in the GISS GCM. The ensuing ozone hole agrees well with observations, as do modeled surface UV increases of up to 42%. The presence of the ozone hole causes a reduction in lower stratospheric solar heating and an increase in upper stratospheric descent and dynamical heating in the model, as expected. However, both the degree of ozone depletion and the dynamical response exhibit large interannual variability. The results are in accord with observational studies showing a strong anticorrelation between the interannual variability of tropospheric wave forcing and of the antarctic ozone hole, suggesting that midwinter tropospheric wave energy may be the best predictor of the severity of the ozone hole the following spring. (Auth. mod.)

52-140

Cirrus cloud radiative and microphysical properties from ground observations and in situ measurements during FIRE 1991 and their application to exhibit problems in cirrus solar radiative transfer modeling.

Kinne, S., et al, *Journal of the atmospheric sciences,* Sep. 15, 1997, 54(18), p.2320-2344, 37 refs.

Climatology, Cloud physics, Optical properties, Solar radiation, Radiation balance, Sounding, Photometry, Ice crystal optics, Particle size distribution, Transmissivity, Models

52-141

Climatic and physiographic controls on wetland type and distribution in Manitoba, Canada.

Halsey, L., Vitt, D., Zoltai, S., *Wetlands,* June 1997, 17(2), p.243-262, Refs. p.261-262.

Wetlands, Distribution, Landscape types, Classifications, Geophysical surveys, Permafrost surveys, Permafrost transformation, Permafrost hydrology, Climatic factors, Statistical analysis, Canada—Manitoba

52-142

Spring and summer hydrology of a valley-bottom wetland, Ellesmere Island, Northwest Territories, Canada.

Glenn, M.S., Woo, M.K., *Wetlands,* June 1997, 17(2), p.321-329, 23 refs.

Wetlands, Arctic landscapes, Soil tests, Surface drainage, Hydrologic cycle, Valleys, Permafrost hydrology, Snowmelt, Runoff, Hydrogeochemistry, Seasonal variations, Canada—Northwest Territories—Ellesmere Island

52-143

Phase behavior of the supercooled aqueous solutions of dimethyl sulfoxide, ethylene glycol, and methanol as seen by dielectric spectroscopy.

Murthy, S.S.N., *Journal of physical chemistry B,* July 31, 1997, 101(31), p.6043-6049, 51 refs.

Solutions, Supercooling, Liquid cooling, Phase transformations, Dielectric properties, Low temperature tests, Stability, Enthalpy, Spectroscopy, Molecular energy levels

52-144

Case study of cloud seeding over Moscow on 9 May 1995.

Beliaev, V.P., et al, *Russian meteorology and hydrology,* 1996, No.5, p.47-55, Translated from Meteorologiia i gidrologiia. 5 refs.

Precipitation (meteorology), Weather modification, Cloud physics, Cloud seeding, Cloud dissipation, Silver iodide, Artificial nucleation, Performance, Russia—Moscow

52-145

Dates of ice phenomena on rivers in conditions of contemporary climate.

Soldatova, I.I., *Russian meteorology and hydrology,* 1996, No.4, p.55-62, Translated from Meteorologiia i gidrologiia. 7 refs.

Climatology, Climatic changes, River basins, River ice, Ice conditions, Freezeup, Ice breakup, Seasonal variations, Statistical analysis

52-146

Temperature inversions over the western Arctic from radiosonde data.

Zaitseva, N.A., Skony, S.M., Kahl, J.D., *Russian meteorology and hydrology,* 1996, No.6, p.6-17, Translated from Meteorologiia i gidrologiia. 27 refs.

Climatology, Marine atmospheres, Polar atmospheres, Atmospheric boundary layer, Air temperature, Radio echo soundings, Temperature inversions, Seasonal variations, Statistical analysis, Correlation, Arctic Ocean

52-147

Determination of saturated water vapor pressure in droplet-ice cloud by prognostic models.

Pressman, D.IA., *Russian meteorology and hydrology,* 1996, No.6, p.18-25, Translated from Meteorologiia i gidrologiia. 4 refs.

Climatology, Thermodynamics, Atmospheric pressure, Vapor pressure, Cloud physics, Cloud droplets, Ice crystal growth, Phase transformations, Ice vapor interface, Saturation, Mathematical models

52-148

Study of negative ozone anomaly in the East Siberian ozone maximum in winter and spring 1995.

Dorokhov, V.M., Potapova, T.E., Goutail, F., Pommereau, J.P., *Russian meteorology and hydrology,* 1996, No.6, p.42-49, Translated from Meteorologiia i gidrologiia. 15 refs.

Climatology, Subpolar regions, Atmospheric composition, Stratosphere, Aerosols, Degradation, Ozone, Seasonal variations, Spectroscopy, Russia—Siberia

52-149

Seasonal pycnocline splitting due to ice edge motion.

Golovin, P.N., Dmitrenko, I.A., Zatsepin, A.G., Krylov, A.D., *Russian meteorology and hydrology,* 1996, No.6, p.66-72, Translated from Meteorologiia i gidrologiia. 10 refs.

Oceanography, Sea ice, Drift, Ice edge, Ice water interface, Water flow, Turbulent flow, Turbulent exchange, Ice cover effect, Stratification, Seasonal variations

52-150

Long-term oscillations of river freezing and breakup dates in different geographical zones.

Ginzburg, B.M., Soldatova, I.I., *Russian meteorology and hydrology,* 1996, No.6, p.80-85, Translated from Meteorologiia i gidrologiia. 6 refs.

Climatology, River ice, Ice conditions, Freezeup, Ice breakup, Statistical analysis, Seasonal variations, Air temperature, Correlation

52-151

Wind wave transformation by ice cover in the northwestern Black Sea.

Bukatov, A.E., Zavialov, D.D., *Russian meteorology and hydrology,* 1996, No.3, p.57-66, Translated from Meteorologiia i gidrologiia. 11 refs.

Oceanography, Sea ice, Ice air interface, Water waves, Wave propagation, Oscillations, Turbulent boundary layer, Spectra, Stress concentration, Ice deformation, Ice cover effect, Mathematical models, Wind factors, Russia—Black Sea

52-152

Modeling the composition of liquid stratospheric aerosols.

Carslaw, K.S., Peter, T., Clegg, S.L., *Reviews of geophysics,* May 1997, 35(2), p.125-154, Refs. p.150-154.

Climatology, Atmospheric composition, Stratosphere, Aerosols, Gases, Solubility, Liquid phases, Polar stratospheric clouds, Cloud physics, Models, Thermodynamics, Temperature effects

52-153

Ozone variability in the high latitude summer stratosphere.

Natarajan, M., Callis, L.B., *Geophysical research letters,* May 15, 1997, 24(10), p.1191-1194, 6 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Ozone, Air flow, Distribution, Turbulent diffusion, Photochemical reactions, Models

52-154

Phase evolution of young sea ice.

Wettlaufer, J.S., Worster, M.G., Huppert, H.E., *Geophysical research letters,* May 15, 1997, 24(10), p.1251-1254, 23 refs.

Sea ice, Ice physics, Young ice, Phase transformations, Ice growth, Slush, Ice water interface, Brines, Drainage, Convection, Simulation

52-155

Recent observations of a spring-summer surface warming over the Arctic Ocean.

Martin, S., Munoz, E., Drucker, R., *Geophysical research letters,* May 15, 1997, 24(10), p.1259-1262, 11 refs.

Climatology, Oceanography, Marine atmospheres, Polar atmospheres, Air temperature, Surface temperature, Seasonal variations, Statistical analysis, Arctic Ocean

52-156

Glaciochemistry of polar ice cores: a review.

Legrand, M., Mayewski, P., *Reviews of geophysics,* Aug. 1997, 35(3), p.219-243, Refs. p.240-243.

Climatology, Air pollution, Glacier ice, Ice sheets, Ice cores, Drill core analysis, Aerosols, Snow impurities, Ice dating, Ion density (concentration), Profiles, Statistical analysis

This paper deals with the chemistry of polar ice focused on the soluble mineral and organic species and their interpretation in terms of past atmospheric composition. The authors discuss ice core dating, the difficulties connected with trace measurements, the significance of the ionic composition of snow, examine temporal and spatial variations in the ionic budget of the precipitation; and evaluate ice core studies in terms of the chemical composition of the past atmosphere. They review how Greenland and antarctic ice cores that span the last few centuries have provided information on the impact of human activities and how the chemistry of deep ice cores provides information on various past natural phenomena such as climatic variations. (Auth. mod.)

52-157

Phase transformations of micron-sized $H_2SO_4H_2O$ particles studied by infrared spectroscopy.

Martin, S.T., Salcedo, D., Molina, L.T., Molina, M.J., *Journal of physical chemistry B,* July 3, 1997, 101(27), p.5307-5313, 27 refs.

Solutions, Particles, Freezing, Drops (liquids), Phase transformations, Heterogeneous nucleation, Ice spectroscopy, Infrared spectroscopy, Atmospheric composition, Simulation, Spectra

52-158

Reconstruction of Windsor Bridge piers.

Pierce, P.C., Mieczkowski, J.J., Gannon, E.J., Korhonen, C.J., MP 5134, *Transportation research record,* Nov. 1996, No.1544, p.46-54, 8 refs.

Bridges, Piers, Protection, Shells, Design criteria, Freeze thaw cycles, Freeze thaw tests, Freezing points, Damage, Low temperature tests, Thermal analysis

52-159

Impact of concrete placing method on air content, air-void system parameters, and freeze-thaw durability.

Hover, K.C., Phares, R.J., *Transportation research record,* Sep. 1996, No.1532, p.1-8, 14 refs.

Concrete placing, Concrete durability, Concrete pavements, Pumps, Concrete admixtures, Mechanical properties, Air entrainment, Freeze thaw tests, Frost resistance

52-160

Effect of pumping on air characteristics of conventional concrete.

Lessard, M., Baalbaki, M., Aïtcin, P.C., *Transportation research record,* Sep. 1996, No.1532, p.9-14, 2 refs.

Concrete admixtures, Concrete pavements, Concrete placing, Pumps, Performance, Air entrainment, Freeze thaw cycles, Freeze thaw tests, Frost resistance, Mechanical tests

52-161

High dosage Type-C fly ash and limestone in sand-gravel concrete.

Abou-Zeid, M.N., Wojakowski, J.B., Cross, S.A., *Transportation research record,* Sep. 1996, No.1532, p.36-43, 13 refs.

Concrete admixtures, Concrete aggregates, Concrete durability, Frost resistance, Freeze thaw tests, Chemical composition, Physical properties, Degradation

52-162

Effect of aggregate contamination on concrete pavement durability.

Wojakowski, J., Hossain, M., *Transportation research record,* Sep. 1996, No.1532, p.44-50, 4 refs.

Concrete pavements, Concrete durability, Concrete admixtures, Concrete aggregates, Chemical properties, Impurities, Degradation, Freeze thaw tests, Frost resistance, Cold weather performance

52-163

Normal modes of an ice sheet.

Hindmarsh, R.C.A., *Journal of fluid mechanics,* Mar. 25, 1997, Vol.335, p.393-413, 26 refs.

Ice sheets, Ice mechanics, Ice cover thickness, Glacier flow, Oscillations, Profiles, Rheology, Mathematical models

52-164

Civil aircraft protection against ice (CAPRI).

Members of the CAPRI Consortium, European Commission Aeronautics Research Series. Publication EUR 15344 EN and Advances in onboard systems technology. Edited by A. del Core, Chichester, John Wiley & Sons, 1996, p.1-31.

DLC TL557.I3 A28

Aircraft icing, Research projects, Ice physics, Ice mechanics, Ice adhesion, Ice solid interface, Ice removal, Ice prevention, Protection, Models, Vibration, Instruments

52-165

Glacial and interglacial erosion in Scandinavian mountains in a W-E comparison including an approach to a quantitative calculation.

Rudberg, S., Frölunda, V., *Zeitschrift für Geomorphologie,* June 1997, 41(2), p.183-204, With German and French summaries. Refs. p.202-204.

Glacial geology, Glacial erosion, Geomorphology, Mountains, Mass transfer, Bedrock, Geological maps, Topographic maps, Valleys, Scandinavia

52-166

Aircraft carburettor icing studies.

Gardner, L., Moon, G., Canada. National Research Council. Mechanical engineering report LR-536, Ottawa, 1970, 33p., 8 refs.

DLC TJ1.M4197

Aircraft icing, Engines, Carburetors, Fuels, Antifreezes, Admixtures, Low temperature tests, Protective coatings, Polymers, Mechanical tests

52-167

Streamflow patterns in the alpine environment of North Boulder Creek, Colorado Front Range.

Caine, N., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.27-42, With German summary. 27 refs.

Watersheds, Alpine landscapes, Stream flow, Hydrography, Snow hydrology, Snowmelt, Runoff, Seasonal variations, Statistical analysis, Snow cover effect, United States—Colorado—Green Lakes Valley

52-168

On the characteristics and possible origins of ice in rock glacier permafrost.

Haeberli, W., Vonder Mühll, D., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.43-57, With German summary. Refs. p.55-57.

Geomorphology, Permafrost mass transfer, Permafrost thermal properties, Periglacial processes, Ice creep, Ground ice, Dielectric properties, Rock glaciers, Rock mechanics, Viscous flow, Supersaturation

52-169

Displacement measurements 1965-1994 on the rock glacier Macun 1 (Lower Engadine, Switzerland)—new results. [Bewegungsmessungen 1965-1994 am Blockgletscher Macun I (Unterengadin/Schweiz)—neue Ergebnisse]

Zick, W., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.59-71, In German with English and French summaries. 3 refs.

Periglacial processes, Rock glaciers, Surface structure, Topographic surveys, Rock mechanics, Mass transfer, Seasonal variations, Statistical analysis, Mechanical tests, Switzerland—Lower Engadine

52-170

Permafrost in the Zermatt—Gornergrat—Stockhorn area: distribution and permafrost related construction works. [Dauerfrostboden im Gebiet Zermatt—Gornergrat—Stockhorn: Verbreitung und permafrostbezogene Erschließungsarbeiten]

King, L., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.73-93, In German with English summary. 32 refs.

Alpine landscapes, Permafrost surveys, Permafrost distribution, Mountain soils, Geomorphology, Periglacial processes, Rock glaciers, Solifluction, Bedrock, Frost action, Topographic effects, Construction, Switzerland—Alps

52-171

To the history of the Lower Grindelwald Glacier during the last 2800 years—palaeosols, fossil wood and historical pictorial records—new results.

Holzhauser, H., Zumbühl, H.J., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.95-127, With German summary. Refs. p.125-127.

Mountain glaciers, Glacier oscillation, Glacial geology, Glacier surveys, Sediments, Paleoecology, Moraines, Radioactive age determination, Geochronology, History, Switzerland—Lower Grindelwald Glacier

52-172

Fluvial factor in the evolution of alpine valleys and of ice-marginal topography in Vorarlberg (W-Austria) during the Upper Pleistocene and Holocene.

De Graaff, L.W.S., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.129-159, With German summary. Refs. p.126-129.

Pleistocene, Geomorphology, Alpine landscapes, Glacial geology, Glacial erosion, Water erosion, Ice edge, Snow line, Valleys, Profiles, Paleoecology, Austria—Vorarlberg

52-173

Some geomorphological-hydrological aspects of rock glaciers in the Andes (San Juan, Argentina).

Schrott, L., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.161-173, With German summary. Refs. p.171-173.

Geomorphology, Alpine landscapes, Rock glaciers, Talus, Mass transfer, Periglacial processes, Permafrost hydrology, Ground thawing, Meltwater, Water storage, Frozen rock temperature, Argentina—Andes

52-174

Fossil cryogenic forms of southern South America. [Fossiler kryogener Formenschatz des südlichen Südamerika]

Trombotto, D., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.175-186, In German with English summary. 32 refs.

Paleoclimatology, Geomorphology, Geocryology, Periglacial processes, Solifluction, Stratigraphy, Altiplanation, Nivation, Quaternary deposits, Fossils, Classifications, South America

52-175

Extent of the last glaciation in the Bolivian Andes (Cordillera Real) and paleoclimatic implications.

Heine, K., *Zeitschrift für Geomorphologie,* May 1996, Suppl.104, p.187-202, With German summary. 31 refs.

Pleistocene, Geomorphology, Paleoclimatology, Air temperature, Alpine landscapes, Glaciation, Moraines, Classifications, Radioactive age determination, Geochronology, Correlation, Bolivia—Andes

52-176

Parallel computing and operational sea-ice forecasting.

Cook, J., NATO Advanced Research Workshop on High Performance Computing in the Geosciences, Les Houches, France, June 21-25, 1993. Proceedings. Edited by F.X. Le Dimet and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.462, Dordrecht, Kluwer Academic Publishers, 1995, p.107-113, 3 refs.

DLC QE48.8.H54

Oceanography, Sea ice distribution, Ice forecasting, Spacecraft, Synthetic aperture radar, Data processing, Computerized simulation, Computer programs, Computer applications, Image processing, Performance

52-177

Verification of the effectiveness of TMDs using wind tunnel section model tests.

Livesey, F., Søndergaard, T., *Journal of wind engineering and industrial aerodynamics,* Nov. 15, 1996, 64(2-3), BEATRICE Euroconference, 2nd, Villa Vigoni Loveno (CO), Italy, Sep. 6-9, 1995. Proceedings, p.161-170, 4 refs.

Bridges, Snow fences, Stability, Snow loads, Snow cover effect, Oscillations, Damping, Wind factors, Simulation, Wind tunnels, Design criteria, Mechanical tests

52-178

Detection of ice layers on road surfaces using a polarimetric millimeter wave sensor at 76GHz.

Finkele, R., *Electronics letters,* June 19, 1997, 33(13), p.1153-1154, 6 refs.

Road icing, Ice detection, Sensors, Wave propagation, Radio waves, Reflectivity, Polarization (waves), Ice dielectrics, Ice cover effect, Models

52-179

Effects of salt type on concrete scaling.

McDonald, D.B., Perenchio, W.F., *Concrete international,* July 1997, 19(7), p.23-26, 7 refs.

Concrete slabs, Concrete durability, Salting, Chemical properties, Ice removal, Corrosion, Degradation, Freeze thaw tests, Mechanical tests, Performance

52-180

Air-entrainment control or consequences.

Hulshizer, A.J., *Concrete international,* July 1997, 19(7), p.38-40, 11 refs.

Concrete structures, Concrete durability, Freeze thaw cycles, Frost resistance, Degradation, Concrete admixtures, Physical properties, Air entrainment, Bubbles, Specifications

52-181

Moisture accumulation and pore water pressures at base of pavements.

Eigenbrod, K.D., Kennepohl, G.J.A., *Transportation research record,* Nov. 1996, No.1546, p.151-161, 11 refs.

Bituminous concretes, Pavement bases, Concrete aggregates, Bearing strength, Ground thawing, Meltwater, Water pressure, Bearing strength, Gravel, Countermeasures, Mechanical tests

52-182

Vehicle traction performance on snowy and icy surfaces.

Lu, J.J., *Transportation research record,* Nov. 1996, No.1536, p.82-89, 22 refs.

Vehicles, Traction, Road icing, Cold weather performance, Tires, Ice solid interface, Rubber ice friction, Rubber snow friction, Mechanical tests

52-183

Deicers aid winter road maintenance. *Better roads,* Dec. 1996, 66(12), p.49-52.

Winter maintenance, Road maintenance, Ice control, Ice prevention, Salting, Classifications, Chemical composition, Cold weather performance, Cost analysis, Environmental protection

52-184

Mixing ratio of $CaCl_2$ and NaCl for effective deicer.

Iverson, D.L., McGraw, J.W., Mauritis, M., Jang, J.W., *Journal of materials in civil engineering.* May 1997, 9(2), p.62-64, 6 refs.

Road maintenance, Winter maintenance, Chemical ice prevention, Salting, Admixtures, Chemical composition, Solubility, Liquid phases, Freezing points, Cold weather tests, Cold weather performance, Temperature effects

52-185

Erratics in the Outback Nunataks of northern Victoria Land and their provenance.

Höfle, H.C., Henningsen, D., Vetter, U., *Geologisches Jahrbuch. Reihe B,* 1996, No.89, Polar Issue 6, German Antarctic North Victoria Land Expedition, GANOVEX: From Oates Coast to Marie Byrd Land. Edited by N.W. Roland, p.57-71, With German and Russian summaries. 7 refs. It is noted that the first author of this paper died before it was finished. Henningsen and Vetter completed the project on the basis of field work and a draft manuscript by Höfle.

Glacial geology, Ice sheets, Rocks, Antarctica—Outback Nunataks

Numerous erratics deposited by former ice sheets during glacial maxima were found on the Outback Nunataks in northwestern Victoria Land. Mapping of the small-scale erosional forms on glaciated bedrock surfaces at the sites where the erratics were found shows that the flow directions of the former ice sheet correspond approximately to those of present-day glaciers. The largest number of erratics in the best state of preservation occurs in the immediate vicinity of the present-day margin of the ice sheet on the lowest part of the Outback Nunataks. The number of erratics decreases markedly with increasing elevation; thus at the upper limit of their distribution only the most resistant rocks are found and these are relatively rare. The upper limit is 50-250 m above the present-day surface of the ice sheet. On the basis of detailed thin section study, the local erratics were distinguished from those transported from further away and, using the flow directions of the ice sheet, information was deduced about the origin of the erratics. (Auth.)

52-186

Aeromagnetic programme of GANOVEX VI - layout, execution, and data processing.

Damaske, D., *Geologisches Jahrbuch. Reihe B,* 1996, No.89, Polar Issue 6, German Antarctic North Victoria Land Expedition, GANOVEX: From Oates Coast to Marie Byrd Land. Edited by N.W. Roland, p.295-319, With German and Russian summaries. 21 refs.

Ice shelves, Magnetic surveys, Geomagnetism, Charts, Aerial surveys, Antarctica—Ross Ice Shelf, Antarctica—McMurdo Sound, Antarctica—Bowers Mountains

During the GANOVEX VI expedition an aeromagnetic program was conducted in two areas of the Ross Sea sector of Antarctica: one survey addressed the geotectonic problems of the Ross Sea depression in the area of the northwestern Ross Ice Shelf and McMurdo Sound, the other survey concentrated on the Bowers Mountains. The surveys were set up with a standard profile line spacing of 4.4 km and tie-line spacing of 22 km. Both surveys were flown at a constant altitude of 2000 ft over the ice shelf and sea ice areas and 9000 ft in the mountainous areas of northern Victoria Land. A fixed-wing aircraft carried the magnetometer and the navigation system. Besides the aircraft's standard Inertial Navigation System (INS), the Trident IV radio location system installed in the area was used for positioning the flight lines. McMurdo was the base for the southern survey and a field camp at Cape Williams was the base for the northern survey. A total of 16,400 km of survey lines were flown. After processing the data, maps of the anomalies of the total magnetic field were produced, covering nearly 45,000 km^2. (Auth. mod.)

52-187

Subice morphology deduced by radio echo soundings (RES) in the area between David and Mawson Glaciers, Victoria Land.

Damm, V., *Geologisches Jahrbuch. Reihe B,* 1996, No.89, Polar Issue 6, German Antarctic North Victoria Land Expedition, GANOVEX: From Oates Coast to Marie Byrd Land. Edited by N.W. Roland, p.321-331, With German and Russian summaries. 8 refs.

Radio echo soundings, Ice cover thickness, Aerial surveys, Seismic surveys, Subsurface investigations, Mapping, Antarctica—David Glacier, Antarctica—Mawson Glacier

Ice thicknesses in the area between David and Mawson Glaciers were measured by radio echo sounding (RES) during GANOVEX VII (1992-93) and the 9th Italian Antarctic Expedition (1993-94). The aim of these measurements was twofold: to obtain a map of the ice thicknesses and subice topography in the region for the ice thickness correction of gravity data; and to determine the subice relief along the ACRUP-1 seismic profile (Antarctic Crustal Profile 1). Details of this exploration and data collection by RES equipment are provided and discussed: the extent of the surveys, sub-ice morphology and topography, and the area of greatest ice thickness. (Auth. mod.)

52-188

Rapid method for gravity terrain corrections using a spreadsheet program, such as EXCEL© or LOTUS-123©.

Reitmayr, G., *Geologisches Jahrbuch. Reihe B,* 1996, No.89, Polar Issue 6, German Antarctic North Victoria Land Expedition, GANOVEX: From Oates Coast to Marie Byrd Land. Edited by N.W. Roland, p.333-342, With German and Russian summaries. 11 refs.

Gravimetric prospecting, Topographic surveys, Terrain identification, Computer programs, Antarctica—Victoria Land

A practical method was developed for the topographic correction of the gravimetric survey data obtained during the German expeditions in northern Victoria Land. The area with the measuring point in the center is divided into pie-shaped segments whose surface varies with distance from the center according to hyperbolic functions. The earth's surface has to be digitized at characteristic points along the radial side of each segment using a topographic map. The coordinates are entered in a preconfigured table of a spreadsheet program, such as Excel© or Lotus-123©. The gravity correction is immediately calculated and automatically entered into this table. The algorithm was also programmed in Basic so that the option of making linear changes in altitude along the radius of the segments is also available. (Auth.)

52-189

Gravity surveys in northern Victoria Land, Antarctica, during GANOVEX VI.

Reitmayr, G., Thierbach, R., *Geologisches Jahrbuch. Reihe B,* 1996, No.89, Polar Issue 6, German Antarctic North Victoria Land Expedition, GANOVEX: From Oates Coast to Marie Byrd Land. Edited by N.W. Roland, p.343-370, With German and Russian summaries. 22 refs.

Gravimetric prospecting, Radio echo soundings, Measuring instruments, Ice cover thickness, Antarctica—Williams, Cape, Antarctica—Terra Nova Bay

In 1990-91, measurements were made in the areas of Cape Williams and the Terra Nova Bay. At each measuring point, the coordinates were determined using the Global Positioning System (GPS). Owing to the conditions prevailing in the survey area, evaluation of the data required special corrections. A major source of error was the imprecise knowledge of ice thicknesses, especially lateral changes and errors in the topographic maps. A compilation of the empirical data and the values calculated from them are presented; the complete Bouguer and free-air gravity anomalies are represented on colored maps together with earlier data for the survey areas. The most conspicuous feature is a decrease by about 250 mGal in the Bouguer values from the Ross Sea coast to the inland part of Terra Nova Bay survey area. This is presumably an expression of the thickening of the continental crust inland from the Ross Sea. A similar gravity gradient does not appear in the Cape Williams area. (Auth. mod.)

52-190

Pressure dependence of Raman linewidths in ices VII and VIII.

Besson, J.M., Kobayashi, M., Nakai, T., Endo, S., Pruzan, P., *Physical review B,* May 1, 1997, 55(17), p.11,191-11,201, 39 refs.

Ice physics, Deuterium oxide ice, High pressure ice, Phase transformations, Vibration, Ice spectroscopy, Molecular structure, Latticed structures, Spectra, Backscattering, High pressure tests, Thermodynamic properties

52-191

H_2O hydrogen bonding in density-functional theory.

Hamann, D.R., *Physical review B,* Apr. 15, 1997, 55(16), p.R10,157-R10,160, 36 refs.

Ice physics, Ice models, Thermodynamic properties, Ice sublimation, Molecular structure, Orientation, Molecular energy levels, Hydrogen bonds, Mathematical models, Theories

52-192

Laboratory studies of angle- and polarization-dependent light scattering in sea ice.

Miller, D., Quinby-Hunt, M.S., Hunt, A.J., *Applied optics,* Feb. 20, 1997, 36(6), p.1278-1288, 29 refs.

Sea ice, Ice optics, Brines, Ice air interface, Refractivity, Light scattering, Polarization (waves), Physical properties, Remote sensing, Solar radiation, Simulation

52-193
Enrichment in specific soluble sugars of two eucalyptus cell-suspension cultures by various treatments enhances their frost tolerance via a noncolligative mechanism.
Travert, S., Valerio, L., Fourasté, I., Boudet, A.M., Teulières, C., *Plant physiology,* Aug. 1997, 114(4), p.1433-1442, 35 refs.
Plant physiology, Cryobiology, Trees (plants), Acclimatization, Frost resistance, Cold tolerance, Low temperature tests, Chemical properties, Simulation

52-194
Effect of cold acclimation on the lipid composition of the inner and outer membrane of the chloroplast envelope isolated from rye leaves.
Uemura, M., Steponkus, P.L., *Plant physiology,* Aug. 1997, 114(4), p.1493-1500, 38 refs.
Plant physiology, Frost resistance, Grasses, Plant tissues, Layers, Damage, Chemical properties, Acclimatization, Temperature effects

52-195
Reinvestigation of the interglacial pollen flora at Leveäniemi, Swedish Lapland.
Robertsson, A.M., *Boreas,* June 1997, 26(2), p.81-89, 42 refs.
Arctic landscapes, Organic soils, Glacial deposits, Paleoecology, Palynology, Quaternary deposits, Stratigraphy, Vegetation patterns, Sweden—Lapland

52-196
Holocene pollen stratigraphy and bog development in the western part of the Kola Peninsula, Russia.
Kremenetskiĭ, K.V., Vaschalova, T., Goriachkin, S., Cherkinskiĭ, A., Sulerzhitskiĭ, L., *Boreas,* June 1997, 26(2), p.91-102, 40 refs.
Arctic landscapes, Tundra terrain, Forest tundra, Quaternary deposits, Peat, Paleoecology, Forest lines, Vegetation patterns, Palynology, Stratigraphy, Radioactive age determination, Russia—Kola Peninsula

52-197
Lacustrine sedimentation and tectonics: an example from the Weichselian at Lønstrup Klint, Denmark.
Sadolin, M., Pedersen, G.K., Pedersen, S.A.S., *Boreas,* June 1997, 26(2), p.113-126, 27 refs.
Pleistocene, Glaciation, Glacial geology, Quaternary deposits, Sedimentation, Lacustrine deposits, Tectonics, Stratigraphy, Geochronology, Denmark—Lønstrup Klint

52-198
Structure and rhythmic pattern of glaciofluvial deposits north of Lake Vänern, south-central Sweden.
Lundqvist, J., *Boreas,* June 1997, 26(2), p.127-140, 50 refs.
Pleistocene, Quaternary deposits, Moraines, Classifications, Glacier flow, Glacial deposits, Glacial geology, Sedimentation, Glacier oscillation, Sweden—Vänern, Lake

52-199
Quantitative study of the distributary braidplain of the Preboreal ice-contact Gardermoen delta complex, southeastern Norway.
Tuttle, K.J., Østmo, S.R., Andersen, B.G., *Boreas,* June 1997, 26(2), p.141-156, Refs. p.154-156.
Subarctic landscapes, Geomorphology, Glacial geology, Glacier ablation, Deltas, Quaternary deposits, Meltwater, Water erosion, Sedimentation, Stratigraphy, Lithology, Norway—Gardermoen Delta

52-200
Thermal conductivity of granular materials relevant to the thermal evolution of cometary nuclei.
Shirono, S., Yamamoto, T., *Planetary and space science,* July 1997, 45(7), p.827-834, 22 refs.
Extraterrestrial ice, Ice physics, Amorphous ice, Porous materials, Ice thermal properties, Thermal conductivity, Temperature variations, Mathematical models

52-201
Ion irradiation and extended CO emission in cometary comae.
Brucato, J.R., Castorina, A.C., Palumbo, M.E., Satorre, M.A., Strazzulla, G., *Planetary and space science,* July 1997, 45(7), p.835-840, 34 refs.
Extraterrestrial ice, Cosmic dust, Carbon dioxide, Ice physics, Ice spectroscopy, Infrared spectroscopy, Ionization, Spectra, Ice sublimation, Organic nuclei, Geochemistry

52-202
Effects of slow and rapid warming on the cryopreservation of marine microalgae.
Cañavate, J.P., Lubian, L.M., *Cryobiology,* Sep. 1997, 35(2), p.143-149, 19 refs.
Cryobiology, Preserving, Marine biology, Algae, Viability, Frozen liquids, Thawing, Cooling rate, Temperature variations, Laboratory techniques

52-203
New light on the Holocene shore displacement curve on Lista, the southernmost part of Norway. Based primarily on Professor Ulf Hafsten's material from 1955-1957 and 1966.
Prøsch-Danielsen, L., *Norsk geografisk tidsskrift,* June 1997, 51(2), p.83-101, 52 refs.
Subarctic landscapes, Geomorphology, Shoreline modification, Landscape development, Sea level, Paleoecology, Palynology, Quaternary deposits, Stratigraphy, Radioactive age determination, Statistical analysis, Norway—Lista

52-204
Local climates simulated by two generations of Canadian GCM land surface schemes.
Verseghy, D.L., *Atmosphere-ocean,* Sep. 1996, 34(3), p.435-456, With French summary. 12 refs.
Climatology, Models, Simulation, Soil physics, Tundra climate, Soil freezing, Soil air interface, Surface temperature, Heat balance, Heat flux, Diurnal variations, Vegetation factors, Canada

52-205
Thickness and ridging of pack-ice causing difficult shipping conditions in the Beaufort Sea, summer 1991.
Melling, H., Riedel, D.A., *Atmosphere-ocean,* Sep. 1996, 34(3), p.457-487, With French summary. 27 refs.
Oceanography, Ice surveys, Sea ice distribution, Pack ice, Ice cover thickness, Pressure ridges, Acoustic measurement, Moorings, Profiles, Topographic features, Statistical analysis, Seasonal variations, Beaufort Sea

52-206
Small icebergs and iceberg fragments off Newfoundland: relationships to deterioration mechanisms and the regional iceberg population.
Marko, J.R., *Atmosphere-ocean,* Sep. 1996, 34(3), p.549-579, With French summary. 29 refs.
Oceanography, Sea ice distribution, Icebergs, Classifications, Ice volume, Cracking (fracturing), Ice deterioration, Ice water interface, Seasonal variations, Statistical analysis, Canada—Newfoundland

52-207
Two decades of tenacity.
Cottrill, A., *Offshore engineer,* Sep. 1997, p.30-36.
Crude oil, Offshore drilling, Offshore structures, Modular construction, Pile structures, Icebergs, Protection, Cost analysis, Economic development

52-208
Design challenge with teeth.
Cottrill, A., *Offshore engineer,* Sep. 1997, p.38-40.
Offshore structures, Offshore drilling, Pile structures, Modular construction, Walls, Protection, Icebergs, Fracture zones, Protection, Ice solid interface, Design criteria

52-209
Slipping to success on GBS.
Cottrill, A., *Offshore engineer,* Sep. 1997, p.43-48.
Crude oil, Economic development, Offshore structures, Pile structures, Concrete structures, Walls, Modular construction, Concrete placing, Icebergs, Protection

52-210
Ice winter of 1995/96 on the German coasts between Ems and Oder, with a survey of the entire Baltic area.
Strübing, K., *Deutsche Hydrographische Zeitschrift,* 1996, 48(1), p.73-87, 7 refs.
Oceanography, Shores, Air temperature, Freezeup, Ice conditions, Sea ice distribution, Ice surveys, Seasonal variations, Baltic Sea

52-211
Ice conditions in Zalew Szczecinski (Stettiner Haff) and in Zatoka Pomorska (Pomeranian Bight) during the winter of 1995/96.
Schmelzer, N., Sztobryn, M., Stanisławczyk, I., *Deutsche Hydrographische Zeitschrift,* 1996, 48(1), p.89-95.
Oceanography, Sea ice distribution, Ice conditions, Ice cover thickness, Seasonal variations, Air temperature, Wind factors, Baltic Sea

52-212
CASP II and the Canadian cyclones during the 1989-92 cold seasons.
Gyakum, J.R., Zhang, D.L., Witte, J., Thomas, K., Wintels, W., *Atmosphere-ocean,* Mar. 1996, 34(1), p.1-16, With French summary. 20 refs.
Synoptic meteorology, Climatology, Subpolar regions, Storms, Atmospheric circulation, Atmospheric pressure, Seasonal variations, Statistical analysis, Classifications

52-213
Multiscale analysis of a case of slow growth/rapid cyclogenesis during CASP II.
Gyakum, J.R., Stewart, R.E., *Atmosphere-ocean,* Mar. 1996, 34(1), p.17-50, With French summary. 24 refs.
Climatology, Synoptic meteorology, Subpolar regions, Storms, Marine atmospheres, Atmospheric circulation, Atmospheric pressure, Fronts (meteorology), Sounding

52-214
Life cycle of the intense IOP-14 storm during CASP II. Part I: analysis and simulations.
Huo, Z.H., Zhang, D.L., Gyakum, J., *Atmosphere-ocean,* Mar. 1996, 34(1), p.51-80, With French summary. 25 refs.
Synoptic meteorology, Climatology, Subpolar regions, Fronts (meteorology), Storms, Atmospheric disturbances, Advection, Mathematical models, Simulation, Remote sensing

52-215
Life cycle of the intense IOP-14 storm during CASP II. Part II: sensitivity experiments.
Huo, Z.H., Zhang, D.L., Gyakum, J., *Atmosphere-ocean,* Mar. 1996, 34(1), p.81-102, With French summary. 30 refs.
Synoptic meteorology, Climatology, Subpolar regions, Marine meteorology, Storms, Classifications, Atmospheric pressure, Heat flux, Topographic effects, Weather forecasting, Simulation

52-216
Warm frontal structure in association with a rapidly deepening extratropical cyclone.
Hudak, D.R., Stewart, R.E., Thomson, A.D., List, R., *Atmosphere-ocean,* Mar. 1996, 34(1), p.103-132, With French summary. 31 refs.
Synoptic meteorology, Climatology, Storms, Subpolar regions, Marine meteorology, Fronts (meteorology), Snowfall, Ice detection, Ice crystal structure, Coalescence, Freezing points, Radar echoes, Reflectivity

52-217
Horizontal aircraft passes across 0°C regions within winter storms.
Stewart, R.E., Crawford, R.W., Szeto, K.K., Hudak, D.R., *Atmosphere-ocean,* Mar. 1996, 34(1), p.133-159, With French summary. 27 refs.
Synoptic meteorology, Air temperature, Subpolar regions, Storms, Fronts (meteorology), Aerial surveys, Temperature measurement, Freezing points, Probes, Ice detection, Ice melting, Thermodynamics

52-218
Airborne surveys of the atmospheric boundary layer above the marginal ice zone on the Newfoundland Shelf.
Smith, P.C., MacPherson, J.I., *Atmosphere-ocean,* Mar. 1996, 34(1), p.161-184, With French summary. 16 refs.
Climatology, Marine atmospheres, Ice shelves, Atmospheric boundary layer, Aerial surveys, Sounding, Profiles, Turbulent flow, Temperature inversions, Ice air interface, Ice cover effect, Canada—Newfoundland

52-219
Comparison of airborne electromagnetic ice thickness data with NOAA/AVHRR and ERS-1/SAR images.
Prinsenberg, S.J., Peterson, I.K., Holladay, S., *Atmosphere-ocean,* Mar. 1996, 34(1), p.185-205, With French summary. 11 refs.
Oceanography, Ice surveys, Remote sensing, Aerial surveys, Pack ice, Spaceborne photography, Sounding, Lasers, Ice cover thickness, Snow depth, Sensor mapping, Correlation

52-220
Comparison of Canadian daily ice charts with surface observations off Newfoundland, winter 1992.
Carrieres, T., Greenan, B., Prinsenberg, S., Peterson, I.K., *Atmosphere-ocean,* Mar. 1996, 34(1), p.207-226, With French summary. 19 refs.
Oceanography, Ice surveys, Ice forecasting, Sea ice distribution, Drift, Ice cover thickness, Charts, Radio beacons, Wind velocity, Correlation, Accuracy, Canada—Newfoundland

52-221
Current meter observations from the Labrador and Newfoundland shelves and comparisons with barotropic model predictions and IIP surface currents.
Narayanan, S., Prinsenberg, S., Smith, P.C., *Atmosphere-ocean,* Mar. 1996, 34(1), p.227-255, With French summary. 19 refs.
Oceanographic surveys, Subpolar regions, Ocean currents, Hydrography, Velocity measurement, Boundary layer, Air water interactions, Wind factors, Statistical analysis, Seasonal variations, Models, Labrador Sea, Canada—Newfoundland

52-222
Surface winds during an intense outbreak of arctic air in southwestern British Columbia.
Jackson, P.L, *Atmosphere-ocean,* June 1996, 34(2), p.285-311, With French summary. 21 refs.
Climatology, Synoptic meteorology, Wind (meteorology), Atmospheric disturbances, Polar atmospheres, Atmospheric boundary layer, Wind velocity, Atmospheric pressure, Hydraulics, Topographic effects, Models, Canada—British Columbia

52-223
Anomalous sea-ice extent in Hudson Bay, Baffin Bay and the Labrador Sea during three simultaneous NAO and ENSO episodes.
Mysak, L.A., Ingram, R.G., Wang, J., Van der Baaren, A., *Atmosphere-ocean,* June 1996, 34(2), p.313-343, With French summary. Refs. p.341-343.
Climatology, Marine atmospheres, Sea ice distribution, Ice conditions, Ice edge, Atmospheric circulation, Air ice water interaction, Atmospheric pressure, Surface temperature, Seasonal variations, Statistical analysis, Labrador Sea, Canada—Hudson Bay, Baffin Bay

52-224
Radar observations of snow formation in a warm pre-frontal snowband.
Reuter, G.W., Beaubien, R., *Atmosphere-ocean,* Dec. 1996, 34(4), p.605-626, With French summary. Refs. p.624-626.
Precipitation (meteorology), Fronts (meteorology), Synoptic meteorology, Snowfall, Ice crystal optics, Sounding, Radar echoes, Reflectivity, Thermodynamics, Mathematical models

52-225
Synoptic- and planetary-scale signatures of precipitating systems over the Mackenzie River Basin.
Lackmann, G.M., Gyakum, J.R., *Atmosphere-ocean,* Dec. 1996, 34(4), p.647-674, With French summary. 27 refs.
Synoptic meteorology, Subpolar regions, River basins, Atmospheric circulation, Moisture transfer, Meteorological data, Classifications, Weather forecasting, Canada—Northwest Territories—Mackenzie River

52-226
Forecasts of hydrological parameters over the Mackenzie River Basin: sensitivity to initial conditions, horizontal resolution and forecast range.
Ek, N., Ritchie, H., *Atmosphere-ocean,* Dec. 1996, 34(4), p.675-710, With French summary. 19 refs.
Weather forecasting, River basins, Subpolar regions, Hydrologic cycle, Classifications, Water balance, Statistical analysis, Mathematical models, Accuracy, Canada—Northwest Territories—Mackenzie River

52-227
Sticking probability of a hydrogen atom on icy mantle.
Masuda, K., Takahashi, J., *Advances in space research,* 1997, 19(7), Life sciences: complex organics in space. Proceedings of the F3.2 Symposium of COSPAR Scientific Commission F which was held during the Thirty-first COSPAR Scientific Assembly, Birmingham, U.K., 14-21 July 1996. Edited by F. Raulin and J.M. Greenberg, p.1019-1022, 12 refs.
Ice adhesion, Amorphous ice, Hydrogen bonds

52-228
Surveying and mapping program of the United States in Antarctica.
Mullen, R.R., Mullins, J.L., *Revista cartografica,* June 1996, No.64, p.103-105, With Spanish summary.
Research projects, Maps, Charts, Geodetic surveys
This paper reviews the United States Geological Survey's Antarctic Surveying and Mapping program in support of the United States Antarctic Program. It discusses topographic mapping and geodetic surveys, satellite imaging mapping, south pole program, U.S. SCAR Map Library and the United States gazetteer of geographic names. It also describes cooperative mapping programs with the Argentine Antarctic Institute to map Seymour I. and McMurdo Dry Valleys mapping with the New Zealand Department of Surveys and Land Information. (Auth.)

52-229
Observations of isolated wave-turbulence interactions in the stable atmospheric boundary layer.
Edwards, N.R., Mobbs, S.D., *Royal Meteorological Society. Quarterly journal A,* Apr. 1997, 123(539), p.561-584, This paper is a practical application of the model built and discussed in: "Modelling isolated wave-turbulence interactions in the stable atmospheric boundary layer," by Edwards and Mobbs, Q.J.Roy. Met. Soc., (1997), 123:585-604. 11 refs.
Turbulence, Turbulent flow, Air temperature, Atmospheric boundary layer, Antarctica—Halley Station
Turbulence measurements of the stable atmospheric boundary layer made at Halley Station are presented. The interaction between small-scale turbulence and larger solitary wave disturbances is investigated. Spectral methods are used to separate the wave and turbulence parts of the flow, and the appropriateness of this approach is discussed. Both individual wave events and an average of 18 wave events are studied. The transport of wave-induced velocity by wave-induced turbulence is found to be mostly upwards, whilst a strong downward turbulent heat flux accompanies each wave. Waves are often found to be associated with a burst of low-level turbulence which occurs later than the perturbation in the mean shear. The effect of the turbulence on the wave is shown to be small, whilst the instantaneous local effect of the wave on the turbulence appears to be approximately linear in the wave amplitude. Comparisons are made between the observations and numerical predictions. These tend to confirm the need for at least second-order closure schemes for the turbulence modelling. (Auth.)

52-230
Late Holocene deforestation and peat formation in the Charlevoix highlands: onset of the subalpine and alpine belts. [Déboisement et entourbement des hauts sommets de Charlevoix à l'Holocène supérieur: origine des étages alpin et subalpin]
Bussières, B., Payette, S., Filion, L., *Géographie physique et Quaternaire,* 1996, 50(3), p.257-269, In French with English and German summaries. 56 refs.
Alpine landscapes, Landscape development, Vegetation patterns, Peat, Soil formation, Revegetation, Fires, Environmental impact, Quaternary deposits, Radioactive age determination, Canada—Quebec—Charlevoix

52-231
Upper Pleistocene sub-sequence of St. Pierre Sediments - St. Maurice Rhythmites - Vieilles-Forges Sands, St. Lawrence Valley, Québec. [La sous-séquence des Sédiments de Saint-Pierre - Rythmites du Saint-Maurice - Sables des Vieilles-Forges, Pléistocène supérieur, vallée du Saint-Laurent, Québec]
Clet, M., Occhietti, S., *Géographie physique et Quaternaire,* 1996, 50(3), p.287-310, In French with English and German summaries. Refs. p.309-310.
Pleistocene, River basins, Quaternary deposits, Sedimentation, Paleoecology, Palynology, Vegetation patterns, Revegetation, Stratigraphy, Radioactive age determination, Geochronology, Canada—Quebec—St. Lawrence Valley

52-232
Polliniferous till of the Nunavik Peninsula, northern Québec. [Le till pollinifère de la péninsule du Nunavik, Québec septentrional]
Fréchette, B., Bouchard, M.A., Richard, P.J.H., *Géographie physique et Quaternaire,* 1996, 50(3), p.331-340, In French with English and German summaries. Refs. p.339-340.
Pleistocene, Tundra vegetation, Glacial geology, Quaternary deposits, Glacial deposits, Lacustrine deposits, Palynology, Spectra, Sedimentation, Biogeography, Statistical analysis, Canada—Quebec—Nunavik Peninsula

52-233
Postglacial vegetation at the northern limit of lichen woodland in northwestern Québec.
Gajewski, K., Garralla, S., Milot-Roy, V., *Géographie physique et Quaternaire,* 1996, 50(3), p.341-350, With French and German summaries. 27 refs.
Paleoclimatology, Cooling, Paleoecology, Palynology, Quaternary deposits, Forest lines, Forest tundra, Migration, Lichens, Radioactive age determination, Canada—Quebec

52-234
Postglacial hydrogeomorphological changes and rates of surface lowering in a small Appalachian catchment near Rimouski (Bas-Saint-Laurent, Québec). [Évolution postglaciaire du régime hydrosédimentaire et vitesse de l'ablation dans un petit bassin-versant des Appalaches près de Rimouski (Bas-Saint-Laurent, Québec)]
Hétu, B., Bail, P., *Géographie physique et Quaternaire,* 1996, 50(3), p.351-363, In French with English and German summaries. 46 refs.
Sedimentation, Watersheds, River basins, Water erosion, Hydrology, Quaternary deposits, Geomorphology, Alluvium, Stratigraphy, Lithology, Grain size, Radioactive age determination, Canada—Quebec—Bas-Saint-Laurent

52-235
Luminescence dating of feldspar in sedimentary environments: the problem of zeroing. [Datation par les méthodes de luminescence des feldspaths des milieux sédimentaires: le problème de la remise à zéro]
Lamothe, M., *Géographie physique et Quaternaire,* 1996, 50(3), p.365-376, In French with English and German summaries. 34 refs.
Pleistocene, Quaternary deposits, Sediments, Lacustrine deposits, Marine deposits, Luminescence, Age determination, Accuracy, Statistical analysis, Geochronology

52-236

Snow cover regime and permafrost dynamics: example of the Manitounuk Strait, northern Québec. [L'enneigement et la dynamique du pergélisol: l'exemple du détroit de Manitounuk, Québec nordique]

Roche, Y., Allard, M., *Géographie physique et Quaternaire,* 1996, 50(3), p.377-393, In French with English and German summaries. 31 refs.

Subarctic landscapes, Soil temperature, Thermal regime, Profiles, Permafrost thermal properties, Snow accumulation, Snow depth, Vegetation factors, Snow cover effect, Sensor mapping, Landscape development, Canada—Quebec—Manitounuk Strait

52-237

Vocabulary of glacial geomorphology, X. [Le vocabulaire de la géomorphologie glaciare, X (suivi de l'Index des chroniques I à X)]

Laverdière, C., Guimont, P., *Géographie physique et Quaternaire,* 1996, 50(3), p.399-405, In French. Refs. p.403-404.

Geomorphology, Glacial geology, Classifications, Terminology, Frozen ground mechanics

52-238

Climate change and water resources in Finland.

Vehviläinen, B., Huttunen, M., *Boreal environmental research,* Mar. 14, 1997, 2(1), Symposium on Climate Change and Waters in the Boreal Zone, Kuhmo, Finland, Nov. 21-24, 1995. Selected papers, p.3-18, 20 refs.

Watersheds, Climatic changes, Water supply, Surface drainage, Water balance, Hydrologic cycle, Snow hydrology, Snowmelt, Snow water equivalent, Runoff forecasting, Mathematical models, Finland

52-239

Effects of climatic change on hydrological patterns of a forested catchment: a physically based modeling approach.

Lepistö, A., Kivinen, Y., *Boreal environmental research,* Mar. 14, 1997, 2(1), Symposium on Climate Change and Waters in the Boreal Zone, Kuhmo, Finland, Nov. 21-24, 1995. Selected papers, p.19-31, 23 refs.

Climatology, Climatic changes, Watersheds, Ground water, Snowmelt, Snow water equivalent, Water balance, Runoff forecasting, Seasonal variations, Models, Simulation

52-240

Baltic Sea ice season in changing climate.

Haapala, J., Leppäranta, M., *Boreal environmental research,* Mar. 14, 1997, 2(1), Symposium on Climate Change and Waters in the Boreal Zone, Kuhmo, Finland, Nov. 21-24, 1995. Selected papers, p.93-108, Refs. p.107-108.

Climatology, Climatic changes, Air temperature, Ice forecasting, Sea ice distribution, Air ice water interaction, Ice cover thickness, Seasonal variations, Freezeup, Ice breakup, Mathematical models, Baltic Sea

52-241

Diffusion of metal ions in frozen capillary barriers.

Mohamed, A.M.O., Shooshpasha, I., Yong, R.N., *Engineering geology,* Aug. 14, 1997, 47(1-2), p.1-15, 28 refs.

Engineering geology, Waste treatment, Soil tests, Soil freezing, Unfrozen water content, Leaching, Metals, Ion diffusion, Frozen ground chemistry, Capillarity, Temperature effects, Simulation

52-242

Freeze-fracture transmission electron microscopy.

Gulik-Krzywicki, T., *Current opinion in colloid & interface science,* Apr. 1997, 2(2), p.137-144, 41 refs.

Cryogenics, Cryobiology, Preserving, Colloids, Imaging, Electron microscopy, X ray diffraction, Replicas, Imaging, Resolution, Bibliographies

52-243

Spatial and temporal variations in surface albedo of a subarctic landscape using surface-based measurements and remote sensing.

Lafleur, P.M., Wurtele, A.B., Duguay, C.R., *Arctic and alpine research,* Aug. 1997, 29(3), p.261-269, 17 refs.

Remote sensing, Subarctic landscapes, Tundra terrain, Radiation balance, Phenology, Albedo, Spaceborne photography, LANDSAT, Sensor mapping, Radiometry, Seasonal variations

52-244

Influence of local topography, soils, and vegetation on microclimate and hydrology at a High Arctic site, Ellesmere Island, Canada.

Young, K.L., Woo, M.K., Edlund, S.A., *Arctic and alpine research,* Aug. 1997, 29(3), p.270-284, Refs. p.281-284.

Arctic landscapes, Active layer, Slope processes, Hydrology, Microclimatology, Snowmelt, Meltwater, Water table, Ground water, Topographic effects, Vegetation factors, Seasonal variations, Canada—Northwest Territories—Ellesmere Island

52-245

Effects of flowering time and temperature on growth and reproduction in *Leontodon autumnalis* var. *taraxaci*, a late-flowering alpine plant.

Totland, Ø., *Arctic and alpine research,* Aug. 1997, 29(3), p.285-290, 49 refs.

Plants (botany), Plant ecology, Growth, Phenology, Seasonal variations, Temperature effects, Climatic factors, Simulation

52-246

Phenology and seed development of the alpine sedges *Carex curvula* and *Carex firma* in response to contrasting topoclimates.

Wagner, J., Reichegger, B., *Arctic and alpine research,* Aug. 1997, 29(3), p.291-299, 39 refs.

Plants (botany), Grasses, Alpine landscapes, Plant ecology, Phenology, Growth, Insolation, Topographic effects, Altitude, Snowmelt, Snow cover effect, Microclimatology

52-247

Montane *Kobresia myosuroides* fen community type in the southern Rocky Mountains of Colorado, U.S.A.

Cooper, D.J., Sanderson, J.S., *Arctic and alpine research,* Aug. 1997, 29(3), p.300-303, 34 refs.

Wetlands, Alpine landscapes, Plant ecology, Ecosystems, Classifications, Biomass, Vegetation patterns, United States—Colorado—Rocky Mountains

52-248

Long-term limnological data from the larger lakes of Yellowstone National Park, Wyoming, U.S.A.

Theriot, E.C., Fritz, S.C., Gresswell, R.E., *Arctic and alpine research,* Aug. 1997, 29(3), p.304-314, 24 refs.

Limnology, Alpine landscapes, Watersheds, Water chemistry, Biomass, Sampling, Hydrogeochemistry, Transparence, Seasonal variations, Statistical analysis, United States—Wyoming—Yellowstone National Park

52-249

Neoglacial climate control of subarctic *Picea abies* stand dynamics and range limit in northern Sweden.

Kullman, L., Engelmark, O., *Arctic and alpine research,* Aug. 1997, 29(3), p.315-326, Refs. p.324-326.

Trees (plants), Plant ecology, Subarctic landscapes, Vegetation patterns, Forest lines, Migration, Growth, Soil freezing, Snow cover effect, Sampling, Age determination, Statistical analysis, Vegetation patterns, Sweden

52-250

Holocene pollen and stomates from a forest-tundra site on the Taimyr Peninsula, Siberia.

Clayden, S.L., Cwynar, L.C., MacDonald, G.M., Velichko, A.A., *Arctic and alpine research,* Aug. 1997, 29(3), p.327-333, 22 refs.

Forest tundra, Arctic landscapes, Paleoecology, Quaternary deposits, Lacustrine deposits, Palynology, Drill core analysis, Vegetation patterns, Classifications, Russia—Siberia

52-251

Summer radiation balance for alpine tundra on Mount Washington, New Hampshire, U.S.A.

Babrauckas, B.R., Schmidlin, T.W., *Arctic and alpine research,* Aug. 1997, 29(3), p.339-344, 10 refs.

Climatology, Alpine landscapes, Alpine tundra, Tundra climate, Radiation balance, Solar radiation, Seasonal variations, Cloud cover, Photometry, United States—New Hampshire—Washington, Mount

52-252

Sea-ice melt-pond fraction as determined from low level aerial photographs.

Derksen, C., Piwowar, J., LeDrew, E., *Arctic and alpine research,* Aug. 1997, 29(3), p.345-351, 10 refs.

Oceanographic surveys, Ice surveys, Sea ice, Snow cover, Snowmelt, Meltwater, Ponds, Distribution, Aerial surveys, Infrared photography, Photointerpretation, Microclimatology

52-253

Characteristics and prediction of high-frequency avalanche runout.

Smith, M.J., McClung, D.M., *Arctic and alpine research,* Aug. 1997, 29(3), p.352-357, 11 refs.

Avalanche mechanics, Avalanche tracks, Snow mechanics, Periodic variations, Slope orientation, Topographic effects, Statistical analysis, Avalanche forecasting

52-254

Humus composition and transformations in a Pergelic Cryohemist of coastal Antarctica.

Beyer, L., Blume, H.P., Sorge, C., Schulten, H.R., Erlenkeuser, H., Schneider, D., *Arctic and alpine research,* Aug. 1997, 29(3), p.358-365, 41 refs.

Soil tests, Soil chemistry, Peat, Organic soils, Mosses, Degradation, Soil formation, Nuclear magnetic resonance, Carbon isotopes, Antarctica—Casey Station

Soil organic matter (SOM) of an antarctic Pergelic Cryohemist was studied with special emphasis on soil formation processes under extreme climate conditions. An integrated approach using wet-chemical analyses, carbon-13 nuclear magnetic resonance spectroscopy and pyrolysis-field ionization mass spectrometry was applied to characterize the SOM composition at different depths. Dead mosses material are the source of fresh organic matter for soil formation in the Pergelic Cryohemist. The chemical degradation of the organic matter is not as intensive as in soils of temperate climate regimes. The extremely cold climate conditions retard the transformation of fresh organic residues. Therefore in this antarctic peaty soil, carbohydrates dominate in the composition of the SOM also in the deeper horizons. (Auth. mod.)

52-255

Hydrocarbons and organic carbon in the Upper Proterozoic sedimentary rocks of the northwestern Kola Peninsula: implications for assessment of the petroleum potential in the Barents Sea shelf.

Mitrofanov, F.P., Liubtsov, V.V., Predovskiĭ, A.A., Pripachkin, V.A., *Russian geology and geophysics,* 1996, 37(8), p.117-128, Translated from Geologiia i geofizika. 17 refs.

Marine geology, Sedimentation, Geological surveys, Hydrocarbons, Gases, Natural resources, Exploration, Stratigraphy, Rock properties, Sampling, Russia—Kola Peninsula, Barents Sea

52-256

On the relation between annual maximum extent of ice cover in the Baltic Sea and sea level pressure as well as air temperature field.

Tinz, B., *Geophysica,* 1996, 32(3), p.319-341, Refs. p.339-341.

Climatology, Sea ice distribution, Air temperature, Atmospheric pressure, Atmospheric circulation, Air ice water interaction, Ice conditions, Statistical analysis, Correlation, Seasonal variations, Baltic Sea

52-257

Quaternary glacial history of Mount Olympus, Greece.

Smith, G.W., Nance, R.D., Genes, A.N., *Geological Society of America. Bulletin,* July 1997, 109(7), p.809-824, Refs. p.823-824.

Pleistocene, Glacial geology, Mountain glaciers, Glaciation, Soil profiles, Glacial deposits, Glacial erosion, Quaternary deposits, Stratigraphy, Geochronology, Greece—Olympus, Mount

52-258

Case for Sirius Group alpine glaciation at Mount Fleming, South Victoria Land, Antarctica: a case against Pliocene East Antarctic Ice Sheet reduction.

Stroeven, A.P., Prentice, M.L., *Geological Society of America. Bulletin,* July 1997, 109(7), p.825-840, Refs. p.838-840.

Pleistocene, Glacial geology, Alpine glaciation, Glacier oscillation, Glacial erosion, Glacial deposits, Stratigraphy, Geomorphology, Theories, Antarctica—Fleming, Mount

On the premise that the Sirius Group tills and the marine diatoms were deposited by the East Antarctic Ice Sheet, and that the East Antarctic Ice Sheet was much reduced in area and volume during the Pliocene, the Sirius Group lodgment tills on Mount Fleming, in the Dry Valleys sector of the Transantarctic Mountains, were studied. Results suggests that the Sirius Group lodgment tills at Mount Fleming do not support the hypothesis that the East Antarctic Ice Sheet was much reduced during the Pliocene, and demonstrate that Sirius Group lodgment tills on Mount Fleming were deposited by alpine ice. (Auth. mod.)

52-259

Cage occupancy and compressibility of deuterated N_2-clathrate hydrate by neutron diffraction.

Kuhs, W.F., Chazallon, B., Radaelli, P.G., Pauer, F., *Journal of inclusion phenomena and molecular recognition in chemistry,* Sep. 1997, 29(1), p.65-77, 25 refs.

Clathrates, Hydrates, Molecular structure, Phase transformations, Latticed structures, Ice models, Neutron diffraction, High pressure tests, Compressive properties, Ice vapor interface, Thermodynamics, Spectra

52-260

Note on air drag on sea ice in stably stratified flow.

Myrhaug, D., Slaattelid, O.H., Hansen, E.H., *Journal of wind engineering and industrial aerodynamics,* Nov. 1, 1996, 64(1), p.5-14, 10 refs.

Atmospheric boundary layer, Sea ice, Ice air interface, Internal friction, Air flow, Stratification, Fluid dynamics, Wind velocity, Buoyancy, Surface energy, Mathematical models

52-261

Center of the Iceland hotspot experiences volcanic unrest.

Einarsson, P., Brandsdóttir, B., Gudmundsson, M.T., Björnsson, H., Grínvold, K., *Eos,* Sep. 2, 1997, 78(35), p.369,374-375, 7 refs.

Subpolar regions, Tectonics, Volcanoes, Explosion effects, Magma, Seismology, Glacier melting, Geothermal thawing, Lake bursts, Flooding, Iceland—Vatnajökull

52-262

Navy to release storehouse of Arctic Ocean data.

Showstack, R., *Eos,* Sep. 2, 1997, 78(35), p.369-370.

Oceanographic surveys, Ocean bottom, Ocean currents, Mapping, Submarines, Bottom topography, Sounding, Recording, History, Arctic Ocean

52-263

CP/MAS ^{13}C NMR spectra of frozen solutions of poly(vinyl alcohol) with different tacticities.

Horii, F., Masuda, K., Kaji, H., *Macromolecules,* Apr. 21, 1997, 30(8), p.2519-2520, 13 refs.

Polymers, Frozen liquids, Nuclear magnetic resonance, Spectra, Molecular structure, Hydrogen bonds, Solubility, Low temperature tests

52-264

Heat-affected zone toughness of a TMCP steel designed for low-temperature applications.

Gianetto, J.A., Braid, J.E.M., Bowker, J.T., Tyson, W.R., *Journal of offshore mechanics and arctic engineering,* May 1997, 119(2), p.134-144, 27 refs.

Ships, Offshore structures, Steels, Microstructure, Impact strength, Fracture zones, Welding, Thermal stresses, Tensile properties, Thermal analysis, Mechanical tests, Cold weather performance

52-265

Proceedings. Snow engineering: recent advances.

International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996, Izumi, M., ed, Nakamura, T., ed, Sack, R.L., ed, Rotterdam, A.A. Balkema, 1997, 634p., Refs. passim. For selected papers see 52-266 through 52-380.

Snow loads, Snowfall, Snow depth, Blowing snow, Snowdrifts, Snow melting, Artificial melting, Snow removal, Avalanches, Road icing, Road maintenance, Buildings, Roofs, Cold weather construction

52-266

Perspectives on the science engineering effects of snow.

Sack, R.L., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.3-10, 37 refs.

Buildings, Snow depth, Snow density, Snowdrifts, Snow loads, Wind pressure, Building codes, Standards

52-267

Building design in snow country: past, present and future.

Izumi, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.11-26, 2 refs.

Buildings, Houses, Snow loads, Cold weather construction, Economic development, Cost analysis, Regional planning, Japan

52-268

Removal and the melting of snow on roads.

Fukuda, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.27-32, 5 refs.

Road icing, Tires, Chemical ice prevention, Snow removal, Snow melting, Artificial melting, Road maintenance, Japan

52-269

Snow becomes a splendid cooler—exciting challenge in the town of Funagata.

Kobiyama, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.33-38.

Snow disposal, Snow thermal properties, Snow air interface, Cold storage, Air conditioning, Cooling systems, Utilities, Japan—Yamagata Prefecture

52-270

Equitemperature metamorphism of snow.

Brown, R.L., Edens, M.Q., Barber, M., Sato, A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.41-48, 8 refs.

Snow thermal properties, Snow heat flux, Snow cover structure, Snow density, Depth hoar, Metamorphism (snow)

52-271

Heat and mass transport in snow under a temperature gradient.

Sokratov, S.A., Maeno, N., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.49-54, 12 refs.

Snow thermal properties, Snow heat flux, Snow permeability, Temperature gradients, Thermal conductivity, Vapor transfer

52-272

Numerical study of a snow wind scoop.

Kawakami, S., Uematsu, T., Kobayashi, T., Kaneda, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.55-62, 23 refs.

Snowdrifts, Blowing snow, Snow erosion, Wind erosion, Mathematical models

52-273

Avalanche experiments with styrene foam particles.

Nohguchi, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.63-68, 7 refs.

Avalanche modeling, Avalanche mechanics, Mathematical models

52-274

Development of the nowcasting map of the risk of dry snow avalanches.

Iwanami, K., Nohguchi, Y., Yamada, Y., Ikarashi, T., Nakamura, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.69-76, 10 refs.

Snowstorms, Snowfall, Snow cover stability, Weather forecasting, Avalanche forecasting, Meteorological charts, Computerized simulation, Japan—Niigata Prefecture

52-275

Slip tests between the surfaces of snow/ice and some kinds of shoes.

Kobayashi, T., et al, International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.77-80, 6 refs.

Road icing, Accidents, Human factors engineering, Clothing, Rubber ice friction, Rubber snow friction, Skid resistance, Sanding, Safety, Cold weather tests

52-276

Investigations on avalanche disasters and related weather situations.

Ito, T., Hasegawa, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.81-84, 1 ref.

Snowstorms, Snowfall, Snow depth, Snow cover stability, Weather forecasting, Avalanche forecasting, Japan

52-277

Study of avalanches in the Tianshan Mountains, Xinjiang, China.

Qiu, J.Q., et al, International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.85-90, 12 refs.

Avalanche mechanics, Avalanche tracks, Avalanche engineering, Snow loads, China—Tian Shan

52-278
Statistics on avalanche accidents in the central part of Japan (1900-1989).
Izumi, K., Kobayashi, S., Yano, K., Endo, Y., Ohzeki, Y., Watanabe, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.91-96, 1 ref.
Avalanches, Accidents, Statistical analysis, Japan

52-279
Performance testing and effectiveness of avalanche blaster Gaz.Ex in Japan's central mountains.
Kamiishi, I., Hayakawa, N., Fukushima, Y., Kawada, K., Yamada, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.97-100, 1 ref.
Avalanche triggering, Avalanche mechanics, Blasting, Explosives, Japan

52-280
Experience with snow measurement devices in avalanche research.
Höller, P., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.101-104, 7 refs.
Forest strips, Forest land, Snow cover stability, Snow depth, Snow temperature, Snow survey tools, Meteorological instruments, Avalanche formation, Avalanche forecasting

52-281
Measuring system for snow depth profiles in Maglev guideway using the light cross section method.
Kawashima, K., Iikura, S., Endo, T., Fujii, T., Imai, T., Nakane, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.105-108, 3 refs.
Railroad tracks, Snow depth, Snow survey tools, Snow optics, Lasers, Photographic techniques

52-282
Areal observation of blowing snow using a telemetering network of snow particle counters.
Kosugi, K., Sato, T., Higashiura, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.109-112, 14 refs.
Blowing snow, Snow optics, Particle size distribution, Meteorological instruments, Telemetering equipment, Data transmission

52-283
Temporal and spatial distribution of snowmelt in the subalpine region, Mt. Hachimantai.
Kojima, A., Ohta, T., Hashimoto, T., Suzuki, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.113-116, 2 refs.
Snow hydrology, Snow heat flux, Snowmelt, Runoff forecasting, Mathematical models, Japan

52-284
Penetration tests of snow covering a pit.
Nohguchi, Y., Ikarashi, T., Iwanami, K., Nakamura, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.117-120, 2 refs.
Snow cover stability, Snow strength, Snow hardness, Penetration tests, Hardness tests

52-285
On a relation between probability occurrence of solid precipitation and ground air temperature.
Hasemi, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.121-124, 3 refs.
Snowfall, Snowstorms, Ice storms, Precipitation (meteorology), Air temperature, Surface temperature, Weather forecasting, Statistical analysis, Japan

52-286
Are neural networks a distinct tool for prediction and estimate of newly fallen snow.
Yamada, Y., Iwanami, K., Maeda, N., Amenomori, M., Michigami, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.125-128, 10 refs.
Snowfall, Snow depth, Snow water equivalent, Weather forecasting, Computerized simulation, Statistical analysis

52-287
Characteristics of blowing snow fluctuation.
Sato, T., Higashiura, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.129-132, 6 refs.
Blowing snow, Snowdrifts, Visibility, Wind velocity, Particle size distribution, Weather forecasting, Statistical analysis

52-288
Application of a random walk model to blowing snow.
Sato, T., Uematsu, T., Kaneda, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.133-138, 8 refs.
Blowing snow, Snowdrifts, Snow erosion, Wind erosion, Visibility, Statistical analysis, Mathematical models

52-289
Experiment of metamorphism using "standard" snow.
Sato, A., Edens, M.Q., Brown, R.L., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.139-142, 10 refs.
Artificial snow, Snow cover structure, Snow density, Ice microstructure, Ice sintering, Metamorphism (snow), Environmental tests

52-290
Method for estimating snow weight in mountainous areas.
Shimizu, M., Nakamura, H., Abe, O., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.143-146, 3 refs.
Snowfall, Snow density, Snow loads, Air temperature, Precipitation (meteorology), Weather forecasting, Japan

52-291
Few considerations concerning acid snow and acid rain on the Japan Sea coast.
Katoh, K., Taguchi, Y., Aoyama, K., Endo, J., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.147-150, 6 refs.
Marine atmospheres, Atmospheric composition, Air pollution, Snowfall, Snow impurities, Snow composition, Scavenging, Soil pollution, Soil chemistry, Japan

52-292
Sulfur isotope ratios of sulphate in wet deposits in Japan.
Yanagisawa, F., Ueda, A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.151-154, 8 refs.
Atmospheric composition, Air pollution, Precipitation (meteorology), Snowfall, Snow composition, Scavenging, Soil pollution, Soil chemistry, Japan

52-293
Database for climatic environments of snowy areas in Japan.
Ishizaka, M., Kobayashi, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.155-160, 7 refs.
Snowfall, Snow cover distribution, Snow depth, Snow water content, Meteorological data, Data processing, Japan

52-294
Dielectric properties of wet snow in microwave region.
Nakata, W., Suzuki, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.161-166, 1 ref.
Wet snow, Snow water content, Snow electrical properties, Ice dielectrics, Microwaves

52-295
Granulation of snow.
Nohguchi, Y., Kobayashi, T., Iwanami, K., Nishimura, K., Sato, A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.167-170, 3 refs.
Snow compaction, Snow compression, Ice sintering, Ice crystal adhesion, Blowing snow, Avalanche formation

52-296
Chemical composition of snow and rime at Mt. Zao, Yamagata Prefecture, Japan.
Yanagisawa, F., Yano, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.171-174, 8 refs.
Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow composition, Snow impurities, Glaze, Ice composition, Japan

52-297
Study on snow particle changes.
Yano, K., Abe, H., Tanaka, H., Sato, A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.175-177, 2 refs.
Metamorphism (snow), Snow crystal structure, Ice crystal replicas, Photographic techniques

52-298
Study of the thermodynamics of Juhyo (ice-monsters).
Yano, K., Tosabayashi, M., Onda, H., Sato, A., Kobayashi, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.179-182, 5 refs.
The Japanese term juhyo literally means icing on trees but is often translated as ice monster because the resulting ice shapes resemble strange creatures.
Trees (plants), Ice accretion, Ice thermal properties, Thermal conductivity, Ice heat flux, Ice growth

52-299
Estimation of ground snow weight based on daily precipitation and daily mean air temperature.
Sakurai, S., Joh, O., Shibata, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.185-192, 9 refs.
Snowfall, Snow loads, Precipitation (meteorology), Air temperature, Meteorological data, Statistical analysis, Japan

52-300
Reduction of earthquake energies on buildings by snow on their roofs.
Nakamura, T., Nohguchi, Y., Kobayashi, T., Yamada, Y., Ohtani, K., Takada, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.193-200, 4 refs.
Houses, Wooden structures, Roofs, Snow (construction material), Snow loads, Snow cover effect, Earthquakes, Attenuation

52-301
Unbalanced snow loads on gable roofs.
O'Rourke, M.J., Auren, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.201-208, 6 refs.
Buildings, Roofs, Snow loads, Snowdrifts, Wind pressure, Design criteria, Cold weather construction

52-302
Characteristics of roofing materials as related to adfreezing of snow.
Ito, T., Tomabechi, T., Mihashi, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.209-214, 7 refs.
Buildings, Roofs, Ice adhesion, Snow loads, Metal snow friction, Plastics snow friction, Snow slides, Snow removal

52-303
Japanese recommendation 1993 for snow loads on buildings.
Mihashi, H., Takahashi, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.215-222, 17 refs.
Snowfall, Snow depth, Snow loads, Buildings, Roofs, Building codes, Design criteria, Cold weather construction, Japan

52-304
New European code on snow loads.
Del Corso, R., et al, International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.223-228, 4 refs.
Snow loads, Buildings, Roofs, Building codes, Design criteria, Cold weather construction

52-305
Lateral loads on structures due to snow avalanche impacts.
Decker, R., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.229-234, 27 refs.
Avalanche modeling, Avalanche mechanics, Avalanche engineering, Snow loads, Dynamic loads, Impact tests

52-306
Snow load carrying capacity of single-layer latticed cylindrical roof structures.
Yamada, S., Taguchi, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.235-240, 11 refs.
Buildings, Roofs, Snow loads, Design criteria, Structural analysis, Cold weather construction, Mathematical models

52-307
Influence of altitude and sea factor on the geographic distribution of snow depths in Japan.
Takahashi, T., Mihashi, H., Izumi, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.241-248, 14 refs.
Marine atmospheres, Snowfall, Snow cover distribution, Snow depth, Weather forecasting, Statistical analysis, Japan

52-308
Database and methodology for conducting site specific snow load case studies for the United States.
Tobiasson, W., Greatorex, A., MP 5008, International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.249-256, 3 refs.
Snow surveys, Snowfall, Snow cover distribution, Snow depth, Snow loads, Weather stations, Meteorological data, Data processing, Statistical analysis, United States
The authors have developed data and a methodology for determining the ground snow load at locations not covered in the ground snow load map of the United States due to extreme local snow load variations in the area. The elevation, the years of record available, the maximum observed value and the "50-year" ground snow load at a number of nearby sites are considered. A plot of elevation vs. load is often helpful.

52-309
Analysis of snowfall series observed during long periods at four meteorological stations in the Italian territory.
Del Corso, R., Mercalli, L., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.257-264, 12 refs.
Snowfall, Snow depth, Snow water equivalent, Weather stations, Meteorological data, Statistical analysis, Italy

52-310
Direct measurement of roof snow load.
Umemura, T., Sasame, T., Fukushima, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.265-268, 1 ref.
Buildings, Roofs, Steel structures, Wooden structures, Snow loads, Strain measuring instruments, Structural analysis

52-311
Probabilistic models for snow loads in structural analysis.
Ra'zer, V., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.269-273, 2 refs.
Buildings, Roofs, Snow depth, Snow accumulation, Snow loads, Design criteria, Structural analysis, Statistical analysis, Mathematical models

52-312
Survey of snowdrift on the pipeline structures.
Kitamura, N., Aoyama, K., Nishizawa, T., Tsuji, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.275-278, 4 refs.
Bridges, Steel structures, Snowfall, Snow depth, Snow accumulation, Snow loads, Air temperature, Japan

52-313
Heating characteristics of self temperature control heater.
Hori, Y., Ito, T., Taniguchi, T., Yamada, T., Shinojima, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.279-282, 3 refs.
Buildings, Roofs, Snow removal, Snow melting, Artificial melting, Electric heating, Temperature control

52-314
Demonstration of an electric heater that prevents icing at eaves.
Hirama, S., Wakasa, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.283-286, 1 ref.
Buildings, Roofs, Electric heating, Icicles, Ice prevention, Snow removal, Snow melting, Artificial melting

52-315
Effect of characteristics of the electric heating cable on snow melting.
Iwamoto, K., Sayama, S., Nishikawa, Y., Yamaguchi, M., Sudo, M., Sakai, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.287-290, 3 refs.
Road icing, Ice prevention, Snow removal, Snow melting, Artificial melting, Electric heating, Road maintenance

52-316
Observations of snow accumulation on the roof of an actual domed structure.
Suda, K., Kikuta, M., Maeda, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.291-295.
Buildings, Roofs, Snow depth, Snow accumulation, Snow slides, Snow loads

52-317
Observations of snow banks formed under the very large sloped roofs.
Abe, O., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.297-302, 9 refs.
Buildings, Roofs, Snow slides, Snowdrifts, Snow depth, Snow loads

52-318

Wind tunnel model studies of roof snow loads resulting from multiple snowstorms.

Isyumov, N., Mikitiuk, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.303-312, 17 refs.

Buildings, Roofs, Snowstorms, Snow depth, Snow accumulation, Blowing snow, Snowdrifts, Snow loads, Wind tunnels

52-319

Laboratory study of snow drifts on gable roofs.

Kamimura, S., O'Rourke, M.J., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.313-316, 6 refs.

Buildings, Roofs, Blowing snow, Snowdrifts, Snow loads, Environmental tests

52-320

Application of wind tunnel modeling to some snow related problems.

Nozawa, T., Suzuya, J., Uematsu, Y., Miura, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.317-320, 4 refs.

Buildings, Roofs, Snow accumulation, Snowdrifts, Snow loads, Particle size distribution, Wind factors, Wind tunnels

52-321

Water flume evaluation of snowdrift loads on two-level flat roofs.

O'Rourke, M.J., Wrenn, P., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.321-328, 11 refs.

Buildings, Roofs, Snowdrifts, Snow accumulation, Snow loads, Environmental tests

52-322

Snow loads in roof steps—building code studies.

Irwin, P.A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.329-336, 10 refs.

Buildings, Roofs, Snow depth, Snowdrifts, Snow loads, Building codes, Canada

52-323

Removal of newly deposited snow on a gable roof.

Kobayashi, T., Kumagai, M., Mizuno, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.337-340, 3 refs.

Houses, Roofs, Snow removal equipment, Ice cutting, Electric equipment

52-324

Snow sliding on a membrane roof.

Tomabechi, T., Ito, T., Takakura, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.341-344, 3 refs.

Buildings, Roofs, Ice adhesion, Snow depth, Snow strength, Snow loads, Snow slides, Snow removal, Artificial melting

52-325

Snow simulation within the closed space of the Jules Verne Climatic Wind Tunnel.

Gandemer, J., Palier, P., Boisson-Kouznetzoff, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.347-352, 1 ref.

Wind tunnels, Artificial snow, Blowing snow, Snowstorms, Snow water content, Snow loads, Environmental tests

52-326

Modelling and numerical simulation of snow drift around snow fences.

Sundsbø, P.A., Hansen, E.W.M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.353-359, 21 refs.

Snow fences, Blowing snow, Snowdrifts, Snow loads, Snow erosion, Wind erosion, Computerized simulation

52-327

Preventing avalanches at Guozigou in Xinjiang Autonomous Uygur Region of China.

Li, C.L., Huang, L.D., Li, J.C., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.361-364.

Avalanches, Accidents, Avalanche engineering, Revegetation, Protective vegetation, Snow hedges, Highway planning, Road maintenance, China—Xinjiang

52-328

Ammonium carbamate as corrosion inhibiting deicing material.

Hansen, C.N., Cho, H.S., Lee, H.S., Lee, H.S., Decker, R., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.365-370, 6 refs.

Road icing, Chemical ice prevention, Salting, Ice removal, Road maintenance, Corrosion, Cost analysis

52-329

Field observation of microclimatic and ground thermal regimes during frost penetration beneath highways.

Ishizaki, T., Fukuda, M., Mishima, N., Yokota, S., Toya, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.371-374, 3 refs.

Subgrade soils, Soil freezing, Frost penetration, Frost heave, Frost protection, Freezing indexes, Soil air interface, Microclimatology, Road maintenance, Japan—Hokkaido

52-330

Experimental studies on the prevention of road freezing using electric heat.

Kobayashi, S., Yoshida, N., Yamada, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.375-378, 4 refs.

Road icing, Ice prevention, Electric heating, Road maintenance

52-331

Mechanism of ice debonding on an asphalt mixture containing rubber particles.

Taniguchi, T., Inaba, Y., Murai, S., Nishizawa, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.379-386, 3 refs.

Pavements, Bitumens, Rubber, Road icing, Ice solid interface, Ice adhesion, Ice prevention, Road maintenance

52-332

Transport rate of snow floating in an open channel.

Fukushima, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.387-394, 8 refs.

Road maintenance, Snow removal, Snow melting, Artificial melting, Channels (waterways), Drains, Water flow, Mathematical models, Japan

52-333

Height and density of new snow on slopes.

Endo, Y., Kominami, Y., Niwano, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.395-398, 4 refs.

Snow depth, Snow density, Snow loads, Slope processes

52-334

Snow disasters on roads in Heilongjiang Province, China.

Akitaya, E., Kobayashi, S., Le, P.F., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.399-402.

Road icing, Snowdrifts, Highway planning, China—Heilongjiang Province

52-335

Research on making indexes of obstruction to traffic in winter.

Takahashi, N., Hara, F., Kawabata, T., Abe, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.403-406.

Snow removal, Urban planning, Human factors engineering, Japan—Hokkaido

52-336

Analyses of walking characteristics in winter and falling accidents in Sapporo.

Takamiya, N., Kido, H., Hara, F., Takanishi, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.407-410, 2 refs.

Road icing, Sidewalks, Accidents, Human factors engineering, Safety, Japan—Hokkaido

52-337

Study on measures used by women in walking in winter.

Hara, F., Akitaya, E., Suda, C., Morita, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.411-414, 2 refs.

Road icing, Sidewalks, Accidents, Clothing, Safety, Human factors engineering, Japan—Hokkaido

52-338
Variations of road traffic flow according to road surface conditions in a snowy area.
Horii, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.415-418, 3 refs.
Road icing, Highway planning, Cold weather operation, Safety, Japan

52-339
Studies on the influence of accumulated snow affecting route choice behavior.
Orita, J., Yuzawa, A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.419-422, 9 refs.
Road icing, Highway planning, Cold weather operation, Safety

52-340
Effectiveness of fences in protecting workmen at construction sites from severe wind and snowdrifts.
Hongo, T., Tomabechi, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.423-426, 3 refs.
Cold weather construction, Cold weather operation, Snowdrifts, Blowing snow, Snow fences, Windbreaks, Safety

52-341
Strength and frost heave properties of stabilized soils using lime and slag.
Kawabata, S., Kamiya, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.427-430, 3 refs.
Subgrade soils, Soil freezing, Frost heave, Frozen ground strength, Frozen ground compression, Liming, Soil stabilization, Frost resistance, Frost protection

52-342
Numerical analysis of electric road heating coupled with full-scaled experiments.
Yokoyama, T., Kobayashi, S., Hirama, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.431-434, 2 refs.
Road icing, Ice prevention, Snow removal, Snow melting, Artificial melting, Electric heating, Heat recovery, Road maintenance

52-343
New evaluation of the effectiveness of salt for road anti-icing.
Murakuni, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.435-438.
Road icing, Ice prevention, Salting, Skid resistance, Road maintenance, Japan

52-344
Study of a snow-melting and antifreeze system for prevention of auto accidents on slippery bridge decks.
Nakamura, H., Tanimoto, T., Hamada, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.439-442, 3 refs.
Bridges, Road icing, Ice prevention, Ice removal, Snow removal, Artificial melting, Radiant heating, Water pipes, Heat transfer, Mathematical models, Safety, Road maintenance

52-345
Development of a narrow, high speed rotary snowplow.
Emoto, T., Ohta, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.443-446.
Snow removal equipment, Motor vehicles, Road maintenance

52-346
Making traffic secure in a heavy snowfall area in winter—Gassan Road information system.
Nagata, K., Oba, T., Kato, A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.447-451, 1 ref.
Road icing, Snowstorms, Weather forecasting, Data transmission, Warning systems, Safety, Highway planning, Road maintenance, Japan

52-347
Improving the efficiency of winter road management: road surface freezing forecast system, spreading of pre-wetted salt, and continuous salt concentration measuring system.
Maeno, H., Suzuki, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.453-456.
Road icing, Weather forecasting, Frost forecasting, Salting, Safety, Highway planning, Road maintenance, Japan

52-348
Problems related to placing snow dumping channels in a flat terrain.
Hayakawa, N., Fukushima, Y., Taniuchi, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.457-460, 2 refs.
Snow melting, Artificial melting, Snow removal, Drains, Water pipes, Channels (waterways), Municipal engineering, Japan

52-349
Stagnation of snow at a bend in a snow drain channel.
Imamura, F., Shuto, N., Yamamoto, J., Kamiyama, A., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.461-464, 3 refs.
Snow removal, Snow melting, Artificial melting, Drains, Channels (waterways), Water flow

52-350
Clever device to melt snow using running water.
Nakagawa, T.M.S., Nakagawa, R., Jr., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.465-468, 5 refs.
Snow removal equipment, Snow melting, Artificial melting, Drains, Channels (waterways), Municipal engineering

52-351
Rise in stage and limiting conditions for snow transport in elbows of snow drains.
Takahashi, M., Kimura, K., Kitayama, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.469-472, 5 refs.
Snow removal, Snow melting, Artificial melting, Drains, Channels (waterways), Water flow

52-352
Characteristics of ice/water mixture flow in a branching pipe and development of an ice fraction control technique.
Kawada, Y., Takizawa, S., Shirakashi, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.473-476, 5 refs.
Ice thermal properties, Ice water interface, Water pipes, Pipe flow, Flow control, Cooling systems, Utilities

52-353
Snow melting systems with ground water.
Goto, N., Numazawa, K., Katsuragi, Y., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.477-480, 2 refs.
Snow removal, Snow melting, Artificial melting, Ground water, Heat transfer, Municipal engineering, Cost analysis, Japan

52-354
Residential planning under heavy snow conditions in Norway.
Apeland, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.483-488, 5 refs.
Houses, Residential buildings, Cold weather construction, Urban planning, Norway

52-355
Impact of ice dams on buildings in snow country.
Mackinlay, I., Flood, R.S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.489-496, 5 refs.
Buildings, Roofs, Snow loads, Snow ice, Snow retention, Cold weather construction, Building codes

52-356
Study on the design technique of public housing at snowy area in Japan.
Tsukidate, T., Noguchi, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.497-500, 2 refs.
Residential buildings, Cold weather construction, Urban planning, Human factors engineering, Japan

52-357
Role of atrium in Aomori Public College—design approach to an attractive campus in snowy country.
Sasaki, T., Satoh, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.501-505.
Buildings, Cold weather construction, Human factors engineering, Japan

52-358
Living style and planning of multifamily housing for snowy, cold regions of Japan.
Noguchi, T., Tsukidate, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.507-510, 6 refs.
Residential buildings, Urban planning, Cold weather construction, Human factors engineering, Japan—Hokkaido

52-359

Snowdrift control design: application of CFD simulation techniques.

Waechter, B.F., Sinclair, R.J., Schuyler, G.D., Williams, C.J., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.511-516, 10 refs.

Blowing snow, Snowdrifts, Snow accumulation, Snow loads, Snow erosion, Wind velocity, Wind erosion, Buildings, Stations, Cold weather construction, Computerized simulation, Antarctica—Amundsen-Scott Station

Computer modelling techniques, employing computational fluid dynamics (CFD) and a finite area element model (FAE), were used to predict snowdrift deposition patterns around a new building at the Amundsen-Scott Station. Through interpretation of the wind flow field predicted through CFD, snowdrift prone areas around an existing building, that is raised above the snow surface, were identified. The wind flow field, generated by CFD, was subsequently used as input to an FAE computer snowdrift prediction model. The characteristics of the drift deposition patterns predicted by the computer simulation techniques were in satisfactory agreement with snowdrift patterns measured around the existing reference building at the Station. It is concluded that the FAE model predicts realistic snowdrift accumulation patterns when CFD-predicted local wind velocity fields are combined with local meteorological data. (Auth.)

52-360

Snowdrifting around a tall building in a snowy area.

Mitsuhashi, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.517-520, 3 refs.

Residential buildings, Blowing snow, Snowdrifts, Snow accumulation, Snow loads, Wind tunnels, Environmental tests, Japan

52-361

Investigation of the indoor environment of well-insulated and airtight houses in the Tohoku district.

Hasegawa, K., Yoshino, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.521-524, 3 refs.

Houses, Cold weather construction, Indoor climates, Climate control, Thermal insulation, Heating, Ventilation, Japan

52-362

Indoor thermal problems of residential buildings in cold and snowy regions of Japan.

Yoshino, H., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.525-528, 5 refs.

Residential buildings, Houses, Cold weather construction, Indoor climates, Thermal insulation, Heating, Health, Japan

52-363

Principles of avalanche hazard mapping in Switzerland.

Salm, B., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.531-538, 11 refs.

Snow cover stability, Avalanche forecasting, Regional planning, Safety, Mapping, Statistical analysis, Switzerland

52-364

Snow observation network for a mountainous area.

Nakamura, H., Shimizu, M., Abe, O., Kimura, T., Nakawo, M., Nakamura, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.539-541, 1 ref.

Snow surveys, Snow cover distribution, Snowfall, Snow depth, Snow loads, Weather stations, Meteorological data, Air temperature, Japan

52-365

Water balance in a heavy snow region.

Kazama, S., Sawamoto, M., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.543-548, 5 refs.

Snowfall, Snow depth, Snow hydrology, Snowmelt, Precipitation (meteorology), Evapotranspiration, Water balance, Runoff forecasting, Statistical analysis, Japan

52-366

Remaining snow patterns in mountains, Yukigata, as a scene in spring.

Nohguchi, Y., Kawashima, K., Kobayashi, T., Yamada, Y., Endo, Y., Izumi, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.549-552, 8 refs.

Snow cover distribution, Snow melting, Alpine landscapes, Topographic features, Topographic effects, Japan

52-367

Case study on the utilization of snow and ice as natural cold energy source for low-temperature storage materials.

Suzuki, T., Kobayashi, S., Tsushima, K., Shao, S.D., Teng, Y., Liu, G.Z., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.553-558, 6 refs.

Snow thermal properties, Ice thermal properties, Ice refrigeration, Cold storage, Underground storage

52-368

Air-conditioning system by stored snow. Part I: control system of air temperature/humidity and its performance.

Kobiyama, M., Wang, A., Takahashi, T., Yoshinaga, H., Kawamoto, S., Iijima, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.559-563, 2 refs.

Snow thermal properties, Snow heat flux, Snow air interface, Air conditioning, Cold storage, Cooling systems, Humidity, Air temperature, Temperature control

52-369

Air-conditioning system by stored snow. Part II: characteristics of the direct heat exchange between snow and air.

Wang, A., Kobiyama, M., Takahashi, T., Kawamoto, S., Yoshinaga, H., Iijima, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.565-568, 2 refs.

Snow thermal properties, Snow heat flux, Snow air interface, Heat transfer, Air conditioning, Cold storage, Cooling systems

52-370

Cold storage system for food using only natural energy.

Okajima, K., Nakagawa, H., Matsuda, S., Yamashita, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.569-572, 4 refs.

Ice thermal properties, Ice heat flux, Ice air interface, Ice refrigeration, Cold storage

52-371

Water source of snow, ice and desertification.

Wang, L.W., Yonetani, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.573-576, 9 refs.

Mountain glaciers, Glacial hydrology, Glacier melting, Glacial rivers, Water reserves, Deserts, Desiccation, Soil conservation, Land reclamation, Revegetation, Protective vegetation, China—Taklimakan Desert

52-372

Possibility of using snow as a source of active water determined by ^{17}O-NMR analysis.

Takahashi, S., Takahashi, S., Muranaka, T., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.577-584, 17 refs.

Snow composition, Snowmelt, Water chemistry, Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Ion density (concentration), Oxygen isotopes, Nuclear magnetic resonance

52-373

Development of Tokamachi-City in a heavy snowfall area: fighting, utilizing, and enjoying snow.

Baba, Y., et al, International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.585-588.

Snow removal, Snow melting, Artificial melting, Drains, Channels (waterways), Municipal engineering, Urban planning, Cost analysis, Japan

52-374

Quantitative evaluation of walking environment in winter for a snowy city.

Miyakoshi, K., Kobayashi, K., Matsumoto, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.589-592, 3 refs.

Snow removal, Sidewalks, Safety, Human factors engineering, Urban planning, Japan

52-375

Intermediate, public-private, territories in snowy cities.

Kitahara, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.593-596, 3 refs.

Urban planning, Cold weather construction, Sidewalks, Human factors engineering, Japan

52-376

Local color traits in connection with the snowy climate of the Tohoku area.

Iijima, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.597-600, 5 refs.

Snowfall, Visibility, Urban planning, Human factors engineering, Japan

52-377
Aufeis growth observed in northeast China.
Narita, H., Ishikawa, N., Ishii, Y., Kobayashi, S., Tushima, K., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.601-604, 2 refs.
Naleds, Road icing, Ice formation, Ice growth, Ice structure, Highway planning, China—Heilongjiang Province

52-378
Preparation of the Experimental Building for Snow and Ice Disaster Prevention.
Higashiura, M., et al, International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.605-608, 2 refs.
Organizations, Research projects, Laboratories, Cold chambers, Wind tunnels, Environmental tests, Artificial snow, Artificial ice, Blowing snow, Japan

52-379
Density change of ground snow in Hakkoda.
Sasaki, M., Shuto, N., Sawamoto, M., Nagao, M., Kazama, S., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.609-612.
Snow surveys, Snow depth, Snow accumulation, Snow compression, Snow density, Japan—Aomori Prefecture

52-380
Snow cover conditions in Finnish Lapland.
Hooli, J., International Conference on Snow Engineering, 3rd, Sendai, Japan, May 26-31, 1996 Proceedings. Snow engineering: recent advances. Edited by M. Izumi, T. Nakamura, and R.L. Sack, Rotterdam, A.A. Balkema, 1997, p.613-618, 13 refs.
Snow surveys, Snowfall, Snow cover distribution, Snow depth, Snow accumulation, Snow loads, Interception, Snow water equivalent, Runoff forecasting, Flood forecasting, Finland

52-381
Excystment and growth of chrysophytes and dinoflagellates at low temperatures and high salinities in antarctic sea-ice.
Stoecker, D.K., Gustafson, D.E., Merrell, J.R., Black, M.M.D., Baier, C.T., *Journal of phycology,* Aug. 1997, 33(4), p.585-595, 45 refs.
Algae, Sea ice, Ice salinity, Ice temperature, Ice cores, Biomass, Antarctica—McMurdo Sound
Extreme environmental conditions have been thought to limit algal growth in the upper sea ice. In McMurdo Sound chrysophyte statocysts (stomatocysts) and dinoflagellate hypnozygotes (resting cysts) overwinter in first- and second-year fast ice exposed to temperatures of -20°C or lower. In early Nov., when temperatures in the upper ice are <-8°C and brine salinities are >126 psu, dinoflagellate cysts activate and shortly thereafter excyst. During early Nov., chrysophyte statocysts also begin to excyst. Net daily primary production occurs in the sea ice brine at temperatures as low as -7.1°C, at brine salinities as high as 129 psu. High densities of physiologically active cryo- and halotolerant algae can occur in the upper fast ice under extreme conditions of temperature and salinity. (Auth.)

52-382
***Octadecabacter arcticus* gen. nov., sp. nov. and *O. antarcticus*, sp. nov., nonpigmented, psychrophilic gas vacuolate bacteria from polar sea ice and water.**
Gosink, J.J., Herwig, R.P., Staley, J.T., *Systemic and applied microbiology,* Aug. 1997, 20(3), p.356-365, 37 refs.
Bacteria, Cryobiology, Microbiology, Sea ice, Antarctica—McMurdo Sound
Heterotrophic, psychrophilic, gas vacuolate bacteria were recovered from arctic and antarctic sea ice and water. Cellular fatty acid analysis was used to group these isolates. One group herein described as the new genus *Octadecabacter,* had octadecenoic acid (18:1) in excess of 70% of their total fatty acid content. Phylogenetic analysis of the 16S rRNA of several strains from this group revealed that they were members of the α *Proteobacteria* and were most closely related to the genus *Roseobacter.* Further phenotypic and genotypic tests showed that these strains can be distinguished from *Roseobacter* on the basis of low levels of DNA/DNA hybridization, lack of bacteriochlorophyll *a*, and because they are psychrophiles. *Octadecabacter* gen. nov., contains both a north polar species, *O. arcticus* sp. nov. str. 238, and a south polar species, *O. antarcticus* sp. nov. str. 307. This genus may be useful for examining the extent of procaryotic biogeographic dispersal. (Auth.)

52-383
Varved clay chronology as a means of recording paleoseismic events in southern Sweden.
Tröften, P.E., Mörner, N.A., *Journal of geodynamics,* Sep.-Dec. 1997, 24(1-4), p.249-258, 44 refs.
Pleistocene, Quaternary deposits, Tectonics, Subpolar regions, Glacial geology, Glacial deposits, Clays, Deformation, Seismology, Earthquakes, Geochronology, Sweden

52-384
Biogeochemistry of nitrous oxide in permanently ice-covered lakes of the McMurdo Dry Valleys, Antarctica.
Priscu, J.C., *Global change biology,* Aug. 1997, 3(4), p.301-315, Refs. p.313-315.
Limnology, Icebound lakes, Ice water interface, Ice air interface, Vapor transfer, Microbiology, Atmospheric composition, Climatic factors, Water chemistry, Geochemistry, Ice cover effect, Antarctica—McMurdo Dry Valleys
This manuscript presents an overview of published work on nitrous oxide in the permanently ice-covered lakes of the McMurdo Dry Valleys. Recent data on nitrous oxide from the major lakes in this region of Antarctica are used to draw general conclusions regarding sources and sinks for this gas within the liquid water column, and to estimate exchanges with the atmosphere. Areal flux from the lakes to the atmosphere is several hundred times greater than areal fluxes reported for oceanic systems. Owing to the relatively small combined surface area of these lakes, absolute atmospheric transfer is only a small fraction of annual global emission. (Auth. mod.)

52-385
Preliminary results of botanical and microbiological investigations on Severnaya Zemlya 1995.
Bölter, M., Kanda, H., NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.169-178, 14 refs.
Arctic landscapes, Ecosystems, Soil microbiology, Plants (botany), Sampling, Soil tests, Vegetation patterns, Classifications, Russia—Severnaya Zemlya

52-386
Distribution, growth and regeneration of *Larix gmelinii* (Rupr.) Rupr. along the timberline ecotone of Mt. Dal'nyaya Ploskaya, central Kamchatka.
Okitsu, S., NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.179-187, 21 refs.
Subarctic landscapes, Forest lines, Forest tundra, Forest ecosystems, Vegetation patterns, Sampling, Growth, Revegetation, Russia—Kamchatka Peninsula

52-387
Growth responses of two alpine plants to artificially generated warmed environment in Tateyama Range, Toyama, Japan.
Kojima, S., Tsubota, M., Wada, N., NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.188-195, 7 refs.
Alpine landscapes, Ecosystems, Plant ecology, Growth, Climatic factors, Temperature effects, Global warming, Simulation, Environmental tests, Heating, Japan—Tateyama Range

52-388
Preliminary report on phenological monitoring using experimental chambers in Mt. Kisokomagatake, central Japan.
Nakashinden, I., et al, NIPR Symposium on Polar Biology, Proceedings. No.10, Tokyo, National Institute of Polar Research, Feb. 1997, p.196-204, 12 refs.
Plant ecology, Phenology, Tundra vegetation, Tundra climate, Alpine tundra, Global warming, Simulation, Temperature effects, Growth, Environmental tests, Japan—Kisokomagatake, Mount

52-389
Characteristic vertical wavenumbers for the polar mesosphere.
Hall, C.M., Hoppe, U.P., *Geophysical research letters,* Apr. 15, 1997, 24(8), p.837-840, 8 refs.
Polar atmospheres, Gravity waves, Sounding, Spectra, Velocity measurement, Attenuation, Seasonal variations, Statistical analysis

52-390
Laboratory and in situ evidence for the presence of ice particles in a PMSE region.
Zadorozhnyĭ, A.M., et al, *Geophysical research letters,* Apr. 15, 1997, 24(8), p.841-844, 19 refs.
Polar atmospheres, Electric fields, Aerosols, Ice crystals, Particle size distribution, Radar echoes, Scattering, Performance, Impact, Sensors, Simulation

52-391
Accuracy of temperatures from UKMO analyses of 1994/95 in the arctic winter stratosphere.
Pullen, S., Jones, R.L., *Geophysical research letters,* Apr. 15, 1997, 24(8), p.845-848, 6 refs.
Climatology, Polar atmospheres, Stratosphere, Air temperature, Freezing points, Sounding, Accuracy, Cloud physics, Statistical analysis

52-392
Variations of tropospheric HCl amounts over northern Sweden.
Wegner, A., Stiller, G.P., Von Clarmann, T., Trieschmann, O., Fischer, H., *Geophysical research letters,* Apr. 15, 1997, 24(8), p.849-852, 14 refs.
Polar atmospheres, Atmospheric composition, Aerosols, Chemical properties, Chemical analysis, Infrared spectroscopy, Spectra, Statistical analysis, Sweden

52-393
Wintertime in situ profile of BrO between 17 and 27 km in the arctic vortex.
McKinney, K.A., Pierson, J.M., Toohey, D.W., *Geophysical research letters,* Apr. 15, 1997, 24(8), p.853-856, 14 refs.
Climatology, Polar atmospheres, Stratosphere, Photochemical reactions, Atmospheric composition, Aerosols, Profiles, Sounding

52-394
1991-92 atmospheric methane anomaly: southern hemisphere ^{13}C decrease and growth rate fluctuations.
Lowe, D.C., Manning, M.R., Brailsford, G.W., Bromley, A.M., *Geophysical research letters,* Apr. 15, 1997, 24(8), p.857-860, 31 refs.
Climatology, Polar atmospheres, Atmospheric composition, Carbon isotopes, Aerosols, Isotope analysis, Turbulent diffusion, Seasonal variations, Antarctica—Scott Base
Measurements of atmospheric methane from 1989-1996 at Baring Head, New Zealand, and at Scott Base show a seasonal cycle in the mixing ratio with a peak to peak amplitude of 18 ppb. The simultaneous changes in the mixing ratio growth rate and $\delta^{13}C$ together with the rapid drop and slow recovery in the latter provide a stringent test of possible causes. Although a combination of causes cannot be ruled out, decreased emissions from an isotopically heavy source such as biomass burning best meet the constraints of the data. (Auth. mod.)

52-395
Satellite-derived maps of arctic and antarctic sea ice motion: 1988 to 1994.
Emery, W.J., Fowler, C.W., Maslanik, J.A., *Geophysical research letters,* Apr. 15, 1997, 24(8), p.897-900, 24 refs.
Oceanography, Sea ice distribution, Drift, Spaceborne photography, Microwaves, Image processing, Seasonal variations
Standard image processing methods applied to Special Sensor Microwave/Imager data provide previously unseen details about sea ice motion in the Arctic and southern oceans. Means calculated from daily ice motions for 1988-1994 confirm the basic circulation patterns established from drifting stations and buoys. In the Antarctic, the gridded motion fields show a nearly continuous westward transport along the antarctic coast, with well-defined regions of exchange between this East Wind Drift and the Antarctic Circumpolar Current. This detailed view of mean ice motion in the southern ocean is unique and presents a comprehensive overview not previously available for antarctic ice motions. (Auth. mod.)

52-396

Single-zircon Pb evaporation geochronology constrains basement-cover relationships in the Lower Hecla Hoek Complex of northern Ny Friesland, Svalbard.

Hellman, F.J., Gee, D.G., Johansson, Å., Witt-Nilsson, P., *Chemical geology,* May 1, 1997, 137(1-2), p.117-134, Refs. p.132-134.

Tectonics, Subpolar regions, Earth crust, Geological surveys, Sedimentation, Rock properties, Stratigraphy, Profiles, Isotope analysis, Geochronology, Radioactive age determination, Norway—Svalbard

52-397

Geochemical characterization of the Luochuan loess-paleosol sequence, China, and paleoclimatic implications.

Gallet, S., Jahn, B.M., Torii, M., *Chemical geology,* Nov. 22, 1996, 133(1-4), p.67-88, Refs. p.86-88.

Paleoclimatology, Loess, Earth crust, Sedimentation, Soil formation, Geochemistry, Stratigraphy, Sampling, Geochronology, Isotope analysis, China—Loess Plateau

52-398

Non-biogenic graphite in 3.8-Ga metamorphic rocks from the Isua district, Greenland.

Naraoka, H., Ohtake, M., Maruyama, S., Ohmoto, H., *Chemical geology,* Nov. 22, 1996, 133(1-4), p.251-260, 22 refs.

Earth crust, Sedimentation, Geochemistry, Thin sections, Hydrocarbons, Carbon isotopes, Isotope analysis, Greenland

52-399

Remote sensing of snowpack by microwave radiometer mounted on satellite.

Sasaki, M., Suzuki, M., Murata, K., *Electronics and communications in Japan, part 1: communications,* Mar. 1997, 80(3), p.58-66, Translated from Denshi Joho Tsushin Gakkai Ronbunshi. 9 refs.

Remote sensing, Snow surveys, Snow depth, Brightness, Correlation, Radiometry, Spacecraft, Snow optics, Attenuation, Data processing

52-400

Ecosystem alterations influenced by the tidal power station on the coast of the Barents Sea.

Semënov, V.N., *La houille blanche,* 1997, 52(3), p.86-87, With French summary. 1 ref.

Shores, Marine biology, Ecosystems, Tidal currents, Water level, Electric power, Dams, Water intakes, Water chemistry, Environmental impact, Countermeasures, Barents Sea

52-401

Heat flux monitoring during cryogenic pipe freezing: a case study.

Tavner, A.C.R., Bowen, R.J., Bishop, C.W., *Chemical engineering research and design,* Mar. 1996, 74(A2), p.239-241, 2 refs.

Water pipelines, Pipeline freezing, Sealing, Artificial freezing, Cryogenics, Heat flux, Flow control, Surface temperature, Temperature measurement, Ice water interface

52-402

Survey and partial characterization of ice-nucleating fluids secreted by giant-rosette (*Lobelia* and *Dendrosenecio*) plants of the mountains of eastern Africa.

Embuscado, M.E., BeMiller, J.N., Knox, E.B., *Carbohydrate polymers,* Sep.-Oct. 1996, 31(1-2), p.1-9, 21 refs.

Cryobiology, Plant physiology, Frost resistance, Alpine landscapes, Supercooling, Solutions, Polymers, Ice nuclei, Sampling, Chemical analysis, Freezing points, Kenya—Kenya, Mount

52-403

Complex organics in laboratory simulations of interstellar/cometary ices.

Bernstein, M.P., Allamandola, L.J., Sandford, S.A., *Advances in space research,* 1997, 19(7), Life sciences: complex organics in space. Proceedings of the F3.2 Symposium of COSPAR Scientific Commission F which was held during the Thirty-first COSPAR Scientific Assembly, Birmingham, U.K., 14-21 July 1996. Edited by F. Raulin and J. M. Greenberg, p.991-998, Refs. p.997-998.

Extraterrestrial ice, Cosmic dust, Ice physics, Ice composition, Hydrocarbons, Ultraviolet radiation, Photochemical reactions, Infrared spectroscopy, Spectra, Simulation

52-404

Phase and structural transitions in vicinal water on protein surfaces by means of the DSC.

Staszczuk, P., *Journal of thermal analysis,* Apr. 1997, 48(4), p.755-767, 63 refs.

Adsorption, Water structure, Temperature measurement, Phase transformations, Water films, Melting, Temperature effects, Thermal analysis

52-405

Premelting of ice and its environmental consequences.

Dash, J.G., Fu, H.Y., Wettlaufer, J.S., *Reports on progress in physics,* Jan. 1995, 58(1), p.115-167, Refs. p.160-167.

Ice physics, Snow physics, Ice melting, Liquid phases, Liquid solid interfaces, Phase transformations, Regelation, Frost heave, Geocryology, Precipitation (meteorology)

52-406

Features of weather around Syowa Station in the ACR period, 1987-1991.

Kaneto, S., *Antarctic record,* Mar. 1997, 41(1), p.1-8, In Japanese with English summary. 8 refs.

Weather observations, Meteorological data, Snow accumulation, Sea ice, Stratosphere, Antarctica—Showa Station, Antarctica—Asuka Station

Meteorological data obtained at Showa and Asuka stations during 1987-1991 are compared with normal values and data from Mizuho Station. At Showa Station, the first half of the period of observation was characterized by weak wind, little snow accumulation and sea ice drifting away from the shore during summer. In the lower stratosphere, the strongest sudden warming was observed in the spring of 1988, with no decay of the polar vortex. At Asuka Station, the data showed that the yearly mean wind speed is highest at inland stations. (Auth. mod.)

52-407

Cloud distribution in the Antarctic from satellite data.

Yamanouchi, T., *Antarctic record,* Mar. 1997, 41(1), p.23-40, In Japanese with English summary. Refs. p.39-40.

Clouds (meteorology), Cloud droplets, Brightness, Temperature, Imaging, Spaceborne photography, Albedo, Antarctica—Showa Station

Analyses of cloud distribution in the Antarctic, based on data of NOAA AVHRR channels 3, 4, and 5 received at Showa Station, are discussed. Brightness temperature differences of the channels are found effective in detecting clouds. A significant difference was found between the cloud cover over the continental ice sheet and that over the ocean. Compared to the cloud distribution determined from surface measurements, cloud cover determination from the temperature difference between channels 3 and 4, in summer, showed good agreement. However, between channels 4 and 5 in summer and winter, there was only a vague agreement. Results showing cloud distribution over East Antarctica throughout the year are presented. (Auth. mod.)

52-408

Radiation observations at Asuka Station, Antarctica and radiative properties of the atmosphere and snow surface.

Aoki, T., *Antarctic record,* Mar. 1997, 41(1), p.41-62, In Japanese with English summary. Refs. p.61-62.

Solar radiation, Albedo, Radiance, Air masses, Clouds (meteorology), Snow optics, Radiation measurement, Snow air interface, Snow cover structure, Antarctica—Asuka Station

Radiation observations at Asuka Station in 1988 are summarized. The diurnal and seasonal variations of net radiation at different antarctic stations are compared. Snow albedo is simulated with a multiple scattering model for the atmosphere-snow system. Results show that the spectral albedo of snow depends on the snow grain size, solar zenith angle, cloud condition and structure of snow layers. It is shown that near infrared wavelengths are effective for remote sensing of the snow physical parameters and discrimination between the snow surface and clouds from space. (Auth. mod.)

52-409

Albedo distribution in Lützow-Holm Bay and its neighborhood.

Nakagawa, K., *Antarctic record,* Mar. 1997, 41(1), p.63-71, In Japanese with English summary. 15 refs.

Albedo, Sea ice, Mapping, Spaceborne photography, Data processing, Antarctica—Lützow-Holm Bay

A method has been developed for estimating the filtered narrow band surface albedo with NOAA/AVHRR data, and has been applied to analysis of the surface albedo distribution in Lützow-Holm Bay and vicinity in 1990. Sixteen maps of the surface albedo distribution have been drawn. A comparison of the albedos inferred from satellite data with those actually observed in Ongul Strait shows that the satellite-inferred, filtered narrow band albedos agree with the daily means of ground-observed, unfiltered broad band albedo. There is a characteristic pattern of surface albedo distribution in this area: the open sea albedo is less than 5%, whereas most of the compact pack ice and fast ice albedo is more than 60%. The albedo is lowest in the eastern part of Lützow-Holm Bay; off the Sôya Coast it is less than 40%. The ice sheet of Antarctica has the remarkably high albedo of more than 80%. (Auth. mod.)

52-410

Surface temperature distribution in Lützow-Holm Bay and its neighborhood.

Nakagawa, K., *Antarctic record,* Mar. 1997, 41(1), p.73-81, In Japanese with English summary. 6 refs.

Spaceborne photography, Data processing, Mapping, Air temperature, Ice air interface, Ice sheets, Antarctica—Lützow-Holm Bay

All the NOAA/AVHRR thermal infrared images received at Showa Station from Feb. 1990 to Jan. 1991 were analyzed to make temperature distribution maps. From this analysis the warmer area in midslope, i.e. the so-called thermal belt, appeared on the ice sheet slope along the coast around Lützow-Holm Bay, especially on the Sôya Coast, frequently in winter. The relationship between the thermal belt on the Sôya Coast and the surface inversion layer over Showa Station was investigated. When the surface inversion layer thickness increased, the thermal belt was displaced toward the interior or higher part of the ice sheet slope. (Auth. mod.)

52-411

Radiative effects of clouds and cryosphere in the Antarctic.

Yamanouchi, T., *Antarctic record,* Mar. 1997, 41(1), p.83-102, In Japanese with English summary. Refs. p.101-102.

Albedo, Solar radiation, Clouds (meteorology), Sea ice, Ice sheets, Radiation measurement, Ice cover effect, Air temperature, Ice air interface, Antarctica—Showa Station, Antarctica—Amundsen-Scott Station

Examination of the effects of clouds, ice sheet and sea ice on the radiation budget in the Antarctic using Earth Radiation Budget Experiment (ERBE) data are reported. The continental ice sheet affects not only the albedo, but also the surface temperature because of elevation, and hence the OLR. Sea ice, which is a critical climate feedback factor, appears to have less impact on radiation than do clouds. However, these surfaces lie underneath clouds, and it was found that the independent effect of sea ice is as large as that of clouds, and clouds are masking the radiative effect of sea ice by more than half. The radiation budget at the top of the atmosphere from satellite observation and that at the surface from the surface radiation measurements at Showa and Amundsen-Scott stations were compared. Cloud radiative forcing at both stations for the surface, atmosphere and top of the atmosphere was derived. (Auth.)

52-412

Characteristics and seasonal variations of precipitation phenomena at Syowa Station.

Konishi, H., Endoh, T., *Antarctic record,* Mar. 1997, 41(1), p.103-129, In Japanese with English summary. Refs. p.128-129.

Clouds (meteorology), Precipitation (meteorology), Air temperature, Atmospheric circulation, Sea ice, Snowfall, Seasonal variations, Antarctica—Showa Station

Long-term observations of precipitating clouds were carried out at Showa Station in 1989. The seasonal variations of clouds and precipitation were analyzed corresponding to the seasonal changes of air temperature and sea ice area. The occurrence frequencies of cloud vortices which brought snowfall to Showa Station increased in the fall and spring seasons corresponding to activity of the circumpolar trough. However, the activities of cloud systems that bring precipitation weaken in spring when the sea ice area expands to low latitudes, because of less supply of heat and vapor. In 1989, the amount of precipitation in the spring, brought by a few snowfall events, was equal to the amount of precipitation in the fall, brought by frequent snowfall events. Radar observations revealed that there were 3 abundant snowfall seasons at Showa Station, and the amount

of snowfall was uniform in all seasons except summer. The amounts of precipitation in fall, winter and spring were 74, 74 and 53 mm, respectively. (Auth. mod.)

52-413

Observations of precipitable water, column liquid water and column ice water at Syowa Station.

Wada, M., Konishi, H., *Antarctic record,* Mar. 1997, 41(1), p.131-148, In Japanese with English summary. 10 refs.

Air masses, Water vapor, Precipitation (meteorology), Clouds (meteorology), Air temperature, Brightness, Antarctica—Showa Station

Observations of water vapor, liquid water content and ice water content in the atmosphere were carried out at Showa Station in 1988. Precipitable water, column liquid water and column ice water were measured. This paper reports the results and the relationships among them and temperature, humidity and satellite brightness temperatures. Based on the relations, the characteristics of clouds and precipitation are discussed. (Auth.)

52-414

Continuous measurement of surface O_3 concentration at Syowa Station and onboard *Shirase*.

Aoki, S., *Antarctic record,* Mar. 1997, 41(1), p.231-247, In Japanese with English summary. Refs. p.246-247.

Atmospheric composition, Ozone, Air pollution, Atmospheric circulation, Diurnal variations, Seasonal variations, Antarctica—Showa Station

Continuous measurements of lower tropospheric ozone were carried out at Showa Station since Feb. 1988. The diurnal variation of the lower tropospheric ozone was observable only during spring. The average amplitude of the diurnal variation reached a maximum value of about 2 ppb in Sep. and Oct. The maximum and minimum concentrations of the diurnal variations occurred before sunrise and in the afternoons, respectively. The daily mean ozone concentrations showed a clear seasonal cycle, with maximum concentration in winter and minimum concentration in summer, and mean amplitude of about 20 ppb. Minimum concentrations of the seasonal cycle were almost the same for each year, but maximum concentrations varied from year to year; higher concentrations appeared in 1988 and 1990, and lower concentrations in 1989, 1991 and 1992. These variations are ascribed to changes of the atmospheric circulation in the Antarctic. It was found that extremely low values of lower tropospheric ozone, with periods of a few days, appeared sporadically between Aug. and Oct. every year. (Auth. mod.)

52-415

Relationship between tropospheric ozone concentration and atmospheric transport over Syowa Station, Antarctica.

Murayama, S., Aoki, S., Nakazawa, T., *Antarctic record,* Mar. 1997, 41(1), p.249-258, In Japanese with English summary. 13 refs.

Ozone, Atmospheric composition, Atmospheric circulation, Seasonal variations, Antarctica—Showa Station

Measurements of the tropospheric O_3 concentration over Showa Station were carried out from May 1989 to Jan. 1990. The O_3 concentration increased with height for the whole period. Lower tropospheric O_3 concentration showed a prominent seasonal variation, with maximum concentration in winter and minimum in summer. In the upper troposphere, the concentration reached high values in winter, decreased gradually from Sep. to early Nov. and then increasing again. From the results, it is hypothesized that the seasonal variation of height-dependent atmospheric transport processes could influence that of the tropospheric O_3 concentration over Showa Station. (Auth. mod.)

52-416

Ozone observations by the Japanese Antarctic Research Expedition (JARE).

Matsubara, K., *Antarctic record,* Mar. 1997, 41(1), p.259-269, In Japanese with English summary. 19 refs.

Ozone, Ultraviolet radiation, Measurement, Atmospheric composition, Meteorological instruments, Aerosols, Antarctica—Showa Station

Ozone observations by the Japanese Antarctic Research Expedition have been carried out since 1961. In the period of the Antarctic Climate Research Project, new observations were carried out at Showa Station using instruments such as the Dobson Spectrophotometer and ozonesonde. Surface ozone, UV-B radiation, columnar NO_2 and O_3, total ozone and aerosol were determined using a Dasibi ozone meter, Brewer spectrophotometer, visible spectrometer, and Polar Patrol Balloon, respectively. Columnar and vertical ozone amount from the equatorial region to Antarctica, obtained on board the research vessel *Shirase*, are also reported. (Auth. mod.)

52-417

Chemistry of the reactive nitrogen in the antarctic stratosphere.

Kondo, Y., Koike, M., *Antarctic record,* Mar. 1997, 41(1), p.271-283, In Japanese with English summary. Refs. p.282-283.

Atmospheric composition, Seasonal variations, Ozone, Chemical analysis, Antarctica—Showa Station

The column amounts of NO_2 have been measured using a visible spectrometer at Showa Station since Mar. 1990. The NO_2 column exhibits a large seasonal variation, with a maximum in summer and a minimum in winter. The recovery of NO_2 in spring is 2-3 times slower than the fall decay. The low NO_2 level in mid-winter to early spring is considered to be due to a conversion into HNO_3 on PSCs and due to the denitrification by gravitational sedimentation of PSC particles. Results from a chemical box model agreed well with this slow rate of NO_2 increase in spring, when heterogeneous chemistry on PSCs was included. The reduction of NO_2 by 30% was found after the breakup of the austral polar vortex in 1992. (Auth. mod.)

52-418

Behavior of chemical components in the snow and atmosphere on the Mizuho Plateau.

Kanamori, S., Kanamori, N., Watanabe, O., Nishikawa, M., Kamiyama, K., Motoyama, H., *Antarctic record,* Mar. 1997, 41(1), p.291-309, In Japanese with English summary. 21 refs.

Atmospheric composition, Snow composition, Aerosols, Seasonal variations, Antarctica—Mizuho Plateau

Atmospheric aerosols were studied at Showa Station from 1988 to 1990. Some chemicals, such as $exSO_4^{2-}$, MSA and NH_4^+, showed an annual trend, high in summer and low in winter. The seasonal variations of gaseous HCl, SO_2, HNO_2, HNO_3 were also studied. The occurrence of very high HCl gas in summer, and the comparable concentrations of other gases to those of aerosols, were found. From the observation at 5 snow pits on the Mizuho Plateau, apparent seasonal variations in $\delta^{18}O$, Cl^- and Na^+ were found only at the 2 inland points. Most snow samples showed positive $exCl^-$ values. A rough linear relationship among concentrations in chemicals was found between atmospheric aerosols and corresponding snow on the Mizuho Plateau; the concentration in the aerosol is roughly reflected in the snow composition. (Auth. mod.)

52-419

Ice production and convective mixing in the coastal polynya off Lützow-Holm Bay, Antarctica.

Ushio, S., Takizawa, T., Ohshima, K.I., Kawamura, T., *Antarctic record,* Mar. 1997, 41(1), p.329-334, In Japanese with English summary. 5 refs.

Sea ice distribution, Polynyas, Oceanographic surveys, Convection, Ice formation, Salinity, Antarctica—Lützow-Holm Bay, Antarctica—Breid Bay

A coastal polynya often forms around Lützow-Holm Bay, even in severe winter. To clarify the characteristics of oceanic structure in the polynya, the water mass of the convective-mixed layer was analyzed. Haline convection by the high ice production in the winter polynya contributes to the formation of a thicker mixed layer than that in the pack ice region. Furthermore, the active convection leads to entrainment of the oxygen-poor deep water underlying the winter mixed layer. Consequently, in the polynya located over the continental shelf break, the oxygen content of the mixed layer is somewhat lower than that in the other polynya, Breid Bay, where haline convection reaches only to the shallow sea bottom of the continental shelf. (Auth.)

52-420

Temperature structure and SSM/I images of the Cosmonaut polynya region.

Takizawa, T., Ohshima, K.I., Ushio, S., Kawamura, T., Enomoto, H., *Antarctic record,* Mar. 1997, 41(1), p.335-346, In Japanese with English summary. 4 refs.

Polynyas, Sea ice distribution, Oceanographic surveys, Imaging, Spaceborne photography, Temperature measurement, —Indian Ocean

Analysis of the water temperature structure in the Indian Ocean between 60-68°S, 35-65°E in 1987-1992, shows that water with temperature below -1.5°C was present in the antarctic coastal region. The Circumpolar Deep Water, with temperature higher than 1.0°C, was found at about 150 m depth, from northeast to northwest, of the cold water area. The SSM/I images in 1987-1991 indicate that polynya activity was intense in 1988. Due to weak activity, small and sporadic polynyas formed in 1987, 1989, 1990 and 1991. It is considered that the atmospheric convergence line and the Antarctic Divergence region are responsible for polynya activity in the southern Indian Ocean. (Auth. mod.)

52-421

Sea ice drift off Queen Maud Land, Antarctica.

Miyakawa, T., Ohshima, K.I., *Antarctic record,* Mar. 1997, 41(1), p.347-354, In Japanese with English summary. 7 refs.

Pack ice, Drift, Sea ice, Atmospheric pressure, Ocean currents, —Indian Ocean, Antarctica—Riiser-Larsen Peninsula

Characteristics of sea ice drift off Queen Maud Land are described based on data from a buoy deployed in the pack ice region off Showa Station on Feb. 20, 1992. The drift of the buoy is consistently westward, with some variability. Averaged velocity of the drift is about 20 cm/s in the area from 39°E (Feb. 20) to 14°E (Apr. 10). The drift velocity becomes especially high west of the Riiser-Larsen Peninsula. Drift vectors of sea ice off Queen Maud Land are obtained from 68 NOAA/AVHRR images. In general, the drift vectors follow the bottom contours: they are mostly westward in the coastal region and northward in the east of Gunnerus Ridge. Both the buoy and AVHRR analyses suggest that the sea ice drift is influenced considerably by the ocean currents. (Auth.)

52-422

Observations of sea-ice conditions in the antarctic coastal region using ship-board video cameras.

Shimoda, H., et al, *Antarctic record,* Mar. 1997, 41(1), p.355-365, In Japanese with English summary. 5 refs.

Sea ice distribution, Ice structure, Albedo, Ice cover thickness, Air temperature, Ice air interface, Photographic equipment, Antarctica—Lützow-Holm Bay, Antarctica—Breid Bay

During the JARE-30, JARE-31, and JARE-32 sea-ice conditions were recorded by video camera on board the *Shirase.* The sea-ice images were used to estimate compactness and thickness quantitatively. Analyzed areas are those from Breid Bay to Showa Station. The results show yearly variations of ice compactness and thickness, latitudinal variations of thickness, and differences in thickness histograms between JARE-30 and JARE-32 in Lützow-Holm Bay. Albedo values were measured simultaneously by a short-wave radiometer. These values are proportional to those of ice compactness. The relationship between ice compactness and vertical gradient of air temperature above sea ice is discussed. (Auth. mod.)

52-423

Characteristics and growth processes of sea ice in Lützow-Holm Bay.

Kawamura, T., Takizawa, T., Ohshima, K.I., Ushio, S., *Antarctic record,* Mar. 1997, 41(1), p.367-383, In Japanese with English summary. Refs. p.381-383.

Ice growth, Sea ice, Snow accumulation, Ice cover thickness, Ice composition, Snow ice interface, Ice structure, Antarctica—Lützow-Holm Bay

Observations of multiyear sea ice were made in Lützow-Holm Bay in 1990-91 to determine the snow and ice characteristics and ice growth processes. The snow depth in the Bay reached the remarkably high values of 1.0 to 1.5 m during winter. Fast ice with deep snow cover showed little growth during winter, but it thickened substantially during the summer months. Based on ice core structure, salinity and stable isotopic composition, it is concluded that the ice grows upward, caused by snow and superimposed ice formation; evidence of snow cover melting, which is a prerequisite for superimposed ice formation, was found. The summer upward-growth was not found in sea ice with low snow accumulation. Snow cover, therefore, significantly affects the growth processes and structure of sea ice. (Auth. mod.)

52-424

Micrometeorology and heat balance over the fast ice.

Nakagawa, K., *Antarctic record,* Mar. 1997, 41(1), p.385-394, In Japanese with English summary. 7 refs.

Microclimatology, Fast ice, Sea ice, Snow depth, Radiation balance, Snow air interface, Snow ice interface, Antarctica—Ongul Sound

Micrometeorological conditions were observed over fast ice with overlying thick snow cover, and underlying deep sea approximately in the center of Ongul Strait in Lützow-Holm Bay from the end of Mar. to the beginning of Dec., 1990. The radiation balance showed an annual variation: it was negative for a period including the polar night, and changed to positive after Oct. Corresponding to the radiation balance, both sensible heat flux from air to snow and the conductive heat flux from the fast ice to snow, changed. The sensible heat flux changed with the radiation balance like a mirror image. As the prevailing wind velocity increased, the temperature and humidity increased; the radiative heat loss, the sensible heat flux from air to snow, and the conductive heat flow from the fast ice to snow, decreased. (Auth. mod.)

52-425
Ocean and sea-ice observations during the Antarctic Climate Research program.
Kawamura, T., Takizawa, T., Ohshima, K.I., Ushio, S., *Antarctic record,* Mar. 1997, 41(1), p.395-414, In Japanese with English summary. 6 refs.
Oceanographic surveys, Sea ice, Ice cover thickness, Snow depth, Ice composition, Ice air interface, Snow air interface, Antarctica—Lützow-Holm Bay, Antarctica—Ongul Sound
Air-ice-sea interaction studies were conducted in Ongul Sound and the Lützow-Holm Bay in 1990-92. Measurements were carried out in order to reveal the flow and oceanic structure under the fast ice. Current meters and thermistor chains were also moored to collect long-term data. Sea ice cores were sampled and analyzed to determine the structure and growth processes. In this report, the authors describe oceanographic observations in detail, as well as the structure and development of sea ice at points across the Ongul Sound, and ice growth processes in an artificial pool in the Sound. (Auth. mod.)

52-426
NOAA satellite observation in the Antarctic.
Seko, K., *Antarctic record,* Mar. 1997, 41(1), p.415-432, In Japanese with English summary. Refs. p.431-432.
Weather observations, Meteorological instruments, Data processing, Spaceborne photography, Wind factors, Ice surface, Snow accumulation, Imaging, Antarctica—Showa Station
The NOAA Satellite AVHRR data received at Showa Station offer simultaneous images on 5 wavelengths covering an area 2,000 km on a side with resolution of 1 km, which help to clarify a number of phenomena. The AVHRR is a radiometer which observes in 4 or 5 channels covering the visible and infrared regions. Phenomena in the atmosphere and at the snow surface can be studied from the AVHRR data. Data are received from at least one orbit per day and are of uniform quality. Results of the following analyses are summarized in this report: analysis using the time sequence of infrared channel data; detection of the katabatic wind information; and detection of the ice sheet surface and snow accumulation information. (Auth.)

52-427
Bare ice fields developed in the inland part of the antarctic ice sheet.
Takahashi, S., *Antarctic record,* Mar. 1997, 41(1), p.433-445, In Japanese with English summary. 10 refs.
Ice sublimation, Ice sheets, Albedo, Ice surface, Ice air interface, Air temperature, Antarctica—Sør Rondane Mountains
Observations of bare ice fields were carried out at Seal Rock in the Sør Rondane Mountains. A higher sublimation rate, 200 to 280 mm/a, was noted. Air temperature on the bare ice was about 1°C higher than that on the snow surface. The higher sublimation rate is attributed to the low albedo of the bare ice; its value is roughly estimated from the heat budget data. The bare ice fields are classified into 4 types according to origin. (Auth. mod.)

52-428
Dark streams observed on NOAA satellite images over the katabatic wind zone, Antarctica.
Endoh, T., Yamanouchi, T., Ishikawa, T., Kakegawa, H., Kawaguchi, S., *Antarctic record,* Mar. 1997, 41(1), p.447-457, In Japanese with English summary. 7 refs.
Wind factors, Air temperature, Atmospheric circulation, Spaceborne photography, Image processing, Streams
In the katabatic wind zone, some characteristic streams are frequently observed in NOAA satellite images, especially in the winter season. These dark streams move and change location and their width slightly in a series of successive images; however, distributions seem to be restricted to areas of some specific topographies. The air temperature is not particularly low and remains steady, and the wind speed is constantly high, 13 m/s or more. The air temperature inside the stream is 15°C or higher than outside of it. Along the central line of the stream, the air temperature varies with height at the dry adiabatic lapse rate. It is suggested that these dark stream images are composed to a warmer air stream compared with that of the outside and a strongly forced downward current along the slope. (Auth. mod.)

52-429
Glaciological studies near the Sør Rondane Mountains, East Antarctica.
Motoyama, H., Azuma, N., Fujita, S., *Antarctic record,* Mar. 1997, 41(1), p.459-466, In Japanese with English summary. 5 refs.
Ice sheets, Rheology, Glaciology, Climatic factors, Glacier mass balance, Climatic changes, Mountains, Antarctica—Sør Rondane Mountains
In order to study the influence of the Sør Rondane Mountains on the stability of the antarctic ice sheet, the following activities were carried out in 1988 and 1989: a series of shallow drillings along a selected flow line upstream of the Sør Rondane Mountains to Breid Bay; surface flow velocity, strain and mass balance measurements on the flow line; and monitoring of a valley glacier in the Sør Rondane Mountains. Results are discussed and presented in tables and charts. (Auth. mod.)

52-430
Eruption of Mt. Pinatubo and climate of Syowa Station.
Kaneto, S., *Antarctic record,* Mar. 1997, 41(1), p.285-290, In Japanese with English summary. 5 refs.
Climatology, Aerosols, Atmospheric composition, Air pollution, Stratosphere, Air temperature, Volcanoes, Ozone, Antarctica—Showa Station
In June 1991, the volcano Pinatubo erupted and injected a large volcanic cloud into the lower and middle stratosphere. In Aug. 1991, Mt. Hudson, in southern Chile, erupted; its volcanic cloud reaches up to 18 km. From NOAA/AVHRR data, within 1991, the volcanic aerosol of Pinatubo dispersed mainly in tropical latitudes and that of Hudson spread in the area south of 40°S. The eruption effects are investigated here by comparing meteorological observation results at Showa Station with global analyses. The optical observations which measure direct effects of eruption materials, show a significant effect in late 1991. Abnormal deviations were detected in surface temperature and total ozone amount. Effects on stratospheric temperature were not detected. (Auth. mod.)

52-431
Proceedings of the Eighth Workshop on the Hydraulics of Ice Covered Rivers. Winter environments of regulated rivers.
Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia, Andres, D.D., ed, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, 543p., Refs. passim. For selected papers see 52-432 through 52-457.
Rivers, River ice, Ice cover, Hydraulics, Lake ice, Electric power

52-432
Analysis of events leading to the February 1992 flooding of the town of Peace River, Alberta.
Assaf, H., Parmely, L., Chan-McLeod, A., Galvagno, P., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.1-21, 8 refs.
Rivers, Flooding, River ice, Ice breakup, Ice formation, Runoff, Ice jams, Snowmelt, Freezeup, Dams, Canada—Alberta—Peace River

52-433
Hydrologic response to freeze-up on large northern rivers (case study).
Conly, F.M., Prowse, T.D., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.23-42, 21 refs.
Rivers, River ice, Freezeup, Ice formation, Hydrologic cycle, Hydrography, Water level, Canada—Northwest Territories—Liard River, Canada—Northwest Territories—Mackenzie River

52-434
Effects of hydropower peaking operations on the thickness of ice accumulations.
Zufelt, J.E., MP 5009, Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.43-57, 2 refs.
Electric power, River ice, Ice cover thickness, Water level, Mathematical models, Dams
Hydropower operations alter the natural levels of discharge in a river. In general, the effect of a hydropower dam is to average the flow, cutting off the very high and very low periods of discharge which may result in flooding or drought conditions on a seasonal scale. Peaking operations, however, may reverse this trend, resulting in flows that are much higher or lower than the natural daily flow levels for that time of the year. During winter, natural discharge levels are low, and peaking operations may result in periods of abnormally high and low discharge in rivers under ice-covered conditions. These large variations in discharge may cause ice movement or grounding over the course of the cycling period. Therefore, the range of cycling is often limited during ice formation and breakup periods when the ice cover is most likely to move. Restrictions are often based on the peak discharge in the cycle and the water levels expected downstream. Due to the additional resistance offered by an ice cover, the attenuation of the peaking wave as it travels downstream can be much greater than for open-water conditions. This paper examines the effects of this attentuation on the peak discharge, water levels, and ice thickness experienced downstream of the hydropower facility.

52-435
Frazil generation and ice floe formation on a regulated river.
Andres, D.D., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.59-75, 10 refs.
Ice floes, Frazil ice, River ice, Freezeup, Ice models, Mathematical models, Canada—Alberta—Peace River

52-436
Anchor ice growth in channels.
Hammar, L., Shen, H.T., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.77-92, 14 refs.
Bottom ice, River ice, Frazil ice, Channels (waterways), Analysis (mathematics), Ice growth, Ice accretion

52-437
Environmental review of ice management operations on the Rideau River in Ottawa.
Reid, B.A., Torrens, L.W., Hodgins, D.B., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.121-142, 6 refs.
Environmental impact, Watersheds, Ice jams, River ice, Ice breakup, Flooding, Flood control, Canada—Ontario—Ottawa, Canada—Ontario—Rideau River

52-438
Under-ice hydraulics and mixing in regulated Peace River.
Neill, C.R., Yaremko, E.K., Van Der Vinne, P.G., Andres, D.D., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.159-185, 12 refs.
River ice, Hydraulics, Ice bottom surface, Ice conditions, River flow, Canada—Alberta—Peace River

52-439

Method for calculating flow resistance in ice-covered alluvial channels.

Smith, B.T., Ettema, R., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.187-206, 14 refs.

Channels (waterways), Ice cover effect, River flow, Alluvium, Flow rate

52-440

Ice jam flooding near the confluence of the Missouri and Yellowstone rivers.

Wuebben, J.L., MP 5010, Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.207-224, 2 refs.

Flooding, River ice, Ice jams, Ice breakup, Ice conditions, Hydrology, United States—Missouri River, United States—Yellowstone River

This investigation focused on ice-related flooding along the Missouri River, just below the confluence with the Yellowstone River near Williston, ND. This area is at the upper end of Lake Sakakawea. With the closure of Garrison Dam in 1953, Lake Sakakawea began filling, reaching operational levels in 1965. Changes in the hydraulics, sedimentation and ice regime of the Missouri River caused by the impoundment have led to an increase in the potential for overbank flooding. This paper presents an evaluation of the ice regime of the Missouri and Yellowstone Rivers using historical and recent information on ice processes and ice-related flooding. A scheme for estimating the potential for ice-related flooding based on a correlation of weather and hydraulic data is outlined. The method has been used in two subsequent winters to estimate the timing and severity of river ice breakup.

52-441

Ice engineering overview.

Raban, R., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.225-232, 2 refs.

River ice, Lake ice, Ice cover effect, Environmental impact

52-442

Marine radar monitoring of Niagara River ice conditions.

Crissman, R.D., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.233-250, 5 refs.

River ice, Ice conditions, Electric power, Radar photography, Mapping, Niagara River, Canada—Ontario, United States—New York

52-443

Effect of river regulations on winter environment experience from Iceland.

Freysteinsson, S., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.251-258, 2 refs.

Electric power, Rivers, Environmental impact, Reservoirs, Iceland—Thjórsá River

52-444

Assessing the effects of alternative project operation on upstream ice conditions: Aroostook River at Fort Fairfield, Maine.

White, K.D., Acone, S.E., MP 5011, Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.259-273, 10 refs.

River ice, Ice conditions, Flooding, Dams, Ice cover thickness, Freezeup, Hydraulics, United States—Maine—Aroostook River

Breakup ice jams in the Aroostook River have caused severe flooding in Fort Fairfield, ME. In general, the most damaging jams halt in the area between Fort Fairfield and the international border. It has been suggested that the backwater of Tinker Dam, which extends into Fort Fairfield, contributes to the formation or stopping of ice jams in the reach between the dam and the town. This report presents the results of an investigation of the effects of river geometry on the ice regime of the Aroostook River upstream from Tinker Dam, and whether dam operations or some type of dredging might affect this regime. Results show that present dam operations at freezeup are preferable to lowering the water level. Current gate operations are also preferable to lowering the gates at breakup when flows are greater than 283 m^3/s. Observed frazil deposition in the upper reaches of the pool correlates well with the location of jam stoppages. The modeled channel improvement scheme that showed the most promise for decreasing ice thickness at the critical location is to remove the island-shoal area at the McDonald Brook confluence.

52-445

Norwegian experiences with environmental problems by ice, specially connected to regulations.

Asvall, R.P., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.275-283, 2 refs.

River ice, Lake ice, Ice conditions, Electric power, Hydrology, Environmental impact, Norway

52-446

Snow dumping site using riverbanks and their influence on the environment of rivers.

Tachibana, H., Hara, F., Saeki, H., Abe, M., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.285-302, 3 refs.

Rivers, Snow removal, Snow impurities, Snow composition, Pollution, Environmental impact, Japan—Sapporo

52-447

Stream water chemistry during winter in the Yukon Territory.

Whitfield, P.H., Whitley, W.G., Wade, N.L., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.303-329, 19 refs.

Streams, Stream flow, Water chemistry, Rivers, River basins, Wetlands, Erosion, Canada—Yukon Territory, Canada—Yukon Territory—Wheaton River

52-448

Research on solid particles in river ice.

Tachibana, H., Hara, F., Saeki, H., Abe, M., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.331-347, 2 refs.

River ice, Impurities, Ice composition, Ice floes, Particles, Snow ice, Particle size distribution, Lake ice, Japan—Teshio River

52-449

Conditions of arching at bridge piers due to ice sheets.

Hara, F., Hirano, A., Hanada, M., Saeki, H., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.349-364, 6 refs.

River ice, Ice jams, Ice cover effect, Flooding, Piers

52-450

Design alternatives for the Lake Erie-Niagara River ice boom.

Crissman, R.D., Abdelnour, R., Shen, H.T., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.365-394, 14 refs.

Ice booms, Design, Lake ice, River ice, Freezeup, Ice loads, Pontoon bridges, Performance, Erie, Lake, Niagara River, Canada—Ontario, United States—New York

52-451

Chaudière River—existing ice jam conditions and possible mitigation measures.

Petryk, S., Tremblay, P.R., Lacroix, J., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.397-420, 7 refs.

River ice, Ice jams, Ice conditions, Ice breakup, Hydraulics, Dams, Countermeasures, Ice cover effect, Canada—Quebec, Canada—Chaudière River

52-452

Ice jam simulations in rivers with islands.

Jasek, M., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.421-441, 7 refs.

Ice jams, Ice models, Channels (waterways), Flooding, Mathematical models, Yukon River, Canada—Yukon Territory—Whitehore, United States—Alaska

52-453

Results of field surveys on the break-up of ice in the Teshio River.

Hara, F., Takahashi, Y., Kaneto, T., Saeki, H., Yamaguchi, H., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.443-461, 5 refs.

River ice, Ice breakup, Water level, Freezing, Flow rate, Japan—Teshio River

52-454

Breakup forecasting.

Beltaos, S., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.463-482, 33 refs.

River ice, Ice jams, Ice cover, Ice breakup, Forecasting, Runoff, Shear stress, Canada—Thames River, Canada—Grand River, Canada—Moose River, Canada—Nashwaak River, Canada—Restigouche River

52-455

Breakup forecasting on the Mackenzie River at the Fort Providence ferry crossing, NWT.

Hicks, F.E., Cui, W., Andres, D.D., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.483-501, 10 refs.

River ice, Ice breakup, Forecasting, Ice models, Canada—Northwest Territories—Fort Providence, Canada—Northwest Territories—Mackenzie River

52-456

Ice study on the Yukon River at Whitehorse.

Breland, A., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.503-522.

River ice, Ice conditions, Ice cover, Water level, Yukon River, Canada—Yukon Territory—Whitehorse

52-457

Research needs on river ice processes related to hydro-electric installations.

Petryk, S., Raban, R., Marcotte, N., Workshop on the Hydraulics of Ice Covered Rivers, 8th, Aug. 16-18, 1995, Kamloops, British Columbia. Proceedings. Winter environments of regulated rivers. Edited by D.D. Andres, Kamloops, British Columbia, Committee on River Ice Processes and the Environment, Canadian Geophysical Union, Hydrology Section, 1997, p.523-543, 19 refs.

River ice, Ice conditions, Ice cover, Ice jams, Ice models, Electric power, Hydrology, Research projects, Organizations

52-458

Alien in Antarctica: reflections upon forty years of exploration and research on the frozen continent.

Swithinbank, C., Blacksburg, VA, The McDonald & Woodward Publishing Company, 1997, 214p., Includes a short list of acronyms and a brief glossary. Refs. p.199-206.

DLC G875.S95A3 1997

Exploration, History, Antarctica—Victoria Land, Antarctica—Ross Sea, Antarctica—Ross Ice Shelf

The work is autobiographical, recounting the author's beginning interest in and eventual dedication to studying geological and geophysical aspects of the polar regions, especially of the various ice forms. The major emphasis of his work centered on the Victoria Land/Ross Sea/Ross Ice Shelf areas of Antarctica. Along the way, many of his colleagues were those whose names have long associations with Antarctica and for whom many antarctic physical features are named. Interspersed are numerous fine photographs and black and white sketch maps in and of the regions of specialization.

52-459

Minutes of aircraft/runway deicing/anti-icing technology crossfeed.

Baca, A., Herring, C., *U.S. Air Force Materiel Command, Wright-Patterson AFB, OH. Report,* Sep. 1996, AFMC-TM-96-9002, 476p., ADA-315 985, This report consists mostly of slides of military, government, and industry briefings presented at a meeting held in Arlington, VA, Aug. 20-21, 1996.

Aircraft icing, Runways, Road icing, Chemical ice prevention, Ice removal, Environmental protection

52-460

Numerical simulation of a regional icing event by a mesoscale model.

Muller, B.D., *U.S. Air Force Institute of Technology, Wright-Patterson AFB, OH. Report,* May 1996, AFIT-96-056, 93p., ADA-312 185, MS thesis submitted to Colorado State University, Fort Collins, CO. 38 refs.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Accidents, Cloud physics, Supercooled clouds, Cloud droplets, Weather forecasting, Computerized simulation

52-461

Representative values of icing-related variables aloft in freezing rain and freezing drizzle.

Jeck, R.K., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Technical note,* Mar. 1996, DOT/FAA/AR-TN95/119, 44p., ADA-307 822, 33 refs.

Aircraft icing, Ice accretion, Ice forecasting, Ice storms, Accidents, Supercooled clouds, Cloud physics, Cloud droplets, Weather forecasting, Statistical analysis

52-462

Use of automotive glycol antifreeze test strips for determining the freeze point of glycol-based aircraft deicing fluid.

Pugacz, E.J., Masters, C.O., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Technical note,* Apr. 1995, DOT/FAA/CT-TN95/24, 8p. + appends., ADA-299 128.

Aircraft icing, Chemical ice prevention, Antifreezes, Freezing points

52-463

Aircraft icing over northwest Europe.

Ashley, H., *U.S. Army Air Corps Air Weather Service. Technical report,* July 1945, No.105-46, 15p., ADA-297 000.

Aircraft icing, Ice forecasting, Meteorological factors, Weather observations, Weather forecasting

52-464

Analysis of B-1B exterior jet blast windshield anti-icing performance using pre-cooled compressor bleed air.

Emmer, D.S., Bouchard, M.P., *U.S. Air Force Materiel Command. Wright Laboratory, Wright-Patterson AFB, OH. Report,* July 1994, WL-TR-94-3129, 22p., ADA-292 522, 10 refs.

Aircraft icing, Ice prevention, Ice removal, Artificial melting, Defrosting

52-465

Ice impact analysis on blades.

Chamis, C.C., Murthy, P.L.N., Singhal, S.N., Reddy, E.S., Erosion, corrosion and foreign object damage effects in gas turbines. AGARD conference proceedings, AGARD-CP-558, Neuilly-sur-Seine, France, NATO, Advisory Group for Aerospace Research & Development (AGARD), 1994, p.23/1-23/12, ADA-289 820, 12 refs. Presented at the Propulsion and Energetics Panel (PEP) Symposium, Rotterdam, Netherlands, Apr. 25-28, 1994.

Jet engines, Aircraft icing, Ice accretion, Ice loads, Impact strength, Structural analysis

52-466

Winter storms research in Canada.

MacPherson, J.I., Isaac, G.A., Flight in an adverse environment. AGARD lecture series, AGARD-LS-197, Neuilly-sur-Seine, France, NATO, Advisory Group for Aerospace Research & Development (AGARD), 1994, p.2/1-2/21, ADA-288 350, 36 refs.

Snowstorms, Ice storms, Weather forecasting, Research projects, Aircraft icing, Ice forecasting, Canada

52-467

Icing: accretion, detection, protection.

Reinmann, J.J., Flight in an adverse environment. AGARD lecture series, AGARD-LS-197, Neuilly-sur-Seine, France, NATO, Advisory Group for Aerospace Research & Development (AGARD), 1994, p.4/1-4/27, ADA-288 350, 24 refs.

Aircraft icing, Ice accretion, Ice forecasting, Ice detection, Ice prevention

52-468

Meteorological factors that affect the formation and prediction of aircraft icing.

Bjorkman, C.S., *U.S. Air Force Institute of Technology, Wright-Patterson AFB, OH. Report,* 1994, AFIT/CI/CIA-94-029, 116p., ADA-281 984, MS thesis submitted to Ohio State University, Columbus, OH. Refs. p.110-116.

Aircraft icing, Ice accretion, Ice formation indicators, Ice forecasting, Cloud physics, Meteorological factors, Weather forecasting

52-469

Aerodynamics of a finite wing with simulated ice.

Bragg, M.B., Khodadoust, A., Kerho, M., Symposium on Numerical and Physical Aspects of Aerodynamic Flows, 5th, California State University, Long Beach, CA, Jan. 13-15, 1992. Edited by T. Cebeci, Research Triangle Park, NC, U.S. Army Research Office, 1993, 10p., ADA-266 941, 17 refs.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Computerized simulation

52-470

Numerical modeling of runback water on ice protected aircraft surfaces.

Al-Khalil, K.M., Keith, T.G., Jr., De Witt, K.J., Symposium on Numerical and Physical Aspects of Aerodynamic Flows, 5th, California State University, Long Beach, CA, Jan. 13-15, 1992. Edited by T. Cebeci, Research Triangle Park, NC, U.S. Army Research Office, 1993, 12p., ADA-266 941, 11 refs.

Aircraft icing, Ice accretion, Ice prevention, Ice heat flux, Ice melting, Ice air interface, Heat transfer, Water films, Air water interactions, Liquid solid interfaces, Air flow, Mathematical models, Computerized simulation

52-471

Composite structural/unstructured-mesh Euler method for complex airfoil shapes.

Hefazi, H., Chen, L.T., Symposium on Numerical and Physical Aspects of Aerodynamic Flows, 5th, California State University, Long Beach, CA, Jan. 13-15, 1992. Edited by T. Cebeci, Research Triangle Park, NC, U.S. Army Research Office, 1993, 6p., ADA-266 941, 14 refs.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Mathematical models

52-472

Experimental and computational ice shapes and resulting drag increase for a NACA 0012 airfoil.

Shin, J.W., Bond, T.H., Symposium on Numerical and Physical Aspects of Aerodynamic Flows, 5th, California State University, Long Beach, CA, Jan. 13-15, 1992. Edited by T. Cebeci, Research Triangle Park, NC, U.S. Army Research Office, 1993, 10p., ADA-266 941, 10 refs.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Mathematical models, Computerized simulation

52-474

Report.

FAA International Conference on Airplane Ground Deicing, Reston, VA, May 28-29, 1992, Washington, D.C., U.S. FAA, Flight Standards Service, May 1992, 313p., ADA-263 617.

Aircraft icing, Accidents, Chemical ice prevention, Ice detection, Safety

52-475

Icing cloud simulator for use in helicopter engine induction system ice protection testing.

Brunnenkant, S.W., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Technical note,* Dec. 1992, DOT/FAA/CT-TN92/43, 42p., ADA-263 203, 5 refs.

Helicopters, Aircraft icing, Ice accretion, Ice loads, Ice prevention, Cloud droplets, Cloud physics, Cold weather tests, Environment simulation, Computer programs

52-476

Study in use and management of de/anti-icing constituents with regard to new storm water legislation.

Gibbs, D.P., Willing, B.L., *U.S. Air Force Institute of Technology, Wright-Patterson AFB, OH. Report,* Sep. 1992, AFIT/GEE/CEV/92s-9, 99p., ADA-261 478, MS thesis by two authors. 64 refs.

Aircraft icing, Chemical ice prevention, Runways, Runoff, Drainage, Water pollution, Soil pollution, Waste disposal, Environmental protection, Legislation

52-477
Icing prevention by ultrasonic nucleation of supercooled water droplets in front of subsonic aircraft.
Worsnop, D.R., Miake-Lye, R., Hed, Z., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Technical note,* Oct. 1992, DOT/FAA/CT-TN92/38, 50p., ADA-258 212, 10 refs.
Aircraft icing, Ice prevention, Supercooled clouds, Cloud droplets, Artificial nucleation, Ice acoustics, Ultrasonic tests

52-478
Verification of U-21 cloud parameter measurement equipment and comparison of natural and artificial ice accretion characteristics on rotor blade airfoil sections.
Belte, D., Robbins, R.D., *U.S. Army Aviation Engineering Flight Activity, Edwards AFB, CA. USAAEFA Project,* May 1987, No.83-01, 122p., ADA-210 365, 38 refs.
Helicopters, Aircraft icing, Ice accretion, Ice detection, Ice forecasting, Ice loads, Cloud physics, Supercooled clouds, Cold weather tests, Environmental tests

52-479
Electromagnetic emissions from a modular low voltage Electro-Impulse De-Icing (EIDI) system.
Zieve, P., Huffer, B., Ng, J., *U.S. Federal Aviation Administration. Technical Center, Atlantic City Airport, NJ. Report,* Mar. 1989, DOT/FAA/CT-88/31, 16p. + appends., ADA-208 191, 7 refs.
Aircraft icing, Ice prevention, Ice removal, Electric equipment, Electronic equipment, Electromagnetic properties, Cold weather tests

52-480
Preliminary airworthiness evaluation of modified second-generation pneumatic boot deicing system on a JUH-1H.
Brown, J.D., Cassil, C.E., Herbst, M.K., *U.S. Army Aviation Engineering Flight Activity, Edwards AFB, CA. USAAEFA Project,* Oct. 1988, No.87-08, 51p., ADA-206 255, 7 refs.
Helicopters, Aircraft icing, Ice detection, Ice prevention, Ice removal, Cold weather tests

52-481
Numerical simulation of flow over iced airfoils.
Coleman, L.A., *U.S. Air Force Institute of Technology, Wright-Patterson AFB, OH. Report,* Dec. 1988, AFIT/GAE/AA/88D-4, 128p., ADA-203 291, MS thesis. 29 refs.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Turbulent flow, Mathematical models

52-482
Icing considerations for HALE (high altitude, long endurance) aircraft.
Vogel, G.N., *U.S. Naval Environmental Prediction Research Facility, Monterey, CA. Technical report,* Nov. 1988, TR 88-11, 51p., ADA-202 584, 22 refs.
Aircraft icing, Ice accretion, Ice forecasting, Ice detection, Cloud physics, Supercooled clouds

52-483
Evaluation of the improved OV-1D anti-icing system.
Miess, J., Blacker, M., Piotrowski, J., *U.S. Army Aviation Engineering Flight Activity, Edwards AFB, CA. USAAEFA Project,* Apr. 1988, No.87-25, 60p., ADA-198 438, 9 refs.
Aircraft icing, Ice accretion, Ice detection, Ice prevention, Jet engines, Cold weather tests

52-484
Offshore oil and gas activities in the Barents Sea: Norwegian requirements for environmental impact assessment and chemical documentation.
Edvardsson, T., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.133-138.
Environmental impact, Environmental protection, Petroleum industry, Natural gas, Offshore drilling, Oil spills, Barents Sea

52-485
Global natural processes and resources in the Arctic and in the North.
Mikulenko, K.I., Skriabin, R.M., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.139-145, 6 refs.
Natural resources, Research projects, Regional planning

52-486
Environmental impact assessment system in Hokkaido: an example for collective environment property.
Aoi, T., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.146-153.
Environmental impact, Environmental protection, Regional planning, Japan—Hokkaido

52-487
Acidification and toxic effects on surface waters of the Kola Peninsula: consequences of its industrialization.
Moiseenko, T., Kashulin, N., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.154-162, 6 refs.
Environmental impact, Water pollution, Water chemistry, Ecosystems, Russia—Kola Peninsula

52-488
Barents Sea water & sediment pollution objective analysis: modern ideas of water and sediment quality in the area of the Stockman Gas Condensate deposit.
Zoueva, M.N., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.163-173, 2 refs.
Environmental impact, Water pollution, Surface waters, Water chemistry, Hydrocarbons, Sediments, Barents Sea

52-489
Assessment of the current state of ecosystems of the Kola Peninsula water basins.
Mokrotovarova, O.I., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.174-181, 1 ref.
Environmental impact, Water pollution, Ecosystems, Water chemistry, Plankton, River basins, Rivers, Biomass, Russia—Kola Peninsula, Russia—Pechenga River, Russia—Kolos-yoki River

52-490
Inter-hemispheric Bering Strait Tunnel and Railway Project "Transcontinental".
Koumal, G., Razbegin, V., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.231-237.
Railroads, Tunnels, Electric power, Economic development, Cost analysis, International cooperation, Bering Strait

52-491
Possibilities for wind and other renewable energies under arctic conditions.
Wolff, J., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.238-245, 7 refs.
Wind power generation, Electric power, Diesel engines, Cold weather operation

52-492
R & D in the field of hydro power in northern Finland.
Aula, A., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.246-250, 4 refs.
Wind power generation, Electric power, Cold weather operation, Finland

52-493
Developing an arctic ecohouse.
Airaksinen, R., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.251-260, 3 refs.
Houses, Design, Heating, Wood, Insulation, Ventilation, Heat recovery, Cold weather operation, Finland

52-494
Development of railway transport in the Euro-Arctic region.
Bärlund, G., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.261-267.
Railroads, International cooperation, Economic development, Cold weather operation, Finland, Russia

52-495
Intermodal transportation and the arctic.
Carmichael, G.E., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.268-272.
Railroads, International cooperation, Economic development

52-496
On establishing the Northern Forum Academy of Science.
Skriabin, R.M., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.278-284.
Organizations, Education, International cooperation, Norway, Russia

52-497
Arctic and antarctic tourism: can the one learn from the other.
Stonehouse, B., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.347-356, 11 refs.
Environmental impact, Legislation, Antarctica
Tourism is a growing industry providing opportunities for development at both ends of the world. This paper draws attention to one aspect—shipborne tourism—that is currently increasing in importance and impact in both polar regions. In Antarctica, the most effective regulation of shipborne tourism so far has arisen from guidelines provided by the tour operators themselves, a system that now requires reinforcement by inspection rather than new and complex regulations from Antarctic Treaty authorities. The Arctic has no such code, and there is little evidence that legislation provides an effective alternative. (Auth. mod.)

52-498
Effects of tourism on nature in wilderness and nature conservation areas in northern Finland.
Sippola, A.L., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.382-391, 13 refs.
Environmental impact, Environmental protection, Finland

52-499
Climatological changes in the arctic and their effects on tourism.
Moore, J.C., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.392-403, 10 refs.
Environmental impact, Climatic changes, Precipitation (meteorology), Global warming, Ozone, Sea ice, Global change, Air temperature, Models

52-500
On the possibilities of developing tourism in the Sakha Republic (Yakutia).
Gabishev, S., Skriabin, R., *University of Lapland. Arctic Centre Reports,* 1996, No.22, Proceedings of the Arctic Opportunities Conference, Sep. 12-15, 1994, Rovaniemi, Finland. Edited by M. Lange, p.407-413.
Economic development, International cooperation, Russia—Yakutia

52-501
Continental slope sedimentation adjacent to an ice margin. I. Seismic facies of Labrador Slope.
Hesse, R., *Geo-marine letters,* 1992, No.12, p.189-199, 27 refs. For part 2 see 51-2178.
Sedimentation, Ice edge, Marine geology, Slopes, Seismic surveys, Labrador Sea

52-502
Hybrid expert system for avalanche forecasting.
Schweizer, M., Föhn, P.M.B., Schweizer, J., Ultsch, A., Proceedings of the International Conference in Innsbruck, Austria, 1994. Information and Communications Technologies in Tourism. Edited by W. Schertler, et al, Vienna, Springer-Verlag, 1994, p.148-153, 16 refs.
Avalanche forecasting, Accuracy

52-503
Dynamic response of overhead transmission lines due to ice shedding.
Roshan Fekr, M., Montreal, Canada, McGill University, 1995, 72p. + appends., M.A. thesis. 18 refs.
Power line icing, Power lines, Loads (forces), Mathematical models

52-504
Regional arctic ice thickness and brine flux from AVHRR.
Yu, Y.L., Seattle, WA, University of Washington, 1996, 142p., University Microfilms order No.9704566, Ph.D. thesis. Refs. p.133-142.
Ice cover thickness, Brines, Radiometry, Accuracy, Sea ice, Surface temperature, Ice models, Ice growth, Thermodynamics, Beaufort Sea, Greenland Sea

52-505
Automated tracking of ice floes using nonhomologous regression and local geometric information.
McDevitt, R.J., Charlottesville, VA, University of Virginia, 1996, 158p., University Microfilms order No.9701309, Ph.D. thesis. 16 refs.
Ice floes, Ice models, Sea ice, Mathematical models, Synthetic aperture radar, Radar tracking

52-506
Frozen state transitions in relation to freeze drying.
Roos, Y.H., *Journal of thermal analysis,* Mar. 1997, 48(3), p.535-544, 18 refs.
Freeze drying, Phase transformations, Solutions, Frozen liquids, Supercooling, Ice water interface, Ice melting, Ice sublimation, Temperature control, Plastic properties

52-507
Exogenic geodynamics of cryolite zone: directions of investigations.
Chizhov, A.B., *Moscow University. Geology bulletin,* 1996, 51(1), p.49-53, Translated from Vestnik Moskovskogo Universiteta. Geologiia. 8 refs.
Geocryology, Engineering geology, Ground ice, Soil freezing, Frozen ground mechanics, Phase transformations, Geomorphology, Classifications

52-508
Readjustment of the Krafla spreading segment to crustal rifting measured by satellite radar interferometry.
Sigmundsson, F., Vadon, H., Massonnet, D., *Geophysical research letters,* Aug. 1, 1997, 24(15), p.1843-1846, 22 refs.
Geophysical surveys, Synthetic aperture radar, Image processing, Marine geology, Subpolar regions, Tectonics, Earth crust, Subsidence, Deformation, Iceland

52-509
New parameterization of H_2SO_4/H_2O aerosol composition: atmospheric implications.
Tabazadeh, A., Toon, O.B., Clegg, S.L., Hamill, P., *Geophysical research letters,* Aug. 1, 1997, 24(15), p.1931-1934, 13 refs.
Cloud physics, Aerosols, Cloud droplets, Vapor pressure, Ice vapor interface, Ice formation, Homogeneous nucleation, Temperature effects, Chemical properties, Models

52-510
Spatial and temporal changes in extreme air temperatures in the Arctic over the period 1951-1990.
Przybylak, R., *International journal of climatology,* May 1997, 17(6), p.615-634, Refs. p.633-634.
Climatology, Climatic changes, Polar atmospheres, Air temperature, Periodic variations, Cloud cover, Temperature variations, Diurnal variations, Records (extremes), Statistical analysis

52-511
Distribution of ^{230}Th in the Labrador Sea and its relation to ventilation.
Moran, S.B., Charette, M.A., Hoff, J.A., Edwards, R.L., Landing, W.M., *Earth and planetary science letters,* July 1997, 150(1-2), p.151-160, 27 refs.
Oceanographic surveys, Hydrography, Suspended sediments, Radioactive isotopes, Isotope analysis, Sampling, Ventilation, Advection, Scavenging, Water transport, Turbulent diffusion, Labrador Sea

52-512
Ice sheet development in central Greenland: implications from the Nd, Sr and Pb isotopic compositions of basal material.
Weis, D., Demaiffe, D., Souchez, R., Gow, A.J., Meese, D.A., MP 5013, *Earth and planetary science letters,* July 1997, 150(1-2), p.161-169, 24 refs.
Ice sheets, Ice formation, Origin, Glacial geology, Ice cores, Ice composition, Bedrock, Sediments, Isotope analysis, Drill core analysis, Greenland
The Nd, Sr and Pb isotopic compositions of silt particles from the basal silty ice of the two deep ice cores in central Greenland, GISP 2 and GRIP, are compared to those of the subglacial rock material at GISP 2 (dolerite boulder, till and granitic bedrock). The silt particles embedded in the GRIP basal ice result from the reworking of the subglacial till unit overlying granitic bedrock at GISP 2, 28 km to the east. This implies that the till unit is continuous in central Greenland. The silt particles embedded in the GISP 2 basal ice result from local erosion of the granitic bedrock. This study supports the hypothesis that the Greenland Ice Sheet in the Summit area did not result from in situ growth from local snowbanks. The composition of the dolerite boulder points to East Greenland as the most probable source region for the ice sheet.

52-513
Comparison of terrestrial and marine records of changing climate of the last 500,000 years.
Tzedakis, P.C., et al, *Earth and planetary science letters,* July 1997, 150(1-2), p.171-176, 23 refs.
Paleoclimatology, Paleoecology, Climatic changes, Sedimentation, Quaternary deposits, Marine deposits, Geochronology, Palynology, Radioactive age determination, Stratigraphy, Statistical analysis

52-514
Paleoecological significance of new species of *Limbicysta* (Arcritarcha) from the upper Albian of the Canadian Arctic Islands.
MacRae, R.A., Hills, L.V., McIntyre, D.J., *Canadian journal of earth sciences,* Nov. 1996, 33(11), p.1475-1486, With French summary. 39 refs.
Paleoecology, Subpolar regions, Marine geology, Algae, Stratigraphy, Microscope slides, Classifications, Distribution, Water chemistry, Canada—Northwest Territories—Axel Heiberg Island

52-515
Late-glacial flow patterns, deglaciation, and postglacial emergence of south-central Baffin Island and the north-central coast of Hudson Strait, eastern Canadian Arctic.
Manley, W.F., *Canadian journal of earth sciences,* Nov. 1996, 33(11), p.1499-1510, With French summary. Refs. p.1509-1510.
Pleistocene, Glacial geology, Quaternary deposits, Marine geology, Ice sheets, Glacier oscillation, Glacier flow, Isostasy, Striations, Glacial deposits, Radioactive age determination, Canada—Northwest Territories—Baffin Island

52-516
Theoretical and experimental study of acoustic propagation in porous media subject to freezing. [Étude théorique et expérimentale de la propagation acoustique dans les milieux poreux soumis au gel]
Leclaire, P., Aguirre-Puente, J., Cohen-Ténoudji, F., *Canadian journal of earth sciences,* Nov. 1996, 33(11), p.1511-1519, In French with English summary. 22 refs.
Acoustics, Frozen ground physics, Seismic velocity, Sound transmission, Sound waves, Elastic waves, Wave propagation, Attenuation, Temperature effects, Simulation

52-517
Cascading Fermi resonances and the soft mode in dense ice.
Struzhkin, V.V., Goncharov, A.F., Hemley, R.J., Mao, H.K., *Physical review letters,* June 9, 1997, 78(23), p.4446-4449, 26 refs.
Ice physics, Ice spectroscopy, High pressure tests, Infrared spectroscopy, Radiation absorption, Reflectivity, Resonance, Spectra, Vibration, Phase transformations

52-518
Assessing surface-atmosphere interactions using former Soviet Union standard meteorological network data. Part II: cloud and snow cover effects.
Groisman, P.IA., Genikhovich, E.L., Bradley, R.S., Il'in, B.M., *Journal of climate,* Sep. 1997, 10(9), p.2184-2199, 52 refs.
Climatology, Climatic changes, Meteorological data, Surface temperature, Air temperature, Turbulent exchange, Heat flux, Soil air interface, Snow air interface, Snow cover effect, Cloud cover, Weather forecasting, Statistical analysis

52-519
Low-frequency sound propagation in an underwater waveguide with an ice surface layer of finite width.
Grudskiĭ, S.M., Mikhalkovich, S.S., Khil'ko, A.I., *Acoustical physics,* Sep.-Oct. 1997, 43(5), p.542-545, Translated from Akusticheskiĭ zhurnal. 8 refs.
Ice acoustics, Underwater acoustics, Ice floes, Ice water interface, Ice cover effect, Sound waves, Wave propagation, Low frequencies, Attenuation, Mathematical models

52-520
Acoustic radiation of an ice plate excited by a laser thermooptical source.
Maksimov, A.O., *Acoustical physics,* Sep.-Oct. 1997, 43(5), p.577-582, Translated from Akusticheskiĭ zhurnal. 15 refs.
Sea ice, Ice physics, Ice acoustics, Underwater acoustics, Lasers, Ice optics, Optical absorption, Radiation absorption, Thermal diffusion, Sound waves, Wave propagation, Mathematical models

52-521
Comparison of stream bank erosion processes on forested and moorland streams in the Balquhidder catchments, central Scotland.
Stott, T., *Earth surface processes and landforms,* Apr. 1997, 22(4), p.383-399, Refs. p.397-399.
Watersheds, Banks (waterways), Stream flow, Water erosion, Soil erosion, Frost action, Ice needles, Vegetation factors, Freezing indexes, Seasonal variations, Correlation, United Kingdom—Scotland

52-522
Development of a black spruce (*Picea mariana*) shoreline stand in relation to snow level variations at Lake Bienville in northern Quebec.
Boivin, S., Bégin, Y., *Canadian journal of forest research,* Mar. 1997, 27(3), p.295-303, With French summary. 45 refs.
Forest ecosystems, Shores, Growth, Damage, Climatic factors, Vegetation patterns, Tundra vegetation, Snow accumulation, Snow cover distribution, Snow cover effect, Periodic variations, Canada—Quebec—Bienville, Lake

52-523
Glacier snow line mapping using ERS-1 SAR imagery.
Adam, S., Pietroniro, A., Brugman, M.M., *Remote sensing of environment,* July 1997, 61(1), p.46-54, 27 refs.
Glacier surveys, Spaceborne photography, Synthetic aperture radar, Snow line, Sensor mapping, Specular reflection, Backscattering, Topographic effects, Snow cover effect, Image processing, Accuracy

52-524
Radiative transfer of snowpack/vegetation canopy at the SSM/I channels and satellite data analysis.
Jin, Y.Q., *Remote sensing of environment,* July 1997, 61(1), p.55-63, 13 refs.
Remote sensing, Spaceborne photography, Forest canopy, Radiation balance, Scattering, Snow cover distribution, Radiometry, Image processing, Snow optics, Resolution, Mathematical models

52-525
Lair of the ice worms.
Pain, S., *New scientist,* Aug. 9, 1997, 155(2094), p.19.
Oceanography, Marine biology, Ocean bottom, Natural gas, Hydrates, Hummocks, Ice composition, Biomass

52-526
Can we crack Europa's icy secrets.
Hecht, J., *New scientist,* Aug. 9, 1997, 155(2094), p.20.
Extraterrestrial ice, Satellites (natural), Ground ice, Ice detection, Exploration, Spacecraft, Remote sensing

52-527
^{13}C in tree rings along an air pollution gradient in the Karelian Isthmus, northwest Russia and southeast Finland.
Niemelä, P., Lumme, I., Mattson, W., Arkhipov, V., *Canadian journal of forest research,* Apr. 1997, 27(4), p.609-612, With French summary. 17 refs.
Air pollution, Subpolar regions, Forest ecosystems, Trees (plants), Aerosols, Carbon isotopes, Radioactive age determination, Sampling, Periodic variations, Environmental tests, Russia—Karelian Isthmus, Finland

52-528
Model computations on the critical combination of snow loading and windspeed for snow damage of scots pine, Norway spruce and Birch sp. at stand edge.
Peltola, H., Nykänen, M.L., Kellomäki, S., *Forest ecology and management,* Aug. 1, 1997, 95(3), p.229-241, Refs. p.239-241.
Forest lines, Forest canopy, Snow loads, Wind velocity, Damage, Mathematical models, Snow air interface, Turbulent flow, Snow cover effect, Topographic effects, Countermeasures

52-529
Late Permian palynomorph assemblages from Ufimian and Kazanian type sequences in Russia, and comparison with Roadian and Wordian assemblages from the Canadian Arctic.
Utting, J., Esaulova, N.K., Silant'ev, V.V., Makarova, O.V., *Canadian journal of earth sciences,* Jan. 1997, 34(1), p.1-16, With French summary. 49 refs.
Earth crust, Sedimentation, Fossils, Stratigraphy, Palynology, Paleoecology, Classifications, Correlation, Russia—Tartarstan, Canada—Northwest Territories—Sverdrup Basin

52-530
Full-scale field experiment (1978-1995) on growth of permafrost by means of lake drainage, western arctic coast: a discussion of the method and some results.
Mackay, J.R., *Canadian journal of earth sciences,* Jan. 1997, 34(1), p.17-33, With French summary. Refs. p.31-33.
Arctic landscapes, Lakes, Drainage, Periglacial processes, Permafrost origin, Permafrost hydrology, Thermokarst development, Permafrost beneath lakes, Soil freezing, Ice growth, Frozen ground thermodynamics, Convection, Research projects, Canada—Northwest Territories—Illisarvik

52-531
Paleomagnetic evidence for low-latitude glaciation during deposition of the Neoproterozoic Rapitan Group, Mackenzie Mountains, N.W.T., Canada.
Park, J.K., *Canadian journal of earth sciences,* Jan. 1997, 34(1), p.34-49, With French summary. 38 refs.
Mountain glaciers, Glaciation, Tectonics, Remanent magnetism, Rock magnetism, Geomagnetism, Orientation, Stratigraphy, Sampling, Canada—Northwest Territories—Mackenzie Mountains

52-532
Interpretation of lithofacies of the Ashtabula Till along the south shore of Lake Erie, northeastern Ohio.
Szabo, J.P., Bruno, P.W., *Canadian journal of earth sciences,* Jan. 1997, 34(1), p.66-75, With French summary. 52 refs.
Pleistocene, Glacier oscillation, Glacial geology, Glacial deposits, Lacustrine deposits, Classifications, Lithology, Stratigraphy, Sedimentation, Sampling, United States—Ohio—Erie, Lake

52-533
Dirt Hills structure: an ice-thrust feature in southern Saskatchewan, Canada.
Christiansen, E.A., Sauer, E.K., *Canadian journal of earth sciences,* Jan. 1997, 34(1), p.76-85, With French summary. 23 refs.
Pleistocene, Glacial geology, Moraines, Glacier oscillation, Ice push, Bedrock, Deformation, Shear flow, Stratigraphy, Boreholes, Ice cover effect, Geomorphology, Canada—Saskatchewan—Dirt Hills

52-534
High-latitude surface temperature estimates from thermal satellite data.
Key, J.R., Collins, J.B., Fowler, C., Stone, R.S., *Remote sensing of environment,* Aug. 1997, 61(2), p.302-309, 32 refs.
Climatology, Radiometry, Spacecraft, Surface temperature, Snow surface temperature, Glacier ice, Sea ice, Ice temperature, Brightness, Correlation, Seasonal variations
In this article, clear-sky surface-temperature retrieval algorithms for use with the Advanced Very High Resolution Radiometer (AVHRR) and the Along Track Scanning Radiometer (ATSR) for the Arctic and the Antarctic, over ocean and land, are presented. The methods are similar to those used in estimating sea and land surface temperatures but are developed with data specific to the polar regions. (Auth. mod.)

52-535
Uncertainties in reactive uptake coefficients for solid stratospheric particles. 1. Surface chemistry.
Carslaw, K.S., Peter, T., *Geophysical research letters,* July 15, 1997, 24(14), p.1743-1746, 17 refs.
Climatology, Stratosphere, Cloud physics, Heterogeneous nucleation, Aerosols, Ice vapor interface, Adsorption, Hydrates, Surface properties, Models

52-536
Uncertainties in reactive uptake coefficients for solid stratospheric particles. 2. Effect on ozone depletion.
Carslaw, K.S., Peter, T., Müller, R., *Geophysical research letters,* July 15, 1997, 24(14), p.1747-1750, 20 refs.
Climatology, Stratosphere, Polar stratospheric clouds, Hydrates, Aerosols, Ice formation, Heterogeneous nucleation, Photochemical reactions, Degradation, Ozone, Models

52-537
Snow cover identification through cirrus-cloudy atmospheres using daytime AVHRR imagery.
Hutchison, K.D., Locke, J.K., *Geophysical research letters,* July 15, 1997, 24(14), p.1791-1794, 5 refs.
Snow surveys, Snow cover, Cloud cover, Detection, Spaceborne photography, Radiometry, Resolution, Image processing, Albedo

52-538
Apparent effects of the Mt. Pinatubo eruption on the Greenland ice sheet melt extent.
Abdalati, W., Steffen, K., *Geophysical research letters,* July 15, 1997, 24(14), p.1795-1797, 22 refs.
Climatology, Radiometry, Atmospheric composition, Optical properties, Volcanic ash, Aerosols, Ice sheets, Glacier melting, Seasonal variations, Correlation, Greenland

52-539
Permafrost monitoring and detection of climate change.
Smith, M.W., Riseborough, D.W., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), Frozen Ground Workshop, Hanover, New Hampshire, Dec. 9-11, 1995. Selected papers, p.301-309, With French summary. 23 refs.
Climatology, Climatic changes, Surface temperature, Soil temperature, Temperature variations, Temperature measurement, Degree days, Bedrock, Permafrost thermal properties, Soil air interface, Thermal regime, Mathematical models, Snow cover effect

52-540
Climatic warming and the degradation of warm permafrost.
Lunardini, V.J., MP 5014, *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), Frozen Ground Workshop, Hanover, New Hampshire, Dec. 9-11, 1995. Selected papers, p.311-320, With French summary. 22 refs. For another version see 50-6482.
Climatology, Global warming, Permafrost thermal properties, Permafrost transformation, Degradation, Geothermal thawing, Thaw depth, Freeze thaw cycles, Mathematical models, Forecasting, Theories
Permafrost—a widespread constituent of the terrestrial environment—by definition is dependent upon the ambient temperature for its existence and properties. Thus, it is very sensitive to climatic changes. Simple relations based upon conductive heat transfer, with thawing and geothermal heat flow, are presented to predict the transient effects of surface temperature increases on the thermal state of permafrost. The results indicate that, based on the usual global warming scenarios, relatively small amounts of permafrost will disappear within 50-100 years. This is specifically shown for the most thermally sensitive cases, that is, warm or relict permafrost.

52-541
Measurement interval and the accurate assessment of ground temperature trends.
Riseborough, D.W., Burgess, M.M., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), Frozen Ground Workshop, Hanover, New Hampshire, Dec. 9-11, 1995. Selected papers, p.321-335, With French summary. 9 refs.
Frozen ground temperature, Permafrost surveys, Temperature measurement, Accuracy, Seasonal variations, Thermal diffusion, Thermal regime, Permafrost thermal properties, Statistical analysis, Forecasting

52-542
Deep-seated creep of massive ground ice, Tuktoyaktuk, NWT, Canada.
Dallimore, S.R., Nixon, F.M., Egginton, P.A., Bisson, J.G., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), Frozen Ground Workshop, Hanover, New Hampshire, Dec. 9-11, 1995. Selected papers, p.337-347, With French summary. 12 refs.
Ground ice, Frozen ground mechanics, Permafrost mass transfer, Ice creep, Boreholes, Drill core analysis, Slope orientation, Slope stability, Deformation, Canada—Northwest Territories—Tuktoyaktuk

52-543

Physical modelling of periglacial solifluction: review and future strategy.

Harris, C., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), Frozen Ground Workshop, Hanover, New Hampshire, Dec. 9-11, 1995. Selected papers, p.349-360, With French summary. 29 refs.

Geomorphology, Periglacial processes, Solifluction, Slope processes, Phase transformations, Frost heave, Mass movements (geology), Freeze thaw cycles, Frozen ground mechanics, Models, Mechanical tests

52-544

Origin of rock glaciers: observations from Mellemfjord, Disko Island, central West Greenland.

Humlum, O., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), p.361-380, With French summary. Refs. p.378-380.

Geomorphology, Periglacial processes, Rock glaciers, Permafrost mass transfer, Glacier ice, Ice cores, Ice composition, Structural analysis, Classifications, Terminology, Topographic features, Greenland—Disko Island

52-545

Occurrence of a Holocene rock glacier on Mount Kenya: some observations and comments.

Grab, S.W., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), p.381-389, With French summary. 17 refs.

Geomorphology, Landforms, Periglacial processes, Mountain soils, Rock glaciers, Structural analysis, Sorting, Profiles, Kenya—Kenya, Mount

52-546

Sand-wedge and ventifact palaeoenvironmental indicators in northwest Saskatchewan, Canada, 11 ka to 9.9 ka BP.

Fisher, T.G., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), p.391-408, With French summary. 52 refs.

Pleistocene, Geomorphology, Discontinuous permafrost, Permafrost indicators, Periglacial processes, Eolian soils, Sands, Wedges, Patterned ground, Wind factors, Canada—Saskatchewan

52-547

Formation of miniature sorted patterns by shallow ground freezing: a field experiment.

Ballantyne, C.K., *Permafrost and periglacial processes,* Oct.-Dec. 1996, 7(4), p.409-424, With French summary. Refs. p.422-424.

Frozen ground mechanics, Periglacial processes, Regolith, Patterned ground, Sorting, Thermal regime, Freeze thaw cycles, Frost heave, Ice formation, Ice needles, Simulation, Lithology

52-548

Origin and physical and chemical characteristics of glacial overburden in Essex and Kent counties, southwestern Ontario.

Morris, T.F., Kelly, R.I., *Canadian journal of earth sciences,* Mar. 1997, 34(3), p.233-246, With French summary. 48 refs.

Glacial geology, Quaternary deposits, Moraines, Geomorphology, Spaceborne photography, Geological maps, Landscape development, Lacustrine deposits, Stratigraphy, Sedimentation, Canada—Ontario

52-549

Late-glacial (Allerød - Younger Dryas) Coleoptera from central Cape Breton Island, Nova Scotia, Canada.

Miller, R.F., *Canadian journal of earth sciences,* Mar. 1997, 34(3), p.247-259, With French summary. 47 refs.

Pleistocene, Paleoecology, Paleoclimatology, Tundra vegetation, Quaternary deposits, Organic soils, Sampling, Stratigraphy, Radioactive age determination, Canada—Nova Scotia

52-550

Ice seasons 1991-1995 along the Finnish coast.

Seinä, A., Grönvall, H., Kalliosaari, S., Vainio, J., *Finnish Institute of Marine Research. Report,* 1996, No.27, p.3-77, In English and Finnish. 5 refs.

Oceanographic surveys, Ice surveys, Shores, Sea ice distribution, Ice cover thickness, Freezeup, Ice breakup, Ice navigation, Seasonal variations, Snow depth, Finland

52-551

Classification of the maximum annual extent of ice cover in the Baltic Sea 1720-1995.

Seinä, A., Palosuo, E., *Finnish Institute of Marine Research. Report,* 1996, No.27, p.79-91, 12 refs.

Climatology, Winter, Sea ice distribution, Records (extremes), Periodic variations, Statistical analysis, Air ice water interaction, Classifications, Baltic Sea

52-552

Seismic signals induced by snow avalanche flow.

Kishimura, K., Izumi, K., *Natural hazards,* Jan. 1997, 15(1), p.89-100, 11 refs.

Avalanche forecasting, Avalanche mechanics, Velocity measurement, Seismic reflection, Vibration, Spectra, Topographic effects, Detection, Earthquakes, Correlation

52-553

Seasonal patterns of coupled flow in the active layer at three sites in northwest North America.

Hinkel, K.M., Outcalt, S.I., Taylor, A.E., *Canadian journal of earth sciences,* May 1997, 34(5), p.667-678, With French summary. 38 refs.

Soil tests, Permafrost transformation, Permafrost heat transfer, Permafrost thermal properties, Active layer, Soil temperature, Electrical resistivity, Snowmelt, Soil water migration, Thermoelectric effects, Seasonal variations

52-554

Late Quaternary loess-paleosol record at Kurtak, southern Siberia.

Chlachula, J., Rutter, N.W., Evans, M.E., *Canadian journal of earth sciences,* May 1997, 34(5), p.679-686, With French summary. 17 refs.

Paleoclimatology, Climatic changes, Quaternary deposits, Loess, Sediment transport, Periglacial processes, Stratigraphy, Profiles, Geochronology, Lithology, Remanent magnetism, Russia—Siberia

52-555

Extensive tests on the application of reverse Monte Carlo modelling to single-crystal neutron diffuse scattering from ice Ih.

Beverley, M.N., Nield, V.M., *Journal of physics: condensed matter,* June 16, 1997, 9(24), p.5145-5156, 10 refs.

Ice physics, Ice spectroscopy, Neutron scattering, Ice crystal structure, Molecular structure, Molecular energy levels, Statistical analysis, Models, Accuracy

52-556

Interaction models for mixtures with application to phase transitions.

Gray, J.M.N.T., Svendsen, B., *International journal of engineering science,* Jan. 1997, 35(1), p.55-74, 16 refs.

Snow thermal properties, Snow physics, Phase transformations, Mass transfer, Admixtures, Freezing front, Snowmelt, Regelation, Absorption, Surface properties, Heat balance, Mathematical models

52-557

Bearing capacity and settlement of shaped piles in permafrost.

Ladanyi, B., Guichaoua, A., International Conference on Soil Mechanics and Foundation Engineering, 11th, 1981. Proceedings, Rotterdam, A.A. Balkema, 1981, p.1421-1427, 21 refs.

Permafrost beneath structures, Piles, Bearing strength, Settlement (structural), Surface properties, Topographic effects, Design, Mechanical tests, Dynamic loads, Frozen ground mechanics, Analysis (mathematics)

52-558

Simulation of the effect of frost on soil nailed walls. [Modelisation de l'influence du gel sur un mur en sol cloue]

Unterreiner, P., Frank, R., Schlosser, F., International Conference on Soil Mechanics and Foundation Engineering, 13th, New Delhi, India, Jan. 5-10, 1994. Proceedings, Vol.2, New Delhi, Oxford & IBH Publishing Co. Pvt. Ltd., 1994, p.849-852, In French. 17 refs.

DLC TA710.A1 I518

Frozen ground mechanics, Soil stabilization, Anchors, Walls, Frost action, Soil freezing, Simulation

52-559

Probabilistic analysis of weather related loads on overhead transmission lines in Ontario, Canada.

Krishnasamy, S.G., Tabatabai, M., International Conference on Probabilistic Methods Applied to Electric Power Systems, 3rd, London, UK, July 3-5, 1991. Proceedings, Exeter, Institution of Electrical Engineers, 1991, p.81-85, 4 refs.

DLC TK1005.I547

Power line icing, Transmission lines, Stability, Design criteria, Ice solid interface, Ice loads, Wind factors, Statistical analysis, Meteorological data, Correlation, Mathematical models

52-560

Radar observations of snowbands in Finland—a preliminary report.

Saarikivi, P., NATO Advanced Study Institute on Mesoscale Meteorology, Bonas, France, July 13-31, 1982. Proceedings. Theories, observations and models. Edited by D.K. Lilly et al and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.114, Dordrecht, D. Reidel Publishing Company, 1983, p.285-292, 8 refs.

DLC QC883.4.N37

Precipitation (meteorology), Synoptic meteorology, Fronts (meteorology), Snowfall, Classifications, Remote sensing, Radar echoes, Finland

52-561

Preliminary data on the accumulation of usnic acid related to ozone depletion in two antarctic lichens.

Quilhot, W., *Santiago de Chile. Instituto Antártico Chileno. Serie cientifica,* 1996, No.46, p.105-111, With Spanish summary. Refs. p.109-111.

Lichens, Photosynthesis, Ultraviolet radiation, Ozone, Atmospheric composition, Antarctica—South Shetland Islands

The absorbing properties of UV radiation of lichen phenols agree with their photoprotector capacity determined by *in vivo* and *in vitro* methods. The photostability that characterizes these compounds makes it possible to study the relations between the UV absorbers and ozone levels in different time scales. Usnic acid is the most frequent UV-B absorber in antarctic lichens. In *Neuropogon aurantiaco-ater* (Jacq.) I.M. Lamb. and *Ramalina terebrata* Hook. et Tayl., collected in Antarctica over a period of 30 years, the highest concentrations of usnic acid were observed when the ozone diminished to critical values. (Auth.)

52-562

UV radiation on Robert I. [Radiación UV solar en isla Robert, Shetland del Sur, Antártica]

Fernández, E., Morales, R., Quilhot, W., *Santiago de Chile. Instituto Antártico Chileno. Serie cientifica,* 1996, No.46, p.113-119, In Spanish with English summary. 14 refs.

Ultraviolet radiation, Radiation measuring instruments, Meteorological instruments, Ozone, Antarctica—Robert Island

Solar ultraviolet radiation measurements were carried out by means of chemical actinometry and spectroradiometric instruments on Robert I. during Jan. 1996. The maximal irradiances of the UV-A and UV-B spectral range were detected between 13:00 and 14:00 hrs (local time) during clear, sunny days. The actinometric measurements agree with the spectroradiometric determination (r=0.9936) and permit the authors to propose this method for local and regional scale measurements. (Auth. mod.)

52-563
Proceedings.
FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996, *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, 2 vols., ADA-316 438 (Vol.1), Refs. passim. Vol.1: Plenary sessions, 256p., contains the texts accompanying the presentations to the opening plenary session, and summaries and recommendations of the working groups, to the closing plenary session. Vol.2: Working group papers, 640p., contains the individual papers of the working groups, for which see 52-564 through 52-618.
Aircraft icing, Ice accretion, Ice loads, Ice detection, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Weather forecasting, Safety

52-564
Analysis of aircraft icing environments associated with supercooled drizzle.
Cober, S.G., Isaac, G.A., Strapp, J.W., Marcotte, D., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.1-11, ADA-316 441, 22 refs.
Aircraft icing, Ice accretion, Ice detection, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Weather forecasting

52-565
Freezing drizzle encountered by a research aircraft over the Park Range in Colorado.
Lawson, R.P., Politovich, M.K., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.13-22, ADA-316 441, 17 refs.
Aircraft icing, Ice accretion, Ice loads, Cloud physics, Supercooled clouds, Cloud droplets, Cold weather tests, United States—Colorado—Park Range

52-566
In situ measurements of aircraft icing.
Stith, J., Poellot, M., Grainger, C., Rinehart, R., Tilbury, R., Zerr, R., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.23-31, ADA-316 441, 4 refs.
Aircraft icing, Ice accretion, Ice loads, Ice detection, Ice forecasting, Supercooled clouds, Cloud droplets, Ice storms, Snow pellets

52-567
Supercooled large droplet distributions in the natural environment and comparison to artificial drizzle from the Air Force water spray tanker.
Ashenden, R., Marwitz, J.D., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.33-43, ADA-316 441, 9 refs.
Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Accidents, Cloud physics, Supercooled clouds, Cloud droplets, Particle size distribution, Cold weather tests, Safety

52-568
Canadian climatology of freezing precipitation, and a detailed study using data from St. John's, Newfoundland.
Strapp, J.W., Stuart, R.A., Isaac, G.A., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.45-55, ADA-316 441, 8 refs.
Aircraft icing, Ice forecasting, Cloud physics, Precipitation (meteorology), Ice storms, Meteorological data, Weather forecasting, Canada

52-569
Representative values of icing-related variables aloft in freezing rain and freezing drizzle.
Jeck, R.K., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.57-67, ADA-316 441, 13 refs.
Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Precipitation (meteorology), Ice storms, Meteorological data, Weather forecasting

52-570
Comparison of two processing techniques for optical array probes.
Hobbs, R., Morrison, B., Ashenden, R., Ide, R.F., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.69-89, ADA-316 441, 7 refs.
Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Particle size distribution, Unfrozen water content, Moisture detection, Meteorological instruments, Data processing

52-571
Comparison of liquid water content measurement techniques in an icing wind tunnel.
Ide, R.F., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.91-103, ADA-316 441, 5 refs.
Aircraft icing, Ice accretion, Ice detection, Ice forecasting, Wind tunnels, Cloud physics, Supercooled clouds, Cloud droplets, Unfrozen water content, Moisture detection, Particle size distribution

52-572
On the accuracy of PMS optical array probes.
Korolev, A.V., Strapp, J.W., Isaac, G.A., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.105-113, ADA-316 441, 5 refs.
Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Particle size distribution, Unfrozen water content, Moisture detection, Meteorological instruments

52-573
Some instrumentation effects on airborne measurements of the drop size distribution in freezing drizzle.
Lawson, R.P., et al, *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.115-123, ADA-316 441, 17 refs.
Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Particle size distribution, Meteorological instruments, Image processing

52-574
NRC Corvair-500 research aircraft: configuration in the Canadian Freezing Drizzle Experiment.
Marcotte, D.L., Strapp, J.W., Cober, S.G., Isaac, G.A., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.125-135, ADA-316 441, 8 refs.
Aircraft icing, Ice detection, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Particle size distribution, Unfrozen water content, Meteorological instruments

52-575
Operational perspective on ice detection and protection systems research and development.
Bracken, J., Green, S., Bettcher, J., Erickson, S., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.137-148, ADA-316 441, 10 refs.
Aircraft icing, Ice detection, Ice forecasting, Ice prevention, Safety

52-576
Impedance-based sensor technology for assessing airframe icing.
Parkins, D.C., Edmonds, J., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.149-160, ADA-316 441, 4 refs.
Aircraft icing, Ice formation indicators, Ice detection, Thickness gages, Warning systems

52-577
Ultrasonic detection of large droplets ice accretions.
Le Pimpec, M., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.161-167, ADA-316 441.
Aircraft icing, Ice detection, Supercooled clouds, Cloud droplets, Acoustic measurement, Ultrasonic tests

52-578
Super-cooled, large drop (SLD) ice formation detection.
Sweet, D.B., Reich, A.D., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.169-178, ADA-316 441, 18 refs.
Aircraft icing, Ice formation indicators, Ice detection, Supercooled clouds, Cloud droplets, Moisture detection, Warning systems

52-579
Remote detection and avoidance of inflight icing.
Ryerson, C.C., MP 5015, *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.179-190, ADA-316 441, 49 refs.
Aircraft icing, Ice forecasting, Ice detection, Cloud physics, Supercooled clouds, Cloud droplets, Particle size distribution, Unfrozen water content, Lidar, Radar tracking, Radio echo soundings, Warning systems
Icing forecasts are not sufficiently accurate to prevent all icing mishaps. Remote detection of icing potential ahead of aircraft may allow avoidance and escape from icing encounters. Remote detection is intended to identify and assess icing potential ahead of an aircraft, with regard to aircraft type and airspeed, and provide guidance for avoidance in a manner similar to current wind shear and thunderstorm avoidance systems. Remote detection requires mapping of temperature and cloud liquid water magnitude by droplet size in the flight path ahead of the aircraft. Two promising technologies include multiple field-of-view lidar and differential attenuation radar. Both technologies have had limited testing. The advantage of radar is its ability to penetrate clouds and measure liquid water, and lidar is able to detect cloud droplet size spectra. Several other potential technologies, and the potential and problems of icing prediction detection, are assessed.

52-580
Application of new electrothermal systems on aircraft for extended ice protection.
Perkins, P.J., Lynch, G.P.B., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.191-214, ADA-316 441, 3 refs.
Aircraft icing, Ice prevention, Ice removal, Ice melting, Artificial melting, Electric heating

52-581
Low adhesion surfaces for ice protection.
Hindel, J.T., Rauckhorst, R.L., III, *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.215-227, ADA-316 441.
Aircraft icing, Ice adhesion, Ice prevention, Ice removal, Protective coatings, Inflatable structures

52-582
Ice protection systems for a new commuter aircraft.
Averous, F., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.229-239, ADA-316 441.
Aircraft icing, Ice detection, Ice prevention, Ice removal, Inflatable structures

52-583
Use of flush-mounted smart skin sensors for the detectin/exit criteria.
Zollinger, P., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.241-255, ADA-316 441, Footnotes passim.
Aircraft icing, Ice detection, Supercooled clouds, Cloud droplets, Moisture detection, Warning systems

52-584
Overview of experimental water droplet impingement research and future aviation community requirements, including SLD experimental data.
Papadakis, M., Bidwell, C.S., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.257-274, ADA-316 441, 31 refs.
Aircraft icing, Ice accretion, Ice detection, Ice prevention, Ice removal, Supercooled clouds, Cloud droplets, Research projects

52-585
Eulerian approach to ice droplets impingement calculations.
Bourgault, Y., Habashi, W.G., Dompierre, J., Chevalier, G., Di Bartolomeo, W., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.275-284, ADA-316 441, 31 refs.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Supercooled clouds, Cloud droplets, Computerized simulation

52-586
Formation of an ice ridge beyond protected regions.
Al-Khalil, K., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.285-295, ADA-316 441, 9 refs.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Supercooled clouds, Cloud droplets, Accidents

52-587
In-flight icing—the critical need for improved forecasts and indexing of the hazard.
Stack, D.T., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.297-300, ADA-316 441, 3 refs.
Aircraft icing, Ice forecasting, Weather forecasting, Safety

52-588
Forecast and verification experiment for supercooled large drops (SLD).
Marwitz, J., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.301-306, ADA-316 441, 12 refs.
Aircraft icing, Ice forecasting, Supercooled clouds, Cloud droplets, Weather forecasting

52-589
Comparison of a physically-based aircraft icing forecast algorithm with currently used automated algorithms using SSM/I retrievals.
Tremblay, A., Cober, S., Glazer, A., Isaac, G., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.307-317, ADA-316 441, 12 refs.
Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Weather forecasting, Spaceborne photography, Image processing, Computerized simulation

52-590
Verification of in-flight icing forecasts: methods and issues.
Brown, B.G., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.319-330, ADA-316 441, 19 refs.
Aircraft icing, Ice forecasting, Weather observations, Weather forecasting, Statistical analysis

52-591
Differentiation of freezing drizzle from ice hydrometeors and freezing rain with dual-polarization radar.
Reinking, R.F., Matrosov, S.Y., Martner, B.E., Kropfli, R.A., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.331-338, ADA-316 441, 8 refs.
Aircraft icing, Ice forecasting, Ice detection, Precipitation (meteorology), Cloud physics, Supercooled clouds, Cloud droplets, Radio echo soundings, Weather forecasting

52-592
Measurements of supercooled liquid water and applications to aircraft inflight icing.
Hill, G.E., MP 5016, *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.339-351, ADA-316 441, Partially supported by the U.S. Army Cold Regions Research and Engineering Laboratory.
Aircraft icing, Ice forecasting, Ice detection, Cloud physics, Supercooled clouds, Cloud droplets, Unfrozen water content, Moisture detection, Meteorological instruments
An expendable instrument attached to radiosondes has been developed to measure vertical profiles of supercooled liquid water (SLW). A vibrating wire is exposed to the air as the balloon rises through a cloud. Changes in vibration frequency due to ice collection are used to find SLW concentrations. Comparisons are made with independent SLW measurements by microwave radiometers and by aircraft. It is found that with cold clouds (T < -10°C) the vibrating wire yields accurate results, but with warmer clouds the instrument underestimates the SLW by about a factor of two on average.

52-593
Stovepipe algorithm: identifying locations where supercooled large droplets are likely to exist.
Bernstein, B.C., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.353-364, ADA-316 441, 10 refs.
Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Weather forecasting

52-594
Aircraft icing detection using satellite data and weather forecast model results.
Vivekanandan, J., Thompson, G., Lee, T.F., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.365-373, ADA-316 441, 16 refs.
Aircraft icing, Ice detection, Ice forecasting, Cloud physics, Supercooled clouds, Weather forecasting, Spaceborne photography, Computerized simulation

52-595
Meteorologically-based icing severity index.
Politovich, M.K., Thompson, G., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.375-385, ADA-316 441, 12 refs.
Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Unfrozen water content, Weather forecasting, Meteorological data, Data processing, Statistical analysis

52-596
Aerodynamics of supercooled-large-droplet ice accretions and the effect on aircraft control.
Bragg, M.B., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.387-399, ADA-316 441, 27 refs.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Supercooled clouds, Cloud droplets, Cloud physics

52-597
Effect of icing on aerodynamic characteristics of aircraft with unswept wings and ensuring their flight safety.
Andreev, G.T., Naumov, S.IA., Rogozhkin, IU.M., Sheliukhin, IU.F., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.401-411, ADA-316 441.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow

52-598
JAA certification policy NPA 25F-219 flight in icing conditions acceptable handling characteristics and performance effects.
Parelon, E., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.413-435, ADA-316 441, Includes the text of the Joint Aviation Authorities (JAA) Notice of Proposed Amendment, NPA 25F-219, as an attachment.
Aircraft icing, Ice loads, Cold weather performance, Safety, Standards, International cooperation

52-599

Review of certification for flight in icing conditions and recommendations for necessary improvements.

Bettcher, J., Green, S., Erickson, S., Bracken, J., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.437-445, ADA-316 441, 6 refs.

Aircraft icing, Ice loads, Cold weather performance, Safety, Standards

52-600

EURICE—A EUropean Research on aircraft Ice CErtification.

Amendola, A., Mingione, G., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.447-457, ADA-316 441, 11 refs.

Aircraft icing, Ice loads, Cold weather performance, Safety, Standards, Research projects, International cooperation

52-601

Flight in icing conditions: international standardization of certification requirements for transport category airplanes.

Fender, C.S., Kotker, D.J., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.459-468, ADA-316 441.

Aircraft icing, Ice loads, Cold weather performance, Safety, Standards, International cooperation

52-602

NASA Lewis Icing Research Tunnel: testing and data acquisition.

Irvine, T.B., Anderson, D.N., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.469-483, ADA-316 441, 14 refs.

Wind tunnels, Aircraft icing, Ice accretion, Ice loads, Cloud physics, Supercooled clouds, Cloud droplets, Cold weather tests, Environmental tests, Research projects

52-603

Study of large droplet ice accretion in the NASA Lewis IRT at near-freezing conditions; part 2.

Addy, H.E., Jr., Miller, D.R., Ide, R.F., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.485-497, ADA-316 441, 5 refs.

Aircraft icing, Ice accretion, Ice loads, Cloud physics, Supercooled clouds, Cloud droplets, Wind tunnels, Environmental tests

52-604

Large scale icing tests in the ONERA S1MA wind tunnel.

Charpin, F., Prieur, J., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.499-510, ADA-316 441, 14 refs.

Aircraft icing, Ice accretion, Ice loads, Cloud physics, Supercooled clouds, Cloud droplets, Wind tunnels, Cold weather tests, Environmental tests

52-605

Effect of altitude on icing tunnel airfoil icing simulation.

Oleskiw, M.M., De Gregorio, F., Esposito, B., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.511-520, ADA-316 441, 16 refs.

Aircraft icing, Ice accretion, Ice loads, Altitude, Atmospheric pressure, Wind tunnels, Environmental tests, Environment simulation

52-606

Survey of ice accretions formed in freezing drizzle under natural icing and simulated icing behind the United States Air Force tanker and in the NASA-Lewis Icing Research Tunnel.

Perkins, P.J., Dow, J.P., Sr., Sweet, D., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.521-531, ADA-316 441, 6 refs.

Aircraft icing, Ice accretion, Ice loads, Cloud physics, Supercooled clouds, Cloud droplets, Precipitation (meteorology), Wind tunnels, Environmental tests

52-607

Aircraft icing due to supercooled large droplets.

Brahimi, M.T., Tran, P., Tezok, F., Paraschivoiu, I., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.533-543, ADA-316 441, 38 refs.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Computerized simulation

52-608

Computational simulation of large droplet icing.

Wright, W.B., Potapczuk, M.G., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.545-555, ADA-316 441, 13 refs.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Cloud physics, Supercooled clouds, Cloud droplets, Computerized simulation

52-609

Flight into freezing rain/drizzle: a general aviation/business jet manufacturer's perspective.

Heathman, S., Rice, R., Wariner, D., Woodson, S., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.557-563, ADA-316 441, 6 refs.

Aircraft icing, Ice forecasting, Ice detection, Ice formation indicators, Supercooled clouds, Cloud droplets, Precipitation (meteorology), Ice storms, Weather forecasting, Safety

52-610

Some observations on design, certification, and training for operation of aircraft in icing situations.

Hellsten, C.P., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.565-573, ADA-316 441, 1 footnote.

Aircraft icing, Ice forecasting, Weather forecasting, Education, Safety

52-611

Difficulties in the operation of aircraft in icing conditions.

Erickson, S., Green, S., Bettcher, J., Bracken, J., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.575-584, ADA-316 441, 13 refs.

Aircraft icing, Ice forecasting, Weather forecasting, Education, Safety

52-612

Aircraft icing: the dispatcher's role in forecasting and avoidance.

Horton, S.K., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.585-586, ADA-316 441.

Aircraft icing, Ice forecasting, Weather forecasting, Safety

52-613

How a Canadian air carrier (for example) informs, trains and provides instructions for its crews on operations where severe icing conditions may be encountered.

Squires, J., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.587-592, ADA-316 441.

Aircraft icing, Ice forecasting, Weather forecasting, Safety, Education

52-614

Development of an ice accretion monitor for aircraft.

Smith, R.L., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.593-599, ADA-316 441, 8 refs.

Aircraft icing, Ice accretion, Ice detection, Monitors, Warning systems

52-615

Airfoil performance monitoring using the Turbulence Intensity Parameter.

Maris, J.M., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.601-607, ADA-316 441, 1 ref.

Aircraft icing, Ice loads, Air flow, Turbulence, Monitors, Warning systems, Safety

52-616

GOES experimental aircraft icing risk product.

Ellrod, G.P., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.609-611, ADA-316 441, Slides of presentation only.

Aircraft icing, Ice forecasting, Weather forecasting, Supercooled clouds, Spaceborne photography

52-617

Flush mount ice detector.

DNE Technologies, Inc., Wallingford, CT, *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.627-632, ADA-316 441.

Aircraft icing, Ice detection, Warning systems

52-618

SOLA-ASDIS system proof of concept and technical overview.

Palmer, S.D., Lamb, M.G., *U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report,* Aug. 1996, DOT/FAA/AR-96/81, FAA International Conference on Aircraft Inflight Icing, Springfield, VA, May 6-8, 1996. Proceedings. Vol.2, p.635-640, ADA-316 441.

Aircraft icing, Ice detection, Warning systems

52-619

Mass balance of North Greenland.

Reeh, N., Rignot, E., *Science,* Oct. 10, 1997, 278(5336), p.207-209, For item being commented on and responded to, see 51-0306. 6 refs. and notes.

Ice sheets, Ice volume, Glacier ablation, Mass balance, Remote sensing, Greenland, Arctic Ocean

52-620

Multiscale surface roughness and backscattering—summary.

Manninen, A.T., *Journal of electromagnetic waves and applications,* Apr. 1997, 11(4), p.471-475, 8 refs.

Sea ice, Ice physics, Surface roughness, Microwaves, Backscattering, Spectra, Statistical analysis, Correlation, Fractals

52-621

Application of a quasispectral cloud parameterization scheme to a mesoscale snowfall event over the Baltic Sea.

Devantier, R., Raabe, A., *Contributions to atmospheric physics,* Aug. 1996, 69(3), p.375-384, 35 refs.

Synoptic meteorology, Marine atmospheres, Precipitation (meteorology), Cloud physics, Classifications, Snowfall, Snow accumulation, Water content, Mathematical models, Turbulent diffusion, Baltic Sea

52-622

Stability of the northern stratospheric winter polar vortex in dependence on the horizontal resolution in a global model.

Beck, A., *Contributions to atmospheric physics,* Aug. 1996, 69(3), p.449-460, With German summary. 33 refs.

Climatology, Atmospheric circulation, Polar atmospheres, Stratosphere, Gravity waves, Turbulent exchange, Heating, Stability, Mathematical models

52-623

Elevated PCB contamination of coastal plants near polynyas in the High Arctic.

France, R.L., *Bulletin of environmental contamination and toxicology,* July 1997, 59(1), p.76-82, 15 refs.

Plant ecology, Lichens, Shores, Subpolar regions, Polynyas, Hydrocarbons, Air pollution, Sedimentation, Environmental impact, Environmental tests, Air water interactions, Sampling

52-624

Role of free amino acids in the nitrogen economy of arctic cryptogams.

Kielland, K., *Ecoscience,* 1997, 4(1), p.75-79, With French summary. 29 refs.

Tundra vegetation, Tundra soils, Forest ecosystems, Organic soils, Nutrient cycle, Plant tissues, Absorption, Mosses, Lichens, Sampling, Chemical analysis

52-625

Host affiliation in two subarctic hemiparasitic plants: *Bartsia alpina* and *Pedicularis lapponica*.

Nilsson, C.H., Svensson, B.M., *Ecoscience,* 1997, 4(1), p.80-85, With French summary. 35 refs.

Plant ecology, Subarctic landscapes, Vegetation patterns, Ecosystems, Roots, Plant tissues, Isotope analysis, Carbon isotopes

52-626

Tracking the motion of sea ice by correlation sonar.

Galloway, J.L., Melling, H., *Journal of atmospheric and oceanic technology,* June 1997, 14(3)pt.2, p.616-629, 16 refs.

Oceanography, Acoustic measurement, Ice acoustics, Underwater acoustics, Sound waves, Scattering, Pack ice, Drift, Velocity measurement, Accuracy, Statistical analysis, Correlation

52-627

New data from Cold War treasure trove.

Carlowicz, M., *Eos,* Mar. 4, 1997, 78(9), p.93,97, 5 refs.

Oceanographic surveys, Maps, Ocean bottom, Drift stations, Hydrography, International cooperation, Computer applications, Arctic Ocean

52-628

Ice flows and floes on Europa. *Eos,* Apr. 22, 1997, 78(16), p.165.

Extraterrestrial ice, Satellites (natural), Regolith, Topographic features, Ice floes, Ice detection, Spaceborne photography

52-629

Drilling in the Arctic: unearthing the planet's secrets.

Johnson, A., *Eos,* Apr. 22, 1997, 78(16), p.169.

Oceanographic surveys, Climatology, Bottom sediment, Offshore drilling, Drill core analysis, Research projects, International cooperation, Arctic Ocean

52-630

Magnetic map will define Antarctica's structure.

Johnson, A.C., Von Frese, R.R.B., ADMAP Working Group, *Eos,* May 6, 1997, 78(18), p.185, 2 refs.

Geological surveys, Geological maps, Geomagnetism, Gravity, Data processing, Research projects

A new, multinational, Antarctic Digital Magnetic Anomaly Project (ADMAP) has been launched to compile near-surface and satellite magnetic anomaly data into a digital map and database for the antarctic continent and surrounding oceans. The unified data set will be a powerful tool for determining the structure, geologic processes, and tectonic evolution of the continent.

52-631

Integration of Special Sensor Microwave/Imager (SSM/I) and in situ data for snow studies from space.

Sun, C.Y., Logan, Utah State University, 1996, 140p., University Microfilms order No.AAD97-17064, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec.B, 1997, p.7423.

Remote sensing, Snow surveys, Snow hydrology, Classifications, Wet snow, Spaceborne photography, Radiometry, Statistical analysis

52-632

Investigations of glacier surface properties and ice velocity of the South Patagonian icefield from synthetic aperture radar (SAR).

Forster, R.R., Ithaca, Cornell University, 1997, 135p., University Microfilms order No.AAD97-16121, Ph.D thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec.B, 1997, p.7421.

Glacier surveys, Glacier surfaces, Glacier flow, Velocity measurement, Spaceborne photography, Synthetic aperture radar, Sensor mapping, Topographic features, Correlation, Chile—Patagonia

52-633

Optical characterization of H_2O/HNO_3 films representative of polar stratospheric clouds and the mechanisms for heterogeneous chlorine activation on these surfaces.

Berland, B.S., Boulder, University of Colorado, 1996, 176p., University Microfilms order No.AAD97-17555, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec B, 1997, p.7543.

Cloud physics, Polar stratospheric clouds, Heterogeneous nucleation, Aerosols, Water films, Ice vapor interface, Ice optics, Optical properties, Ice spectroscopy, Refractivity, Simulation

52-634

Effects of chronic ammonium sulfate treatments on forest trees at the Bear Brook Watershed in Maine.

White, G.J., Farmington, University of Maine, 1996, 168p., University Microfilms order No.AAD97-15070, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec B, 1997, p.7331.

Watersheds, Plant physiology, Trees (plants), Frost resistance, Damage, Nutrient cycle, Hydrogeochemistry, Environmental tests, Aerosols, Simulation, United States—Maine

52-635

Microwave thawing of foods: effect of power levels, dielectric properties and sample geometry.

Chamchong, M., Ithaca, Cornell University, 1997, 126p., University Microfilms order No.AAD97-14893, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec B, 1997, p.7286.

Frozen liquids, Porous materials, Thawing, Microwaves, Heat transfer, Phase transformations, Dielectric properties, Mathematical models

52-636

Holocene climatic variability for lake sites in the Bolivian Andes and interior Alaska based on sedimentology and radiocarbon dating by accelerator mass spectrometry.

Abbott, M.B., Duluth, University of Minnesota, 1997, 117p., University Microfilms order No.AAD97-15279, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec B, 1997, p.7415.

Paleoclimatology, Climatic changes, Quaternary deposits, Lacustrine deposits, Radioactive age determination, Stratigraphy, Water level, Geochemistry, Isotope analysis, Bolivia—Titicaca, Lake, United States—Alaska

52-637

Modern and Late Pleistocene glacial studies in the Central Andes of Peru and Bolivia: application of satellite remote sensing and digital terrain analysis.

Klein, A.G., Ithaca, Cornell University, 1997, 204p., University Microfilms order No.AAD97-11615, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec B, 1997, p.7417.

Mountain glaciers, Pleistocene, Glacial geology, Glacier oscillation, Paleoclimatology, Sensor mapping, Spaceborne photography, Photogrammetry, Peru—Andes, Bolivia—Andes

52-638

Interactions of oxygen, hydrogen and water with Zr (0001) and Zr(1010).

Li, B., London, University of Western Ontario, 1997, 185p., Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.57(12), Sec B, 1997, p.7547.

Ice physics, Solubility, Adsorption, Diffusion, Ice formation, Layers, Mathematical models

52-639

Effects of waves on pancake ice.

Frankenstein, S., Potsdam, NY, Clarkson University, 1996, 244p., University Microfilms order No. 9700878, Ph.D. thesis. Refs. p.241-244.

Ice floes, Ocean waves, Mathematical models, Drift, Sea ice, Ice cover, Ice water interface, Hydrodynamics, Antarctica—Weddell Sea

This thesis investigates both experimentally and analytically the interaction in the Weddell Sea between waves and pancake ice, including floe drift and floe-floe collisions. It is found that a floe's initial velocity, but not its oscillation amplitude, is dependent on the starting conditions. Both parameters appear to be independent of the floe thickness and concentration. Fractal dimension calculations reveal that two first-order differential equations are needed to describe the floe motion. Even though the thinner floes are observed to collide more often than the thicker floes, they do not remain in contact longer. For refrigerated tests lasting longer than twenty minutes the ice concentration governs both the floe motion and the collision characteristics. This is due to the continuous production of frazil at the beach. (Auth. mod.)

52-640
Preliminary survey of cryobiontic algal communities from Cierva Point (Antarctic Peninsula).
Mataloni, G., Tesolin, G., *Antarctic science,* Sep. 1997, 9(3), p.250-257, Refs. p.256-257.
Algae, Biomass, Ecology, Microbiology, Cryobiology, Colored ice, Colored snow, Antarctica—Cierva Cove
Algal communities coloring snow and ice were studied at 14 sites at Cierva Cove. Chlorophyta were the dominant group in cryobiontic communities, both in species richness and abundance. Cyanobacteria and diatoms, in turn, showed a higher species number at low altitude, well drained temporary snow fields, probably denoting a cryoxenic character. Descriptions of the 6 species newly recorded for Antarctica are given, and the taxonomic position of some *Scotiella, Trochiscia* and *Koliella* species is discussed. It is suggested that further research is needed to assess the importance of various stress factors in the progressive drop in species richness and biosynthesis of secondary carotenoids associated with a change in snow color from green to orange-red to pink-red. (Auth.)

52-641
Holocene isostasy and late Cenozoic development of landforms including Beaver and Radok Lake basins in the Amery Oasis, Prince Charles Mountains, Antarctica.
Adamson, D.A., Mabin, M.C.G., Luly, J.G., *Antarctic science,* Sep. 1997, 9(3), p.299-306, 17 refs.
Glacial geology, Isostasy, Geomorphology, Glaciation, Limnology, Moraines, Antarctica—Beaver Lake, Antarctica—Radok Lake
Geomorphological observations around the basin of Beaver Lake include an absence of raised shoreline features, the presence down to the present tidal limit of *in situ* ventifacts and residual landforms, the cliffed southern shoreline and adjacent shallow subhorizontal floor of Beaver Lake, and the composition of recent moraines on the basin's north eastern edge. This lack of Holocene uplift is consistent with low uplift rates observed from coastal oases of East Antarctica and suggests minor, rather than major, changes to the antarctic ice sheet during the most recent Quaternary glacial cycle. The formation of Beaver basin is attributed to Late Cenozoic glacial excavation by south flowing ice of the palaeo-Nemesis Glacier, initially eroding when relative sea level was higher than it is today. The basin containing Radok Lake was excavated by the palaeo-Battye Glacier probably when most effective during the numerous long cold periods of the Late Cenozoic. (Auth. mod.)

52-642
Distribution, activity and characteristics of the alpine-type glaciers of northern Prince Charles Mountains, East Antarctica.
Krebs, K.A., Mabin, M.C.G., *Antarctic science,* Sep. 1997, 9(3), p.307-312, 8 refs.
Glaciers, Cirque glaciers, Glacier surveys, Glacier surfaces, Distribution, Snow accumulation, Glacier oscillation, Orientation, Antarctica—Prince Charles Mountains
In the northern Prince Charles Mountains, a total of 47 glaciers have been investigated using maps and aerial photographs, and in the summer of 1991-92 17 of these were examined in the field. Their distribution and their present-day snowline altitudes appear to be influenced by their location with respect to snow-bearing winds, particularly the summer winds that bring moisture from the open waters of Prydz Bay. Moraine morphologies indicate that these glaciers advance and retreat out-of-phase with the larger ice sheet outlet glaciers. During the last glacial maximum the alpine-type glaciers retreated while the ice sheet outlet glaciers showed a minor expansion. This is believed to be due to the alpine-type glaciers being starved of snowfall as the expanded last glacial maximum sea-ice cover around the continent would have removed their maritime moisture sources. Recent contrasts in the behavior of the alpine glaciers may reflect changes in summer sea ice extent in Prydz Bay. (Auth.)

52-643
Blanketing snow and ice; constraints on radiocarbon dating deglaciation in East Antarctic oases.
Gore, D.B., *Antarctic science,* Sep. 1997, 9(3), p.336-346, Refs. p.344-346.
Snow cover effect, Ice cover effect, Sedimentation, Radioactive age determination, Cryobiology, Lacustrine deposits, Marine deposits, Antarctica—East Antarctica
Radiocarbon dating of marine, lacustrine or terrestrial biogenic deposits is the main technique used to determine when deglaciation of the oases of East Antarctica occurred. However, at many of the oases of East Antarctica, snow and ice presently form extensive blankets that fill valleys and some lake basins, cover perennial lake ice and in places overwhelm local topography to form ice domes up to hundreds of square kilometers in area. Field observations from Larsemann Hills and Taylor Is. suggest that under these conditions, terrestrial and lacustrine biogenic sedimentation is neither widespread nor abundant. If similar conditions prevailed in and around the oases immediately following retreat of the ice sheet, then a lengthy hiatus might exist between deglaciation and the onset of widespread or abundant biogenic sedimentation. As a result, radiocarbon dating might be a clumsy tool with which to reconstruct deglaciation history, and independent dating methods that record emergence of the hilltops from the continental ice must be employed as well. (Auth. mod.)

52-644
Reconstruction of ice flow across the Bunger Hills, East Antarctica.
Augustinus, P.C., Gore, D.B., Leishman, M.R., Zwartz, D., Colhoun, E.A., *Antarctic science,* Sep. 1997, 9(3), p.347-354, 28 refs.
Glaciation, Ice sheets, Glacier flow, Glacier oscillation, Ice scoring, Paleoclimatology, Antarctica—Bunger Hills
In the Bunger Hills, mapping of the glacial drift sheets and examination of striae patterns and other palaeo-ice flow direction indicators show that the largely ice-free region records the imprint of ice sheet expansion(s) during the Late Cenozoic. In particular, ice moulded features and striae in southern Bunger Hills suggest formation during at least two episodes of ice sheet expansion. The older event relates to thin ice with flow constrained by the topography, whilst the younger event relates to regional expansion of thick ice across the area. Discrimination of the order of emplacement of the cross-cutting striae patterns is possible at a number of sites. Palaeo-ice flow indicators confirm that ice sheet expansion over southern Bunger Hills was purely from the southern and eastern margins, although minor advances of the northeast flowing Edisto Glacier onto coastal areas occurred following retreat of the last extensive ice sheet phase. (Auth. mod.)

52-645
Analysis of a 34-year air temperature record from Fossil Bluff (71°S, 68°W), Antarctica.
Harangozo, S.A., Colwell, S.R., King, J.C., *Antarctic science,* Sep. 1997, 9(3), p.355-363, 21 refs.
Air temperature, Meteorological data, Climatic changes, Seasonal variations, Thermal analysis, Antarctica—Fossil Bluff
An analysis of a long-term surface air temperature record for Fossil Bluff in the George VI Sound, West Antarctic Peninsula (WAP) documents in detail some important aspects of the climate of this area for the first time. The analysis identifies the close dependency of air temperatures on latitude in the WAP but reveals that the strength of this dependency is greatest in winter. This result along with others leads to the Fossil Bluff climate regime being characterized as 'continental' rather than 'maritime' as found further north. The WAP as a whole displays large interannual temperature variability, but this is greatest in Marguerite Bay rather than the Fossil Bluff area. Evidence is also provided for secular climatic change appearing in summer throughout the WAP over the last few decades. The representativeness of existing Antarctic Peninsula annual air temperature climatologies, based mainly on snow temperature measurements, for the winter and summer periods is also noted. (Auth.)

52-646
Equation of state of ice VII up to 106 GPa.
Wolanin, E., et al, *Physical review B,* Sep. 1, 1997, 56(10), p.5781-5785, 35 refs.
Ice physics, Deuterium oxide ice, High pressure tests, Phase transformations, X ray diffraction, Molecular structure

52-647
Electron-stimulated desorption of D^+ from D_2O ice: surface structure and electronic excitations.
Sieger, M.T., Simpson, W.C., Orlando, T.M., *Physical review B,* Aug. 15, 1997, 56(8), p.4925-4937, 55 refs.
Ice physics, Deuterium oxide ice, Amorphous ice, Surface structure, Hydrogen bonds, Ice spectroscopy, Ion exchange, Molecular energy levels, Phase transformations, Photochemical reactions, Decomposition, Spectra, Temperature effects

52-648
High-pressure infrared study of solid methane: phase diagram up to 30 GPa.
Bini, R., Pratesi, G., *Physical review B,* June 1, 1997, 55(22), p.14,800-14,809, 32 refs.
Extraterrestrial ice, Ice physics, Simulation, Hydrocarbons, Natural gas, Infrared spectroscopy, Phase transformations, High pressure tests, Cryogenics, Temperature effects, Molecular structure

52-649
Nutrient availability, plant abundance, and species diversity in two alpine tundra communities.
Theodose, T.A., Bowman, W.D., *Ecology,* Sep. 1997, 78(6), p.1861-1872, Refs. p.1869-1870.
Plant ecology, Alpine tundra, Tundra soils, Tundra vegetation, Ecosystems, Meadow soils, Soil chemistry, Modification, Nutrient cycle, Biomass, Roots, Seasonal variations, Statistical analysis

52-650
Reconstruction of millennial forest dynamics from tree remains in a subarctic tree line peatland.
Arseneault, D., Payette, S., *Ecology,* Sep. 1997, 78(6), p.1873-1883, Refs. p.1881-1883.
Peat, Forest tundra, Forest lines, Revegetation, Subarctic landscapes, Climatic changes, Fires, Environmental impact, Sediments, Age determination, Correlation

52-651
Freezing of aqueous specimens: an X-ray diffraction study.
Lepault, J., Bigot, D., Studer, D., Erk, I., *Journal of microscopy,* Sep. 1997, 187(pt.3), p.158-166, 22 refs.
Ice physics, Amorphous ice, Electron microscopy, X ray diffraction, Cryobiology, Solutions, Freezing, High pressure tests, Ice structure, Laboratory techniques, Preserving, Phase transformations, Temperature effects

52-652
NASA Lewis Icing Research Tunnel user manual.
Soeder, R.H., Andracchio, C.R., *U.S. National Aeronautics and Space Administration. Technical memorandum,* June 1990, NASA-TM-102319, 37p., N90-23407, 7 refs.
Wind tunnels, Aircraft icing, Ice accretion, Supercooled clouds, Cloud droplets, Environmental tests, Manuals

52-653
Flight evaluation of several ground deicing/anticing fluids on general aviation aircraft.
Kohlman, D.L., Rahbarrad, M., *U.S. Federal Aviation Administration. Technical Center, Atlantic City International Airport, NJ. Technical note,* Dec. 1990, DOT/FAA/CT-TN90/31, 26p. + appends., N91-17005.
Aircraft icing, Chemical ice prevention, Air flow, Cold weather tests

52-654
Electromagnetic emissions from an Electro-Impulse Deicing system in a composite wing equipped with lightning protection.
Zumwalt, G.W., *U.S. Federal Aviation Administration. Technical Center, Atlantic City International Airport, NJ. Technical note,* Sep. 1991, DOT/FAA/CT-TN90/32, 8p. + append., N91-32284, 4 refs.
Aircraft icing, Ice prevention, Ice removal, Electromagnetic properties, Electric equipment, Electric fields, Composite materials, Electrical grounding

52-655
LEWICE/E: an Euler based ice accretion code.
Potapczuk, M.G., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1992, NASA-TM-105389, 23p., N92-14001, 13 refs. Prepared for the 30th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 6-9, 1992, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).
Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Mathematical models, Computer programs

52-656
Results of an icing test on a NACA 0012 airfoil in the NASA Lewis Icing Research Tunnel.
Shin, J.W., Bond, T.H., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1992, NASA-TM-105374, 19p., N92-15051, 7 refs. Prepared for the 30th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 6-9, 1992, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).
Wind tunnels, Aircraft icing, Ice accretion, Ice loads, Environmental tests

52-657
Alternatives to the snow shovel. *Consumer reports,* Oct. 1997, 62(10), p.28-32.
Snow removal equipment, Cold weather performance, Classifications

52-658

Fossil fungi from the lower Tertiary Iceberg Bay Formation, Eureka Sound Group, Axel Heiberg Island, Northwest Territories, Canada.

Kalgutkar, R.M., *Review of palaeobotany and palynology,* July 1997, 97(1-2), p.197-226, Refs. p.224-226.

Pleistocene, Quaternary deposits, Paleoecology, Fungi, Fossils, Sampling, Lithology, Classifications, Structural analysis, Microscope slides, Geochronology, Statistical analysis, Canada—Northwest Territories—Axel Heiberg Island

52-659

Graptolites of the genus *Mediograptus* Bouček and Přibyl from the uppermost Llandovery of Cornwallis Island, Arctic Canada.

Loydell, D.K., McKenniff, J., Lenz, A.C., *Canadian journal of earth sciences,* June 1997, 34(6), p.765-769, With French summary. 21 refs.

Pleistocene, Paleoecology, Subpolar regions, Sediments, Fossils, Classifications, Scanning electron microscopy, Structural analysis, Distribution, Canada—Northwest Territories—Cornwallis Island

52-660

Compositional and thermal state of the upper mantle beneath the Bering Sea basalt province: evidence from the Chukchi Peninsula of Russia.

Akinin, V.V., Roden, M.F., Francis, D., Apt, J., Moll-Stalcup, E., *Canadian journal of earth sciences,* June 1997, 34(6), p.789-800, With French summary. 40 refs.

Pleistocene, Quaternary deposits, Marine geology, Tectonics, Magma, Geochemistry, Rock properties, Chemical composition, Chemical analysis, Geothermy, Russia—Chukchi Peninsula

52-661

Sorption/desorption of radioactive contaminants by sediment from the Kara Sea.

Fuhrmann, M., Zhou, H., Neiheisel, J., Schoonen, M.A.A., Dyer, R., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.5-24, 23 refs.

Oceanography, Radioactive wastes, Waste disposal, Bottom sediment, Absorption, Water pollution, Radioactive isotopes, Isotope analysis, Environmental impact, Environmental tests, Sampling, Russia—Kara Sea

52-662

History and source of particulate ^{137}Cs and ^{239,240}Pu deposition in sediments of the Ob River Delta, Siberia.

Sayles, F.L., Livingston, H.D., Panteleyev, G.P., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.25-41, 28 refs.

Rivers, Floodplains, Deltas, Bottom sediment, Radioactivity, Radioactive isotopes, Isotope analysis, Environmental tests, Fallout, Origin, Russia—Ob' River

52-663

Assessment of the flux of ^{90}Sr contamination through the Ob' River and estuary to the Kara sea.

Paluszkiewicz, T., Hibler, L.F., Becker, P., Mandych, A., Richmond, M.C., Thomas, S., *Science of .he total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, 43-56, 30 refs.

Rivers, Estuaries, Radioactive wastes, Waste disposal, Radioactivity, Radioactive isotopes, Solubility, Sediment transport, Absorption, Hydrologic cycle, Models, Environmental impact, Russia—Ob' River

52-664

Sunken nuclear submarine *Komsomolets* and its effects on the environment.

Høibråten, S., Thoresen, P.E., Haugan, A., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.67-78, 15 refs.

Oceanography, Submarines, Nuclear power, Accidents, Radioactive wastes, Radioactive isotopes, Dispersions, Stability, Corrosion, Water pollution, Environmental impact, Dispersions, Countermeasures

52-665

Plutonium in fish, algae, and sediments in the Barents, Petshora and Kara Seas.

Ikäheimonen, T.K., Rissanen, K., Matishov, D.G., Matishov, G.G., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.79-87, 17 refs.

Oceanographic surveys, Bottom sediment, Biomass, Algae, Radioactivity, Fallout, Radioactive wastes, Isotope analysis, Sampling, Statistical analysis, Environmental tests, Barents Sea, Russia—Kara Sea

52-666

Sea-ice production and transport of pollutants in the Laptev Sea, 1979-1993.

Rigor, I., Colony, R., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.89-110, 31 refs.

Oceanography, Sea ice, Freezeup, Ice melting, Ice openings, Drift, Sediment transport, Ice composition, Radioactivity, Water pollution, Dispersions, Wind factors, Seasonal variations, Environmental tests, Russia—Laptev Sea

52-667

Potential for rapid transport of contaminants from the Kara Sea.

Pfirman, S.L., Kögeler, J.W., Rigor, I., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.111-122, 40 refs.

Oceanography, Sea ice, Ice shelves, Pollution, Drift, Ocean currents, Ice water interface, Ice cover effect, Sediment transport, Russia—Kara Sea

52-668

Benchmarking of numerical models describing the dispersion of radionuclides in the Arctic Seas.

Scott, E.M., et al, *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.123-134, 8 refs.

Oceanography, Water pollution, Bottom sediment, Radioactive isotopes, Radioactive wastes, Advection, Diffusion, Dispersions, Environmental impact, Safety, Standards, Mathematical models, Forecasting

52-669

Collective doses to man from dumping of radioactive waste in the Arctic Seas.

Nielsen, S.P., Iosjpe, M., Strand, P., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.135-146, 16 refs.

Oceanography, Water pollution, Radioactivity, Radioactive wastes, Waste disposal, Environmental impact, Health, Safety, Mathematical models, Forecasting, Arctic Ocean

52-670

Perturbation in the ^{240}Pu/^{239}Pu global fallout ratio in local sediments following the nuclear accidents at Thule (Greenland) and Palomares (Spain).

Mitchell, P.I., León Vintró, L., Dahlgaard, H., Gascó, C., Sánchez-Cabeza, J.A., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.147-153, 29 refs.

Subpolar regions, Marine deposits, Radioactive isotopes, Isotope analysis, Fallout, Environmental tests, Aircraft, Accidents, Greenland—Thule

52-671

Mobilisation of ^{137}Cs and ^{90}Sr from sediments: potential sources to arctic waters.

Oughton, D.H., Børretzen, P., Salbu, B., Tronstad, E., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.155-165, 18 refs.

Oceanography, Marine deposits, Pollution, Suspended sediments, Sedimentation, Sea ice, Sea water, Radioactive isotopes, Diffusion, Ion exchange, Simulation, Sampling, Environmental tests

52-672

Environment of the nuclear test sites on Novaya Zemlya.

Skorve, J., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.167-172, 4 refs.

Geophysical surveys, Spaceborne photography, Arctic landscapes, Continuous permafrost, Hydrogeology, Geomorphology, Ground thawing, Meltwater, Explosion effects, Nuclear power, Environmental impact, Russia—Novaya Zemlya

52-673

Radioactive contamination from dumped nuclear waste in the Kara Sea - results from the joint Russian-Norwegian expeditions in 1992-1994.

Salbu, B., et al, *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.185-198, 21 refs.

Oceanographic surveys, Radioactive wastes, Waste disposal, Marine deposits, Sediments, Detection, Sampling, Water pollution, Radioactive isotopes, Fallout, Environmental tests, Statistical analysis, Russia—Kara Sea

52-674

Simulation of the atmospheric transport and deposition on a local/meso- and regional scale after hypothetical accidents at the Kola nuclear power plant.

Thaning, L., Baklanov, A., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.199-210, 26 refs.

Nuclear power, Accidents, Radioactivity, Radioactive isotopes, Air pollution, Atmospheric circulation, Fallout, Sedimentation, Simulation, Environmental tests, Meteorological factors, Safety, Russia—Kola Peninsula

52-675

Estimates of fluxes of ^{137}Cs in northern waters from recent measurements.

Kershaw, P., Gurbutt, P., Woodhead, D., Leonard, K., Rees, J., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.211-223, 21 refs.

Oceanographic surveys, Sampling, Radioactivity, Radioactive isotopes, Water pollution, Water transport, Environmental tests, Waste disposal, Fallout

52-676

Potential radionuclide release rates from marine reactors dumped in the Kara Sea.

Warden, J.M., et al, *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.225-236, 10 refs.

Oceanography, Radioactive wastes, Water pollution, Waste disposal, Decomposition, Dispersions, Covering, Corrosion, Models, Forecasting, Russia—Kara Sea

52-677

Radioactive contamination in the environment of the nuclear enterprise 'Mayak' PA. Results from the joint Russian-Norwegian field work in 1994.

Christensen, G.C., et al, *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.237-248, 15 refs.

Nuclear power, Radioactive wastes, Waste disposal, Explosion effects, Sampling, Boreholes, Radioactivity, Isotope analysis, Soil pollution, Environmental impact, Environmental tests, Russia—Chelyabinsk

52-678

New estimation of La Hague contribution to the artificial radioactivity of Norwegian waters (1992-1995) and Barents Sea (1992-1997).

Guegueniat, P., Kershaw, P., Hermann, J., Bdilly du Bois, P., *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.249-266, 13 refs.

Nuclear power, Oceanography, Surface waters, Radioactivity, Radioactive wastes, Water transport, Ocean currents, Radioactive isotopes, Channels (waterways), Distribution, Barents Sea

52-679

Evidence for radionuclide transport by sea ice.

Meese, D.A., Reimnitz, E., Tucker, W.B., Gow, A.J., Bischof, J., Darby, D., MP 5017, *Science of the total environment,* Aug. 25, 1997, 202(1-3), Symposium and International Conference on Environmental Radioactivity in the Arctic, 2nd, Oslo, Norway, Aug. 21-25, 1995. Proceedings. Edited by P. Strand et al, p.267-278, 26 refs.

Oceanographic surveys, Radioactivity, Water chemistry, Sea ice, Ice composition, Bottom sediment, Ice rafting, Clay minerals, Ice cores, Sampling, Radioactive isotopes, Environmental tests

Ice and ice-borne sediments were collected across the Arctic Basin during a recent US/Canada trans-Arctic expedition. Sediments were analyzed for ^{137}Cs, clay mineralogy and carbon. Concentrations of ^{137}Cs ranged from 5 to 73 Bq/kg in the ice-borne sediments. Concentrations of ice samples without sediment were all less than 1 Bq/m^3. The sediment sample with the highest ^{137}Cs concentration was collected in the Beaufort Sea. This concentration was significantly higher than in bottom sediments collected in the same area, indicating an ice transport mechanism from an area with correspondingly higher concentrations. Recent results from the application of ice transport models and sediment analyses indicate that it is very likely that sediments are transported by ice, from the Siberian shelf areas to the Beaufort Sea.

52-680

Tibetan ice forces climate rethink.

Hecht, J., *New scientist,* June 28, 1997, 154(2088), p.17.

Paleoclimatology, Climatic changes, Temperature variations, Distribution, Ice sheets, Ice cores, Ice dating, Oxygen isotopes, China—Tibet

52-681

Not a snowball's chance...

Matthews, R., *New scientist,* July 12, 1997, 155(2090), p.24-27.

Extraterrestrial ice, Global change, Water supply, Spaceborne photography, Ice detection, Theories

52-682

Impact of climate change on the snow cover pattern in Estonia.

Jaagus, J., *Climatic change,* May-June 1997, 36(1-2), p.65-77, 17 refs.

Climatology, Climatic changes, Snow air interface, Snow accumulation, Snow cover distribution, Air temperature, Correlation, Statistical analysis, Temperature effects, Forecasting, Estonia

52-683

Performance degradation of a typical twin engine commuter type aircraft in measured natural icing conditions.

Ranaudo, R.J., Mikkelsen, K.L., McKnight, R.C., Perkins, P.J., Jr., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1984, NASA-TM-83564, 8p. + figs., N84-13173, 16 refs. Prepared for the 22nd Aerospace Sciences Conference, Reno, NV, Jan. 9-12, 1984, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Supercooled clouds, Cloud droplets, Cold weather tests

52-684

Rain and deicing experiments in a wind tunnel.

Fasso, G., *U.S. National Aeronautics and Space Administration. Technical memorandum,* June 1983, NASA-TM-77077, 11p., N83-30394, Translation of a paper presented at the Association Française des Ingénieurs et Techniciens de l'Aéronautique et de l'Espace, Congrès International Aéronautique, 8th, Paris, France, May 29-31, 1967.

Aircraft icing, Ice prevention, Ice removal, Rain, Wind tunnels, Environmental tests

52-685

Experimental comparison of icing cloud instruments.

Olsen, W., Takeuchi, D., Adams, K., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1983, NASA-TM-83340, 19p. + figs., N83-24487, 15 refs. Prepared for the 21st Aerospace Sciences Conference, Reno, NV, Jan. 10-13, 1983, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Unfrozen water content, Moisture detection, Weather forecasting, Meteorological instruments, Wind tunnels

52-686

Numerical simulation of an electrothermal deicer pad.

Marano, J.J., *U.S. National Aeronautics and Space Administration. Contractor report,* Mar. 1983, NASA-CR-168097, 107p., N83-23281, M.S. thesis submitted to the University of Toledo, Toledo, OH. 12 refs.

Aircraft icing, Propellers, Ice adhesion, Ice prevention, Ice removal, Ice melting, Artificial melting, Electric heating, Mathematical models, Computer programs

52-687

Method of predicting flow rates required to achieve anti-icing performance with a porous leading edge ice protection system.

Kohlman, D.L., *U.S. National Aeronautics and Space Administration. Contractor report,* Feb. 1983, NASA-CR-169996, 21p., N83-19738, 4 refs.

Aircraft icing, Chemical ice prevention, Ice removal

52-688

Wind tunnel evaluation of airfoil performance using simulated ice shapes.

Bragg, M.B., Zaguli, R.J., Gregorek, G.M., *U.S. National Aeronautics and Space Administration. Contractor report,* Nov. 1982, NASA-CR-167960, 168p., N83-15265, 5 refs.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Wind tunnels, Environmental tests

52-689

Development and test of a Microwave Ice Accretion Measurement Instrument (MIAMI).

Magenheim, B., Rocks, J.K., *U.S. National Aeronautics and Space Administration. Contractor report,* 1982, NASA-CR-3598, 79p., N83-14123, 3 footnotes passim.

Aircraft icing, Ice accretion, Ice electrical properties, Ice detection, Thickness gages, Warning systems, Microwaves

52-690

Interaction of radio frequency electromagnetic fields with atmospheric water droplets and applications to aircraft ice prevention.

Hansman, R.J., Jr., *Massachusetts Institute of Technology. Department of Aeronautics and Astronautics. Flight Transportation Laboratory. FTL report,* June 1982, R82-5, 191p., N82-30432, Thesis. 68 refs. Also published as U.S. National Aeronautics and Space Administration, Report, NASA-CR-169246.

Aircraft icing, Ice accretion, Ice prevention, Supercooled clouds, Cloud droplets, Microwaves, Electric fields, Electric heating, Mathematical models, Computerized simulation

52-691

Identification of potential aircraft icing regions through multispectral analysis of GOES-8 imagery.

Schrumpf, B.D., *U.S. Air Force Institute of Technology, Wright-Patterson AFB, OH. Report,* Jan. 1997, AFIT-96-136, 155p., ADA-320 083, M.S. thesis submitted to Colorado State University, Fort Collins, CO. Refs. p.150-155.

Aircraft icing, Ice accretion, Ice forecasting, Weather forecasting, Cloud cover, Cloud physics, Supercooled clouds, Cloud droplets, Unfrozen water content, Spaceborne photography, Image processing

52-692

New Zealand Antarctic Programme 1993/94.

New Zealand. Ministry of Foreign Affairs and Trade. NZAP, Christchurch, NZ, NZAP, 1993, 41p.

Research projects, Organizations, Ice sheets, Pack ice, Soil pollution, Water pollution, Meltwater, Glacier melting, Permafrost, Antarctica

52-693

Proceedings: the 9th Workshop on River Ice, Sep. 24-26, 1997, Fredericton, N.B. [Compte Rendu: Le 9e Atelier sur les Glaces Fluviales, sep. 24-26, 1997, Fredericton, N.B.]

Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B., Ismail, S., ed, Fredericton, New Brunswick Power Corporation, 1997, 442p., Refs. passim. For selected papers see 52-694 through 52-721.

River ice, Electric power, Ice jams, Ice models, Ice cover, Ice floes

52-694

Variations of climate and streamflow over the Saint John Basin since 1872.

Hare, F.K., Dickison, R.B.B., Ismail, S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.1-21, 19 refs.

Climatic changes, Stream flow, River basins, Snow water equivalent, Precipitation (meteorology), Thawing, Canada—New Brunswick—Saint John Basin

52-695
Internet video monitoring of ice boom performance.
Crissman, R.D., Lalumiere, L.A., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.23-41, 6 refs.
Ice booms, Performance, Monitors, Electric power, Computers, Computer programs, Design, Design criteria, Pontoon bridges, Erie, Lake, Niagara River

52-696
Lake Winnipeg Regulation ice stabilization program.
Zbigniewicz, H.S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.43-53, 4 refs.
Lakes, Lake ice, Reservoirs, Electric power, Ice booms, Freezeup, Cost analysis, Canada—Manitoba—Winnipeg

52-697
Operation of a peaking hydropower plant in winter: estimating downstream water-surface profiles and release constraints.
Daly, S.F., Tuthill, A., McGilvary, R.M., MP 5018, Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.55-72, 3 refs.
Electric power, Dams, River ice, Ice cover effect, River flow, Ice models, Simulation, United States—Missouri River, United States—South Dakota—Pierre
This study estimated the stage frequency at selected cross sections in the Missouri River downstream of Oahe Dam. Also estimated were release constraints on the operation of Oahe Dam by simulating the flow conditions in the Missouri River for a selected period of each of the 27 historical winter seasons (1967-68 through 1993-94) that the dam has been in operation. The selected periods corresponded to each year's most severe ice conditions. The simulations were done with the unsteady flow model UNET and used a) the recorded Oahe Dam hourly release rates, b) the best estimate of the Missouri River ice conditions, and c) the Missouri River cross-section geometry calibrated to 1994 conditions. The simulations were also done for the estimated future aggraded Missouri River cross section geometry. Three sets of stage frequencies were produced for each selected cross section under the existing channel conditions, and three sets were produced under the estimated future conditions. An estimate was also made of the expected duration of constraints to the Oahe Dam releases caused by the presence of ice on the Missouri River each winter. This was done by selecting a specific position of the leading edge of the river ice cover as the indicator of when the Oahe Dam releases would need to be constrained. The statistics of the constraint duration were then developed on the basis of the length of time that the river ice cover extended upstream of both of these locations over the period of record. The statistics of the estimated constraints on the total volume released, for both the 25,000 and 35,000 cfs maximum-release scenarios, were also estimated for existing and future (year 2036) channel conditions.

52-698
Headpond ice jams—where will they occur.
Judge, D.G., Lavender, S.T., Carson, R.W., Ismail, S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.73-87, 3 refs.
Ice jams, River ice, Ice cover, Ice forecasting, Ice models, Mathematical models, Canada—New Brunswick—Saint John River

52-699
Effects of uncertainty in ice roughness on equilibrium ice thickness and stage.
White, K.D., Daly, S.F., MP 5019, Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.89-99, With French summary. 14 refs.
Ice jams, Ice cover thickness, Ice breakup, Mathematical models, Ice models
The U.S. Army Corps of Engineers requires the use of risk and uncertainty methods in the analysis and design of hydraulic and flood control structures. When the uncertainties are quantified, the risk associated with different levels of protection can be quantified as well. At the present time, these methods address the uncertainties encountered in developing discharge-probability functions and stage-discharge functions for gaged and ungaged watersheds in open-water conditions. There are no established methods to perform similar analyses in ice-affected rivers. The additional sources of error include ice roughness, ice thickness, and ice properties such as porosity and cohesion. In addition, discharge measurement errors present in open-water cases are compounded by the measurement errors caused by the presence of ice, such as frozen recorders and ice-affected stages leading to overly high discharge estimates. This paper addresses the additional complexities introduced when risk and uncertainty analyses are attempted for ice-covered conditions. In particular, the effects of uncertainty in ice roughness on the calculated equilibrium ice jam thickness and stage are explored.

52-700
Fluid resistance of rubble field of ice.
Hara, F., Kawai, T., Kinoshita, H., Saeki, H., Yamaguchi, H., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.101-110, 4 refs.
Ice floes, Ice water interface, Fluid mechanics, Ice jams, Ice cover, Shear stress, Water flow

52-701
Factors influencing ice conveyance at river confluences.
Ettema, R., Muste, M., Kruger, A., MP 5020, Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.111-124, 2 refs. Funded by the U.S. Army Cold Regions Research and Engineering Laboratory under contract No.DACA 4303900.
Rivers, River ice, Ice jams, Hydraulics, River flow, Ice cover effect, Mathematical models, United States—Mississippi River, United States—Missouri River
This paper presents the preliminary findings of a study aimed at evaluating the factors influencing ice conveyance and incipient ice jamming in river confluences. The paper begins by categorizing the different conditions of ice conveyance at a confluence. The categorization is based on two-part general classification; free drift of ice into confluences, and the movement of contiguous accumulations of ice into confluences. Sub-categories of each general category also are identified. The variables defining ice conveyance for the two general categories then are assembled by means of dimensional analysis into two sets of non-dimensional parameters. Next, the paper briefly presents preliminary results from a hydraulic model used to investigate flow and ice through the confluence of the Missouri and Mississippi Rivers, a confluence with an occasional, though severe, jam problem. The model makes use of particle image velocimetry to determine and map whole fields of water and ice velocities in the confluence. The categories of possible confluent ice conditions, together with the non-dimensional parameters and the results from the hydraulic model, are used to make a preliminary evaluation of the actual extent of ice-jam problems at confluences. The evaluation suggests that the three most common causes of ice jams are sluggish water velocities in the outflow channel from a confluence, the presence of an ice cover in the outflow channel, and local bathymetric features typical of confluences.

52-702
Breakup ice control structure for the Salmon River in Connecticut.
Tuthill, A.M., White, K.D., MP 5021, Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.125-139, 11 refs.
Ice jams, River ice, Ice breakup, Countermeasures, Dams, Ice control, Piers, United States—Connecticut River, United States—Salmon River, United States—Connecticut—East Haddam
This paper presents a conceptual design for a breakup ice control structure on the Salmon River at East Haddam, CT. Ice jams initiate just downstream of a small neighborhood, where the Salmon River transitions to a flat tidal reach above its confluence with the Connecticut River. Ice jam flood severity has increased since 1979, when a dam located upstream of the community was lowered. The Salmon River watershed is small and relatively steep, responding rapidly to rainfall and snowmelt events. As a result, the ice breakup can be extremely dynamic. Design development relied on equilibrium ice jam modeling to simulate worst case existing conditions and estimate the performance of structural ice control alternatives under two ice breakup scenarios. The first breakup scenario assumed that a semi-intact ice sheet would rest against the piers and retain a floating equilibrium jam upstream, allowing water discharge to pass beneath. Under a second, and worst case scenario, a grounded jam in direct contact with the piers would divert water flow around the structure via an armored channel in the overbank area. The proposed ice retention structure consists of a row of concrete piers, spaced across the main channel, 60 m upstream of an existing dam.

52-703
Field measurements of anchor and frazil ice.
Hirayama, K., Terada, K., Sato, M., Hirayama, K., Sasamoto, M., Yamazaki, M., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.141-151, 7 refs.
Bottom ice, Frazil ice, Ice formation, Measurement, Freezing indexes, Ice density, Flow rate, Air temperature, Temperature effects, Japan—Niuppu River, Japan—Hokkaido

52-704
Anchor ice formation and growth on gravel channel bed.
Kerr, D.J., Shen, H.T., Daly, S.F., MP 5022, Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.153-171, 9 refs.
Bottom ice, Ice formation, Ice growth, Heat loss, Frazil ice
Preliminary results of a laboratory study on anchor ice formation and growth on gravel channel bed are presented. The study showed that the anchor ice formed in supercooled turbulent flow from the accumulation of frazil ice on the bed. In-situ thermal growth was not observed. The location of the initiation of anchor ice accumulation relative to the bed gravel and the growth pattern of the anchor ice accumulations varied with the flow condition. The growth of anchor ice generally consisted of an initial stage of localized frazil deposition, followed by a transition stage, then the final stage of continued uniform growth. Three types of anchor ice forms were observed during the initial stage of growth. The anchor ice can accumulate in forms of tails, scales, or balls. During the transition stage, flattening or releasing of anchor ice occurred. If the anchor ice was not released during the transition stage, an anchor ice blanket would form and grow in thickness at a steady rate with respect to the heat loss rate.

52-705
Extreme frazil and bottom ice formation causing ice problems in a regulated river.
Asvall, R.P., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.173-181.
Bottom ice, Frazil ice, Ice formation, River ice, Rivers, Watersheds, Ice conditions, Norway—Lagen River, Norway—Otta River

52-706
Design method to counter the abrasion of hydraulic structures due to ice sheet movements.
Hara, F., Ohshima, K., Hanada, M., Ujihira, M., Tachibana, H., Saeki, H., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.183-196, 6 refs.
Ice solid interface, Abrasion, River ice, Ice cover, Piers, Concrete structures, Ice floes, Compressive properties, Analysis (mathematics), Lake ice, Japan

52-707
Ice-load measurements on the Lake Erie-Niagara River ice boom: 1996-97.
Cowper, B., Abdelnour, R., Gong, Y.X., Crissman, R.D., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.197-216, 7 refs.
Ice loads, Ice booms, River ice, Lake ice, Design, Design criteria, Countermeasures, Erie, Lake, Niagara River, Canada—Ontario, United States—New York

52-708
Ice bridges: theory and design.
Troitsky, M.S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.217-223, 4 refs.
Bridges, Ice (construction material), Design, Wood, Ice cover strength, Bearing strength

52-709

Effects of climate on river ice jams.

Beltaos, S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.225-244, 33 refs.

River ice, Ice jams, Climatic factors, Ice breakup, Ice conditions, Canada

52-710

Experimental study on the process of ice jam development.

Kawai, T., Hara, F., Masaki, S., Nishihata, A., Saeki, H., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.245-256, 8 refs.

Ice jams, River ice, Ice floes, Ice cover, Ice edge, Analysis (mathematics), Ice mechanics, Ice solid interface

52-711

Ice jam progression on the Upper St. John River.

Zufelt, J.E., Tuthill, A.M., Stanley, J.M., Jr., MP 5023, Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.257-268, 5 refs.

Ice breakup, Ice jams, River ice, Flooding, Forecasting, United States—Maine, Saint John River

The upper St. John River in northern Maine typically experiences a dynamic ice breakup. Ice jams and flooding occur annually at many locations along this generally uninhabited reach of the river. Dickey, ME, is the most upstream community on the St. John River and, therefore, does not receive warning from upstream communities that an ice run has begun or that there is potential of damaging ice jams and flooding. In Apr. 1991, a severe ice jam in Dickey caught residents unprepared, with many residents being stranded as ice and water surrounded their homes and destroyed the only bridge across the St. John River for 100 km. While downstream communities may receive some warning that an ice run or jam has occurred in Dickey and is on its way downstream, the warning time may be minimal. This paper describes observations of the ice breakup progression along the St. John River upstream of Dickey and how this information might be used in forecasting ice runs or breakup at Dickey and communities downstream.

52-712

Comparison of the ICEJAM and RIVJAM ice jam profile models.

Healy, D., Hicks, F., Beltaos, S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.269-288, 13 refs.

Ice jams, Mathematical models, Ice models, Accuracy, Water level, Canada—Ontario—Thames River, Canada—Restigouche River

52-713

Evolution of the ICESIM model.

Carson, R.W., Groeneveld, J.L., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.289-302, 7 refs.

Ice models, Ice jams, River ice, Computer programs, River basins, Canada—Manitoba—Nelson River, Canada—Manitoba—Limestone River

52-714

Modelling an ice jam release surge on the Saint John River, New Brunswick.

Hicks, F., McKay, K., Shabayek, S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.303-314, 10 refs.

Ice jams, River ice, Flooding, Flood forecasting, Mathematical models, Ice models, Saint John River, Canada—New Brunswick—Grand Falls, United States—Maine—Fort Kent, Canada—New Brunswick—Saint Leonard

52-715

Effects of river ice on bank morphology and riparian vegetation along Peace River, Clayhurst to Fort Vermillion.

Uunila, L.S., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.315-334, 27 refs.

River ice, Ice jams, Flooding, Banks (waterways), Vegetation, Environmental impact, Substrates, Canada—British Columbia, Canada—Alberta, Canada—Peace River

52-716

Trends in river ice cover in Atlantic Canada.

Brimley, W.A., Freeman, C.N., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.335-349, 4 refs.

River ice, Ice cover, History, Climatic factors, Temperature effects, Air ice water interaction, Canada—Newfoundland, Canada—Labrador, Canada—New Brunswick, Canada—Nova Scotia

52-717

Ice jam flood mechanisms on the Porcupine River at Old Crow, Yukon Territory.

Jasek, M.J., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.351-370, 7 refs.

River ice, Ice jams, Flooding, Water level, Naleds, Ice breakup, Temperature effects, Canada—Yukon Territory—Old Crow, Canada—Yukon Territory—Porcupine River, Canada—Yukon Territory—Bluefish River

52-718

Ice conditions in the southwest Miramichi River and its possible influence on winter movement of post-spawned Atlantic salmon.

Caissie, D., Komadina-Douthwright, S.M., Cunjak, R.A., Burrell, B., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.371-390, 15 refs.

River ice, Ice conditions, Ice cover effect, Ecology, Frazil ice, Ice cover thickness, Snow depth, Canada—New Brunswick—Miramichi River

52-719

Limitations imposed by winter ice on potential grow-out sites for the surf clam *Spisula solidissima*.

Boghen, A.D., St-Hilaire, A., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.391-407, 15 refs.

Ice cover thickness, Ice cover effect, Ecology, Estuaries, Ice formation, Frazil ice, Ice conditions, Canada—New Brunswick—Richibucto Estuary

52-720

Temporal variation of physical parameters in the lower Restigouche Estuary, during the ice-covered season.

Clément, M., St-Hilaire, A., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.409-424, 10 refs.

Estuaries, Ice cover effect, Temperature effects, Water temperature, Salinity, Tidal currents, Canada—Restigouche River

52-721

Winter habitat availability for salmonids in Newfoundland streams: a comparison between stream orders and habitat type.

Scruton, D.A., Clarke, K.D., Bowdring, F.A., Pennell, C.J., Workshop on River Ice, 9th, Sep. 24-26, 1997, Fredericton, N.B. Proceedings. Edited by S. Ismail, Fredericton, New Brunswick Power Corporation, 1997, p.425-439, 31 refs.

Watersheds, Ice cover effect, Snow cover effect, Ecology, Streams, Water level, Substrates, Canada—Newfoundland—Copper Lake, Canada—Newfoundland—Pinchgut Brook

52-722

Short range radar observations on Ekströmisen, Antarctica.

Rosenberger, A., Oerter, H., Miller, H., *Polarforschung.* 1995 (Pub. 1997), 65(1), p.1-14, With German summary. 9 refs.

Ice shelves, Electrical resistivity, Radar, Ice surface, Mapping, Ice density, Antarctica—Ekström Ice Shelf, Antarctica—Neumayer Station

A new digital impulse radar, designed at Alfred Wegener Institute, has undergone a first field-test on the Ekström Ice Shelf. Due to a special dynamic compression scheme, the instrument has excellent short range capabilities and the resolution is better than one meter. Several profiles were acquired during the tests in the summer season 1992-1993 from which examples are given. The longest profile covers 60 km starting from Halvfarryggen down to the central part of the Ekström Ice Shelf and continues north towards the Georg von Neumayer Station. Although the data quality of the long range record suffered from electromagnetic compatibility problems, which could not be immediately remedied in the field, the short range records show detailed structure which may give some insight into the flow kinematics of the Ekström Ice Shelf. (Auth. mod.)

52-723

Glaciological investigations in the grounding line area of the Foundation Ice Stream, Antarctica.

Lambrecht, A., Mayer, C., Hempel, L., Nixdorf, U., Oerter, H., *Polarforschung,* 1995 (Pub. 1997), 65(1), p.15-25, With German summary. For another version see F-57151 or 51-3477. Refs. p. 24-25.

Ice sheets, Glacier mass balance, Ice surface, Glacier thickness, Bottom topography, Seismic surveys, Antarctica—Foundation Ice Stream, Antarctica—Ronne Ice Shelf

During the summer of 1994-95, an extensive program of glaciological, geophysical and geodetic measurements was carried out along a flow line of the Foundation Ice Stream. The collected data are the basis for mass flux determinations in the entrainment area of the ice stream into the Ronne Ice Shelf. In this paper, the collected data and first results are presented, including information about ice thickness, water column thickness and the uppermost layered sea bed in the grounding line area of the Foundation Ice Stream. In addition, airborne radio echo soundings (RES) were conducted over the southeastern part of the Ronne Ice Shelf gaining more widespread information about the ice thickness. The data derived from these different methods agree well. The radio echo sounding data indicate a position of the grounding line, which is some 40 km further south than expected. Therefore, the area of the Filchner-Ronne Ice Shelf is about 1700 km^2 larger than was previously thought. (Auth. mod.)

52-724

Soil biology and inorganic nutrients of King George and Windmill Islands. Part 1. [Bodenbiologische Untersuchungen in der maritimen und kontinentalen Antarktis (King George Island und Windmill Islands). Teil 1. Umweltparameter und anorganische Nährstoffe]

Bölter, M., Blume, H.P., Kappen, L., *Polarforschung,* 1995 (Pub. 1997), 65(1), p.41-61, In German with English summary. Refs. p.58-61.

Soil analysis, Cryobiology, Geochemistry, Ecology, Freeze thaw cycles, Climatic factors, Antarctica—King George Island, Antarctica—Wilkes Land

A comparative study was carried out on soils of the maritime and the continental Antarctic. Soil samples are described for surface layers (0-10 cm) by their *in situ* temperature profiles as well as by field and laboratory analyses of grain sizes, pH and nutrient contents. Active cryoturbation is a main factor of mixing processes in surfaces with high silt and clay content. In both regions processes of podzolization were recognized. Microclimatic conditions show the importance of small scale processes which are of special importance for freeze-thaw cycles. The distribution of nutrients and other inorganic components is rather homogeneous in regosols and leptosols. But in soils with organic top layers by lichen and moss cushions (crusts) accumulation occurs as well as displacement of metal ions into deeper layers (>10 cm). Histosols show patterns of brown soils. Special attention is given to the origin of nitrogen compounds. (Auth. mod.)

52-725

Holocene peat sediment dating and glacier oscillations. [Datation de quelques sédiments tourbeaux holocènes et oscillations glaciaires aux îles Kerguelen]

Frenot, Y., Gloaguen, J.C., Van de Vijver, B., Beyens, L., *Académie des sciences, Paris. Comptes rendus. Série III,* July 1997, 320(7), p.567-573, In French with abridged version in English. 21 refs.

Climatic changes, Precipitation (meteorology), Air temperature, Glacier oscillation, Glacier melting, Peat, Sediments, Age determination, Glaciation, Paleoclimatology, Paleobotany, —Kerguelen Islands

The retreat of the glacier snouts on Kerguelen Is. is clearly related to the slight warming and the reduced precipitation over the last 25 years. Organic deposits sampled on the new deglaciated areas have

been dated using ^{14}C method. Information on the ecological conditions that predominated during the formation of these peat deposits was assessed from their fossil diatom flora content. The range of the glacier fluctuations is discussed. Two warm periods are recognized, 10,000 and 5,000 yr B.P., respectively. A third period, 2,200-900 yr B.P., was characterized by small fluctuations of the glacier snouts. The current deglaciation, which began at the end of the Little Ice Age and accelerated 25 yr ago, is the most important since the beginning of the Holocene period. (Auth.)

52-726

Extreme fire season in the central taiga forests of Yakutia.

Ivanova, G.A., Fire in ecosystems of boreal Eurasia. Edited by J.G. Goldammer and V.V. Furiaev. Forestry sciences. Vol.48, Dordrecht, Kluwer Academic Publishers, 1996, p.260-270, 14 refs.

DLC QH545.F5 F5745

Taiga, Subarctic landscapes, Forest ecosystems, Fires, Distribution, Seasonal variations, Environmental impact, Sampling, Statistical analysis, Russia—Yakutia

52-727

Post-fire mortality and regeneration of *Larix sibirica* and *Larix dahurica* in conditions of long-term permafrost.

Matveev, P.M., Usol'tzev, V.A., Fire in ecosystems of boreal Eurasia. Edited by J.G. Goldammer and V.V. Furiaev. Forestry sciences. Vol.48, Dordrecht, Kluwer Academic Publishers, 1996, p.366-371, 18 refs.

DLC QH545.F5 F5745

Forest ecosystems, Continuous permafrost, Fires, Damage, Revegetation, Classifications

52-728

Main trends of post-fire succession in near-tundra forests of Central Siberia.

Abaimov, A.P., Sofronov, M.A., Fire in ecosystems of boreal Eurasia. Edited by J.G. Goldammer and V.V. Furiaev. Forestry sciences. Vol.48, Dordrecht, Kluwer Academic Publishers, 1996, p.372-386, Refs. p.384-386.

DLC QH545.F5 F5745

Continuous permafrost, Subarctic landscapes, Tundra vegetation, Forest ecosystems, Fires, Revegetation, Classifications, Vegetation patterns, Russia—Siberia

52-729

Inferring past climatic changes in Canada using paleolimnological techniques.

Smol, J.P., Cumming, B.F., Douglas, M.S.V., Pienitz, R., *Geoscience Canada,* Sep. 1994, 21(3), p.113-118, With French summary. Refs. p.116-118.

Paleoclimatology, Climatic changes, Limnology, Paleoecology, Lacustrine deposits, Tundra terrain, Arctic landscapes, Sampling, Correlation, Snow cover effect, Ice cover effect, Canada

52-730

Anti-icing: lower the cost of safer roads, part 2.
MP 5042, *Public works,* Aug. 1997, 128(9), p.44-46, Excerpted from 50-6060. For part 1, see 51-5039.

Road icing, Winter maintenance, Cold weather operation, Snow removal, Salting, Chemical properties, Modification, Logistics, Classifications, Weather forecasting, Manuals

52-731

Anti-icing: lower the cost of safer roads, part 3.
MP 5043, *Public works,* Sep. 1997, 128(10), p.72-74., Excerpted from 50-6060. For part 1, see 51-5039; for part 2, see 52-730.

Road icing, Ice control, Ice prevention, Salting, Cold weather operation, Snow removal equipment, Cold weather performance, Meteorological factors, Forecasting, Cost analysis

52-732

Turbulence model for iced airfoils and its validation.

Shin, J.W., Chen, H.H., Cebeci, T., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1992, NASA-TM-105373, 15p., N92-15052, 16 refs. Prepared for the 30th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 6-9, 1992, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Turbulent boundary layer, Mathematical models

52-733

Suppression of radiating harmonics Electro-Impulse Deicing (EIDI) systems.

Zieve, P., Ng, J., Friedberg, R.A., *U.S. Federal Aviation Administration. Technical Center, Atlantic City International Airport, NJ. Technical note,* Oct. 1991, DOT/FAA/CT-TN90/33, 15p. + append., N92-19764, 9 refs.

Aircraft icing, Ice prevention, Ice removal, Electromagnetic properties, Electric equipment, Electric fields, Electrical insulation, Electrical grounding

52-734

Results of a low power ice protection system test and a new method of imaging data analysis.

Shin, J.W., Bond, T.H., Mesander, G.A., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1992, NASA-TM-105745, 16p., N92-28696, 2 refs. Presented at the 48th Annual Forum and Technology Display of the American Helicopter Society (AHS), Washington, D.C., June 3-5, 1992.

Aircraft icing, Ice prevention, Ice removal, Inflatable structures, Wind tunnels, Environmental tests, Image processing

52-735

Lewis Icing Research Tunnel test of the aerodynamic effects of aircraft ground deicing/anti-icing fluids.

Runyan, L.J., Zierten, T.A., Hill, E.G., Addy, H.E., Jr., *U.S. National Aeronautics and Space Administration. Technical paper,* Aug. 1992, NASA-TP-3238, 130p., N92-30395, 9 refs.

Aircraft icing, Chemical ice prevention, Air flow, Turbulent boundary layer, Wind tunnels, Environmental tests, Computerized simulation

52-736

Numerical investigation of the effects of icing on fixed and rotary wing aircraft.

Sankar, L.N., Kaladi, V.M., *U.S. National Aeronautics and Space Administration. Contractor report,* July 1992, NASA-CR-190542, n.p., N92-34105, Refs. passim.

Aircraft icing, Ice loads, Ice air interface, Air flow, Computerized simulation

52-737

Experimental study of performance degradation of a rotating system in the NASA Lewis RC Icing Tunnel.

Korkan, K.D., ed, *U.S. National Aeronautics and Space Administration. Contractor report,* [1992], NASA-CR-190684, Var. p., N92-34141, Refs. passim. Consists of two papers for which see 52-737 and 52-739.

Helicopters, Aircraft icing, Ice accretion, Ice loads, Wind tunnels, Environmental tests

52-738

Effects of simulated icing conditions on lift, thrust, and torque variations of a model helicopter rotor as a function of time.

Eagleson, L.A., *U.S. National Aeronautics and Space Administration. Contractor report,* [1992], NASA-CR-190684, Experimental study of performance degradation of a rotating system in the NASA Lewis RC Icing Tunnel. Edited by K.D. Korkan, 5p + figs., N92-34141, 5 refs.

Helicopters, Aircraft icing, Ice accretion, Ice loads, Wind tunnels, Environmental tests, Statistical analysis

52-739

Icing tests of a model main rotor.

Bond, T.H., Flemming, R.J., Britton, R.K., *U.S. National Aeronautics and Space Administration. Contractor report,* [1992], NASA-CR-190684, Experimental study of performance degradation of a rotating system in the NASA Lewis RC Icing Tunnel. Edited by K.D. Korkan, 15p. + append., N92-34141, 9 refs. Presented at the 46th Annual Forum of the American Helicopter Society (AHS), Washington, D.C., May, 1990.

Helicopters, Aircraft icing, Ice accretion, Ice loads, Wind tunnels, Environmental tests, Cold weather performance

52-740

Study of the structure of a water molecular assembly in a hydrophobic nanospace at low temperature with in situ X-ray diffraction.

Iiyama, T., Nishikawa, K., Suzuki, T., Kaneko, K., *Chemical physics letters,* Aug. 1, 1997, 274(1-2-3), p.152-158, 20 refs.

Water structure, Molecular structure, Low temperature tests, X ray diffraction, Adsorption, Porous materials, Temperature effects, Molecular energy levels, Ice physics

52-741

Marine arctic fog: an accumulator of currently used pesticide.

Rice, C.P., Chernyak, S.M., *Chemosphere,* Aug. 1997, 35(4), p.867-878, Refs. p.876-878.

Atmospheric composition, Polar atmospheres, Marine atmospheres, Air pollution, Organic nuclei, Fog, Water vapor, Aerosols, Environmental tests, Sampling, Ice vapor interface, Evaporation

52-742

Bridges of Science between North America and the Russian Far East; Proceedings of the 45th Arctic Science Conference.

Arctic Science Conference, 45th, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia, Meehan, R.H., ed, Sergienko, V., ed, Weller, G., ed, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, 292p., Refs. passim. For selected papers see 52-743 through 52-759 and 52-831.

Global change, Climatic changes, Marine biology, Environmental impact, Paleoclimatology, Sea level

52-743

Trends and prospects for international cooperation of the Far Eastern branch of the Russian Academy of Sciences in Asia-Pacific region.

El'iakov, G.B., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.3-5.

International cooperation, Organizations, Research projects

52-744

Scientific cooperation in a new age: opportunities and challenges.

Sher, G.S., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.6-11, 4 refs.

International cooperation, Organizations, Research projects

52-745
Beringia revisited: what is new in Beringian research and where do we go from here.
Hopkins, D., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.21-23.
Paleoecology, Pleistocene, Theories, History, Paleoclimatology, Bering Sea, Bering Strait, Chukchi Sea

52-746
Contact structures and functions of the eastern regions of Russia.
Baklanov, P.IA., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.28-32.
Natural resources, Regional planning, Economic development, Transportation, Russia

52-747
Vascular plants of the Russian Far East.
Kharkevich, S.S., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.43-49, 36 refs.
Plants (botany), History, Russia—Far East

52-748
Subarctic steppe distribution through space and time: a microclimate modeling approach.
Wesser, S.D., Armbruster, W.S., Debevec, E.M., Edwards, M.E., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.63-69, 15 refs.
Steppes, Forest land, Subarctic landscapes, Microclimatology, Models, Climatic changes, Global change, United States—Alaska

52-749
Decade of benthic research on the continental shelves of the northern Bering and Chukchi seas: lessons learned.
Grebmeier, J.M., Cooper, L.W., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.87-98, 34 refs.
Marine biology, Ecosystems, Plankton, Biomass, Ocean currents, Bottom sediment, Bering Sea, Chukchi Sea

52-750
Development of a regional climate model of the western Arctic.
Lynch, A.H., Chapman, W.L., Walsh, J.E., Weller, G., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.128-134, 8 refs.
Air ice water interaction, Climatology, Models, Ice cover effect, Sea ice, Moisture, Heat flux, Air temperature, Sea level, Bering Strait, Russia—Siberia, United States—Alaska

52-751
On the flux of methane and carbon dioxide from aquatic ecosystems of the northern Asia to the atmosphere.
Semiletov, I.P., et al, Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.140-148, 28 refs.
Carbon dioxide, Atmospheric composition, Tundra, Taiga, Wetlands, Lakes, Water chemistry, Polar atmospheres, Air water interactions, Ecosystems, Global change, Bering Sea, Russia—Laptev Sea, Russia—Kolyma Lowland

52-752
Global pollution and its effects on the climate of the Arctic.
Weller, G., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.149-155, 23 refs. For another source see 49-2658.
Air pollution, Environmental impact, Global change, Greenhouse effect, Climatology, Sea ice, Sea level, Global warming, Ice sheets, Polar atmospheres, Atmospheric composition

52-753
Strategy of water and land resources use in agricultural production under environmental changes.
Demin, V.G., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.156-158.
Natural resources, Regional planning, Water reserves, Mathematical models, Water supply, Irrigation, Agriculture, Cost analysis, Global change, Climatic changes, CIS

52-754
Airborne contaminants in vegetation of arctic Alaska and Russia.
Ford, J., Vlasova, T., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.159-168, 22 refs.
Air pollution, Haze, Polar atmospheres, Mosses, Lichens, Environmental impact, Ecosystems, United States—Alaska, Russia—Noril'sk, Russia—Taymyr Peninsula

52-755
Anthropogenic changes of soils in the region of construction of Kolyma hydroelectric power station.
Pshenichnikov, B.F., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.169-171.
Electric power, Structures, Environmental impact, Soil composition, Permafrost, Fires, Russia—Kolyma River, Russia—Magadan

52-756
Diagnostic method to calculate hydrodynamic structures and their interannual variability in the south Kuril regions.
Vasil'ev, A.S., Vlasova, G.A., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.172-176, 5 refs.
Mathematical models, Ocean currents, Water transport, Surface temperature, Seasonal variations, Okhotsk Sea, Russia—Kuril Islands

52-757
Pedological investigations of the late-Pleistocene Bering Land Bridge.
Höfle, C., Ping, C.L., Edwards, M.E., Mann, D.H., Hopkins, D.M., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.179-185, 13 refs.
Pleistocene, Cryogenic soils, Paleoecology, Frozen ground chemistry, Frozen ground physics, Ice lenses, Active layer, Permafrost

52-758
Floristic novelties in Beringia: patterns and questions of their origins.
Murray, D.F., Kelso, S., IUrtsev, B.A., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.186-192, 14 refs.
Plants (botany), Paleobotany, Site surveys, Arctic landscapes

52-759
Moisture availability controlled extent of Middle Pleistocene glaciers in central Beringia.
Roof, S.R., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.193-202, 37 refs.
Pleistocene, Moisture, Glacier alimentation, Sea level, Paleoclimatology, Insolation, Ice cover effect, Sea ice, Stratigraphy, United States—Alaska—Baldwin Peninsula

52-760
Antarctic climate research data, Part 6: aerological sounding data at Asuka Station, Antarctica from Jan. 1989 to Oct. 1991.
Kaneto, S., Azuma, N., Meshida, S., Iwasaki, A., Sukegawa, Y., Yamanouchi, T., *Japanese Antarctic Research Expedition. JARE data reports*, Mar. 1997, No.221, 73p.
Weather observations, Climatology, Meteorological data, Air temperature, Wind (meteorology), Seasonal variations, Meteorological instruments, Antarctica—Asuka Station
As part of the Antarctic Climate Research program, a study was conducted to determine interannual variations of the antarctic atmosphere. Data from aerological observations carried out at Asuka Station from Jan. 1989 to Oct. 1991, including upper air temperature, wind and humidity, are described and are presented in tables and graphs. Instrumentation used in the observational program and data processing are discussed.

52-761
Monte Carlo studies of effects of substrate size on water-substrate interaction energy and water structure.
Fang, J.X., Marlow, W.H., Lu, J.X., Lucchese, R.R., *Journal of chemical physics,* Oct. 1, 1997, 107(13), p.5212-5216, 29 refs.
Water structure, Low temperature tests, Substrates, Liquid solid interfaces, Molecular energy levels, Models, Statistical analysis

52-762
Fixed finite element model of heat transfer with phase change—part II: analysis of numerical examples.
Kreja, I., Budkowska, B.B., *International journal of offshore and polar engineering,* Sep. 1997, 7(3), p.226-232, 20 refs.
Phase transformations, Heat transfer, Liquid solid interfaces, Temperature gradients, Ice formation, Freezing front, Ground thawing, Piles, Computer programs, Mathematical models, Simulation

52-763
Experience with the dismantling of three secondary steam generators in unit A in Gundremmingen by the 'ice-sawing' technique.
Steiner, H., Eickelpasch, N., Tegethoff, H., *Nuclear engineering and design,* July 1997, 170(1-3), p.165-173, 5 refs.
Nuclear power, Equipment, Steel structures, Stabilization, Radioactive wastes, Radioactivity, Waste disposal, Ice formation, Ice cutting, Environmental protection

52-764
After the thaw.
Graham, D.D., *Golf course management,* Apr. 1997, 65(4), p.151-155.
Municipal engineering, River ice, Ice jams, Flooding, Meadow soils, Grasses, Fungi, Soil freezing, Damage, Revegetation, Winter maintenance, Ice cover effect, Countermeasures

52-765
New criteria for the determination of the frost susceptibility of a gravel material. [Neue Kriterien für die Beurteilung der Frostempfindlichkeit eines nichtbindigen Lockermaterials]
Premstaller, M., *Geotechnik,* 1997, 20(2), p.126-128,72, In German with English summary. 2 refs.
Roads, Pavements, Construction materials, Cold weather performance, Frost resistance, Frost action, Frost heave, Mechanical tests, Standards

52-766
Nivicole myxomycetes of the Khibine Mountains (Kola Peninsula).
Novozhilov, Y., Schnittler, M., *Nordic journal of botany,* 1996, 16(5), p.549-561, 31 refs.
Plant ecology, Microbiology, Ecosystems, Subpolar regions, Snow line, Fungi, Algae, Sampling, Scanning electron microscopy, Structural analysis, Classifications, Snow cover effect, Russia—Kola Peninsula

52-767
Thermohaline oscillation in the LSG OGCM: propagating anomalies and sensitivity to parameterizations.
Osborn, T.J., *Journal of physical oceanography,* Oct. 1997, 27(10), p.2233-2255, 47 refs.
Climatology, Surface temperature, Ocean currents, Heat flux, Salinity, Convection, Air ice water interaction, Models, Climatic factors, Ice cover effect
New experiments are reported that extend previous studies of the internally generated variability found when the Hamburg LSG Ocean General Circulation Model is integrated under mixed boundary conditions. It is demonstrated that the salinity anomalies that propagate around the meridional circulation of the Atlantic Ocean are merely signals emitted from the source of the variability in the southern ocean; they do not play an active role in its generation. It is the southern ocean flip-flop oscillator, as suggested by a previous study, that is the driving mechanism of the 320-yr period oscillations. A second mode of propagation is identified that may be related to the periodicity of the oscillations: westward propagation of upper-ocean salinity anomalies around the coast of Antarctica. It is shown that this mode is driven by the same density-upwelling wave motion as reported elsewhere in the literature. Changes in surface fluxes implied by the alteration to the model have implications for the flux adjustments necessary when the LSG model is coupled to an atmosphere model. The results presented here indicate considerable scope for reducing such flux adjustments. (Auth. mod.)

52-768
Model for the influence of wind and oceanic currents on the size of a steady-state latent heat coastal polynya.
Willmott, A.J., Morales Maqueda, M.A., Darby, M.S., *Journal of physical oceanography,* Oct. 1997, 27(10), p.2256-2275, 22 refs.
Oceanography, Shores, Polynyas, Ice edge, Air ice water interaction, Ocean currents, Wind factors, Frazil ice, Drift, Mathematical models

52-769
Bathymetry of the Reykjanes Ridge.
Keeton, J.A., et al, *Marine geophysical researches,* Feb. 1997, 19(1), p.55-64, 25 refs.
Marine geology, Oceanographic surveys, Subpolar regions, Ocean bottom, Sounding, Tectonics, Geologic structures, Geological maps, Iceland—Reykjanes Ridge

52-770
Bacterial number, heterotrophy and extracellular enzyme activity in the Bransfield Strait, Antarctica.
Kim, S.J., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.9-16, 18 refs.
Marine biology, Oceanographic surveys, Bottom sediment, Bacteria, Biomass, Sampling, Ecosystems, Classifications, Statistical analysis, Antarctica—Bransfield Strait

52-771
Distribution and abundance of planktonic organisms in Bransfield Strait during austral summer 1989/1990.
Kim, D.Y., Kim, S.A., Yoo, K.I., Han, M.S., Kim, Y.O., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.17-27, 16 refs.
Marine biology, Oceanographic surveys, Plankton, Classifications, Ecosystems, Classifications, Distribution, Sampling, Antarctica—Bransfield Strait

52-772
Coastal and inshore water interaction, mixing and primary productivity in the Bransfield Strait, Antarctica during austral summer 1989/90.
Hong, G.H., Kim, D.Y., Chung, H.S., Pae, S.J., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.43-59, Refs. p.57-59.
Oceanographic surveys, Marine biology, Biomass, Water temperature, Turbulent diffusion, Hydrography, Sampling, Nutrient cycle, Hydrogeochemistry, Seasonal variations, Antarctica—Bransfield Strait

52-773
High resolution seismic survey of Maxwell Bay, King George Island: glacial marine sedimentation and tectonics.
Kim, Y.D., Nam, S.H., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.79-86, 13 refs.
Marine geology, Oceanographic surveys, Bottom topography, Seismic surveys, Profiles, Tectonics, Bottom sediment, Glacial geology, Antarctica—King George Island

52-774
Seismicity in Antarctica and local earthquake activities around Syowa Station, East Antarctica.
Kaminuma, K., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.87-96, 19 refs.
Seismic surveys, Seismic velocity, Earthquakes, Geomorphology, Marine geology, Sea level, Tectonics, Isostasy, Antarctica—Showa Station

52-775
Antarctic volcanic hazard.
Gonzalez-Ferran, O., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.97-105, 40 refs.
Volcanoes, Explosion effects, Geomorphology, Safety, Geological surveys, International cooperation, Monitors, Warning systems

52-776
Petrology and geochemistry of the volcano-plutonic rocks in the Barton and the Weaver Peninsula, King George Island, Antarctica.
Jin, M.S., Lee, M.S., Kang, P.C., Jwa, Y.J., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.107-134, 23 refs.
Geomorphology, Geological surveys, Volcanoes, Magma, Lithology, Rock properties, Classifications, Geochemistry, Tectonics, Radioactive age determination, Antarctica—King George Island

52-777
Geochemical comparisons on the volcanic rocks in the Antarctic Peninsula, the South Shetland Islands and southern South America.
Jwa, Y.J., Park, B.K., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.135-143, 16 refs.
Geological surveys, Geochronology, Marine geology, Volcanoes, Magma, Lithology, Geochemistry, Tectonics, Correlation, Antarctica—Antarctic Peninsula, Antarctica—South Shetland Islands

52-778
Epithermal alteration and mineralization zoning within the stratovolcano, Barton Peninsula, King George Island.
Park, M.E., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.145-158, 26 refs.
Volcanoes, Hydrothermal processes, Magma, Metals, Minerals, Geochemistry, Rock properties, Walls, Gas inclusions, Classifications, Antarctica—King George Island

52-779
Diatoms in the Holocene sediments of the Maxwell Bay, King George Island, Antarctica.
Kim, W.H., Kim, M.O., Park, B.K., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.159-177, Refs. p.173-175.
Marine biology, Plankton, Biomass, Quaternary deposits, Bottom sediment, Sedimentation, Sampling, Drill core analysis, Classifications, Age determination, Antarctica—King George Island

52-780
Sea-level observation in the antarctic region by the Republica Oriental del Uruguay II. Harmonic analysis.
Forbes, E.A., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.193-195, 5 refs.
Oceanographic surveys, Sea level, Tides, Seasonal variations, Statistical analysis

52-781
Structure of jetlike winds in the lower atmosphere, King George Island, Antarctica.
Choi, H., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.197-201, 7 refs.
Polar atmospheres, Climatology, Turbulent boundary layer, Turbulent exchange, Wind direction, Wind velocity, Atmospheric circulation, Profiles, Antarctica—King George Island

52-782

Thermospheric temperatures measured at the King Sejong Station, Antarctica.

Kim, J.S., *Korean journal of polar research,* June 1991, 2(1) (Special issue), International Symposium on Antarctic Sciences, 2nd, Seoul, Korea, Sep. 17-18, 1990. Collected papers, p.203-211, 7 refs.

Polar atmospheres, Climatology, Air temperature, Seasonal variations, Solar radiation, Ultraviolet radiation, Geomagnetism, Spectroscopy, Antarctica—King George Island

52-783

Neutron scattering studies of vapor deposited amorphous ice.

Kolesnikov, A.I., et al, *Physical review letters,* Sep. 8, 1997, 79(10), p.1869-1872, 24 refs.

Ice physics, Extraterrestrial ice, Simulation, Amorphous ice, Deuterium oxide ice, Adsorption, Ice spectroscopy, Neutron scattering, Spectra, Vibration, Ice density

52-784

On growth and form in geomorphology.

Spedding, N., *Earth surface processes and landforms,* Mar. 1997, 22(3), p.261-265, 31 refs.

Geomorphology, Landscape development, Glaciology, Glacial erosion, Theories, Forecasting, Models

52-785

Approaches to modelling long-term landscape evolution: lessons from ice sheet modelling.

Kerr, A., *Earth surface processes and landforms,* Mar. 1997, 22(3), p.267-271, 13 refs.

Geomorphology, Landscape development, Forecasting, Mathematical models, Glacial hydrology, Glacier flow, Ice mechanics, Periodic variations, Correlation, Accuracy, Time factor

52-786

Temporal and spatial representativeness of alpine sediment yields: Cascade Mountains, British Columbia.

Evans, M., *Earth surface processes and landforms,* Mar. 1997, 22(3), p.287-295, 20 refs.

Geomorphology, Alpine landscapes, Cirques, Lacustrine deposits, Drill core analysis, Remanent magnetism, Sedimentation, Landscape development, Climatic factors, Slope orientation, Lithology, Quaternary deposits, Radioactive age determination, Canada—British Columbia—Glacier Lake

52-787

Long-term perspective on glacial erosion.

Lidmar-Bergström, K., *Earth surface processes and landforms,* Mar. 1997, 22(3), p.297-306, 36 refs.

Pleistocene, Glacial geology, Geomorphology, Glacial erosion, Bedrock, Ice solid interface, Weathering

52-788

Rate of glacial valley deepening during the Late Quaternary in Assynt, Scotland.

Hebdon, N.J., Atkinson, T.C., Lawson, T.J., Young, I.R., *Earth surface processes and landforms,* Mar. 1997, 22(3), p.307-315, 20 refs.

Pleistocene, Geomorphology, Landscape development, Glacial geology, Glacial erosion, Karst, Caves, Altitude, Radioactive age determination, United Kingdom

52-789

Role of fluvial and glacial erosion in landscape evolution: the Ben Ohau Range, New Zealand.

Kirkbride, M., Matthews, D., *Earth surface processes and landforms,* Mar. 1997, 22(3), p.317-327, 15 refs.

Pleistocene, Geomorphology, Landscape development, Alpine landscapes, Topographic features, Glacial geology, Glacial erosion, Cirques, Water erosion, Tectonics, Isostasy, New Zealand—Ben Ohau Range

52-790

Clathrates: computer programs to calculate fluid inclusion *V-X* properties using clathrate melting temperatures.

Bakker, R.J., *Computers & geosciences,* Feb. 1997, 23(1), p.1-18, Refs. p.12-14.

Clathrates, Gas inclusions, Geochemistry, Thermodynamics, Melting points, Stability, Ice melting, Ice physics, Phase transformations, Computer programs, Computerized simulation, Models, Temperature effects

52-791

Infrared absorption spectrum of carbon dioxide ice from 1.8 to 333 μm.

Hansen, G.B., *Journal of geophysical research,* Sep. 1997, 102(E9), p.21,569-21,587, 44 refs.

Extraterrestrial ice, Carbon dioxide, Ice optics, Optical properties, Ice spectroscopy, Radiation absorption, Infrared spectroscopy, Scattering, Spectra, Remote sensing, Simulation, Statistical analysis

52-792

Extreme-value statistics for frost penetration depths in northeastern United States.

DeGaetano, A.T., Wilks, D.S., McKay, M., *Journal of geotechnical and geoenvironmental engineering,* Sep. 1997, 123(9), p.828-835, 24 refs.

Climatology, Frost penetration, Soil freezing, Snow depth, Snow cover effect, Air temperature, Heat flux, Meteorological data, Records (extremes), Statistical analysis, Models, Forecasting

52-793

Frost heave loading of constrained footing by centrifuge modeling.

Ketcham, S.A., Black, P.B., Pretto, R., MP 5024, *Journal of geotechnical and geoenvironmental engineering,* Sep. 1997, 123(9), p.874-880, 22 refs.

Foundations, Frost heave, Soil freezing, Frozen ground mechanics, Soil tests, Mechanical tests, Mass transfer, Loads (forces), Stress concentration, Simulation, Models

This paper presents measurements and results of three centrifuge experiments that model the uplift loading of a constrained footing by the frost heaving of a layer of freezing, saturated silt. The experiments were performed at different scales to investigate the validity of scale factors predicted for small-scale frost heave modeling. The working hypothesis was that the developing frost heave forces measured in the different models should, using the predicted scale factors, scale to the same full-scale response. Results from the tests support this hypothesis and provide an indication that the centrifuge modeling technique is applicable to frost heave loading of structures.

52-794

Authigenic chabazite and implications for weathering in Sirius Group diamictite, Table Mountain, Dry Valleys, Antarctica.

Dickinson, W.W., Grapes, R.H., *Journal of sedimentary research A,* Sep. 1997, 67(5), p.815-820, 40 refs.

Glacial deposits, Glacial geology, Rock properties, Freeze thaw cycles, Ice sublimation, Soil freezing, Weathering, Geocryology, Antarctica—Tabular Mountain

Petrographic examination shows authigenic chabazite and calcite in the ice-free or weathering horizon of glacially deposited diamictites in the Sirius Group on Table Mountain. Some samples contain as much as 18% chabazite, which fills pores in matrix clays which are thought to have formed by repeated cycles of freezing and thawing during a warmer and wetter climate than the present. The presence of authigenic minerals in the Sirius suggests that chemical weathering is active and may take place in frozen ground along interfacial films of brine. Precipitation of the minerals is likely to occur at the boundary between the ice-free and ice-cemented horizons. As the ice cement sublimates, the film of brine becomes more concentrated until precipitation occurs in the process of efflorescence. Because the depth to the ice-cement boundary fluctuates in response to major climatic changes, authigenic minerals that mark the position of this boundary may be a proxy indicator of past climates. (Auth. mod.)

52-795

Cryolander: a new method for fine-scale *in situ* sampling of intertidal surface sediments.

Wiltshire, K.H., Blackburn, J., Paterson, D.M., *Journal of sedimentary research A,* Sep. 1997, 67(5), p.977-981, 18 refs.

Littoral zone, Sediments, Sampling, Core samplers, Cryogenics, Soil freezing, Liquefied gases, Scanning electron microscopy, Design, Thin sections, Performance

52-796

Effect of temperature on the transverse cracking behavior of cross-ply composite laminates.

Huang, X., Gillespie, J.W., Jr., Eduljee, R.F., *Composites part B: engineering,* 1997, 28B(4), p.419-424, 17 refs.

Composite materials, Synthetic materials, Polymers, Cracking (fracturing), Cold weather performance, Low temperature tests, Temperature effects, Damage, Strain tests, Ultrasonic tests, Models

52-799

Ice management key to E&P in arctic regions.

George, D., *Offshore,* Aug. 1997, 57(8), p.87,106.

Offshore structures, Offshore drilling, Icebergs, Damage, Protection, Ice reporting, Ice detection, Ice control, Design criteria

52-800

Finnish companies preparing for Russian Arctic operations.

Beckman, J., *Offshore,* Aug. 1997, 57(8), p.90.

Crude oil, Natural gas, Offshore structures, Marine transportation, Logistics, Economic development, Design criteria, Russia

52-801

Regional patterns of heavy metals (Co, Cr, Cu, Fe, Ni, Pb, V and Zn) and sulphur in terrestrial moss samples as indication of airborne pollution in a 188,000 km^2 area in northern Finland, Norway and Russia.

Äyräs, M., et al, *Journal of geochemical exploration,* Apr. 1997, 58(2-3), p.269-281, 28 refs.

Plant ecology, Mosses, Subpolar regions, Air pollution, Metals, Distribution, Maps, Environmental tests, Sampling, Origin, Statistical analysis, Finland, Norway, Russia

52-802

Anthropogenic noble-metal enrichment of topsoil in the Monchegorsk area, Kola Peninsula, northwest Russia.

Boyd, R., et al, *Journal of geochemical exploration,* Apr. 1997, 58(2-3), p.283-289, 21 refs.

Subpolar regions, Watersheds, Soil pollution, Geochemistry, Metals, Aerosols, Sedimentation, Soil tests, Sampling, Environmental tests, Statistical analysis, Russia—Kola Peninsula

52-803

Isotopic constraints on the influence of the Icelandic plume.

Taylor, R.N., Thirlwall, M.F., Murton, B.J., Hilton, D.R., Gee, M.A.M., *Earth and planetary science letters,* Apr. 1997, 148(1-2), p.E1-E8, 27 refs.

Marine geology, Subpolar regions, Earth crust, Magma, Radioactive isotopes, Isotope analysis, Ocean bottom, Geochemistry, Geothermy, Iceland

52-804

Quaternary history of sea ice and paleoclimate in the Amerasia basin, Arctic Ocean, as recorded in the cyclical strata of Northwind Ridge.

Phillips, R.L., Grantz, A., *Geological Society of America. Bulletin,* Sep. 1997, 109(9), p.1101-1115, Refs. p.1114-1115.

Marine geology, Pleistocene, Quaternary deposits, Paleoecology, Drill core analysis, Sea ice distribution, Ice cover thickness, Icebergs, Glacier oscillation, Stratigraphy, Lithology, Arctic Ocean

52-805

Holocene relative sea-level history of Franz Josef Land, Russia.

Forman, S.L., Weihe, R., Lubinski, D., Tarasov, G., Korsun, S., Matishov, G., *Geological Society of America. Bulletin,* Sep. 1997, 109(9), p.1116-1133, Refs. p.1132-1133.

Glacial geology, Glacier oscillation, Marine geology, Ice sheets, Marine deposits, Isostasy, Geomorphology, Sea level, Quaternary deposits, Radioactive age determination, Geochronology, Russia—Franz Josef Land

52-806

Seasonal variability of mesocyclone activity in the Bellingshausen/Weddell region of Antarctica.

Turner, J., Corcoran, G., Cummins, S., Lachlan-Cope, T., Leonard, S., *Global atmosphere and ocean system,* 1996, Vol.5, p.73-97, Refs. p.96-97.

Atmospheric disturbances, Atmospheric circulation, Meteorological data, Sea ice, Ice air interface, Seasonal variations, Antarctica—Antarctic Peninsula, Antarctica—Bellingshausen Sea, Antarctica—Weddell Sea

One year's AVHRR satellite imagery covering the Antarctic Peninsula and Weddell and Bellingshausen seas has been manually analyzed for mesocyclone activity. A total of 452 mesocyclones were identified with the majority existing for less than 6 hours. Most had a comma-shaped cloud signature. The modal size range was 300-399 km, although the reduction in numbers at larger diameters was small. There was a large annual cycle in mesocyclone activity with more developing in the summer, especially over the Ronne Ice Shelf. The mean latitude of formation changed by 10° over the year and had a more southerly location during the summer, suggesting a link with the sea ice cover. The synoptic-scale circulation had a marked effect on the month-to-month variations in mesocyclone formation. (Auth.)

52-807

Chemical characteristics of summer precipitation at Point Barrow, Arctic Alaska.

Hou, S.G., Qin, D.H., Zhang, Q.S., *Chinese journal of polar science. Series No.14,* June 1997, 8(1), p.1-7, 14 refs.

Precipitation (meteorology), Chemical properties, Electrical resistivity, Ions, United States—Alaska—Point Barrow

52-808

Ecology of newly formed sea ice in the Weddell Sea, Antarctica. I: chlorophyll *a* and nutrients.

Wang, Z.P., Dieckmann, G., Gardinger, R., *Chinese journal of polar science. Series No.14,* June 1997, 8(1), p.18-26, 13 refs.

Sea ice, Ice composition, Frazil ice, Ice formation, Ecology, Antarctica—Weddell Sea

Textural composition, chlorophyll *a* and nutrients (phosphate, nitrate and silicate) of newly formed ice from the Weddell Sea were analyzed during the autumn of 1992. Frazil ice, congelation ice and mixed frazil/congelation ice were the main textural types. Mean concentrations of chlorophyll *a* and nutrients varied considerably with ice texture. High chlorophyll *a* occurred mostly in ice floes consisting mainly of frazil ice. Nutrients were significantly lower in frazil ice than in congelation ice. Similar observations were made in one-year old sea ice. (Auth. mod.)

52-809

Climatic changes in the regions of Antarctic Great Wall Station, Southern Chile and South Georgia Island.

Zhao, J.L., *Chinese journal of polar science. Series No.14,* June 1997, 8(1), p.27-32, 3 refs.

Climatic changes, Air temperature, Precipitation (meteorology), Ocean currents, Antarctica—Great Wall Station, —South Georgia

A comparative study is made of the climatic change curves in the Alerce region of southern Chile during the past 4000 y., the temperature and precipitation curves in the area around the Great Wall Station for the past 16,000 y., the fluctuation trend of the Antarctic Convergence for the past 4000 y., and climatic changes on South Georgia. It is concluded that the uniformity of environmental changes found in all the areas covered in the study confirms that they are controlled by one and the same factor: the fluctuations of the Antarctic Convergence. (Auth. mod.)

52-810

Measurement of NO_2 and analysis of relationship between stratospheric NO_2 and O_3 over Zhongshan Station, Antarctica.

Guo, S., Zhou, X.J., Lu, L.H., Zheng, X.D., Gao, X.J., *Chinese journal of polar science. Series No.14,* June 1997, 8(1), p.48-55, 7 refs.

Ozone, Stratosphere, Atmospheric composition, Seasonal variations, Antarctica—Zhongshan Station

Continuous measurements of stratospheric as well as total column concentrations of O_3 and NO_2 over the Zhongshan Station are reported. Analyses of the seasonal variations of the two elements, and their relationship to the development of the ozone hole in 1993-1995, confirm that the decrease of atmospheric NO_2 contributes significantly to ozone depletion.

52-811

Preliminary study on oxygen isotope of ice cores of Collins Ice Cap, King George Island, Antarctica.

Yan, M., *Chinese journal of polar science. Series No.14,* June 1997, 8(1), p.65-71, 12 refs.

Glacier formation, Ice cores, Ice composition, Firn, Oxygen isotopes, Ice dating, Antarctica—King George Island

Oxygen isotope concentrations in glacier-forming material shows no difference at different altitudes of the Collins Ice Cap, and the $\delta^{18}O$ variations of surface firn are extremely small. Affected by seasonal variations of temperature, the oxygen isotope composition of winter layers is distinctly different from that of summer layers, whose $\delta^{18}O$ value is higher and the variation coefficient is smaller. By means of direct comparison, the oxygen isotope/temperature gradient of the ice cap is defined as 0.74 per mill/°C of the annual mean temperature. (Auth. mod.)

52-813

Aircraft surface coatings.

Boeing Commercial Airplane Company, Seattle, WA, *U.S. National Aeronautics and Space Administration. Contractor report,* June 1982, NASA-CR-165928, 161p., N84-28778, 4 refs.

Aircraft icing, Ice prevention, Ice removal, Protective coatings, Wind tunnels, Environmental tests

52-814

Documentation of ice shapes on the main rotor of a UH-1H helicopter in hover.

Lee, J.D., Harding, R., Palko, R.L., *U.S. National Aeronautics and Space Administration. Contractor report,* Jan. 1984, NASA-CR-168332, 26p., N84-17139, 5 refs.

Helicopters, Aircraft icing, Ice accretion, Ice loads, Environmental tests

52-815

Progress toward the development of an aircraft icing analysis capability.

Shaw, R.J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1984, NASA-TM-83562, 19p. + figs., N84-20490, 73 refs. Prepared for the 22nd Aerospace Sciences Conference, Reno, NV, Jan. 9-12, 1984, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice forecasting, Supercooled clouds, Cloud droplets, Computerized simulation

52-816

UH-1H helicopter icing flight test program: an overview.

Shaw, R.J., Richter, G.P., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1985, NASA-TM-86925, 8p. + figs., N85-15702, 15 refs. Prepared for the 23rd Aerospace Sciences Conference, Reno, NV, Jan. 14-17, 1985, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Helicopters, Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Environmental tests

52-817

NASA Altitude Wind Tunnel (AWT): its role in advanced icing research and development.

Blaha, B.J., Shaw, R.J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1985, NASA-TM-86920, 5p. + figs., N85-15758, 13 refs. Prepared for the 23rd Aerospace Sciences Conference, Reno, NV, Jan. 14-17, 1985, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Wind tunnels, Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Environmental tests

52-818

Icing flight research: aerodynamic effects of ice and ice shape documentation with stereo photography.

Mikkelsen, K.L., McKnight, R.C., Ranaudo, R.J., Perkins, P.J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1985, NASA-TM-86906, 7p. + figs., N85-18049, 17 refs. Prepared for the 23rd Aerospace Sciences Conference, Reno, NV, Jan. 14-17, 1985, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice detection, Ice air interface, Air flow, Supercooled clouds, Cloud droplets, Stereophotography

52-819

Altitude Wind Tunnel (AWT)—a unique facility for propulsion system and adverse weather testing.

Chamberlin, R., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1985, NASA-TM-86921, 6p. + figs., N85-18067, 6 refs. Prepared for the 23rd Aerospace Sciences Conference, Reno, NV, Jan. 14-17, 1985, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Wind tunnels, Aircraft icing, Ice accretion, Ice loads, Jet engines, Environmental tests

52-820

Ice shapes and the resulting drag increase for a NACA 0012 airfoil.

Olsen, W., Shaw, R.J., Newton, J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1984, NASA-TM-83556, 13p. + figs., N85-27839, 5 refs. Prepared for the 22nd Aerospace Sciences Conference, Reno, NV, Jan. 9-12, 1984, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Environmental tests

52-821

Formation and characterization of simulated small droplet icing clouds.

Ingebo, R.D., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1986, NASA-TM-87180, 3p. + figs., N86-14554, 4 refs. Prepared for the 24th Aerospace Sciences Conference, Reno, NV, Jan. 6-8, 1986, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Weather forecasting, Environmental tests

52-822

Particle trajectory computation on a 3-dimensional engine inlet.

Kim, J.J., *U.S. National Aeronautics and Space Administration. Contractor report,* Jan. 1986, NASA-CR-175023, 102p., N86-20379, Ph.D. thesis submitted to Wichita State University, Wichita, KS. 49 refs. Also published as U.S. Federal Aviation Administration, Report, DOT-FAA-CT-86-1.

Jet engines, Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Mathematical models, Computerized simulation

52-823

Numerical and experimental investigation of electrothermal aircraft deicing.

Leffel, K.L., *U.S. National Aeronautics and Space Administration. Contractor report,* Jan. 1986, NASA-CR-175024, 260p., N86-20380, M.S. thesis submitted to the University of Toledo, Toledo, OH. 20 refs.

Helicopters, Aircraft icing, Ice prevention, Ice removal, Ice melting, Artificial melting, Electric heating, Thermal analysis, Mathematical models, Computerized simulation

52-824
Wind tunnel tests of rotor blade sections with replications of ice formations accreted in hover.
Lee, J.D., Berger, J.H., McDonald, T.J., *U.S. National Aeronautics and Space Administration. Contractor report,* Mar. 1986, NASA-CR-175089, 28p., N86-22558, 6 refs.
Helicopters, Aircraft icing, Ice accretion, Ice loads, Wind tunnels, Environmental tests

52-825
Documentation of ice shapes accreted on the main rotor of a UH-1H helicopter in level flight.
Hanson, M.K., Lee, J.D., *U.S. National Aeronautics and Space Administration. Contractor report,* Mar. 1986, NASA-CR-175088, 11p., N86-22559, 5 refs.
Helicopters, Aircraft icing, Ice accretion, Ice loads, Cold weather tests, Environmental tests

52-826
Measurement of aircraft performance and stability and control after flight through natural icing conditions.
Ranaudo, R.J., et al, *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1986, NASA-TM-87265, 9p. + figs., N86-22582, 11 refs. Prepared for the 3rd Flight Testing Conference, Las Vegas, NV, Apr. 2-4, 1986, cosponsored by the American Institute of Aeronautics and Astronautics (AIAA) and other organizations.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Cold weather tests, Environmental tests

52-827
In-flight measurements of wing ice shapes and wing section drag increases caused by natural icing conditions.
Mikkelsen, K.L., Juhasz, N., Ranaudo, R.J., McKnight, R.C., Freedman, R., Greissing, J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Apr. 1986, NASA-TM-87301, 10p. + figs., N86-24667, 13 refs.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Cold weather tests, Environmental tests

52-828
Evaluation of capillary reinforced composites.
Ciardullo, S.W., Stoffer, L.J., *U.S. National Aeronautics and Space Administration. Contractor report,* [1985], NASA-CR-175061, 131p., N86-24760, The NTIS (National Technical Information Service) documentation form cites J.E. Cahill, P.M. Eichelberger, J.F. Halase, W.K. South, and R.D. Zerkle as the authors. They are cited as key contributors in the text.
Jet engines, Aircraft icing, Ice prevention, Defrosting, Heating, Heat transfer, Composite materials, Capillarity, Computerized simulation

52-829
Theoretical analysis of the electrical aspects of the basic electro-impulse problem in aircraft de-icing applications.
Henderson, R.A., Schrag, R.L., *U.S. National Aeronautics and Space Administration. Contractor report,* June 1986, NASA-CR-176808, 104p., N86-26330, 44 refs. Also published as Wichita State University, Aeronautical report, AR 86-2.
Aircraft icing, Ice prevention, Ice removal, Electric equipment, Electric fields, Electromagnetic properties, Mathematical models, Computer programs

52-830
Analysis and tests for design of an electro-impulse de-icing system.
Zumwalt, G.W., Schrag, R.L., Bernhart, W.D., Friedberg, R.A., *U.S. National Aeronautics and Space Administration. Contractor report,* May 1985, NASA-CR-174919, 194p., N86-27268, Refs. passim.
Aircraft icing, Ice prevention, Ice removal, Electric equipment, Electric fields, Electromagnetic properties, Environmental tests, Mathematical models, Computerized simulation

52-831
Aircraft investigations into arctic aerosol: instrumentation, techniques, and some results.
Khattatov, V.U., Postnov, A.A., Skuratov, S.N., Dzhabotov, A.E., Bridges of Science between North America and the Russian Far East. Proceedings of the 45th Arctic Science Conference, Aug. 25-27, 1994, Anchorage, AK; Aug. 29-Sep. 2, 1994, Vladivostok, Russia. Edited by R.H. Meehan, V. Sergienko, and G. Weller, Fairbanks, AK, American Association for the Advancement of Science (Arctic and Pacific Divisions), 1994, p.135-139, 7 refs.
Aerosols, Polar atmospheres, Light scattering, Lidar, Haze, Airborne radar, Russia—Laptev Sea, Russia—Kara Sea, Norway—Spitsbergen, Greenland Sea, Greenland, Baffin Bay

52-832
De-icing of the Altitude Wind Tunnel turning vanes by electro-magnetic impulse.
Zumwalt, G.W., Ross, R., *U.S. National Aeronautics and Space Administration. Contractor report,* Mar. 1986, NASA-CR-177260, 46p., N86-27291, 7 refs. Also published as Wichita State University, Aeronautical report, AR 86-3.
Wind tunnels, Aircraft icing, Ice removal, Electric equipment, Electric fields, Electromagnetic properties

52-833
In-flight photogrammetric measurement of wing ice accretions.
McKnight, R.C., Palko, R.L., Humes, R.L., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1986, NASA-TM-87191, 9p. + figs., N86-31562, 6 refs. Prepared for the 24th Aerospace Sciences Conference, Reno, NV, Jan. 6-8, 1986, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).
Aircraft icing, Ice accretion, Ice detection, Stereophotography, Photogrammetry

52-834
Experimental study of the aerodynamics of a NACA 0012 airfoil with a simulated glaze ice accretion.
Bragg, M.B., *U.S. National Aeronautics and Space Administration. Contractor report,* Nov. 1986, NASA-CR-179897, 315p., N87-11701, 19 refs.
Aircraft icing, Ice accretion, Glaze, Ice loads, Ice air interface, Air flow, Wind tunnels, Environmental tests

52-835
Flight test report of the NASA icing research airplane: performance, stability, and control after flight through natural icing conditions.
Jordan, J.L., Platz, S.J., Schinstock, W.C., *U.S. National Aeronautics and Space Administration. Contractor report,* Oct. 1986, NASA-CR-179515, Var. p., N87-11797, 6 refs.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Cold weather tests, Environmental tests

52-836
Heater made from graphite composite material for potential deicing application.
Hung, C.C., Dillehay, M.E., Stahl, M., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1987, NASA-TM-88888, 15p. + figs., N87-12559, 18 refs. Prepared for the 25th Aerospace Sciences Conference, Reno, NV, Jan. 12-15, 1987, sponsored by the American Institute of Aeronautics and Astronautics (AIAA). For another version see 42-3734.
Aircraft icing, Ice prevention, Ice removal, Ice melting, Artificial melting, Electric heating, Composite materials

52-837
Structural properties of impact ices accreted on aircraft structures.
Scavuzzo, R.J., Chu, M.L., *U.S. National Aeronautics and Space Administration. Contractor report,* Jan. 1987, NASA-CR-179580, 57p., N87-18121, 15 refs.
Aircraft icing, Ice adhesion, Ice accretion, Ice loads, Impact tests, Computerized simulation

52-838
Experimental investigation of multi-element airfoil ice accretion and resulting performance degradation.
Potapczuk, M.G., Berkowitz, B.M., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1989, NASA-TM-101441, 38p., N89-15084, 15 refs. Prepared for the 27th Aerospace Sciences Conference, Reno, NV, Jan. 9-12, 1989, sponsored by the American Institute of Aeronautics and Astronautics (AIAA). For another version see 45-372.
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Computerized simulation, Environmental tests

52-839
Determination of longitudinal aerodynamic derivatives using flight data from an icing research aircraft.
Ranaudo, R.J., Batterson, J.G., Reehorst, A.L., Bond, T.H., O'Mara, T.M., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1989, NASA-TM-101427, 17p., N89-15121, 7 refs. Prepared for the 27th Aerospace Sciences Conference, Reno, NV, Jan. 9-12, 1989, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).
Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Mathematical models, Computerized simulation, Environmental tests

52-840
Icing Research Tunnel test of a model helicopter rotor.
Miller, T.L., Bond, T.H., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1989, NASA-TM-101978, 12p., N89-19305, 7 refs. Prepared for the 45th Annual Forum and Technology Display of the American Helicopter Society, Boston, MA, May 22-24, 1989.
Helicopters, Aircraft icing, Ice accretion, Ice loads, Wind tunnels, Environmental tests

52-841
Electromagnetic properties of ice coated surfaces.
Dominek, A.K., Walton, E., Wang, N., Beard, L., *U.S. National Aeronautics and Space Administration. Contractor report,* Feb. 1989, NASA-CR-184780, 14p., N89-20355, 6 refs.
Aircraft icing, Ice detection, Radar echoes

52-842
Electro-impulse de-icing testing analysis and design.
Zumwalt, G.W., Schrag, R.L., Bernhart, W.D., Friedberg, R.A., *U.S. National Aeronautics and Space Administration. Contractor report,* 1988, NASA-CR-4175, 344p., N90-10031, Refs. passim.
Aircraft icing, Ice prevention, Ice removal, Electric equipment, Electric fields, Electromagnetic properties, Wind tunnels, Environmental tests, Mathematical models, Computerized simulation

52-843
Ecology of arctic environments.
Woodin, S.J., ed, Marquiss, M., ed, British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, 286p., Refs. passim. For selected papers see 52-844 through 52-852.
DLC QH84.1.E26
Ecosystems, Arctic landscapes, Plant ecology, Plant physiology, Air pollution, Climatic changes, Environmental impact, Vegetation factors, Vegetation patterns

52-844
Arctic soils and permafrost.
FitzPatrick, E.A., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.1-39, Refs. p.36-39.
DLC QH84.1.E26
Permafrost physics, Permafrost physics, Geomorphology, Arctic landscapes, Periglacial processes, Freeze thaw cycles, Frozen ground mechanics, Active layer, Hydrogeochemistry, Weathering, Microelement content

52-845
Microbial ecology, decomposition and nutrient cycling.
Robinson, C.H., Wookey, P.A., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.41-68, Refs. p.62-68.
DLC QH84.1.E26
Soil microbiology, Arctic landscapes, Fungi, Ecology, Ecosystems, Biomass, Nutrient cycle, Soil chemistry, Decomposition, Seasonal variations, Climatic factors

52-846
Role of bryophytes and lichens in polar ecosystems.
Longton, R.E., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.69-96, Refs. p.91-96.
DLC QH84.1.E26
Tundra vegetation, Ecosystems, Arctic landscapes, Lichens, Mosses, Vegetation patterns, Vegetation factors, Nutrient cycle, Climatic factors
This account reviews the role of bryophytes and lichens in arctic and antarctic vegetation, and in energy flow, nutrient cycling and other functional processes in polar ecosystems. Consideration is given to the way in which arctic bryophytes and lichens may be expected to respond to climatic change and other effects of man on the tundra environment. Instructive in this respect is a comparison of Cool-Arctic ecosystems with those on nutrient-rich antarctic islands subject to similar temperatures in summer but to warmer, wetter winters.

52-847
Role of arctic vegetation in ecosystem and global processes.
Chapin, F.S., III, McFadden, J.P., Hobbie, S.E., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.97-112, Refs. p.109-112.
DLC QH84.1.E26
Plant ecology, Ecosystems, Biomass, Tundra vegetation, Global warming, Air pollution, Environmental impact, Vegetation factors, Statistical analysis

52-848
Habitat fragility as an aid to long-term survival in arctic vegetation.
Crawford, R.M.M., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.113-136, Refs. p.134-136.
DLC QH84.1.E26
Plant ecology, Ecosystems, Growth, Plant physiology, Cold weather survival, Acclimatization, Phenology, Light effects, Ice cover effect, Oxygen

52-849
Pathways and effects of contaminants in the Arctic.
Steinnes, E., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.209-217, 22 refs.
DLC QH84.1.E26
Ecosystems, Fallout, Radioactive wastes, Radioactivity, Air pollution, Water pollution, Atmospheric circulation, Ocean currents, Environmental impact, Statistical analysis

52-850
Effects of acid deposition on arctic vegetation.
Woodin, S.J., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.219-239, Refs. p.236-239.
DLC QH84.1.E26
Air pollution, Aerosols, Sedimentation, Ecosystems, Plant ecology, Plant physiology, Snow impurities, Environmental impact, Chemical properties, Ice cores, Sampling, Origin

52-851
Effects of enhanced UV-B radiation on subarctic vegetation.
Björn, L.O., et al, British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.241-253, Refs. p.251-253.
DLC QH84.1.E26
Plant ecology, Plant physiology, Subarctic landscapes, Ecosystems, Climatology, Ozone, Solar radiation, Ultraviolet radiation, Simulation, Environmental tests, Light effects, Growth

52-852
Effects of CO_2 and climate change on arctic ecosystems.
Oechel, W.C., Cook, A.C., Hastings, S.J., Vourlitis, G.L., British Ecological Society. Special publication no.13, Cambridge, Blackwell Science Ltd., 1997, p.255-273, Refs. p.269-273.
DLC QH84.1.E26
Ecosystems, Plant ecology, Photosynthesis, Surface energy, Climatic changes, Global warming, Atmospheric composition, Carbon dioxide, Environmental impact, Seasonal variations, Forecasting

52-853
Cold acclimation and freezing tolerance—a complex interaction of light and temperature.
Gray, G.R., Chauvin, L.P., Sarhan, F., Huner, N.P.A., *Plant physiology,* June 1997, 114(2), p.467-474, Refs. p.473-474.
Plant physiology, Grasses, Plant tissues, Cold tolerance, Growth, Acclimatization, Frost resistance, Cold stress, Temperature effects, Photosynthesis, Chemical analysis

52-854
Condensation of nitrogen: implications for Pluto and Triton.
Duxbury, N.S., Brown, R.H., Anicich, V., *Icarus,* Sep. 1997, 129(1), p.202-206, 32 refs.
Extraterrestrial ice, Ice physics, Ice sublimation, Regolith, Transparence, Grain size, Albedo, Condensation, Frost, Ice sublimation, Seasonal variations, Simulation

52-855
Numerical investigation of performance degradation of wings and rotors due to icing.
Sankar, L.N., Kwon, O.J., *U.S. National Aeronautics and Space Administration. Contractor report,* [1991], NASA-CR-192233, n.p., N93-18783, 3 refs.
Aircraft icing, Ice loads, Ice air interface, Air flow

52-856
Ozone hole over Antarctica. [Das Ozonloch über der Antarktis]
Röth, E.P., Ozonloch - Ozonsmog: Gründlagen der Ozonchemie. Meyers Forum 26. Ozone hole - ozone smog: fundamentals of ozone chemistry, Mannheim, Germany, BI-Taschenbuchverlag, 1994, p.57-73, In German. A glossary and a list of references for the entire work are included.
DLC QC879.7.R682 1994
Ozone, Atmospheric composition, Chemical composition
The progression of the ozone hole over Antarctica is reviewed for the period 1985-1994. A series of diagrams outlines the history of this progression: latitudinal changes in columnar thickness and concentration; ozone thicknesses in Oct., 1956-1957; altitude profile over the South Pole in Aug., Oct., and Dec. 1987; the annual march of ozone (in Dobson units) over Halley Station, 1957 and 1959; the geographic range, 75S-85N, of ozone columnar thicknesses during Apr., 1978 and Jan. and Oct. 1979; the expansion of ozone minimums over Antarctica during Oct., 1979-1989; and others.

52-857
Duration and structure of the past four interglaciations.
Winograd, I.J., Landwehr, J.M., Ludwig, K.R., Coplen, T.B., Riggs, A.C., *Quaternary research,* Sep. 1997, 48(2), p.141-154, Refs. p.153-154.
Paleoclimatology, Pleistocene, Glaciation, Sea level, Quaternary deposits, Radioactive age determination, Oxygen isotopes, Periodic variations, Correlation, Statistical analysis

52-858
Scattering properties of natural terrestrial snows versus icy satellite surfaces.
Domingue, D., Hartman, B., Verbiscer, A., *Icarus,* July 1997, 128(1), p.28-48, 33 refs.
Satellites (natural), Extraterrestrial ice, Regolith, Light scattering, Backscattering, Snow optics, Snow composition, Anisotropy, Grain size, Particles, Correlation

52-859
Re-analysis of the solar phase curves of the icy Galilean satellites.
Domingue, D., Verbiscer, A., *Icarus,* July 1997, 128(1), p.49-74, Refs. p.73-74.
Satellites (natural), Extraterrestrial ice, Photometry, Scattering, Regolith, Surface properties, Grain size, Surface roughness, Reflectivity, Models, Statistical analysis

52-860
Laboratory investigation of the evolution of cometary analogs: results and interpretation.
Kossacki, K.J., Kömle, N.I., Leliwa-Kopystyński, J., Kargl, G., *Icarus,* July 1997, 128(1), p.127-144, 33 refs.
Extraterrestrial ice, Ice physics, Ice sublimation, Phase transformations, Porous materials, Admixtures, Mechanical properties, Thermal conductivity, Stratification, Simulation, Mathematical models

52-861
Ammonia-water system and the chemical differentiation of icy satellites.
Hogenboom, D.L., Kargel, J.S., Consolmagno, G.J., Holden, T.C., Lee, L., Buyyounouski, M., *Icarus,* July 1997, 128(1), p.171-180, Refs. p.179-180.
Extraterrestrial ice, Satellites (natural), Regolith, Geocryology, Ice physics, Hydrates, Solutions, Phase transformations, Melting points, High pressure tests, Geochemistry, Simulation

52-862
Spectroscopic study of CO diluted in N_2 ice: applications for Triton and Pluto.
Quirico, E., Schmitt, B., *Icarus,* July 1997, 128(1), p.181-188, 14 refs.
Extraterrestrial ice, Ice physics, Satellites (natural), Admixtures, Regolith, Reflectivity, Ice spectroscopy, Infrared spectroscopy, Spectra, Ice optics, Simulation

52-863
Physical state and composition of polar stratospheric clouds inferred from airborne lidar measurements during SESAME.
David, C., Godin, S., Megie, G., Emery, Y., Flesia, C., *Journal of atmospheric chemistry,* May 1997, 27(1), p.1-16, 34 refs.
Synoptic meteorology, Polar stratospheric clouds, Cloud physics, Aerosols, Liquid phases, Phase transformations, Cooling rate, Freezing points, Heterogeneous nucleation, Temperature effects, Detection, Lidar, Aerial surveys

52-864
Fire history and composition of the subalpine forest of western Colorado during the Holocene.
Fall, P.L., *Journal of biogeography,* May 1997, 24(3), p.309-325, Refs. p.324-325.
Paleoecology, Forest ecosystems, Wetlands, Alpine tundra, Vegetation patterns, Fires, Revegetation, Palynology, Drill core analysis, Geochronology, United States—Colorado

52-865
First year ice interactions on Molikpaq: measurements and experiments.
Kato, K., Kumakura, Y., *Journal of marine science and technology,* 1996, 1(4), p.220-229, 10 refs.
Offshore structures, Sea ice, Ice loads, Dynamic loads, Ice solid interface, Ice deformation, Fracture zones, Models, Simulation, Mechanical tests, Statistical analysis, Forecasting

52-866
Watershed responses to climate change at Glacier National Park.
Fagre, D.B., Comanor, P.L., White, J.D., Hauer, F.R., Running, S.W., *American Water Resources Association. Journal,* Aug. 1997, 33(4), p.755-765, 25 refs.
Watersheds, Climatic changes, Hydrologic cycle, Ecosystems, Snow hydrology, Snow courses, Snow water equivalent, Hydrography, Simulation, Forecasting, United States—Montana—Glacier National Park

52-867
Stream water chemistry in watersheds receiving different atmospheric inputs of H+, NH_4+, NO_3-, and SO_4^{2-}.
Stottlemyer, R., *American Water Resources Association. Journal,* Aug. 1997, 33(4), p.767-779, Refs. p.778-779.
Watersheds, Precipitation (meteorology), Aerosols, Hydrogeochemistry, Streams, Water chemistry, Ion density (concentration), Aerosols, Snow hydrology, Meltwater, Seasonal variations, Statistical analysis, Snow cover effect

52-868
Watershed approach to ecosystem monitoring in Denali National Park and Preserve, Alaska.
Thorsteinson, L.K., Taylor, D.L., *American Water Resources Association. Journal,* Aug. 1997, 33(4), p.795-810, Refs. p.809-810.
Watersheds, Hydrologic cycle, Subarctic landscapes, Ecosystems, Tundra terrain, Glacial hydrology, Snow hydrology, Hydrography, Runoff, Environmental protection, United States—Alaska—Denali National Park and Preserve

52-869
Morphologic response of subalpine streams to transbasin flow diversion.
Ryan, S., *American Water Resources Association. Journal,* Aug. 1997, 33(4), p.839-854, Refs. p.853-854.
Watersheds, Stream flow, Flow control, Flow measurement, Geomorphology, Channels (waterways), Runoff, Snowmelt, Environmental impact

52-870
Experimental simulation of runback ice.
Calay, R.K., Holdø, A.E., Mayman, P., Lun, I., *Journal of aircraft,* Mar.-Apr. 1997, 34(2), p.206-212, 9 refs.
Aircraft icing, Simulation, Wind tunnels, Ice accretion, Air flow, Ice air interface, Ice cover effect, Topographic effects, Fluid dynamics, Buoyancy

52-871
Infrared camera detects aircraft icing conditions.
Flinn, E.D., *Aerospace America,* Mar. 1996, 34(3), p.18-19.
Aircraft icing, Ice detection, Transparence, Reflectivity, Sensors, Chemical ice prevention, Infrared photography, Image processing, Spectra, Computer applications

52-872
Comparison of freezing and thawing durability of non-air entrained concrete pavers under ASTM C 67 and ASTM C 666.
Ghafoori, N., Mathis, R., *ACI material journal,* July-Aug. 1997, 94(4), p.325-331, 15 refs.
Concrete pavements, Bricks, Cold weather performance, Concrete durability, Frost resistance, Degradation, Freeze thaw tests, Cement admixtures, Standards, Specifications

52-873
Historical observations of Prince Gustav Ice Shelf.
Cooper, A.P.R., *Polar record,* Oct. 1997, 33(187), p.285-294, 22 refs.
Ice shelves, Ice physics, Glacier oscillation, Glacier melting, History, Topographic maps, Antarctica—Prince Gustav Ice Shelf
Prince Gustav Ice Shelf, situated between James Ross I. and Trinity Peninsula, has retreated rapidly between 1989 and 1995. This paper re-examines historical accounts of the area and plots the position of the ice shelf at various times, from 1843 onwards. These results show that an episode of rapid retreat between 1957 and 1959 preceded the recent rapid retreat, and that the ice shelf has been retreating for most of the period since 1843. The mechanisms underlying the two periods of rapid retreat are considered. (Auth.)

52-874
Mesospheric standing waves near South Pole.
Hernandez, G., Smith, R.W., Kelley, J.M., Fraser, G.J., Clark, K.C., *Geophysical research letters,* Aug. 15, 1997, 24(16), p.1987-1990, 17 refs.
Climatology, Atmospheric circulation, Periodic variations, Gravity waves, Wave propagation, Sounding, Antarctica—South Pole
Optical measurements of mesospheric winds near South Pole during Aug. 1996 show the presence of large-scale standing waves with periods of 51.3-hr and 107-hr, respectively. The direction of the presently observed mean wind is nearly parallel to wind direction of the 51.3-hr standing oscillation, suggesting an interaction between the mean wind field and the wave during this observation. Based on the simultaneous observation at Scott Base of an uncommon wave, the 11.6-hr wave observed from South Pole can be identified as a zonal wavenumber one inertio-gravity mode of oscillation. (Auth. mod.)

52-875
Formation and implications of ice particle nucleation in the stratosphere.
Tabazadeh, A., Toon, O.B., Jensen, E.J., *Geophysical research letters,* Aug. 15, 1997, 24(16), p.2007-2010, 28 refs.
Cloud physics, Stratosphere, Polar stratospheric clouds, Homogeneous nucleation, Heterogeneous nucleation, Aerosols, Ice nuclei, Ice formation, Models, Simulation, Temperature effects

52-876
On the occurrence of ClO in cirrus clouds and volcanic aerosol in the tropopause region.
Borrmann, S., Solomon, S., Avallone, L., Toohey, D., Baumgardner, D., *Geophysical research letters,* Aug. 15, 1997, 24(16), p.2011-2014, 12 refs.
Climatology, Cloud physics, Aerosols, Volcanic ash, Turbulent diffusion, Heterogeneous nucleation, Ice nuclei, Ice formation, Chemical properties, Spectroscopy

52-877
Evidence from driftwood records for century-to-millennial scale variations of the high latitude atmospheric circulation during the Holocene.
Tremblay, L.B., Mysak, L.A., Dyke, A.S., *Geophysical research letters,* Aug. 15, 1997, 24(16), p.2027-2030, 6 refs.
Climatology, Polar atmospheres, Atmospheric circulation, Wind direction, Sea ice, Drift, Sediment transport, Periodic variations, Correlation, Ice models

52-878
Effect of orography on precipitation in the western Himalayan region.
Singh, P., Kumar, N., *Journal of hydrology,* Dec. 1, 1997, 199(1-2), p.183-206, 21 refs.
Mountains, River basins, Precipitation (meteorology), Snow accumulation, Snow cover distribution, Altitude, Topographic effects, Statistical analysis, India—Himalaya Mountains

52-879
Heterogeneous chlorine chemistry in the tropopause region.
Solomon, S., et al, *Journal of geophysical research,* Sep. 20, 1997, 102(D17), p.21,411-21,429, Refs. p.21,427-21,429.
Climatology, Aerosols, Cloud cover, Cloud physics, Sounding, Ozone, Degradation, Optical properties, Heterogeneous nucleation, Photochemical reactions, Ice vapor interface, Environmental impact, Seasonal variations

52-880
Evolution of chlorine and nitrogen species in the lower stratosphere during Antarctic spring: use of tracers to determine chemical change.
Mickley, L.J., Abbatt, J.P.D., Frederick, J.E., Russell, J.M., III, *Journal of geophysical research,* Sep. 20, 1997, 102(D17), p.21,479-21,491, 38 refs.
Climatology, Polar atmospheres, Degradation, Heterogeneous nucleation, Radiation absorption, Photochemical reactions, Aerosols, Stratosphere, Ozone, Environmental impact, Models
Observations of O_3, HCl, NO, and NO_2 from the Halogen Occultation Experiment (HALOE) provide a means to investigate chemical change in the lower stratosphere over Antarctica during Oct. 1992. Two long-lived species are used as tracers to identify a series of air parcels having similar chemical composition. The set of parcels chosen using tracer analysis show uniformly low O_3 mixing ratios. The repartitioning of the active chlorine family in favor of HCl halts the processes that destroy ozone and makes available active nitrogen in the form of NO and NO_2. The investigation confirms earlier results and validates tracer analysis as a reliable method to probe chemical change in the stratosphere. (Auth. mod.)

52-881
Frost deicer salt scaling testing of concrete: effect of drying and natural weathering.
Jacobsen, S., Marchand, J., Boisvert, L., Pigeon, M., Sellevold, E.J., *Cement, concrete and aggregates,* June 1997, 19(1), p.8-16, 23 refs.
Concrete durability, Concrete admixtures, Chemical ice prevention, Damage, Weathering, Freeze thaw cycles, Frost action, Mechanical tests, Drying, Laboratory techniques, Accuracy

52-882
Application of electromagnetic methods in the delimitation of saline permafrost in the Yamal Peninsula, northeastern Siberia. [Application des méthodes électromagnétiques à la délimitation du pergélisol salin dans la Péninsule de Yamal, secteur nord-ouest de la Sibérie]
Krylov, S., Bobrov, N., Seguin, M.K., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.133-145, In French with English summary. 18 refs.
Permafrost surveys, Permafrost distribution, Permafrost beneath structures, Permafrost structure, Saline soils, Dielectric properties, Mapping, Sounding, Electrical resistivity, Polarization (charge separation), Ice detection, Russia—Siberia

52-883
Weathering of quartzite on a cryoplanation terrace in northern Yukon, Canada.
Lauriol, B.M., Lalonde, A.E., Dewez, V., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.147-153, With French summary. 8 refs.
Pleistocene, Periglacial processes, Terraces, Bedrock, Lithology, Geocryology, Altiplanation, Snow cover effect, Weathering, Sampling, Geochemistry, Canada—Yukon Territory

52-884
Monitoring of periglacial slope processes in the Swiss Alps: the first two years of frost shattering, heave and creep.
Matsuoka, N., Hirakawa, K., Watanabe, T., Moriwaki, K., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.155-177, With French summary. 68 refs.
Periglacial processes, Alpine landscapes, Geomorphology, Slope processes, Weathering, Sorting, Meltwater, Freeze thaw cycles, Seasonal freeze thaw, Frost heave, Frost shattering, Frozen rock temperature, Diurnal variations, Switzerland—Alps

52-885
Electrical resistivity measurements on the rock glaciers of Grizzly Creek, St Elias Mountains, Yukon.
Evin, M., Fabre, D., Johnson, P.G., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.179-189, With French summary. 30 refs.
Rock glaciers, Classifications, Periglacial processes, Moraines, Ice detection, Sounding, Electrical resistivity, Origin, Permafrost indicators, Canada—Yukon Territory—Saint Elias Mountains

52-886
Formation of high-mountain talus slopes related to debris-flow activity in the High Tatra Mountains.
Kotarba, A., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.191-204, With French summary. 48 refs.
Geomorphology, Mountain soils, Alpine landscapes, Slope processes, Classifications, Slope stability, Rain, Periglacial processes, Talus, Lacustrine deposits, Drill core analysis, X ray analysis, Poland—High Tatra Mountains

52-887
Neural network method to determine the presence or absence of permafrost near Mayo, Yukon Territory, Canada.
Leverington, D.W., Duguay, C.R., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.205-215, With French summary. 39 refs.
Permafrost surveys, Geophysical surveys, Permafrost indicators, Permafrost distribution, Sensor mapping, Radiometry, Spaceborne photography, Correlation, Classifications, Data processing, Canada—Yukon Territory—Mayo

52-888

Ground icing formation: experimental and statistical analyses of the overflow process.

Hu, X.G., Pollard, W.H., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.217-235, With French summary. 26 refs.

Geocryology, Ground water, Water flow, Ice growth, Naleds, Stratification, Ice accretion, Simulation, Temperature effects, Ice air interface, Analysis (mathematics), Statistical analysis

52-889

Note on mapping discontinuous permafrost with GIS: Manitounuk Strait, northern Québec, Canada. [Essai de cartographie du pergélisol discontinu à l'aide d'un SIG: Détroit de Manitounuk, Québec nordique, Canada]

Ménard, E., Allard, M., Michaud, Y., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.237-244, In French with English summary. 26 refs.

Geophysical surveys, Permafrost surveys, Discontinuous permafrost, Surface structure, Vegetation patterns, Photointerpretation, Topographic maps, Correlation, Accuracy, Canada—Quebec—Manitounuk Strait

52-890

Some observations regarding protalus ramparts.

Hall, K., Meiklejohn, I., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.245-249, With French summary. 1 ref.

Talus, Firn, Geomorphology, Slope processes, Periglacial processes, Models, Classifications, Detection

52-891

Pleistocene gelifluction and rock deformation on slopes in southern Wyoming.

Mears, B., Jr., *Permafrost and periglacial processes,* Apr.-June 1997, 8(2), p.251-255, With French summary. 7 refs.

Pleistocene, Mountain soils, Slope processes, Periglacial processes, Solifluction, Permafrost mass transfer, Sediments, Ice wedges, Shear flow, United States—Wyoming

52-892

Thermodynamics of frost heaving: a thermodynamic proposition for dynamic phenomena.

Ozawa, H., *Physical review E,* Sep. 1997, 56(3-A), p.2811-2816, 26 refs.

Ice mechanics, Frost action, Frost heave, Ice growth, Ice water interface, Water transport, Porous materials, Thermodynamics, Theories

52-893

Supercooled water and the kinetic glass transition.

Sciortino, F., Gallo, P., Tartaglia, P., Chen, S.H., *Physical review E,* Dec. 1996, 54(6), p.6331-6343, 51 refs.

Water structure, Molecular structure, Supercooling, Molecular energy levels, Phase transformations, Temperature effects, Thermodynamics, Computerized simulation, Ice physics

52-894

Aging of porous media following fluid invasion, freezing, and thawing.

Salmon, E., Ausloos, M., Vandewalle, N., *Physical review E,* June 1997, 55(6-A), p.R6348-R6351, 12 refs.

Fluid dynamics, Porous materials, Freeze thaw cycles, Mathematical models, Fractals, Damage, Statistical analysis

52-895

Terminating the 100 kyr ice age cycle.

Tarasov, L., Peltier, W.R., *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,665-21,693, Refs. p.21,692-21,693.

Pleistocene, Ice age theory, Paleoclimatology, Glaciation, Ice sheets, Ice volume, Glacier mass balance, Oscillations, Mathematical models, Heat balance

52-896

Large-scale ice clouds in the GFDL SKYHI general circulation model.

Donner, L.J., et al, *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,745-21,768, 31 refs.

Climatology, Cloud physics, Cloud cover, Optical properties, Radiation balance, Ice crystals, Particle size distribution, Ice formation, Ice sublimation, Ice vapor interface, Mathematical models

52-897

Variations in western arctic temperatures in response to cloud radiative and synoptic-scale influences.

Stone, R.S., *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,769-21,776, Refs. p.21,774-21,776.

Climatology, Air temperature, Surface temperature, Temperature variations, Seasonal variations, Synoptic meteorology, Advection, Cloud cover, Radiation balance, Statistical analysis

52-898

Prediction of cloud droplet number in a general circulation model.

Ghan, S.J., Leung, L.R., Easter, R.C., Abdul-Razzak, H., *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,777-21,794, Refs. p.21,792-21,794.

Climatology, Clouds (meteorology), Cloud physics, Cloud droplets, Aerosols, Phase transformations, Coalescence, Turbulent diffusion, Ice crystals, Snow crystals, Homogeneous nucleation, Ice vapor interface, Statistical analysis, Forecasting, Mathematical models

52-899

Extinction efficiency and single-scattering albedo for laboratory and natural cirrus clouds.

Yang, P., Liou, K.N., Arnott, W.P., *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,825-21,835, 41 refs.

Climatology, Cloud physics, Optical properties, Ice crystal optics, Ice crystal size, Particle size distribution, Light scattering, Albedo, Refractivity, Attenuation, Simulation, Mathematical models

52-900

Seasonal snowpack radiobrightness interpretation using a SVAT-linked emission model.

Galantowicz, J.F., England, A.W., *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,933-21,946, 44 refs.

Climatology, Snow surveys, Remote sensing, Radiometry, Snow heat flux, Snow cover effect, Snow cover structure, Seasonal freeze thaw, Regelation, Soil air interface, Brightness, Mathematical models

52-901

Recent intra-annual snow accumulation at South Pole: implications for ice core interpretation.

McConnell, J.R., Bales, R.C., Davis, D.R., *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,947-21,954, 14 refs.

Climatology, Ice cores, Polar atmospheres, Snow accumulation, Snow depth, Drift, Seasonal variations, Sampling, Statistical analysis, Correlation, Accuracy, Antarctica—Amundsen-Scott Station

This paper uses a unique, 7.25-yr record of recent, year-round monthly snow accumulation at the Amundsen-Scott Station to compute the number of years of averaging required to statistically ensure that an ice core record would have equivalent representation of snow from each month of the calendar year. For current South Pole meteorological conditions, averaging times of the order of 300 years are required to ensure equal representation of each month, with May being the least well-represented month. To ensure equal representation of 3-month seasons still requires averaging times of the order of 130 years. (Auth. mod.)

52-902

Probability of occurrence of blowing snow.

Li, L., Pomeroy, J.W., *Journal of geophysical research,* Sep. 27, 1997, 102(D18), p.21,955-21,964, 26 refs.

Snow physics, Blowing snow, Turbulent boundary layer, Snow air interface, Sublimation, Wind velocity, Wind factors, Forecasting, Statistical analysis, Meteorological factors

52-903

Geomorphology of the upper Val di Genova (Adamello Group, central Alps). [Geomorfologia dell'Alta Val di Genova (Gruppo dell'Adamello, Alpi Centrali)]

Baroni, C., Carton, A., *Geografia fisica e dinamica quaternaria,* 1996, 19(1), p.3-17, In Italian with English summary. Refs. p.14-16.

Geomorphology, Geological surveys, Alpine landscapes, Valleys, Glacial geology, Glacier oscillation, Ice edge, Periglacial processes, Stratigraphy, Profiles, Landscape development, Sediment transport, Moraines, Radioactive age determination, Italy—Val di Genova

52-904

Holocene fluvial dynamics in the middle valley of the Potenza River (central Italy). [Dinamica fluviale olocenica nella media valle del Fiume Potenza (Italia Centrale)]

Calderoni, G., Cilla, G., Dramis, F., Farabollini, P., *Geografia fisica e dinamica quaternaria,* 1996, 19(1), p.19-28, In Italian with English summary. 35 refs.

Pleistocene, Geomorphology, Valleys, River basins, Quaternary deposits, Stratigraphy, Water erosion, Sediment transport, Radioactive age determination, Geochronology, Italy—Potenza River

52-905

Geomorphological notes on the Upper Valle del Sabbione and the Val d'Ischietto, (Argentera Group, Maritime Alps). [Note geomorfologiche sull'Alta Valle del Sabbione e sulla Val d'Ischietto (Gruppo dell'Argentera, Alpi Marittime)]

Ribolini, A., *Geografia fisica e dinamica quaternaria,* 1996, 19(1), p.79-91, In Italian with English summary. 26 refs.

Alpine landscapes, Geomorphology, Glacial geology, Glacial erosion, Rock glaciers, Cirques, Talus, Mass movements (geology), Geologic structures, Geological surveys, Italy—Maritime Alps

52-906

Jökulhlaup of Grimsvötn (Iceland) on 5 Nov. 1996. [Le jökulhlaup du Grimsvötn (Islande) du 5 Novembre 1996]

Cerutti, A.V., *Geografia fisica e dinamica quaternaria,* 1996, 19(1), p.139-141, In French with English and Italian summaries.

Volcanoes, Explosion effects, Magma, Geothermal thawing, Glacier melting, Lake bursts, Flooding, Iceland—Grimsvötn

52-907

Reports on the Glaciological Survey of 1995. [Relazioni della Campagna Glaciologica 1995]

Armando, E., Smiraglia, C., Zanon, G., *Geografia fisica e dinamica quaternaria,* 1996, 19(1), p.147-198, In Italian.

Glacier surveys, Alpine glaciation, Mountain glaciers, Glacier oscillation, Ice edge, Seasonal variations, Italy—Alps

52-908

Contaminant fate in high arctic lakes: development and application of a mass balance model.

Freitas, H., Diamond, M., Semkin, R., Gregor, D., *Science of the total environment,* Aug. 18, 1997, 201(3), p.171-187, 46 refs.

Limnology, Water pollution, Lake water, Mass balance, Water transport, Ice water interface, Ice cover effect, Snowmelt, Sedimentation, Hydrogeochemistry, Mathematical models

52-909

Precision of tests for assessment of the deicer salt scaling resistance of concrete.

Marchand, J., Pleau, R., Pigeon, M., *Cement, concrete, and aggregates,* Dec. 1996, 18(2), p.85-91, 18 refs.

Concrete durability, Concrete pavements, Concrete admixtures, Freeze thaw tests, Standards, Frost resistance, Degradation, Salting, Mechanical tests, Statistical analysis, Accuracy

52-910

Break-up dates of alpine lakes as proxy data for local and regional mean surface air temperatures.

Livingstone, D.M., *Climatic change,* Oct. 1997, 37(2), p.407-439, Refs. p.436-439.

Climatology, Alpine landscapes, Synoptic meteorology, Air temperature, Surface temperature, Temperature variations, Lake ice, Ice breakup, Degree days, Volcanic ash, Aerosols, Correlation

52-911

Direct contact melting of two-dimensional arbitrarily shaped solids on an isothermally heated horizontal plate.

Hirata, T., Ishikawa, M., Hashimoto, R., *Heat transfer—Japanese research,* 1995, 24(7), p.589-602, Translated from Japanese Society of Mechanical Engineers, Transactions. 5 refs.

Ice physics, Ice melting, Ice solid interface, Ice water interface, Orientation, Heat transfer, Thermal conductivity, Meltwater, Classifications, Mathematical models

52-912

Navier-Stokes analysis of airfoils with leading edge ice accretions.

Potapczuk, M.G., *U.S. National Aeronautics and Space Administration. Contractor report,* Feb. 1993, NASA-CR-191008, 203p., N93-22822, 76 refs. For Ph.D. thesis of same title see 44-1017.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Turbulent boundary layer, Mathematical models, Computer programs

52-913

Experimental study of the aerodynamics of a NACA 0012 airfoil with a simulated glaze ice accretion—Volume II.

Bragg, M.B., *U.S. National Aeronautics and Space Administration. Contractor report,* Mar. 1993, NASA-CR-191007, 399p., N93-22823, 7 refs. For an earlier version see 52-834. Volume I is cited in the references as NASA-CR-179571 but without a NTIS accession number.

Aircraft icing, Ice accretion, Glaze, Ice loads, Ice air interface, Air flow, Wind tunnels, Computerized simulation

52-914

Users manual for the NASA Lewis three-dimensional ice accretion code (LEWICE3D).

Bidwell, C.S., Potapczuk, M.G., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Dec. 1993, NASA-TM-105974, 139p., N94-21590, 10 refs.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Ice air interface, Air flow, Wind tunnels, Computer programs, Manuals

52-915

Characteristics of surface roughness associated with leading edge ice accretion.

Shin, J.W., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Jan. 1994, NASA-TM-106459, 16p., N94-23522, 16 refs. Prepared for the 32nd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 10-13, 1994, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice detection, Surface roughness, Wind tunnels, Image processing

52-916

3-D LDV measurements on a 30-degree swept wing with a simulated ice accretion.

Bragg, M.B., Kerho, M.F., *U.S. National Aeronautics and Space Administration. Contractor report,* Apr. 1994, NASA-CR-195327, 60p., N94-30124.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Velocity measurement, Wind tunnels, Environmental tests

52-917

Close-up analysis of inflight ice accretion.

Reehorst, A.L., Ratvasky, T.P., Sims, J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Jan. 1994, NASA-TM-106457, 10p., N94-23523, 13 refs. Prepared for the 32nd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 10-13, 1994, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice detection, Cold weather tests

52-918

Overview of a model rotor icing test in the NASA Lewis Icing Research Tunnel.

Britton, R.K., Bond, T.H., Flemming, R.J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Jan. 1994, NASA-TM-106471, 22p., N94-23299, 4 refs. Prepared for the 32nd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 10-13, 1994, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Helicopters, Aircraft icing, Ice accretion, Ice loads, Wind tunnels, Environmental tests

52-919

Experimental study of the aerodynamics of a swept and unswept semispan wing with a simulated glaze ice accretion.

Bragg, M.B., *U.S. National Aeronautics and Space Administration. Contractor report,* May. 1994, NASA-CR-195330, 226p., N94-30152, 7 refs.

Aircraft icing, Glaze, Ice accretion, Ice loads, Ice air interface, Air flow, Surface roughness, Wind tunnels, Environmental tests, Computerized simulation

52-920

Icing test results on an advanced two-dimensional high-lift multi-element airfoil.

Shin, J.W., Wilcox, P., Chin, V., Sheldon, D., *U.S. National Aeronautics and Space Administration. Technical memorandum,* June 1994, NASA-TM-106620, 20p., N94-33705, 13 refs. Prepared for the 12th Applied Aerodynamics Conference, Colorado Springs, CO, June 20-23, 1994, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Wind tunnels, Environmental tests

52-921

User's manual for the NASA Lewis ice accretion/ heat transfer prediction code with electrothermal deicer input.

Masiulaniec, K.C., Wright, W.B., *U.S. National Aeronautics and Space Administration. Contractor report,* July 1994, NASA-CR-4530, 169p., N95-11888, 22 refs. Also published as U.S. Federal Aviation Administration, Technical note, DOT/FAA/CT-TN92/33.

Aircraft icing, Ice formation, Ice accretion, Ice forecasting, Ice melting, Ice removal, Artificial melting, Electric heating, Heat transfer, Mathematical models, Computer programs, Manuals

52-922

Collection efficiency and ice accretion calculations for a sphere, a swept MS(1)-317 wing, a swept NACA-0012 wing tip, an axisymmetric inlet, and a Boeing 737-300 inlet.

Bidwell, C.S., Mohler, S.R., Jr., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Jan. 1995, NASA-TM-106831, 42p., N95-18582, 18 refs. Prepared for the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 9-12, 1995, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Jet engines, Computerized simulation

52-923

Methods for scaling icing test conditions.

Anderson, D.N., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Jan. 1995, NASA-TM-106827, 9p., N95-19284, 12 refs. Prepared for the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 9-12, 1995, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Mathematical models, Environmental tests, Cold weather tests, Safety

52-924

Ice accretion with varying surface tension.

Bilanin, A.J., Anderson, D.N., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Jan. 1995, NASA-TM-106826, 11p., N95-19285, 11 refs. Prepared for the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 9-12, 1995, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Cloud droplets, Liquid solid interfaces, Interfacial tension, Impact tests, Mathematical models

52-925

Additional improvements to the NASA Lewis ice accretion code LEWICE.

Wright, W.B., Bidwell, C.S., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Mar. 1995, NASA-TM-106849, 12p., N95-22669, 6 refs. Prepared for the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 9-12, 1995, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Computerized simulation

52-926

Further investigations of icing effects on an advanced high-lift multi-element airfoil.

Miller, D., Shin, J.W., Sheldon, D., Khodadoust, A., Wilcox, P., Langhals, T., *U.S. National Aeronautics and Space Administration. Technical memorandum,* May 1995, NASA-TM-106947, 17p., N95-27762, 7 refs. Prepared for the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 9-12, 1995, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Wind tunnels, Environmental tests

52-927

Users manual for the improved NASA Lewis ice accretion code LEWICE 1.6.

Wright, W.B., *U.S. National Aeronautics and Space Administration. Contractor report,* June 1995, NASA-CR-198355, 95p., N95-29132, 38 refs.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Heat transfer, Wind tunnels, Mathematical models, Computer programs, Manuals

52-928

Investigation of water droplet trajectories within the NASA Icing Research Tunnel.

Reehorst, A.L., Ibrahim, M., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Aug. 1995, NASA-TM-107023, 9p., N95-32769, 11 refs. Prepared for the International Icing Symposium '95, Montreal, Canada, Sep. 18-21, 1995, cosponsored by the American Helicopter Society (AHS) and the Society of Automotive Engineers (SAE).

Aircraft icing, Ice accretion, Supercooled clouds, Cloud droplets, Wind tunnels, Computerized simulation

52-929

Convective heat transfer from castings of ice roughened surfaces in horizontal flight.

Dukhan, N., Van Fossen, G.J., Jr., Masiulaniec, K.C., DeWitt, K.J., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Nov. 1995, NASA-TM-107109, 21p., N96-15199, 11 refs. Prepared for the International Icing Symposium '95, Montreal, Canada, Sep. 18-21, 1995, cosponsored by the American Helicopter Society (AHS) and the Society of Automotive Engineers (SAE).

Aircraft icing, Ice accretion, Ice heat flux, Ice air interface, Surface roughness, Heat transfer, Convection, Computerized simulation

52-930

Evaluation of constant-Weber-number scaling for icing tests.

Anderson, D.N., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Jan. 1996, NASA-TM-107141, 15p., N96-18415, 12 refs. Prepared for the 34th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 15-18, 1996, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Wind tunnels, Environmental tests, Mathematical models, Computerized simulation

52-931

Background information on arctic environmental cooperation and the environmental policy of the European Union.

Mähönen, O., *Finland. Finnish Ministry of Environment. Report,* 1997, No.18, 40p., Refs. p.31-34.

Oceanography, Arctic landscapes, Ecosystems, Economic development, Environmental impact, Environmental protection, Legislation, Organizations, Research projects, International cooperation

52-932

Five years of solar UV-radiation monitoring in Sweden.

Josefsson, W., *Swedish Meteorological and Hydrological Institute. RMK report,* Oct. 1996, No.71, 27p., 6 refs.

Climatology, Radiation balance, Solar radiation, Ultraviolet radiation, Radiometry, Cloud cover, Seasonal variations, Statistical analysis, Safety, Sweden

52-933

Solar UV-radiation monitoring 1996.

Josefsson, W., *Swedish Meteorological and Hydrological Institute. RMK report,* Feb. 1997, No.74, 7p., 5 refs.

Climatology, Solar radiation, Ultraviolet radiation, Ozone, Radiometry, Seasonal variations, Statistical analysis, Sweden

52-934

Eleven year cycle of dust concentration variability observed in the dust profile of the GISP2 ice core from central Greenland: possible solar cycle connection.

Ram, M., Stolz, M., Koenig, G., *Geophysical research letters,* Oct. 1, 1997, 24(19), p.2359-2362, 21 refs.

Paleoclimatology, Ice sheets, Ice cores, Ice composition, Dust, Profiles, Lasers, Light scattering, Solar radiation, Periodic variations, Greenland

52-935

CCl_2F_2 mixing ratio profiles in the 1995 late winter arctic vortex from balloon-borne spectra.

Hartmann, J.M., Kochel, J.M., Payan, S., Camy-Peyret, C., Engel, A., *Geophysical research letters,* Oct. 1, 1997, 24(19), p.2367-2370, 18 refs.

Climatology, Polar atmospheres, Stratosphere, Aerosols, Distribution, Sounding, Infrared spectroscopy, Profiles, Spectra, Subsidence

52-936

Erosion rates of alpine bedrock summit surfaces deduced from in situ ^{10}Be and ^{26}Al.

Small, E.E., Anderson, R.S., Repka, J.L., Finkel, R., *Earth and planetary science letters,* Aug. 1997, 150(3-4), p.413-425, 40 refs.

Alpine landscapes, Periglacial processes, Bedrock, Erosion, Frost weathering, Frost action, Gamma irradiation, Isotope analysis, Geochemistry, Landscape development, Models

52-937

Global climate and thousand-year temperature trend in the Late Glaciation and Holocene.

Klimenko, V.V., Klimanov, V.A., Kozharinov, A.V., Fedorov, M.V., *Russian meteorology and hydrology,* 1996, No.7, p.15-22, Translated from Meteorologiia i gidrologiia. 27 refs.

Pleistocene, Paleoclimatology, Climatic changes, Global change, Air temperature, Periodic variations, Palynology, Spectra

52-938

Time variations of total ozone over the Molodezhnaya observatory (Antarctica).

Kokin, G.A., *Russian meteorology and hydrology,* 1996, No.7, p.33-40, Translated from Meteorologiia i gidrologiia. 10 refs.

Climatology, Polar atmospheres, Atmospheric composition, Ozone, Stratosphere, Sounding, Wind factors, Statistical analysis, Seasonal variations, Antarctica—Molodezhnaya Station

The mean values of total ozone (TO), pressure, and temperature at the Molodezhnaya observatory, are calculated for Sep. and Oct. from 1987 through 1993. Reliable regression relationships are shown to exist between mean values of TO, equatorial zonal wind speed in the 15-10 hPa layer, pressure at 30 km, temperature at 20 km, and the index of geomagnetic activity. Multiple regressions are calculated. These regressions yield the linear trend of TO over the Molodezhnaya observatory for the indicated period to be 0.4% per year. (Auth. mod.)

52-939

Polar snow cover changes and global warming.

Ye, H.C., Mather, J.R., *International journal of climatology,* Feb. 1997, 17(2), p.155-162, 17 refs.

Climatology, Global warming, Polar atmospheres, Precipitation (meteorology), Snow accumulation, Glacier thickness, Snow water equivalent, Hydrologic cycle, Models

A study of both current and double CO_2 temperature and precipitation data for all land areas poleward of 60° latitude using three different general circulation models suggests possible changes in snow accumulation due to increasing CO_2. Increased snow accumulation will occur in the Antarctic whereas a small decrease in snow depth is to be expected in the Northern Hemisphere. Total snow accumulation for all land areas poleward of latitude 60° is found to increase under a double CO_2 scenario. (Auth. mod.)

52-940

Detection and characterization of denitrifying bacteria from a permanently ice-covered antarctic lake.

Ward, B.B., Priscu, J.C., *Hydrobiologia,* Mar. 28, 1997, Vol.347, p.57-68, 27 refs.

Microbiology, Bacteria, Limnology, Icebound lakes, Biomass, Ecosystems, Sampling, Detection, Water chemistry, Stratification, Geochemical cycles, Antarctica—Bonney, Lake

Denitrifying bacterial strains were isolated from Lake Bonney, a permanently ice-covered and chemically stratified lake in the McMurdo dry valley region of Antarctica. Three strains, identified as denitrifiers by their ability to produce nitrous oxide using nitrate or nitrite as a respiratory substrate, were characterized as to their temperature and salinity optima for aerobic growth in batch culture; all three were psychrophilic and moderately halophilic. Maximum growth rates were measured for all three strains. Distributions related to the observed chemical distributions imply the occurrence of denitrification in the west lobe of the lake and not in the east lobe. (Auth. mod.)

52-941

CASP annual report—1 February 1994-31 January 1995.

Cambridge Arctic Shelf Programme, Cambridge, 1995, 22p.

Oceanography, Research projects, Meetings, Geological surveys, International cooperation, Petroleum industry, Exploration, Geochronology

52-942

Snow and avalanche. Annual report 1995-96.

Colorado Avalanche Information Center, Denver, Colorado Geological Survey, July 1996, 32p.

Snow surveys, Snow accumulation, Snowstorms, Avalanches, Avalanche forecasting, Meteorological factors, Safety, Accidents, Statistical analysis, Education, United States—Colorado

52-943

Snowcover accumulation, relocation and management.

Pomeroy, J.W., Gray, D.M., NHRI Science report No.7, Saskatoon, Saskatchewan, National Hydrology Research Institute, 1995, 144p., Refs. p.123-134.

Snow cover, Snow accumulation, Snow depth, Snow cover distribution, Snow density, Snow water equivalent, Blowing snow, Snow mechanics, Sublimation, Snow physics, Analysis (mathematics), Canada

52-944

Geocryological conditions of Tien Shan and the Pamirs. [Geokriologicheskie usloviia Tian'-Shania i Pamira]

Gorbunov, A.P., Severskiĭ, E.V., Titkov, S.N., Yakutsk, Institut merzlotovedeniia SO RAN, 1996, 194p., In Russian. Refs. p.183-192.

Geocryology, Naleds, Permafrost distribution, Ground ice, Moraines, Frozen ground temperature, Permafrost depth, Alluvium, Frozen rocks, Thermokarst, Frost heave, Solifluction, Mapping, Russia—Tien Shan, Pamirs

52-945

Engineering-geological and geocryological conditions of the shelves of the Barents and Kara seas. [Inzhenerno-geologicheskie i geokriologicheskie usloviia shel'fa Barentseva i Karskogo morei]

Mel'nikov, V.P., Spesivtsev, V.I., Novosibirsk, Nauka, 1995, 195p. + 1 fold. page of illus., In Russian. Refs. p.186-195.

Engineering geology, Geocryology, Marine geology, Frozen rock temperature, Crude oil, Natural gas, Natural resources, Glacial geology, Pleistocene, Bottom topography, Barents Sea, Russia—Kara Sea

52-946

Snow noise disturbance in antarctic radio communications and development of mobile antenna for snow vehicle in Antarctica.

Fukushima, I., Kubo, E., *Antarctic record,* July 1997, 41(2), p.513-536, In Japanese with English summary. 15 refs.

Snow vehicles, Radio communication, Antennas, Noise (sound), Snow electrical properties

Radio operators of the Japanese Antarctic Research Expedition (JARE) have encountered critical radio noise disturbances caused by blizzards during oversnow travel. This noise appears to be caused by corona discharge at the edges of the vertical whip antenna. This paper describes several examples of snow noise experienced in Antarctica by JARE, the mechanism of generation of the noise, and a method of reducing the intensity of the noise. It also describes a High Efficiency Transmission Line Antenna which is small enough to mount on a snow vehicle and reduces the intensity of the snow noise. (Auth.)

52-947

Activities of the summer party of the 35th Japanese Antarctic Research Expedition in 1993-1994.

Watanabe, O., *Antarctic record,* July 1997, 41(2), p.537-548, In Japanese with English summary.

Research projects, Expeditions, Ice breaking, Sea ice, Transportation, Cargo

The 35th Japanese Antarctic Research Expedition (JARE-35) consisted of 40 wintering members and 16 summer members plus 3 foreign scientists from the U.S.A. and Australia. The icebreaker *Shirase* left Tokyo on Nov. 14, 1993, and arrived at the pack ice edge near Lützow-Holm Bay on Dec. 17. Due to unusually severe sea ice conditions, continuous icebreaking began at this point, and continued until the *Shirase* was stalled 10 nautical miles from Showa Station. At this point, the expedition stores were transferred to Showa Station by helicopter airlift and snow vehicle through sea ice routes. These operations transported more than 96% of the total expedition baggage. Observations of physical and chemical oceanography, marine biology and earth sciences were carried out. (Auth. mod.)

52-948

Meteorological observations at Syowa Station in 1994 by the 35th Japanese Antarctic Research Expedition.

Inagawa, Y., Yamamoto, Y., Taguchi, Y., Abo, T., Ijima, O., *Antarctic record,* July 1997, 41(2), p.549-588, In Japanese with English summary. 5 refs.

Weather observations, Meteorological data, Meteorological instruments, Snowstorms, Ozone, Antarctica—Showa Station

This paper describes the results of meteorological observations carried out by JARE-35 from Feb. 1, 1994 to Jan. 31, 1995 at Showa Station. The method of observations, instruments, and statistics are discussed. Blizzards occurred 28 times, spanning sixty days. The lowest value of daily representative total ozone was 134 m atm-cm, on Sep. 27, which was the lowest value ever recorded at Showa Station. (Auth. mod.)

52-949

Patterns and variations in natural succession following massive ice-scour of a rocky intertidal seashore.

McCook, L.J., Chapman, A.R.O., *Journal of experimental marine biology and ecology,* July 1, 1997, 214(1-2), p.121-147, 62 refs.

Ice scoring, Shores, Rocks, Ecology, Revegetation, Canada—Nova Scotia—Halifax

52-950

Ozone treaty 'must tackle CFC smuggling'.

Spurgeon, D., *Nature,* Sep. 1997, 389(6648), p.219.

Ozone, Air pollution, Atmospheric composition, Ultraviolet radiation, Meetings, Illegal trade

52-951

Contribution of southern ocean surface-water stratification to low atmospheric CO_2 concentrations during the last glacial period.

François, R., et al, *Nature,* Oct. 30, 1997, 389(6654), p.929-935, 28 refs.

Sea water, Chemical composition, Water flow, Sediments, Atmospheric composition, Carbon dioxide, —South Atlantic Ocean, —Indian Ocean

The nitrogen-isotope record preserved in southern ocean sediments, along with several geochemical tracers for the settling fluxes of biogenic matter, reveals patterns of past nutrient supply to phytoplankton and surface-water stratification in this oceanic region. Areal averaging of these spatial patterns indicates that reduction of the CO_2 'leak' from ocean to atmosphere by increased surface-water stratification south of the Polar Front made a greater contribution to the lowering of atmospheric CO_2 concentration during the Last Glacial Maximum than did the increased export of organic carbon from surface to deep waters occurring further north. (Auth.)

52-952

Ice-volcano interaction of the 1996 Gjálp subglacial eruption, Vatnajökull, Iceland.

Gudmundsson, M.T., Sigmundsson, F., Björnsson, H., *Nature,* Oct. 30, 1997, 389(6654), p.954-957, 28 refs.

Glaciers, Volcanoes, Meltwater, Heat transfer, Iceland

52-953

Antarctic ozone expands in altitude.

Monastersky, R., *Science news,* Oct. 25, 1997, 152(17), p.262.

Atmospheric composition, Ozone

The author gives an update on the state of the ozone hole over Antarctica as of Oct. 1997, based on conversations with David Hoffmann, a scientist at NOAA's Boulder, CO office. The destroyed ozone reached 20 km for the first time, according to balloon flight measurements in early Oct. Meanwhile, Paul Newman at NASA's Maryland facility confirmed the measurements and expressed optimism that this may be the beginning of the recovery of Antarctica's ozone over the next 15-20 years, if the top starts coming down.

52-954

Aircraft accident report—Continental Airlines, Inc., Flight 1713, McDonnell Douglas DC-9-14, N626TX, Stapleton International Airport, Denver, Colorado, November 15, 1987. *U.S. National Transportation Safety Board,* Sep. 1988, NTSB/AAR-88/09, 90p., PB88-910411.

Aircraft icing, Ice loads, Accidents, Safety

52-955

Aircraft accident report—Unstabilized approach and loss of control, NPA, Inc. dba United Express, Flight 2415, British Aerospace BA-3101, N41OUE, Tri-Cities Airport, Pasco, Washington, December 26, 1989. *U.S. National Transportation Safety Board,* Nov. 1991, NTSB/AAR-91/06, 62p., PB91-910406.

Aircraft icing, Ice loads, Accidents, Safety

52-956

Aircraft accident report—Ryan International Airlines, DC-9-15, N565PC, loss of control on takeoff, Cleveland-Hopkins International Airport, Cleveland, Ohio, February 17, 1991. *U.S. National Transportation Safety Board,* Nov. 1991, NTSB/AAR-91/09, 100p., PB91-910410.

Aircraft icing, Ice loads, Accidents, Safety

52-957

Solid-state aircraft icing sensor research.

Nelson, L.D., O'Brien, M.J., *U.S. National Science Foundation. Division of Industrial Science and Technological Innovation. Report,* Aug. 1989, NSF/ISI-89163, 43p., PB92-135730, 23 refs. Submitted to NSF under an SBIR (Small Business Innovative Research) grant.

Aircraft icing, Ice accretion, Ice detection, Ice electrical properties, Ice dielectrics, Electronic equipment, Electrical measurement, Monitors

52-958

Special investigation report: Piper Aircraft Corporation, PA-46 Malibu/Mirage accidents/incident, May 31, 1989 to March 17, 1991. *U.S. National Transportation Safety Board,* July 1992, NTSB/SIR-92/03, 95p., PB92-917007.

Aircraft icing, Ice loads, Accidents, Safety

52-959

Aircraft accident report: takeoff stall in icing conditions, USAIR Flight 405, Fokker F-28, N485US, LaGuardia Airport, Flushing, New York, March 22, 1992. *U.S. National Transportation Safety Board,* Feb. 1993, NTSB/AAR-93/02, 123p., PB93-910402.

Aircraft icing, Ice loads, Accidents, Safety

52-960

Cloud liquid water content measurement tests using dual-wavelength radar.

Martner, B.E., Kropfli, R.A., Ash, L.E., Snider, J.B., *U.S. National Oceanic and Atmospheric Administration. Environmental Research Laboratories. Environmental Technology Laboratory. NOAA technical memorandum,* Oct. 1993, ERL ETL-235, 47p., PB94-125960, 25 refs.

Aircraft icing, Ice forecasting, Cloud physics, Clouds (meteorology), Cloud droplets, Water content, Moisture detection, Meteorological instruments, Radar, Radio echo soundings

52-961

Aircraft accident report: in-flight icing encounter and loss of control, Simmons Airlines, d.b.a. American Eagle Flight 4184, Avions de Transport Regional (ATR), Model 72-212, N401AM, Roselawn, Indiana, October 31, 1994. Volume I. *U.S. National Transportation Safety Board,* July 1996, NTSB/AAR-96/01, 322p., PB96-910401.

Aircraft icing, Ice loads, Accidents, Safety

52-962

Aircraft accident report: in-flight icing encounter and loss of control, Simmons Airlines, d.b.a. American Eagle Flight 4184, Avions de Transport Regional (ATR), Model 72-212, N401AM, Roselawn, Indiana, October 31, 1994. Volume II. Response of Bureau Enquêtes-Accidents to Safety Board's draft report. *U.S. National Transportation Safety Board,* July 1996, NTSB/AAR-96/02, 274p. + appends., PB96-910402.

Aircraft icing, Ice loads, Accidents, Safety

52-963

Microfabricated ice detection sensor.

DeAnna, R.G., Mehregany, M., Roy, S., Zakar, E., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1997, NASA-TM-107432, 10p., ADA-327 064, 8 refs. Prepared for the Smart Structures and Materials Conference, San Diego, CA, Mar. 2-6, 1997, sponsored by the Society for Photo-Optical Instrumentation Engineers (SPIE). Also published as U.S. Army Research Laboratory, Technical report, ARL-TR-1355.

Aircraft icing, Ice detection, Ice electrical properties, Electrical measurement, Electronic equipment, Warning systems

52-964

Modern airfoil ice accretions.

Addy, H.E., Jr., Potapczuk, M.G., Sheldon, D.W., *U.S. National Aeronautics and Space Administration. Technical memorandum,* 1997, NASA-TM-107423, 13p., N1997-17671, 7 refs. Prepared for the 35th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 6-10, 1997, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Wind tunnels, Environmental tests, Computerized simulation

52-965

Experimental method for measuring water droplet impingement efficiency on two- and three-dimensional bodies.

Papadakis, M., Wichita, KS, State University, 1986, 354p., University Microfilms order No.DA8709283, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, July 1987, 48(1), p.192.

Jet engines, Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Supercooled clouds, Cloud droplets, Environmental tests, Computerized simulation

52-966

Three-dimensional numerical simulation of transient heat transfer occurring in electrothermal deicing systems.

Yaslik, A.D., Toledo, OH, University, 1991, 205p., University Microfilms order No.DA9216433, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, July 1992, 53(1), p.490.

Aircraft icing, Ice accretion, Ice heat flux, Ice removal, Ice melting, Artificial melting, Electric heating, Heat transfer, Mathematical models, Computer programs

52-967

Numerical investigation of Type II non-Newtonian de/anti-icing fluid effects on take-off performance for general aviation aircraft.

Cronin, D.J., Ames, Iowa State University, 1995, 212p., University Microfilms order No.DA9610950, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, June 1996, 56(12), p.6850.

Aircraft icing, Chemical ice prevention, Air flow, Turbulent boundary layer, Viscosity, Wind tunnels, Mathematical models

52-968

Measurements of the convective heat transfer coefficient from ice roughened surfaces in parallel and accelerated flows.

Dukhan, N.A.E.F., Toledo, OH, University, 1996, 365p., University Microfilms order No.DA9713232, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, May 1997, 57(11), p.7188.

Aircraft icing, Ice accretion, Ice heat flux, Ice air interface, Surface roughness, Air flow, Convection, Heat transfer coefficient, Mathematical models

52-969

Glaciology and meteorology of Anvers Island. Volume 1. Surface meteorological data for Palmer Station, Antarctica, February 1-December 31, 1965.

Rundle, A.S., Ahrnsbrak, W.F., Plummer, C.C., Columbus, Ohio State University, Research Foundation, June 1968, 374p., PB-180254, Prepared for the U.S. National Science Foundation.

Weather stations, Meteorological data, Wind velocity, Wind direction, Atmospheric pressure, Air temperature, Surface temperature, Antarctica—Palmer Station

52-970

Glaciology and meteorology of Anvers Island. Volume 2. Surface meteorological data for Palmer Station, Antarctica, January 1-December 31, 1966.

Rundle, A.S., DeWitt, S.R., Columbus, Ohio State University, Research Foundation, June 1968, 404p., Prepared for the U.S. National Science Foundation.

Weather stations, Meteorological data, Wind velocity, Wind direction, Atmospheric pressure, Air temperature, Surface temperature, Antarctica—Palmer Station

This report presents in tabular form, the results of surface meteorological observations at Palmer Station, Jan. 1-Dec. 31, 1966. The tabulated data consist of the hourly wind speed, quarter hourly wind direction, hourly air temperature, and hourly atmospheric pressure for each day. The data also include the average wind speed, mean wind direction, and fastest hour, the maximum, minimum, and mean temperature, and the maximum, minimum, and mean pressure for each day.

52-971

Extended abstracts.

International Conference on the Biogeochemistry of Trace Elements, 4th, University of California, Berkeley, CA, June 23-26, 1997, Iskandar, I.K., ed, Hardy, S.E., ed, Chang, A.C., ed, Pierzynski, G.M., ed, MP 5025, Hanover, NH, U.S. Army Cold Regions Research and Engineering Laboratory, 1997, 785p., For selected papers see 52-972 through 52-974.

Soil pollution, Soil chemistry, Geochemistry, Land reclamation, Plant physiology

52-972

Heavy metal remediation via the dispersion by chemical reaction process.

Marion, G.M., Brar, G.S., Pelton, D.K., Palazzo, A.J., Payne, J.R., MP 5026, International Conference on the Biogeochemistry of Trace Elements, 4th, University of California, Berkeley, CA, June 23-26, 1997. Extended abstracts. Edited by I.K. Iskander, et al, Hanover, NH, U.S. Army Cold Regions Research and Engineering Laboratory, 1997, p.413-414, 6 refs.

Soil pollution, Soil chemistry, Waste treatment, Liming, Land reclamation, Plant physiology

52-973

Root growth and metal uptake of plants grown on zinc-contaminated soils as influenced by soil treatment and plant species.

Palazzo, A.J., Lee, C.R., MP 5027, International Conference on the Biogeochemistry of Trace Elements, 4th, University of California, Berkeley, CA, June 23-26, 1997. Extended abstracts. Edited by I.K. Iskander, et al, Hanover, NH, U.S. Army Cold Regions Research and Engineering Laboratory, 1997, p.441-442, 3 refs.

Soil pollution, Soil chemistry, Waste treatment, Land reclamation, Roots, Plant physiology, Revegetation

52-974

Modeling the reactivity and transport of copper in soils.

Selim, H.M., Ma, L., Iskandar, I.K., Amacher, M.C., MP 5028, International Conference on the Biogeochemistry of Trace Elements, 4th, University of California, Berkeley, CA, June 23-26, 1997. Extended abstracts. Edited by I.K. Iskander, et al, Hanover, NH, U.S. Army Cold Regions Research and Engineering Laboratory, 1997, p.747-748, 3 refs.

Soil pollution, Soil chemistry, Geochemistry, Ion exchange

52-975

Operation Order 201. "Operation Deep Freeze". Specific annual seasons are indicated by suffix yr/yr, i.e. 97/98.

U.S. Naval Support Force Antarctica, Aug. 1997, var. p.

Research projects, Cold weather operation, Logistics, Military operation, Military facilities, Radio communication, Transportation

This Operation Order provides basic guidance for the conduct of "Operation Deep Freeze" 97/98, the annual U.S. Department of Defense operational and logistic support for the United States Antarctic Program (USAP). It lists 11 Annexes, including air and ship operations, logistics, administration, medical/dental services and requirements, field operations and communications. Eleven Appendices include air and ship operation schedules, scientific programs, communications plan, uniform standards and requirements, and a distribution list.

52-976

Determination of climatic parameters necessary for avalanche prediction risks within one day. [Détermination des paramètres météo nécessaires à la prévision du risque d'avalanche à échéance d'un jour]

Durand, Y., Mérindol, L., *La houille blanche,* 1997, 344(7), p.62-68, In French with English summary. 9 refs.

Avalanche forecasting, Alpine landscapes, Snow cover stability, Precipitation (meteorology), Meteorological factors, Mathematical models, Performance, Accuracy

52-977

Coupling a multi-layered snow model with a GCM. [Couplage d'un modèle de neige avec un modèle de climat]

Brun, E., Martin, E., Spiridonov, V., *La houille blanche,* 1997, 344(7), p.69-75, In French with English summary. 27 refs.

Climatology, Snow cover distribution, Snow cover structure, Snow crystal structure, Layers, Albedo, Snow heat flux, Snow air interface, Snow cover effect, Simulation, Seasonal variations

52-978

Objective determination of snow grains characteristics from images. [Détermination objective des caractéristiques des grains de neige à partir d'images]

Lesaffre, B., Pougatch, E., Martin, E., *La houille blanche,* 1997, 344(7), p.76-82, In French with English summary. 6 refs.

Snow physics, Snow crystal structure, Grain size, Snow optics, Classifications, Imaging, Image processing, Simulation, Computer applications, Computer programs

52-979

Periodic assessment of energy and seasonal hydrological patterns of the Zongo Glacier (Bolivia). [Bilan d'énergie ponctuel et saisonnalité hydrologique du glacier Zongo (Bolivie)]

Wagnon, P., Ribstein, P., *La houille blanche,* 1997, 344(7), p.83-87, In French with English summary. 12 refs.

Mountain glaciers, Glacial hydrology, Glacier melting, Snow air interface, Runoff, Snow heat flux, Radiation balance, Humidity, Sublimation, Seasonal variations, Bolivia—Zongo Glacier

52-980

Quality of ferritic-bainitic steel X70 for welded pipes of arctic gas trunk pipelines.

Litvinenko, D.A., Chu, V.U., Li, S.V., Chevskaia, O.N., *Steel in translation,* 1996, 26(7), p.57-61, Translated from Stal'.

Pipes (tubes), Gas pipelines, Steels, Microstructure, Chemical properties, Admixtures, Cold weather performance, Tensile properties, Impact strength, Temperature effects

52-981

Real-time kinetics of the uptake of $ClONO_2$ on ice and in the presence of HCl in the temperature range 160 K≤ T ≤ 200 K.

Oppliger, R., Allanic, A., Rossi, M.J., *Journal of physical chemistry A,* Mar. 6, 1997, 101(10), p.1903-1911, 35 refs.

Climatology, Cloud physics, Doped ice, Heterogeneous nucleation, Polar stratospheric clouds, Ice vapor interface, Adsorption, Mass balance, Substrates, Temperature effects, Simulation

52-982

Activation energy for the emission of 420 nm luminescence from UV-excited polycrystalline H_2O ice.

Quickenden, T.I., Hanlon, A.R., Freeman, C.G., *Journal of physical chemistry A,* June 19, 1997, 101(25), p.4511-4516, 20 refs.

Ice physics, Luminescence, Ultraviolet radiation, Ice temperature, Temperature effects, Molecular energy levels

52-983

Freezing of $HNO_3/H_2SO_4/H_2O$ solutions at stratospheric temperatures: nucleation statistics and experiments.

Koop, T., Luo, B.P., Biermann, U.M., Crutzen, P.J., Peter, T., *Journal of physical chemistry A,* Feb. 6, 1997, 101(6), p.1117-1133, 68 refs.

Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Hydrates, Freezing rate, Heterogeneous nucleation, Ice formation, Simulation, Laboratory techniques, Statistical analysis

52-984

Crystallization kinetics of HNO_3/H_2O films representative of polar stratospheric clouds.

Tisdale, R.T., Middlebrook, A.M., Prenni, A.J., Tolbert, M.A., *Journal of physical chemistry A,* Mar. 13, 1997, 101(11), p.2112-2119, 48 refs.

Climatology, Polar atmospheres, Polar stratospheric clouds, Cloud physics, Supercooled clouds, Aerosols, Heterogeneous nucleation, Nucleation rate, Ice spectroscopy, Infrared spectroscopy, Simulation

The crystallization of binary HNO_3/H_2O aerosols may be an important step in the formation of type Ia polar stratospheric clouds. Fourier transform infrared (FTIR) spectroscopy is used to probe the crystallization kinetics of supercooled H_2O:HNO_3 films to nitric acid dihydrate (NAD) and trihydrate (NAT), respectively. Homogeneous nucleation calculations were performed using the temperature-dependent activation energies in conjunction with previous measurements of aerosol nucleation rates at 190-202 K to determine the freezing rates for HNO_3/H_2O particles over a wide temperature range. These calculations indicate that nucleation of NAD from supercooled 2:1 H_2O:HNO_3 aerosols is rapid at relevant stratospheric temperatures. (Auth. mod.)

52-985

Heterogeneous interactions of HBr and HOCl with cold sulfuric acid solutions: implications for arctic boundary layer bromine chemistry.

Abbatt, J.P.D., Nowak, J.B., *Journal of physical chemistry A,* Mar. 13, 1997, 101(11), p.2131-2137, 29 refs.

Climatology, Atmospheric boundary layer, Aerosols, Solubility, Cloud physics, Degradation, Photochemical reactions, Heterogeneous nucleation, Vapor pressure, Ozone, Simulation

52-986

Interaction of HCl with ice: investigation of the predicted trihydrate, hexahydrate, and monolayer regimes.

Foster, K.L., Tolbert, M.A., George, S.M., *Journal of physical chemistry A,* July 3, 1997, 101(27), p.4979-4986, 46 refs.

Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Hydrates, Heterogeneous nucleation, Monomolecular films, Ice vapor interface, Adsorption, Temperature effects, Ice spectroscopy, Simulation

Knowledge of the interaction of hydrogen chloride (HCl) with ice is important for an understanding of heterogeneous reactions on polar stratospheric clouds. The interaction of HCl with ice as a function of ice temperature, HCl partial pressure, and ice film thickness was studied using laser-induced thermal desorption (LITD) techniques. Ice films were prepared by depositing H_2O vapor onto a cooled Al_2O_3 substrate. The ice was then exposed to HCl partial pressures at ice temperatures from 140 to 186 K. HCl uptake by ice was monitored as a function of time using the HCl LITD signals. At stratospheric temperatures between 180 and 186 K, HCl uptake on ice

varied from 4 X 10^{14} to 2 x 10^{16} molecules/cm^2, a variation attributed to varying ice surface roughness. HCl uptake was limited to ca. 1 ML on the smoothest ice films, in agreement with previous estimates of monolayer HCl uptake by stratospheric ice. (Auth. mod.)

52-987

Global thermodynamic atmospheric modeling: search for new heterogeneous reactions.

Fairbrother, D.H., Sullivan, D.J.D., Johnston, H.S., *Journal of physical chemistry A,* Oct. 2, 1997, 101(40), p.7350-7358, 23 refs.

Climatology, Polar atmospheres, Stratosphere, Aerosols, Degradation, Heterogeneous nucleation, Photochemical reactions, Models, Thermodynamics

This article demonstrates quantitatively how far reactions are from chemical equilibrium over the full space of a two-dimensional atmospheric model. One purpose of this study is to seek additional stratospheric or tropospheric gas-phase chemical reactions that might undergo heterogeneous catalysis. If a reaction is interesting, is slow in the gas phase, and has a high thermodynamic tendency to react, it is a good candidate for a laboratory study to seek a heterogeneous catalyst. Four heterogeneous reactions important in causing the antarctic "ozone hole" have high thermodynamic tendencies to occur under atmospheric conditions, but one of these is only weakly thermodynamically allowed in some regions of the atmosphere. The reaction of SO_2 and HNO_3 to form HONO has a high thermodynamic potential to occur, is a well-known laboratory reaction at ice temperature, and may occur in nitric acid-rich sulfate aerosols. (Auth. mod.)

52-988

Air-to-snow mineral transfer—crustal elements in aerosols, fresh snow and snowpits on the Greenland ice sheet.

Colin, J.L., et al, *Atmospheric environment,* Oct. 1997, 31(20), p.3395-3406, Refs. p.3404-3406.

Climatology, Snow air interface, Ice sheets, Snowstorms, Scavenging, Snow composition, Aerosols, Sampling, Geochemistry, Minerals, Seasonal variations, Greenland—Summit

52-989

Regional atmospheric deposition patterns of Ag, As, Bi, Cd, Hg, Mo, Sb and Tl in a 188,000 km^2 area in the European Arctic as displayed by terrestrial moss samples—long-range atmospheric transport vs local impact.

Reimann, C., et al, *Atmospheric environment,* Dec. 1997, 31(23), p.3887-3901, Refs. p.3899-3901.

Climatology, Air pollution, Polar atmospheres, Aerosols, Metals, Geochemistry, Mosses, Monitors, Environmental tests, Atmospheric circulation, Sampling, Mapping

52-990

On the measurements of cloud condensation nuclei at Palmer Station, Antarctica.

DeFelice, T.P., Saxena, V.K., Yu, S.C., *Atmospheric environment,* Dec. 1997, 31(23), p.4039-4044, 16 refs.

Climatology, Cloud physics, Cloud cover, Supersaturation, Atmospheric composition, Condensation nuclei, Atmospheric boundary layer, Sampling, Antarctica—Palmer Station

CCN (cloud condensation nuclei) spectral measurements are especially rare in the antarctic region. This paper presents and discusses the predominant characteristics associated with a first dataset of daily daylight period averaged CCN spectral measurements at a remote region of the globe, namely Palmer Station. Daily daylight period averages are chosen since the day is dominated by daylight during the sampling period and the CCN measurement frequency is a maximum during the daylight period. (Auth. mod.)

52-991

Microscale heat transfer in biological systems at low temperatures.

Rubinsky, B., *Experimental heat transfer,* Jan.-Mar. 1997, 10(1), p.1-29, 90 refs.

Microbiology, Cryobiology, Microstructure, Ice formation, Antifreezes, Freezing points, Temperature effects, Heat transfer, Ice water interface, Cold tolerance, Damage

52-992

Cloud top phase determination from the fusion of signatures in daytime AVHRR imagery and HIRS data.

Hutchison, K.D., Etherton, B.J., Topping, P.C., Huang, H.L., *International journal of remote sensing,* Oct. 1997, 18(15), p.3245-3262, 18 refs.

Remote sensing, Cloud cover, Cloud physics, Sounding, Radiometry, Water vapor, Profiles, Ice detection, Ice crystal optics, Image processing, Classifications

52-993

Severe chemical ozone loss in the Arctic during the winter of 1995-96.

Müller, R., et al, *Nature,* Oct. 16, 1997, 389(6652), p.709-712, 36 refs.

Ozone, Atmospheric composition, Polar stratospheric clouds, Air temperature, Remote sensing, Polar regions

52-994

Bad winter for Arctic ozone.

Stolarski, R., *Nature,* Oct. 23, 1997, 389(6653), p.788-789, 2 refs.

Ozone, Stratosphere, Air temperature, Photochemical reactions

52-995

Prolonged stratospheric ozone loss in the 1995-96 Arctic winter.

Rex, M., et al, *Nature,* Oct. 23, 1997, 389(6653), p.835-838, 30 refs.

Ozone, Stratosphere, Atmospheric composition, Chemical composition, Polar stratospheric clouds

52-996

Observed hemispheric asymmetry in global sea ice changes.

Cavalieri, D.J., Gloersen, P., Parkinson, C.L., Comiso, J.C., Zwally, H.J., *Science,* Nov. 7, 1997, 278(5340), p.1104-1106, 22 refs.

Sea ice distribution, Carbon dioxide, Climatic changes

From Nov. 1978 through Dec. 1996, the areal extent of sea ice decreased by 2.9% per decade in the Arctic and increased by 1.3% per decade in the Antarctic. The observed hemispheric asymmetry in these trends is consistent with a modeled response to a carbon dioxide-induced climate warming. The interannual variations, which are 2.3% of the annual mean in the Arctic, with a predominant period of about 5 years, and 3.4% of the annual mean in the Antarctic, with a predominant period of about 3 years, are uncorrelated. (Auth.)

52-997

Lake Baikal record of continental climate response to orbital insolation during the past 5 million years.

Williams, D.F., et al, *Science,* Nov. 7, 1997, 278(5340), p.1114-1117, 48 refs.

Climatic changes, Insolation, Sediments, Russia—Baykal, Lake

52-998

Airborne polar experiment (APE). Tests and qualification of the scientific instrumentation installed on the stratospheric platform M-55 aircraft.

De Rossi, G., Puccini, M., Puccetti, G., *SPIE—The International Society for Optical Engineering. Proceedings,* 1995, Vol.2583, Advanced and next-generation satellites. Edited by H. Fujisada and M.N. Sweeting, p.301-311, 4 refs.

DLC TL796.A33 1995

Research projects, Polar regions, Aircraft, Stratosphere, Polar stratospheric clouds, Troposphere

The paper describes the environmental tests to be carried out on the scientific instrumentation to be flown on the M-55 Geophysika in the frame of the APE Program. The instruments, developed by different European research institutes, are for remote sensing and *in situ* measurements of the major components of the Earth's stratosphere. The paper presents the technological activities that ENEA (Ente Nazionale per le Nuove Tecnologie l'Energia e l'Ambiente) is carrying out in its laboratories to verify the correspondence of the various instruments to meet the requirements for airborne application. The reference documents used have been the RTCA/DO-160C and the MDB (Myasishchev Design Bureau) specifications. The program considers at present the fulfillment of two experimental campaigns, a first one in the Arctic and a second one in Antarctica. (Auth. mod.)

52-999

Design concepts for OLME experiment on board FASat-Alfa microsatellite.

Valenzuela, A., Mujica, F., *SPIE—The International Society for Optical Engineering. Proceedings,* 1995, Vol.2583, Advanced and next-generation satellites. Edited by H. Fujisada and M.N. Sweeting., p.576-584, 10 refs.

DLC TL796.A33 1995

Research projects, Aircraft, Ozone, Measuring instruments

The Ozone Layer Monitoring Experiment (OLME) is one of the primary payloads for the Chilean FASat-Alfa microsatellite. The objective of this experiment is to measure Solar Backscattered Ultra Violet (SBUV) radiation at several wavelengths, with the purpose to retrieve total ozone content, specially over Chile and Antarctica. The OLME instrument must be light, small and relatively cheap, to meet the mission constraints, so a simple unorthodox design is pursued, using CCDs and interference filters, together with non-imaging detectors. The design concepts behind this new approach to ozone remote sensing are presented, together with the processing procedures developed to retrieve ozone content from radiance measurements. (Auth.)

52-1000

Antarctica: East Queen Maud Land - Enderby Land Glaciological Folio.

Watanabe, O., ed, Glaciological Folio Series, Tokyo, National Institute of Polar Research, Apr. 1997, var. p., Refs. passim.

Glaciology, Research projects, Ice surface, Topographic surveys, Maps, Snow accumulation, Traverses, Snow surface, Snow temperature, Meteorological data, Antarctica—Queen Maud Land, Antarctica—Enderby Land

This binder presents the results of a comprehensive glaciological research program carried out, in east Queen Maud Land and Enderby Land, by the Japanese antarctic research expeditions between 1967 and 1997. Included are maps of the area investigated showing the following: the ice sheet surface features; the prevailing windfield, inferred from the snow surface topography; snow accumulation (surface mass balance); snow surface features along various traverse routes; the 10-m snow temperature; bedrock topography; and a base map. Each map comes with a text discussing the data and a list of references.

52-1001

Earth cryosphere as an object of cryology. [Kriosfera Zemli kak ob"ekt kriologii]

Mel'nikov, V.P., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.5-13, In Russian with English summary. 21 refs.

Geocryology, Atmospheric physics

52-1002

Cryosphere in the Earth history. [Kriosfera v istorii Zemli]

Konishchev, V.N., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.14-20, In Russian with English summary. 23 refs.

Geocryology, Paleoecology, Glacial geology

52-1003

Environmental restructuring at the Pleistocene/Holocene boundary in the East Siberian Arctic and its role in mammalian extinction and establishment of modern ecosystems. [Prirodnaia perestroika v Vostochno-Sibirskoĭ Arktike na rubezhe pleĭstotsena i golotsena i ee rol' v vymiranii mlekopitaiushchhikh i stanovlenii sovremennykh ekosistem]

Sher, A.V., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.21-29, In Russian with English summary. 35 refs.

Pleistocene, Paleoecology, Tundra vegetation, Steppes, Permafrost, Russia—Siberia

52-1004

Regionalization of the territory of the permafrost zone by the extent to which ecological conditions are affected by technological geocryological processes. [Raĭonirovanie territorii kriolitozony po stepeni vliianiia tekhnogennykh geokriologicheskikh protsessov na ekologicheskie usloviia]

Garagulia, L.S., Gordeeva, G.I., Khrustalev, L.N., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.30-38, In Russian with English summary. 4 refs.

Permafrost, Geocryology, Engineering geology, Permafrost beneath structures, Frost heave, Thermokarst, Permafrost beneath roads

52-1005

Snow cover changes and their role in climate. [Izmeneniia snezhnogo pokrova i ikh klimaticheskaia rol']

Krenke, A.N., Kitaev, L.M., Turkov, D.V., Kadomtseva, T.G., Aĭzina, E.M., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.39-46, In Russian with English summary. 16 refs.

Snow cover effect, Climatic changes, Snow depth, Remote sensing, Snow water content, Snow water equivalent

52-1006

Permafrost-climatic monitoring of Russia: methodology, results of observation and forecast. [Merzlotno-klimaticheskiĭ monitoring Rossii: metodologiia, rezul'taty nabliudeniĭ, prognoz]

Pavlov, A.V., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.47-58, In Russian with English summary. 33 refs.

Global warming, Climatic changes, Permafrost thermal properties, Air temperature, Temperature effects, Geocryology, Frozen ground temperature, Active layer, Thaw depth, Russia—Siberia

52-1007

Prediction of permafrost thawing and distribution and changes of frost soil cracking for the territory of Russia under climate warming. [Prognoz ottaivaniia i raspredeleniia vechnoĭ merzloty i izmeneniia kriogennogo rastreskivaniia gruntov na territorii Rossii pri poteplenii klimata]

Grechishchev, S.E., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.59-65, In Russian with English summary. 5 refs.

Permafrost, Frost shattering, Cryogenic soils, Ground thawing, Global change, Global warming, Forecasting, Thaw depth, Analysis (mathematics), Russia

52-1008

Tendency in evolution of the seasonally frozen ground zone of West Siberia for the nearest decades. [O tendentsii v evoliutsii sezonnoĭ kriolitozony Zapadnoĭ Sibiri na blizhaĭshie desiatiletiia]

Skorbilin, N.A., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.66-68, In Russian with English summary. 12 refs.

Frozen ground, Frost penetration, Russia—Siberia

52-1009

Peculiarities of frozen saline grounds and their electric and elastic properties. [Osobennosti zasolennykh merzlykh gruntov i ikh elektricheskie i uprugie svoĭstva]

Chervinskaia, O.P., Zykov, IU.D., Frolov, A.D., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.69-77, In Russian with English summary. 12 refs.

Frozen ground, Saline soils, Salinity, Electrical properties, Elastic properties, Analysis (mathematics)

52-1010

Ice property at high concentration of structure defects. [Svoĭstva l'da pri vysokoĭ kontsentratsii strukturnykh defektov]

Shavlov, A.V., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.78-86, In Russian with English summary. 12 refs.

Ice structure, Ice electrical properties, Ice deformation, Temperature effects, Amorphous ice, Spectra, Ice physics

52-1011

Mechanisms of the atmospheric vortexes. [Mekhanizmy atmosfernykh vikhreĭ]

Mel'nikov, V.P., Sumul'skiĭ, I.I., *Kriosfera zemli,* Jan.-Mar. 1997, 1(1), p.87-96, In Russian with English summary. 30 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric disturbances, Air flow, Permafrost, Solar radiation, Supercooling

52-1012

Cryopedology '97: II International Conference: abstracts of papers. [Kriopedologiia 97: II mezhdunarodnaia konferentsiia , Rossiia, Syktyvkar, 5-8 avgusta 1997 g.: tezisy dokladov]

International Conference on Cryopedology, 2nd, Syktyvkar, Russia, Aug. 5-8, 1997, Zaboeva, I.V., ed, Syktyvkar, Russia, Institut biologii Komi NTs UrO Rossiĭskoĭ AN, 1997, 207p., 134 abstracts in Russian and English.

Permafrost, Frozen ground, Soil mapping, Data processing, Cryogenic soils, Tundra soils, Soil pollution, Ecology, Taiga, Russia

52-1013

Problems of Earth Cryosphere; basic and applied studies: abstracts of papers. [Mezhdunarodnaia konferentsiia "Problemy kriologii zemli"; fundamental'nye i prikladnye issledovaniia; Pushchino, 21-25 aprelia 1997: tezisy dokladov]

International conference on "Problems of Earth Cryosphere"; basic and applied studies, Pushchino, April 21-25, 1997, Pushchino, Pushchinskiĭ nauchnyĭ tsentr RAN, 1997, 313p., 153 abstracts in Russian and English.

Geocryology, Permafrost, Periglacial processes, Microbiology, Bacteria, Frozen ground mechanics, Frozen ground physics, Data processing

52-1014

Characterization of viable bacteria from Siberian permafrost by 16S rDNA sequencing.

Shi, T., Reeves, R.H., Gilichinskiĭ, D.A., Friedmann, E.I., *Microbial ecology,* 1997, 33(3), p.169-179, 52 refs.

Bacteria, Microbiology, Permafrost, Cryobiology, Soil microbiology, Russia—Siberia

52-1015

Snow cover and seasonal freezing of ground in northern Tian'-Shan. [Snezhnyĭ pokrov i sezonnoe promerzanie gruntov severnogo Tian'-Shania]

Severskiĭ, I.V., Severskiĭ, E.V., Yakutsk, Institut merzlotovedeniia SO AN SSSR, 1990, 181p., In Russian.

Snow cover effect, Soil freezing, Slope orientation, Geocryology, Snow water content, Air temperature, Thaw depth, Frost penetration, Frozen ground temperature, Soil temperature, Tien Shan

52-1016

Permafrost in Kyrgyzstan. [Vechnaia merzlota v Kirgizii]

Gorbunov, A.P., Frunze, ILIM, 1966, 75p., In Russian. 5 refs.

Permafrost, Alpine landscapes, Landscape development, Permafrost origin, Ground ice, Lacustrine deposits, Solifluction, Naleds, Frost shattering, Kyrgyzstan, Tien Shan

52-1017

Abstracts of the Proceedings of the 1st International Conference on Cryopedology.

Gilichinskiĭ, D.A., ed, International Conference on Cryopedology, 1st, Pushchino, Nov. 10-16, 1992, Pushchino, Pushchino Research Centre, 1992, 85p., 94 abstracts. Proceedings include "Cryosols: the effects of cryogenesis on the processes and peculiarities of soil formation," (Nov. 10-14) and "Joint Russian-American Seminar on Cryopedology and Global Change" (Nov. 15-16). For individual papers see 47-1700 through 47-1743.

Geocryology, Permafrost, Cryogenic soils, Desert soils, Soil profiles, Soil formation, Soil microbiology, Soil chemistry, Frozen ground

52-1018

Oxygen isotope content of ground ice. [Izotopnokislorodnyĭ sostav podzemnykh l'dov]

Koniakhin, M.A., Mikhalev, D.V., Solomatin, V.I., Moscow, Moskovskiĭ gosudarstvennyĭ universitet, 1996, 155p., In Russian with English table of contents and summary. 67 refs.

Oxygen isotopes, Ground ice, Ice composition, Ice wedges, Snow cover, Ground water, Surface waters, Active layer, Permafrost physics, Paleoecology, Russia

52-1019

Recognition and interpretation of flow direction indicators for former glaciers and meltwater streams.

Ryder, J.M., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.1-22, 28 refs.
DLC QE579.D75

Glacial geology, Glacial hydrology, Geomorphology, Mountain glaciers, Landforms, Bedrock, Outwash, Meltwater, Glacial erosion, Striations, Glacier flow

52-1020

Drift exploration potential maps derived from terrain geology maps.

Proudfoot, D.N., Bobrowsky, P.T., Meldrum, D.G., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.23-31, 28 refs.
DLC QE579.D75

Geological surveys, Glacial geology, Glacial deposits, Quaternary deposits, Glacier flow, Sedimentation, Geological maps, Minerals, Exploration

52-1021

Glacial geology applied to drift prospecting in Buttle Valley, Vancouver Island.

Hicock, S.R., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.33-41, 8 refs.
DLC QE579.D75

Geological surveys, Alpine landscapes, Glacial geology, Bedrock, Glacial deposits, Glacial erosion, Tectonics, Minerals, Exploration, Glacier flow, Geochemistry, Canada—British Columbia—Vancouver Island

52-1022

Drift-prospecting sampling methods.

Plouffe, A., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.43-52, 29 refs.
DLC QE579.D75

Glacial geology, Mineralogy, Bedrock, Exploration, Trenching, Glacial deposits, Drill core analysis, Core samplers, Performance

52-1023

Quaternary stratigraphy and till geochemistry in the Tintina Trench, near Faro and Ross River, Yukon Territory.

Plouffe, A., Jackson, L.E., Jr., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.53-66, 40 refs.
DLC QE579.D75

Glacial geology, Glacial deposits, Quaternary deposits, Bedrock, Geochemistry, Stratigraphy, Lithology, Gold, Sampling, Exploration, Canada—Yukon Territory—Tintina Trench

52-1024

Glacial dispersal patterns of mineralized bedrock: with examples from the Nechako Plateau, central British Columbia.

Levson, V.M., Giles, T.R., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.67-76, 44 refs.
DLC QE579.D75

Glacial geology, Bedrock, Glacial deposits, Glacier flow, Sediment transport, Mineralogy, Exploration, Lithology, Soil chemistry, Sampling, Canada—British Columbia—Nechako Plateau

52-1025
Origin and stratigraphy of Pleistocene gravels in Dawson Range and suggestions for future exploration of gold placers, southwestern Carmacks map area (NTS 1151).
Jackson, L.E., Jr., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.77-83, 26 refs.
DLC QE579.D75
Pleistocene, Geological surveys, Quaternary deposits, Glacial geology, Glacial deposits, Outwash, Gravel, Exploration, Stratigraphy, Placer mining, Gold, Canada—Yukon Territory—Dawson Range

52-1026
Glacial dispersal of indicator boulders; some aspects of a case study from the Lower Saint Lawrence region, Quebec.
Rappol, M., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.107-112, 16 refs.
DLC QE579.D75
Pleistocene, Glacial geology, Glacier flow, Glacial erosion, Sediment transport, Bedrock, Rocks, Lithology, Glacial deposits, Ice solid interface, Canada—Quebec—St. Lawrence Valley

52-1027
Lithological analysis in drift prospecting studies.
Bobrowsky, P.T., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.113-120, Refs. p.118-120.
DLC QE579.D75
Glacial geology, Mineralogy, Glacial deposits, Exploration, Sampling, Geochemistry, Lithology, Sediment transport, Statistical analysis

52-1028
Effective low-cost reconnaissance drift prospecting in areas of variable terrain: an example from the south-east Taseko Lakes area, central British Columbia.
Broster, B.E., Huntley, D.H., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.121-126, 25 refs.
DLC QE579.D75
Glacial geology, Glacial deposits, Sediment transport, Glacier flow, Glacial erosion, Landforms, Terrain identification, Exploration, Alpine landscapes, Lithology, Canada—British Columbia—Taseko Lakes

52-1029
Residence sites of trace elements in oxidized till.
DiLabio, R.N.W., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.139-148, 30 refs.
DLC QE579.D75
Glacial geology, Glacial deposits, Mineralogy, Gold, Geochemistry, Lithology, Grain size, Classifications, Exploration

52-1030
Geochemical partitioning in till.
Shilts, W.W., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.149-163, 17 refs.
DLC QE579.D75
Glacial geology, Glacial deposits, Glacial erosion, Lithology, Clays, Grain size, Mineralogy, Classifications, Geochemistry

52-1031
Standard laboratory procedure for separating clay-sized detritus from unconsolidated glacial sediments and their derivatives.
Lindsay, P.J., Shilts, W.W., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.165-166, 4 refs.
DLC QE579.D75
Glacial geology, Glacial deposits, Clays, Sedimentation, Decomposition, Sampling, Laboratory techniques

52-1032
Analytical methods for drift.
Lett, R.E., Drift exploration of the Canadian Cordillera. Edited by P.T. Bobrowsky et al. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Mineral Resources Division. Geological Survey Branch. Paper 1995-2, Victoria, 1995, p.215-228, Refs. p.225-228.
DLC QE579.D75
Glacial geology, Glacial deposits, Mineralogy, Gold, Detection, Sampling, Geochemistry, Laboratory techniques, Classifications

52-1033
Stretching mode of deposited CO as a probe for the morphology of 5 K ices.
Givan, A., Loewenschuss, A., Nielsen, C.J., *Chemical physics letters,* Aug. 22, 1997, 275(1-2), p.98-102, 30 refs.
Ice physics, Ice structure, Molecular structure, Ice spectroscopy, Infrared spectroscopy, Adsorption, Monomolecular films, Ice vapor interface, Profiles, Spectra, Low temperature tests

52-1034
Analysis of the arctic aerosol for a ten year period using various neutron activation analysis methods.
Landsberger, S., Zhang, P., Wu, D., Chatt, A., *Journal of radioanalytical and nuclear chemistry,* Mar. 1997, 217(1), International Conference on Modern Trends in Activation Analysis, 9th, Seoul, Korea, Sep. 24-30, 1995. Proceedings, Part 5, p.11-15, 11 refs.
Climatology, Polar atmospheres, Aerosols, Air pollution, Environmental tests, Neutron activation analysis, Sampling, Statistical analysis, Seasonal variations, Correlation

52-1035
Adjustment and feedbacks in a global coupled ocean-atmosphere model.
Braconnot, P., Marti, O., Joussaume, S., *Climate dynamics,* Aug. 1997, 13(7-8), p.507-519, 58 refs.
Climatology, Global change, Atmospheric physics, Surface temperature, Greenhouse effect, Heat flux, Solar radiation, Air ice water interaction, Ice cover effect, Simulation

52-1036
Observational study of the influence of the Great Lakes on the speed and intensity of passing cyclones.
Angel, J.R., Isard, S.A., *Monthly weather review,* Sep. 1997, 125(9), p.2228-2237, 22 refs.
Climatology, Atmospheric circulation, Lake effects, Atmospheric boundary layer, Wind velocity, Seasonal variations, Statistical analysis, Lake ice, Ice cover effect, Air ice water interaction, Climatic factors, United States—Great Lakes

52-1037
Evolution of the Martian water cycle.
Houben, H., Haberle, R.M., Young, R.E., Zent, A.P., *Advances in space research,* Apr. 1997, 19(8), Planetary atmospheres and ionospheres and reference atmospheres: Proceedings of the C3.1 Symposium of COSPAR Scientific Commission C held during the 31st COSPAR Scientific Assembly, Birmingham, UK, 14-21 July 1996. Edited by L.V. Zasova, p.1233-1236, 11 refs.
Extraterrestrial ice, Mars (planet), Atmospheric composition, Climatology, Regolith, Adsorption, Water vapor, Hydrologic cycle, Ice sheets, Ice sublimation, Simulation

52-1038
Sensitivity of Martian southern polar cap edge winds and surface stresses to dust optical thickness and to the large-scale sublimation flow.
Siili, T., Haberle, R.M., Murphy, J.R., *Advances in space research,* Apr. 1997, 19(8), Planetary atmospheres and ionospheres and reference atmospheres: Proceedings of the C3.1 Symposium of COSPAR Scientific Commission C held during the 31st COSPAR Scientific Assembly, Birmingham, UK, 14-21 July 1996. Edited by L.V. Zasova, p.1241-1244, 14 refs.
Extraterrestrial ice, Ice sheets, Mars (planet), Climatology, Surface temperature, Atmospheric composition, Optical properties, Wind direction, Dust, Ice sublimation, Ice cover effect, Mathematical models

52-1039
Meltwater pulses in the northern North Atlantic: retrodiction and forecast by numerical modelling.
Schäfer-Neth, C., Stattegger, K., *Geologische Rundschau,* Aug. 1997, 86(2), p.492-498, 20 refs.
Pleistocene, Oceanography, Ocean currents, Ice sheets, Glacier melting, Meltwater, Salinity, Mathematical models, Forecasting, North Atlantic

52-1040
Glaciomarine sedimentation and palaeo-glacial setting of Maxwell Bay and its tributary embayment, Marian Cove, South Shetland Islands, West Antarctica.
Yoon, H.I., Han, M.W., Park, B.K., Oh, J.K., Chang, S.K., *Marine geology,* Aug. 1997, 140(3-4), p.265-282, 46 refs.
Marine geology, Glacial geology, Marine deposits, Glacial deposits, Bottom topography, Stratigraphy, Seismic surveys, Glacier oscillation, Sedimentation, Pleistocene, Antarctica—Marian Cove
High-resolution seismic profiles and piston cores were collected from Maxwell Bay and its tributary embayment, Marian Cove, during the Korea Antarctic Research Program (1992-93 and 1995-96) to elucidate the glaciomarine sedimentation processes and recent glacial history of the area. Sediment cores from the cover penetrated three distinct fining-upward lithofacies: basal till in the lower part of the core, accumulated just seaward of the grounding line of the tidewater glacier; interlaminated sand and mud in the middle part, deposited in ice-proximal zone by a combination of episodic subglacial meltwater inflow and iceberg dumping; and pebbly mud in the upper part, deposited in ice-distal zone by both surface meltwater plume and ice-rafting from the glacier front. (Auth. mod.)

52-1041
Evaluation of conditions along the grounding line of temperate marine glaciers: an example from Muir Inlet, Glacier Bay, Alaska.
Seramur, K.C., Powell, R.D., Carlson, P.R., *Marine geology,* Aug. 1997, 140(3-4), p.307-327, 52 refs.
Marine geology, Glacial geology, Geomorphology, Deltas, Moraines, Bottom sediment, Sedimentation, Subglacial drainage, Grounded ice, Ice edge, Seismic reflection, Profiles, Periodic variations, United States—Alaska—Glacier Bay

52-1042
Ice jam database.
White, K.D., Griffin, G.E., MP 5029, *Military engineer,* Aug.-Sep. 1997, 89(586), p.39-41.
River ice, Ice jams, Periodic variations, Flood forecasting, Statistical analysis, Computer applications, Computer programs, Data processing

52-1043
Chukotka: a natural-economic review. [Chukotka: prirodno-ekonomicheskiĭ ocherk]
Kotov, A.N., ed, Moscow, Art-Liteks, 1995, 370p. (Pertinent p.15-150, 250-370), In Russian with summary in Chukchi, Koryak, English and French. 375 refs.
Natural resources, Permafrost, Ground ice, Ecosystems, Ecology, Economic development, Russia—Chukotskiy Peninsula

52-1044

Matched-field localization for multiple sources in an uncertain environment, with application to arctic ambient noise.

Greening, M.V., Zakarauskas, P., Dosso, S.E., *Acoustical Society of America. Journal,* June 1997, 101(6), p.3525-3538, 47 refs.

Underwater acoustics, Ice acoustics, Pressure ridges, Cracking (fracturing), Sounding, Spectra, Sound waves, Wave propagation, Detection, Orientation, Origin, Ice cover effect, Mathematical models

52-1045

Molecular surface structure of ice (0001): dynamical low-energy electron diffraction, total-energy calculations and molecular dynamics simulations.

Materer, N., et al, *Surface science,* June 10, 1997, 381(2-3), p.190-210, 51 refs.

Ice physics, Surface structure, Molecular structure, Layers, Ice spectroscopy, Molecular energy levels, Vibration, Lattice models, Ice models, Simulation

52-1046

Landscape change following deforestation at the arctic tree line in Québec, Canada.

Arseneault, D., Payette, S., *Ecology,* Apr. 1997, 78(3), p.693-706, Refs. p.705-706.

Plant ecology, Forest lines, Forest tundra, Tundra vegetation, Vegetation patterns, Fires, Environmental impact, Revegetation, Landscape development, Permafrost origin, Peat, Radioactive age determination, Snow cover effect, Canada—Quebec

52-1047

Elastic moduli and instability in molecular crystals.

Shpakov, V.P., Tse, J.S., Belosludov, V.R., Belosludov, R.V., *Journal of physics: condensed matter,* July 7, 1997, 9(27), p.5853-5865, 25 refs.

Ice physics, Molecular structure, Molecular energy levels, Phase transformations, High pressure ice, Amorphous ice, Lattice models, Analysis (mathematics), Ice elasticity, Thermodynamics

52-1048

Nitrogen fluxes in a high elevation Colorado Rocky Mountain basin.

Baron, J.S., Campbell, D.H., *Hydrological processes,* June 15, 1997, 11(7), p.783-799, Refs. p.797-799.

Watersheds, Alpine landscapes, Precipitation (meteorology), Aerosols, Hydrogeochemistry, Sedimentation, Ecosystems, Algae, Hydrography, Snowmelt, Tundra soils, Seasonal variations, United States—Colorado—Front Range

52-1049

Hydrological cycles on the north and south peripheries of mountain-glacial basins of central Asia.

Aizen, V., Aizen, E., *Hydrological processes,* Apr. 1997, 11(5), p.451-469, 41 refs.

Glacial hydrology, Precipitation (meteorology), Hydrologic cycle, Water balance, Mountain glaciers, Watersheds, Glacier melting, Glacier mass balance, Snowmelt, Runoff, Hydrography, Asia

52-1050

Long-term variations in TOMS ozone over 60-70°S.

Zou, H., Gao, Y.Q., *Geophysical research letters,* Sep. 15, 1997, 24(18), p.2295-2298, 19 refs.

Climatology, Polar atmospheres, Atmospheric composition, Ozone, Degradation, Wind direction, Turbulent diffusion, Seasonal variations, Spectroscopy

This article discusses the long-term variations, seasonal cycle, trends, Quasi-biennial Oscillation and El Niño-Southern Oscillation in total ozone over 60-70°S latitude zone, using data from the Total Ozone Mapping Spectrometer on Nimbus 7 (version 7). The study is focused on the zonal distribution of the above long-term variations in this latitude zone. Recognizably different characteristics are revealed in the ozone variations over West Antarctica from those over East Antarctica. The discussion of these differences notes the possible impact of the land-sea contrast in West Antarctica on the ozone variations. (Auth.)

52-1051

Freezing of polar stratospheric clouds in orographically induced strong warming events.

Tsias, A., et al, *Geophysical research letters,* Sep. 15, 1997, 24(18), p.2302-2306, 21 refs.

Climatology, Cloud physics, Polar stratospheric clouds, Gravity waves, Hydrates, Aerosols, Ice formation, Ice vapor interface, Homogeneous nucleation, Temperature effects, Models

52-1052

Mass balance and surface movement of the Greenland ice sheet at Summit, Central Greenland.

Hvidberg, C.S., Keller, K., Gundestrup, N.S., Tscherning, C.C., Forsberg, R., *Geophysical research letters,* Sep. 15, 1997, 24(18), p.2307-2310, 23 refs.

Glacier surveys, Geophysical surveys, Ice sheets, Glacier mass balance, Glacier flow, Velocity measurement, Glacier thickness, Topographic maps, Greenland—Summit

52-1053

Dielectric properties of ice at millimeter wavelengths.

Koh, G., MP 5030, *Geophysical research letters,* Sep. 15, 1997, 24(18), p.2311-2313, 14 refs.

Ice physics, Ice dielectrics, Dielectric properties, Radio waves, Ice optics, Transmissivity, Refractivity, Radiation absorption, Cold chambers, Simulation

The use of radars to study the geophysical features in a polar environment requires reliable information about the dielectric permittivity of ice at microwave and millimeter-wave frequencies. To address this requirement, ε (relative complex dielectric permittivity) of ice at millimeter wavelengths was obtained using an interference technique. The interference pattern was produced by measuring the transmittance through bubble-free ice slabs at normal incident angle as the frequency was swept from 75 to 110 GHz. From the resulting interference patterns, ε' was determined to be 3.17 and virtually independent of frequency.

52-1054

Chemistry of stratospheric ozone depletion.

Tuck, A., *HPAC—heating/piping/air conditioning,* Jan. 1997, 69(1), p.111-116, 7 refs.

Climatology, Polar atmospheres, Stratosphere, Ozone, Degradation, Aerosols, Environmental impact, Legislation, International cooperation

The Montreal Protocol of 1987 and the Copenhagen Amendment of 1992 have been agreed to and implemented by the nations of the world acting in concert. The amount of chlorine that would destroy ozone in the antarctic vortex and globally is leveling off as a result of these controls, as indicated by the slower growth rates of the injection of halocarbons into the troposphere (halocarbons include chlorine and bromine compounds). Of particular interest to the mechanical engineered systems community are the CFC-11 and CFC-12 growth rates. Within the accuracy of the ability to measure, CFC-11 growth has peaked and may even be in decline, and CFC-12 has peaked. However, because they are long-lived in the atmosphere (approximately 50 and 100 years, for CFC-11 and CFC-12 respectively), the best estimates are that it will take several decades before, for example, the ozone hole disappears. It is vital that there is effective global compliance with the international protocols to ensure that chlorine levels decline in the real atmosphere. (Auth. mod.)

52-1055

Effect of late summer fertilization on the frost hardening of second-year Scots pine seedlings.

Rikala, R., Repo, T., *New forests,* July 1997, 14(1), p.33-44, Refs. p.42-44.

Forestry, Plant physiology, Trees (plants), Nutrient cycle, Growth, Frost resistance, Cold tolerance, Cold weather tests

52-1056

Comprehensive records of global change from polar ice cores, loess profiles and deep sea cores for last 150 000 years.

Kang, J.C., Wen, J.H., *Chinese journal of polar research,* June 1997, 9(2), p.134-144, In Chinese with English summary. Refs. p.142-143.

Ice cores, Paleoclimatology, Loess, Global change

Studies of mid-latitude loess profiles and comparison with polar ice cores and deep sea cores provide a general pattern of global environmental change and regional differentiation over the last 150,000 years. The last Interglacial, 140,000 yr B.P., is divided into 5 stages; the last Glacial, 80,000-10,000 yr B.P., is divided into 3 stages. The Interglacial shows 4 warm, and 3 cold, cycles.

52-1057

Acoustic scattering from a three-dimensional protuberance on a thin, infinite, submerged elastic plate.

Kapoor, T.K., Schmidt, H., *Acoustical Society of America. Journal,* July 1, 1997, 102(1), p.256-265, 31 refs.

Oceanography, Sea ice, Underwater acoustics, Ice acoustics, Sound waves, Wave propagation, Scattering, Ice cover effect, Ice bottom surface, Surface roughness, Resonance, Plates, Analysis (mathematics)

52-1058

Thermodynamic stability and phase transitions of PSC particles.

Koop, T., Carslaw, K.S., Peter, T., *Geophysical research letters,* Sep. 1, 1997, 24(17), p.2199-2202, 26 refs.

Climatology, Cloud physics, Polar stratospheric clouds, Phase transformations, Aerosols, Hydrates, Heterogeneous nucleation, Ice vapor interface, Particle size distribution, Thermodynamics, Models, Temperature effects

52-1059

Evidence for a relationship between spring snow cover in North America and summer rainfall in New Mexico.

Gutzler, D.S., Preston, J.W., *Geophysical research letters,* Sep. 1, 1997, 24(17), p.2207-2210, 21 refs.

Climatology, Precipitation (meteorology), Rain, Seasonal variations, Atmospheric circulation, Snow cover distribution, Snow cover effect, Weather forecasting, Synoptic meteorology

52-1060

Polar stratospheric clouds observed at Eureka (80°N, 86°W) in the Canadian Arctic during the 1994/1995 winter.

Nagai, T., Uchino, O., Itabe, T., Shibata, T., Mizutani, K., Fujimoto, T., *Geophysical research letters,* Sep. 1, 1997, 24(17), p.2243-2246, 22 refs.

Climatology, Polar atmospheres, Polar stratospheric clouds, Lidar, Detection, Backscattering, Profiles, Aerosols, Classifications, Canada—Northwest Territories—Eureka

52-1061

Durability and bond of high performance concrete and repaired portland cement concrete.

Li, S.G., Storrs, University of Connecticut, 1997, 232p., University Microfilms order No.AAD97-30891, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.2022.

Concrete pavements, Concrete durability, Concrete placing, Winter maintenance, Salting, Freeze thaw cycles, Degradation, Frost resistance, Mechanical tests

52-1062

Examination of a subsurface impact on a floating ice sheet.

Conley, J.A., Washington, D.C., George Washington University, 1997, 84p., University Microfilms order No.AAD97-29562, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.2018.

Floating ice, Ice mechanics, Ice bottom surface, Ice solid interface, Submarines, Impact, Ice deformation, Fracture zones, Mathematical models

52-1063

Release of meltwater and ionic solute from melting snow.

Harrington, R.F., Tucson, University of Arizona, 1997, 216p., University Microfilms order No.AAD97-29516, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.1768.

Snow hydrology, Watersheds, Hydrogeochemistry, Snow water equivalent, Snowmelt, Meltwater, Water transport, Ion diffusion, Mass transfer, Mathematical models

52-1064

Mechanisms and dissolution kinetics of augite and a welded tuff, with implications for groundwater chemistry at Snowshoe Mountain, southwestern Colorado.

Hoch, A.R., Laramie, University of Wyoming, 1997, 148p., University Microfilms order No.AAD97-30357, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.1755.

Alpine landscapes, Hydrogeochemistry, Regolith, Ground water, Snowmelt, Meltwater, Surface drainage, Solubility, Weathering, United States—Colorado—Snowshoe Mountain

52-1065

Intraspecific variation in freezing tolerance of *Populus trichocarpa* and *Populus trichocarpa* hybrids.

McCamant, T., Pullman, Washington State University, 1996, 128p., University Microfilms order No.AAD97-31108, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.1627.

Trees (plants), Plant physiology, Frost resistance, Cold tolerance, Cold weather survival, Cold weather tests, Vegetation patterns

52-1066

Centrifuge modelling of large soil deformation due to ice scour.

Lach, P.R., St. John's, Memorial University of Newfoundland, 1996, 727p., University Microfilms order No.AADNN-17609, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.2021.

Marine geology, Underground pipelines, Ocean bottom, Soil mechanics, Deformation, Icebergs, Ice scoring, Ice solid interface, Simulation, Mechanical tests, Mathematical models, Design criteria

52-1067

Dynamic behaviour of pile foundations with soil-pile interaction.

Han, Y.C., St. John's, Memorial University of Newfoundland, 1995, 236p., University Microfilms order No.AADNN-17597, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.2019.

Engineering geology, Pile structures, Foundations, Dynamic properties, Vibration, Damping, Frozen ground mechanics, Simulation

52-1068

Postglacial changes in vegetation and climate near treeline in British Columbia.

Pellatt, M.G., Burnaby, Simon Fraser University, 1996, 225p., University Microfilms order No.AADNN-17046, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.1771.

Paleoclimatology, Paleoecology, Paleobotany, Forest ecosystems, Forest lines, Palynology, Vegetation patterns, Lacustrine deposits, Radioactive age determination, Canada—British Columbia

52-1069

Sedimentology and geomorphology of the glacial Lake Hind area, southwestern Manitoba, Canada.

Sun, C.Y., Winnipeg, University of Manitoba, 1996, 233p., University Microfilms order No.AADNN-16319, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.1761.

Pleistocene, Geomorphology, Glacial hydrology, Glacial lakes, Glacier melting, Flooding, Water erosion, Deltas, Lacustrine deposits, Quaternary deposits, Canada—Manitoba

52-1070

Modelling study of thunderstorm electrification and lightning flash rate.

Solomon, R.C., Seattle, University of Washington, 1997, 112p., University Microfilms order No.AAD97-30077, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58(4), Sec.B, 1997, p.1930.

Precipitation (meteorology), Thunderstorms, Cloud electrification, Cloud physics, Condensation nuclei, Charge transfer, Ice nuclei, Ice electrical properties, Lightning, Mathematical models

52-1071

Freezing and its effect on chemical and biological properties of soil.

Edwards, A.C., Cresser, M.S., Advances in soil science. Vol.18, New York, Springer-Verlag, 1992, p.59-79, Refs. p.76-79.

DLC S590.A38

Soil science, Soil freezing, Soil physics, Frozen ground mechanics, Frost penetration, Freeze thaw cycles, Ice water interface, Geochemistry, Soil water migration, Soil microbiology, Nutrient cycle

52-1072

Unidirectional freezing of waste-activated sludge: the presence of sodium chloride.

Chu, C.P., Feng, W.H., Tsai, Y.H., Lee, D.J., *Environmental science & technology,* May 1997, 31(5), p.1512-1517, 29 refs.

Sewage disposal, Waste disposal, Water treatment, Sludges, Salting, Freeze thaw tests, Phase transformations, Sedimentation, Freezing front, Freezing rate, Particle size distribution

52-1073

Force balance of sea ice in a numerical model of the Arctic Ocean.

Steele, M., Zhang, J.L., Rothrock, D., Stern, H., *Journal of geophysical research,* Sep. 15, 1997, 102(C9), p.21,061-21,079, 33 refs.

Oceanography, Sea ice, Ice cover strength, Ice mechanics, Stress concentration, Ice pressure, Drift, Air ice water interaction, Wind factors, Ice cover effect, Mathematical models, Seasonal variations, Arctic Ocean

52-1074

New database documents the magnetic character of the Arctic and North Atlantic.

Macnab, R., Verhoef, J., Roest, W., Arkani-Hamed, J., *Eos,* Nov. 7, 1995, 76(45), p.449,458, 8 refs.

Marine geology, Ocean bottom, Magnetic surveys, Magnetic anomalies, Geomagnetism, Tectonics, Continental drift, Geological maps, Arctic Ocean, North Atlantic

52-1075

Spatial distribution of snow in western Dronning Maud Land, East Antarctica, mapped by a ground-based snow radar.

Richardson, C., Aarholt, E., Hamran, S.E., Holmlund, P., Isaksson, E., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,343-20,353, Refs. p.20,352-20,353.

Snow surveys, Snow cover distribution, Snow accumulation, Snow depth, Snow density, Radio echo soundings, Profiles, Sensor mapping, Antarctica—Queen Maud Land

During the summer 1993-94, the spatial distribution of snow was mapped by a ground-based snow radar in western Queen Maud Land. Snow radar soundings were performed along continuous profiles extending from the ice shelf up to the polar plateau, a total distance of 1040 km. The high-resolution radar registrations revealed subsurface layering in the uppermost 12 m of the snowpack. The snow layering was well developed in the coastal area and less well developed on the polar plateau. High spatial variability in snow accumulation was observed on a regional as well as on a local scale. The variability was very high in areas with large surface slopes, such as the grounding zone and around nunataks. The highest variability was recorded in the nunatak area. (Auth. mod.)

52-1076

Physical basis of glacier volume-area scaling.

Bahr, D.B., Meier, M.F., Peckham, S.D., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,355-20,362, 26 refs.

Glacier mass balance, Ice volume, Surface properties, Statistical analysis, Correlation, Glacier oscillation, Analysis (mathematics)

52-1077

Continuum mixture model of ice stream thermomechanics in the Laurentide Ice Sheet. I. Theory.

Marshall, S.J., Clarke, G.K.C., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,599-20,613, 38 refs.

Glaciology, Ice sheets, Ice mechanics, Glacier flow, Viscous flow, Ice creep, Ice deformation, Sliding, Shear stress, Thermodynamics, Mathematical models, Theories

52-1078

Continuum mixture model of ice stream thermomechanics in the Laurentide Ice Sheet. 2. Application to the Hudson Strait Ice Stream.

Marshall, S.J., Clarke, G.K.C., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,615-20,637, Refs. p.20,636-20,637.

Pleistocene, Glaciology, Ice sheets, Ice mechanics, Bottom ice, Ice cover thickness, Glacier oscillation, Glacier surges, Calving, Icebergs, Thermodynamics, Sea level, Mathematical models, Climatic factors, Canada—Hudson Strait

52-1079

Introduction to special section: the Trans-Alaska Crustal Transect (TACT) across arctic Alaska.

Plafker, G., Mooney, W.D., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,639-20,643, 9 refs.

Geological surveys, Earth crust, Tectonics, Arctic landscapes, Seismic reflection, Geological maps, Research projects, United States—Alaska

52-1080

Crustal implications of bedrock geology along the Trans-Alaska Crustal Transect (TACT) in the Brooks Range, northern Alaska.

Moore, T.E., Wallace, W.K., Mull, C.G., Adams, K.E., Plafker, G., Nokleberg, W.J., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,645-20,684, Refs. p.20,681-20,684.

Pleistocene, Geological surveys, Earth crust, Geologic structures, Arctic landscapes, Tectonics, Bedrock, Stratigraphy, Geological maps, Classifications, United States—Alaska—Brooks Range

52-1081

Integrated model for the tectonic development of the frontal Brooks Range and Colville Basin 250 km west of the Trans-Alaska Crustal Transect.

Cole, F., et al, *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,685-20,708, Refs. p.20,706-20,708.

Pleistocene, Tectonics, Geologic processes, Magma, Subsidence, Arctic landscapes, Sedimentation, Stratigraphy, Thermal analysis, Radioactive age determination, Models, United States—Alaska—Brooks Range

52-1082

Stratigraphic contrasts and tectonic relationships between Carboniferous successions in the Trans-Alaska Crustal Transect corridor and adjacent areas, northern Alaska.

Dumoulin, J.A., Watts, K.F., Harris, A.G., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,709-20,726, Refs. p.20,725-20,726.

Pleistocene, Tectonics, Arctic landscapes, Geologic processes, Stratigraphy, Lithology, Paleoecology, Sedimentation, United States—Alaska

52-1083
Permian deposition in the north central Brooks Range, Alaska: constraints for tectonic reconstructions.
Adams, K.E., Mull, C.G., Crowder, R.K., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,727-20,748, Refs. p.20,746-20,748.
Pleistocene, Tectonics, Earth crust, Arctic landscapes, Sedimentation, Geochemistry, Stratigraphy, Geologic processes, Models, United States—Alaska—Brooks Range

52-1084
Tectonic evolution of the central Brooks Range mountain front: evidence from the Atigun Gorge region.
Mull, C.G., Glenn, R.K., Adams, K.E., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,749-20,772, Refs. p.20,770-20,772.
Pleistocene, Earth crust, Tectonics, Sedimentation, Arctic landscapes, Geologic processes, Geologic structures, Lithology, Stratigraphy, United States—Alaska—Brooks Range

52-1085
Multistory duplexes with forward dipping roofs, north central Brooks Range, Alaska.
Wallace, W.K., Moore, T.E., Plafker, G., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,773-20,796, Refs. p.20,795-20,796.
Pleistocene, Earth crust, Arctic landscapes, Tectonics, Sedimentation, Lithology, Geologic structures, Geological surveys, Geochronology, United States—Alaska—Brooks Range

52-1086
Stratigraphic and structural implications of conodont and detrital zircon U-Pb ages from metamorphic rocks of the Coldfoot terrane, Brooks Range, Alaska.
Moore, T.E., Aleinikoff, J.N., Harris, A.G., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,797-20,820, Refs. p.20,817-20,820.
Pleistocene, Paleoecology, Earth crust, Arctic landscapes, Tectonics, Sedimentation, Lithology, Seismic reflection, Profiles, Isotope analysis, Radioactive age determination, United States—Alaska—Brooks Range

52-1087
Late Mesozoic and Cenozoic thermotectonic evolution of the central Brooks Range and adjacent North Slope foreland basin, Alaska: including fission track results from the Trans-Alaska Crustal Transect (TACT).
O'Sullivan, P.B., Murphy, J.M., Blythe, A.E., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,821-20,845, Refs. p.20,843-20,845.
Pleistocene, Tectonics, Earth crust, Arctic landscapes, Geologic processes, Sedimentation, Deformation, Lithology, Radioactive age determination, Geochronology, Statistical analysis, United States—Alaska—Brooks Range

52-1088
Seismic images of crustal duplexing and continental subduction in the Brooks Range.
Wissinger, E.S., Levander, A., Christensen, N.I., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,847-20,871, Refs. p.20,870-20,871.
Pleistocene, Earth crust, Seismic surveys, Seismic reflection, Seismic velocity, Tectonics, Geologic structures, Models, United States—Alaska—Brooks Range

52-1089
Deep seismic structure and tectonics of northern Alaska; crustal-scale duplexing with deformation extending into the upper mantle.
Fuis, G.S., Murphy, J.M., Lutter, W.J., Moore, T.E., Bird, K.J., Christensen, N.I., *Journal of geophysical research,* Sep. 10, 1997, 102(B9), p.20,873-20,896, 33 refs.
Geologic structures, Tectonics, Earth crust, Arctic landscapes, Seismic surveys, Seismic reflection, Seismic velocity, Models, United States—Alaska—Brooks Range

52-1090
IGARSS'97. Remote sensing—a scientific vision for sustainable development.
International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997, New York, Institute of Electrical and Electronics Engineers, 1997, 2105p. (4 vols.), Refs. passim. For selected papers see 52-1091 through 52-1141, or F-58196 through F-58200, F-58202 through F-58207 I-58195 and I-58201.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Snow surveys, Snow cover distribution, Terrain identification, Spaceborne photography, Synthetic aperture radar, Radio echo soundings, Radiometry, Backscattering, Image processing
This conference deals mainly with satellite remote sensing of the atmosphere, land, and oceans; 13 papers are pertinent to the Antarctic. They include the following: SSM satellite determination of the total water vapor in the atmosphere; classification and distribution of sea ice from AVHRR satellite images; discrimination between clouds and sea ice by AVHRR images; measuring sea ice concentration and floe size by shipborne video camera; detection of sea ice edges by SAR; an algorithm to derive sea ice concentration from brightness temperatures in satellite images; surface temperatures of the ice sheet from satellite radiometer data, 1979-1975; the effect of clouds and humidity on sea ice concentration; the effect of air temperature and wind on sea ice concentration; SAR for ship navigation; satellite sea ice mapping for ship routing to the Australian antarctic stations; sea ice classification from satellite scatterometer images; and ice edge detection from satellite scatterometer images.

52-1091
Retrieval of total water vapor in polar regions using SSM/T2 channels.
Miao, J.G., Schlüter, N., Heygster, G., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.61-63, 6 refs.
DLC QE33.2.R4I57 1997
Polar atmospheres, Atmospheric composition, Humidity, Water vapor, Moisture detection, Radiometry, Radio echo soundings, Spaceborne photography, Image processing
A method to retrieve the total water vapor in the cloudless atmosphere using SSM/T2 channels is proposed based on a unique property of three contiguous channels situated on the flank of the water vapor absorption line at 183.31 GHz. One of its advantages is its independence to the surface emission, which is the main disturbing factor in retrieving atmospheric parameters from passive satellite measurements. Due to the high sensitivity of the SSM/T2 channels to water vapor, this method is suitable to the total water vapor retrieval for dry polar atmospheres. An algorithm is constructed for austral winter cases through model simulation using radiosonde profiles. (Auth.)

52-1092
Radiance thresholds and texture parameters for Antarctic surface classification.
Baraldi, A., Meloni, G.P., Parmiggiani, F., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.67-69, 7 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Terrain identification, Cloud cover, Radiometry, Spaceborne photography, Image processing
A sequence of AVHRR images is investigated in order to obtain information about sea ice distribution in the Ross Sea. A supervised classifier, based on decision rules in AVHRR NearIR (2) and thermal (3 and 4) channels, is tuned to the given data set to extract pixels belonging to classes: a) sea; b) multiyear ice (ice shelves and bergs); c) first season ice types (floes and pack); and d) clouds (thin/thick clouds, water clouds and ice clouds). Pixel-based classification is affected by underestimation of ice clouds due to interference of multiyear ice and pack. To reduce ice/cloud misclassification, an alternative classification approach exploiting textural information is attempted. (Auth. mod.)

52-1093
Cloud and ice detection using NOAA/AVHRR data.
Muramoto, K., Saito, H., Matsuura, K., Yamanouchi, T., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.73-75, 10 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Terrain identification, Cloud cover, Radiometry, Spaceborne photography, Image processing
In the polar regions, it is difficult to discriminate between clouds and ground surface from satellite visible or infrared data, because of the high albedo and low surface temperature of snow and ice cover. In this paper, a method to classify cloud, sea ice and ground is proposed. This study is based upon analysis of the NOAA/AVHRR infrared images in Antarctica. The algorithm consists of two major approaches: extraction of image features and a classification algorithm. Minimum distance classifier was used to classify that region into one of three categories using five image features. To improve the classification accuracy, threshold boundaries for minimum distance classifier were changed. Both classified and misclassified areas were decreased with increasing the threshold levels. (Auth.)

52-1094
Improved elevation change measurement of the Greenland ice sheet from satellite radar altimetry.
Davis, C.H., Perez, C., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.397-401, 13 refs.
DLC QE33.2.R4I57 1997
Glacier surveys, Ice sheets, Glacier mass balance, Glacier thickness, Glacier oscillation, Glacier surfaces, Height finding, Radio echo soundings, Spaceborne photography, Greenland

52-1095
Multi-year ice concentration from RADARSAT.
Fetterer, F., Bertoia, C., Ye, J.P., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.402-404, 4 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice reporting, Synthetic aperture radar, Spaceborne photography, Image processing

52-1096
Vector radiative transfer for scattering signature from multi-layer snow/vegetation at SSM/I channels.
Jin, Y.Q., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.405-407, 5 refs.
DLC QE33.2.R4I57 1997
Snow surveys, Snow cover distribution, Snow surface temperature, Vegetation patterns, Forest canopy, Terrain identification, Radiometry, Backscattering, Spaceborne photography

52-1097
Deriving glaciers variation integrated remote sensing and GIS in the Tibetan Plateau.
Li, Z., Zeng, Q.Z., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.408-410, 6 refs.
DLC QE33.2.R4I57 1997
Glacier surveys, Mountain glaciers, Glacier oscillation, Glacial meteorology, Spaceborne photography, China—Qinghai-Xizang Plateau, China—Kunlun Mountains

52-1098
On the accuracy of snow cover segmentation in optical satellite images.
Luca, D., Seidel, K., Datcu, M., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.411-413, 13 refs.
DLC QE33.2.R4I57 1997
Snow surveys, Snow cover distribution, Snow optics, Terrain identification, Spaceborne photography, Image processing

52-1099
Sea ice concentration and floe size distribution in the Antarctic using video image processing.
Muramoto, K., Endoh, T., Kubo, M., Matsuura, K., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.414-416, 9 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice floes, Photographic reconnaissance, Image processing
A technique is described for measuring sea ice characteristics over a wide area of ice covered water. The sea ice was photographed by video camera from the ship. Continuous video images are obtained using geometric transformation and template matching. Both size of the ice and concentration along the ship's route can be obtained continuously. (Auth.)

52-1100
Compatibility of sea ice edges detected in ERS-SAR images and SSM/I data.
Schmidt, R., Hunewinkel, T., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.417-419, 6 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Ice detection, Ice water interface, Ocean waves, Synthetic aperture radar, Radiometry, Spaceborne photography, Antarctica—Bellingshausen Sea
Sea ice changes directly the wave dynamics and has an impact on the nonlinear imaging of ocean waves by SAR. The energy distribution of the SAR image spectrum of a wave system propagating in sea ice deviates characteristically from the energy distribution of the same wave system propagating in open water. In this study parameters have been derived from the second moments of SAR image spectra, which are suitable to describe this effect quantitatively. These parameters are used to define an ice edge. Results of this analysis are compared with ice concentration isolines derived from SSM/I data using the NASA Team algorithm, and with a high resolving ice edge detection algorithm based on the 85 GHz channels of the SSM/I. Ice edges detected in ERS-SAR images agree well with the 30% ice concentration isolines of the NASA Team algorithm. The ice edge detection algorithm for the SSM/I data is in good agreement with the SAR ice edge. (Auth. mod.)

52-1101
Ice concentration estimation based on local inversion.
Arai, K., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1997, p.553-555, 4 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Radiometry, Spaceborne photography, Image processing

52-1102
Improving the MODIS global snow-mapping algorithm.
Klein, A.G., Hall, D.K., Riggs, G.A., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.619-621, 5 refs.
DLC QE33.2.R4I57 1997
Snow surveys, Snow cover distribution, Forest canopy, Vegetation patterns, Radiometry, Spaceborne photography, Image processing

52-1103
HUT brightness temperature model for snow-covered terrain.
Hallikainen, M., Pulliainen, J., Kurvonen, L., Grandell, J., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.622-624, 8 refs.
DLC QE33.2.R4I57 1997
Snow cover distribution, Snow surface temperature, Snow electrical properties, Snow cover effect, Microwaves, Radiometry, Mathematical models

52-1104
Snow crystal shape and microwave scattering.
Foster, J.L., Hall, D.K., Chang, A.T.C., Rango, A., Wergin, W., Erbe, E., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.625-627, 8 refs.
DLC QE33.2.R4I57 1997
Snow crystal structure, Ice crystal size, Snow cover effect, Snow electrical properties, Snow surface temperature, Thermal radiation, Microwaves, Scattering

52-1105
Mapping snow cover with repeat pass synthetic aperture radar.
Shi, J.C., Hensley, S., Dozier, J., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.628-630, 5 refs.
DLC QE33.2.R4I57 1997
Snow surveys, Snow cover distribution, Snow cover effect, Synthetic aperture radar, Backscattering, Mapping, Image processing

52-1106
Snow monitoring using EMISAR and ERS-1 data within the European Multi-sensor Airborne Campaign EMAC-95.
Guneriussen, T., Johnsen, H., Solberg, R., Volden, E., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.631-633, 7 refs.
DLC QE33.2.R4I57 1997
Snow surveys, Wet snow, Snow water content, Snow cover structure, Terrain identification, Synthetic aperture radar, Backscattering, Spaceborne photography, Image processing, Norway

52-1107
Ground penetration radar and ERS SAR data for glacier monitoring.
Hamran, S.E., Guneriussen, T., Hagen, J.O., Ødegård, R., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.634-636, 6 refs.
DLC QE33.2.R4I57 1997
Glacier surveys, Glacier thickness, Snow ice interface, Radio echo soundings, Electromagnetic prospecting, Synthetic aperture radar, Backscattering, Spaceborne photography, Norway—Svalbard

52-1108
Comparison of ranging scatterometer and ERS-1 SAR microwave signatures over boreal forest zone during winter season.
Koskinen, J., Pulliainen, J., Mäkynen, M., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.637-639, 4 refs.
DLC QE33.2.R4I57 1997
Snow cover distribution, Snow cover structure, Forest canopy, Vegetation patterns, Terrain identification, Synthetic aperture radar, Backscattering, Spaceborne photography, Finland

52-1109
Multi-source snow cover monitoring in the Swiss Alps.
Piesbergen, J., Haefner, H., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.640-642, 8 refs.
DLC QE33.2.R4I57 1997
Snow surveys, Snow cover distribution, Snow line, Snow water content, Terrain identification, Synthetic aperture radar, Spaceborne photography, Switzerland

52-1110
Radar backscatter from boreal forest in winter.
Hallikainen, M., Mäkynen, M., Pulliainen, J., Vänskä, T., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.803-805, 1 ref.
DLC QE33.2.R4I57 1997
Taiga, Forest canopy, Vegetation patterns, Snow cover distribution, Snow water content, Snow cover effect, Airborne radar, Radio echo soundings, Backscattering, Terrain identification, Finland

52-1111
Temperature corrected Bootstrap algorithm.
Comiso, J.C., Zwally, H.J., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.857-861, 16 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice temperature, Ice detection, Ice edge, Ice water interface, Terrain identification, Radiometry, Spaceborne photography, Image processing
A temperature corrected Bootstrap Algorithm has been developed using Nimbus-7 Scanning Multichannel Microwave Radiometer data. The procedure first calculates the effective surface emissivity, and a mixing formulation that utilizes ice concentrations using brightness temperatures from 6 GHz and 37 GHz channels. These effective emissivities are then used to calculate surface ice temperatures which in turn are used to convert the 18 GHz and 37 GHz brightness temperatures to emissivities. Ice concentrations are then derived using the same technique as with the Bootstrap algorithm but using emissivities instead of brightness temperatures. The results show significant improvements in areas where ice temperature is expected to vary considerably such as near the continental areas in the Antarctic, where the ice temperature is colder than average, and in marginal ice-zones. (Auth. mod.)

52-1112
Wave dispersion by frazil-pancake ice from SAR imagery.
Wadhams, P., De Carolis, G., Parmiggiani, F., Tadross, M., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.862-864, 5 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice cover thickness, Frazil ice, Ice edge, Ice detection, Ice water interface, Ocean waves, Radio echo soundings, Synthetic aperture radar, Spaceborne photography, Image processing, Greenland Sea

52-1113
Next-generation coherent radar depth sounder for measurement of Greenland ice sheet thickness.
Legarsky, J., Chuah, T.S., Gogineni, S.P., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1997, p.996-998, 5 refs.
DLC QE33.2.R4I57 1997
Ice sheets, Glacier surveys, Glacier thickness, Glacier mass balance, Topographic surveys, Height finding, Airborne radar, Radio echo soundings, Greenland

52-1114
Simulation of close-in and stand-off mine detection.
Trang, A.H., Irion, H.G., Jr., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1132-1134, 4 refs.
DLC QE33.2.R4I57 1997
Mines (ordnance), Snow cover effect, Electromagnetic prospecting, Subsurface investigations, Radio echo soundings, Backscattering, Mathematical models

52-1115
Exploration of innovative radar sensing schemes for subsurface object detection.
O'Neill, K., MP 5031, International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1135-1137, 2 refs.
DLC QE33.2.R4I57 1997
Mines (ordnance), Electromagnetic prospecting, Subsurface investigations, Radio echo soundings, Radar echoes, Environment simulation, Statistical analysis
The problem of abandoned landmines and unexploded ordnance is particularly acute when these objects are near the surface, so that their radar returns cannot easily be separated from the ground surface response. To address this, the author pursues simulations here designed to test methods of sensor deployment and data processing that exploit angular, positional, and frequency diversity for detection of metallic targets that are on the order of the subsurface wavelength in size. Rigorous 2-D computations were performed and results processed for the angular correlation function (ACF) approach, in which one performs a coherent average of received signals from two incidence and observation angles. Simulations pursue the behavior of the ACF under realistic ground roughness and moisture content, target geometry, and highest practical resolution GPR frequencies. To achieve an expanded ensemble of cases, given a single subject ground surface, the author averages both over frequencies and overlapping incident beam locations.

52-1116
CLIMACS: design of a high radiometric resolution SAR for land and sea ice applications.
Adrian, V., Suinot, N., Lin, C.C., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1150-1152, 3 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Terrain identification, Vegetation patterns, Global warming, Radiometry, Synthetic aperture radar, Spaceborne photography

52-1117
Study of atmospheric boundary layer rolls near Spitsbergen by using ERS SAR images of the sea surface and a numerical model.
Alpers, W., Müller, G., Brümmer, B., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1162-1164, 5 refs.
DLC QE33.2.R4I57 1997
Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric disturbances, Atmospheric boundary layer, Wind velocity, Radio echo soundings, Synthetic aperture radar, Spaceborne photography, Greenland Sea, Norway—Spitsbergen

52-1118
Identifying classes in SAR sea ice imagery using correlated texture.
Soh, L.K., Tsatsoulis, C., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1177-1179, 11 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Synthetic aperture radar, Spaceborne photography, Image processing

52-1119
Radar detection of near-surface buried metallic reflectors in wet soil.
O'Neill, K., MP 5032, International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1288-1290, 4 refs.
DLC QE33.2.R4I57 1997
Mines (ordnance), Electromagnetic prospecting, Subsurface investigations, Radio echo soundings, Radar echoes, Statistical analysis
For ground penetrating radar (GPR) sensing, with antennas positioned safely or conveniently above the surface, one must contend with the ground surface reflection as well as reflections from targets sought below it. Employing low enough frequencies to penetrate moist soil means resolution that will often not allow one to distinguish the surface from target return. New measurements at CRREL were analyzed using innovative methods to successfully reveal buried mine and mine-like targets in wet, rocky soil. With broad band short pulse illumination, one method used a simple model that predicted the expected waveforms when surface and target echoes interacted. The other method treated the same cases but proceeds from the observation that the total overlapping surface plus target return is distended in time relative to a reflection from the surface alone. By processing to define and isolate cumulative energy return over time, one could distinguish cases in which targets lay just below the surface. Both methods were successful with moist loamy soil. Performance of the second approach was also good in an extreme case, when seasonal effects were exploited.

52-1120
Comparison of sea ice type, sea ice temperature, and snow thickness distributions in the arctic seasonal ice zones with the DMSP SSM/I.
St. Germain, K.M., Cavalieri, D.J., Markus, T., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1291-1293, 4 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice temperature, Snow ice interface, Snow depth, Radiometry, Spaceborne photography

52-1121
Results of satellite, and in-situ remote sensing measurement and modeling studies of arctic sea ice which support the monitoring of changes in the global climate.
Onstott, R.G., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1294-1296, 4 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Radio echo soundings, Backscattering, Spaceborne photography, Global warming

52-1122
SeaSat Scatterometer observations of sea ice.
Swift, C.T., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1297-1299, 3 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Radar echoes, Backscattering, Spaceborne photography, Statistical analysis

52-1123
Antarctic surface temperatures using satellite infrared data from 1979 through 1995.
Comiso, J.C., Stock, L., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1300-1304, 11 refs.
DLC QE33.2.R4I57 1997
Polar atmospheres, Air temperature, Surface temperature, Climatic changes, Ice sheets, Glacial meteorology, Ice temperature, Ice heat flux, Ice air interface, Cloud cover, Radiometry, Spaceborne photography, Statistical analysis
The large scale spatial and temporal variations of surface ice temperature over the antarctic region are studied using infrared data derived from the Nimbus-7 Temperature Humidity Infrared Radiometer (THIR) from 1979 through 1985 and from the NOAA Advanced Very High Resolution Radiometer (AVHRR) from 1984 through 1995. Enhanced techniques suitable for the polar regions for cloud masking and atmospheric correction were used before converting radiances to surface temperatures. The observed spatial distribution of surface temperature is highly correlated with surface ice sheet topography and agrees well with ice station temperatures with 2K to 4K standard deviations. The average surface ice temperature over the entire continent fluctuates by about 30K from summer to winter while that over the antarctic plateau varies by about 45K. Interannual fluctuations of the coldest temperatures are observed to be as large as 15K. Despite large temporal variability, a regression analysis shows no apparent trend in temperature during the period 1979 through 1995. (Auth. mod.)

52-1124
Modeling and interpretation of ultra-wideband microwave scattering measurements of simulated sea ice.
Kanagaratnam, P., Gogineni, S.P., Jezek, K., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1305-1307, 5 refs.
DLC QE33.2.R4I57 1997
Salt ice, Snow ice interface, Ice electrical properties, Ice detection, Radar echoes, Microwaves, Backscattering

52-1125
Modeling interpretation of active and passive measurements from sea ice.
Fung, A.K., Tjuatja, S., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1308-1310, 6 refs.
DLC QE33.2.R4I57 1997
Sea ice, Salt ice, Snow ice interface, Ice electrical properties, Ice detection, Radar echoes, Backscattering

52-1126
Influence of the atmosphere on the remote sensing of sea ice using passive microwave radiometers.
Oelke, C., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1311-1313, 7 refs.
DLC QE33.2.R4I57 1997
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice temperature, Ice air interface, Humidity, Cloud cover, Radiometry, Spaceborne photography, Antarctica—Weddell Sea
The effects of weather systems on sea-ice concentration retrievals using passive microwaves are investigated because significant errors in estimating short-time variations and climatological concentration trends occur due to clouds and water vapor. For the assessment of these weather effects, the atmospheric parameters integrated water vapor content (W) and cloud liquid water path (LWP) are derived from radiosonde ascents measured in the pack-ice area of the Weddell Sea/Antarctica in 1992. Using a microwave radiative transfer model and typical surface emissivities, brightness temperatures are calculated from the radiosonde ascents. The first-year, multiyear and total sea-ice concentrations are calculated using the NASA team sea-ice algorithm for the SSM/I radiometer (Special Sensor Microwave/Imager). Using these results the derived sea-ice concentrations can be corrected for the modelled atmospheric effects. (Auth. mod.)

52-1127

Analysis of sea ice thickness and mass estimation with a spaceborne laser altimeter.

Luntama, J.P., Koponen, S., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1997, p.1314-1316, 4 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice cover thickness, Ice surface, Lidar, Height finding, Topographic surveys, Spaceborne photography

52-1128

Wavelet analysis of satellite images for coastal monitoring.

Liu, A.K., Wu, S.Y., Tseng, W.Y., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1441-1443, 5 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice detection, Ice reporting, Drift, Radar tracking, Spaceborne photography, Image processing

52-1129

Effects of large structure in wet snow cover on SAR measurements.

Shi, J.C., Kattelmann, R.C., Dozier, J., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1451-1453, 4 refs.

DLC QE33.2.R4I57 1997

Snow surveys, Snow hydrology, Snowmelt, Snow permeability, Snow cover stability, Water flow, Seepage, Runoff forecasting, Avalanche forecasting, Synthetic aperture radar, Backscattering

52-1130

Determination of the dominant spatial modes of terrestrial snow cover over North America using passive microwave derived data.

LeDrew, E.F., Derksen, C.P., Goodison, B.E., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1672-1674, 5 refs.

DLC QE33.2.R4I57 1997

Snow surveys, Snow cover distribution, Snow cover structure, Snow water equivalent, Snow air interface, Atmospheric circulation, Atmospheric pressure, Radiometry, Radio echo soundings, Spaceborne photography, Image processing, Statistical analysis

52-1131

Microwave measurements of sea ice in the Kara and Laptev Sea.

Johnsen, K.P., Darovskikh, A.N., Heygster, G.C., Wiesmann, A., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1675-1677, 9 refs.

DLC QE33.2.R4I57 1997

Sea ice, Ice heat flux, Snow ice interface, Snow temperature, Snow depth, Snow water content, Radiometry, Radio echo soundings, Russia—Kara Sea, Russia—Laptev Sea

52-1132

First realtime use of RADARSAT SAR imagery for ship navigation in Antarctica.

Danduran, P., Mouchot, M.C., Garello, R., Fleury, D., Thépaut, I., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1678-1680, 5 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice reporting, Ice navigation, Ice routing, Synthetic aperture radar, Spaceborne photography, Data transmission, Antarctica—Dumont d'Urville Station

In polar regions, navigation strongly depends on ice conditions which can be defined by ice types and ice concentration. For a long time, satellite imagery, specially AVHRR and SAR data, has been providing such information. Henceforth, until now the availability of SAR images for ship navigation in Antarctica was not sufficient for this data to be used in a realtime approach. However, due to its onboard recorder, the Canadian satellite, RADARSAT, can acquire images over Antarctica on a regular basis. The experiment presented in this paper investigates its potential for ship routing to Antarctica and, in particular, towards the Dumont d'Urville Station. (Auth.)

52-1133

ICEWATCH—real-time sea ice monitoring of the Northern Sea Route using satellite radar technology.

Johannessen, O.M., et al, International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1681-1685, 4 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice conditions, Ice reporting, Ice navigation, Ice routing, Synthetic aperture radar, Radar tracking, Spaceborne photography, Northern Sea Route

52-1134

Sea ice concentration in response to weather systems in the Weddell Sea: comparison between SSM/I data and model simulations.

Fischer, H., Oelke, C., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1686-1688, 7 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice conditions, Ice air interface, Air temperature, Wind (meteorology), Ice models, Spaceborne photography, Antarctica—Weddell Sea

This study compares sea ice concentrations derived from Special Sensor Microwave/Imager (SSM/I) data with results from a dynamic-thermodynamic sea ice model forced by daily means of air temperature and wind. The analyses focus on two regions with different ice characteristics and concentrations in the eastern and western Weddell Sea for the austral winter period June to July 1992. Additional synoptic observations, surface and radiosonde measurements from a RV *Polarstern* cruise are used for validation. Fluctuations of wind and air temperature are found to be equally important for rapid changes of sea ice concentrations on a daily time scale. The typical reduction of SSM/I-derived sea ice concentration is in the range of 5-10% for transient cyclones, but simulated ice concentrations are reduced by 5%. (Auth.)

52-1135

Design and development of an operational sea ice mapping system for meteorological applications in the Antarctic.

Williams, R.N., Crowther, P., Pendlebury, S.F., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1689-1691, 6 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice conditions, Ice reporting, Ice navigation, Ice routing, Weather forecasting, Radiometry, Spaceborne photography, Data transmission, Antarctica—Casey Station, Antarctica—Davis Station, Antarctica—Mawson Station

A semi-automated sea ice mapping system has been developed for use by meteorologists responsible for providing information to antarctic shipping on current sea ice conditions in the vicinity of Casey, Davis and Mawson stations. The system uses AVHRR images from NOAA satellites and processes these images to identify areas of cloud, open water and sea ice. It further analyzes sea ice regions to determine concentrations of sea ice found within these regions. The system is currently being used on a trial basis, at the Bureau of Meteorology in Hobart, to evaluate its effectiveness, prior to installation at the Casey Station late in 1997. (Auth.)

52-1136

Relationship between cirrus particle size and cloud top temperature.

Han, Q.Y., Chou, J., Welch, R.M., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1760-1762, 14 refs.

DLC QE33.2.R4I57 1997

Cloud cover, Cloud physics, Ice crystal size, Particle size distribution, Ice detection, Air temperature, Radiometry

52-1137

Snow accumulation on Greenland estimated from ERS scatterometer data.

Wismann, V.R., Winebrenner, D.P., Boehnke, K., Arthern, R.J., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1823-1825, 8 refs.

DLC QE33.2.R4I57 1997

Snow surveys, Snow cover distribution, Snow accumulation, Snow ice interface, Firn, Ice sheets, Glacier alimentation, Radio echo soundings, Backscattering, Spaceborne photography, Greenland

52-1138

Thawing processes during Siberian spring observed by ERS scatterometer and SAR.

Boehnke, K., Wismann, V.R., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1826-1828, 7 refs.

DLC QE33.2.R4I57 1997

Snow melting, Ground thawing, Thaw depth, Frozen ground temperature, Soil temperature, Terrain identification, Radio echo soundings, Backscattering, Synthetic aperture radar, Spaceborne photography, Russia—Siberia

52-1139

Ice classification in the southern ocean using ERS-1 scatterometer data.

Early, D.S., Long, D.G., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1838-1840, 5 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Radio echo soundings, Backscattering, Spaceborne photography, Image processing, Statistical analysis

A simple method for classifying southern ocean sea ice from enhanced resolution ERS-1 scatterometer images is presented. The enhanced resolution images are created with the Scatterometer Image Reconstruction (SIR) algorithm. This algorithm uses a dense, irregular sample grid created with multiple, overlapping passes of the ERS-1 scatterometer to achieve resolutions better than the nominal 50 km ERS-1 resolution. Because the scatterometer provides measurements over a range of incidence angles, the incidence angle dependence of the observed σ^{o} can be used as part of the classification algorithm along with the incidence angle normalized σ^{o}, improving the accuracy of the classification. In this study, a third parameter, the standard deviation of a measure of the anisotropy, is used to further help delineate sea ice types. (Auth.)

52-1140

Automated antarctic ice edge detection using NSCAT data.

Remund, Q.P., Long, D.G., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1841-1843, 4 refs.

DLC QE33.2.R4I57 1997

Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Ice detection, Radio echo soundings, Backscattering, Spaceborne photography, Image processing

Polar sea ice plays an important role in the global climate and other geophysical processes. Although spaceborne scatterometers such as NSCAT have low inherent spatial resolution, resolution enhancement techniques can be utilized to make NSCAT data useful for monitoring sea ice extent in the Antarctic. Dual polarization radar measurements are *A* and *B* values and are used in a linear discrimination analysis to identify sea ice and ocean pixels in composite images. Ice edge detection noise reduction is performed through region growing and erosion/dilation techniques. The algorithm is applied to actual NSCAT data. The resulting edge closely matches the NSIDC SSM/I derived 50% ice concentration edge. (Auth.)

52-1141

Effect of temporally varying parameters on L- and C-band SAR observations of boreal forests.

Pulliainen, J., Kurvonen, L., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Singapore, Aug. 3-8, 1997. IGARSS'97. Remote sensing—a scientific vision for sustainable development. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1997, p.1874-1877, 4 refs.

DLC QE33.2.R4I57 1997

Taiga, Biomass, Forest canopy, Forest soils, Frost penetration, Synthetic aperture radar, Backscattering, Spaceborne photography, Image processing, Finland

52-1142

Proceedings of the International Snow Science Workshop, 1996.

International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996, Banff, Canada, ISSW Committee, 1996, 327p., Refs. passim. For selected papers see 52-1143 through 52-1206.

Avalanches, Avalanche forecasting, Countermeasures, Avalanche mechanics, Warning systems, Snow cover stability, Blowing snow, Safety, Rescue operations, Rescue equipment, Survival, Snow slides

52-1143

Avalanche forecasting with GIS.

Bolognesi, R., Denuelle, M., Dexter, L., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.11-13, 3 refs.

Avalanche forecasting, Avalanche modeling, Computer programs, Topographic surveys

52-1144

Analysis of weather and avalanche records from Alta, Utah and Mammoth Mountain, California using classification trees.

Davis, R.E., Elder, K., Howlett, D., Bouzaglou, E., MP 5033, International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.14-18, 6 refs.

Avalanche mechanics, Climatic factors, Avalanche formation, Data processing, Avalanche forecasting, Wind factors, Snow depth, United States—Utah—Alta, United States—California—Mammoth Mountain

52-1145

Genliniv for Windows—an integrated software for snow data analysis.

Dumas, J.L., Gendre, C., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.19-26, 8 refs.

Computers, Computer programs, Computer applications, Data processing, Avalanche forecasting

52-1146

Cyberspace Snow and Avalanche Center: an avalanche information center for the future.

Frankenfield, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.27-28.

Avalanches, Data processing, Computer applications

52-1147

Climate change and Sierra Nevada snowpack.

Johnson, T., Fohl, P., Dozier, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.29-34, 10 refs.

Climatic changes, Water reserves, Snow water equivalent, Snow accumulation, Global warming, Precipitation (meteorology), United States—California—Sierra Nevada

52-1148

Visualization and analysis of the Swiss avalanche bulletin using GPS.

Leuthold, H., Allgöwer, B., Meister, R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.35-40, 10 refs.

Avalanche forecasting, Avalanche modeling, Avalanche formation

52-1149

New Westwide Avalanche Network.

Tremper, B., et al, International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.41-43.

Avalanches, Computer applications, Computer programs, Data processing, Countermeasures, Avalanche forecasting, Organizations, Canada

52-1150

Canadian Avalanche Centre—a five year retrospective.

Dennis, A., Geldsetzer, T., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.44-46.

Avalanches, Organizations, Safety, History, Research projects, Canada

52-1151

Avalanche forecasting in Iceland and Norway: proposed guidelines for implementation and operation of local avalanche forecasting.

Kristensen, K., Magnússon, M.M., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.47-52, 6 refs.

Avalanche forecasting, Accuracy, Iceland, Norway

52-1152

Preparedness of the Icelandic Meteorological Office in response to potential avalanche danger.

Magnússon, M.M., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.53-59, 4 refs.

Avalanches, Avalanche forecasting, Countermeasures, Organizations, Safety, Warning systems, Research projects, Rescue operations, Iceland

52-1153

Evolution of public avalanche information: the North American experience with avalanche danger rating levels.

Dennis, A., Moore, M., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.60-66.

Avalanches, Warning systems, Safety, Avalanche forecasting

52-1154

Decision-making on variable risk terrain.

Penniman, D., Boisselle, R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.67-72, 26 refs.

Avalanches, Warning systems, Safety

52-1155

ANENA—the French Association for Snow and Avalanche Study.

Sivardière, F., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.73-74.

Avalanches, Organizations, Safety, Research projects, France

52-1156

Near surface faceted crystals: conditions necessary for growth and contribution to avalanche formation, southwest Montana, U.S.A.

Birkeland, K., Johnson, R., Schmidt, S., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.75-80, 22 refs.

Avalanche formation, Avalanche mechanics, Metamorphism (snow), Temperature gradients, Snow crystals, Depth hoar, Avalanche forecasting, United States—Montana

52-1157

Observations on buried surface hoar—persistent failure planes for slab avalanches in British Columbia, Canada.

Davis, R.E., Jamieson, B., Hughes, J., Johnston, C., MP 5034, International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.81-85, 14 refs.

Avalanches, Depth hoar, Metamorphism (snow), Snow strength, Shear strength, Snow slides, Canada—British Columbia

To relate shear strength of buried surface hoar to metamorphic changes, prominent layers of surface hoar buried on Jan. 7, 1995 and Dec. 28, 1995 in the Cariboo Mountains of British Columbia were sampled for section plane analysis, tested with shear frame and photographed approximately every ten days for two months. Initially both layers were very unstable and were the failure planes for many dry slab avalanches. The photographs and section planes show the metamorphic changes associated with the changes in strength and stability during the winter. Initially, well-developed surface hoar provides an "umbrella" effect, effectively preventing subsequent snowfall particles from contacting (and sintering to) the underlying layer. For a strengthening layer, preliminary results show that the surface hoar crystals growing larger bonds to the grains below, while the overall thickness of the surface hoar layer decreases.

52-1158

Surface hoar growing for several days.

Hachikubo, A., Akitaya, E., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.86-90, 7 refs.

Depth hoar, Heat flux, Crystals, Snow surface, Latent heat, Surface temperature, Radiant cooling

52-1159

Dry-slab density and thickness during major storms.

Mears, A., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.91-93, 5 refs.

Avalanches, Avalanche formation, Avalanche mechanics, Snowstorms, Snow density, Snow depth, Data processing, Snow slides

52-1160

On the topographical origin of some remaining snow patterns, "Yukigata".

Yamada, Y,, International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.94-99, 14 refs.

Avalanches, Landslides, Topography, Models, Snowmelt, Snow accumulation

52-1161

Measurements on skier triggering.

Camponovo, C., Schweizer, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.100-103, 8 refs.

Snow mechanics, Avalanche formation, Avalanche mechanics, Loads (forces), Snow strength

52-1162
Stochastic model of snow cover stability on mountain slopes.
Chernous, P.A., Fedorenko, IU.V., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.104-106, 5 refs.
Snow cover stability, Mathematical models, Avalanches, Avalanche modeling, Stresses

52-1163
Creep and failure of alpine snow: measurements and observations.
Conway, H., Breyfogle, S., Johnson, J.B., Wilbour, C., MP 5035, International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.107-112, 24 refs.
Snow creep, Avalanche mechanics, Avalanche forecasting, Avalanche triggering, Slope processes, Snow slides, Rain
The authors investigated the creep behavior of alpine snow in an effort to help understand and predict the timing of avalanche release. Measurements of motion of glide shoes buried within a natural snowpack show strains within low density snow are typically large. The rate of deformation increases with temperature and is especially rapid in the presence of liquid water. Creep rates decrease rapidly as the snow densifies. The slope-parallel shearing component of motion is much smaller than expected from the usual constitutive assumptions for snow. Even when snow is first wetted and on slopes up to 36°, the resultant direction of motion is typically close to vertical. They explain this apparently anomalous behavior by considering the effects of metamorphic processes and "capillary strain" (when liquid water is present) which cause deformation independently of gravity. The authors discuss how capillary induced shrinkage at the surface might alter the distribution of stress through the slab sufficiently to cause existing zones of deficit to extend in length. A rain induced surface alteration occurs rapidly over a wide region and has the potential to perturb all existing zones of deficit simultaneously, thereby increasing the possibility of slope failure. The analysis predicts slope failure is more likely if the overlying slab is thin and the stability is already close to critical. Field observations of behavior at the onset of rain support this prediction.

52-1164
Effect of snow temperatures on skier triggering of dry slab avalanches.
McClung, D.M., Schweizer, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.113-117, 9 refs.
Snow temperature, Snow slides, Avalanche formation, Avalanche triggering, Avalanche mechanics, Metamorphism (snow), Temperature effects

52-1165
Compression test for snow stability.
Jamieson, B., Johnston, C., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.118-125, 4 refs.
Snow compression, Snow cover stability, Snow strength, Snow physics, Snow stratigraphy, Slope orientation

52-1166
Experience with stability evaluation for a surface hoar layer during winter 1995-96 at Rogers Pass, British Columbia, Canada.
Schweizer, J., Skjönsberg, D., McMahon, B., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.126-128, 2 refs.
Depth hoar, Snow crystals, Snow strength, Snow cover stability, Avalanche forecasting, Avalanche protection, Countermeasures, Canada—British Columbia—Rogers Pass

52-1167
Measurements of charge-to-mass ratios on individual blowing snow particles.
Schmidt, D.S., Dent, J.D., Schmidt, R.A., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.129-134, 14 refs.
Blowing snow, Snow electrical properties, Particles, Analysis (mathematics)

52-1168
Drift-flux modelling and numerical simulation of snow-accumulation.
Sundsbø, P.A., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.135-139, 13 refs.
Snow fences, Snowdrifts, Mathematical models, Snow creep, Air flow

52-1169
Assessing the accuracy of SIR-C snow cover classification.
Albright, T., Shi, J.C., Dozier, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.140-143, 6 refs.
Synthetic aperture radar, Accuracy, Snow cover distribution, Classifications, LANDSAT, Mapping

52-1170
Driftometer.
Bolognesi, R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.144-148, 21 refs.
Snowdrifts, Avalanche forecasting, Instruments, Wind velocity, Wind factors, Accuracy

52-1171
Acoustic detection system for operational avalanche forecasting.
Chritin, V., Rossi, M., Bolognesi, R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.149-153, 6 refs.
Avalanche forecasting, Warning systems, Acoustics, Sensors, Data processing

52-1172
Instrumentation for in-situ snow liquid water measurements.
Denoth, A., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.154-157, 4 refs.
Snow electrical properties, Dielectric properties, Sensors, Measuring instruments, Wet snow, Antennas

52-1173
Improvements by measuring shear strength of weak layers.
Föhn, P., Camponovo, C., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.158-162, 11 refs.
Shear strength, Stress strain diagrams, Snow strength, Snow slides, Avalanche mechanics, Accuracy, Measurement, Shear stress, Avalanche triggering

52-1174
Pore-space characterization of wet snow in the pendular regime.
Frankenfield, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.163-164, 7 refs.
Wet snow, Analysis (mathematics), Particles, Capillarity

52-1175
Remote avalanche warning-, alarm-, and control systems, fundamentals, applications and experience.
Gubler, H., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.165-172, 4 refs.
Warning systems, Avalanche forecasting, Avalanche protection, Safety, Sensors, Measurement

52-1176
Test of a multiplex snow-depth sensor along a down slope.
Guyomarc'h, G., Mérindol, L., Sudul, M., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.173-178, 6 refs.
Snow depth, Measurement, Sensors, Wind factors, Snow erosion, France—Grenoble

52-1177
Automatic monitoring of snow depth.
Labine, C., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.179-183, 4 refs.
Snow depth, Measurement, Acoustics, Sensors, Accuracy, Canada—Northwest Territories—Ellesmere Island, Canada—Alberta—Edmonton, United States—Utah—Beaver Mountain

52-1178
Reliable estimation of avalanche activity using seismic methods.
Leprettre, B., Navarre, J.P., Taillefer, A., Danielou, Y., Panel, J.M., Touvier, F., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.184-188, 7 refs.
Avalanche forecasting, Accuracy, Seismology, Avalanche formation

52-1179
Preliminary investigations of glide/creep motion sensors in Alta, Utah.
Rice, B., Howlett, D., Decker, R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.189-194, 8 refs.
Snow slides, Snow creep, Avalanche forecasting, Sensors, Accuracy, Climatic factors, United States—Utah—Alta

52-1180
Preliminary results controlled shear experiments.
Schweizer, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.195-197, 11 refs.
Snow mechanics, Snow strength, Snow temperature, Shear strength, Temperature effects, Strains, Shear stress, Stress strain diagrams

52-1181
Remote monitoring of avalanche activity.
Statham, G., Wilson, A., Kelly, J., Bilak, R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.198-199.
Avalanche forecasting, Warning systems, Sensors, Cold weather performance, Remote sensing, Design

52-1182
Glide avalanche forecasting.
Wilson, A., Statham, G., Bilak, R., Allen, B., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.200-202, 5 refs.
Avalanche forecasting, Snow slides, Sensors, Avalanche mechanics, Snow creep

52-1183
Snow science and safety for the mountain guide.
Bruns, W., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.203-206, 4 refs.
Safety, Accidents, Avalanches, Survival

52-1184
Heli-ski survival guide.
Burr, E., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.207-208.
Safety, Avalanches, Helicopters, Rescue operations, Survival

52-1185
Alpine touring access management on public lands in avalanche terrain.
Comey, R.H., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.209-212.
Avalanche forecasting, Safety, United States—Wyoming—Jackson Hole

52-1186
New avalanche control programme at the Lake Louise Ski Area.
Klassen, M., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.213-216.
Avalanche protection, Safety, History, Labor factors, Canada—Alberta—Louise, Lake

52-1187
Avalanche hazard evaluation at ski areas.
Ueland, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.217-218.
Avalanche protection, Avalanche triggering, Countermeasures, Avalanche forecasting, Accuracy, United States—Montana—Big Sky

52-1188
Density and friction measurements in a flowing dry snow avalanche.
Burrell, K.J., Dent, J.D., Louge, M.Y., Schmidt, D.S., Adams, E.E., Jazbutis, T.G., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.219-223, 3 refs.
Avalanche mechanics, Snow slides, Snow density, Friction, Avalanche tracks, Shear stress

52-1189
Frequency/magnitude relationship of avalanches in the Chugach Range, Alaska.
Hamre, D., McCarty, D., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.224-230, 5 refs.
Avalanche mechanics, Avalanche modeling, Avalanche tracks, Avalanche forecasting, United States—Alaska—Chugach Mountains

52-1190
Ryggfonn avalanche dynamics project.
Kristensen, K., Larsen, J.O., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.231-232, Extended abstract with map.
Avalanche mechanics, Avalanche modeling, Norway—Grasdalen

52-1191
Experiences on the use and the effectiveness of permanent supporting structures in Switzerland.
Margreth, S., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.233-238, 7 refs.
Avalanche protection, Avalanche engineering, Countermeasures, Avalanche tracks, Avalanche mechanics, Switzerland

52-1192
Avalanche modeling in France—theory and applications.
Naaim, M., Brugnot, G., Charry, J.C., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.239-243, 3 refs.
Avalanche modeling, Mathematical models, Avalanche forecasting, France

52-1193
Snow avalanche experiments at ski jump.
Nishimura, K., Nohguchi, Y., Ito, Y., Kosugi, K., Izumi, K., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.244-251, 9 refs.
Avalanches, Avalanche mechanics, Avalanche modeling, Air flow

52-1194
Head formation in light granular avalanches.
Nohguchi, Y., Nishimura, K., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.252-256, 5 refs.
Avalanche formation, Avalanche mechanics, Avalanche modeling, Mathematical models

52-1195
Loveland Basin avalanche, February 1996.
Atkins, D., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.257-263, 10 refs.
Avalanche formation, Avalanche mechanics, Avalanche tracks, Avalanche forecasting, Snow water equivalent, Snowfall, Snow depth, Wind velocity, Air temperature, Avalanche modeling, United States—Colorado—Loveland Basin

52-1196
Two destructive avalanches in Iceland.
Egilsson, J.G., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.264-267.
Avalanches, Damage, Accidents, Rescue operations, Rescue equipment, Avalanche tracks, Warning systems, Avalanche protection, Countermeasures, Iceland—Vestfirdir

52-1197
Powerline Pass—B.C. north coast mountain: the history of avalanche damage, mitigation and a modern epic.
Flavelle, S., MacKenzie, H., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.268-270, 10 refs.
Avalanches, History, Transmission lines, Power lines, Power line supports, Countermeasures, Avalanche protection, Survival, Canada—British Columbia

52-1198
Bridal Veil Falls avalanche 1996.
Griffith, K., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.271-275, 8 refs.
Avalanches, Avalanche triggering, Avalanche tracks, Avalanche mechanics, Snowfall, Damage, Snow slides, United States—Utah—Bridal Veil Falls

52-1199
Storms and avalanches of November 1995, Khumbu Himal, Nepal.
Kattelmann, R., Yamada, T., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.276-278, 17 refs.
Avalanches, Snowstorms, Records (extremes), Rescue operations, Nepal—Khumbu Himal

52-1200
Secondary alpine hazards induced by the 1995-1996 eruption of Ruapehu Volcano, New Zealand.
Keys, H.J.R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.279-284, 8 refs.
Volcanoes, Volcanic ash, Avalanches, Snow slides, Snow impurities, Avalanche mechanics, New Zealand—Ruapehu Volcano

52-1201
Further studies on the influence of the GAZ-EX on a continental snowpack, Glory Bowl slide path, Teton Pass, Wyoming.
Elder, K., Newcomb, R., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.285-287, 2 refs.
Snow depth, Avalanche triggering, Countermeasures, Performance, United States—Wyoming—Teton Pass

52-1202
New long range control methods.
Schmoker, M., Stanford, M., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.288-294.
Avalanche triggering, Military equipment, Tanks (combat vehicles), Cold weather operation, Cold weather performance, United States—Washington

52-1203
Avalanche probing revisited.
Auger, T., Jamieson, B., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.295-298, 5 refs.
Rescue operations, Rescue equipment, Avalanches, Survival

52-1204
Snowpack study in technical communication.
Chisholm, R.M., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.299-305, 18 refs.
Education, Manuals, Snow physics, Research projects

52-1205
Avalanche victim's air-from-snow breathing device.
Crowley, T.J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.306-308, 3 refs.
Avalanches, Survival, Rescue equipment

52-1206
Avalanche balloons—preliminary results.
Tschirky, F., Schweizer, J., International Snow Science Workshop, Banff, Canada, Oct. 6-11, 1996. Proceedings, Banff, ISSW Committee, 1996, p.309-312, 3 refs.
Avalanches, Survival, Rescue equipment

52-1207
Model investigation of turbulence-driven pressure-pumping effects on the rate of diffusion of CO_2, N_2O, and CH_4 through layered snowpacks.
Massman, W.J., Sommerfeld, R.A., Mosier, A.R., Zeller, K.F., Hehn, T.J., Rochelle, S.G., *Journal of geophysical research,* Aug. 20, 1997, 102(D15), p.18,851-18,863, 38 refs.
Snow physics, Soil physics, Snow air interface, Atmospheric pressure, Turbulent boundary layer, Turbulent diffusion, Thermal diffusion, Aerosols, Gases, Advection, Mathematical models, Snow cover effect, Wind factors

52-1208
Recent increase in H_2O_2 concentration at Summit, Greenland.
Anklin, M., Bales, R.C., *Journal of geophysical research,* Aug. 20, 1997, 102(D15), p.19,099-19,104, 22 refs.
Climatology, Aerosols, Air pollution, Snow air interface, Firn stratification, Ice sheets, Ice cores, Drill core analysis, Chemical composition, Seasonal variations, Greenland—Summit

52-1209
Heterogeneous chemistry in aircraft wakes: constraints for uptake coefficients.
Kärcher, B., *Journal of geophysical research,* Aug. 20, 1997, 102(D15), p.19,119-19,135, 48 refs.
Climatology, Air pollution, Atmospheric composition, Stratosphere, Condensation trails, Heterogeneous nucleation, Ice nuclei, Aerosols, Turbulent diffusion, Classifications, Ice vapor interface, Mathematical models

52-1210
UARS study of lower stratospheric polar processing in the early stages of northern and southern winters.
Yudin, V.A., et al, *Journal of geophysical research,* Aug. 20, 1997, 102(D15), p.19,137-19,148, 44 refs.
Climatology, Polar atmospheres, Polar stratospheric clouds, Aerosols, Particles, Air flow, Heterogeneous nucleation, Seasonal variations, Meteorological factors, Sounding, Models
UARS data and results from a three-dimensional transport model have been used to compare and contrast the extent of the early stages of chemical processing by polar stratospheric clouds (PSCs) during the 1991-1993 Northern and Southern Hemisphere winters of the Upper Atmosphere Research Satellite (UARS) mission. In the Southern Hemisphere, polar processing fills the vortex in a bit over 2 weeks. Estimates of the spectral aerosol measure of the aerosol spectrum from CLAES observations illustrate that PSC particles are seen where cold temperatures occur inside the polar vortex and heterogeneous conversion of chlorine species on PSCs are expected. (Auth. mod.)

52-1211

Distribution of antarctic polar stratospheric clouds as seen by the CLAES experiment.

Mergenthaler, J.L., Kumer, J.B., Roche, A.E., Massie, S.T., *Journal of geophysical research,* Aug. 20, 1997, 102(D15), p.19,161-19,170, 41 refs.

Climatology, Polar atmospheres, Atmospheric composition, Ozone, Spectroscopy, Polar stratospheric clouds, Aerosols, Distribution, Radiation absorption, Sedimentation

The distribution and optical characteristics of antarctic polar stratospheric clouds (PSCs) during the winter of 1992 as seen from the cryogenic limb array etalon spectrometer (CLAES) on the NASA Upper Atmosphere Research Satellite (UARS) are presented. An analysis of the vertical and areal distribution using the aerosol absorption coefficient is presented, including a polar map showing the frequency of PSC occurrence during the two CLAES antarctic viewing periods. The PSC seasonal evolution from CLAES is compared with a climatology based on the Stratospheric Aerosol Measurements II (SAM II) system. (Auth. mod.)

52-1212

Vertical profiles of N_2O_5, HO_2NO_2, and NO_2 inside the arctic vortex, retrieved from nocturnal MIPAS-B2 infrared limb emission measurements in February 1995.

Wetzel, G., et al, *Journal of geophysical research,* Aug. 20, 1997, 102(D15), p.19,177-19,186, 33 refs.

Climatology, Polar atmospheres, Air pollution, Atmospheric composition, Stratosphere, Aerosols, Turbulent diffusion, Radiometry, Profiles, Spectra, Statistical analysis, Models, Correlation

52-1213

Evaluation of induced infiltration in glacial drift aquifers.

Conrad, L.P., Beljin, M.S., International Symposium on Groundwater Management, San Antonio, TX, Aug. 14-16, 1995. Proceedings, New York, American Society of Civil Engineers, 1995, p.294-299, 17 refs.

DLC TD403.G7157

Stream flow, Hydrogeology, Glacial deposits, Alluvium, Ground water, Water table, Water transport, Seepage, Wells, Pumps, Flow control, Mathematical models

52-1214

GIS used to derive operational hydrologic products from in situ and remotely sensed snow data.

Carroll, T.R., International Workshop on Geographical Information Systems in Assessing Natural Hazards, Perugia, Italy, Sep. 20-22, 1993. Selected papers. Edited by A. Carrara et al and Advances in Natural and Technological Hazards Research, Vol.5., Dordrecht, Kluwer Academic Publishers, 1995, p.335-342,352-353, 9 refs.

DLC GB5001.G46

Snow surveys, Snow cover distribution, Snow hydrology, Snow water equivalent, Remote sensing, Aerial surveys, Radiometry, Geophysical surveys, Flood forecasting

52-1215

Effects of the shear stress strength and the average normal stress on deformation of frozen soil.

Ma, W., Wu, Z.W., Chang, X.X., Sheng, Y., *Progress in natural science,* Oct. 1997, 7(5), p.594-599, 4 refs.

Frozen ground mechanics, Soil tests, Strain tests, Soil strength, Soil creep, Shear stress, Deformation, Rheology

52-1216

Photogrammetry breaks the ice—glacial monitoring in North Cascades National Park.

DeGross, M., *Geo info systems,* Oct. 1997, 7(10), p.16-23, 3 refs.

Mountain glaciers, Glacier surveys, Photogrammetric surveys, Spaceborne photography, Glacier mass balance, Sensor mapping, Glacier oscillation, Computer programs, United States—Washington—North Cascades National Park

52-1217

Proceedings of the ACSYS Conference on the Dynamics of the Arctic Climate System.

ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994, Lemke, P., ed, Anderson, L., ed, Barry, R., ed, Vuglinskiĭ, V.S., ed, *World Meteorological Organization. Technical document,* Sep. 1996, WMO/TD No.760, 482p. + appends., Refs. passim. For selected papers see 52-1218 through 52-1299.

Climatology, Polar atmospheres, Ocean currents, Air ice water interaction, Sea ice, Ice cover

52-1218

ACSYS as a journey of discovery.

Aagaard, K., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.3-7, Extended abstract. 1 ref.

Research projects, Sea ice, Climatology, Ocean currents, Polar atmospheres

52-1219

Hydroclimatology of north-flowing high latitude rivers.

Lawford, R.G., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.8-23, 16 refs.

Rivers, River basins, Runoff, River flow, Climatic factors, Permafrost, Freezeup, Hydrology, Meltwater, Drainage, Precipitation (meteorology), Arctic Ocean, Canada—Northwest Territories—Mackenzie River

52-1220

Atmospheric components of the hydrological cycle in the Arctic.

Barry, R.G., Serreze, M.C., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.24-31, 38 refs.

Hydrologic cycle, Polar atmospheres, Evapotranspiration, Moisture transfer, Precipitation (meteorology), Drainage, River basins, Runoff, Rivers, Arctic Ocean

52-1221

Hydrological studies in the arctic zone of Russia.

Ivanov, V.V., Vuglinskiĭ, V.S., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.32-41, 15 refs.

Hydrologic cycle, Water balance, River flow, Runoff, Deltas, Estuaries, Surface waters, Russia

52-1222

On sensitivity of a simulated high-latitude atmosphere to sea-ice fluctuation and to parameterization of cloud optical properties.

Meleshko, V.P., Kattsov, V.M., Sporyshev, P.V., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.42-46, Extended abstract.

Sea ice, Ice cover effect, Air ice water interaction, Ice conditions, Polar atmospheres, Cloud physics, Optical properties

52-1223

Processes of air-sea interaction in polar regions.

Makshtas, A.P., Timachev, V.F., Zachek, A.S., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.48-53, 19 refs.

Sea ice, Ice cover effect, Heat flux, Aerosols, Polar atmospheres, Air ice water interaction, Ice air interface, Radiation balance, Turbulent exchange

The authors consider some questions from a previous review of the results of full-scale experiments, carried out in the early 1950s in the Arctic and the Antarctic. Results show the following: the aerosol component has an important role in the formation of the long-wave radiation balance of sea ice cover surface, which governs the increase of incoming long-wave radiation by 10-20%; the stratification effects of the near-ice air layer must be taken into account to describe turbulent energy exchange in the uniform zones of the sea ice cover; the most important improvement of the ice cover models is the parameterization of the melting of hummocks and formation of puddles, occupying up to 30% of the ice cover surface and radically enhancing the processes of its decay; and the heat flux from the ocean to the bottom of the ice has a well-pronounced spatial variability. (Auth. mod.)

52-1224

Modeling interactions between shortwave radiation, pack ice and the upper ocean.

Maykut, G.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.55-59, 20 refs.

Pack ice, Ice water interface, Sea ice, Ice cover effect, Solar radiation, Meltwater, Albedo, Mass balance, Ice melting, Heat flux

52-1225

Remote sensing of arctic sea ice.

Askne, J., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.60-64, 29 refs.

Sea ice, Remote sensing, Heat flux, Ice models, Sensors, Synthetic aperture radar, Ice conditions

52-1226

Problems of sea ice modelling for climate research.

Lemke, P., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.66-72, 13 refs.

Sea ice, Ice models, Accuracy, Thermodynamics, Climatology, Weather forecasting

52-1227

Climatic variability of the Arctic Ocean circulation connected with interannual variations of atmospheric processes.

Timokhov, L.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.73-77, 4 refs.

Ocean currents, Sea water, Salinity, Water temperature, Air water interactions, Seasonal variations, Arctic Ocean

52-1228

Water modification on Arctic continental shelves: seasonal cycle and interannual variation.

Melling, H., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.78-82, 28 refs.

Ice water interface, Water temperature, Salinity, Sea water, Wind factors, River flow, Oceanography, Ice cover effect, Polynyas, Arctic Ocean, Beaufort Sea

52-1229

Convective water mass and ice formation in Arctic shelf seas: numerical process studies.

Backhaus, J.O., Fohrmann, H., Harms, I.H., Jungclaus, J.H., Rubino, A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.83-96, 25 refs.

Polynyas, Sea water, Models, Sea ice, Ice cover effect, Ocean bottom, Ocean currents, Ice formation, Ice cover thickness, Salinity, Arctic Ocean, Barents Sea, Russia—Kara Sea

52-1230

Arctic Ocean water masses and circulation: an overview based on the 1991 expedition of IB ODEN.

Jones, E.P., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.97-102, 3 refs.

Ocean currents, Sea water, Runoff, River flow, Water chemistry, Models, Arctic Ocean

52-1231

Characteristics of water and sediment discharge formation from small watersheds of the Arctic zone under the impact of technology.

Bobrovitskaia, N.N., Vasilenko, N.G., Zubkova, K.M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.105-109, 3 refs.

Streams, Environmental impact, Watersheds, Sediments, Runoff, Snow melting, Russia—Yamal Peninsula

52-1232

ECMWF and METEO-FRANCE GCM simulations of precipitation and surface mass balance of the Greenland ice sheet.

Genthon, C., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.110-114, 7 refs.

Models, Simulation, Accuracy, Ice cover effect, Sea ice, Mass balance, Precipitation (meteorology), Ice sheets, Greenland

52-1233

River water inflow to the Arctic seas.

Ivanov, V.V., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.115-124, 6 refs.

River flow, Runoff, River basins, Russia

52-1234

Initiation of ice sheet growth, Milankovitch solar radiation variations, and the 100 kyr ice age cycle.

Ledley, T.S., Chu, S.P., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.125-129, 16 refs.

Ice cover, Air temperature, Solar radiation, Pleistocene, Sea ice, Ice models, Ice air interface, Oxygen isotopes

52-1235

Research results for evaporation from different landscapes in the Arctic zone.

Novikov, S.M., Trofimov, S.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.130-133, 8 refs.

Evaporation, Water balance, Heat balance, Permafrost hydrology, Swamps, Evaporimeters, Tundra terrain, Russia—Yamal Peninsula, Russia—Siberia

52-1236

Cryogenic transformation of the surface- and subsurface inflows into the Arctic seas.

Sokolov, B.L., Markov, M.L., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.135-138.

Runoff, Seasonal variations, Seasonal freeze thaw, Freeze thaw cycles, River ice, Meltwater, Stream flow, River basins, Russia—Yakutia, Transbaykal

52-1237

Hydrological cycle modelling for Arctic river basins.

Vinogradov, IU.B., Vinogradova, T.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.139-143, 1 ref.

Hydrologic cycle, Runoff, River basins, Mathematical models, Snowmelt, Hydrography, Russia—Pechora River, Russia—Sula River, Russia—Nyashenny Brook

52-1238

Atmospheric water vapor convergence and river runoff in northern high latitudes.

Walsh, J.E., Portis, D., Zhou, X., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.144-148.

Precipitation (meteorology), Evaporation, Polar atmospheres, Runoff, Hydrologic cycle, Water vapor, Arctic Ocean, Canada—Northwest Territories—Mackenzie River

52-1239

Investigation of the atmospheric effect on snowmelt in the Arctic and Subarctic.

Zhang, T., Stamnes, K., Bowling, S.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.149-153, 8 refs.

Snow air interface, Snowmelt, Water vapor, Air temperature, Seasonal variations, Mathematical models, Turbulent flow, Temperature inversions, Solar radiation, Snow surface, Radiation balance, United States—Alaska—Barrow

52-1240

Valuation of possible changes in glacio-hydrological characteristics under global warming: southeastern Alaska glaciation.

Davidovich, N.V., Ananicheva, M.D., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.154-160, 7 refs.

Glacial hydrology, Global warming, Global change, Climatic factors, Carbon dioxide, Glacier ablation, Glacier melting, Temperature effects, Air temperature, United States—Alaska

52-1241

Mechanisms of formation and predictability of the intermediate and high latitudes atmospheric blockings.

Bekriaev, R.V., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.164-168, 8 refs.

Mathematical models, Wave propagation, Atmospheric physics, Polar atmospheres

52-1242

Regional climate model of the Arctic atmosphere.

Botzet, M., et al, ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.169-173, 5 refs.

Polar atmospheres, Models, Accuracy, Sea ice, Ice cover thickness

52-1243

Wintertime cold-air outbreaks from the Arctic ice.

Brümmer, B., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.174-178, 1 ref.

Ice air interface, Sea ice, Boundary layer, Ice edge, Ice cover effect, Air masses, Latent heat, Heat flux

52-1244

Importance of the low level inversions upon the Arctic weather and climate.

Wilhelmsen, K., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.180-184, 3 refs.

Air temperature, Temperature inversions, Wind factors, Polar atmospheres, Atmospheric circulation, Atmospheric pressure, Wind velocity, Norway—Bear Island, Norway—Jan Mayen, Fram Strait

52-1245

On the impact of sub-grid scale sea-ice distribution on atmospheric climate and air-sea fluxes.

Grötzner, A., Sausen, R., Claussen, M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.185-188, 3 refs.

Sea ice, Ice conditions, Sea ice distribution, Air ice water interaction, Ice cover effect, Heat flux, Latent heat, Thermal radiation

52-1246

Interaction of the modern climatic changes of atmosphere, ocean and ice cover in the Arctic.

Gudkovich, Z.M., Zakharov, V.F., Aksenov, E.O., Pozdnyshev, S.P., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.189-193.

Air ice water interaction, Climatic changes, Ice cover effect, Sea ice distribution, Ice conditions, Salinity, Sea water, Runoff, Atmospheric pressure

52-1247

Airborne measurements of turbulent transfer of momentum and heat related to floe field structure in the Fram Strait.

Hartmann, J., Augstein, E., Kottmeier, C., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.194-198, 6 refs.

Heat transfer, Sea ice, Ice floes, Air water interactions, Ice edge, Turbulence, Heat flux, Heat transfer coefficient, Analysis (mathematics), Fram Strait

52-1248

Heat and Water Budgets over the northern polar region as estimated from 14 atmospheric general circulation models.

Kattsov, V.M., Pavlova, T.V., Govorkova, V.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.199-203, 3 refs.

Atmospheric circulation, Polar atmospheres, Models, Accuracy, Precipitation (meteorology), Evaporation, Heat flux, Arctic Ocean, Greenland

52-1249

On the variability of surface heat fluxes at high latitudes.

Moore, G.W.K., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.204-208.

Polar atmospheres, Atmospheric circulation, Heat flux, Air water interactions, Barents Sea, Greenland, Labrador Sea

52-1250

Temperature inversions in Arctic atmosphere.

Nagurnyĭ, A.P., Alekseev, G.V., Rozanov, E.V., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.209-215, 13 refs.

Temperature inversions, Air temperature, Polar atmospheres, Solar radiation, Aerosols, Greenhouse effect

52-1251

Physical and optical/radiative properties of Arctic aerosols: potential effects on Arctic climate.

Pueschel, R.F., Kinne, S.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.216-220, 15 refs.

Polar atmospheres, Atmospheric physics, Aerosols, Climatology, Optical properties, Light scattering, Solar radiation, Analysis (mathematics), Snow cover effect, Ice cover effect

52-1252

Calculation of heat fluxes for Arctic regions dependent on sea ice distribution.

Lüpkes, C., Schlünzen, K.H., Birnbaum, G., Von Salzen, K., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.221-225, 4 refs.

Heat flux, Sea ice distribution, Ice cover effect, Models, Atmospheric boundary layer, Ice air interface, Heat transfer

52-1253

Atmospheric Radiation Measurement (ARM) Program North Slope of Alaska/Adjacent Arctic Ocean (NSA/AAO) Cloud and Radiation Testbed (CART): science issues.

Stamnes, K., Zak, B.D., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.227-231, 4 refs.

Radiance, Infrared radiation, Radiation balance, Solar radiation, Polar atmospheres, Water vapor, Cloud physics, Radiometry, United States—Alaska—Barrow

52-1254

Dependence of surface albedo in the Arctic on surface characteristics, clouds and solar elevation.

Stamnes, K., Jin, Z.H., Zak, B.D., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.232-236, 13 refs.

Snow surface, Ice surface, Albedo, Cloud cover, Air ice water interaction, Models, Snow depth, Ice cover thickness, Salinity

52-1255

Use of Advanced Earth Observing Satellite to study radiation/cloud/climate interactions and ozone chemistry in the Arctic.

Stamnes, K., Filiushkin, V.V., Zak, B.D., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.237-240.

Polar atmospheres, Ozone, Solar radiation, Cloud physics, Models, Cloud cover, Spacecraft

52-1256

Methods for estimating the characteristics of the atmospheric boundary layer in polar regions.

Makshtas, A.P., Timachev, V.F., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.242-246, 8 refs.

Atmospheric boundary layer, Polar atmospheres, Mathematical models, Ice air interface, Heat flux, Seasonal variations

52-1257

Atmospheric Radiation Measurement (ARM) Program North Slope of Alaska and Adjacent Arctic Ocean (NSA/AAO) Cloud and Radiation Testbed (CART): an overview.

Zak, B.D., Stamnes, K., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.247-252, 12 refs.

Research projects, Radiance, Infrared radiation, Radiation balance, Solar radiation, Polar atmospheres, Water vapor, Cloud physics, Radiometry, United States—Alaska—Barrow

52-1258

Modelling convection in a melt pond.

Bogorodskiĭ, P.V., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.255-259, 9 refs.

Meltwater, Heat transfer, Sea ice, Ice melting, Ice air interface, Analysis (mathematics), Heat flux

52-1259

Operational ice-ocean coupled model of the Northern Hemisphere.

Cheng, A., Preller, R.H., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.260-264, 9 refs.

Ice water interface, Drift, Sea ice, Ice cover thickness, Sea ice distribution, Ice conditions, Ice models, Accuracy, Ice forecasting

52-1260

Surface melt puddles on multi-year sea ice in the Eurasian Arctic.

Eicken, H., Gradinger, R., Ivanov, B., Makshtas, A., Pác, R., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.267-271, 5 refs.

Ice cover, Sea ice, Ice melting, Ice surface, Meltwater, Albedo

52-1261

Sensitivity of a large-scale sea-ice-upper-ocean model to uncertainties in the atmospheric forcing.

Fichefet, T., Morales Maqueda, M.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.272-277, 20 refs.

Sea ice, Ice cover effect, Ice models, Ice cover thickness, Sea ice distribution, Accuracy

52-1262

Parameterizing the strength of Arctic sea ice.

Flato, G.M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.278-282, 10 refs.

Sea ice, Ice cover strength, Ice models, Ice cover thickness

52-1263

Russian historical material on sea ice as a part of global digital sea ice data bank.

Frolov, I.E., Smolianitskiĭ, V.M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.283-288, 6 refs.

Sea ice, Data processing, History

52-1264

Large-scale simulation of Arctic sea ice 1986-1992.

Harder, M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.289-293, 7 refs.

Ice models, Sea ice, Drift, Simulation, Mathematical models

52-1265

On coupling a dynamic-thermodynamic snow sea-ice model to a global climate model.

Holland, D.M., Oberhuber, J.M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.294-299, 16 refs.

Sea ice, Ice models, Air ice water interaction, Models, Heat flux, Thermodynamics, Climatology

52-1266

Mesoscale simulation of the Arctic ice pack.

Hopkins, M.A., MP 5036, ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.300-303, 6 refs.

Sea ice, Ice cover thickness, Ice models, Simulation

52-1267
Seasonal evolution of sea ice cover and shelf water off Labrador simulated in a coupled ice-ocean model.
Ikeda, M., Yao, T., Yao, Q., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.304-308, 4 refs.
Sea ice, Ice cover, Ice models, Ice air interface, Simulation, Ice cover thickness, Labrador Sea

52-1268
Measurement, analysis and parametrization of melt pond albedo.
Morassutti, M.P., LeDrew, E.F., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.311-315, 6 refs.
Meltwater, Ice melting, Sea ice, Albedo, Ice models

52-1269
Characteristics of surface energy partitioning over snow-covered first-year sea ice in the Canadian Arctic Archipelago during the spring transition.
Papakyriakou, T.N., LeDrew, E.F., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.316-321, 11 refs.
Sea ice, Snow ice interface, Surface energy, Snow cover effect, Snow density, Albedo, Snow depth, Canada—Northwest Territories—Arctic Archipelago

52-1270
Interaction of solar radiation with summer sea ice.
Perovich, D.K., Tucker, W.B., MP 5037, ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.322-326, 13 refs.
Solar radiation, Sea ice, Albedo, Meltwater, Ice melting, Absorption

52-1271
Relating Arctic pack ice stress and strain at the 10km scale.
Richter-Menge, J.A., Elder, B.C., Overland, J.E., Salo, S., MP 5038, ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.327-331, 10 refs.
Sea ice, Pack ice, Stress strain diagrams, Ice deformation, Ice models

52-1272
Modelling the seasonal variability of the Arctic Ocean using a thermodynamic model of the sea ice-ocean system.
Riabchenko, V.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.332-336, 9 refs.
Air ice water interaction, Thermodynamics, Seasonal variations, Mathematical models, Salinity, Ocean currents, Arctic Ocean

52-1273
Sea ice climatic model.
Shutilin, S.V., Afanas'eva, IU.M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.337-341, 6 refs.
Sea ice, Ice models, Air ice water interaction, Heat flux, Albedo, Mathematical models

52-1274
Melt pond evolution on summer sea ice.
Tucker, W.B., Perovich, D.K., MP 5039, ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.342-346, 4 refs.
Sea ice, Ice cover, Ice melting, Meltwater, Ice cover effect, Radiation absorption, Albedo, Air ice water interaction

52-1275
Fram Strait ice draft series.
Vinje, T., Nordlund, N., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.347-351, 11 refs.
Ice cover thickness, Sea ice distribution, Ice surveys, Fram Strait

52-1276
Tracing the circulation of the low "NO" waters in the Eurasian basin of the Arctic Ocean.
Anderson, L.G., Jones, E.P., Rudels, B., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.355-358, 1 ref.
Ocean currents, Sea water, Salt water, Water chemistry, Flow rate, Water flow, Arctic Ocean

52-1277
Hydrographic observations during the "Arctic '94" expedition.
Aagaard, K., et al, ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.359-363.
Hydrography, Expeditions, Ocean currents, Oceanography, Salinity, Sea water, Oxygen, Arctic Ocean

52-1278
Residence times in the upper Arctic Ocean.
Becker, P., Björk, G., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.364-368, 7 refs. Abstract only.
Ocean currents, Sea water, Models, Arctic Ocean

52-1279
Ventilation times of the deep waters in the Arctic Ocean derived from ^{14}C and ^{39}Ar data.
Schlosser, P., Kromer, B., Östlund, G., Ekwurzel, B., Bönisch, G., Loosli, H., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.369-373, 9 refs.
Radioactive age determination, Ocean bottom, Sea water, Ocean currents, Arctic Ocean

52-1280
Anomalous warm water in the Canadian Basin of the Arctic Ocean.
Carmack, E.C., Macdonald, R.W., Perkin, R.G., McLaughlin, F.A., Pearson, R.J., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.374-377, 16 refs.
Ocean currents, Sea water, Water temperature, Salinity, Water pollution, Arctic Ocean

52-1281
Numerical investigation of interannual variability of circulation of the Barents Sea for summer season.
Chvil'ev, S.V., Semenov, G.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.378-382, 5 refs.
Ocean currents, Seasonal variations, Models, Barents Sea

52-1282
Freshwater component in the Arctic Ocean outflow through the Fram Strait.
Friedrich, H.J., Houssais, M.N., Quadfasel, D.R., Rudels, B., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.385-389, 7 refs.
Ocean currents, Sea water, Sea ice, Ice water interface, Salinity, Analysis (mathematics), Water flow, Flow rate, Ice melting, Fram Strait, Arctic Ocean

52-1283
Atlantic-Arctic exchange in a large scale ocean circulation model.
Gerdes, R., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.390-395, 5 refs.
Ocean currents, Models, Oceanography, Salinity, Arctic Ocean, Atlantic Ocean

52-1284
Winter convection features in the Lofoten Basin.
Ivanov, V.V., Korablev, A.A., Miakoshin, O., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.401-405, 6 refs.
Salinity, Seasonal variations, Heat flux, Convection, Oceanography, Ocean currents, Mathematical models

52-1285
Is the intensity of the deep convection in the Nordic seas an indicator of the long-term climate variability.
Ivanov, V.V., Korablev, A.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.406-410, 13 refs.
Salinity, Seasonal variations, Heat flux, Convection, Oceanography, Ocean currents, Climatic changes, Greenland Sea, Fram Strait

52-1286
Characterization of mesoscale variability of currents at the continental shelf break of the Mackenzie Shelf.
Kulikov, E.A., Carmack, E.C., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.411-414, 4 refs.
Ocean currents, Salinity, Water temperature, Upwelling, Wave propagation, Ice cover effect, Wind velocity, Beaufort Sea

52-1287
Adjusted geostrophic circulation in the Amundsen Basin.
Lewis, D., Swift, J.H., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.415-419.
Ocean currents, Hydrography, Salinity, Velocity measurement, Arctic Ocean

52-1288
Feedback mechanisms affecting the thermohaline circulation.
Lohmann, G., Gerdes, R., Chen, D., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.420-424, 7 refs.
Salinity, Ocean currents, Ice models, Mathematical models, Air ice water interaction, Heat flux, Air temperature, Ice cover effect

52-1289
Mackenzie Shelf brine factory: a river runs through it.
Macdonald, R.W., Paton, D.W., Carmack, E.C., Omstedt, A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.425-429, 12 refs.
Brines, Ice formation, Sea ice, Runoff, Ice melting, Meltwater, Oxygen isotopes, Arctic Ocean, Canada—Northwest Territories—Mackenzie River

52-1290
Physical and geochemical properties across the Atlantic/Pacific water mass boundary in the Southern Canadian Basin.
McLaughlin, F.A., Carmack, E.C., Macdonald, R.W., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.430-435, 5 refs.
Hydrography, Water temperature, Salinity, Water chemistry, Ocean currents, Arctic Ocean

52-1291
Greenland Sea deep water: a balance between convection and advection.
Meincke, J., Rudels, B., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.436-440, 5 refs.
Convection, Ocean bottom, Salinity, Advection, Temperature measurement, Ocean currents, Greenland Sea, Arctic Ocean

52-1292
Internal waves and vertical mixing over the Laptev Sea slope.
Muench, R.D., Dewey, R.K., Schauer, U., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.441-445, 6 refs.
Heat flux, Water temperature, Salinity, Spectra, Analysis (mathematics), Oceanography, Sea water, Heat capacity, Ocean currents, Turbulence, Russia—Laptev Sea

52-1293
Model of the Arctic Ocean circulation.
Neelov, I.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.446-450.
Ocean currents, Mathematical models, Oceanography, Salinity, Arctic Ocean

52-1294
Baroclinic and barotropic factors in the Arctic Ocean general circulation.
Poliakov, I.V., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.451-456, 9 refs.
Ocean currents, Atmospheric circulation, Wind factors, Salinity, Oceanography, Arctic Ocean

52-1295
Thermohaline circulation of the Arctic Ocean.
Poliakov, I.V., Timokhov, L.A., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.457-461, 11 refs.
Ocean currents, Sea water, Water level, Salinity, Oceanography, Arctic Ocean

52-1296
Winter convection and seasonal sea-ice melt above the Arctic Ocean thermocline.
Rudels, B., Anderson, L.G., Jones, E.P., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.462-466.
Convection, Sea ice, Ice melting, Salinity, Ocean currents, Arctic Ocean

52-1297
Circulation and water mass modifications along the Nansen Basin slope.
Schauer, U., Rudels, B., Muench, R.D., Timokhov, L., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.468-472, 4 refs.
Ocean currents, Salinity, Water temperature, Barents Sea, Arctic Ocean

52-1298
Numerical modelling of the climatic thermohaline water circulation in the North Atlantic and the Arctic Ocean.
Semenov, G.A., Bezgreshnov, A.M., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.473-477, 3 refs.
Mathematical models, Ocean currents, Ice cover effect, Climatology, Salinity, Arctic Ocean, North Atlantic Ocean

52-1299
Circulation and formation of cold, saline water on the northeast shelf of the Chukchi Sea.
Weingartner, T.J., Cavalieri, D.J., Groves, J., ACSYS Conference on the Dynamics of the Arctic Climate System, Göteborg, Sweden, Nov. 7-10, 1994. Proceedings. Edited by P. Lemke, L. Anderson, R. Barry, and V. Vuglinskiĭ, Geneva, Switzerland, World Meteorological Organization, 1996, p.478-482, 16 refs.
Ocean currents, Oceanography, Salinity, Latent heat, Polynyas, Wind factors, Water temperature, Chukchi Sea, Arctic Ocean

52-1300
Ultraviolet remote sensing technology.
Krueger, A.J., Global environmental change: the role of space in understanding Earth. 27th Goddard Memorial Symposium: Proceedings of a conference held Mar. 8-10, 1989, Washington, D.C. Edited by R.G. Johnson and Science and technology series, vol.76: A Supplement to Advances in the Astronautical Sciences, San Diego, CA, Univelt, Inc., 1990, p.123-130, Abridged version of the paper, some illustrations were not available.
DLC GE180.G63 1989
Ozone, Atmospheric composition, Chemical composition, Measuring instruments
The Nimbus 7 satellite's Total Ozone Mapping Spectrometer (TOMS) has obtained images of the antarctic ozone hole, and demonstrated that volcanic eruptions can be unambiguously detected from space in view of the absorption of the plumes' sulfur dioxide. While the TOMS currently has an average spatial resolution of 66 km and a 24-hr temporal resolution, total ozone features at mid-latitudes change within time-scales of hours and may involve structural features as small as 15-25 km. It is projected that these observational requirements are achievable with TOMS-like instruments in GEO, using CCD detector arrays in place of mechanical scanning.

52-1301
Areal and seasonal extent of sea-ice cover off the northwestern side of the Antarctic Peninsula: 1979 to 1996.
Hewitt, R.P., *CCAMLR Science*, 1997, Vol.4, Scientific Committee and the Commission for the Conservation of Antarctic Marine Living Resources. Journal. Edited by E. Sabourenkov, p.65-73, With French, Russian and Spanish summaries. 19 refs.
Sea ice distribution, Ice cover effect, Seasonal variations, Biomass, Antarctica—Antarctic Peninsula
Analysis of seasonal sea-ice cover of an area measuring 1.25 x 10^6 km^2 off the northwestern side of the Antarctic Peninsula indicates that there were 4 periods of extensive ice cover during the last 18 years. Periods of extensive winter ice cover peaked in 1980, 1986, 1991 and 1995 and were foreshadowed by the late retreat of ice during the springs of 1985, 1990 and 1994. Ice cover during the summer months and winter ice cover during years between periods of extensive ice cover decreased during the second half of the time series. Maximum ice-cover during the periods of extensive ice cover did not change. Annual curves of sea-ice cover were integrated over time to produce an annual index of sea-ice cover in units of 10^6/month. This index may be used in conjunction with studies of variability in biological production, particularly the reproductive success of antarctic krill, in the Antarctic Peninsula. (Auth. mod.)

52-1302
Temporal and spatial occurrence of UV-absorbing mycosporine-like amino acids in tissues of the antarctic sea urchin *Sterechinus neumayeri* during springtime ozone-depletion.
Karentz, D., Dunlap, W.C., Bosch, I., *Marine biology*, Aug. 1997, 129(2), p.343-353, Refs. p.352-353.
Marine biology, Ultraviolet radiation, Physiological effects, Ozone, Antarctica—Hero Inlet
From Sep. to Nov. 1991, UV-absorbing mycosporine-like amino acids (MAAs) were monitored in a natural population of the sea urchin *Sterechinus neumayeri* from a coastal area of Anvers I. MAA concentrations were determined for specific tissues (gonad, digestive tract and body wall) from adults collected at 4 depths (intertidal, 8, 15 and 24 m). Four MAAs were identified: mycosporine-glycine, shinorine, porphyra-334 and palythine. Concentrations of MAA content in ovaries decreased with depth on all sample dates; however, the MAA content of the digestive tract and body wall did not exhibit a consistent pattern of change with depth. Large daily and seasonal fluctuations in the light regime, which are characteristic of antarctic coastal environments, apparently do not provide reliable cues to elicit a detectable, temporal, biochemical response. (Auth. mod.)

52-1303
Reconstruction of Holocene landscape development and present vegetation of the Val Fenga (Tyrol/Grisons). [Holozäne Landschaftsentwicklung und aktuelle Vegetation im Fimbertal (Val Fenga, Tirol/Graubünden)]
Bauerochse, A., Katenhusen, O., *Phytocoenologia*, Sep. 30, 1997, 27(3), p.353-453, In German with English summary. Refs. p.444-453.
Alpine landscapes, Climatology, Geomorphology, Landscape development, Forest lines, Paleobotany, Palynology, Classifications, Vegetation patterns, Models, Geochronology, Statistical analysis, Switzerland—Alps

52-1304
Light scattering by hexagonal ice crystals: solutions by a ray-by-ray integration algorithm.
Yang, P., Liou, K.N., *Optical Society of America. Journal A*, Sep. 1997, 14(9), p.2278-2289, 29 refs.
Cloud physics, Remote sensing, Ice crystal optics, Light scattering, Wave propagation, Particles, Dielectric properties, Electric fields, Polarization (waves), Refractivity, Attenuation, Mathematical models

52-1305
Remote arctic drilling operations in Russia, Ardalin field.
Reyna, E.M., Nicholson, S., Brady, S., *Journal of petroleum technology*, Sep. 1997, 49(9), p.986-988, Synopsis of paper presented at SPE Annual Technical Conference and Exhibition, Denver, CO, Oct. 6-9, 1996.
Arctic landscapes, Tundra terrain, Hydrocarbons, Oil wells, Drilling, Environmental impact, Permafrost preservation, Economic development, Russia—Ardalin

52-1306

Modeling sea ice as a granular material, including the dilatancy effect.

Tremblay, L.B., Mysak, L.A., *Journal of physical oceanography,* Nov. 1997, 27(11), p.2342-2360, 37 refs.

Oceanography, Sea ice, Ice mechanics, Sliding, Air ice water interaction, Ice cover effect, Ice heat flux, Viscosity, Seasonal variations, Thermodynamic properties, Rheology, Ice models, Mathematical models

52-1307

Sensitivity to surface forcing and boundary layer mixing in a global ocean model: annual-mean climatology.

Large, W.G., Danabasoglu, G., Doney, S.C., McWilliams, J.C., *Journal of physical oceanography,* Nov. 1997, 27(11), p.2418-2447, Refs. p.2446-2447.

Climatology, Oceanography, Ocean currents, Boundary layer, Thermal diffusion, Turbulent diffusion, Air ice water interaction, Ice cover effect, Fluid dynamics, Mathematical models, Bottom topography, Topographic effects

52-1308

Mobility and retention of heavy metals, arsenic and sulphur in podzols at eight locations in northern Finland and Norway and the western half of the Russian Kola Peninsula.

Räisänen, M.L., Kashulina, G., Bogatyrev, I., *Journal of geochemical exploration,* Sep. 1997, 59(3), p.175-195, Refs. p.193-195.

Geological surveys, Soil chemistry, Soil pollution, Aerosols, Arctic landscapes, Podsol, Metals, Geochemistry, Sampling, Profiles, Environmental tests, Statistical analysis, Finland, Norway, Russia—Kola Peninsula

52-1309

Neotectonic and seismic activity in the Armorican and Cornubian massifs: regional stress field with glacio-isostatic influence?

Van Vliet-Lanoë, B., Bonnet, S., Hallegouët, B., Laurent, M., *Journal of geodynamics,* Sep.-Dec. 1997, 24(1-4), p.219-239, Refs. p.235-239.

Pleistocene, Geomorphology, Seismology, Tectonics, Earth crust, Earthquakes, Deformation, Glacial geology, Isostasy, Stratigraphy, Geochronology, Theories, France—Brittany, United Kingdom—England

52-1310

Ice watch.

Pearce, F., *New scientist,* Sep. 27, 1997, 155(2101), p.16.

Climatology, Research projects, Oceanographic surveys, Sea ice, Solar radiation, Ice melting, Global warming, Arctic Ocean

52-1311

Longwave radiation modeling in mountainous environments.

Saunders, I.R., Bailey, W.G., *Physical geography,* Jan.-Feb. 1997, 18(1), p.37-52, Refs. p.50-52.

Climatology, Cloud cover, Alpine tundra, Radiation measurement, Radiation balance, Models, Simulation, Correlation

52-1312

Azimuthal modulation of C-band scatterometer ω^0 over southern ocean sea ice.

Early, D.S., Long, D.G., *IEEE transactions on geoscience and remote sensing,* Sep. 1997, 35(5), p.1201-1209, 22 refs.

Oceanography, Remote sensing, Ice surveys, Microwaves, Radiometry, Orientation, Scattering, Sea ice, Glacier ice, Surface structure, Correlation, Statistical analysis

In a continuing evaluation of the ERS-1 C-band scatterometer as a tool for studying polar sea ice, the authors evaluate the azimuthal modulation characteristics of antarctic sea ice. ERS-1 AMI scatterometer mode data sets from several study regions dispersed in antarctic seasonal sea ice pack are evaluated for azimuthal modulation. Results show that over the ice pack, azimuthal modulation is less than 1 dB at the scale of observation of the ERS-1 C-band scatterometer. (Auth. mod.)

52-1313

Determination of the ice dielectric permittivity using the data of the test in Antarctica of the ground-penetrating radar for Mars'98 mission.

Herique, A., Kofman, W., *IEEE transactions on geoscience and remote sensing,* Sep. 1997, 35(5), p.1338-1349, 16 refs.

Glacier surveys, Geophysical surveys, Balloons, Radar echoes, Ice dielectrics, Dielectric properties, Wave propagation, Attenuation, Extraterrestrial ice, Ground ice, Simulation, Analysis (mathematics), Antarctica—Dumont d'Urville Station

A ground-penetrating radar will be integrated inside the guiderope ballast of the Mars'98 balloon mission. A prototype of this impulse system working in the 5-15 MHz band was tested close to Dumont d'Urville Station in Feb. 1993. This paper describes the performances of the radar and electromagnetic propagation in antarctic glaciers. This knowledge allows to use the frequency wavenumber migration to focus the signal, to increase the signal-to-noise ratio and to rebuild an image of the subsurface. (Auth. mod.)

52-1314

Monitoring Siberian forests and agriculture with the ERS-1 Windscatterometer.

Schmullius, C.C., *IEEE transactions on geoscience and remote sensing,* Sep. 1997, 35(5), p.1363-1366, 13 refs.

Climatology, Remote sensing, Forest ecosystems, Taiga, Spacecraft, Synthetic aperture radar, Backscattering, Biomass, Frozen ground mechanics, Freeze thaw cycles, Vegetation patterns, Russia—Siberia

52-1315

Monopole-antenna: a practical snow and soil wetness sensor.

Denoth, A., *IEEE transactions on geoscience and remote sensing,* Sep. 1997, 35(5), p.1371-1375, 15 refs.

Snow hydrology, Remote sensing, Soil water, Wet snow, Dielectric properties, Snow water content, Probes, Sensors, Antennas, Performance

52-1316

Water level measurements in the polar regions: status and technology.

Russin, E.M., Shih, H.H., Edwing, R.F., *U.S. National Oceanic and Atmospheric Administration. National Ocean Service. Office of Oceanography and Marine Assessment. Technical memorandum,* Sep. 1990, NOAA/TM/NOS/OMA-54, 29p. + appends., PB91-113134, 19 refs.

Sea level, Tides, Oceanographic surveys, Data transmission, Global warming, Research projects

This report is a survey of work that NOS and others are or have been doing in the area of sea level measurements in polar regions, with a special emphasis on the needs of NOAA's Climate and Global Change Program and the Global Sea Level Observing System, known as GLOSS. The report assesses the state-of-the-art technology involved, the potential for future development, and provides recommendations for near and long-term projects. It also recommends that Prudhoe Bay, AK, be established as a pilot station for further investigations into the measurement requirements of other arctic stations and that a cooperative program be initiated with the National Science Foundation for establishing stations in Antarctica. (Auth.)

52-1317

Arctic deployment of USCGC *Polar Star*—winter 1982. Volume 1. Executive summary.

Voelker, R.P., Geisel, F.A., Dane, K.E., *U.S. Maritime Administration. Office of Research and Development. Report,* Nov. 1982, MA-RD-940-83002, 41p., PB84-129626, 5 refs.

Icebreakers, Ice breaking, Ice navigation, Ice surveys, Ice conditions, Ice cover thickness, Pressure ridges, Ice edge, Drift, United States—Alaska, Bering Sea, Chukchi Sea

52-1318

Arctic deployment of USCGC *Polar Star*—winter 1982. Volume 2. Environmental data.

Voelker, R.P., Geisel, F.A., Wohl, G.M., Dane, K.E., *U.S. Maritime Administration. Office of Research and Development. Report,* Nov. 1982, MA-RD-940-83003, 33p. + appends., PB84-129634, 8 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Pressure ridges, Ice floes, Ice edge, Drift, Meteorological data, United States—Alaska, Bering Sea, Chukchi Sea

52-1319

Arctic deployment of USCGC *Polar Star*—winter 1982. Volume 3. Polar Class performance: trafficability, level ice, and pressure ridges.

Geisel, F.A., Voelker, R.P., Dane, K.E., *U.S. Maritime Administration. Office of Research and Development. Report,* Nov. 1982, MA-RD-940-83004, 37p. + appends., PB84-129642, 14 refs.

Icebreakers, Ice breaking, Ice navigation, Ice loads, Metal ice friction, Ice cover strength, Ice cover thickness, Pressure ridges, Ice edge, United States—Alaska, Bering Sea, Chukchi Sea

52-1320

Arctic deployment of USCGC *Polar Star*—winter 1982. Volume 4. Ice loads on steering gear systems.

Menon, B., Howard, D., Blount, H., Glenn, I., *U.S. Maritime Administration. Office of Research and Development. Report,* Sep. 1982, MA-RD-940-83005, 65p., PB84-129659, 6 refs.

Icebreakers, Ice breaking, Ice navigation, Ice loads, Metal ice friction, Ice cover strength, Propellers, Impact tests, Statistical analysis, United States—Alaska, Bering Sea, Chukchi Sea

52-1321

Arctic deployment of USCGC *Polar Star*—winter 1982. Volume 4A. Ice loads on steering gear systems: appendices.

Menon, B., Howard, D., Blount, H., Glenn, I., *U.S. Maritime Administration. Office of Research and Development. Report,* Sep. 1982, MA-RD-940-83005A, 138p., PB85-103596, 2 refs.

Icebreakers, Ice breaking, Ice navigation, Ice loads, Metal ice friction, Ice cover strength, Propellers, Impact tests, Data processing, Computerized simulation, Mathematical models, United States—Alaska, Bering Sea, Chukchi Sea

52-1322

Arctic deployment of USCGC *Polar Star*—winter 1982. Volume 5. Instrumentation system and computer software documentation.

Geisel, F.A., Voelker, R.P., Dane, K.E., *U.S. Maritime Administration. Office of Research and Development. Report,* Nov. 1982, MA-RD-940-83006, 32p., PB84-129667, 1 ref.

Icebreakers, Ice breaking, Ice navigation, Ice loads, Metal ice friction, Ice cover strength, Strain measuring instruments, Computerized simulation, Data processing, United States—Alaska, Bering Sea, Chukchi Sea

52-1323

IASC project catalogue 1997.

International Arctic Science Committee, IASC report, No.8, Oslo, 1997, 45p.

Organizations, Research projects, International cooperation, Regional planning, Meetings

52-1324

Meteorological data at Japanese Ny-Ålesund Observatory, Svalbard in 1992 and 1993.

Aoki, S., Nakanishi, Y., Wada, M., Yamanouchi, T., *Tokyo. National Institute of Polar Research. NIPR arctic data reports,* Dec. 1996, No.1, 111p.

Polar atmospheres, Marine atmospheres, Weather stations, Meteorological data, Atmospheric pressure, Air temperature, Humidity, Insolation, Wind velocity, Wind direction, Norway—Svalbard

52-1325

Meteorological data at Japanese Ny-Ålesund Observatory, Svalbard in 1994 and 1995.

Aoki, S., Nakanishi, Y., Wada, M., Yamanouchi, T., *Tokyo. National Institute of Polar Research. NIPR arctic data reports,* Dec. 1996, No.2, 179p.

Polar atmospheres, Marine atmospheres, Weather stations, Meteorological data, Atmospheric pressure, Air temperature, Humidity, Insolation, Wind velocity, Wind direction, Norway—Svalbard

52-1326
Mass balance of Axel Heiberg Island glaciers 1960-1991: a reassessment and discussion.
Cogley, J.G., Ecclestone, M.A., Jung-Rothenhäusler, F., Ommanney, C.S.L., *Environment Canada. National Hydrology Research Institute, Saskatoon, Saskatchewan. NHRI science report,* 1995, No.6, 168p., Refs. p.79-90.
Glacier surveys, Mountain glaciers, Glacier mass balance, Glacier oscillation, Glacial meteorology, Snow line, Snow stakes, Global change, Sea level, Canada—Northwest Territories—Axel Heiberg Island

52-1327
Annual report 1996. [Årsmelding 1996]
Norsk Polarinstitutt (Norwegian Polar Institute), Tromsø, Norway, [1997], 23p., In Norwegian with English summary on p.17. List of publications p.18-23.
Organizations, Research projects, Regional planning, Cost analysis

52-1328
Influence of clouds and pollution in the arctic region: some characteristics of short- and long-wave radiation at Resolute, Northwest Territories, Canada. Final report.
Vowinckel, E., Columbus, Ohio State University, Research Foundation, May 1969, 10p., 6 refs. Prepared for the U.S. National Science Foundation, Division of Environmental Sciences.
Polar atmospheres, Air pollution, Cloud cover, Atmospheric composition, Radiation balance, Canada—Northwest Territories—Resolute

52-1329
Analysis of ground aircraft de/anti-icing laboratory holdover time and physical properties.
Louchez, P., Zouzou, A., Laforte, J.L., *Transport Canada. Transportation Development Centre, Montreal. Publication,* Mar. 1996, TP 12712E, 111p. + appends., With French summary. 35 refs.
Aircraft icing, Ice adhesion, Ice accretion, Chemical ice prevention, Ice removal, Liquid solid interfaces, Safety, Environmental tests, Computerized simulation, Computer programs

52-1330
Evaluation of ground test friction measuring equipment on runways and taxiways under winter conditions.
Wambold, J.C., *Transport Canada. Airports Safety and Technical Services, Ottawa. Publication,* Sep. 1996, TP 12866E, 33p. + appends., With French summary. 16 refs.
Runways, Road icing, Aircraft, Tires, Rubber ice friction, Rubber snow friction, Skid resistance, Traction, Cold weather tests, Canada—Ontario—North Bay

52-1331
Glaciers of the Swiss Alps 1983/84 and 1984/85. [Die Gletscher der Schweizer Alpen 1983/84 und 1984/85]
Aellen, M., Herren, E., *Schweizerische Akademie der Naturwissenschaften. Gletscherkommission. Jahrbuch. Bericht,* 1992, No.105/106, 150p., In German and French with English summary. 29 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier mass balance, Switzerland

52-1332
Simple dilatometer for determination of the free water content of snow.
Pihkala, P., Spring, E., *Helsinki. University. Department of Geophysics. Report series in geophysics,* 1982, No.17, 5p., 2 refs.
Snow water content, Snow survey tools, Moisture meters

52-1333
Freezing precipitation in the southeastern United States.
Young, W.R., College Station, Texas A & M University, 1978, 123p., M.S. thesis. 35 refs.
Ice storms, Precipitation (meteorology), Glaze, Meteorological data, Weather forecasting

52-1334
Project catalogue '97.
Danmarks og Grønlands Geologiske Undersøgelse (GEUS) (Geological Survey of Denmark and Greenland), Copenhagen, 1997, 110p., List of publications p.24-42. GEUS is the result of the merger in June 1995 into one organization, of Danmarks Geologiske Undersøgelse (Geological Survey of Denmark) and Grönlands Geologiske Undersøgelse (Geological Survey of Greenland).
Organizations, Research projects, Cost analysis

52-1335
Skagway to Canadian border. Final environmental statement.
Alaska Department of Highways. Southeastern District, Juneau, AK, 1973, Var. p.
Highway planning, Economic development, Land development, Environmental impact, United States—Alaska

52-1336
Development of instructions for the establishment of optimized plans for snow removal and gritting in road winter maintenance. [Entwicklung einer Anleitung zur Aufstellung optimierter Räum- und Streupläne im Straßenwinterdienst]
Durth, W., Hanke, H., *Forschung Straßenbau und Straßenverkehrstechnik,* 1986, No.461, 35p., In German with English and French summaries. 13 refs.
Snow removal, Sanding, Highway planning, Road maintenance, Germany

52-1337
Role of buried viable seeds in arctic and alpine communities.
McGraw, J.B., Vavrek, M.C., Ecology of soil seed banks. Edited by M.A. Leck et al, San Diego, Academic Press, Inc., 1989, p.91-105, Refs. p.385-444.
DLC QK910.E27
Plant ecology, Ecosystems, Alpine tundra, Tundra vegetation, Tundra soils, Subsurface investigations, Classifications, Growth, Revegetation, Viability, Cold weather survival

52-1338
Snow deposition of atmospheric semivolatile organic chemicals.
Franz, T.P., Gregor, D.J., Eisenreich, S.J., SETAC Technical Publications Series and SETAC Annual Meeting, 15th, Denver, CO, Oct. 30-Nov. 3, 1994. Collected papers. Atmospheric deposition of contaminants to the Great Lakes and coastal waters. Edited by J.E. Baker, Pensacola, SETAC Press, 1997, p.73-107, 204 refs.
DLC TD427.A84A86
Precipitation (meteorology), Air pollution, Snow impurities, Snow cover, Aerosols, Hydrocarbons, Organic nuclei, Snow air interface, Scavenging, Sedimentation, Sampling, Models

52-1339
Influence of tertiary creep on the uplift behaviour of a pipe embedded in a frozen soil.
Hu, J., Selvadurai, A.P.S., International Conference on Advances in Underground Pipeline Engineering, 2nd, Bellevue, WA, June 25-28, 1995. Proceedings, New York, American Society of Civil Engineers, 1995, p.345-358, 23 refs.
DLC TJ930.A32
Underground pipelines, Gas pipelines, Frozen ground mechanics, Soil creep, Frost action, Frost heave, Stresses, Deformation, Damage, Dislocations (materials), Mathematical models

52-1340
Effects of phenology, physiology, and gradients in community composition, structure, and microclimate on tundra ecosystem CO_2 exchange.
Tenhunen, J.D., Siegwolf, R.T.W., Oberbauer, S.F., Ecological Studies, Vol.100 and Ecophysiology of photosynthesis. Edited by E.D. Schulze and M.M. Caldwell, Heidelberg, Springer-Verlag, 1994, p.431-460, Refs. p.455-458.
DLC QK882.E28
Ecosystems, Climatic changes, Vegetation factors, Tundra climate, Tundra vegetation, Mosses, Phenology, Carbon dioxide, Vapor transfer, Photosynthesis, Soil air interface, Microclimatology, Models

52-1341
Responses of ground vegetation to prolonged simulated acid rain in sub-arctic pine-birch forest.
Shevtsova, A., Neuvonen, S., *New phytologist,* Aug. 1997, 136(4), p.613-625, 65 refs.
Forest ecosystems, Subarctic landscapes, Vegetation patterns, Lichens, Rain, Air pollution, Aerosols, Chemical properties, Simulation, Growth, Damage, Environmental impact, Environmental tests, Statistical analysis

52-1342
Turbulence observations above a smooth melting surface on the Greenland ice sheet.
Meesters, A.G.C.A., Bink, N.J., Vugts, H.F., Cannemeijer, F., Henneken, E.A.C., *Boundary-layer meteorology,* Oct. 1997, 85(1), p.81-110, Refs. p.108-110.
Glacial meteorology, Ice sheets, Radiation absorption, Ice heat flux, Glacier melting, Ice air interface, Profiles, Turbulent exchange, Wind velocity, Surface roughness, Theories, Greenland

52-1343
On the turbulence structure in the stable boundary layer over the Greenland ice sheet.
Forrer, J., Rotach, M.W., *Boundary-layer meteorology,* Oct. 1997, 85(1), p.111-136, 20 refs.
Atmospheric boundary layer, Turbulent exchange, Stratification, Heat flux, Wind velocity, Ice sheets, Ice air interface, Ice cover effect, Profiles, Statistical analysis, Greenland

52-1344
Monitoring changes of ice streams using time series of satellite-altimetry-based digital terrain models.
Herzfeld, U.C., et al, *Mathematical geology,* Oct. 1997, 29(7), p.859-890, Refs. p.888-890.
Glacier surveys, Glacier oscillation, Ice shelves, Grounded ice, Photogrammetric surveys, Topographic surveys, Topographic maps, Height finding, Spacecraft, Radar echoes, Statistical analysis, Antarctica—Lambert Glacier, Antarctica—Amery Ice Shelf
Applications to Seasat data and data from the Geosat Exact Repeat Mission indicate that the grounding line of Lambert Glacier/Amery Ice Shelf, the largest ice stream in East Antarctica, has advanced 10-12 km between 1978 and 1987-89. The objectives of this paper are to explore possibilities and limitations of satellite-altimetry-based mapping to capture changes for shorter time windows and for smaller areas, and to investigate some methodological aspects of the data analysis. Maps of the lower Lambert Glacier and the entire Amery Ice Shelf are presented for austral winters 1978, 1987, 1988, and 1989. (Auth. mod.)

52-1345
Climatic effects on tundra carbon storage inferred from experimental data and a model.
McKane, R.B., et al, *Ecology,* June 1997, 78(4), p.1170-1187, 58 refs.
Climatology, Climatic changes, Greenhouse effect, Simulation, Ecosystems, Tundra soils, Tundra climate, Carbon dioxide, Soil air interface, Geochemical cycles, Models

52-1346
Reconstruction and analysis of historical changes in carbon storage in arctic tundra.
McKane, R.B., et al, *Ecology,* June 1997, 78(4), p.1188-1198, 60 refs.
Ecosystems, Tundra soils, Organic soils, Soil water, Carbon dioxide, Storage, Periodic variations, Biomass, Climatic changes, Models, Geochemical cycles

52-1347
Holocene dynamics of treeline forests in the Sierra Nevada.
Lloyd, A.H., Graumlich, L.J., *Ecology,* June 1997, 78(4), p.1199-1210, Refs. p.1208-1210.
Paleoclimatology, Climatic changes, Forest ecosystems, Alpine landscapes, Forest lines, Vegetation patterns, Periodic variations, Sediments, Age determination, Statistical analysis, United States—California—Sierra Nevada

52-1348

Fresh water masses in the Kara Sea during summer.

Johnson, D.R., McClimans, T.A., King, S., Grenness, Ø., *Journal of marine systems,* Aug. 1997, 12(1-4), p.127-145, 28 refs.

Oceanographic surveys, Water pollution, Radioactive wastes, Ocean currents, Estuaries, Buoyancy, Turbulent diffusion, Water transport, Hydrography, Ice cover effect, Ice melting, Forecasting, Russia—Kara Sea

52-1349

Accumulation rate of loess in Tadjikistan and China: relationship with global ice volume cycles.

Shackleton, N.J., et al, Quaternary Proceedings, No.4. Wind blown sediments in the Quaternary record. Edited by E. Derbyshire, Chichester, John Wiley & Sons, 1995, p.1-6, 23 refs.

DLC QE597.W55

Pleistocene, Quaternary deposits, Loess, Dust, Sedimentation, Geochronology, Remanent magnetism, Isotope analysis, Ice sheets, Ice volume, Global change, Statistical analysis, Spectra, Correlation, China, Tajikistan

52-1350

Loess-palaeosol sequences as recorders of palaeoclimatic variations during the last glacial-interglacial cycle: some problems of correlation in north-central China.

Derbyshire, E., Keen, D.H., Kemp, R.A., Rolph, T.A., Shaw, J., Meng, X.M., Quaternary Proceedings, No.4. Wind blown sediments in the Quaternary record. Edited by E. Derbyshire, Chichester, John Wiley & Sons, 1995, p.7-18, 45 refs.

DLC QE597.W55

Paleoclimatology, Climatic changes, Quaternary deposits, Loess, Sedimentation, Stratigraphy, Remanent magnetism, Statistical analysis, Correlation, Geochronology, Accuracy, China—Loess Plateau

52-1351

Comparison of magnetic fabrics from loessic silts across the Tibetan Front, western China.

Clarke, M.L., Quaternary Proceedings, No.4. Wind blown sediments in the Quaternary record. Edited by E. Derbyshire, Chichester, John Wiley & Sons, 1995, p.19-26, 12 refs.

DLC QE597.W55

Pleistocene, Quaternary deposits, Stratigraphy, Loess, Eolian soils, Alluvium, Sedimentation, Soil structure, Anisotropy, Remanent magnetism, Statistical analysis, Correlation, China

52-1352

Magnetic property and particle size variations in the Late Pleistocene and Holocene parts of the Dadongling loess section near Xining, China.

Chen, F.H., Wu, R.J., Pompei, D., Oldfield, F., Quaternary Proceedings, No.4. Wind blown sediments in the Quaternary record. Edited by E. Derbyshire, Chichester, John Wiley & Sons, 1995, p.27-40, 18 refs.

DLC QE597.W55

Pleistocene, Quaternary deposits, Loess, Remanent magnetism, Stratigraphy, Diagenesis, Lithology, Particle size distribution, Statistical analysis, China—Xining

52-1353

Soils in aeolian sequences as evidence of Quaternary climatic change: problems and possible solutions.

Catt, J.A., Quaternary Proceedings, No.4. Wind blown sediments in the Quaternary record. Edited by E. Derbyshire, Chichester, John Wiley & Sons, 1995, p.59-68, 74 refs.

DLC QE597.W55

Soil science, Soil classification, Paleoclimatology, Quaternary deposits, Soil formation, Diagenesis, Eolian soils, Terminology, Geochronology, Models

52-1354

Loess-palaeosol-sequences in Tadjikistan as a palaeoclimatic record of the Quaternary in Central Asia.

Bronger, A., Winter, R., Derevjanko, O., Aldag, S., Quaternary Proceedings, No.4. Wind blown sediments in the Quaternary record. Edited by E. Derbyshire, Chichester, John Wiley & Sons, 1995, p.69-81, 59 refs.

DLC QE597.W55

Pleistocene, Paleoclimatology, Quaternary deposits, Loess, Stratigraphy, Lithology, Profiles, Particle size distribution, Grain size, Geochronology, Correlation, Tajikistan

52-1355

Frost tolerance and biochemical changes during hardening and dehardening in contrasting white clover populations.

Svenning, M.M., Røsnes, K., Junttila, O., *Physiologia plantarum,* Sep. 1997, 101(1), p.31-37, 26 refs.

Plant physiology, Grasses, Frost resistance, Cold tolerance, Acclimatization, Low temperature tests, Simulation, Chemical analysis

52-1356

Arctic Ocean trials of Trackpoint Ultrashort Baseline Acoustic Positioning Systems.

Black, M.R., Butler, B., Symposium on Autonomous Underwater Vehicle Technology, Cambridge, MA, July 19-20, 1994. Proceedings, Piscataway, Institute of Electrical and Electronics Engineers, 1994, p.297-302, 3 refs.

DLC GC67.S96a

Oceanography, Vehicles, Navigation, Subglacial observations, Underwater acoustics, Wave propagation, Telemetering equipment, Radio beacons, Orientation, Tests, Performance

52-1357

Polarimetric backscatter from fresh and metamorphic snowcover at millimeter wavelengths.

Chang, P.S., Mead, J.B., Knapp, E.J., Sadowy, G.A., Davis, R.E., McIntosh, R.E., MP 5040, *IEEE transactions on antennas and propagation,* Jan. 1996, 44(1), p.58-73, 31 refs.

Snow cover structure, Microstructure, Classifications, Anisotropy, Metamorphism (snow), Grain size, Remote sensing, Radar echoes, Backscattering, Polarization (waves), Snow optics, Backscattering, Mathematical models

This paper presents polarimetric radar backscatter data from snowcover. It compares measured backscatter data with detailed *in situ* measurements of the snowcover including microstructural anisotropies within the snowpack. Observations of backscatter were made during melt-freeze cycles, and measurable differences in the normalized radar cross section between older metamorphic snow and fresh low-density snow were observed. A simple backscatter model based on measured particle size and anisotropy is found to predict the Mueller matrix for dry snowcover with reasonable accuracy.

52-1358

Performance and economic feasibility of ground source heat pumps in cold climate.

Healy, P.F., Ugursal, V.I., *International journal of energy research,* 1997, Vol.21, p.857-870, 9 refs.

Buildings, Heat pumps, Geothermy, Cold weather performance, Cooling systems, Temperature control, Computerized simulation, Cost analysis, Frozen ground thermodynamics, Fluid dynamics, Design

52-1359

Enhancement and inhibition of soil petroleum biodegradation through the use of fertilizer nitrogen: an approach to determining optimum levels.

Walworth, J.L., Woolard, C.R., Braddock, J.F., Reynolds, C.M., MP 5053, *Journal of soil contamination,* 1997, 6(5), p.465-480, 23 refs.

Soil tests, Admixtures, Soil pollution, Soil microbiology, Crude oil, Degradation, Soil water, Salinity, Water content, Simulation, Environmental protection

52-1360

Persistence of equatorial ground ice on Mars.

Mellon, M.T., Jakosky, B.M., Postawko, S.E., *Journal of geophysical research,* Aug. 25, 1997, 102(E8), p.19,357-19,369, 41 refs.

Mars (planet), Regolith, Geocryology, Extraterrestrial ice, Ground ice, Interstitial ice, Water vapor, Vapor diffusion, Condensation, Ice models, Mathematical models

52-1361

Effect of the overflows on the circulation in the subpolar North Atlantic: a regional model study.

Redler, R., Böning, C.W., *Journal of geophysical research,* Aug. 15, 1997, 102(C8), p.18,529-18,552, Refs. p.18,551-18,552.

Oceanography, Subpolar regions, Ocean currents, Velocity, Boundary layer, Bottom topography, Topographic effects, Water transport, Fluid dynamics, Models, Simulation, North Atlantic Ocean

52-1362

Long-term trends of temperature, salinity, density, and transient tracers in the central Greenland Sea.

Bönisch, G., Blindheim, J., Bullister, J.L., Schlosser, P., Wallace, D.W.R., *Journal of geophysical research,* Aug. 15, 1997, 102(C8), p.18,553-18,571, 35 refs.

Oceanographic surveys, Hydrography, Subpolar regions, Ocean currents, Water temperature, Salinity, Isotope analysis, Aerosols, Periodic variations, Greenland Sea

52-1363

Flow dynamics of a wide arctic canyon.

Signorini, S.R., Münchow, A., Haidvogel, D., *Journal of geophysical research,* Aug. 15, 1997, 102(C8), p.18,661-18,680, 37 refs.

Oceanographic surveys, Ocean currents, Profiles, Water transport, Velocity measurement, Water pressure, Upwelling, Bottom topography, Topographic effects, Fluid dynamics, Mathematical models, Arctic Ocean

52-1364

Relation between ice deformation, oceanic heat flux, and the ice thickness distribution in the Arctic Ocean.

Björk, G., *Journal of geophysical research,* Aug. 15, 1997, 102(C8), p.18,681-18,698, 31 refs.

Oceanography, Sea ice, Ice cover thickness, Classifications, Ice mechanics, Ice water interface, Heat flux, Albedo, Deformation, Pressure ridges, Mathematical models, Ice models, Ice cover effect, Arctic Ocean

52-1365

Energy and exergy evaluation of ice production by absorption refrigeration.

Cortez, L.A.B., Larson, D.L., Da Silva, A., *American Society of Agricultural Engineers. Transactions,* Mar.-Apr. 1997, 40(2), p.395-403, 20 refs.

Refrigeration, Cooling systems, Ice makers, Performance, Phase transformations, Evaporation, Thermodynamics, Analysis (mathematics)

52-1366

Development of a time-temperature integrator and a container for ice-making system using cold outdoor air.

Matsuda, J., Sakuma, T., Yonezawa, S., Sato, M., *American Society of Agricultural Engineers. Transactions,* Mar.-Apr. 1997, 40(2), p.427-433, 7 refs.

Ice makers, Tanks (containers), Water flow, Flow control, Air water interactions, Ice formation, Layers, Air temperature, Freezing indexes

52-1367

Age scale of the air in the summit ice: implication for glacial-interglacial temperature change.

Schwander, J., Sowers, T., Barnola, J.M., Blunier, T., Fuchs, A., Malaizé, B., *Journal of geophysical research,* Aug. 27, 1997, 102(D16), p.19,483-19,493, 50 refs.

Pleistocene, Paleoclimatology, Surface temperature, Climatic changes, Ice sheets, Ice cores, Bubbles, Ice dating, Firn, Snow air interface, Vapor diffusion, Models, Correlation, Greenland

52-1368

^{41}Ca bomb pulse and atmospheric transport of radionuclides.

Zerle, L., et al, *Journal of geophysical research,* Aug. 27, 1997, 102(D16), p.19,517-19,527, 33 refs.

Environmental tests, Aerosols, Nuclear explosions, Fallout, Glacier ice, Ice cores, Radioactive isotopes, Isotope analysis, Atmospheric circulation, Stratosphere, Models

52-1369

Susceptibility of ice formation in upper tropospheric clouds in insoluble aerosol components.

DeMott, P.J., Rogers, D.C., Kreidenweis, S.M., *Journal of geophysical research,* Aug. 27, 1997, 102(D16), p.19,575-19,584, 44 refs.

Climatology, Cloud physics, Cloud droplets, Ice crystal growth, Freezing nuclei, Homogeneous nucleation, Heterogeneous nucleation, Aerosols, Solubility, Freezing points, Temperature effects, Analysis (mathematics), Climatic factors

52-1370

Reconstructing annual and seasonal climatic responses from volcanic events since A.D. 1270 as recorded in the deuterium signal from the Greenland Ice Sheet Project 2 ice core.

White, D.E., White, J.W.C., Steig, E.J., Barlow, L.K., *Journal of geophysical research,* Aug. 27, 1997, 102(D16), p.19,683-19,694, 39 refs.

Climatology, Cooling, Ice sheets, Ice cores, Volcanoes, Volcanic ash, Sedimentation, Snow composition, Vapor diffusion, Isotope analysis, Ice dating, Statistical analysis, Greenland

52-1371

Aerosol climatology at the high-alpine site Jungfraujoch, Switzerland.

Baltensperger, U., et al, *Journal of geophysical research,* Aug. 27, 1997, 102(D16), p.19,707-19,715, 37 refs.

Climatology, Alpine landscapes, Atmospheric boundary layer, Aerosols, Turbulent diffusion, Mass transfer, Diurnal variations, Seasonal variations, Topographic effects, Models, Wind factors, Sampling, Switzerland—Jungfraujoch

52-1372

Correction to "On the theories of type 1 polar stratospheric cloud formation" by A.R. MacKenzie, et al.

MacKenzie, A.R., Kulmala, M., Laaksonen, A., Vesala, T., *Journal of geophysical research,* Aug. 27, 1997, 102(D16), p.19,729-19,730, For pertinent paper see 49-6084. 3 refs.

Cloud physics, Aerosols, Polar stratospheric clouds, Freezing points, Heterogeneous nucleation, Theories, Temperature effects

52-1373

Geology and seismic stratigraphy of the antarctic margin, 2.

Barker, P.F., ed, Cooper, A.K., ed, *American Geophysical Union. Antarctic research series,* 1997, Vol.71, 187p., Refs. passim. For individual papers see E-58242 through E-58244, E-58246 through E-58251, L-58245 or 52-1374 through 52-1382.

Geological surveys, Glacial geology, Glacial deposits, Marine geology, Topographic surveys, Sedimentation, Seismic surveys

This is the second of two volumes in the American Geophysical Union's Antarctic Research Series to present contributions that provide a description of several regions of the antarctic continental margin, where the wedges of glacially derived sediment are particularly well developed and have been mapped in detail. The volume reflects the large amount of marine seismic data examined and interpreted. It also explores the additional information that will be required to help interpret the drill cores when they become available. Five papers use seismic and related acoustic data to describe the offshore depositional environment and the history of sedimentation over several million years, on the continental shelf and continental rise west of the Antarctic Peninsula. Other papers begin, or even anticipate, the direct sampling that should develop in the future.

52-1374

Cenozoic tectonic, sedimentary and glacial history of the continental shelf west of Graham Land, Antarctic Peninsula.

Larter, R.D., Rebesco, M., Vanneste, L.E., Gambôa, L.A.P., Barker, P.F., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.1-27, Refs. p.24-27.

Tectonics, Sedimentation, Glacial deposits, Glacial geology, Marine geology, Seismic surveys, Antarctica—Antarctic Peninsula

The combined seismic reflection data sets collected on 7 separate cruises provide constraints on several aspects of the tectonic, sedimentary and glacial history of the continental shelf west of Graham Land. Subduction ceased along this margin during the Tertiary as ridge-crest segments of the Antarctic-Phoenix ridge migrated into the trench. Seismic profiles show evidence of local uplift shortly after the arrival of a ridge-crest segment at the margin, followed by long-term subsidence. The maximum uplift was concentrated in a fairly narrow zone along a mid-shelf structural high. This high forms the seaward flank of a shelf sedimentary basin province. Most of the basin sediments appear to have been deposited before the latest phase of uplift along the high. On the seaward flank of the high there is an extensive prograded out shelf. This has developed mostly since the latest Miocene. Preservation of outer shelf "glacial-margin sequences", and the record of glacial history contained in them, has been favored by steady tectonic subsidence. (Auth. mod.)

52-1375

History of sedimentation on the continental rise west of the Antarctic Peninsula.

Rebesco, M., Larter, R.D., Barker, P.F., Camerlenghi, A., Vanneste, L.E., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.29-49, For the Extended abstract of this article see E-51898. Refs. p.46-49.

Marine geology, Bottom topography, Seismic surveys, Sedimentation, Glacial geology, Pleistocene, Ocean currents, Antarctica—Antarctic Peninsula

The authors reconstruct the history of sedimentation on the continental rise west of the Antarctic Peninsula Pacific margin, describing and interpreting the sedimentary processes that constructed 8 hemipelagic sediment drifts. During the Late Pleistocene, the drifts were maintained by deposition from southwest-flowing thermohaline bottom currents. These currents entrained the fine-grained components of turbidity currents generated as a result of small-scale instabilities on the upper continental slope of the glaciated Antarctic Peninsula margin. Turbidity current channels are confined to the lower slope and to the continental rise between the drifts. Three stages of evolution of the margin are recognized. The drifts on the continental rise reflect the onset of glacial progradation of the margin and contain a continuous and expanded record of Late Cenozoic antarctic glacial history. (Auth. mod.)

52-1376

Planar crest of Graham Land, northern Antarctic Peninsula: possible origins and timing of uplift.

Elliot, D.H., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.51-73, Refs. p.69-73.

Glacial geology, Geomorphology, Tectonics, Sedimentation, Marine geology, Geochronology, Glaciation, Antarctica—West Antarctica

Physiographically, the crest of the northern half of the Antarctic Peninsula is characterized by an elevated bedrock erosion surface that is capped by an ice carapace. The regional tectonic and magmatic history is interpreted to suggest that the erosion surface was formed either through the Late Cretaceous and Paleocene following the development of the Pacific-Antarctic Ridge, or in the Neogene following ridge crest-trench collision. In the former case, uplift may have occurred in the Late Paleogene following changes in subduction rate and prior to any extensive glaciation; the uplifted terrain would then have been the locus for ice growth and expansion. In the Neogene case, glaciation must have affected the formation of the surface, and rapid uplift would have occurred in Late Miocene through Pliocene time. In either case, differential movements must have occurred between the Cenozoic arc terrain and the Mesozoic terrain forming the uplifted erosion surface. On balance, Neogene uplift is considered more likely. (Auth. mod.)

52-1377

Crustal structure and sedimentation in Powell Basin.

King, E.C., Leitchenkov, G., Galindo-Zaldivar, J., Maldonado, A., Lodolo, E., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.75-93, Refs. p.92-93.

Marine geology, Bottom topography, Seismic surveys, Geomagnetism, Geomorphology, Sedimentation, Glacial geology, Tectonics, —South Atlantic Ocean

Powell Basin is a small ocean basin which lies off the northeast end of the Antarctic Peninsula. The crustal velocity-depth structure in the northern part of the basin, determined by a reversed seismic refraction profile, matches that of typical oceanic crust. A possible relict spreading axis which trends NW-SE through the center of the basin has been identified on seismic reflection profiles. A gravity low on satellite gravity maps coincides with the interpreted spreading axis. Magnetic anomalies over the basin are of very low amplitude and there is no discernible spreading pattern. Sediments are up to 2 km thick in the central part of the basin, and 3 km thick beneath the continental rise to the east and west. There is a lower sedimentary unit with low reflection amplitudes and a conformable upper unit with high reflection amplitudes. The change in character between the two is interpreted as evidence for glacial-interglacial cyclicity in the supply of coarse detritus to the basin. (Auth. mod.)

52-1378

Seismic expression of glacially deposited sequences in the Bellingshausen and Amundsen Seas, West Antarctica.

Nitsche, F.O., Gohl, K., Vanneste, K., Miller, H., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.95-108, Refs. p.107-108.

Glacial geology, Marine geology, Seismic surveys, Bottom topography, Glaciation, Glacial deposits, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea

As part of a reconnaissance survey of the West Antarctic continental margin, multichannel seismic data were acquired on the continental shelf, slope and rise of the Bellingshausen and Amundsen Seas in early 1994. Four lines extend across the outer shelf and slope to the continental rise, showing seismic sequences interpreted as having been produced by glacial and glacial-marine processes. Predominantly prograding sequences on the outer shelf and upper slope suggest that a grounded ice sheet advanced toward and across the shelf break several times during the glacial evolution of this region of Antarctica. Comparison of the profiles reveals that significant differences, but also striking similarities exist in the stratal patterns along the margin. Similar phases of progradation and aggradation observed on all of the profiles indicate a consistent long-term glacial development along the margin of the Amundsen and Bellingshausen Seas. (Auth. mod.)

52-1379

Deglaciation of Prydz Bay, East Antarctica, based on echo sounding and topographic features.

O'Brien, P.E., Leitchenkov, G., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.109-125, Refs. p.124-126.

Glacial geology, Glacial deposits, Glaciation, Sedimentation, Glacier oscillation, Sea level, Bottom topography, Moraines, Antarctica—Prydz Bay

Echo sounder, multichannel seismic and core data from Prydz Bay and the adjoining continental slope are used to define areas of different bed topography and acoustic character and to map bed features. Nine provinces are recognized, exhibiting different degrees of iceberg ploughing, basement outcrop, sculpting by the Lambert Glacier and sediment character. The ice deposited till on Four Ladies Bank, and transported material to the top of the Prydz Channel Fan via a deforming bed on the floor of Prydz Channel. With the onset of deglaciation and sea level rise, the ice stream flowing in Prydz Channel detached from its bed and its grounding line retreated rapidly to a series of retreat positions roughly parallel to flow, crossing Four Ladies Bank and the Amery Depression. The grounding line then retreated from the entire Amery Depression. Large moraines in the western part of the bay may represent Last Glacial Maximum moraines. The presence of iceberg scouring down to 690 m indicates ice keel ploughing while sea level was lower, either soon after ice retreat or during the Last Glacial Maximum. (Auth. mod.)

52-1380
Sub-ice topography in selected areas of Victoria Land, Antarctica: implications for its glacial erosion history.
Delisle, G., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.127-135, Refs. p.134-135.
Glacial erosion, Subglacial observations, Topographic surveys, Glacial geology, Glaciation, Glacier flow, Mapping, Antarctica—Victoria Land
Radar mapping of the sub-ice topography of several areas of Victoria Land has demonstrated deep subglacial valleys that trend in various directions. They are interpreted as the result of fluvial and glacial erosion, primarily active during the early Cenozoic and prior to large-scale antarctic glaciation. The onset of large scale ice flow from the interior of East Antarctica to the coast has not reshaped the previously developed sub-ice topography to a great extent. The current ice flow regime crosses the subglacial valleys at various angles without modifying them by glacial erosion because of cold-based conditions at the base. The sub-ice topographic maps suggest substantial vertical displacement along southwest-northeast faults, which appear to have evolved during block faulting of the coastal regions of Victoria Land. Since the Jurassic, a layer of at least 1700 m of post-Paleocene deposits appears to have been eroded from the coastal regions of Victoria Land and transported into the Ross Sea prior to the onset of the advance of the east antarctic ice sheet. (Auth. mod.)

52-1381
Paleoenvironmental record in core ANTA91-30 (Drygalski Basin, Ross Sea, Antarctica).
Brambati, A., et al, *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.137-151, Refs. p.149-151.
Marine geology, Glacial geology, Sedimentation, Drill core analysis, Paleoecology, Ice shelves, Glaciation, Antarctica—Ross Sea
A paleoenvironmental reconstruction was carried out from physical, textural, mineralogical, chemical, radiometric and micropaleontological analyses of a sediment core collected in the Drygalski Basin, Ross Sea. Results indicate the presence of 2 main units. The lower one is a basal till, probably deposited during the last glacial maximum. The upper unit represents a complete post-glacial sedimentary sequence and is divided into 4 subunits, representing the decoupling of the ice sheet (proximity to the grounding line); an early glaciomarine (ice shelf) phase; a climatic change; and establishment of the present open marine conditions. ^{14}C ages indicate that decoupling of the ice shelf started before 18.1 ka and that open marine conditions were established by almost 10.9 ka ago. (Auth.)

52-1382
Grounding-line systems: processes, glaciological inferences and the stratigraphic record.
Powell, R.D., Alley, R.B., *American Geophysical Union. Antarctic research series,* 1997, Vol.71, Geology and seismic stratigraphy of the antarctic margin, 2. Edited by P.F. Barker and A.K. Cooper, p.169-187, Refs. p.182-187.
Glacial geology, Glacier flow, Glacial deposits, Ice shelves, Bottom topography, Moraines, Meltwater, Sedimentation
Recent studies at grounding lines of modern marine-ending glaciers indicate deposits with different geometries may be produced in different glacial conditions. Depositional systems accumulating at grounding lines of modern temperate tidewater cliffs are positive topographic elements (morainal banks), whereas those at grounding lines of glaciers with polar ice ending as ice shelves appear to have wedge geometries (grounding-line wedges, diamicton aprons or "till deltas"). The apparent major control over these two end-members of grounding-line systems is subglacial meltwater. With abundant, free-flowing water, (and glacial freezing/refreezing processes), morainal banks appear to form; with smaller volumes of more confined water and deforming beds, grounding-line wedges appear to form. (Auth. mod.)

52-1383
Temporal patterns of protozooplankton abundance and their food in Ellis Fjord, Princess Elizabeth Land, eastern Antarctica.
Grey, J., Laybourn-Parry, J., Leakey, R.J.G., McMinn, A., *Estuarine, coastal and shelf science,* July 1997, 45(1), p.17-25, 63 refs.
Marine biology, Estuaries, Plankton, Microbiology, Bacteria, Ecosystems, Biomass, Nutrient cycle, Classifications, Sampling, Subglacial observations, Seasonal variations, Antarctica—Ellis Fjord
The abundance and biomass of ciliates, dinoflagellates and heterotrophic and phototrophic nanoflagellates were determined at three sites along an ice-covered antarctic fjord between Jan. and Nov. 1993. In general, the protozooplankton exhibited a seasonal variation which closely mirrored that of chlorophyll *a* and bacterioplankton. The fjord mouth consistently had the highest densities of ciliates and the most diverse community. To the authors' knowledge, this is the first seasonal study of an antarctic fjord. The Ellis Fjord is very unproductive compared to lower latitude systems, and supports low biomass of phytoplankton and microbial plankton during most of the year. This relates to severe climatic and seasonal conditions, and the lack of allochthonous carbon inputs to the system. Thus, high latitude estuaries may differ significantly from lower latitude systems, which generally rank among the most productive aquatic systems in the world. (Auth. mod.)

52-1384
Seasonal variability of total and easily leachable element contents in topsoils (0-5 cm) from eight catchments in the European Arctic (Finland, Norway and Russia).
Niskavaara, H., Reimann, C., Chekushin, V., Kashulina, G., *Environmental pollution,* May 1997, 96(2), p.261-274, 32 refs.
Air pollution, Aerosols, Soil pollution, Snow hydrology, Snowmelt, Leaching, Arctic landscapes, Frozen ground chemistry, Sampling, Seasonal variations, Statistical analysis, Environmental tests, Finland, Norway, Russia

52-1385
Computational model for finite element analysis of the freeze-drying process.
Mascarenhas, W.J., Akay, H.U., Pikal, M.J., *Computer methods in applied mechanics and engineering,* Aug. 15, 1997, 148(1-2), p.105-124, 29 refs.
Freeze drying, Frozen liquids, Ice sublimation, Ice solid interface, Vapor diffusion, Self diffusion, Absorption, Mass transfer, Heat balance, Mathematical models, Computerized simulation

52-1386
Ecosystem development on terraces along the Kugururok River, northwest Alaska.
Binkley, D., Suarez, F., Stottlemyer, R., Caldwell, B., *Écoscience,* 1997, 4(3), p.311-318, With French summary. 29 refs.
Subarctic landscapes, Littoral zone, Floodplains, Terraces, Forest ecosystems, Trees (plants), Biomass, Soil microbiology, Revegetation, Vegetation patterns, Animals, United States—Alaska—Kugururok River

52-1387
Growth and nitrogen utilization in seedlings of mountain birch (*Betula pubescens* ssp. tortuosa) as related to plant nitrogen status and temperature: a two-year study.
Weih, M., Karlsson, P.S., *Écoscience,* 1997, 4(3), p.365-373, With French summary. 40 refs.
Plant ecology, Plant physiology, Trees (plants), Growth, Biomass, Nutrient cycle, Subarctic landscapes, Seasonal variations, Temperature effects

52-1388
Viscoelasticity of frozen/thawed egg yolk.
Telis, V.R.N., Kieckbusch, T.G., *Journal of food science,* May-June 1997, 62(3), p.548-550, 14 refs.
Colloids, Frozen liquids, Cold storage, Viscoelasticity, Freeze thaw tests, Rheology, Ice formation, Freezing points, Temperature effects, Shear properties

52-1389
Soil dressing with sulphur: does it reduce frost hardiness in spruce seedlings.
Sheppard, L.J., *Environmental and experimental botany,* June 1997, 37(2-3), p.137-146, 37 refs.
Plant physiology, Aerosols, Air pollution, Trees (plants), Roots, Nutrient cycle, Ion diffusion, Absorption, Damage, Frost resistance, Environmental tests, Simulation

52-1390
Effect of short-term dehydration and rehydration on photosynthesis and respiration by antarctic bryophytes.
Davey, M.C., *Environmental and experimental botany,* June 1997, 37(2-3), p.187-198, 31 refs.
Mosses, Plant ecology, Ecosystems, Microclimatology, Plant tissues, Desiccation, Water content, Photosynthesis, Cold weather survival, Antarctica—Signy Island
The hypothesis that rates of carbon exchange and recovery following dehydration by antarctic bryophytes are related to habitat water availability was investigated. Carbon fixation was measured using an infra-red gas analysis system. As the water content of the bryophytes was reduced, respiration rates fell less quickly than those for gross photosynthesis. Comparison of the experimental observations with measurements of field water contents suggested that water contents of hydric and mesic species remained above those required to maintain maximal rates of photosynthesis through most of the growing season, whereas photosynthesis by xeric species was often water-limited. The results provide a basis for the inclusion of water content and desiccation events in models of antarctic bryophyte productivity. (Auth. mod.)

52-1391
Practical method of realizing the triple point of water using totally frozen cells.
Tischler, M., *Metrologia,* 1997, Vol.34, p.177-179, 4 refs.
Water, Freezing, Ice crystal growth, Ice water interface, Cold storage, Impurities, Temperature measurement, Temperature control, Laboratory techniques, Standards, Thermodynamics

52-1392
Homogeneous ice nucleation observed in single levitated micro droplets.
Krämer, B., et al, *Berichte der Bunsen-Gesellschaft fur Physikalische Chemie,* 1996, No.11, p.1911-1914, 14 refs.
Climatology, Ice physics, Homogeneous nucleation, Nucleation rate, Aerosols, Freezing nuclei, Cloud droplets, Lasers, Light scattering, Polarization (waves), Ice crystal optics, Simulation

52-1393
Fascination of snow crystals—how their enchanting shapes are formed. [Faszination der Schneekristalle—wie ihre bezaubernden Formen entstehen]
Furukawa, Y., *Chemie in unserer Zeit,* Apr. 1997, 31(2), p.58-65, In German with English summary. 41 refs.
Snow crystal structure, Snow crystal growth, Ice crystal replicas, Molecular structure

52-1394
Dissolved oxygen depletion problems in ice-covered Alberta rivers.
Bouthillier, P.H., Hrudey, S.E., *Prairie forum,* 1979, 4(2), p.221-236, With French summary. 12 refs.
River ice, Ice cover effect, Ice water interface, Sewage disposal, Water pollution, Water chemistry, Water treatment, Oxygen, Aeration, Canada—Alberta

52-1395
Demonstration of shipment, assembly and operation of an air cushion icebreaking platform for potential support of extended shipping seasons at a remote harbour HL-301 at Churchill, October 1978.
Wade, R.G., *Transport Canada. Research and Development Centre. Report,* Oct. 1978, TP 1912, 12p. + appends., 3 refs.
Air cushion vehicles, Floating structures, Moorings, Ice navigation, Ice breaking, Ice control, Logistics, Canada—Manitoba—Churchill

52-1396
Potential for river icebreaking and flood control using air cushion technology.
Wade, R.G., Flood and Ice Control Seminar, London, Ontario, Jan. 30, 1980, Toronto, Ontario Ministry of Natural Resources (MNR), [1980], p.H1-H7.
River ice, Ice breaking, Ice control, Flood control, Air cushion vehicles

52-1397
Formation of $HCl{\cdot}6H_2O$ from ice and HCl under ultrahigh vacuum.
Graham, J.D., Roberts, J.T., *Chemometrics and intelligent laboratory systems,* 1997, Vol.37, p.139-148, 25 refs.
Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Air pollution, Ozone, Monomolecular films, Ice vapor interface, Ice composition, Ice spectroscopy, Infrared spectroscopy
Chemical reactions that occur in the surface and near surface regions of ice and related particles in polar stratospheric clouds are believed to participate in the sequence of events that ultimately opens the antarctic ozone hole. The interactions of hydrogen chloride (HCl) with

ultrathin (10-100 monolayers thick) films of ice between 120 and 180 K were studied using temperature programmed desorption and Fourier transform infrared reflection absorption spectroscopy. HCl is initially absorbed by ice at 120 K to form the stoichiometrically fixed hexahydrate phase, $HCl{\cdot}6H_2O$. Infrared spectroscopic measurements suggest that the hexahydrate is present as an amorphous solid. Upon the conversion of ice to $HCl{\cdot}6H_2O$, HCl is adsorbed to the thin film surface, possibly with the H-Cl bond intact. (Auth. mod.)

52-1398

Gries Glacier: glacier flow modeling and possible changes in the future. [Griesgletscher: Berechnungen des Gletscherfliessens und Perspektiven für die Zukunft]

Vieli, A., Funk, M., Blatter, H., *Wasser, Energie, Luft—Eau, énergie, air,* 1997, 89(5/6), p.107-114, In German with French and English summaries. 10 refs.

Dams, Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier flow, Glacier oscillation, Climatic changes, Computerized simulation, Switzerland

52-1399

Transition from forced to free convection.

Andreas, E.L., Cash, B.A., MP 5044, Symposium on Boundary Layers and Turbulence, 12th, Vancouver, British Columbia, July 28-Aug. 1, 1997. Preprints, Boston, American Meteorological Society, 1997, p.32-33, 9 refs.

Ice openings, Polynyas, Ice heat flux, Air ice water interaction, Atmospheric boundary layer, Convection

52-1400

Frozen patterns of boundary layer turbulence.

Treviño, G., Andreas, E.L., MP 5045, Symposium on Boundary Layers and Turbulence, 12th, Vancouver, British Columbia, July 28-Aug. 1, 1997. Preprints, Boston, American Meteorological Society, 1997, p.196-197.

Atmospheric boundary layer, Turbulent boundary layer, Turbulence, Mathematical models

52-1401

Modeling the role of sea spray on air-sea heat and moisture exchange.

Edson, J.B., Andreas, E.L., MP 5046, Symposium on Boundary Layers and Turbulence, 12th, Vancouver, British Columbia, July 28-Aug. 1, 1997. Preprints, Boston, American Meteorological Society, 1997, p.490-491, 6 refs.

Marine atmospheres, Atmospheric boundary layer, Air water interactions, Sea spray, Heat flux, Moisture transfer

52-1402

Developing improved plant materials and appropriate seed mixtures for arid, cold training lands.

Jensen, K.B., et al, MP 5047, Land Rehabilitation and Maintenance (LRAM)/Integrated Training Area Management (ITAM) Workshop, 5th, LaCrosse, WI, Aug. 1996. Proceedings, Stevens Point, University of Wisconsin, College of Natural Resources, [1996], p.79-84.

Military facilities, Soil erosion, Soil conservation, Land reclamation, Revegetation, Protective vegetation, Introduced plants, Plant ecology, Grasses

Research was initiated in 1994 to establish a broad genetic base to aid in the development of improved native and introduced grasses and forbs that are capable of providing plant cover and stabilizing highly erodible sites disturbed by heavy military use and to develop appropriate seed mixtures based on the soil type, annual precipitation, and type of military training taking place. Specific objectives include improved establishment, recovery, and persistence under infertile and compacted soils as well as drought and cold temperatures. Broad-based evaluation trials are being conducted at two to three sites each at Fort Carson, CO and the U.S. Army Training Center at Yakima, WA. Extensive native plant collections (156 collections from Ft. Carson and 119 collections from Yakima Training Center) were made during the summers of 1994 and 1995 at both training sites with emphasis on indigenous plants that are adapted to high use training areas.

52-1403

Rehabilitation of sandy soils in cold regions.

Palazzo, A.J., Zang, P., Cary, T.J., MP 5048, Land Rehabilitation and Maintenance (LRAM)/Integrated Training Area Management (ITAM) Workshop, 5th, LaCrosse, WI, Aug. 1996. Proceedings, Stevens Point, University of Wisconsin, College of Natural Resources, [1996], p.85-87, 7 refs.

Military facilities, Sands, Soil erosion, Soil conservation, Land reclamation, Revegetation, Protective vegetation, Grasses

Sandy soils in cold regions are difficult to rehabilitate due to their low moisture and nutrient holding capacities, the short growing season, and the drying effects of winds. A series of research studies were conducted on sandy soils at Fort Drum to develop techniques to obtain a vegetative cover that is quick to establish, long lasting, and of low maintenance. The results show that suitable species are available for reseeding these soils, but there are restrictions in terms of seeding season, time required for establishment, and length of persistence.

52-1404

Improved soil erosion prediction on cold regions military training lands.

Gatto, L.W., Palazzo, A.J., Nissen, P., MP 5049, Land Rehabilitation and Maintenance (LRAM)/Integrated Training Area Management (ITAM) Workshop, 5th, LaCrosse, WI, Aug. 1996. Proceedings, Stevens Point, University of Wisconsin, College of Natural Resources, [1996], p.157-161, Abstract and slide presentation only.

Military facilities, Soil erosion, Frost action, Soil conservation

Military land managers need soil erosion prediction capability to make management decisions on training land capacity and use, and improve soil erosion control. However, data on past patterns cannot necessarily be used as predictors of future erosion because precipitation, runoff erosivity, land use and soil erodibility change with time. The Revised Universal Soil Loss Equation (RUSLE) and the Water Erosion Prediction Project (WEPP) are presently used to predict soil erosion on non-military, low maintenance lands, but CRREL's initial RUSLE and WEPP simulations suggest that the models are currently not configured for use on training lands. They do not account for changes in water runoff and soil erodibility induced by soil freeze-thaw processes and by vehicular and foot trafficking during maneuvers, but it was determined they can be modified to do so with appropriate data.

52-1405

Freeze-thaw durability of common roof insulations.

Tobiasson, W., Young, B., Greatorex, A., MP 5050, International Symposium on Roofing Technology, 4th, Sep. 17-19, 1997. Proceedings. Challenges of the 21st century, Rosemont, IL, National Roofing Contractors Association, 1997, p.352-359, 11 refs.

Roofs, Thermal insulation, Vapor barriers, Waterproofing, Frost protection, Frost resistance, Cold weather construction, Freeze thaw tests

Specimens of extruded and expanded polystyrene, polyurethane, polyisocyanurate, sprayed polyurethane, phenolic, fibrous glass, cellular glass, lightweight concrete, fiberboard, perlite, and cork insulation were frozen in air and thawed in water up to 948 times. Their moisture contents were determined periodically, and relationships developed previously at the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) were used to determine the effect of that moisture on their insulating ability. Most insulations became quite wet, which caused them to lose much of their insulating ability.

52-1406

Two new roof moisture sensor technologies.

Flanders, S.N., Yankielun, N.E., MP 5051, International Symposium on Roofing Technology, 4th, Sep. 17-19, 1997. Proceedings. Challenges of the 21st century, Rosemont, IL, National Roofing Contractors Association, 1997, p.360-367, 13 refs.

Roofs, Waterproofing, Moisture detection, Moisture meters

The authors have devised two prototype leak sensors for low-slope roofs that can both detect the presence of moisture in the roof material and identify the location of the wetted area. One uses flat, inexpensive cable and is ready for commercial development and the other uses inexpensive, autonomous passive sensors imbedded in the roof, which requires further development. Both are patent pending.

52-1407

Frost durability of high performance concretes.

Gagné, R., Aïtcin, P.C., Pigeon, M., Pleau, R., High performance concrete: from material to structure, London, E & FN Spon, 1992, p.239-251, 11 refs.

Concrete strength, Concrete durability, Concrete freezing, Concrete admixtures, Frost resistance, Freeze thaw tests

52-1408

Current contributions of the ongoing project on permafrost. Report on the meeting of the Swiss Academy of Sciences Permafrost Working Group, Apr. 29, 1996. [Aktuelle Beiträge laufender Projekte zum Thema Permafrost. Report zum Treffen der SANW-Koordinationsgruppe Permafrost vom 29. April 1996]

Vonder Mühll, D., ed, *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Arbeitsheft,* Mar. 1997, No.19, 60p., Consists of brief reports and extended abstracts, mostly in German, but with four in French and one in English. Refs. passim.

Permafrost surveys, Permafrost distribution, Permafrost heat balance, Permafrost forecasting, Permafrost dating, Rock glaciers, Periglacial processes, Solifluction, Research projects

52-1409

Structure and strength of lake and river ice.

Timco, G.W., Ottawa, National Research Council Canada, Canadian Hydraulics Centre, 1997, 10p., 17 refs. Reprinted from Proceedings of the Short Course on River Ice, Fredericton, New Brunswick, Sep. 23-24, 1997.

Lake ice, River ice, Ice structure, Ice cover strength, Ice loads, Ice pressure, Ice deformation

52-1410

Ice loads on an elastic model of the Molikpaq.

Cornett, A.M., Timco, G.W., Ottawa, National Research Council Canada, Canadian Hydraulics Centre, 1997, 15p., 16 refs. Reprinted from Proceedings of the 8th International Conference on the Behaviour of Offshore Structures, BOSS'97, Delft, Netherlands, Vol.3.

Offshore structures, Caissons, Ice solid interface, Ice loads, Ice pressure, Ice friction, Dynamic loads, Structural analysis, Environmental tests

52-1411

Water-supply aquifers at Eagle River, Alaska.

Munter, J.A., Allely, R.D., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* Winter 1992, No.108, 20p. + sheets, 48 refs.

Water supply, Water reserves, Ground water, Hydrogeology, Wells, Utilities, United States—Alaska—Eagle River

52-1412

Wolverine Creek sequence: evidence for an allochthon below the Brooks Range allochthon, western Brooks Range, Alaska.

Young, L.E., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Dec. 1992, No.92-4, 19p., 41 refs.

Geological surveys, Exploration, Geologic structures, Lithology, Tectonics, Stratigraphy, Geochronology, United States—Alaska—Brooks Range

52-1413

Surficial geology and morphology of the Alaskan central Arctic Coastal Plain.

Rawlinson, S.E., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Mar. 1993, No.93-1, 172p. + maps, Refs. p.112-123.

Geological surveys, Glacial geology, Glaciation, Glacial deposits, Marine geology, Outwash, Alluvium, Lacustrine deposits, Eolian soils, Stratigraphy, Geomorphology, Geochronology, Tectonics, Paleoclimatology, United States—Alaska—North Slope

52-1414

Mineral investigations on Chichagof and Baranof Islands, and vicinity, southeast Alaska, 1996.

Bittenbender, P.E., Still, J.C., *U.S. Bureau of Land Management. Alaska State Office, Anchorage. BLM-Alaska open file report,* July 1997, No.67, 34p. + map, 13 refs.

Geological surveys, Exploration, Geochemistry, Lithology, Minerals, Natural resources, United States—Alaska—Chichagof Island, United States—Alaska—Baranof Island

52-1415
Arctic environmental change of the last four centuries.
Overpeck, J., et al, *Science,* Nov. 14, 1997, 278(5341), p.1251-1256, Numerous refs.
Climatic changes, Environments, Polar regions

52-1416
Pervasive millennial-scale cycle in North Atlantic Holocene and glacial climates.
Bond, G., et al, *Science,* Nov. 14, 1997, 278(5341), p.1257-1266, Numerous refs.
Climatic changes, Environments, North Atlantic Ocean

52-1417
Damage statistics of ice-strengthened ships in the Baltic Sea 1984-1987.
Kujala, P., *Winter Navigation Research Board, Helsinki. Research report,* 1991, No.50, 66p., 12 refs.
Ships, Ice navigation, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Ice conditions, Accidents, Damage, Statistical analysis, Baltic Sea

52-1418
Cold tolerance, yield, and fruit quality of 'd'Anjou' pears influenced by nitrogen fertilizer rates and time of application.
Raese, J.T., *Journal of plant nutrition,* July-Aug. 1997, 20(7-8), p.1007-1025, 32 refs.
Plant physiology, Trees (plants), Nutrient cycle, Cold tolerance, Biomass, Growth, Agriculture, Seasonal variations, Chemical analysis, Low temperature tests

52-1419
High-latitude cold season frontal cloud systems and their precipitation efficiency.
Szeto, K.K., Stewart, R.E., Hanesiak, J.M., *Tellus,* Aug. 1997, 49A(4), p.439-454, 32 refs.
Synoptic meteorology, Storms, Polar atmospheres, Fronts (meteorology), Cloud physics, Static stability, Snowfall, Turbulent diffusion, Humidity, Simulation, Mathematical models, Temperature effects, Simulation

52-1420
Projections of global mean sea level rise calculated with a 2D energy-balance climate model and dynamic ice sheet models.
De Wolde, J.R., Huybrechts, P., Oerlemans, J., Van de Wal, R.S.W., *Tellus,* Aug. 1997, 49A(4), p.486-502, 26 refs.
Climatology, Surface temperature, Sea level, Global change, Sea water, Thermal expansion, Glacier mass balance, Ice sheets, Mathematical models, Heat balance, Long range forecasting
Projections of changes in surface air temperature and global mean sea level over the next century are presented for all IS92 radiative forcing scenarios. A zonal mean energy-balance climate model is used to estimate temperature changes and thermal expansion, precipitation-dependent sensitivity values are used to estimate the sea-level contribution of glaciers and small ice caps and dynamic ice-sheet models coupled to surface mass balance models are employed with regard to the Greenland and antarctic ice sheets. The largest inter-model differences in individual sea-level contributions are found for thermal expansion and for the antarctic ice-sheet. It is concluded that the inter-model differences in sea-level projections are caused by the use of essentially different models in this paper and in the revised IPCC96 projections. (Auth. mod.)

52-1421
North American and Eurasian snow cover co-variability.
Walland, D.J., Simmonds, I., *Tellus,* Aug. 1997, 49A(4), p.503-512, 38 refs.
Climatology, Snow surveys, Ice surveys, Snow cover distribution, Sea ice distribution, Seasonal variations, Correlation, Statistical analysis, North America, Eurasia

52-1422
Effects of potential climate warming on the relaxation of parameters of boreal forest communities.
Gorshkov, V.V., Bakkal, I.IU., Stavrova, N.I., *Doklady biological sciences,* July-Aug. 1997, Vol.355, p.380-383, Translated from Doklady Akademii nauk. 14 refs.
Forest ecosystems, Forest soils, Fires, Revegetation, Subarctic landscapes, Climatology, Global warming, Temperature effects, Statistical analysis, Models

52-1423
Spatial and temporal dynamics of the forest vegetation in the subarctic regions of Central Siberia over the last nine millennia.
Koshkarova, V.L., Vaganov, E.A., Koshkarov, A.D., *Doklady biological sciences,* July-Aug. 1997, Vol.355, p.402-405, Translated from Doklady Akademii nauk. 15 refs.
Paleoclimatology, Global warming, Forest ecosystems, Paleoecology, Peat, Tundra vegetation, Taiga, Vegetation patterns, Quaternary deposits, Palynology, Geochronology, Russia—Siberia

52-1424
Near-infrared spectral geometric albedos of Charon and Pluto: constraints on Charon's surface composition.
Roush, T.L., Cruikshank, D.P., Pollack, J.B., Young, E.F., Bartholomew, M.J., *Icarus,* Jan. 1996, 119(1), p.214-218, 15 refs.
Satellites (natural), Extraterrestrial ice, Regolith, Ground ice, Surface structure, Remote sensing, Ice detection, Albedo, Spectra, Spectroscopy, Geologic processes

52-1425
Energy balance and evapotranspiration in a high mountain area during summer.
Konzelmann, T., Calanca, P., Müller, G., Menzel, L., Lang, H., *Journal of applied meteorology,* July 1997, 36(7), p.966-973, 31 refs.
Climatology, Alpine landscapes, Climatic factors, Plant ecology, Evapotranspiration, Vegetation factors, Atmospheric boundary layer, Surface energy, Heat balance, Heat flux, Seasonal variations, Sampling

52-1426
Dynamic evolution of the Iceland mantle plume: the lead isotope perspective.
Hanan, B.B., Schilling, J.G., *Earth and planetary science letters,* Sep. 1997, 151(1-2), p.43-60, 67 refs.
Pleistocene, Tectonics, Subpolar regions, Magma, Sampling, Isotope analysis, Geologic processes, Fluid flow, Iceland

52-1427
Mid-Pleistocene climate transition: onset of 100 ka cycle lags ice volume build-up by 280 ka.
Mudelsee, M., Schulz, M., *Earth and planetary science letters,* Sep. 1997, 151(1-2), p.117-123, 23 refs.
Pleistocene, Paleoclimatology, Climatic changes, Glacier oscillation, Ice volume, Calving, Insolation, Ice loads, Bedrock, Deformation, Statistical analysis, Simulation

52-1428
Crustal structure of the central part of the Vøring Basin, mid-Norway margin, from ocean bottom seismographs.
Mjelde, R., et al, *Tectonophysics,* Aug. 30, 1997, 277(4), p.235-257, 35 refs.
Oceanographic surveys, Marine geology, Subpolar regions, Ocean bottom, Earth crust, Magma, Sedimentation, Tectonics, Seismic velocity, Seismic reflection, Profiles, Models, Statistical analysis, Norway—Vøring Margin

52-1429
Heterogeneous reaction of HONO and HBr on ice and on sulfuric acid.
Seisel, S., Rossi, M.J., *Berichte der Bunsen-Gesellschaft fur Physikalische Chemie,* 1997, 101(6), p.943-955, 31 refs.
Climatology, Ice physics, Cloud physics, Supercooling, Aerosols, Ice vapor interface, Heterogeneous nucleation, Adsorption, Temperature effects, Simulation

52-1430
Experimental verification of gas phase bromine enrichment in reactions of HOBr with sea salt doped ice surfaces.
Kirchner, U., Benter, T., Schindler, R.N., *Berichte der Bunsen-Gesellschaft fur Physikalische Chemie,* 1997, 101(6), p.975-977, 22 refs.
Climatology, Atmospheric composition, Aerosols, Degradation, Ice physics, Doped ice, Ice vapor interface, Vapor transfer, Heterogeneous nucleation, Simulation

52-1431
Attempt at automatic measurement of riming proportion.
Harimaya, T., Sawada, T., Muramoto, K.I., *Hokkaido University. Faculty of Science. Journal. Series VII (Geophysics),* 1996, 10(1), p.155-164, 12 refs.
Snowfall, Snow physics, Hoarfrost, Snow crystal growth, Snow crystal structure, Hoarfrost, Snow density, Velocity measurement, Particle size distribution, Photography, Statistical analysis, Classifications

52-1434
Facies characteristics of a proglacial turbiditic sand-lobe at Svalbard.
Lønne, I., *Sedimentary geology,* 1997, Vol.109, p.13-35, 48 refs.
Pleistocene, Quaternary deposits, Deltas, Mud, Stratigraphy, Marine geology, Glacial geology, Grounded ice, Sedimentation, Classifications, Lithology, Norway—Svalbard

52-1435
Passive resonance roof moisture detector.
Yankielun, N.E., Flanders, S.N., MP 4025, *Journal of thermal insulation and building envelopes,* July 1997, Vol.21, p.45-67, 3 refs.
Roofs, Moisture detection, Sensors, Electrical measurement, Electronic equipment, Electrical resistivity, Resonance, Oscillations, Design, Performance
A new, simple, and inexpensive prototype moisture sensor (patent pending) has been developed and tested in a small mockup of a low-sloped roof. The sensor comprises an inductor and a moisture-sensitive capacitor; it requires neither batteries nor wire connections. It is intended to be placed at locations within low sloped roofs that might become wet from a leak, and remain operational for the life of the roof and automatically reset if the roof becomes dry again. The moisture status of the sensor can be detected by a simple electronic circuit that is passed within 3 cm of the sensor. Preliminary tests have been performed that indicate the potential for electromagnetically and remotely polling the sensor to determine moisture status.

52-1436
Neutron moisture probe measurements of fluid displacement during in situ air sparging.
McKay, D.J., Acomb, L.J., MP 5052, *Ground water monitoring and remediation,* 1996, 16(4), p.86-94, 18 refs. For another version see 51-3170.
Land reclamation, Ground water, Water pollution, Soil pollution, Hydrocarbons, Aeration, Air flow, Soil air interface, Probes, Moisture detection, Wells, Air flow, Saturation, Environmental protection
Strawberry Point, AK is contaminated with gasoline- and diesel-range hydrocarbons in soil and ground water. An air sparging system was installed to promote bioremediation in the zone of seasonal ground water fluctuation where the contaminant is concentrated. Neutron probe borehole measurements of percentage of fluid displacement during sparging at two wells revealed dynamic air distributions defined by an initial and relatively rapid expansion phase followed by a consolidation phase. The observations at this site indicated that the effective region of influence is relatively small and that frequent pulsing is needed to optimize oxygen distribution.

52-1437

Proceedings. [Symposium de Chamonix, Juin 1991. Comptes rendus]

International Symposium on Avalanches, Chamonix, France, June 4-8, 1991, Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, 270p. + table of contents, In French, except for six papers in English and two in German. Refs. passim. Cosponsored by the International Commission for Alpine Rescue (CISA: Commission Internationale de Sauvetage Alpin/IKAR: Internationale Commission für Alpines Rettungswesen), Birchwil, Switzerland. For individual papers see 52-1438 through 52-1471.

Avalanches, Avalanche forecasting, Avalanche modeling, Snow surveys, Snow cover stability, Snowdrifts, Snow erosion, Wind erosion, Safety, Accidents

52-1438

Avalanche accidents in France: statistics for 1970-1990. [Accidents d'avalanche en France. Statistique des anneés 1970-1990]

Valla, F., Tuaillon, J.L., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.8-16, In French with English summary. 8 refs.

Avalanches, Accidents, Rescue operations, Statistical analysis, France

52-1439

Avalanche protection devices at Taconnaz: principles and functions. [Le dispositif paravalanche de Taconnaz. Principes et fonctions]

Charlier, C., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.17-24, In French with English summary.

Avalanche engineering, Snow stabilization, Snow retention, Slope protection, Terraces, Earthwork, France

52-1440

Wind tunnel modeling of transport of snow by wind in mountains: Varneralp (Valais) as an example. [Modélisation en soufflerie du transport de neige par le vent en haute montagne: l'exemple de Varneralp (Valais)]

Sivardière, F., Castelle, T., Hertig, J.A., Wuilloud, C., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.25-32, In French with English summary. 7 refs.

Avalanche modeling, Snow cover stability, Snowdrifts, Snow erosion, Snow cornices, Snow slides, Wind erosion, Wind tunnels, Switzerland

52-1441

Automatic measurement of snow depth. [Mesure automatique de hauteur de neige]

Lecorps, D., Sudul, M., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.33-39, In French with English summary.

Snow depth, Snow cover stability, Snow survey tools, Snow acoustics, Weather stations, Avalanche forecasting, France

52-1442

Preparation and analysis of high contrast stratigraphic profiles.

Good, W., Krüsi, G., Von Niederhäusern, J., Roth, A., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.40-45, With French summary. 6 refs.

Snow stratigraphy, Snow cover structure, Snow cover stability, Snow optics, Snow survey tools, Avalanche forecasting

52-1443

Mountain land restoration service, snow, and avalanches. [Le service de restauration des terrains en montagne, la neige et les avalanches]

Saillet, B., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.46-49, In French.

Avalanche forecasting, Regional planning, Organizations, Safety, France

52-1444

Organization for avalanche hazard forecasting in France. [Organisation de la prévision du risque d'avalanches en France]

Pahaut, E., Brunot, G., Brun, E., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.50-56, In French with English summary.

Avalanche forecasting, Snow cover stability, Snow surveys, Weather stations, Organizations, Data transmission, France

52-1445

Measuring the optical parameters of snow. [Mesure des paramètres optiques de la neige]

Sergent, C., Pougatch, E., Sudul, M., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.57-63, In French with English summary. 2 refs.

Snow cover structure, Snow heat flux, Snow optics, Snow survey tools, Albedo, Radiation measuring instruments

52-1446

Snow science and data processing. [Nivologie et informatique]

Dumas, J.L., Danielou, Y., Gendre, C., Pougatch, E., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.64-69, In French with English summary.

Snow surveys, Snow cover stability, Avalanche forecasting, Weather forecasting, Meteorological data, Data transmission, France

52-1447

High altitude laboratory in the Petites Rousses (Alpe d'Huez): four years of measurements. [Le laboratoire d'altitude des Petites Rousses (Alpe d'Huez). Quatre années de mesures]

Brugnot, G., Brun, E., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.70-76, In French with English summary. 6 refs.

Avalanche forecasting, Snow cover stability, Snowdrifts, Snow erosion, Wind erosion, France

52-1448

Study on the transport of snow by the wind. [Étude du transport de la neige par le vent]

Guyomarc'h, G., Merindol, L., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.77-82, In French with English summary. 8 refs.

Snowdrifts, Snow cover stability, Snow erosion, Wind erosion, Avalanche forecasting

52-1449

New instruments and their possible use in avalanche warning.

Gubler, H., Hiller, M., Weilenmann, P., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.83-91, With French summary. 5 refs.

Snow surveys, Snow survey tools, Snow cover stability, Avalanche forecasting, Warning systems, Data transmission, Telemetering equipment

52-1450

Snow avalanche accidents in Norway.

Kristensen, K., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.92-100, With French summary. 19 refs.

Avalanches, Accidents, History, Norway

52-1451

Dams and avalanches in Norway.

Laugesen, J., Sandersen, F., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.101-104, With French summary. 3 refs.

Dams, Avalanches, Accidents, Cost analysis, Norway

52-1452

Numerical modeling of snow transport by saltation. [Modélisation numérique du transport de neige par saltation]

Clappier, A., Castelle, T., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.105-117, In French with English summary. 6 refs.

Snowdrifts, Blowing snow, Snow air interface, Snow erosion, Wind erosion, Turbulent flow, Mathematical models

52-1453

Presentation and interpretation of the results ARVA90.

Good, W., Meraldi, E., Peretti, G., Schild, D., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.118-124, With French summary. 2 refs.

Avalanches, Rescue equipment, Radio beacons, Environmental tests, Switzerland

52-1454

Using photogrammetry to measure the evolution of snow accumulation at a site. [Utilisation des moyens photogrammétriques pour la saisie de l'évolution des dépôts de neige sur un site]

Castelle, T., Kölbl, O., Hawawini, Y., Voisin, J.P., Burnet, R., Christinat, M.O., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.125-135, In French with English summary. 3 refs.

Snow surveys, Snow cover distribution, Snowdrifts, Snow accumulation, Snow erosion, Wind erosion, Photogrammetric surveys

52-1455

Local forecasting of avalanche hazard on a daily basis: experience at three major stations. [Prévision locale du risque d'avalanches. Application quotidienne. Expérience de trois grandes stations des Alpes]

Navillod, L., Julliot, L., Schneider, C., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.136-144, In French.

Avalanche forecasting, Weather forecasting, Data transmission, Safety, France

52-1456

Actions taken by the Chamonix Meteorological Center in February 1991. [Actions menées par le Centre Météorologique de Chamonix lors du mois de février 1991]

Brunot, G., Debray, D., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.145-147, In French.

Avalanche forecasting, Weather forecasting, Safety, France

52-1457

Seismic detection of avalanches. [Détection sismique des avalanches]

Navarre, J.P., Danielou, Y., Panel, J.M., Taillefer, A., Lesaffre, B., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.148-153, In French with English summary. 3 refs.

Avalanche forecasting, Snow cover stability, Snow acoustics, Snowquakes, Seismic surveys

52-1458

AVALOG: a decision making system for forecasting local avalanche hazards. [AVALOG: un environnement d'aide à la décision en matière de prévention locale des risques d'avalanches]

Bolognesi, R., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.154-166, In French with English summary. 5 refs. For another version see 46-1292.

Avalanche forecasting, Computerized simulation, Computer programs, Data transmission, France

52-1459

Three-dimensional modeling of wet snow avalanches: an actual case using the WETSNOW2D code. [Modélisation tridimensionnelle d'avalanches de neige humide. Application à un cas réel: utilisation du code WETSNOW2D]

Martinet, G., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.167-175, In French with English summary. 20 refs.

Avalanche forecasting, Avalanche modeling, Wet snow, Snow cover stability, Computer programs, Computerized simulation, Mathematical models, France

52-1460

Winter maintenance on National Highway 20 and 22 at Col du Pyumorens. [Viabilité hivernale des routes nationales n°20 et 22 au Col du Puymorens]

Di Betta, J., Menager, S., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.176-181, In French with English summary. 7 refs.

Snowdrifts, Blowing snow, Snow fences, Snow hedges, Windbreaks, Road maintenance, France—Pyrenees

52-1461

Avalanche research and prevention of tourist avalanche accidents—theory and practice should cooperate anew. [Lawinenforschung und Vorbeugung von touristischen Lawinenunfällen—Theoretiker und Praktiker sollten eine neuartige Zusammenarbeit entwickeln]

Faarlund, N., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.182-187, In German with English and French summaries. 7 refs.

Avalanches, Safety

52-1462

Avalanche safety day in Yugoslavia. [La journée de la sécurité contre les avalanches en Yougoslavie]

Segula, P., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.188-190, In French with English summary.

Avalanche forecasting, Safety, Education, Slovenia

52-1463

Avalanche zone identification in the Bauges Nature Reserve. [Localisation d'avalanches dans la réserve de faune des Bauges]

Lambert, R., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.191-196, In French with English summary. 3 refs.

Avalanche tracks, Avalanche forecasting, Mapping, France

52-1464

Statistical analysis of avalanche accidents in Switzerland from 1969 to 1989. [Évaluation statistique des accidents dus aux avalanches en Suisse de 1969 à 1989]

Jaccard, C., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.197-202, In French with English summary. 3 refs.

Avalanches, Accidents, Rescue operations, Survival, Statistical analysis, Switzerland

52-1465

Estimating snow avalanche impact pressures on towers.

Norem, H., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.203-215, With French summary. 17 refs.

Avalanche mechanics, Snow loads, Towers, Concrete structures, Impact tests, Mathematical models

52-1466

Space-time modeling of the snow cover for operational forecasting of avalanche hazard. [Modélisation spatio-temporelle du manteau neigeux pour la prévision opérationnelle du risque d'avalanches]

Brun, E., Durand, Y., Guyomarc'h, G., Mérindol, L., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.216-221, In French with English summary. 5 refs.

Snow surveys, Snow stratigraphy, Snow cover stability, Avalanche forecasting, Computerized simulation

52-1467

Measuring particle velocities and concentrations in saltation by laser and subsequent image processing. [Mesure des vitesses et des concentrations de particules en saltation par plan laser puis traitement d'images]

Castelle, T., Fournel, T., Moine, M., Rippert, L., Gay, M., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.222-231, In French with English summary. 3 refs.

Snowdrifts, Blowing snow, Snow erosion, Wind erosion, Particle size distribution, Lasers, Image processing

52-1468

Physical model of water waves—numerical models. [Ondes de submersion modèle physique—modèles numériques]

Naaim, M., De Freitas Maciel, G., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.232-240, In French with English summary. 7 refs.

Avalanche modeling, Avalanche mechanics, Water waves, Wave propagation, Flood forecasting, Computerized simulation

52-1469

Foundation of supporting structures with load bearing elements bored into the ground according to the revised guidelines for avalanche structures in the starting zone (1990 edition). [Fundation von Stützwerken mit gebohrten Tragelementen nach den revidierten Richtlinien für den Lawinenverbau im Anbruchgebiet (Ausgabe 1990)]

Margreth, S., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.241-247, In German with French and English summaries. 5 refs.

Avalanche engineering, Snow fences, Anchors, Design criteria, Specifications, Switzerland

52-1470

MEPRA: expert system for avalanche hazard forecasting. [MEPRA: Modèle Expert d'Aide à la Prévision du Risque d'Avalanches]

Giraud, G., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.248-254, In French with English summary. 5 refs.

Avalanche forecasting, Avalanche modeling, Snow cover stability, Computer programs, Computerized simulation

52-1471

Artificial avalanche release: how to choose between CATEX and GAZEX. [A propos du déclenchement artificiel: comment choisir entre CATEX et GAZEX]

Gay, M., Rapin, F., Symposium de Chamonix, Juin 1991. Comptes rendus (International Symposium on Avalanches, Chamonix, France, June 4-8, 1991. Proceedings), Grenoble, France, ANENA (Association Nationale pour l'Étude de la Neige et des Avalanches), 1991, p.255-259, In French with English summary.

Avalanche triggering, Blasting, Explosives

52-1472

Equation of state of supercooled water simulated using the extended simple point charge intermolecular potential.

Harrington, S., Poole, P.H., Sciortino, F., Stanley, H.E., *Journal of chemical physics,* Nov. 8, 1997, 107(18), p.7443-7450, 31 refs.

Supercooling, Liquid cooling, Water temperature, Liquid phases, Molecular structure, Molecular energy levels, Density (mass/volume), Thermodynamics, Phase transformations, Computerized simulation, Temperature effects

52-1473

X-ray diffraction studies of freezing and melting of water confined in a mesoporous adsorbent (MCM-41).

Morishige, K., Kobuoka, K., *Journal of chemical physics,* Nov. 1, 1997, 107(17), p.6965-6969, 33 refs.

Water structure, Porous materials, Adsorption, Hygroscopic water, Ice water interface, Ice formation, Ice melting, Phase transformations, X ray analysis, Profiles, Temperature effects

52-1474

Understanding all of water's anomalies with a nonlocal potential.

Cho, C.H., Singh, S., Robinson, G.W., *Journal of chemical physics,* Nov. 15, 1997, 107(19), p.7979-7988, 54 refs.

Water structure, Liquid phases, Molecular structure, Hydrogen bonds, Molecular energy levels, Temperature effects, Thermodynamic properties, Density (mass/volume), Theories, Mathematical models

52-1475

New frontier province offshore northwest Greenland: structure, basin development, and petroleum potential of the Melville Bay area.

Whittaker, R.C., Hamann, N.E., Pulvertaft, T.C.R., *AAPG bulletin,* June 1997, 81(6), p.978-998, 59 refs.

Pleistocene, Marine geology, Subpolar regions, Hydrocarbons, Reservoirs, Exploration, Seismic surveys, Seismic reflection, Gravity anomalies, Sedimentation, Tectonics, Greenland—Melville Bay

52-1476

Physical partitioning of mercury in till: an example from central British Columbia, Canada.

Plouffe, A., *Journal of geochemical exploration,* Sep. 1997, 59(3), p.219-232, Refs. p.230-232.

Glacial geology, Glacial deposits, Quaternary deposits, Glacial erosion, Geochemistry, Lithology, Clays, Grain size, Bedrock, Mineralogy, Sampling, Electron microscopy, Canada—British Columbia

52-1477

Collisions with ice/volatile objects: geological implications—a qualitative treatment.

Wilde, P., Quinby-Hunt, M.S., *Palaeogeography, palaeoclimatology, palaeoecology,* Aug. 1997, 132(1-4), Final Meetings of International Geological Correlation Programme Project 293, 1993, Kielce, Poland; 1994, Erlangen, Germany. Proceedings. Geochemical event markers in the Phanerozoic. Edited by M.M. Joachimski et al, p.47-63, Refs. p.60-63.

Extraterrestrial ice, Hydrocarbons, Composite materials, Earth crust, Degradation, Weathering, Impact, Shock waves, Geochemistry, Sea water, Theories

52-1478

Monitoring local environmental conditions with SIR-C/X-SAR.

Pultz, T.J., Crevier, Y., Brown, R.J., Boisvert, J., *Remote sensing of environment,* Feb. 1997, 59(2), p.248-255, 14 refs.

Geophysical surveys, Soil water, Water content, Soil freezing, Dielectric properties, Freeze thaw cycles, Frost, Spaceborne photography, Synthetic aperture radar, Backscattering, Image processing

52-1479

Airborne radio echo sounding of outlet glaciers in Greenland.

Allen, C., Gogineni, S., Wohletz, B., Jezek, K., Chuah, T., *International journal of remote sensing,* Sep. 20, 1997, 18(14), p.3103-3107, 5 refs.

Glacier surveys, Glacier mass balance, Airborne radar, Radio echo soundings, Ice sheets, Ice edge, Ice water interface, Glacier thickness, Grounded ice, Data processing, Statistical analysis, Greenland

52-1480

Shear strength and deformation behaviour of a glacial till.

Chegini, A., Trenter, N.A., International Conference on Advances in Site Investigation Practice, London, UK, Mar. 30-31, 1995. Proceedings., London, Thomas Telford Publishing, 1996, p.851-866, 19 refs.

DLC TA705.A275

Engineering geology, Glacial geology, Glacial deposits, Mechanical properties, Soil strength, Shear strength, Deformation, Shear properties, Mechanical tests, Stress strain diagrams

52-1481

Mapping the sedimentary basins of the Barents and Kara Seas using ERS-1 gravimetry.

Géli, L., Blanc, F., Auger, E., Girad, J.F., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.111-120, ESA SP-383, 19 refs.

DLC QE33.2.A7I58

Geological surveys, Marine geology, Ocean bottom, Sedimentation, Spacecraft, Radiometry, Height finding, Gravity anomalies, Gravimetric prospecting, Tectonics, Sensor mapping, Barents Sea, Russia—Kara Sea

52-1482

Evaluation of the ERS-SAR high resolution precision images in the operational mapping of sea ice in the Kap Farvel waters.

Gill, R.S., Nielsen, P., Valeur, H.H., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.199-206, ESA SP-383, 4 refs.

DLC QE33.2.A7I58

Ice surveys, Ice detection, Sea ice distribution, Icebergs, Ice conditions, Ice edge, Spaceborne photography, Synthetic aperture radar, Sensor mapping, Ice detection, Resolution, Wind factors, Data processing, Greenland—Farewell, Cape

52-1483

Experiences and conclusions of operational ice monitoring with ERS-1 SAR.

Herland, E.A., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.207-209, ESA SP-383, 6 refs.

DLC QE33.2.A7I58

Sea ice distribution, Ice conditions, Ice navigation, Ice reporting, Ice surveys, Spaceborne photography, Synthetic aperture radar, Icebreakers, Telecommunication

52-1484

SAR image classification according to the ice deformation.

Similä, M., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.211-214, ESA SP-383, 6 refs.

DLC QE33.2.A7I58

Ice surveys, Sea ice distribution, Seasonal variations, Ice conditions, Ice deformation, Synthetic aperture radar, Spaceborne photography, Sensor mapping, Classifications, Image processing

52-1485

Determination of sea ice extent and ice types using the AMI-Wind, Antarctica, 1992-1995.

Ezraty, R., Gohin, F., Bryère, P., Maroni, C., Cavanié, A., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.215-217, ESA SP-383, 11 refs.

DLC QE33.2.A7I58

Sea ice distribution, Ice surveys, Spacecraft, Radar echoes, Backscattering, Ice detection, Classifications

Because of its stable signature, its continuous operation (when SAR is not switched on), and the systematic data processing by CERSAT, the scatterometer can provide valuable inputs to the monitoring of sea ice on a regional scale. To illustrate this potential, a video film was elaborated; it shows the weekly evolution of ice backscatter and ice extent over the antarctic ocean from 1992 until 1995. (Auth. mod.)

52-1486

Monitoring the ice movements with ERS SAR interferometry in the antarctic region.

Thiel, K.H., Hartl, P., Wu, X.Q., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.219-223, ESA SP-383, 3 refs.

DLC QE33.2.A7I58

Ice surveys, Glacier flow, Ice shelves, Ice edge, Spaceborne photography, Synthetic aperture radar, Topographic surveys, Image processing, Antarctica—Hemmen Ice Rise

Monitoring the changes of the ice cover and the movement of the ice in the antarctic region continuously is difficult. ERS SAR interferometry provides a tool to perform this task. For the region around Hemmen Ice Rise, it is demonstrated that topography, tidal variations and horizontal displacements can be estimated. (Auth. mod.)

52-1487

Use of ATSR data for monitoring the Antarctic Convergence Zone.

Lasnier, P., Hajji, H., Michon, P., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.225-228, ESA SP-383, 3 refs.

DLC QE33.2.A7I58

Oceanography, Water temperature, Surface temperature, Isotherms, Ocean currents, Radiometry, Spaceborne photography, Seasonal variations

The Sea surface temperature measurements retrieved from the ERS-1 Along-Track Radiometer give an excellent opportunity for monitoring the Antarctic Convergence Zone. A comparison between the theoretical and the satellite-observed zones has demonstrated the feasibility of estimating its position and thus supplying more frequent real-time information for sailing boat records. (Auth. mod.)

52-1488

Monitoring of lead formation and energy exchange in the Weddell Sea.

Thomas, M., Roth, R., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.229-234, ESA SP-383, 7 refs.

DLC QE33.2.A7I58

Sea ice distribution, Polynyas, Ice openings, Detection, Ice water interface, Spaceborne photography, Synthetic aperture radar, Heat flux, Air ice water interaction, Synoptic meteorology, Antarctica—Weddell Sea

In the central Weddell Sea ice drift is driven by the atmospheric forcing. The development of leads and polynyas can be related to the synoptic situation. An ice classification approach based on radiometric and geometric properties and an estimation of sensible heat fluxes using additional meteorological data (synoptical analysis, ECMWF model) is shown for the Weddell Sea. In most of the analyzed cases, the spatial distribution of leads and their size is correlated to their position relative to the prevailing low pressure systems. (Auth. mod.)

52-1489

Icewatch—ice SAR monitoring of the Northern Sea Route.

Johannessen, O.M., Sandven, S., Melent'ev, V.V., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.291-296, ESA SP-383, 6 refs. For another version see 51-2598.

DLC QE33.2.A7I58

Marine transportation, Route surveys, Sea ice distribution, Ice conditions, Ice reporting, Ice navigation, Ice detection, Classifications, Spaceborne photography, Synthetic aperture radar, Backscattering, Image processing, Northern Sea Route

52-1490

Demonstration of ship routing with near real time ERS-1 derived ice charts.

Partington, K., Hodson, B., Teleki, K., Rees, G., Larsen, M., Graves, A., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.313-316, ESA SP-383.

DLC QE33.2.A7I58

Marine transportation, Sea ice distribution, Ice conditions, Ice detection, Icebergs, Ice reporting, Ice navigation, Spaceborne photography, Synthetic aperture radar, Image processing, Mapping

52-1491

Potentials of SAR for sea ice ship routing based on experiences obtained with ERS-1 SAR in the Baltic Sea.

Håkansson, B., Moberg, M., International Workshop on ERS Applications, 2nd, London, UK, Dec. 6-8, 1995. Proceedings, Noordwijk, European Space Agency, 1996, p.317-321, ESA SP-383, 6 refs.

DLC QE33.2.A7 I58

Marine transportation, Ice navigation, Sea ice distribution, Ice surveys, Ice detection, Spaceborne photography, Synthetic aperture radar, Ice reporting, Ice forecasting, Sensor mapping, Baltic Sea

52-1492

In situ observations of the microphysical properties of young cirrus clouds.

Ström, J., Strauss, B., Anderson, T., Schröder, F., Heintzenberg, J., Wendling, P., *Journal of the atmospheric sciences,* Nov. 1, 1997, 54(21), p.2542-2553, 38 refs.

Cloud physics, Phase transformations, Ice crystal growth, Scavenging, Heterogeneous nucleation, Aerosols, Sounding, Probes, Ice detection, Ice crystal structure, Particle size distribution, Replicas

52-1493

Pronival (protalus) ramparts: a review of forms, processes, diagnostic criteria and palaeoenvironmental implications.

Shakesby, R.A., *Progress in physical geograpy,* Sep. 1997, 21(3), p.394-418, Refs. p.414-418.

Slope processes, Landforms, Classifications, Terminology, Talus, Sediment transport, Rock glaciers, Periglacial processes, Nivation, Geomorphology, Snow cover effect, Theories

52-1494

Glaciers.

Knight, P.G., *Progress in physical geography,* Sep. 1997, 21(3), p.434-439, 28 refs.

Glaciology, Ice sheets, Models, Theories

52-1495

Age distribution patterns in open boreal Dahurican larch forests of central Siberia.

Bondarev, A., *Forest ecology and management,* June 15, 1997, 93(3), p.205-214, 37 refs.

Forest ecosystems, Subpolar regions, Plant ecology, Vegetation patterns, Forest lines, Growth, Age determination, Statistical analysis, Models, Simulation, Russia—Siberia

52-1496

Comparison of sulphur and heavy metal contents and their regional distribution in humus and moss samples from the vicinity of Nikel and Zapoljarnij, Kola Peninsula, Russia.

Äyräs, M., Pavlov, V., Reimann, C., *Water, air, and soil pollution,* Sep. 1997, 98(3-4), p.361-380, 16 refs.

Air pollution, Subpolar regions, Aerosols, Metals, Organic soils, Soil pollution, Mosses, Environmental tests, Sampling, Statistical analysis, Mapping, Distribution, Russia—Kola Peninsula

52-1497

Characteristics of short-period wave propagation in regions of Fennoscandia, with emphasis on *Lg*.

Vogfjörd, K.S., Langston, C.A., *Seismological Society of America. Bulletin,* Dec. 1996, 86(6), p.1873-1895, 45 refs.

Earth crust, Subpolar regions, Seismic velocity, Seismic reflection, Wave propagation, Earthquakes, Detection, Profiles, Models, Statistical analysis

52-1498

Ice formation in pores in polymer modified concrete—I. The influence of the admixtures on the water to ice transition.

Klemm, A.J., Klemm, P., *Building and environment,* May 1997, 32(3), p.195-198, 9 refs.

Construction materials, Concrete admixtures, Microstructure, Polymers, Porous materials, Capillary ice, Ice formation, Ice water interface, Phase transformations, Freeze thaw cycles, Low temperature tests, Temperature measurement, Supercooling

52-1499

Ice formation in pores in polymer modified concrete—II. The influence of the admixtures on the water to ice transition in cementitious composites subjected to freezing/thawing cycles.

Klemm, A.J., Klemm, P., *Building and environment,* May 1997, 32(3), p.199-202, 10 refs.

Construction materials, Concrete admixtures, Chemical composition, Composite materials, Polymers, Phase transformations, Freeze thaw cycles, Frost action, Ice solid interface, Enthalpy, Degradation, Mechanical tests

52-1500

Measurement of bismuth at pg g^{-1} concentrations in snow and ice samples by thermal ionisation mass spectrometry.

Chisholm, W., Rosman, K.J.R., Candelone, J.P., Boutron, C.F., Bolshov, M.A., *Analytica chimica acta,* Aug. 11, 1997, 347(3), p.351-358, 39 refs.

Ice sheets, Aerosols, Volcanic ash, Sedimentation, Ice cores, Snow composition, Sampling, Isotope analysis, Spectroscopy, Ionization, Statistical analysis, Periodic variations

52-1501

Hydrological characteristics of the Mackenzie mouth area.

Mikhailova, M.V., *Water resources,* Mar.-Apr. 1997, 24(2), p.219-227, Translated from Vodnye resursy. 14 refs.

River basins, River flow, River ice, Deltas, Channels (waterways), Hydrography, Flooding, Hydrologic cycle, Seasonal freeze thaw, Ice breakup, Canada—Northwest Territories—Mackenzie River

52-1502

2140 cm^{-1} band of frozen CO: laboratory experiments and astrophysical applications.

Palumbo, M.E., Strazzulla, G., *Astronomy and astrophysics,* Mar. 1993, 269(1-2), p.568-580, 30 refs.

Ice physics, Extraterrestrial ice, Simulation, Ice spectroscopy, Cosmic dust, Carbon dioxide, Frozen liquids, Infrared radiation, Ionization, Spectra, Ice detection, Models

52-1503

Molecular-dynamics study of incoherent quasielastic neutron-scattering spectra of supercooled water.

Chen, S.H., Gallo, P., Sciortino, F., Tartaglia, P., *Physical review E,* Oct. 1997, 56(4), p.4231-4243, 52 refs.

Water structure, Ice physics, Molecular structure, Thermodynamics, Diffusion, Supercooling, Molecular energy levels, Neutron scattering, Spectra, Computerized simulation, Temperature effects

52-1504

Warming early Mars with carbon dioxide clouds that scatter infrared radiation.

Forget, F., Pierrehumbert, R.T., *Science,* Nov. 14, 1997, 278(5341), p.1273-1276, 25 refs.

Mars (planet), Climatology, Surface temperature, Heating, Cloud cover, Carbon dioxide, Ice crystal optics, Infrared radiation, Reflectivity, Light scattering, Theories

52-1505

Heavy metals in lichens, southern district of Keewatin, Northwest Territories, Canada.

Chiarenzelli, J.R., Aspler, L.B., Ozarko, D.L., Hall, G.E.M., Powis, K.B., Donaldson, J.A., *Chemosphere,* Sep. 1997, 35(6), p.1329-1341, 38 refs.

Ecosystems, Subpolar regions, Lichens, Metals, Air pollution, Origin, Aerosols, Sampling, Environmental tests, Statistical analysis, Canada—Northwest Territories—Keewatin

52-1506

Modelling the dispersion of ^{137}Cs and ^{239}Pu released from dumped waste in the Kara Sea.

Harms, I.H., *Journal of marine systems,* Oct. 1997, 13(1-4), p.1-19, Refs. p.17-19.

Oceanography, Water pollution, Radioactive wastes, Radioactive isotopes, Waste disposal, Dispersions, Ocean currents, Ice cover effect, Computerized simulation, Forecasting, Mathematical models, Russia—Kara Sea

52-1507

On convection and the formation of Subantarctic Mode Water in the Fine Resolution Antarctic Model(FRAM).

Ribbe, J., Tomczak, M., *Journal of marine systems,* Oct. 1997, 13(1-4), p.137-154, 37 refs.

Oceanography, Ocean currents, Hydrography, Convection, Ventilation, Turbulent diffusion, Models, Simulation

The authors investigate the formation of Subantarctic Mode Water (SAMW) in the Fine Resolution Antarctic Model (FRAM). FRAM velocity fields are applied to advect an ideal tracer in an off-line diffusion and advection model of the southern ocean, and the results from two computational experiments are reported. In the first experiment, the tracer was released to the south of the Antarctic Polar Front (APF), in the second experiment to the north of the front, obtaining insight into the SAMW formation process and the relative importance of convection, downwelling, vertical mixing and subduction in FRAM. A quantitative estimate for the amount of antarctic and subantarctic surface water found north of the APF is given. Its contribution to ventilated water in the upper thermocline is significant. (Auth. mod.)

52-1508
Organic carbon $\delta^{13}C$ variations in sedimentary rocks as chemostratigraphic and paleoenvironmental tools.
Popp, B.N., Parekh, P., Tilbrook, B., Bidigare, R.R., Laws, E.A., *Palaeogeography, palaeoclimatology, palaeoecology,* Aug. 1997, 132(1-4), Final Meetings of International Geological Correlation Programme Project 293, 1993, Kielce, Poland; 1994, Erlangen, Germany. Proceedings. Geochemical event markers in the Phanerozoic. Edited by M.M. Joachimski et al, p.119-132, Refs. p.130-132.
Paleoecology, Photosynthesis, Stratigraphy, Marine deposits, Plankton, Algae, Biomass, Carbon isotopes, Isotope analysis, Laboratory techniques, Accuracy, Simulation, Chemical analysis

52-1509
Spatial and temporal variability of western Antarctic Peninsula sea ice coverage.
Stammerjohn, S.E., Smith, R.C., *American Geophysical Union. Antarctic research series,* 1996, Vol.70, Foundations for ecological research west of the Antarctic Peninsula. Edited by R.M. Ross, E.E. Hofmann and L.B. Quetin, p.81-104, Refs. p.102-104.
DLC QH541.264.A6F67 1996
Sea ice distribution, Seasonal variations, Ice volume, Marine biology, Ice cover effect, Biomass, Imaging, Spaceborne photography, Antarctica—West Antarctica
Spatial and temporal variability of sea ice coverage west of the Antarctic Peninsula, the Palmer Long Term Ecological Research (LTER) study area, is analyzed from Oct. 1978 to Aug. 1994, using surface sea ice concentrations derived from passive microwave satellite data. Ice coverage in the LTER region, nearby regions and the southern ocean are compared. Results show that various regions have distinct characteristics in seasonal and interannual variability in contrast to the southern ocean as a whole. Seasonal ice coverage in the LTER and Bellingshausen regions is distinct from other southern ocean regions in that the period of ice advance is relatively short in comparison to the period of ice retreat. In addition, these regions are the only southern ocean regions which show long term persistence in monthly anomalous ice coverage, so that there is an oscillation between high ice years followed by low ice years. This LTER sea ice record provides a basis against which life-history parameters of primary producers and populations of key species from different trophic levels can be monitored. (Auth. mod.)

52-1510
Surface air temperature variations in the western Antarctic Peninsula region.
Smith, R.C., Stammerjohn, S.E., Baker, K.S., *American Geophysical Union. Antarctic research series,* 1996, Vol.70, Foundations for ecological research west of the Antarctic Peninsula. Edited by R.M. Ross, E.E. Hofmann and L.B. Quetin, p.105-121, Refs. p.120-121.
DLC QH541.264.A6F67 1996
Air temperature, Atmospheric circulation, Climatic factors, Sea ice distribution, Seasonal variations, Air ice water interaction, Ocean currents, Antarctica—West Antarctica
Surface air temperature records from several western Antarctic Peninsula (WAP) stations are examined. The annual progression of surface air temperatures show an along-peninsula gradient indicative of contrasting influences of maritime versus continental climate regimes. WAP temperature records also show a significant warming trend in mid-winter temperatures, with an increase of 4-5°C between 1944 and 1991. Increased temperature variability in fall and winter is linked to the high interannual variability of sea ice coverage. Linear regression analysis shows a significant (99.9%) anticorrelation between air temperature and sea ice extent. The more than 45 year Faraday air temperature record shows significant low frequency coherence with the Southern Oscillation Index (SOI). In addition, high frequency coherences between WAP air temperatures, WAP sea ice extent and SOI support the hypothesis that not only do extreme SOI events affect WAP climate, but monthly SOI fluctuations may be affecting monthly fluctuations in WAP air temperatures and sea ice extent as well. (Auth. mod.)

52-1511
Benthic marine habitats in Antarctica.
Clarke, A., *American Geophysical Union. Antarctic research series,* 1996, Vol.70, Foundations for ecological research west of the Antarctic Peninsula. Edited by R.M. Ross, E.E. Hofmann and L.B. Quetin, p.123-133, Refs. p.131-133.
DLC QH541.264.A6F67 1996
Marine biology, Ecology, Bottom sediment, Ice shelves, Sea ice distribution, Ice cover effect
Benthic habitats in Antarctica differ from those in other parts of the world in several important characteristics. Most of the southern ocean overlies the abyssal plain, where the sediments are primarily siliceous. Ice-rafted debris provides isolated patches of hard substratum but otherwise little is known of the biology of the deep-sea in Antarctica. Shallow water habitats are heavily influenced by ice, with typical intertidal habitats being almost devoid of life. Continental shelves are usually deep around Antarctica and the sediments are predominantly glacial-marine. Antarctica lacks typical fluvial habitats such as rivers, estuaries and has very few intertidal mudflats, and away from the immediate sublittoral the habitats suffer less physical and biological disturbance than the continental shelves of the Arctic. (Auth.)

52-1512
Accumulation of glacial marine sediments in fjords of the Antarctic Peninsula and their use as Late Holocene paleoenvironmental indicators.
Domack, E.W., McClennen, C.E., *American Geophysical Union. Antarctic research series,* 1996, Vol.70, Foundations for ecological research west of the Antarctic Peninsula. Edited by R.M. Ross, E.E. Hofmann and L.B. Quetin, p.135-154, Refs. p.152-154.
DLC QH541.264.A6F67 1996
Glacial geology, Marine geology, Sedimentation, Glacial deposits, Paleoclimatology, Antarctica—Antarctic Peninsula
In order to focus upon changing paleoenvironmental conditions over the past several thousand years kasten cores from 3 fjords of the Antarctic Peninsula were selected for detailed sedimentologic and chronologic study. Sediments in Lallemand Fjord (a polar fjord with an ice shelf) accumulate at the rate of 1 to 2 mm/yr and are primarily terrigenous. Glacier-proximal deposits record the Late Holocene advance of the Müller Ice Shelf by an increase in eolian sand and a decrease in total organic carbon. Sediments in Andvord Bay (a subpolar fjord) are accumulating at the rate of 1.5 to 1.8 mm/yr and are enriched in biogenic material (opaline silica and organic carbon) as a consequence of enhanced productivity. Cores from Brialmont Cove (a sub-polar fjord) are highly variable. Glacier-proximal sedimentation rates are on the order of at least 10-20 mm/yr. Characteristics of all fjord cores in the distal setting (>10 km) is a uniform content of ice rafted material indicating that little fluctuation in this component has taken place over the past several thousand years. (Auth. mod.)

52-1513
Pelagic and sea ice microbial communities.
Garrison, D.L., Mathot, S., *American Geophysical Union. Antarctic research series,* 1996, Vol.70, Foundations for ecological research west of the Antarctic Peninsula. Edited by R.M. Ross, E.E. Hofmann and L.B. Quetin, p.155-172, Refs. p.168-172.
DLC QH541.264.A6F67 1996
Microbiology, Marine biology, Sea ice, Ecology, Antarctica—West Antarctica
This chapter focuses on the composition of the base of the antarctic food web and, in particular, the abundance and distribution of heterotrophic flagellates and ciliates. In polar waters, microbial assemblages inhabit sea ice and the water column; both of these communities are considered in this chapter. Data are scarce from the western Antarctic Peninsula region, so information from the Scotia and Weddell Seas has been incorporated to provide a fuller description of microbial communities. Organisms occupy a variety of microhabitats in the sea ice. Similar to the water column, ice assemblages are comprised of a diversity and abundance of both autotrophs and heterotrophs. Many of the same species occur in both ice and water, supporting the hypothesis that ice-associated forms provide a seed population for water column populations. (Auth. mod.)

52-1514
Marine benthic populations in Antarctica: patterns and processes.
Clarke, A., *American Geophysical Union. Antarctic research series,* 1996, Vol.70, Foundations for ecological research west of the Antarctic Peninsula. Edited by R.M. Ross, E.E. Hofmann and L.B. Quetin, p.373-388, Refs. p.385-388.
DLC QH541.264.A6F67 1996
Marine biology, Biomass, Sea ice distribution, Ice cover effect, Ecology
Benthic marine invertebrates in Antarctica have species/abundance relationships similar to those found in temperate or tropical regions but, several striking examples of gigantism notwithstanding, most species are small. Diversity is generally high, although some taxa are low in diversity when compared with temperate or tropical faunas. Most species produce larger eggs than related non-polar species, and embryonic development is typically slow. Although the southern ocean contains fewer taxa reproducing by feeding pelagic larvae than elsewhere, such larvae are by no means absent. Postjuvenile growth rates are typically slow, and recruitment rates are slow and episodic. Ice is an important factor in many biological processes, and the recently described sub-decadal variability in the extent of winter sea-ice is likely to exert a profound influence on benthic ecological processes in Antarctica. (Auth. mod.)

52-1515
Influence of the crosslinks density on the crystallization of water in PAA gels.
Ponomariova, T., Melnichenko, IU., Albouy, P.A., Rault, J., *Polymer,* July 1997, 38(14), p.3561-3564, 15 refs.
Polymers, Ice physics, Ice formation, Ice melting, Porous materials, Phase transformations, Melting points, Enthalpy, Decomposition, Unfrozen water content, Solubility

52-1516
Portable calorimeter for measuring liquid water content of wet snow.
Kawashima, K., Endo, T., Takeuchi, Y., *Japan. National Research Institute for Earth Science and Disaster Prevention,* Dec. 1996, No.57, p.71-75, In Japanese with English summary. 5 refs.
Wet snow, Snow water content, Snow survey tools, Moisture meters

52-1517
Propeller ice load models.
Koskinen, P., Jussila, M., Soininen, H., *Finland. Technical Research Centre (Valtion teknillinen tutkimuskeskus). VTT research notes,* 1996, No.1739, 82p. + append., PB96-187430, 30 refs.
Ships, Propellers, Ice solid interface, Ice loads, Ice pressure, Metal ice friction, Ice cutting, Ice breaking, Mathematical models, Computerized simulation

52-1518
Laboratory tests of propeller blade profile pressure distribution under ice contact.
Soininen, H., Liukkonen, S., Muhonen, A., *Finland. Technical Research Centre (Valtion teknillinen tutkimuskeskus). VTT research notes,* 1995, Nos.1664,1665, 2 vols., PB96-124300 (Vol.1), PB96-124318 (Vol.2), Vol.1: description and analysis of tests, 70p. + appends. 12 refs. Vol.2: full set of time histories of tests in tabular form, 324p.
Ships, Propellers, Ice solid interface, Ice loads, Ice pressure, Ice cutting, Ice breaking, Ice strength, Dynamic loads, Stress concentration, Environmental tests, Impact tests

52-1519
Long-term variation in fire frequency and radial increment in pine from the middle taiga subzone of central Siberia.
Arbatskaia, M.K., Vaganov, E.A., *Russian journal of ecology,* Sep.-Oct. 1997, 28(5), p.291-297, Translated from Ekologiia. 24 refs.
Plant ecology, Taiga, Subarctic landscapes, Forest ecosystems, Age determination, Growth, Vegetation patterns, Fires, Statistical analysis, Periodic variations, Geochronology, Climatic factors, Russia—Siberia

52-1520
Experimental results of testing plants for land reclamation in the Yamal Peninsula.
Rozhdestvenskiĭ, IU. F., Sarapul'tsev, I.E., *Russian journal of ecology,* Sep.-Oct. 1997, 28(5), p.309-313, Translated from Ekologiia. 11 refs.
Land reclamation, Arctic landscapes, Tundra soils, Plant ecology, Revegetation, Grasses, Growth, Biomass, Environmental protection, Russia—Yamal Peninsula

52-1521
Radiocarbon dating of a recent high-latitude peat profile: Stor Åmyrân, northern Sweden.
Oldfield, F., et al, *Holocene,* Sep. 1997, 7(3), p.283-290, 32 refs.
Climatology, Subarctic landscapes, Peat, Paleoecology, Sediments, Mass balance, Drill core analysis, Geochronology, Radioactive age determination, Profiles, Statistical analysis, Geochemical cycles, Sweden—Stor Åmyrân

52-1522
Ice-flood history reconstructed with tree-rings from the southern boreal forest limit, western Québec.
Tardif, J., Bergeron, Y., *Holocene,* Sep. 1997, 7(3), p.291-300, Refs. p.299-300.
Climatology, Climatic changes, Lake ice, Flooding, Ice breakup, Ice scoring, Abrasion, Trees (plants), Age determination, Sampling, Statistical analysis, Canada—Quebec

52-1523
Palaeoclimatic and palaeoceanographic record of the last 11,000 ^{14}C years from the Skagerrak-Kattegat, northeastern Atlantic margin.
Jiang, H., Björck, S., Knudsen, K.L., *Holocene,* Sep. 1997, 7(3), p.301-310, Refs. p.309-310.
Pleistocene, Paleoclimatology, Paleoecology, Climatic changes, Quaternary deposits, Marine deposits, Sampling, Lithology, Carbon isotopes, Radioactive age determination, Ocean currents, North Sea, Atlantic Ocean

52-1524
Lacustrine pollen record from near altitudinal forest limit, Upper Kolyma region, northeastern Siberia.
Anderson, P.M., Lozhkin, A.V., Belaya, B.V., Glushkova, O.IU., Brubaker, L.B., *Holocene,* Sep. 1997, 7(3), p.331-335, 9 refs.
Paleoclimatology, Paleoecology, Palynology, Classifications, Lacustrine deposits, Quaternary deposits, Forest lines, Forest tundra, Tundra vegetation, Vegetation patterns, Radioactive age determination, Russia—Siberia

52-1525
Seasonality in late-Holocene climate from ice-core records.
Morgan, V., Van Ommen, T.D., *Holocene,* Sep. 1997, 7(3), p.351-354, 12 refs.
Paleoclimatology, Air temperature, Seasonal variations, Ice sheets, Ice cores, Oxygen isotopes, Quaternary deposits, Ice dating, Antarctica—Law Dome
High-resolution ice-core $\delta^{18}O$ data from a site with well preserved seasonal cycles, Law Dome, East Antarctica, are used to extract seasonal temperatures trends over the last 700 years with an effective resolution of a few months. Examination of this record on timescales of decades to centuries shows distinctly different patterns of temperature variation between summer and winter. Over the last 700 years, the summer months show relatively little change. The winters, in contrast, show significant fluctuations including a period of warmer temperatures between 1400 and 1500 and a colder period centered around the early 1800s which corresponds to the latter part of an era of glacier advance and cold winters in Europe sometimes known as the 'Little Ice Age'. (Auth. mod.)

52-1526
Piping causing thermokarst in permafrost, Ungava Peninsula, Quebec, Canada.
Seppälä, M., *Geomorphology,* Oct. 1997, 20(3-4), p.313-319, 21 refs.
Thermokarst development, Periglacial processes, Deltas, Continuous permafrost, Terraces, Frozen ground mechanics, Ice wedges, Seepage, Water erosion, Snowmelt, Permafrost structure, Tunnels, Geomorphology, Canada—Quebec—Ungava Peninsula

52-1527
Applications of snow cover mapping in high mountain regions.
Haefner, H., Seidel, K., Ehrler, H., *Physics and chemistry of the earth,* 1997, 22(3-4), p.275-278, 15 refs.
Snow surveys, Runoff forecasting, Snow cover distribution, Classifications, Alpine landscapes, Sensor mapping, Spaceborne photography, Accuracy, Data processing

52-1528
Remote sensing of snowline rise as an aid to testing and calibrating a glacier runoff model.
Turpin, O.C., Ferguson, R.I., Clark, C.D., *Physics and chemistry of the earth,* 1997, 22(3-4), p.279-283, 15 refs.
Snow cover distribution, Glacial hydrology, Snow line, Snowmelt, Seasonal ablation, Spaceborne photography, Sensor mapping, Image processing, Runoff forecasting, Models

52-1529
Use of ERS-1 SAR data for snow melt detection.
Koskinen, J., Hallikainen, M., *Physics and chemistry of the earth,* 1997, 22(3-4), p.285-289, 9 refs.
Snow cover distribution, Snow surveys, Forest land, Spaceborne photography, Sensor mapping, Image processing, Snow hydrology, Snowmelt, Wet snow, Detection, Classifications

52-1530
Air-sea flux of CO_2—can we short cut the annual cycle? A Greenland-Iceland-Norwegian Sea case study.
Broström, G., *Physics and chemistry of the earth,* Oct.-Dec. 1996, 21(5-6), p.517-522, 21 refs.
Oceanography, Subpolar regions, Marine atmospheres, Carbon dioxide, Air water interactions, Vapor transfer, Water temperature, Seasonal variations, Models, Geochemical cycles, Greenland Sea, Iceland Sea, Norwegian Sea

52-1531
Towards deducing regional sources and sinks from atmospheric CO_2 measurements at Spitsbergen.
Engardt, M., Holmén, K., *Physics and chemistry of the earth,* Oct.-Dec. 1996, 21(5-6), p.523-528, 15 refs.
Climatology, Polar atmospheres, Atmospheric boundary layer, Turbulent diffusion, Carbon dioxide, Geochemical cycles, Air water interactions, Seasonal variations, Models, Norway—Spitsbergen

52-1532
C_4N_2 ice in Titan's north polar stratosphere.
Samuelson, R.E., Mayo, L.A., Knuckles, M.A., Khanna, R.J., *Planetary and space science,* Aug. 1997, 45(8), p.941-948, 15 refs.
Extraterrestrial ice, Satellites (natural), Atmospheric composition, Stratosphere, Aerosols, Condensation, Photochemical reactions, Infrared spectroscopy, Spectra, Ice detection, Refractivity, Models

52-1533
Titan's surface reviewed: the nature of bright and dark terrain.
Lorenz, R.D., Lunine, J.I., *Planetary and space science,* Aug. 1997, 45(8), p.981-992, Refs. p.990-992.
Extraterrestrial ice, Satellites (natural), Regolith, Photochemical reactions, Hydrocarbons, Surface properties, Ground ice, Infrared spectroscopy, Radar echoes, Ice detection, Albedo, Theories

52-1534
Atmospheric entry of large meteoroids: implication to Titan.
Ivanov, B.A., Basilevsky, A.T., Neukum, G., *Planetary and space science,* Aug. 1997, 45(8), p.993-1007, Refs. p.1005-1007.
Extraterrestrial ice, Satellites (natural), Ice mechanics, Atmospheric physics, Regolith, Impact, Deformation, Degradation, Geomorphology, Tensile properties, Models, Theories

52-1535
Frost tolerance and biochemical changes during hardening and dehardening in contrasting white clover populations.
Svenning, M.M., Røsnes, K., Junttila, O., *Physiologia plantarum,* Sep. 1997, 101(1), p.31-37, 26 refs.
Plant physiology, Plant tissues, Acclimatization, Frost resistance, Grasses, Cold weather survival, Low temperature tests, Temperature effects

52-1536
Estimation of methane emission in the Late Pleistocene and Holocene (in the past 125,000 years).
Velichko, A.A., Kremenetskiĭ, K.V., Borisova, O.K., Zelikson, E.M., Nechaev, V.P., *Russian meteorology and hydrology,* 1997, No.3, p.11-22, Translated from Meteorologiia i gidrologiia. 38 refs.
Paleoclimatology, Pleistocene, Paleoecology, Global warming, Natural gas, Geochemical cycles, Tundra terrain, Tundra vegetation, Soil air interface, Vapor transfer, Permafrost transformation, Seasonal ablation, Theories

52-1537
Space-time coherence of ice conditions in Far Eastern seas.
Plotnikov, V.V., *Russian meteorology and hydrology,* 1997, No.3, p.38-43, Translated from Meteorologiia i gidrologiia. 7 refs.
Oceanography, Sea ice distribution, Ice conditions, Periodic variations, Statistical analysis, Correlation, Climatic factors

52-1538
Features of the stressed state of sea ice due to failure.
Sukhorukov, K.K., *Russian meteorology and hydrology,* 1997, No.3, p.44-54, Translated from Meteorologiia i gidrologiia. 12 refs.
Sea ice, Ice cover strength, Ice mechanics, Ice breakup, Ice deterioration, Ice deformation, Cracking (fracturing), Models, Stress concentration
The influence of macrocracks on the bifurcational transformation of the stressed state of ice on a typical linear scale of a few kilometers is found from experimental studies of the stressed-deformed state of the antarctic ice cover during dynamic processes resulting in arterial ice breaks. A bifurcation-sensitive criterion is shown to be the ratio of the spherical stress tensor to the deviator. The criterion can serve as a measure of ice cover macrofailure. (Auth. mod.)

52-1539
Ozone measurements in the presence of cirrus clouds.
Reichardt, J., Serwazi, M., Weitkamp, C., Michaelis, W., Ansmann, A., International Laser Radar Conference, 18th, Berlin, Germany, July 22-26, 1996. Selected papers. Edited by A. Ansmann et al, Heidelberg, Springer-Verlag, 1997, p.359-362, 7 refs.
DLC QC976.L36I58
Climatology, Cloud cover, Optical properties, Ozone, Distribution, Aerosols, Ice crystals, Ice detection, Lidar, Backscattering, Attenuation

52-1540
Comparative study of stratospheric aerosols and ozone at mid and high latitudes during the Pinatubo episode, 1991-1994.
Beyerle, G., McDermid, I.S., Neuber, R., Von der Gathen, P., International Laser Radar Conference, 18th, Berlin, Germany, July 22-26, 1996. Selected papers. Edited by A. Ansmann et al, Heidelberg, Springer-Verlag, 1997, p.489-492, 5 refs.
DLC QC976.L36I58
Climatology, Atmospheric density, Stratosphere, Aerosols, Ozone, Volcanic ash, Lidar, Backscattering, Seasonal variations

52-1541
Lidar observations of the PSCs and stratospheric aerosols over Eureka in Canadian Arctic.
Nagai, T., et al, International Laser Radar Conference, 18th, Berlin, Germany, July 22-26, 1996. Selected papers. Edited by A. Ansmann et al, Heidelberg, Springer-Verlag, 1997, p.505-508, 3 refs.
DLC QC976.L36I58
Climatology, Polar atmospheres, Polar stratospheric clouds, Detection, Aerosols, Chemical properties, Lidar, Backscattering, Seasonal variations, Canada—Northwest Territories—Eureka

52-1542
Lidar observations of polar stratospheric clouds above Spitsbergen.
Stebel, K., et al, International Laser Radar Conference, 18th, Berlin, Germany, July 22-26, 1996. Selected papers. Edited by A. Ansmann et al, Heidelberg, Springer-Verlag, 1997, p.509-512, 5 refs.
DLC QC976.L36I58
Climatology, Polar atmospheres, Polar stratospheric clouds, Detection, Lidar, Aerosols, Profiles, Backscattering, Norway—Spitsbergen

52-1543

Polar stratospheric cloud measurements by multispectral lidar at Sodankylä in winter 1994/95.

Wedekind, C., et al, International Laser Radar Conference, 18th, Berlin, Germany, July 22-26, 1996. Selected papers. Edited by A. Ansmann et al, Heidelberg, Springer-Verlag, 1997, p.513-516, 6 refs.

DLC QC976.L36I58

Climatology, Polar atmospheres, Polar stratospheric clouds, Classifications, Detection, Lidar, Backscattering, Refractivity, Aerosols, Particle size distribution, Finland—Sodankylä

52-1544

Airborne lidar observations of ozone in the arctic winter 1994/95.

Wirth, M., Renger, W., International Laser Radar Conference, 18th, Berlin, Germany, July 22-26, 1996. Selected papers. Edited by A. Ansmann et al, Heidelberg, Springer-Verlag, 1997, p.517-520, 7 refs.

DLC QC976.L36I58

Climatology, Polar atmospheres, Atmospheric composition, Degradation, Polar stratospheric clouds, Aerosols, Turbulent diffusion, Seasonal variations, Lidar, Aerial surveys

52-1545

Measurements at the Eureka arctic NDSC station with a Raman DIAL system.

Carswell, A.I., Donovan, D.P., Bird, J.C., Duck, T.J., Pal, S.R., Whiteway, J.A., International Laser Radar Conference, 18th, Berlin, Germany, July 22-26, 1996. Selected papers. Edited by A. Ansmann et al, Heidelberg, Springer-Verlag, 1997, p.521-524, 6 refs.

DLC QC976.L3I58

Climatology, Polar atmospheres, Stratosphere, Degradation, Ozone, Turbulent diffusion, Seasonal variations, Lidar, Sounding, Backscattering

52-1546

CH_4 and N_2O flux in subarctic agricultural soils.

Cochran, V.L., Schlentner, S.F., Mosier, A.R., Advances in Soil Science. Soil management and greenhouse effect. Edited by R. Lal et al, Boca Raton, CRC Press, Inc., 1995, p.179-186, 23 refs.

DLC S596.S65

Climatology, Atmospheric composition, Natural gas, Grasses, Subarctic landscapes, Soil chemistry, Modification, Sampling, Nutrient cycle, Vapor transfer, Soil air interface, Vegetation factors, Statistical analysis

52-1547

Effect of soil depth and temperature on CH_4 consumption in subarctic agricultural soils.

Sparrow, E.B., Cochran, V.L., Advances in Soil Science. Soil management and greenhouse effect. Edited by R. Lal et al, Boca Raton, CRC Press, Inc., 1995, p.197-204, 29 refs.

DLC S596.S65

Soil chemistry, Soil microbiology, Modification, Nutrient cycle, Subarctic landscapes, Natural gas, Vapor transfer, Soil air interface, Temperature effects

52-1548

Characteristics and geographical distribution of the changes in Scots pine needle surfaces in Finnish Lapland and the Kola Peninsula.

Turunen, M., Huttunen, S., Lamppu, J., Huhtala, P., NATO Advanced Research Workshop on Air Pollutants and the Leaf Cuticle, Fredericton, Canada, Oct. 4-8, 1993. Proceedings. Edited by K.E. Percy et al and NATO ASI, Series G. Ecological Sciences. Vol.36, Berlin, Springer-Verlag, 1994, p.359-369, 15 refs.

DLC QK751.A35

Plant ecology, Subpolar regions, Trees (plants), Plant tissues, Damage, Erosion, Distribution, Air pollution, Aerosols, Environmental impact, Sampling, Scanning electron microscopy, Finland—Lapland, Russia—Kola Peninsula

52-1549

Microphysical processes in clouds.

Young, K.C., New York, Oxford University Press, 1993, 427p., Refs. passim.

DLC QC921.5.Y68

Cloud physics, Precipitation (meteorology), Cloud droplets, Ice water interface, Ice vapor interface, Phase transformations, Ice crystal growth, Ice crystal structure, Hailstone growth, Homogeneous nucleation, Analysis (mathematics), Cloud seeding, Weather modification

52-1550

Early and Middle Weichselian interstadials in the central area of the Scandinavian glaciations.

Donner, J., *Quaternary science reviews,* May-June 1996, 15(5-6), p.471-479, 56 refs.

Pleistocene, Glacier oscillation, Glaciation, Glacial geology, Quaternary deposits, Marine deposits, Stratigraphy, Oxygen isotopes, Isotope analysis, Geochronology, Correlation, Scandinavia

52-1551

Palaeolithic landscapes of Europe and environs, 150,000-25,000 years ago: an overview.

Van Andel, T.H., Tzedakis, P.C., *Quaternary science reviews,* May-June 1996, 15(5-6), p.481-500, Refs. p.495-500.

Pleistocene, Paleoclimatology, Paleoecology, Glaciation, Landscape development, Glacier oscillation, Ice volume, Ice edge, Sediments, Sampling, Geochronology, Correlation

52-1552

Limnic sediments and the taphonomy of Lateglacial pollen assemblages.

Pennington, W., *Quaternary science reviews,* May-June 1996, 15(5-6), p.501-520, 43 refs.

Pleistocene, Paleoecology, Palynology, Vegetation patterns, Spectra, Quaternary deposits, Lacustrine deposits, Sedimentation, Stratigraphy, Meltwater, Statistical analysis, Correlation

52-1553

Quaternary palaeoecology and ecology.

Huntley, B., *Quaternary science reviews,* May-June 1996, 15(5-6), p.591-606, Refs. p.602-606.

Paleobotany, Paleoecology, Quaternary deposits, Geochronology, Stratigraphy, Palynology, Vegetation patterns, Accuracy

52-1554

Capture or repulsion of treated nylon particles by an ice-water interface.

Azouni, M.A., Casses, P., Sergiani, B., *Colloids and surfaces A,* Apr. 14, 1997, 122(1-3), p.199-205, 8 refs.

Colloids, Particles, Polymers, Coatings, Ice water interface, Freezing front, Surface properties, Dispersions, Absorption, Viscosity, Molecular energy levels, Theories

52-1555

Multi-method dating comparison for mid-Pleistocene Rangitawa Tephra, New Zealand.

Pillans, B., et al, *Quaternary science reviews,* Sep. 1996, 15(7), p.641-653, Refs. p.652-653.

Pleistocene, Quaternary deposits, Loess, Volcanic ash, Sedimentation, Stratigraphy, Isotope analysis, Luminescence, Geochronology, Radioactive age determination, Accuracy, Correlation, New Zealand

52-1556

Till and moraine emplacement in a deforming bed surge—an example from a marine environment.

Boulton, G.S., et al, *Quaternary science reviews,* Dec. 1996, 15(10), p.961-987, 32 refs.

Glacial geology, Marine geology, Glacier beds, Glacier surges, Moraines, Ice solid interface, Ocean bottom, Crevasses, Deformation, Classifications, Shear strain, Geomorphology

52-1557

Late Pleistocene and Holocene history of the lakes in the Kola Peninsula, Karelia and the north-western part of the East European plain.

Davydova, N., Servant-Vildary, S., *Quaternary science reviews,* Dec. 1996, 15(10), p.997-1012, 36 refs.

Pleistocene, Limnology, Paleoecology, Palynology, Geomorphology, Arctic landscapes, Research projects, Quaternary deposits, Lacustrine deposits, Permafrost transformation, History, Russia—Kola Peninsula, Russia—Karelia

52-1558

Chemical role of cosmic dust.

Williams, D.A., Taylor, S.D., *Royal Astronomical Society. Quarterly journal,* Dec. 1996, 37(4), p.565-592, Refs. p.590-592.

Cosmic dust, Extraterrestrial ice, Geochemistry, Ice physics, Ice formation, Particles, Infrared radiation, Photochemical reactions, Radiation absorption, Ice sublimation, Condensation, Cohesion, Theories

52-1559

Multi-channel suspended sediment transport model for the Mackenzie Delta, Northwest Territories.

Fassnacht, S.R., *Journal of hydrology,* Oct. 1997, 197(1-4), p.128-145, 29 refs.

Hydrology, Hydraulics, Estuaries, Watersheds, Subarctic landscapes, Deltas, Suspended sediments, Sediment transport, Flow measurement, Dispersions, Computerized simulation, Canada—Northwest Territories—Mackenzie Delta

52-1560

Regularization of a two-dimensional two-phase inverse Stefan problem.

Ang, D.D., Pham Ngoc Dinh, A., Thanh, D.N., *Inverse problems,* June 1997, 13(3), p.607-619, 8 refs.

Stefan problem, Phase transformations, Boundary value problems, Ice water interface, Heat flux, Ice melting, Analysis (mathematics)

52-1561

Microstructural features of railseat deterioration in concrete ties.

Bakharev, T., Struble, L.J., *Journal of materials in civil engineering,* Aug. 1997, 9(3), p.146-153, 14 refs.

Railroad tracks, Joints (junctions), Concrete slabs, Microstructure, Concrete durability, Frost action, Degradation, Abrasion, Water erosion, Freeze thaw tests, Scanning electron microscopy

52-1562

Effects of different methods of preparation of ice mantles of triple point water cells on the temporal behaviour of the triple-point temperatures.

Furukawa, G.T., Mangum, B.W., Strouse, G.F., *Metrologia,* Sep. 1997, 34(3), p.215-233, 12 refs.

Temperature measurement, Resistance thermometers, Ice water interface, Ice formation, Temperature control, Temperature variations, Stability, Accuracy, Cryogenics, Laboratory techniques, Thermodynamics, Standards

52-1563

Freeze-thaw durability of concrete with ground waste tire rubber.

Savas, B.Z., Ahmad, S., Fedroff, D., *Transportation research record,* 1997, No.1574, p.80-88, 10 refs.

Concrete durability, Frost resistance, Concrete aggregates, Concrete admixtures, Air entrainment, Physical properties, Wastes, Tires, Rubber, Particles, Environmental protection, Freeze thaw tests

52-1564

Runway designed to withstand temperature extremes. *Roads & bridges,* May 1997, 35(5), p.36-39.

Runways, Cold weather performance, Bituminous concretes, Concrete pavements, Concrete admixtures, Polymers, Modification, Specifications, Design criteria

52-1565
Resistance of non air-entrained rice hull ash concrete to freezing and thawing in saline environment.
Sandberg, P., CANMET/ACI International Symposium, 2nd, Las Vegas, NV, June 11-14, 1995. Proceedings. Advances in concrete technology. Edited by V.M. Molhotra, Detroit, American Concrete Institute, 1995, p.95-101, ACI SP-154, 7 refs.
DLC TA439.A38
Concrete admixtures, Concrete aggregates, Concrete durability, Frost resistance, Freeze thaw tests, Mechanical tests, Chemical properties, Salinity, Degradation

52-1566
Tests for classification of aggregates for frost-resistant concrete.
Rusin, Z., CANMET/ACI International Symposium, 2nd, Las Vegas, NV, June 11-14, 1995. Proceedings. Advances in concrete technology. Edited by V.M. Molhotra, Detroit, American Concrete Institute, 1995, p.245-261, ACI SP-154, 13 refs.
DLC TA439.A38
Concrete pavements, Concrete durability, Concrete aggregates, Classifications, Frost resistance, Freeze thaw cycles, Mechanical tests, Porosity, Standards

52-1567
Frost durability and deicer salt scaling resistance of high-performance cement pastes reinforced with steel and carbon micro-fibres.
Pleau, R., Azzabi, M., Pigeon, M., Banthia, A., International Conference on Concrete in the Service of Mankind, Dundee, Scotland, June 27-28, 1996. Proceedings. Radical concrete technology, Suffolk, E & FN Spon, 1996, p.343-355, 10 refs.
DLC TA439.R32
Reinforced concretes, Cement admixtures, Mortars, Frost resistance, Degradation, Freeze thaw tests, Freeze thaw cycles, Chemical composition, Flexural strength, Tensile properties

52-1568
Deterioration of concrete due to freezing and thawing.
Marchand, J., Pleau, R., Gagné, R., Materials Science of Concrete IV. Edited by J. Skalny and S. Mindess, Westerville, American Ceramic Society, 1995, p.283-354, Refs. p.343-354.
DLC TA439.M2973
Concrete pavements, Concrete admixtures, Concrete aggregates, Concrete durability, Frost action, Frost resistance, Degradation, Hydrates, Antifreezes, Freeze thaw cycles, Ice formation, Microstructure, Bubbles, Air entrainment

52-1569
Report of pit-wall observations of snow cover in Sapporo 1995-96.
Akitaya, E., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.1-11, In Japanese with English summary. 5 refs.
Snow surveys, Snow depth, Snow stratigraphy, Snow hardness, Snow density, Snow temperature, Snow water content, Japan—Hokkaido

52-1570
Snow surveys in Hokkaido, February 1996.
Naruse, R., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.13-26, In Japanese with English summary. 4 refs.
Snow surveys, Snow depth, Snow stratigraphy, Snow water content, Snow density, Snow hardness, Snow temperature, Japan—Hokkaido

52-1571
Data on avalanche accidents in Hokkaido for the past ninety-five years (1902-1996).
Izumi, K., Kobayashi, S., Akitaya, E., Nishimura, K., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.27-45, In Japanese with English summary. 4 refs.
Avalanches, Accidents, Japan—Hokkaido

52-1572
Sea ice conditions and meteorological observations at Saroma-ko Lagoon, Hokkaido, December 1995-November 1996.
Shirasawa, K., Ikeda, M., Ishikawa, M., Takatsuka, T., Aota, M., Fujiyoshi, Y., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.47-77, With Japanese summary. 2 refs.
Weather stations, Marine meteorology, Meteorological data, Air temperature, Wind velocity, Wind direction, Insolation, Ice conditions, Freezeup, Ice breakup, Japan—Hokkaido

52-1573
Distributions of pack ice in the Okhotsk Sea off Hokkaido observed using a sea-ice radar network, January-April, 1996.
Ishikawa, M., Takatsuka, T., Ikeda, M., Shirasawa, K., Aota, M., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.79-105, In Japanese with English summary.
Ice surveys, Sea ice distribution, Drift, Radar tracking, Japan—Hokkaido, Okhotsk Sea

52-1574
Hydrometeorological and glaciological observations in the Koryto and Ushkovsky glaciers, Kamchatka, 1996.
Kodama, Y., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.107-136, With Japanese summary. 4 refs.
Glacier surveys, Glacial meteorology, Glacial hydrology, Glacier mass balance, Glacier heat balance, Glacier oscillation, Ice cores, Russia—Kamchatka Peninsula

52-1575
Meteorological data report for the sea ice studies at Val, Chaivo and Kleye Strait, northern Sakhalin.
Shirasawa, K., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.137-203, With Japanese summary. 1 ref.
Weather stations, Marine meteorology, Meteorological data, Air temperature, Humidity, Wind velocity, Wind direction, Insolation, Sea ice, Fast ice, Snow ice interface, Ice temperature, Ice heat flux, Air ice water interaction, Russia—Sakhalin Island, Okhotsk Sea

52-1576
Correction to "Meteorological data report for the sea ice studies off the Okhotsk Sea coast of Sakhalin, 1992-1994".
Shirasawa, K., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1996, No.55, p.205-229, For original paper see 49-5188.
Snow temperature, Ice temperature, Water temperature, Air temperature, Ice heat flux, Air ice water interaction, Russia—Sakhalin Island, Okhotsk Sea

52-1577
Report of pit-wall observations of snow cover in Sapporo 1994-95.
Akitaya, E., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1995, No.54, p.1-9, In Japanese with English summary. 3 refs.
Snow surveys, Snow depth, Snow stratigraphy, Snow hardness, Snow density, Snow temperature, Snow water content, Japan—Hokkaido

52-1578
Regional observations of snow cover in Hokkaido, February 1995.
Akitaya, E., Naruse, R., Ozeki, T., Kawashima, Y., Amami, M., Kamata, Y., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1995, No.54, p.11-18, In Japanese with English summary. 4 refs.
Snow surveys, Snow depth, Snow stratigraphy, Snow water content, Snow density, Snow hardness, Japan—Hokkaido

52-1579
Meteorological observation data report for Saroma-ko Lagoon, Hokkaido, January 1993-November 1995.
Shirasawa, K., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1995, No.54, p.19-80, With Japanese summary. 1 ref.
Weather stations, Marine meteorology, Meteorological data, Air temperature, Wind velocity, Wind direction, Insolation, Japan—Hokkaido

52-1580
Distributions of pack ice in the Okhotsk Sea off Hokkaido observed using a sea ice radar network, January-April, 1995.
Ishikawa, M., Takatsuka, T., Ikeda, M., Shirasawa, K., Aota, M., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1995, No.54, p.81-104, In Japanese with English summary.
Ice surveys, Sea ice distribution, Drift, Radar tracking, Japan—Hokkaido, Okhotsk Sea

52-1581
Survey of ice-going capabilities of small vessels in the Baltic Sea. [Itämerellä liikennöivien pienalusten jäissäkulkuominaisuuksien kartoitus]
Kivimaa, S., Jalonen, R., *Finland. Technical Research Centre. VTT research notes (Valtion teknillinen tutkimuskeskus. VTT tiedotteita),* 1995, No.1717, 45p. + appends., PB96-160171, In Finnish with English summary. Refs. passim in Appendix B.
Ships, Ice navigation, Ice loads, Environmental tests, Baltic Sea

52-1582
Steps toward the institutionalization of German polar research in the 19th century. [Schritte zur Institutionalisierung der Polarforschung in Deutschland im 19.Jahrhundert]
Krause, R.A., *Zeitschrift für geologische Wissenschaften,* Dec. 1993, 21(5/6), p.617-626, In German with English summary. Selected from the symposium "Geschichte der Geowissenschaften in den deutschen Ländern", presented at the Berg Akadamie in Freiberg, 17-20 September, 1992. 16 refs.
DLC QE1.Z395
Research projects, History, Polar regions
From 1865 onwards the importance of polar research was propagated in Germany by August Petermann (1822-1877), Moritz Lindeman (1823-1908) and Georg v. Neumayer (1826-1909). Several expeditions were made and East Greenland was found to be an area of great scientific interest. However, there was no continuity in polar science. But the restriction of scientific problems to questions regarding meteorology and geomagnetics was the decisive step for the successful organization of the first international polar year in 1882-83 until around the turn of the century the German government temporarily supported antarctic research. An attempt to define institutionalization is made at the beginning of the paper and some light is thrown upon the history of the German way of institutionalizing polar research. Thus it is possible to analyze problems associated with the institutionalization of polar research and to look at the present trends of science organization. (Auth.)

52-1583
Polar research in Germany, 1945-1992. [Polarforschung in Deutschland von 1945-1992]
Wagner, S., *Zeitschrift für geologische Wissenschaften,* Dec. 1993, 21(5/6), p.761-764, In German with English summary. Selected from the symposium "Geschichte der Geowissenschaften in den deutschen Ländern", presented at the Berg Akadamie in Freiberg, 17-20 September, 1992. 2 refs.
DLC QE1.Z395
Research projects, Expeditions, Polar regions, Antarctica—Schirmacher Hills, Antarctica—Mirnyy Station, Antarctica—Bellingshausen Station, Antarctica—Georg Forster Station
The International Geophysical Year (1957-58) gave new impulses to polar research in Germany. With the overwintering from 1959 to 1961 of three German scientists at Mirnyy Station, began a persistent, cooperative participation in Soviet antarctic expeditions, which lasted over 30 years. In 1979 the German government passed a resolution on an extensive antarctic research program. The political union of Germany in 1990 led to a common German research conception. (Auth. mod.)

52-1584

Dew- and frost-resistant poly(vinyl alcohol) films.

Tomaru, I., *Japan Patent Office. Patent,* 1996, 4p., JP 9612790 A2.

Protective coatings, Frost resistance, Polymers, Chemical composition

52-1585

Antifrosting and antiicing coatings containing hydrophobic materials.

Yoshida, M., Konno, K., Ooichi, T., *Japan Patent Office. Patent,* 1995, 5p., JP 95331122 A2.

Coatings, Ice prevention, Ice control, Frost resistance, Polymers

52-1586

Apparatus for automatic measuring water content in snow by IR ray.

Tachisaki, S., Fukushi, A., Uedokoro, M., Kawakami, H., Nakano, Y., *Japan Patent Office. Patent,* 1997, 5p., JP 9779977 A2.

Snow hydrology, Snow water content, Measuring instruments, Infrared radiation

52-1587

Freezing apparatus for seawater desalination system.

Wajima, K., et al, *Japan Patent Office. Patent,* 1997, 5p., JP 9785232 A2.

Water treatment, Water supply, Sea water freezing, Salinity, Electric power

52-1588

Apparatus for automatic measuring water content in snow by latent heat in phase conversion.

Tachisaki, S., Watanabe, N., Nakano, Y., Kawakami, H., *Japan Patent Office. Patent,* 1997, 4p., JP 9780004 A2.

Snow hydrology, Snow water content, Latent heat, Phase transformations, Measuring instruments

52-1589

Diene rubber compositions for studless tire treads for snowy or icy roads.

Kakumaru, K., Miyawaki, R., Mizuno, Y., *Japan Patent Office. Patent,* 1997, 6p., JP 9787427 A2.

Tires, Surface properties, Rubber, Polymers, Chemical composition, Skid resistance, Carbon black

52-1590

Abrasion- and ice-skid-resistant pneumatic tires.

Kijima, K., Aoki, H., *Japan Patent Office. Patent,* 1996, 6p., JP 9640006 A2.

Tires, Polymers, Surface properties, Skid resistance, Chemical composition, Physical properties

52-1591

Snow-repellent coatings containing powdered poly(tetrafluoroethylene), their manufacture, and coating process.

Takai, K., Yamauchi, G., Ueda, T., *Japan Patent Office. Patent,* 1996, 4p., JP 9603479 A2.

Polymers, Coatings, Chemical composition, Snow, Ice control, Ice prevention

52-1592

Artificial snow formation apparatus for observation of crystal growth of snow.

Seki, M., *Japan Patent Office. Patent,* 1997, 6p., JP 9726241 A2.

Artificial snow, Replicas, Snow crystal growth, Snow crystal structure, Snow physics, Instruments, Laboratory techniques

52-1593

Concentration meter for measurement of $CaCl_2$ in melted snow.

Mitsui, S., Kawakita, Y., Tokoro, T., Yoshikawa, M., *Japan Patent Office. Patent,* 1997, 6p., JP 9741337 A2.

Measuring instruments, Road maintenance, Winter maintenance, Salting, Snowmelt, Meltwater, Chemical composition, Chemical analysis

52-1594

Silicone oil solutions for rendering metals surfaces water repellent and for removing ice from metal surfaces.

Giurgiu, D.E., Hamciuc, V., Pricop, L., *Romania Patent Office. Patent,* 1994, 4p., RO 105292 B1.

Solutions, Polymers, Films, Metals, Ice removal

52-1595

Snow- and ice-melting agents and antifreezing agents.

Takada, C., Azuma, O., *Japan Patent Office. Patent,* 1997, 5p., JP 97132772 A2.

Antifreezes, Snow melting, Ice melting, Ice control, Chemical composition, Coatings

52-1596

Rubber compositions for tire treads.

Teratani, H., *Japan Patent Office. Patent,* 1997, 8p., JP 97136999 A2.

Tires, Rubber, Surface properties, Polymers, Synthetic materials, Chemical composition, Skid resistance

52-1597

Water-level declines in wells in south Anchorage, Alaska: a presentation to Alaska Water Resources Board, September 12, 1985.

Munter, J.A., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Dec. 1987, No.87-15, 3p., 4 refs.

Ground water, Water supply, Water reserves, Wells, Water level, Utilities, United States—Alaska—Anchorage

52-1598

Triaxial creep model of frozen soil under dynamic loading.

Zhu, Y.L., He, P., Zhang, J.Y., Wang, J.C., *Progress in natural science,* Aug. 1997, 7(4), p.465-468, 7 refs.

Frozen ground mechanics, Loess, Soil creep, Plastic flow, Dynamic loads, Mechanical tests, Statistical analysis, Mathematical models

52-1599

Significance of crustal-scale shear zones and synkinematic mafic dykes in the Nagssugtoqidian orogen, SW Greenland: a re-examination.

Hanmer, S., Mengel, F., Connelly, J., Van Gool, J., *Journal of structural geology,* Jan. 1997, 19(1), p.59-75, Refs. p.74-75.

Tectonics, Subpolar regions, Earth crust, Magma, Shear flow, Deformation, Fracture zones, Geologic structures, Greenland

52-1600

Ozone measurement from Dakshin Gangotri, Antarctica, during 1988-89.

Sreedharan, C.R., Sudhakar Rao, G., Gulhane, P.M., *Indian journal of radio & space physics,* Dec. 1989, 18(5/6), p.188-193, 17 refs.

DLC QC801.I42

Ozone, Meteorological data, Stratosphere, Antarctica—Dakshin Gangotri Station, Antarctica—Princess Astrid Coast

Results of 28 balloon soundings monitoring changes in ozone profiles in 1988 over the Dakshin Gangotri Station are presented. These were supplemented by Dobson spectrophotometer measurements from the same station. Sep./Oct. 1988 depletions have been found to be much less pronounced than those occurred during similar period in 1987. Significantly, the stratosphere over Dakshin Gangotri was also not as cold as in 1987. (Auth. mod.)

52-1601

Thermal, hydrological and geochemical dynamics of the active layer at a continuous permafrost site, Taymyr Peninsula, Siberia.

Boike, J., *Berichte zur Polarforschung,* 1997, No.242, 104p., Refs. p.61-67.

Continuous permafrost, Active layer, Hydrodynamics, Thermodynamics, Geochemistry, Russia—Taymyr Peninsula

52-1602

Investigations of the specification of chromium in sea water, sea ice and snow in selected areas of the Arctic. [Untersuchungen zur Chrom-SpezIation in Meerwasser, Meereis und Schnee aus ausgewählten Gebieten der Arktis]

Giese, H., *Berichte zur Polarforschung,* 1997, No.240, 194p., In German with English summary. Refs. p.167-188.

Sea water, Sea ice, Snow, Chemical composition, Metals, Minerals, Arctic Ocean, Norway—Jan Mayen, Norway—Spitsbergen, Greenland

52-1603

Russian-German cooperation: The Expedition Taymyr/Severnaya Zemlya 1996.

Melles, M., ed, Hagedorn, B., ed, Bol'shiianov, D.IU., ed, *Berichte zur Polarforschung,* 1997, No.237, 170p., 96 refs.

Expeditions, Soil science, Permafrost, Hydrology, Geomorphology, Environments, Climatology, Mapping, Remote sensing, Soil biology, Russia—Taymyr Peninsula, Russia—Severnaya Zemlya

52-1604

Determination of atmospheric trace gas amounts and corresponding natural isotopic ratios by means of ground-based FTIR spectroscopy in the high Arctic.

Meier, A., *Berichte zur Polarforschung,* 1997, No.236, 309p., Refs. p.165-175.

Measuring instruments, Atmospheric composition, Gases, Spectra, Isotope analysis, Norway—Spitsbergen

52-1605

Horizontal patchiness in sympagic organisms of the antarctic fast ice.

Swadling, K.M., Gibson, J.A.E., Ritz, D.A., Nichols, P.D., *Antarctic science,* Dec. 1997, 9(4), p.399-406, Refs. p.405-406.

Microbiology, Marine biology, Sea ice, Fast ice, Ice composition, Biomass, Antarctica—Davis Station

Metazoan abundance, chlorophyll concentration and salinity were measured in 54 sea ice cores. The metazoan fauna was dominated by nauplii of the copepod *Paralabidocera antarctica.* Other copepods present included *Stephos longipes. Oncaea curvata. Oithona similis. Ctenocalanus citer,* and unidentified harpacticoid copepods. Chlorophyll *a* concentrations were generally much higher than values recorded at other antarctic coastal sites at the same time of the year, reaching a maximum of 78 mg/m^2. Metazoan abundances did not correlate strongly with chlorophyll or salinity. Significant variability in abundance of *P. antarctica* and *O. similis,* and chlorophyll concentration occurred at the scale of kilometers, whereas salinity and other metazoan abundances were not significantly variable at any of the scales examined. (Auth. mod.)

52-1606

Sensitivity of the antarctic sea ice distribution to its advection in a general circulation model.

Wu, X.R., Budd, W.F., Simmonds, I., *Antarctic science,* Dec. 1997, 9(4), p.445-455, Refs. p.454-455.

Sea ice distribution, Ice models, Ice air interface, Atmospheric circulation, Advection

A dynamic-thermodynamic sea ice model is used and coupled with an atmospheric general circulation model to simulate the seasonal cycle of the global sea ice distribution. The authors have run the coupled system and obtain a creditable seasonal simulation of the antarctic sea ice. To understand the role of ice advection on the seasonal cycle of antarctic sea ice in the coupled system, results from the thermodynamic-only (T) sea ice model have been compared with those from the dynamic thermodynamic (DT) sea ice model. The seasonal cycle of sea ice differs between the two models. When ice motion is eliminated sea ice becomes more compact and thinner, and sea ice is more extensive in summer. Experiments have been performed with a fully coupled atmosphere sea ice system, and also using prescribed daily atmospheric forcing and monthly mean atmospheric forcing, to examine the differences of the sensitivity of the ice advection between the coupled and forcing models. Similar differences have been observed between DT and T in the forcing models. (Auth. mod.)

52-1607
Disturbance and recovery in arctic lands: an ecological perspective.
Crawford, R.M.M., ed, North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2: Environment, Vol.25, Dordrecht, Kluwer Academic Publishers, 1997, 621p., Refs. passim. Proceedings of the NATO Advanced Research Workshop on Disturbance and Recovery of Arctic Terrestrial Ecosystems, Rovaniemi, Finland, Sep. 24-30, 1995. For individual papers see 52-1608 through 52-1642.
DLC QH84.1.D57 1997
Plant ecology, Tundra vegetation, Vegetation patterns, Revegetation, Plant physiology, Environmental impact, Tundra soils, Soil erosion, Air pollution, Soil pollution, Soil conservation, Land reclamation

52-1608
Arctic ecosystems and environmental change: perceptions from the past and predictions for the future.
Huntley, B., Cramer, W., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.1-24, 83 refs.
DLC QH84.1.D57 1997
Ecosystems, Plant ecology, Paleoecology, Paleobotany, Paleoclimatology, Forest lines, Vegetation patterns, Revegetation, Global change

52-1609
Arctic phytogeography: plant diversity, floristic richness, migrations, and acclimation to changing climates.
Billings, W.D., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.24-45, 61 refs.
DLC QH84.1.D57 1997
Plant ecology, Tundra vegetation, Vegetation patterns, Revegetation, Acclimatization, Biogeography, Tundra climate, Global warming

52-1610
Natural disturbance in high arctic vegetation.
Crawford, R.M.M., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.47-62, 40 refs.
DLC QH84.1.D57 1997
Tundra vegetation, Plant ecology, Plant physiology, Acclimatization, Phenology

52-1611
Arctic environmental database for Europe and Asia.
Sørensen, M., Tausnev, N., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.63-69, 5 refs.
DLC QH84.1.D57 1997
Environmental protection, Regional planning, Research projects, Organizations, International cooperation, Data processing, Data transmission

52-1612
Transformation of northern ecosystems under stress: arctic ecological changes from the perspective of ecosystem health.
Rapport, D.J., Hildén, M., Roots, E.F., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.73-89, 36 refs.
DLC QH84.1.D57 1997
Ecosystems, Ecology, Environmental impact, Environmental protection, Human factors, Regional planning

52-1613
Adaptation to disturbance as a part of the strategy of arctic and alpine plants: perspectives for management and restoration.
Oksanen, L., Virtanen, R., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.91-113, 122 refs.

DLC QH84.1.D57 1997

Tundra vegetation, Plant ecology, Plant physiology, Vegetation patterns, Revegetation, Grazing

52-1614
Interpreting environmental manipulation experiments in arctic ecosystems: are "disturbance" responses properly accounted for.
Wookey, P.A., Robinson, C.H., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.115-134, 99 refs.

DLC QH84.1.D57 1997

Tundra vegetation, Plant ecology, Plant physiology, Revegetation, Vegetation patterns, Acclimatization, Phenology, Nutrient cycle, Global warming, Environmental tests

52-1615
Role of nitrogen-fixing cryptogamic plants in the tundra.
Getsen, M.V., Kostiaev, V.IA., Patova, E.N., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.135-150, 35 refs.

DLC QH84.1.D57 1997

Tundra vegetation, Vegetation patterns, Plant ecology, Plant physiology, Lichens, Algae, Bacteria, Tundra soils, Soil microbiology, Nutrient cycle, Russia—Bol'shezemel'skaya Tundra

52-1616
Long-term damage to sub-arctic coastal ecosystems by geese: ecological indicators and measures of ecosystem dysfunction.
Jeffries, R.L., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.151-165, 50 refs.

DLC QH84.1.D57 1997

Wetlands, Littoral zone, Ecosystems, Ecology, Plant ecology, Grasses, Grazing, Environmental impact, Canada—Hudson Bay

52-1617
Disturbance and recovery of permafrost terrain.
Brown, J., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.167-178, 29 refs.

DLC QH84.1.D57 1997

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost heat balance, Permafrost preservation, Active layer, Ground ice, Ground thawing

52-1618
Arctic ecosystem stability and disturbance: a west Siberian case history.
Vil'chek, G.E., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.179-189, 23 refs.

DLC QH84.1.D57 1997

Tundra vegetation, Plant ecology, Tundra soils, Soil erosion, Soil conservation, Ecosystems, Human factors, Grazing, Economic development, Environmental impact, Russia—Tyumen'

52-1619
Numeric simulation of thermokarst formation during disturbance.
Hinzman, L.D., Goering, D.J., Kinney, T.C., Li, S., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.191-211, 42 refs.

DLC QH84.1.D57 1997

Permafrost hydrology, Permafrost heat balance, Permafrost forecasting, Permafrost preservation, Active layer, Ground thawing, Thaw depth, Thermokarst development, Mathematical models

52-1620
Pollution impact on insect biodiversity in boreal forests.
Kozlov, M.V., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.213-250, 187 refs.

DLC QH84.1.D57 1997

Taiga, Forest ecosystems, Ecology, Air pollution, Physiological effects, Environmental impact, Vegetation patterns, Plant ecology, Plant physiology, Russia—Kola Peninsula, Russia—Monchegorsk

52-1621
Satellite remote sensing of the impact of industrial pollution on tundra biodiversity.
Rees, W.G., Williams, M., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.253-282, 39 refs.

DLC QH84.1.D57 1997

Air pollution, Environmental impact, Physiological effects, Tundra vegetation, Vegetation patterns, Plant ecology, Plant physiology, Spaceborne photography, Image processing, Geobotanical interpretation, Terrain identification, Russia—Kola Peninsula

52-1622
Structure of tundra plant cover as an ecological indicator in the Kola Peninsula.
Kapitsa, A.P., Golubeva, E.I., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.283-291, 6 refs.

DLC QH84.1.D57 1997

Air pollution, Environmental impact, Physiological effects, Tundra vegetation, Vegetation patterns, Plant ecology, Plant physiology, Russia—Kola Peninsula

52-1623

Pollution of podzol soils by heavy metals.

Balaganskaia, E., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.293-301, 16 refs.

DLC QH84.1.D57 1997

Air pollution, Podsol, Forest soils, Organic soils, Soil pollution, Soil composition, Soil chemistry, Physiological effects, Plant physiology, Plant tissues, Russia—Kola Peninsula

52-1624

Pollution-induced changes in nutritional status of pine forests on the northern tree line (Kola Peninsula).

Lukina, N.V., Nikonov, V.V., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.303-319, 33 refs.

DLC QH84.1.D57 1997

Air pollution, Forest soils, Tundra soils, Soil pollution, Soil composition, Soil chemistry, Physiological effects, Plant physiology, Plant ecology, Nutrient cycle, Russia—Kola Peninsula

52-1625

Scots pine needle wax and air pollution in the subarctic.

Turunen, M., Huttunen, S., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.321-331, 44 refs.

DLC QH84.1.D57 1997

Air pollution, Physiological effects, Plant physiology, Plant tissues, Plant ecology, Trees (plants), Forest canopy

52-1626

Heavy metal concentrations in lake sediments as an index of freshwater ecosystem pollution.

Dauvalter, V., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.333-351, 43 refs.

DLC QH84.1.D57 1997

Air pollution, Tailings, Water pollution, Lake water, Water chemistry, Lacustrine deposits, Bottom sediment, Soil pollution, Russia—Kola Peninsula

52-1627

Free radical oxidation activity and pigment concentrations in leaves of mountain birches affected by aerial pollution.

Zhirov, V.K., Kuz'min, A.V., Rudenko, S.M., Kozlov, M.V., Panova, T.V., Kazakov, M.L., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.353-362, 33 refs.

DLC QH84.1.D57 1997

Air pollution, Forest canopy, Trees (plants), Physiological effects, Plant physiology, Plant tissues, Plant ecology, Russia—Kola Peninsula

52-1628

Anthropogenic tundra disturbance in Canada and Russia: patterns of response within and among different ecosystems.

Forbes, B.C., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.365-379, 59 refs.

DLC QH84.1.D57 1997

Tundra soils, Tundra vegetation, Human factors, Grazing, Economic development, Environmental impact, Soil erosion, Plant ecology, Vegetation patterns, Revegetation, Land reclamation, Canada, Russia

52-1629

Vegetation recovery following anthropogenic disturbances in Greenland: with special emphasis on native reinvasion.

Strandberg, B., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.381-390, 47 refs.

DLC QH84.1.D57 1997

Tundra vegetation, Tundra soils, Human factors, Environmental impact, Soil erosion, Plant ecology, Vegetation patterns, Revegetation, Greenland

52-1630

Monitoring of radioactive contamination of the shores of the Kola Peninsula, Novaya Zemlya and Franz Josef Land.

Szczypa, J., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.391-407, 29 refs.

DLC QH84.1.D57 1997

Nuclear explosions, Fallout, Radioactive wastes, Waste disposal, Air pollution, Water pollution, Soil pollution, Bottom sediment, Littoral zone, Tundra vegetation, Plant tissues, Barents Sea, Russia—Kola Peninsula, Russia—Novaya Zemlya, Russia—Franz Josef Land

52-1631

Usinsk oil spill: environmental catastrophe or routine event.

Vil'chek, G.E., Tishkov, A.A., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.411-420.

DLC QH84.1.D57 1997

Pipelines, Accidents, Oil spills, Soil pollution, Water pollution, Environmental impact, Cost analysis, Legislation, Russia—Usinsk

52-1632

Patterns and rates of, and factors affecting natural recovery on land disturbed by oil development in arctic Alaska.

Jorgenson, M.T., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.421-442, 29 refs.

DLC QH84.1.D57 1997

Petroleum industry, Tundra vegetation, Tundra soils, Soil pollution, Soil erosion, Plant ecology, Vegetation patterns, Revegetation, Land reclamation, United States—Alaska—North Slope

52-1633

Effects of winter seismic exploration on tundra vegetation and the soil thermal regime in the Arctic National Wildlife Refuge, Alaska.

Emers, M., Jorgenson, J.C., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.443-454, 18 refs.

DLC QH84.1.D57 1997

Petroleum industry, Seismic surveys, Tundra vegetation, Tundra soils, Thaw depth, Soil erosion, Plant ecology, Vegetation patterns, Revegetation, United States—Alaska—Arctic National Wildlife Refuge

52-1634

Arctic Alaskan vegetation disturbance and recovery: a hierarchic approach to the issue of cumulative impacts.

Walker, D.A., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.457-479, 99 refs.

DLC QH84.1.D57 1997

Tundra vegetation, Tundra soils, Soil pollution, Soil erosion, Plant ecology, Vegetation patterns, Revegetation, Soil conservation, Land reclamation, United States—Alaska

52-1635

Reproductive behaviour of arctic/alpine plants and ecological restoration.

Urbanska, K.M., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.481-501, 84 refs.

DLC QH84.1.D57 1997

Plant ecology, Plant physiology, Vegetation patterns, Revegetation, Soil erosion, Soil conservation, Land reclamation

52-1636

Long-term tundra recovery in northern Alaska.

McKendrick, J.D., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.503-518, 19 refs.

DLC QH84.1.D57 1997

Tundra vegetation, Plant ecology, Vegetation patterns, Revegetation, Tundra soils, Soil erosion, Soil conservation, Land reclamation, United States—Alaska—North Slope

52-1637

Long-term conservation strategies: Alaska's North Slope oil and gas experience.

Meehan, R.H., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.519-529, 40 refs.

DLC QH84.1.D57 1997

Petroleum industry, Environmental impact, Environmental protection, Soil erosion, Soil conservation, Regional planning, United States—Alaska—North Slope

52-1638
Self-recovery after technogenic and natural disturbances in the central part of the Yamal Peninsula (western Siberian Arctic).
Khitun, O.V., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.531-552, 62 refs.
DLC QH84.1.D57 1997
Human factors, Petroleum industry, Grazing, Environmental impact, Tundra soils, Soil erosion, Tundra vegetation, Plant ecology, Vegetation patterns, Revegetation, Tundra soils, Soil erosion, Russia—Yamal Peninsula

52-1639
Carbon-nutrient interactions as constraints on recovery of arctic ecosystems from disturbance.
Shaver, G.R., Rastetter, E.B., Nadelhoffer, K.J., Giblin, A.E., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.553-562, 29 refs.
DLC QH84.1.D57 1997
Ecosystems, Environmental impact, Tundra soils, Soil chemistry, Tundra vegetation, Plant ecology, Plant physiology, Nutrient cycle

52-1640
Natural vegetation recovery on anthropogenically disturbed sites in north-western Siberia: an approach to analysis of anthropogenic vegetation.
Sumina, O.I., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.563-571, 18 refs.
DLC QH84.1.D57 1997
Human factors, Environmental impact, Tundra soils, Soil erosion, Tundra vegetation, Plant ecology, Vegetation patterns, Revegetation, Russia—Siberia

52-1641
Secondary successions of arctic ecosystems in relation to tundra restoration.
Tishkov, A.A., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.573-583, 17 refs.
DLC QH84.1.D57 1997
Human factors, Environmental impact, Tundra soils, Soil erosion, Tundra vegetation, Plant ecology, Vegetation patterns, Revegetation, Land reclamation

52-1642
Disturbance of tundra ecosystems and their restoration in the Far North of Russia.
Archegova, I.B., Disturbance and recovery in arctic lands: an ecological perspective. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series, Partnership Sub-Series 2, Vol.25. Edited by R.M.M. Crawford, Dordrecht, Kluwer Academic Publishers, 1997, p.585-590, 8 refs.
DLC QH84.1.D57 1997
Human factors, Environmental impact, Tundra soils, Soil erosion, Tundra vegetation, Plant ecology, Revegetation, Land reclamation, Russia—Siberia

52-1643
CRREL teaches arctic survival.
Darling, M., MP 5054, *Engineer update,* Mar. 1995, 19(3), p.5.
Cold weather survival, Education

52-1644
Snow hunters gather data in mountains.
Arbios, G., *Engineer update,* Aug. 1994, 18(8), p.8.
Snow surveys, Aerial surveys, Snow cover distribution, Snow line, Snow depth, Runoff forecasting

52-1645
Simulator tests pavements at CRREL.
Darling, M., *Engineer update,* May 1997, 21(5), p.3, MP 5055.
Research projects, Vehicles, Simulation, Pavements, Low temperature tests, Mechanical tests, Loads (forces), Frost action, Freeze thaw cycles

52-1646
CRREL researchers sail to North Pole.
Darling, M., MP 5056, *Engineer update,* Nov. 1994, 18(11), p.6.
Exploration, Research projects, Oceanographic surveys, Expeditions, International cooperation, Arctic Ocean, North Pole

52-1647
Ice researcher wins cool award.
Darling, M., MP 5057, *Engineer update,* Oct. 1994, 18(10), p.11.
Research projects, Glaciology

52-1648
Dissociative electron attachment in nanoscale ice films: temperature and morphology effects.
Simpson, W.C., Sieger, M.T., Orlando, T.M., Parenteau, L., Nagesha, K., Sanche, L., *Journal of chemical physics,* Nov. 22, 1997, 107(20), p.8668-8677, 77 refs.
Ice physics, Phase transformations, Deuterium oxide ice, Amorphous ice, Water films, Molecular structure, Molecular energy levels, Ion diffusion, Resonance, Ice spectroscopy, Temperature effects

52-1649
Slush field formation in the Arctic basin.
Bogorodskiĭ, P.V., Makshtas, A.P., *Russian meteorology and hydrology,* 1996, No.8, p.36-42, Translated from Meteorologiia i gidrologiia. 14 refs.
Oceanography, Sea ice, Slush, Thermal regime, Ice melting, Insolation, Radiation absorption, Meltwater, Surface energy, Ice water interface, Heat transfer, Convection, Analysis (mathematics)

52-1650
Technique for determining snow cover of a river basin from satellite data for operational runoff forecasts.
Burakov, D.A., Kashkin, V.B., Sukhinin, A.I., Romasko, V.IU., Ratnenko, I.V., *Russian meteorology and hydrology,* 1996, No.8, p.58-65, Translated from Meteorologiia i gidrologiia. 13 refs.
Snow hydrology, Snow cover distribution, Snowmelt, Runoff forecasting, River basins, Spaceborne photography, Image processing, Computer applications, Statistical analysis, Accuracy

52-1651
Influence of morphometry of water storages on heat exchange and ice formation.
Kalinin, V.G., Trofimov, N.A., *Russian meteorology and hydrology,* 1996, No.8, p.66-70, Translated from Meteorologiia i gidrologiia. 5 refs.
Reservoirs, Water storage, Heat balance, Heat transfer, Turbulent exchange, Ice formation, Air ice water interaction, Analysis (mathematics), Ice forecasting

52-1652
Responses of alpine grassland to four seasons of CO_2 enrichment: a synthesis.
Körner, C., Diemer, M., Schäppi, B., Niklaus, P., Arnone, J., III, *Acta œcologica,* May 1997, 18(3), p.165-175, With French summary. 23 refs.
Plant ecology, Grasses, Ecosystems, Alpine landscapes, Soil air interface, Growth, Biomass, Soil microbiology, Vapor transfer, Carbon dioxide, Simulation

52-1653
Effects of elevated CO_2 on gas exchange characteristics of alpine grassland.
Diemer, M., *Acta œcologica,* May 1997, 18(3), p.177-182, With French summary. 8 refs.
Plant ecology, Ecosystems, Grasses, Alpine landscapes, Carbon dioxide, Vapor transfer, Photosynthesis, Nutrient cycle, Soil air interface, Seasonal variations, Simulation

52-1654
Effect of atmospheric CO_2 enrichment on Rubisco content in herbaceous species from high and low altitude.
Sage, R.F., Schäppi, B., Körner, C., *Acta œcologica,* May 1997, 18(3), p.183-192, With French summary. 24 refs.
Plant ecology, Plant physiology, Grasses, Alpine landscapes, Carbon dioxide, Vapor transfer, Photosynthesis, Acclimatization, Climatic factors, Plant tissues, Chemical analysis, Vegetation patterns

52-1655
***In situ* effects of elevated CO_2 on chlorophyll fluorescence and chloroplast pigments of alpine plants.**
Thron, C., Hahn, K., Lütz, C., *Acta œcologica,* May 1997, 18(3), p.193-200, With French summary. 34 refs.
Plant ecology, Alpine landscapes, Plant physiology, Plant tissues, Photosynthesis, Photochemical reactions, Carbon dioxide, Chlorophylls, Luminescence, Sampling, Climatic factors

52-1656
Does fertilizer application alter the effects of elevated CO_2 on *Carex* leaf litter quality and *in situ* decomposition in an alpine grassland.
Arnone, J.A., III, Hirschel, G., *Acta œcologica,* May 1997, 18(3), p.201-206, With French summary. 19 refs.
Plant ecology, Grasses, Plant tissues, Chemical analysis, Decomposition, Alpine landscapes, Carbon dioxide, Nutrient cycle, Soil chemistry, Modification

52-1657
Three-dimensional stress concentration at grain triple junctions in columnar ice.
Picu, C.R., *Philosophical magazine letters,* Sep. 1997, 76(3), p.159-166, 14 refs.
Ice physics, Ice microstructure, Ice elasticity, Mechanical properties, Stress concentration, Anisotropy, Crack propagation, Nucleation, Compressive properties

52-1658
Relationship between the fall velocity of snowflakes and the shape of their component crystals.
Kajikawa, M., Taniguchi, S., Ito, S., *Seppyo,* Nov. 1996, 58(6), p.455-462, In Japanese with English summary. 17 refs.
Falling snow, Snowflakes, Snow crystal structure, Ice crystal size, Snow air interface, Velocity measurement, Statistical analysis

52-1659
Differences of snow pressure on partial sloping forms.
Yamaya, M., Tsukahara, H., *Seppyo,* Nov. 1996, 58(6), p.463-468, In Japanese with English summary. 17 refs.
Concrete structures, Snow loads, Snow retention, Slope processes, Snow hedges, Trees (plants), Forest strips

52-1660
Review of studies on radio wave electronics with snow and ice.
Suzuki, M., *Seppyo,* Nov. 1996, 58(6), p.469-476, In Japanese. 70 refs.
Falling snow, Snow cover effect, Snow electrical properties, Radio echo soundings, Microwaves, Wave propagation, Attenuation

52-1661
Research trends in gas hydrates: technology development in utilizing gas hydrates.
Mori, Y.H., *Seppyo,* Nov. 1996, 58(6), p.477-480, In Japanese. 17 refs.
Hydrates, Clathrates, Gas inclusions, Fuels

52-1662
Some more words on snow countermeasures for National Highway 17 (part 4). [Kokudo 17-go yuki taisaku yowa (sono 4)]
Abe, T., *Seppyo,* Nov. 1996, 58(6), p.501-509, In Japanese. 9 refs.
Snow removal, Snow fences, Snowsheds, Avalanches, Safety, Road maintenance, Japan

52-1663

Development of a general water quality index. [Mizu no sokatsu suishitsu shihyo no kaihatsu]

Taguchi, T., *Seppyo,* Nov. 1996, 58(6), p.510-516, In Japanese. 3 refs.

Water pollution, Water chemistry, Impurities, Ice crystal structure, Ice crystal replicas

52-1664

Verification on the prediction of the Batura Glacier along the International Karakoram Highway.

Zhang, X.S., et al, *Journal of glaciology and geocryology,* June 1996, 18(2), p.97-103, In Chinese with English summary. 12 refs.

Mountain glaciers, Glacier surveys, Glacier oscillation, Highway planning, Pakistan—Karakoram Mountains

52-1665

Difference of permafrost degeneration in the east of the Tibetan Plateau.

Zhu, L.N., Wu, Z.W., Zang, E.M., Pan, B.W., Liu, Y.Z., Tao, G.X., *Journal of glaciology and geocryology,* June 1996, 18(2), p.104-110, In Chinese with English summary. 6 refs.

Permafrost surveys, Permafrost distribution, Permafrost forecasting, Ground thawing, Global warming, China—Qinghai-Xizang Plateau

52-1666

High resolution record of Malan loess in the Longxi loess plateau and rapid climate changes during the last glaciation.

Chen, F.H., Ma, Y.Z., Li, J.J., *Journal of glaciology and geocryology,* June 1996, 18(2), p.111-118, In Chinese with English summary. 20 refs.

Loess, Soil surveys, Soil profiles, Soil dating, Stratigraphy, Paleoclimatology, Climatic changes, China—Gansu Province

52-1667

Climate instability revealed in the Beiyuan $CaCO_3$ record during the last interglacial age.

Guan, D.H., Xi, X.X., Hao, Y.P., Fang, X.M., Li, J.J., Yu, D.L., *Journal of glaciology and geocryology,* June 1996, 18(2), p.119-124, In Chinese with English summary. 21 refs.

Soil surveys, Soil profiles, Soil composition, Soil dating, Stratigraphy, Ice cores, Ice composition, Paleoclimatology, Global change, China—Gansu Province, Greenland

52-1668

Variation of Cl^- content in paleo-Dongshan Lake during early Pleistocene and monsoonal evolution.

Xi, X.X., Mu, D.F., Fang, X.M., Li, J.J., *Journal of glaciology and geocryology,* June 1996, 18(2), p.125-130, In Chinese with English summary. 8 refs.

Salt lakes, Lacustrine deposits, Quaternary deposits, Soil composition, Soil dating, Stratigraphy, Atmospheric composition, Atmospheric circulation, Paleoclimatology, Global change, China—Gansu Province

52-1669

Response of cryosphere to climatic warming since 1980 over the Northern Hemisphere.

Ding, Y.J., *Journal of glaciology and geocryology,* June 1996, 18(2), p.131-138, In Chinese with English summary. 29 refs.

Global warming, Glacier oscillation, Glacier mass balance, Glacier melting, Permafrost distribution, Permafrost heat balance, Ground thawing, Snow cover distribution

52-1670

Ablation function of the glacier in the source of the Urumqi River.

Ye, B.S., Chen, K.G., Shi, Y.F., *Journal of glaciology and geocryology,* June 1996, 18(2), p.139-146, In Chinese with English summary. 8 refs.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, Glacier ablation, Statistical analysis, China—Tian Shan

52-1671

Characteristics of ablation on continental-type glaciers in China.

Zhang, Y.S., Yao, T.D., Pu, J.C., *Journal of glaciology and geocryology,* June 1996, 18(2), p.147-154, In Chinese with English summary. 7 refs.

Mountain glaciers, Glacial meteorology, Glacier oscillation, Glacier mass balance, Glacier ablation, Glacier melting, Ice sublimation, Statistical analysis, China

52-1672

Progressive yield criteria on creep of frozen soil.

Wang, Z.G., Ma, W., Sheng, Y., Wu, Z.W., *Journal of glaciology and geocryology,* June 1996, 18(2), p.155-161, In Chinese with English summary. 5 refs.

Frozen ground strength, Frozen ground compression, Soil creep, Plastic deformation, Mathematical models

52-1673

Uniaxial compressive strength of frozen saturated silt under vibrating load.

Shen, Z.Y., Zhang, J.Y., *Journal of glaciology and geocryology,* June 1996, 18(2), p.162-169, In Chinese with English summary. 3 refs.

Frozen ground strength, Frozen ground compression, Dynamic loads, Static loads, Soil tests, Strain tests

52-1674

Multi-factor study of salt expansion of sulphate salty soil.

Gao, J.P., Wu, J.H., Deng, Y.S., Wang, J.C., *Journal of glaciology and geocryology,* June 1996, 18(2), p.170-177, In Chinese with English summary. 3 refs.

Saline soils, Soil chemistry, Soil composition, Soil tests, Mathematical models

52-1675

Method for determining elasto-plastic fracture toughness of ice.

Li, F., Shen, W., Sun, X.T., Gong, D.Q., *Journal of glaciology and geocryology,* June 1996, 18(2), p.178-183, In Chinese with English summary. 4 refs.

Ice strength, Ice deformation, Ice breaking, Ice cracks, Ice plasticity, Ice elasticity, Ice optics

52-1676

Application of scanning electronic microscope in study of geocryology.

Wang, J.C., Zhang, X.Z., Wang, Y.J., *Journal of glaciology and geocryology,* June 1996, 18(2), p.184-188, In Chinese with English summary. 2 refs.

Frozen ground strength, Frozen ground compression, Interstitial ice, Soil structure, Microstructure, Scanning electron microscopy

52-1677

Variation trends of temperature and precipitation and their influence on glaciers in the headwaters of the Urumqi River.

Yang, X.Y., Han, T.D., *Journal of glaciology and geocryology,* June 1996, 18(2), p.189-193, In Chinese with English summary. 2 refs.

Mountain glaciers, Glacier surveys, Glacial hydrology, Glacial meteorology, Glacier mass balance, Glacier oscillation, Meltwater, Precipitation (meteorology), Climatic changes, China—Tian Shan

52-1678

Mass balance at the steady state equilibrium line altitude and its application.

Xie, Z.C., Ding, L.F., Liu, C.H., Liu, S.Y., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.1-9, In Chinese with English summary. 17 refs.

Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier oscillation, Snow line, Statistical analysis

52-1679

Energy budget at ELA on Dongkemadi Glacier in the Tanggula Mts. Tibetan Plateau.

Zhang, Y.S., Yao, T.D., Pu, J.C., Ohata, T., Yabuki, H., Fujita, K., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.10-19, In Chinese with English summary. 9 refs.

Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier heat balance, Glacial meteorology, Snow line, China—Qinghai-Xizang Plateau

52-1680

Temperature variations at the surface and 500 hPa in Xining and Tuotuohe regions.

Zhang, X.P., Yao, T.D., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.20-28, In Chinese with English summary. 6 refs.

Weather stations, Air temperature, Surface temperature, Climatic changes, Meteorological data, Statistical analysis, China—Qinghai-Xizang Plateau

52-1681

Effect of climate change on runoff in the Yili River in the Tianshan Mountains.

Ye, B.S., Lai, Z.M., Shi, Y.F., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.29-36, In Chinese with English summary. 11 refs.

Snowmelt, Meltwater, Water balance, Water reserves, Runoff forecasting, Global warming, Computerized simulation, China—Tian Shan

52-1682

Research of convection heat transfer between thermalpile and air.

Wu, Q.B., Liang, S.Y., Gao, X.W., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.37-42, In Chinese with English summary. 7 refs.

Permafrost beneath structures, Permafrost heat transfer, Permafrost preservation, Foundations, Soil stabilization, Soil air interface, Heat pipes, Convection, Heat flux

52-1683

Study on freezing point of wet clay under loading.

Li, Y., Cui, G.X., Lu, H.L., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.43-46, In Chinese with English summary. 1 ref.

Clay soils, Soil water, Water content, Soil freezing, Freezing points, Frozen ground strength, Frozen ground compression

52-1684

Deformation characteristics and calculation of frozen clay shaftwalls.

Wang, R.H., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.47-52, In Chinese with English summary. 4 refs.

Shaft sinking, Clay soils, Soil freezing, Artificial freezing, Soil stabilization, Frozen ground strength, Frozen ground compression, Mathematical models

52-1685

Strength characteristics of frozen soil under loading and unloading.

Gur'ianov, I.E., Ma, W., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.53-57, In Chinese with English summary. 3 refs.

Soil freezing, Frozen ground strength, Frozen ground compression, Soil creep, Soil tests, Strain tests

52-1686

Experimental investigations on ice with single maximum fabric under uniaxial compression.

Gao, X.Q., Jacka, T.H., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.58-63, In Chinese with English summary. 15 refs.

Glacier ice, Ice cores, Ice structure, Ice crystal structure, Ice crystal size, Ice strength, Ice pressure, Ice loads, Ice deformation, Ice creep, Antarctica—Law Dome

An account is given of ice deformation experiments under uniaxial compression. Samples studied include ice with single maximum fabric from cores drilled on Law Dome and laboratory prepared isotropic polycrystalline ice. The tests were carried out at -3.3°C and an octahedral shear stress of 0.3 MPa. The minimum strain rates for core samples are a factor of ca. 4 lower than the isotropic minimum strain rate. This result indicates that the anisotropy does not enhance the strain rate. The approach to similar tertiary strain rates has been found for core ice and laboratory prepared ice, associated with the development of tertiary creep. The resultant fabric pattern in both types of ice is small circle girdle with equilibrium crystal size. It has been demonstrated that small circle girdle fabric is more compatible with compressive stress configuration than single maximum fabric. (Auth.)

52-1687
Reevaluation of the theory of so-called glacier-deformed stones.
Guo, X.D., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.64-71, In Chinese with English summary. 9 refs.
Glaciation, Glacial erosion, Quaternary deposits, Glacial till, Alluvium, Lithology, Rock mechanics, Weathering, Water erosion, China

52-1688
Arctic sea ice and climate change.
Li, P.J., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.72-80, In Chinese with English summary. 29 refs.
Sea ice distribution, Ice cover effect, Air ice water interaction, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Water temperature, Salinity, Paleoclimatology, Global change

52-1689
Review of the effect of degradation of glaciers and permafrost on railways.
Liu, T.L., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.80-87, In Chinese with English summary. 20 refs.
Global warming, Permafrost beneath roads, Permafrost distribution, Ground thawing, Glacier melting, Sea level, Railroads, China

52-1690
Measures against frost-damage of hydraulic structure in Xinjiang.
Guo, D.F., *Journal of glaciology and geocryology,* Mar. 1996, 18(1), p.88-92, In Chinese with English summary. 3 refs.
Hydraulic structures, Channels (waterways), Frost heave, Frost action, Frost protection, China—Xinjiang

52-1691
Distribution of snow cover over the high Asia.
Li, P.J., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.291-298, In Chinese with English summary. 10 refs.
Snow surveys, Snow cover distribution, Snow depth, Snow line, Climatic changes

52-1692
Evaluation of NOAA/NESDIS digitized snow cover monitoring in the Tibetan Plateau.
Cao, M.S., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.299-302, In Chinese with English summary. 6 refs.
Snow surveys, Snow cover distribution, Mapping, Terrain identification, Spaceborne photography, Statistical analysis, China—Qinghai-Xizang Plateau

52-1693
Traverse expedition to the Lambert Glacier basin, eastern Antarctica.
Ren, J.W., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.303-307, In Chinese with English summary. 5 refs.
Glacier surveys, Glacier thickness, Glacier flow, Glacier surfaces, Glacier alimentation, Snow accumulation, Snow ice interface, Antarctica—Lambert Glacier
The Lambert Glacier, feeding into the Amery Ice Shelf, is the largest ice stream in the East Antarctic ice sheet. Preliminary results from recent traverse along a route across its inland accumulation area show that the accumulation rate in this area is very low, not exceeding 150 kg/(m^2·a) at most sites. The mean annual temperature ranges from -45°C to -30°C. Average density of surface 2 m snow is around 400 kg/m^3. Depth-hoar is seen at many sites with an elevation between 1830 and 2700 m. The surface velocity is generally within 20 m/a. Snow redistribution caused by strong katabatic-wind and sastrugi brings about an uncertainty in the annual-layer identification using $\delta^{18}O$ profile in low accumulation area. (Auth.)

52-1694
Variation of $d\delta^{18}O/dT$ in precipitation in the Tibetan Plateau.
Zhang, X.P., Yao, T.D., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.308-314, In Chinese with English summary. 12 refs.
Atmospheric circulation, Atmospheric composition, Air temperature, Precipitation (meteorology), Oxygen isotopes, Isotope analysis, Statistical analysis, China—Qinghai-Xizang Plateau

52-1695
Tensile strength of frozen saturated loess.
Shen, Z.Y., Peng, W.W., Liu, Y.Z., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.315-321, In Chinese with English summary. 6 refs.
Loess, Frozen ground strength, Soil creep, Soil tests, Strain tests, Tensile properties, Compressive properties

52-1696
Analogic conditions of simulation test of frozen soil.
Wang, T.D., Zhao, X.S., Wu, Z.W., Liu, Y.Z., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.322-327, In Chinese with English summary. 4 refs.
Frozen ground strength, Soil creep, Computerized simulation, Mathematical models

52-1697
Experimental studies of fracture toughness K_{IC} for frozen soil.
Li, H.S., Zhang, X.P., Zhu, Y.L., Peng, W.W., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.328-333, In Chinese with English summary. 6 refs.
Frozen ground strength, Frozen ground compression, Soil creep, Soil tests, Strain tests, Cracking (fracturing)

52-1698
Creep failure characteristics of frozen sand under two-step stress.
Sheng, Y., Wu, Z.W., Miao, L.N., Ma, W., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.334-338, In Chinese with English summary. 3 refs.
Sands, Frozen ground strength, Soil creep, Soil tests, Strain tests

52-1699
Torsion-shear strengths of frozen soil under different test methods.
Peng, W.W., Zhang, C.Q., Zhang, J.M., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.339-342, In Chinese with English summary. 5 refs.
Frozen ground strength, Soil creep, Soil tests, Strain tests

52-1700
Comparisons of the creep and crystallographic properties of laboratory prepared ice with core ice.
Gao, X.Q., Jacka, T.H., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.343-349, In Chinese with English summary. 11 refs.
Glacier ice, Ice cores, Ice structure, Ice crystal structure, Ice crystal size, Ice strength, Ice deformation, Ice creep, Antarctica—Law Dome
An account is given of ice deformation experiments in uniaxial compression. Samples studied include isotropic and anisotropic ices, laboratory prepared and from a core drilled near the summit of Law Dome. There are unexplained differences in the minimum strain rates attained by isotropic ices from the core and from the laboratory. Minimum strain rates for anisotropic ice are higher than that of isotropic ice provided that the anisotropy is compatible with the stress configuration. The approach to similar tertiary creep rates has been found for antarctic core ice and laboratory prepared ice, associated with the development of tertiary creep. The resultant fabric patterns are the same in both types of ice and the crystal sizes are also similar. (Auth.)

52-1701
Permafrost change and stability of Qinghai-Tibet Highway.
Wu, Q.B., Tong, C.J., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.350-355, In Chinese with English summary. 5 refs.
Permafrost beneath roads, Permafrost thickness, Permafrost preservation, Active layer, Thaw depth, Frozen ground settling, Highway planning, Human factors, Global warming, China—Qinghai-Xizang Plateau

52-1702
Plotting of trend surfaces of firn line and median altitudes of glaciers in the interior water systems of the Tibetan Plateau and their main features.
Liu, Z.X., Xie, Z.C., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.356-359, In Chinese with English summary. 4 refs.
Glacier surveys, Glacier surfaces, Glacier thickness, Snow line, Topographic surveys, Statistical analysis, China—Qinghai-Xizang Plateau

52-1703
Analysis of pH and conductivity in Guliya ice core since Little Ice Age.
Sheng, W.K., Yao, T.D., Xie, C., Jiao, K.Q., Yang, Z.H., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.360-365, In Chinese with English summary. 6 refs.
Mountain glaciers, Glacial meteorology, Ice cores, Ice composition, Ice electrical properties, Ice dating, Paleoclimatology, Global warming, China—Kunlun Mountains

52-1704
Recent progresses in studies of ice flow in China.
Huang, M.H., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.366-370, In Chinese with English summary. 17 refs.
Research projects, Ice deformation, Ice creep, Glacier flow

52-1705
Present and development tendency on sinking methods of artificially frozen soils.
Ma, Q.Y., *Journal of glaciology and geocryology,* Dec. 1995, 17(4), p.371-374, In Chinese with English summary. 3 refs.
Soil freezing, Artificial freezing, Soil stabilization, Shaft sinking

52-1706
Oscillations of the alpine and polar tree limits in the Holocene. Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, 234p., Refs. passim. For selected papers see 52-1707 through 52-1723.
DLC QC884.2.D4 O83
Paleoclimatology, Climatic changes, Paleoecology, Paleobotany, Palynology, Forest ecosystems, Forest lines, Subpolar regions, Quaternary deposits, Alpine landscapes, Geochronology

52-1707
Forest limit investigations in northernmost Finland.
Eronen, M., Hicks, S., Huttunen, P., Hyvärinen, H., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.1-3, 2 refs.
DLC QC884.2.D4 O83
Forest ecosystems, Subpolar regions, Plant ecology, Forest lines, Vegetation patterns, Climatic factors, Finland

52-1708
Use of recent pollen rain records in investigating natural and anthropogenic changes in the polar tree limit in northern Fennoscandia.
Hicks, S., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.5-18, With German summary. 15 refs.
DLC QC884.2.D4 O83
Forest ecosystems, Forest lines, Subpolar regions, Palynology, Classifications, Climatic factors, Vegetation patterns, Damage, Human factors, Finland

52-1709
Holocene pine and birch limits near Kilpisjärvi, western Finnish Lapland: pollen stratigraphical evidence.
Hyvärinen, H., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.19-27, With German summary. 14 refs.
DLC QC884.2.D4 O83
Forest ecosystems, Forest lines, Subpolar regions, Plant ecology, Palynology, Stratigraphy, Vegetation patterns, Radioactive age determination, Correlation, Finland

52-1710

Pine megafossils as indicators of Holocene climatic changes in Fennoscandia.

Eronen, M., Huttunen, P., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.29-40, With German summary. 34 refs.

DLC QC884.2.D4 O83

Paleoecology, Paleoclimatology, Subpolar regions, Forest lines, Vegetation patterns, Sediments, Radioactive age determination, Climatic changes, Temperature effects, Statistical analysis, Finland

52-1711

Dynamism of the altitudinal margin of the boreal forest in Sweden.

Kullman, L., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.41-55, With German summary. 56 refs.

DLC QC884.2.D4 O83

Forest ecosystems, Forest lines, Plant ecology, Vegetation patterns, Growth, Oscillations, Climatic changes, Temperature effects, Statistical analysis, Sweden

52-1712

Climate and growth of mountain birch near the treeline in northern Sweden and Iceland.

Sveinbjörnsson, B., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.57-67, With German summary. 34 refs.

DLC QC884.2.D4 O83

Forest ecosystems, Plant ecology, Subpolar regions, Growth, Nutrient cycle, Photosynthesis, Forest lines, Vegetation patterns, Climatic factors, Statistical analysis, Sweden, Iceland

52-1713

Glaciological, sedimentological and palaeobotanical data indicating Holocene climatic change in northern Fennoscandia.

Karlén, W., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.69-83, With German summary. Refs. p.80-83.

DLC QC884.2.D4 O83

Paleoclimatology, Paleobotany, Palynology, Subpolar regions, Glacier oscillation, Climatic changes, Air temperature, Vegetation patterns, Lacustrine deposits, Statistical analysis, Radioactive age determination, Finland

52-1714

Deposits indicative of Holocene climatic fluctuations in the timberline areas of northern Europe: some physical proxy data sources and research approaches.

Matthews, J.A., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.85-97, With German summary. Refs. p.94-97.

DLC QC884.2.D4 O83

Paleoclimatology, Climatic changes, Glacier oscillation, Glacial deposits, Periglacial processes, Radioactive age determination, Geochronology, Statistical analysis, Europe

52-1715

Holocene forest limit fluctuations and glacier development in the mountains of southern Norway, and their relevance to climate history.

Kvamme, M., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.99-113, With German summary. Refs. p.110-113.

DLC QC884.2.D4 O83

Paleoclimatology, Climatic changes, Forest tundra, Forest lines, Vegetation patterns, Glacier oscillation, Subpolar regions, Palynology, Radioactive age determination, Statistical analysis, Norway

52-1716

Holocene timberlines and climate in north Norway—an interdisciplinary approach.

Vorren, K.D., Jensen, C., Mook, R., Mørkved, B., Thun, T., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.115-126, With Germany summary. 8 refs.

DLC QC884.2.D4 O83

Forest ecosystems, Forest lines, Subpolar regions, Paleoclimatology, Climatic changes, Surface temperature, Palynology, Stratigraphy, Radioactive age determination, Statistical analysis, Norway

52-1717

Climate and physiology of trees in the alpine timberline regions.

Tranquillini, W., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.127-135, With German summary. 21 refs.

DLC QC884.2.D4 O83

Forest ecosystems, Forest lines, Plant physiology, Photosynthesis, Alpine landscapes, Climatic factors, Air temperature, Frost resistance, Damage, Revegetation

52-1718

Pollen analytical evidence of Holocene climatic fluctuations in the European Central Alps.

Burga, C.A., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.163-174, With German summary. Refs. p.170-174.

DLC QC884.2.D4 O83

Paleoclimatology, Palynology, Paleoecology, Alpine glaciation, Glacier oscillation, Climatic changes, Statistical analysis, Europe

52-1719

Analysis of fossil stomata of conifers as indicators of the alpine tree line fluctuations during the Holocene.

Ammann, B., Wick, L., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.175-185, With German summary. 20 refs.

DLC QC884.2.D4 O83

Alpine landscapes, Forest lines, Oscillations, Paleobotany, Paleoecology, Palynology, Sediments, Stratigraphy, Statistical analysis

52-1720

Late Quaternary forest line oscillations in the West Carpathians.

Rybníčková, E., Rybníček, K., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.187-194, With German summary. 25 refs.

DLC QC884.2.D4 O83

Pleistocene, Forest ecosystems, Forest lines, Alpine landscapes, Oscillations, Paleobotany, Quaternary deposits, Palynology, Vegetation patterns, Poland—Carpathian Mountains

52-1721

Upper timberline dynamics during the last 1100 years in the Polar Ural Mountains.

Shiiatov, S.G., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.195-203, With French summary. 7 refs.

DLC QC884.2.D4 O83

Forest ecosystems, Arctic landscapes, Forest lines, Vegetation patterns, Oscillations, Sediments, Age determination, Correlation, Climatic factors, Russia—Polar Ural Mountains

52-1722

Dendrochronological sampling strategies for radiodensitometric networks in the northern hemisphere Subalpine and Boreal zones.

Schweingruber, F.H., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.205-209, With German summary. 9 refs.

DLC QC884.2.D4 O83

Forest ecosystems, Forest lines, Plant tissues, Sediments, Age determination, Sampling, X ray analysis, Statistical analysis

52-1723

Timberlines as indicators of climatic changes: problems and research needs.

Holtmeier, F.K., Oscillations of the alpine and polar tree limits in the Holocene. Edited by B. Frenzel et al and Palaeoclimate Research. Vol.9. ESF Project "European palaeoclimate and man". Special issue No.4, Mainz, Akademie der Wissenschaften und der Literatur, 1993, p.211-222, With German summary. Refs. p.220-222.

DLC QC884.2.D4 O83

Forest ecosystems, Forest lines, Vegetation patterns, Subpolar regions, Paleoclimatology, Climatic changes, Correlation, Theories

52-1724

Practitioner's guide to cold weather concreting.

American Concrete Institute (ACI) International, ACI publication for practioners, PP-2, Farmington Hills, MI, 1997, 184p., Consists entirely of reprints. For individual papers see 43-347 through 43-349, 43-351, 43-352, 43-354, 43-834, 43-1746, 45-1982 through 45-1984, 46-3562, 46-5334, 47-2291, 47-2216 through 47-2219, 51-2240, 51-3843, 51-4136, 51-4137, and 52-1725 through 52-1734.

Winter concreting, Concrete placing, Concrete curing, Concrete admixtures, Cold weather construction

52-1725

Controlling concrete during hot and cold weather.

Scanlon, J.M., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.55-61, 3 refs. Reprinted from Concrete International, June 1997. For another version see 45-1822.

Winter concreting, Concrete curing, Concrete strength, Cold weather construction

52-1726
Placing cold weather concrete.
Scanlon, J.M., Ryan, R.J., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.62-69, 9 refs. Reprinted from Construction specifier, Dec. 1989.
Winter concreting, Concrete placing, Concrete strength, Concrete admixtures, Frost protection, Cold weather construction

52-1727
Keep your cool when cold-weather concreting.
Hover, K.C., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.80-84, Reprinted from Concrete construction, Nov. 1995.
Winter concreting, Concrete strength, Frost protection, Cold weather construction

52-1728
Cold-weather finishing.
Suprenant, B.A., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.85-88, 6 refs. Reprinted from Concrete construction, Nov. 1993.
Winter concreting, Concrete curing, Concrete hardening, Concrete admixtures, Cold weather construction

52-1729
Admixtures—what's new on the market.
Scanlon, J.M., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.107-110, 7 refs. Reprinted from Concrete international, Oct. 1992.
Winter concreting, Concrete admixtures, Frost protection, Cold weather construction

52-1730
Controlling calcium chloride dosage at concrete batch plants.
Snell, L.M., Cote, D.N., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.134-136, Reprinted from Concrete construction, Oct. 1990.
Winter concreting, Concrete admixtures, Concrete curing, Concrete hardening

52-1731
Portable heaters for the jobsite.
Harding, M.A., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.139-143, 6 refs. Reprinted from Concrete construction, Oct. 1994.
Winter concreting, Concrete heating, Concrete placing, Heating, Portable equipment, Cold weather construction, Cold weather operation

52-1732
Party tents make good enclosures for winter concreting.
Randall, F.A., Jr., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.150-151, Reprinted from Concrete construction, Nov. 1989.
Winter concreting, Portable shelters, Cold weather construction, Cold weather operation

52-1733
Reusable protection system blocks wind.
Santilli, C., Malisch, W., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.152-153, Reprinted from Concrete construction, Mar. 1992.
Covering, Windbreaks, Cold weather construction

52-1734
Superflat slab in cold weather.
Shah, N.K., Practitioner's guide to cold weather concreting, Farmington Hills, MI, American Concrete Institute (ACI) International, 1997, p.182-184, Reprinted from Concrete international, Jan. 1996.
Concrete slabs, Winter concreting, Concrete placing, Industrial buildings, Floors

52-1735
Altitude illness: prevention and treatment. How to stay healthy at altitude: from resort skiing to Himalayan climbing.
Bezruchka, S., Seattle, The Mountaineers, 1994, 93p., 14 refs.
DLC RC103.A4B49 1994
Altitude, Physiological effects, Acclimatization, Health, Safety, Cold weather survival, Manuals

52-1736
Mountaineering first aid: a guide to accident response and first aid care.
Carline, J.D., Lentz, M.J., Macdonald, S.C., Seattle, The Mountaineers, 1996, 141p., 4th edition. 9 refs.
DLC RC88.9.M6C37 1996
Physiological effects, Health, Safety, Rescue operations, Cold weather survival, Manuals

52-1737
Physics of skiing: skiing at the triple point.
Lind, D., Sanders, S.P., Woodbury, NY, American Institute of Physics, AIP Press, 1996, 268p., Refs. passim.
DLC QC26.L56 1997
Skis, Wood snow friction, Plastics snow friction, Snow surface, Water films, Sliding

52-1738
Greenland (Kalaallit Nunaat) 1997 statistical yearbook. Nuuk, Greenland Home Rule Government, Statistics Greenland, 1997, 285p.
Regional planning, Economic development, Legislation, Labor factors, Human factors, Health, Cost analysis, Statistical analysis, Greenland

52-1739
Long-term coordinated changes in the convection activity of the North Atlantic.
Dickson, R., Lazier, J., Meincke, J., Rhines, P., NATO Advanced Study Institute, Les Houches, France, Feb. 13-24, 1995. Proceedings. Decadal climate variability: dynamics and predictability. Edited by D.L.T. Anderson et al and NATO ASI, Series I. Global Environmental Change. Vol.44, Berlin, Springer-Verlag, 1996, p.211-261, Refs. p.258-261.
DLC QC981.8.C5 D36
Oceanography, Subpolar regions, Ocean currents, Atmospheric circulation, Convection, Ventilation, Hydrography, Air water interactions, Wind factors, Seasonal variations, Theories

52-1740
Physical basis for microwave remote sensing of sea ice and snow.
Hallikainen, M., NATO Advanced Science Institute, Plön, Germany, May 1-12, 1995. Proceedings. Remote sensing of processses governing energy and water cycles in the climate system. Edited by E. Raschke and NATO ASI, Series I. Global Environmental Change. Vol.45, Berlin, Springer-Verlag, 1996, p.489-525, Refs. p.523-525.
DLC QC880.R33
Remote sensing, Snow cover distribution, Sea ice distribution, Geophysical surveys, Radiometry, Radar echoes, Physical properties, Microwaves, Brightness, Scattering, Attenuation, Dielectric properties

52-1741
Retrieval of sea ice and snow parameters from microwave radiometer and radar data.
Hallikainen, M., NATO Advanced Science Institute, Plön, Germany, May 1-12, 1995. Proceedings. Remote sensing of processses governing energy and water cycles in the climate system. Edited by E. Raschke and NATO ASI, Series I. Global Environmental Change. Vol.45, Berlin, Springer-Verlag, 1996, p.527-545, Refs. p.543-545.
DLC QC880.R33
Remote sensing, Radiometry, Synthetic aperture radar, Spaceborne photography, Sea ice distribution, Ice conditions, Snow cover distribution, Snow water equivalent, Classifications, Backscattering, Performance

52-1742
Lifetimes of ice crystals in the upper troposphere and stratosphere.
Peter, T., Baker, M., NATO Advanced Research Workshop, Ringberg, Germany, Mar. 21-25, 1994. Proceedings. Clouds, chemistry and climate. Edited by P.J. Crutzen et al and NATO ASI, Series I. Global Environmental Change. Vol.35, Berlin, Springer-Verlag, 1996, p.57-82, Refs. p.79-82.
DLC QC920.7.C56
Climatology, Cloud physics, Stratosphere, Ice physics, Ice crystal structure, Ice vapor interface, Phase transformations, Ice crystal growth, Evaporation, Impurities, Surface properties, Mathematical models

52-1743
Abrupt climatic changes: a global perspective from ice cores.
Jouzel, J., et al, NATO Advanced Research Workshop, Ringberg, Germany, Mar. 21-25, 1994. Proceedings. Clouds, chemistry and climate. Edited by P.J. Crutzen et al and NATO ASI, Series I. Global Environmental Change. Vol.35, Berlin, Springer-Verlag, 1996, p.83-108, Refs. p.103-108.
DLC QC920.7.C56
Pleistocene, Paleoclimatology, Climatic changes, Surface temperature, Ice sheets, Ice cores, Profiles, Sampling, Isotope analysis, Correlation, Statistical analysis
In 1992, the GRIP European deep drilling (Greenland Ice Core Project) reached the bedrock in central Greenland. One year later, the US Greenland Ice Sheet Project (GISP2) successfully completed a second drilling in the same region. These two cores have been analyzed for their ice oxygen 18 content. This paper reviews the important climatic information derived from those profiles and places them in a global perspective through a comparison with the Vostok deuterium record from Antarctica. The means by which these isotopic changes provide a record of the local temperature at the time of formation of the precipitation is summarized. (Auth. mod.)

52-1744
Reconstruction of Holocene landscape development and present vegetation of the Val Fenga (Tyrol/Grisons). [Holozäne Landschaftsentwicklung und aktuelle Vegetation im Fimbertal (Val Fenga, Tirol/Graubünden)]
Bauerochse, A., Katenhusen, O., *Phytocoenologia,* Sep. 30, 1997, 27(3), p.353-453, In German with English summary. Refs. p.444-453.
Alpine landscapes, Landscape development, Forest lines, Vegetation patterns, Climatic changes, Quaternary deposits, Paleoecology, Paleobotany, Palynology, Classifications, Peat, Profiles, Austria—Alps

52-1745
Geochemistry of Tertiary tholeiites and picrites from Qeqertarssuaq (Disko Island) and Nuussuaq, West Greenland with implications for the mineral potential of comagmatic intrusions.
Lightfoot, P.C., Hawkesworth, C.J., Olshefsky, K., Green, T., Doherty, W., Keays, R.R., *Contributions to mineralogy and petrology,* July 1997, 128(2-3), p.139-163, Refs. p.162-163.
Earth crust, Subpolar regions, Geologic processes, Tectonics, Magma, Sampling, Impurities, Geochemistry, Stratigraphy, Mineralogy, Isotope analysis, Statistical analysis, Greenland—Qeqertarssuaq, Greenland—Nuussuaq

52-1746
Organic matter sources and early diagenetic alterations in arctic surface sediments (Lena River delta and Laptev Sea, Eastern Siberia). I. Analysis of the carboxylic acids released via sequential treatments.
Zegouagh, Y., Derenne, S., Largeau, C., Saliot, A., *Organic geochemistry,* Aug.-Sep. 1996, 24(8-9), p.841-857, Refs. p.854-857.
Marine geology, Deltas, Marine deposits, Organic nuclei, Geochemistry, Chemical properties, Microbiology, Degradation, Diagenesis, Origin, Sampling, Russia—Lena River, Russia—Laptev Sea

52-1747

Concentration of cryoprotective lectins in mistletoe (*Viscum album* L.) leaves is correlated with leaf frost hardiness.

Hincha, D.K., Pfüller, U., Schmitt, J.M., *Planta,* Oct. 1997, 203(2), p.140-144, 31 refs.

Plant physiology, Frost resistance, Acclimatization, Plant tissues, Chemical properties, Chemical analysis, Freeze thaw tests, Low temperature tests

52-1748

Using GIS to model tree population parameters in the Rocky Mountain National Park forest-tundra ecotone.

Baker, W.L., Weisberg, P.J., *Journal of biogeography,* July 1997, 24(4), p.513-526, 41 refs.

Forest tundra, Biogeography, Geophysical surveys, Forest ecosystems, Vegetation patterns, Growth, Distribution, Climatic changes, Snow cover effect, Photogrammetry, Models, Statistical analysis, United States—Colorado—Rocky Mountain National Park

52-1749

Vulnerability assessment of Svalbard intertidal zone for oil spills.

Weslawski, J.M., Wiktor, J., Zajaczkowski, M., Futsaeter, G., Moe, K.A., *Estuarine, coastal and shelf science,* Apr. 1997, 44(Suppl.A), p.33-41, 52 refs.

Oceanography, Marine biology, Ecosystems, Subpolar regions, Shores, Littoral zone, Oil spills, Environmental impact, Environmental protection, Models, Indexes (ratios), Maps, Forecasting, Norway—Svalbard

52-1750

Dynamics of the vernal bloom in the marginal ice zone of the Barents Sea: dimethyl sulfide and dimethylsulfoniopropionate budgets.

Matrai, P.A., Vernet, M., *Journal of geophysical research,* Oct. 15, 1997, 102(C10), p.22,965-22,979, Refs. p.22,978-22,979.

Marine biology, Biomass, Microbiology, Seasonal variations, Sea ice, Ice edge, Profiles, Air ice water interaction, Vapor transfer, Aerosols, Geochemical cycles, Climatic factors, Sampling, Barents Sea

52-1751

Toward realism in modeling ocean wave behavior in marginal ice zones.

Meylan, M.H., Squire, V.A., Fox, C., *Journal of geophysical research,* Oct. 15, 1997, 102(C10), p.22,981-22,991, 15 refs.

Oceanography, Ocean waves, Wave propagation, Ice floes, Ice mechanics, Ice edge, Ice cover effect, Ice water interface, Scattering, Damping, Theories, Mathematical models

52-1752

Modeling the thermodynamics of a sea ice thickness distribution. 1. Sensitivity to ice thickness resolution.

Schramm, J.L., Holland, M.M., Curry, J.A., Ebert, E.E., *Journal of geophysical research,* Oct. 15, 1997, 102(C10), p.23,079-23,091, 40 refs.

Sea ice, Ice cover thickness, Distribution, Classifications, Mass balance, Ice water interface, Thermodynamics, Turbulent exchange, Ice models, Simulation, Statistical analysis, Mathematical models, Seasonal variations

52-1753

Modeling the thermodynamics of a sea ice thickness distribution. 2. Sea ice/ocean interactions.

Holland, M.M., Curry, J.A., Schramm, J.L., *Journal of geophysical research,* Oct. 15, 1997, 102(C10), p.23,093-23,107, 34 refs.

Oceanography, Sea ice, Ice cover thickness, Distribution, Salinity, Ice water interface, Heat flux, Ice cover effect, Seasonal variations, Thermodynamics, Mathematical models

52-1754

Sensitivity of northern hemisphere air temperatures and snow expansion to North Pacific sea surface temperatures in the Goddard Institute for Space Studies general circulation model.

Peteet, D., Del Genio, A., Lo, K.K.W., *Journal of geophysical research,* Oct. 27, 1997, 102(D20), p.23,781-23,791, Refs. p.23,790-23,791.

Paleoclimatology, Climatic changes, Air temperature, Marine meteorology, Surface temperature, Temperature variations, Air ice water interaction, Glacier oscillation, Snow accumulation, Ice cores, Correlation

52-1755

Sensitivity of climate simulations to radiative effects of tropical anvil structure.

Zender, C.S., Kiehl, J.T., *Journal of geophysical research,* Oct. 27, 1997, 102(D20), p.23,793-23,803, 39 refs.

Climatology, Cloud cover, Cloud physics, Heating, Condensation, Mass transfer, Ice formation, Ice crystals, Air temperature, Statistical analysis, Forecasting, Analysis (mathematics)

52-1756

Investigation of measured temperature profiles and VHF mesosphere summer echoes at midlatitudes.

Chilson, P.B., Czechowsky, P., Klostermeyer, J., Rüster, R., Schmidt, G., *Journal of geophysical research,* Oct. 27, 1997, 102(D20), p.23,819-23,828, 44 refs.

Climatology, Cloud physics, Air temperature, Gravity waves, Cooling, Lidar, Radar echoes, Backscattering, Profiles, Ice detection

52-1757

Model description for cirrus cloud nucleation from homogeneous freezing of sulfate aerosols.

Tabazadeh, A., Jensen, E.J., Toon, O.B., *Journal of geophysical research,* Oct. 27, 1997, 102(D20), p.23,845-23,850, 33 refs.

Cloud physics, Homogeneous nucleation, Aerosols, Solutions, Cloud droplets, Ice water interface, Thermal diffusion, Supersaturation, Supercooling, Mathematical models, Temperature effects

52-1758

Effects of clouds on aerosol and chemical species production and distribution. 1. Cloud model formulation, mixing, and detrainment.

Taylor, G.R., Kreidenweis, S., Zhang, Y.P., *Journal of geophysical research,* Oct. 27, 1997, 102(D20), p.23,851-23,865, 50 refs.

Cloud physics, Mass transfer, Convection, Aerosols, Chemical properties, Air flow, Turbulent diffusion, Ice nuclei, Snow pellets, Ice formation, Mathematical models

52-1759

Decadal evolution of total ozone decline: observations and model results.

Tourpali, K., Tie, X.X., Zerefos, C.S., Brasseur, G., *Journal of geophysical research,* Oct. 27, 1997, 102(D20), p.23,955-23,962, 39 refs.

Climatology, Atmospheric composition, Degradation, Cloud physics, Ozone, Aerosols, Heterogeneous nucleation, Polar stratospheric clouds, Seasonal variations, Statistical analysis

52-1760

Do general circulation models underestimate the natural variability in the arctic climate.

Battisti, D.S., Bitz, C.M., Moritz, R.E., *Journal of climate,* Aug. 1997, 10(8), p.1909-1920, 24 refs.

Climatology, Polar atmospheres, Climatic changes, Air ice water interaction, Sea ice, Ice cover thickness, Ice cover effect, Snow cover effect, Periodic variations, Mathematical models, Thermodynamics

52-1761

Land-surface model development for the GISS GCM.

Rosenzweig, C., Abramopoulos, F., *Journal of climate,* Aug. 1997, 10(8), p.2040-2054, 40 refs.

Climatology, Soil air interface, Heat flux, Surface temperature, Vegetation factors, Evapotranspiration, Snow cover effect, Simulation, Mathematical models, Seasonal variations

52-1762

Recent changes in solar irradiance in Antarctica.

Stanhill, G., Cohen, S., *Journal of climate,* Aug. 1997, 10(8), p.2078-2086, 49 refs.

Climatology, Polar atmospheres, Atmospheric boundary layer, Solar radiation, Radiation balance, Photometry, Heating, Periodic variations, Statistical analysis

A significant decrease in the annual sums of global irradiance reaching the surface in Antarctica was derived from an analysis of all complete years of measurement available from 12 pyranometer stations, 10 of which were on the coast. The decrease was greater than could be attributed to the nonhomogeneous nature of the database, the estimated errors of measurement, or changes in the amount of cloud cover. The smaller database of radiation balance measurements available showed no statistically significant change. Possible causes of these results are discussed, as is the implication that the recent surface warming in Antarctica is not due to radiative forcing. (Auth. mod.)

52-1763

Improved thermal computations for artificially frozen shaft excavations.

Holden, J.T., *Journal of geotechnical and geoenvironmental engineering,* Aug. 1997, 123(8), p.696-701, 6 refs.

Shafts (excavations), Frozen ground mechanics, Frozen ground thermodynamics, Soil freezing, Artificial freezing, Phase transformations, Thermal diffusion, Freezing front, Mathematical models, Accuracy

52-1764

State of the ecosystems in the central Barents region: scale, factors and mechanism of disturbance.

Kashulina, G., Reimann, C., Finne, T.E., Halleraker, J.H., Äyräs, M., Chekushin, V.A., *Science of the total environment,* Nov. 5, 1997, 206(2-3), p.203-225, Refs. p.223-225.

Forest ecosystems, Tundra vegetation, Subpolar regions, Damage, Degradation, Air pollution, Animals, Mosses, Lichens, Sampling, Environmental tests, Environmental impact, Russia—Kola Peninsula, Finland, Norway

52-1765

Tectonic lineations and frictional faulting on a relatively simple body (Ariel).

Nyffenegger, P., Davis, D.M., Consolmagno, G.J., *Planetary and space science,* Sep. 1997, 45(9), p.1069-1080, Refs. p.1079-1080.

Satellites (natural), Extraterrestrial ice, Regolith, Surface properties, Ground ice, Tectonics, Internal friction, Stress concentration, Fracture zones, Orientation, Stereomapping, Statistical analysis

52-1766

Hydrodynamic loads on ice-class propellers during propeller-ice interaction.

Walker, D., Bose, N., Yamaguchi, H., Jones, S.J., *Journal of marine science and technology,* 1997, 2(1), p.12-20, 14 refs.

Icebreakers, Propellers, Hydrodynamics, Ice solid interface, Cavitation, Loads (forces), Viscous flow, Vapor pressure, Performance, Mechanical tests

52-1767

Modelling the fate of non-polar organic chemicals in an ageing snow pack.

Wania, F., *Chemosphere,* Nov. 1997, 35(10), p.2345-2363, 36 refs.

Snow physics, Snow cover structure, Metamorphism (snow), Scavenging, Air pollution, Impurities, Chemical properties, Meltwater, Mass transfer, Snow air interface, Adsorption, Models

52-1768
ISO observations of interstellar ices and implications for comets.
Ehrenfreund, P., et al, *Icarus,* Nov. 1997, 130(1), p.1-15, Refs. p.13-15.
Extraterrestrial ice, Cosmic dust, Ice detection, Ice composition, Chemical composition, Carbon dioxide, Hydrocarbons, Remote sensing, Infrared reconnaissance, Infrared spectroscopy, Spectra

52-1769
Episodic ocean-induced CO_2 greenhouse on Mars: implications for fluvial valley formation.
Gulick, V.C., Tyler, D., McKay, C.P., Haberle, R.M., *Icarus,* Nov. 1997, 130(1), p.68-86, 32 refs.
Mars (planet), Climatology, Oceans, Extraterrestrial ice, Atmospheric composition, Greenhouse effect, Carbon dioxide, Snowmelt, Sublimation, Water erosion, Geomorphology, Hydrologic cycle, Models

52-1770
Lithologic and structural controls on natural fracture distribution and behavior within the Lisburne Group, northeastern Brooks Range and North Slope subsurface, Alaska.
Hanks, C.L., Lorenz, J., Teufel, L., Krumhardt, A.P., *AAPG bulletin,* Oct. 1997, 81(10), p.1700-1720, 41 refs.
Subpolar regions, Hydrocarbons, Reservoirs, Earth crust, Permeability, Tectonics, Deformation, Fracture zones, Orientation, Stratigraphy, Lithology, United States—Alaska—Brooks Range, United States—Alaska—North Slope

52-1771
Shallow geology of the northern Barents Sea: implications for petroleum potential.
Gustavsen, F.B., Dypvik, H., Solheim, A., *AAPG bulletin,* Nov. 1997, 81(11), p.1827-1842, Refs. p.1840-1842.
Marine geology, Subpolar regions, Earth crust, Hydrocarbons, Reservoirs, Bedrock, Drill core analysis, Seismic reflection, Tectonics, Stratigraphy, Lithology, Barents Sea

52-1772
Heterogeneous PSC ozone loss during an ozone mini-hole.
Grewe, V., Dameris, M., *Geophysical research letters,* Oct. 15, 1997, 24(20), p.2503-2506, 12 refs.
Climatology, Atmospheric composition, Stratosphere, Ozone, Aerosols, Polar stratospheric clouds, Chemical properties, Advection, Degradation, Simulation

52-1773
Regulation of algal blooms in antarctic shelf waters by the release of iron from melting sea ice.
Sedwick, P.N., DiTullio, G.R., *Geophysical research letters,* Oct. 15, 1997, 24(20), p.2515-2518, 27 refs.
Marine biology, Plankton, Biomass, Nutrient cycle, Sea ice, Ice melting, Meltwater, Water chemistry, Sampling, Seasonal variations, Antarctica—Ross Sea
During summer 1995-96, the authors measured iron in the water column and conducted iron-enrichment bottle-incubation experiments at a station in the central Ross Sea, first, in the presence of melting sea ice, and 17 days later, in ice-free conditions. They observed a striking temporal change in mixed-layer dissolved iron concentrations at this station with sea ice present, or in ice-free conditions. The authors surmise that bioavailable iron was released into seawater from the melting sea ice, stimulating phytoplankton production and the biological removal of dissolved iron from the mixed layer, until iron-limited conditions developed. These observations suggest that the episodic release of bioavailable iron from melting sea ice is an important factor regulating phytoplankton production, particularly ice-edge blooms, in seasonally ice-covered antarctic waters. (Auth. mod.)

52-1774
Preliminary water resource assessment of the Girdwood area, Alaska.
Carrick, S., Maurer, M., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Public-data file,* Sep. 1994, No.94-51, 36p., 36 refs.
Water supply, Water reserves, Utilities, Stream flow, Water pollution, Water chemistry, Land development, Environmental impact, United States—Alaska—Girdwood

52-1775
Central Kenai Peninsula ground-water study suggested work.
Munter, J.A., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Administrative report,* Feb. 1989, No.89-1, 7p. + append., 7 refs.
Ground water, Water supply, Wells, Water pollution, Hydrogeology, Hydrogeochemistry, Water chemistry, United States—Alaska—Kenai Peninsula

52-1776
Data from Alaska inventory of contaminated aquifers.
Munter, J.A., Maynard, D.L., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Public-data file,* Sep. 1987, No.87-23, 76p., 36 refs.
Soil pollution, Water pollution, Ground water, Water supply, Water reserves, Wells, Springs (water), United States—Alaska

52-1777
Refraction profile from Hatcher Pass to Seward, south-central Alaska.
Davies, J.N., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Public-data file,* Mar. 1985, No.85-7, 16p.
Geophysical surveys, Seismic surveys, Seismic refraction, Seismic velocity, Earth crust, Seismology, United States—Alaska

52-1778
Ground-water extraction at the Fire Lake Recreation Center, Eagle River, Alaska.
Maynard, D.L., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Public-data file,* Aug. 1987, No.87-13, 13p., 8 refs.
Ground water, Water supply, Wells, Utilities, Alluvium, Hydrogeology, United States—Alaska—Anchorage

52-1779
Contributions to clay mineralogy and petrology, Cook Inlet basin, Alaska.
Triplehorn, D.M., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Alaska open-file report,* Aug. 1976, No.102, 18p.
Bottom sediment, Alluvium, Clay soils, Clay minerals, Mineralogy, Lithology, Soil surveys, Soil dating, Geological surveys, United States—Alaska—Cook Inlet

52-1780
Salinity study, Cook Inlet basin, Alaska.
McGee, D.L., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Geologic report,* 1977, No.54, 6p. + maps, 2 refs.
Exploration, Marine geology, Bottom sediment, Crude oil, Oil wells, Well logging, Salt water, Ground water, Water supply, Water reserves, Hydrogeochemistry, Salinity, United States—Alaska—Cook Inlet

52-1781
Short notes on Alaskan geology 1982-83. *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1984, No.86, 48p., Refs. passim.
Geological surveys, Exploration, Minerals, Hydrogeology, Ground water, Water supply, Water reserves, United States—Alaska

52-1782
Glacial geology of the Mt. Prindle area, Yukon-Tanana upland, Alaska.
Weber, F.R., Hamilton, T.D., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1984, No.86, Short notes on Alaskan geology 1982-83, p.42-48, 8 refs.
Alpine glaciation, Glacial geology, Glacial erosion, Glacial deposits, Geochronology, Geological surveys, United States—Alaska

52-1783
Short notes on Alaskan geology 1981. *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Geologic report,* 1982, No.73, 62p., Refs. passim.
Geological surveys, Exploration, Geochemistry, Minerals, Tectonics, Seismology, Geochronology, United States—Alaska

52-1784
Short notes on Alaskan geology 1978. *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Geologic report,* 1979, No.61, 41p., Refs. passim.
Geological surveys, Exploration, Tectonics, Geochronology, Lithology, United States—Alaska

52-1785
Glaciation of Indian Mountain, west-central Alaska.
Reger, R.D., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Geologic report,* 1979, No.61, Short notes on Alaskan geology 1978, p.15-18, 10 refs.
Alpine glaciation, Glacial geology, Moraines, Rock glaciers, Outwash, Geochronology, Paleoclimatology, United States—Alaska

52-1786
Short notes on Alaskan geology 1977. *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Geologic report,* 1977, No.55, 47p., Refs. passim.
Geological surveys, Exploration, Minerals, Geochemistry, Tectonics, Geochronology, United States—Alaska

52-1787
Katmai caldera: glacier growth, lake rise, and geothermal activity.
Motyka, R.J., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Geologic report,* 1977, No.55, Short notes on Alaskan geology 1977, p.17-21, 7 refs.
Mountain glaciers, Cirque glaciers, Glacier formation, Glacier oscillation, Volcanoes, Lakes, Water level, Water temperature, Geothermy, United States—Alaska—Katmai, Mount

52-1788
Short notes on Alaskan geology 1976. *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Geologic report,* 1976, No.51, 35p., Refs. passim.
Geological surveys, Exploration, Tectonics, Geochemistry, Minerals, Lithology, Geochronology, United States—Alaska

52-1789
Geological literature on the Cook Inlet Basin and vicinity, Alaska.
Maher, J.C., Trollman, W.M., Juneau, Alaska Department of Natural Resources, 1969, 82p., Refs. p.4-60.
Geological surveys, Geophysical surveys, Exploration, Minerals, Natural resources, Petroleum industry, Bibliographies, United States—Alaska—Cook Inlet

52-1790
Phytoplankton succession from 1968 to 1990 in the subarctic Lokka reservoir.
Lepistö, L., Finland. Water and Environmental Research Institute. Publication No.19, Helsinki, National Board of Waters and the Environment, 1995, 42p., Refs. p.35-37.
Limnology, Reservoirs, Biomass, Ecosystems, Plankton, Algae, Classifications, Seasonal variations, Sampling, Finland—Lapland

52-1791
Numerical study of anisotropic, low Reynolds number, free surface flow for ice sheet modeling.
Mangeney, A., Califano, F., Hutter, K., *Journal of geophysical research,* Oct. 10, 1997, 102(B10), p.22,749-22,764, 43 refs.
Ice sheets, Rheology, Glacier flow, Ice mechanics, Ice structure, Anisotropy, Shear strain, Bedrock, Basal sliding, Velocity, Ice solid interface, Mathematical models

52-1792

Major features of glaciochemistry over the last 110,000 years in the Greenland Ice Sheet Project 2 ice core.

Yang, Q.Z., Mayewski, P.A., Twickler, M.S., Whitlow, S., *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,289-23,299, 51 refs.

Paleoclimatology, Pleistocene, Climatic changes, Ice sheets, Ice cores, Drill core analysis, Chemical composition, Isotope analysis, Correlation, Statistical analysis, Greenland

52-1793

High bromine aerosol concentrations near Lake Huron from long-range transport from the Arctic during polar sunrise.

Biegalski, S.R., Landsberger, S., Hoff, R., *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,337-23,343, 24 refs.

Climatology, Atmospheric boundary layer, Atmospheric composition, Aerosols, Origin, Polar atmospheres, Atmospheric circulation, Wind direction, Sampling, Photochemical reactions, Neutron activation analysis, Canada—Huron, Lake

52-1794

Synoptic-scale mass exchange from the troposphere to the stratosphere.

Rood, R.B., Douglass, A.R., Cerniglia, M.C., Read, W.G., *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,467-23,485, 55 refs.

Synoptic meteorology, Wind (meteorology), Atmospheric pressure, Mass transfer, Ozone, Snowstorms, Stratosphere, Turbulent boundary layer, Turbulent exchange, Models, Wind direction

52-1795

Temperature histories in liquid and solid polar stratospheric cloud formation.

Larsen, N., Knudsen, B.M., Rosen, J.M., Kjome, N.T., Neuber, R., Kyrö, E., *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,505-23,517, Refs. p.23,515-23,517.

Climatology, Cloud physics, Polar stratospheric clouds, Classifications, Particles, Physical properties, Liquid phases, Phase transformations, Air temperature, Freezing points, Temperature effects, Radio echo soundings

52-1796

Effects of interannual variation of temperature on heterogeneous reactions and stratospheric ozone.

Tie, X.X., Granier, C., Randel, W., Brasseur, G.P., *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,519-23,527, 39 refs.

Climatology, Polar stratospheric clouds, Chemical properties, Heterogeneous nucleation, Aerosols, Ozone, Degradation, Air temperature, Seasonal variations, Temperature effects, Models

A two-dimensional chemical/dynamical/microphysical model is used to calculate the effect of temperature interannual variability on stratospheric ozone. Two effects associated with temperature variations are considered: the effect on the rate coefficient of heterogeneous reactions occurring at the surface of sulfate aerosols, and the effect of temperature interannual variations on the formation of polar stratospheric clouds (PSCs) and the spring antarctic ozone depletion. The model results also show that during winters 1986 to 1990, the formation of PSCs over Antarctica exhibits a strong interannual variation, due to temperature variability. The interannual variation of the formation of PSCs likely plays an important role for the interannual variability of the spring antarctic ozone hole. (Auth. mod.)

52-1797

Real-time kinetics of the uptake of HOBr and $BrONO_2$ on ice and in the presence of HCl in the temperature range 190-200 K.

Allanic, A., Oppliger, R., Rossi, M.J., *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,529-23,541, 28 refs.

Climatology, Cloud physics, Stratosphere, Aerosols, Doped ice, Ice vapor interface, Adsorption, Chemical properties, Heterogeneous nucleation, Simulation, Models

52-1798

Heterogeneous $BrONO_2$ hydrolysis: effect on NO_2 columns and ozone at high latitudes in summer.

Randeniya, L.K., Vohralik, P.F., Plumb, I.C., Ryan, K.R., *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,543-23,557, 40 refs.

Climatology, Polar atmospheres, Aerosols, Chemical properties, Degradation, Cloud physics, Ozone, Photochemical reactions, Models, Diurnal variations

Laboratory measurements have shown that $BrONO_2 + H_2O_{aerosol} \rightarrow HOBR + HNO_3$ (reaction (3)) has the potential to cause repartitioning of ozone-depleting species. In this work, two-dimensional calculations show clearly that the impact of (3) is greatest for high aerosol levels and for high latitudes in summer. The calculations have been used to determine the effects of increased aerosol loading on calculated NO_2 columns in the Antarctic during summer and autumn of 1990, 1991, 1992 and 1993. It is shown that (3) could be responsible for reductions in NO_2 columns during polar day comparable to those measured in 1992 and 1993 following the eruption of Mount Pinatubo. (Auth. mod.)

52-1799

Observations of high concentrations of total reactive nitrogen (NO_y) and nitric acid (HNO_3) in the lower arctic stratosphere during the Stratosphere-Troposphere Experiment by Aircraft Measurements (STREAM) II campaign in February 1995.

Fischer, H., et al, *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,559-23,571., Refs. p.23,569-23,571.

Climatology, Polar atmospheres, Stratosphere, Cloud physics, Ozone, Polar stratospheric clouds, Degradation, Aerosols, Sedimentation, Heterogeneous nucleation, Aerial surveys, Sampling

52-1800

POAM II retrieval algorithm and error analysis.

Lumpe, J.D., et al, *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,593-23,614, 46 refs.

Climatology, Aerosols, Gases, Polar atmospheres, Ozone, Optical properties, Spacecraft, Photometry, Transmissivity, Polar atmospheres, Accuracy, Statistical analysis, Mathematical models

52-1801

Validation of POAM ozone measurements with coincident MLS, HALOE, and SAGE II observations.

Rusch, D.W., et al, *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,615-23,627, 13 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Ozone, Spacecraft, Radio echo soundings, Photometry, Accuracy, Statistical analysis, Correlation

Ozone measurements from the Polar Ozone and Aerosol Measurement (POAM) experiment launched in Sep. 1993 are compared with those from the Microwave Limb Sounder (MLS), the Halogen Occultation Experiment (HALOE), and the Stratosphere Aerosol and Gas Experiment II (SAGE II) for both arctic and antarctic atmospheres. The accuracy of the POAM ozone measurements is demonstrated by comparing zonal means and standard deviations of the three data sets. The large number of comparisons with satellite instruments demonstrate that the POAM ozone data are valid within the instrumental errors and that the precision and accuracy of the data are adequate for scientific investigation and interpretation. (Auth. mod.)

52-1802

Comparative study of POAM II and electrochemical concentration cell ozonesonde measurements obtained over northern Europe.

Deniel, C., et al, *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,629-23,642, 26 refs.

Climatology, Polar atmospheres, Stratosphere, Ozone, Profiles, Spacecraft, Photometry, Radio echo soundings, Correlation, Statistical analysis, Seasonal variations

52-1803

POAM II ozone observations in the antarctic ozone hole in 1994, 1995, and 1996.

Bevilacqua, R.M., et al, *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,643-23,657, 40 refs.

Climatology, Polar atmospheres, Stratosphere, Photochemical reactions, Degradation, Seasonal variations, Ozone, Photometry, Profiles, Seasonal variations, Statistical analysis

The authors present an overview of Polar Ozone and Aerosol Measurement (POAM) II satellite-based observations of ozone in the antarctic ozone hole in 1994, 1995, and 1996. The POAM II observations are consistent with previous observations suggesting that ozone loss in the ozone hole is confined to the polar vortex. The timing of ozone loss and recovery was similar in each year. Ozone concentrations begin to decrease in July, and the period of largest depletion observed by POAM II occurs between early Sep. and early Oct., when the observations are obtained at high southern latitudes near the vortex center. The POAM II observations show that in late spring, after the ozone hole chemical processing has been completed, ozone mixing ratios are lower inside the antarctic vortex (relative to outside the vortex) at all levels between at least 450 K and 1500 K, presumably resulting from a combination of dynamical and chemical effects. (Auth. mod.)

52-1804

Observations of antarctic polar stratospheric clouds by POAM II: 1994-1996.

Fromm, M.D., et al, *Journal of geophysical research,* Oct. 20, 1997, 102(D19), p.23,659-23,672, 27 refs.

Climatology, Polar atmospheres, Polar stratospheric clouds, Profiles, Altitude, Detection, Photometry, Seasonal variations

The Polar Ozone and Aerosol Measurement (POAM) II solar occultation instrument has made extensive measurements of polar stratospheric clouds (PSCs) since launch in Sep. 1993. The cloud detection algorithm used to identify PSCs from POAM II measurements is described. In May, PSCs are observed at an average altitude of 24 km, with the altitudes moving downward as the altitude of the coldest air descends within the polar vortex during the winter. (Auth. mod.)

52-1805

Well failures in southwest Eagle River, Alaska.

Munter, J.A., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Feb. 1989, No.87-14, 22p., 2 refs.

Ground water, Water supply, Water reserves, Wells, Water level, Utilities, United States—Alaska—Anchorage

52-1806

Evaluation of aquifers near Alpine Woods Subdivision, south Anchorage, Alaska.

Munter, J.A., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Dec. 1987, No.87-13, 10p., 9 refs.

Hydrogeology, Ground water, Water supply, Water reserves, Wells, Utilities, United States—Alaska—Anchorage

52-1807

Water-level declines in wells tapping lower Hillside aquifers, Anchorage, Alaska (1985).

Dearborn, L.L., Munter, J.A., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Dec. 1987, No.87-12, 9p., 5 refs.

Ground water, Water supply, Water reserves, Wells, Water level, Utilities, United States—Alaska—Anchorage

52-1808

Geotechnical cross section of downtown Anchorage: an assessment using the electric-cone-penetration test.

Updike, R.G., Ulery, C.A., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* June 1986, No.86-3, 41p., 32 refs.

Earthquakes, Landslides, Engineering geology, Soil strength, Soil tests, Penetration tests, United States—Alaska—Anchorage

52-1809

Ground-water occurrence in Eagle River, Alaska.

Munter, J.A., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Dec. 1984, No.84-21, 15p., 10 refs.

Ground water, Water supply, Water reserves, Hydrogeology, Wells, Utilities, United States—Alaska—Anchorage

52-1810

Moisture-density and textural analyses of modern tidal-flat sediments, upper Knik Arm, Cook Inlet, Alaska.

Updike, R.G., Yamamoto, N., Glaesman, P.W., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Aug. 1984, No.84-20, 20p., 11 refs.

Bridges, Site surveys, Geological surveys, Engineering geology, Marine geology, Estuaries, Littoral zone, Soil tests, Soil strength, Soil texture, Particle size distribution, United States—Alaska—Knik Arm

52-1811

Interpretation of the aeromagnetic map of the Anchorage Quadrangle, Alaska.

Burns, L.E., Winkler, G.R., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* Aug. 1994, No.94-5, 25p. + maps, 48 refs.

Magnetic surveys, Magnetic anomalies, Geophysical surveys, Geological surveys, Geological maps, Geologic structures, Exploration, Tectonics, Lithology, Geochemistry, Minerals, United States—Alaska—Anchorage

52-1812

Catalog and initial analyses of geologic data related to middle to late Quaternary deposits, Cook Inlet region, Alaska.

Reger, R.D., Pinney, D.S., Burke, R.M., Wiltse, M.A., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Report of investigations,* 1996, No.95-6, 188p. + maps, Refs. p.72-76.

Geological surveys, Geological maps, Quaternary deposits, Volcanic ash, Glacial till, Geochemistry, Stratigraphy, Soil surveys, Soil profiles, Soil dating, Radioactive age determination, United States—Alaska—Cook Inlet

52-1813

Watching the snow to understand avalanches: difficulties and limits. [Observer la neige pour comprendre les avalanches: difficultés et limites]

Duclos, A., *Neige et avalanches,* Sep. 1997, No.79, p.2-8,32, In French with English summary. 4 refs.

Snow cover stability, Snow slides, Avalanche triggering, Avalanche forecasting

52-1814

Avalanche active defense structures pathology. [La pathologie des ouvrages de défense active]

Rapin, F., Queffélan, Y., *Neige et avalanches,* Sep. 1997, No.79, p.16-22,32, In French with English summary. 10 refs.

Avalanche engineering, Snow fences

52-1815

Mortal avalanches. [Avalanches mortelles]

Sarraz-Bournet, P., *Neige et avalanches,* Sep. 1997, No.79, p.23-24,32, In French with English summary.

Avalanches, Accidents, Safety, France

52-1816

Use of avalanche reports in the framework of a trial. [L'utilisation juridique des bulletins neige et avalanches]

Brun, E., *Neige et avalanches,* Sep. 1997, No.79, p.25-28,32, In French with English summary.

Avalanche forecasting, Avalanches, Accidents, Safety, Legislation, France

52-1817

Training of avalanche release specialists in France. [Le CPT (certificat de préposé au tir) nouveau est arrivé]

Sivardière, F., *Neige et avalanches,* Sep. 1997, No.79, p.29-30,32, In French with English summary.

Avalanche triggering, Blasting, Safety, Education, Legislation, France

52-1818

Genesis of 'hummocky moraines' by thrusting in glacier ice: evidence from Svalbard and Britain.

Hambrey, M.J., Huddart, D., Bennett, M.R., Glasser, N.F., *Journal of the Geological Society, London,* 1997, 154(Part 4), p.623-632, 62 refs.

Hummocks, Moraines, Geomorphology, Glacier ice, Norway—Svalbard, United Kingdom

52-1819

Light scattering by polydispersions of randomly oriented hexagonal ice crystals: phase function analyses.

Xu, L., Zhang, G., Ding, J., Chen, H., *Optik,* Sep. 1997, 106(3), p.103-114, With German summary. 20 refs.

Ice crystal optics, Light scattering, Wave propagation, Ice crystal structure, Aggregates, Orientation, Particle size distribution, Analysis (mathematics)

52-1820

Inverse method for tracking ice motion in the marginal ice zone using sequential satellite images.

Buehner, M., Thompson, K.R., Peterson, I., *Journal of atmospheric and oceanic technology,* Dec. 1997, 14(6), p.1455-1466, 28 refs.

Oceanography, Spaceborne photography, Sea ice distribution, Ice edge, Drift, Advection, Ocean currents, Radiometry, Radar tracking, Image processing, Ice forecasting, Mathematical models

52-1821

Multiresolution Fourier Transform and its application to analysis of CO_2 fluctuations over Alert.

Huang, J.P., Higuchi, K., Trivett, N.B.A., *Meteorological Society of Japan. Journal,* June 1997, 75(3), p.701-715, With Japanese summary. 39 refs.

Climatology, Subpolar regions, Atmospheric composition, Carbon dioxide, Periodic variations, Seasonal variations, Geochemical cycles, Spectra, Statistical analysis, Canada—Northwest Territories—Alert

52-1822

Molecular simulation study of freezing/melting phenomena for Lennard-Jones methane in cylindrical nanoscale pores.

Maddox, M.W., Gubbins, K.E., *Journal of chemical physics,* Dec. 8, 1997, 107(22), p.9659-9667, 28 refs.

Porous materials, Porosity, Fluid dynamics, Hydrocarbons, Molecular energy levels, Phase transformations, Freeze thaw cycles, Freezing points, Melting points, Thermodynamics, Temperature effects, Models

52-1823

Energetic ion sputtering effects at Ganymede.

Ip, W.H., Williams, D.J., McEntire, R.W., Mauk, B., *Geophysical research letters,* Nov. 1, 1997, 24(21), p.2631-2634, 29 refs.

Satellites (natural), Regolith, Ground ice, Extraterrestrial ice, Ice erosion, Ionization, Geomagnetism, Remote sensing

52-1824

Quantifying the Pinatubo volcanic signal in south polar snow.

Cole-Dai, J.H., Mosley-Thompson, E., Thompson, L.G., *Geophysical research letters,* Nov. 1, 1997, 24(21), p.2679-2682, 27 refs.

Climatology, Polar atmospheres, Aerosols, Volcanic ash, Snow composition, Sampling, Scanning electron microscopy

Recent snow and firn core samples from South Pole contain increased sulfate (SO_4^{2-}) concentrations during 1992-1994 as a result of the June 1991 Pinatubo eruption and the Aug. 1991 Cerro Hudson eruption in Chile. Traces of Pinatubo tephra (volcanic ash) were identified in the 1993 and 1994 snow layers. These results, when combined with satellite-determined Pinatubo sulfur dioxide emission, make it possible to link quantitatively the atmospheric aerosol mass loading from a low-latitude volcanic eruption to its signal in polar ice cores. (Auth. mod.)

52-1825

Timing of the Antarctic Cold Reversal and the atmospheric CO_2 increase with respect to the Younger Dryas event.

Blunier, T., et al, *Geophysical research letters,* Nov. 1, 1997, 24(21), p.2683-2686, 36 refs.

Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Isotope analysis, Ice dating, Carbon dioxide, Surface temperature, Correlation, Antarctica—Byrd Station, Antarctica—Vostok Station, Greenland

Paleoclimate interactions between the two hemispheres can only be investigated if ice core records from Greenland and Antarctica can be synchronized accurately and reliably. This paper confirms the proposed lead of the Antarctic Cold Reversal on the Younger Dryas cold event. The antarctic cooling precedes the Younger Dryas by at least 1.8 kyr. This suggests that Northern and Southern Hemispheres were in anti-phase during the Younger Dryas cold event. (Auth. mod.)

52-1826

Anomalously low ozone over the Arctic.

Newman, P.A., Gleason, J.F., McPeters, R.D., Stolarski, R.S., *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2689-2692, 15 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric density, Ozone, Spectroscopy, Seasonal variations

52-1827

Meteorology of the polar vortex: spring 1997.

Coy, L., Nash, E.R., Newman, P.A., *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2693-2696, 23 refs.

Climatology, Polar atmospheres, Stratosphere, Air temperature, Heat flux, Wind velocity, Seasonal variations, Statistical analysis

52-1828

MLS observations of arctic ozone loss in 1996-97.

Manney, G.L., Froidevaux, L., Santee, M.L., Zurek, R.W., Waters, J.W., *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2697-2700, 10 refs.

Climatology, Polar atmospheres, Atmospheric composition, Stratosphere, Degradation, Ozone, Radiometry, Sounding, Seasonal variations

52-1829

HALOE observations of the arctic vortex during the 1997 spring: horizontal structure in the lower stratosphere.

Pierce, R.B., Fairlie, T.D., Remsberg, E.E., Russell, J.M., III, Grose, W.L., *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2701-2704, 20 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Turbulent diffusion, Ozone, Sounding, Photochemical reactions

52-1830

Long-term ozone decline over the Canadian Arctic to early 1997 from ground-based and balloon observations.

Fioletov, V.E., et al, *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2705-2708, 17 refs.

Climatology, Polar atmospheres, Atmospheric composition, Degradation, Ozone, Spectroscopy, Radio echo soundings, Seasonal variations, Canada—Northwest Territories

52-1831

Ozone, column ClO, and PSC measurements made at the NDSC Eureka observatory (80°N, 86°W) during the spring of 1997.

Donovan, D.P., et al, *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2709-2712, 21 refs.

Climatology, Polar atmospheres, Atmospheric composition, Ozone, Degradation, Polar stratospheric clouds, Sounding, Lidar, Spectroscopy, Seasonal variations, Canada—Northwest Territories—Eureka

52-1832

MLS observations of ClO and HNO_3 in the 1996-97 arctic polar vortex.

Santee, M.L., Manney, G.L., Froidevaux, L., Zurek, R.W., Waters, J.W., *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2713-2716, 14 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Ozone, Degradation, Photochemical reactions, Sounding, Seasonal variations

52-1833
HALOE observations of the vertical structure of chemical ozone depletion in the arctic vortex during winter and early spring 1996-1997.
Müller, R., et al, *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2717-2720, 26 refs.
Climatology, Polar atmospheres, Stratosphere, Degradation, Turbulent diffusion, Ozone, Aerosols, Photometry, Seasonal variations

52-1834
BrO + Ch_3O_2 reaction: kinetics and role in the atmospheric ozone budget.
Aranda, A., Le Bras, G., La Verdet, G., Poulet, G., *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2745-2748, 20 refs.
Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Degradation, Aerosols, Ozone, Chemical properties, Simulation

52-1835
GCM analysis of local influences on ice core δ signals.
Krinner, G., Genthon, C., Jouzel, J., *Geophysical research letters,* Nov. 15, 1997, 24(22), p.2825-2828, 21 refs.
Paleoclimatology, Surface temperature, Ice sheets, Ice cores, Isotope analysis, Precipitation (meteorology), Accuracy, Correlation, Statistical analysis
A high resolution GCM is used to examine the effect of changes in local surface climate parameters on the ice sheets that can influence the interpretation of the isotopic signal of the ice from deep cores. The model suggests that the 10°C difference between the LGM surface temperature deduced from borehole thermometry and that deduced from the water isotope analysis to a great extent may be due to a modification of the precipitation seasonality in central Greenland. For central East Antarctica, the model tends to suggest a weak opposite bias. (Auth.)

52-1836
Tertiary glacial/interglacial palaeoenvironments and sea-level changes, King George Island, West Antarctica. An overview.
Birkenmajer, K., *Polish Academy of Sciences. Bulletin. Earth sciences,* 1996, 44(3), p.157-181, Refs. p.177-181.
Glacial deposits, Glaciation, Tectonics, Geochronology, Paleoecology, Sea level, Paleoclimatology, Glacial geology, Antarctica—King George Island
The Tertiary strata of King George I. provide evidence for 4 cold (glacial) and 3 warm (interglacial) climatic epochs: the Kraków Glaciation (Early/Middle Eocene, about 50 Ma); the Arctowski Interglacial (Middle Eocene-Early Oligocene, 50-32 Ma); the Polonez Glaciation (Late Early Oligocene, 32-30 Ma, the largest Cenozoic glaciation in Antarctica); the Wesele Interglacial (mid-Oligocene, ca 30 Ma, witnessed retreat of glaciers inland); the Legru Glaciation (Late Oligocene, 30-26 Ma, a local glaciation of King George I.); the Wawel Interglacial (Oligocene/Miocene transition, 26-22 Ma); and the Melville Glaciation (Early Miocene, 22-20 Ma), during which glacially-controlled fossiliferous marine deposits, corresponding to outer shelf/upper slope of a marginal sea, were laid down. There is a good correlation between the Eocene (Kraków) and Early Oligocene (Polonez) glaciations and low stands of world ocean level. There is no good correlation between low stands of world ocean level and the Late Oligocene (Legru), and the Early Miocene (Melville), glaciations. (Auth. mod.)

52-1837
Scavenging processes and export fluxes close to a retreating seasonal ice margin (Ross Sea, Antarctica).
Langone, L., Frignani, M., Cochran, J.K., Ravaioli, M., *Water, air, and soil pollution,* Oct. 1997, 99(1-4), Interactions between sediments and water. Proceedings of the International Symposium, 7th, Baveno, Italy, Sep. 22-25, 1996. Edited by R.D. Evans, J. Wisniewski and J.R. Wisniewski, p.705-715, 21 refs.
Chemical analysis, Sea water, Scavenging, Suspended sediments, Hydrography, Sea ice distribution, Antarctica—Ross Sea
The distribution of dissolved and particulate ^{234}Th in the upper 200 m of the water column was obtained for three stations in the Ross Sea. At site 24a, close to the retreating ice margin, all the sampled depths show deficiencies in ^{234}Th relative to the equilibrium with ^{238}U. These are related to uptake of ^{234}Th onto sinking particles. Residence times of ^{234}Th in solution and of particular ^{234}Th were 130-247 days and 8.1-6.6 days, respectively. A high particle flux was calculated at this station. At the other two sites, ^{234}Th depth profiles are irregular. Bulk mass fluxes measured by floating traps are very low. Also fluxes of organic carbon and nitrogen, and biogenic silica are reported for these two sites. The calculated fluxes are discussed with respect to methodologies and to the dynamics of the ice margin retreat. (Auth. mod.)

52-1838
Intracellular resistance correlates with initial stage of frost hardening in willow (*Salix viminalis*).
Repo, T., Hiekkala, P., Hietala, T., Tahvanainen, L., *Physiologia plantarum,* Nov. 1997, 101(3), p.627-634, 44 refs.
Plant physiology, Trees (plants), Frost resistance, Cold tolerance, Acclimatization, Plant tissues, Chemical composition, Chemical analysis, Dielectric properties, Temperature effects

52-1839
Bacteria in sea ice and underlying brackish water at 54°26'50"N (Baltic Sea, Kiel Bight).
Mock, T., Meiners, K.M., Giesenhagen, H.C., *Marine ecology progress series,* Nov. 17, 1997, Vol.158, p.23-40, Refs. p.38-40.
Marine biology, Microbiology, Bacteria, Algae, Biomass, Sea ice, Ice water interface, Ice cores, Water chemistry, Ice cover effect, Nutrient cycle, Sampling, Baltic Sea

52-1840
Transition elements between comets and asteroids. I. Thermal evolution models.
Coradini, A., et al, *Icarus,* Oct. 1997, 129(2), p.317-336, Refs. p.334-336.
Extraterrestrial ice, Satellites (natural), Porous materials, Phase transformations, Carbon dioxide, Ice physics, Ice sublimation, Vapor diffusion, Thermal regime, Mass transfer, Decomposition, Mathematical models

52-1841
Transition elements between comets and asteroids. II. From the Kuiper Belt to NEO orbits.
Coradini, A., et al, *Icarus,* Oct. 1997, 129(2), p.337-347, 34 refs.
Extraterrestrial ice, Satellites (natural), Ice physics, Phase transformations, Dynamic properties, Thermal diffusion, Amorphous ice, Ice sublimation, Stratigraphy, Models

52-1842
Gravitational deformation in shaping asteroids and small satellites.
Sliuta, E.N., Voropaev, S.A., *Icarus,* Oct. 1997, 129(2), p.401-414, Refs. p.412-414.
Extraterrestrial ice, Satellites (natural), Ice mechanics, Topographic features, Deformation, Gravity, Stress concentration, Ultimate strength, Mathematical models

52-1843
Chasma Boreale, Mars: a sapping and outflow channel with a tectono-thermal origin.
Benito, G., Mediavilla, F., Fernández, M., Márquez, A., Martínez, J., Anguita, F., *Icarus,* Oct. 1997, 129(2), p.528-538, 45 refs.
Mars (planet), Extraterrestrial ice, Polar regions, Geomorphology, Permafrost hydrology, Glacial hydrology, Water erosion, Lake bursts, Flooding, Tectonics, Permafrost transformation

52-1844
Sticking properties of water frost produced under various ambient conditions.
Supulver, K.D., Bridges, F.G., Tiscareno, S., Lievore, J., Lin, D.N.C., *Icarus,* Oct. 1997, 129(2), p.539-554, 35 refs.
Cosmic dust, Extraterrestrial ice, Ice physics, Frost, Ice structure, Ice elasticity, Aggregates, Ice adhesion, Mechanical tests, Simulation

52-1845
Sources of variability in the column photosynthetic cross section for antarctic coastal waters.
Claustre, H., Moline, M.A., Prézelin, B.B., *Journal of geophysical research,* Nov. 15, 1997, 102(C11), p.25,047-25,060, Refs. p.25,058-25,060.
Marine biology, Sea water, Optical properties, Radiance, Plankton, Biomass, Chlorophylls, Solar radiation, Radiance, Sampling, Correlation
Using a highly resolved database collected near Palmer Station from 1991 to 1994, the variability in the column photosynthetic cross section was analyzed. The relationship between the daily integrated primary production rates versus the product of surface irradiance and the integrated chlorophyll content gave a column photosynthetic cross section similar to those determined for temperate and tropical seas. Results illustrate the validity of column photosynthetic cross section-based approaches for estimating primary production for the southern ocean but emphasize the need to address taxon-specific photophysiology to better estimate primary production on smaller spatio-temporal scales. (Auth. mod.)

52-1846
Vertical profiles of bromoform in snow, sea ice, and seawater in the Canadian Arctic.
Sturges, W.T., Cota, G.F., Buckley, P.T., *Journal of geophysical research,* Nov. 15, 1997, 102(C11), p.25,073-25,083, 43 refs.
Oceanography, Subpolar regions, Marine biology, Aerosols, Chlorophylls, Algae, Ice bottom surface, Sea water, Snow composition, Sampling, Profiles, Environmental tests, Canada—Northwest Territories—Resolute Bay

52-1847
Recalculations of pack ice and lead surface energy budgets during the Arctic Leads Experiment (LEADEX) 1992.
Persson, P.O.G., Ruffieux, D., Fairall, C.W., *Journal of geophysical research,* Nov. 15, 1997, 102(C11), p.25,085-25,089, 7 refs.
Climatology, Ice surveys, Pack ice, Radiometry, Surface temperature, Heat transfer coefficient, Turbulent exchange, Radiation balance, Diurnal variations, Statistical analysis, Accuracy, Arctic Ocean

52-1848
Comparison of theory and laboratory measurements of wave propagation and attenuation in grease ice.
Newyear, K., Martin, S., *Journal of geophysical research,* Nov. 15, 1997, 102(C11), p.25,091-25,099, 23 refs.
Oceanography, Sea ice, Ice water interface, Frazil ice, Mechanical properties, Viscosity, Water waves, Wave propagation, Attenuation, Rheology, Mechanical tests, Theories, Mathematical models

52-1849
Surrogate data to estimate crop-hail loss.
Changnon, D., Changnon, S.A., *Journal of applied meteorology,* Sep. 1997, 36(9), p.1202-1210, 14 refs.
Meteorological data, Precipitation (meteorology), Hail, Seasonal variations, Agriculture, Damage, Statistical analysis, Cost analysis, Forecasting

52-1850
Integration of satellite sensor data with DEM for the study of snow cover distribution and depletion pattern.
Baral, D.J., Gupta, R.P., *International journal of remote sensing,* Dec. 1997, 18(18), p.3889-3894, 8 refs.
Snow surveys, Snow cover distribution, Snow hydrology, Spaceborne photography, Sensor mapping, Topographic surveys, Topographic maps, Terrain identification, Image processing, Models

52-1851
Relationships between bitumen chemistry and low temperature behaviour of asphalt.
Isacsson, U., Zeng, H.Y., *Construction and building materials,* Mar. 1997, 11(2), p.83-91, 15 refs.
Bituminous concretes, Concrete admixtures, Chemical analysis, Chemical composition, Mechanical tests, Thermal stresses, Mechanical tests, Low temperature tests, Cracking (fracturing)

52-1852
Arctic tundra albedo and its estimation from spectral hemispheric reflectance.
Eck, T.F., Deering, D.W., Vierling, L.A., *International journal of remote sensing,* Nov. 20, 1997, 18(17), p.3535-3549, 30 refs.
Remote sensing, Radiometry, Arctic landscapes, Tundra terrain, Albedo, Reflectivity, Spectra, Statistical analysis, Vegetation factors

52-1853
Modified normalized difference vegetation index (mNDVI)—a new index to determine frost damages in agriculture based on Landsat TM data.
Jürgens, C., *International journal of remote sensing,* Nov. 20, 1997, 18(17), p.3583-3594, 9 refs.
Spaceborne photography, LANDSAT, Grasses, Phenology, Frost, Damage, Image processing, Detection, Spectra, Statistical analysis, Indexes (ratios)

52-1854
Large thermal expansivity of clathrate hydrates.
Tanaka, H., Tamai, Y., Koga, K., *Journal of physical chemistry B,* Aug. 14, 1997, 101(33), p.6560-6565, 23 refs.
Clathrates, Hydrates, Ice physics, Thermal expansion, Molecular energy levels, Molecular structure, Thermodynamic properties, Proton transport, Temperature effects, Mathematical models

52-1855
Thermodynamic equilibrium of water and ice in hydrated gliadin and hemoglobin.
Sartor, G., Johari, G.P., *Journal of physical chemistry B,* Aug. 14, 1997, 101(33), p.6575-6582, 34 refs.
Hydrocarbons, Hydrates, Solutions, Ice water interface, Ice crystal structure, Phase transformations, Cooling, Hydrogen bonds, Temperature measurement, Thermodynamics, Enthalpy, Analysis (mathematics)

52-1856
Study of grain boundary motion in ice bicrystals.
Di Prinzio, C.L., Nasello, O.B., *Journal of physical chemistry B,* Sep. 25, 1997, 101(39), p.7687-7690, 13 refs.
Ice physics, Ice crystal structure, Molecular structure, Boundary layer, Migration, Orientation, Anisotropy, Electron microscopy

52-1857
Electrostatics of proton arrangements in ice Ic.
Lekner, J., *Physica B,* Sep. 1997, 240(3), p.263-272, 20 refs.
Ice physics, Ice electrical properties, Cubic ice, Molecular structure, Proton transport, Molecular energy levels, Static electricity, Hydrogen bonds, Classifications, Analysis (mathematics)

52-1858
Radially symmetric ice sheet flow.
Morland, L.W., *Royal Society of London. Philosophical transactions,* Sep. 15, 1997, 355(1730), p.1873-1904, 28 refs.
Glaciology, Ice sheets, Glacier flow, Viscous flow, Glacier thickness, Ice mechanics, Basal sliding, Ice solid interface, Mathematical models, Thermal conductivity

52-1859
Wheat *wcs120* gene family. A useful model to understand the molecular genetics of freezing tolerance in cereal.
Sarhan, F., Ouellet, F., Vazquez-Tello, A., *Physiologia plantarum,* Oct. 1997, 101(2), p.439-445, 49 refs.
Plant physiology, Cryobiology, Grasses, Frost resistance, Cold tolerance, Acclimatization, Plant tissues, Chemical analysis, Molecular structure, Mapping, Classifications

52-1860
Characterization of a Fourier transform spectrometer for the Network for Detection of Stratospheric Change.
Mankin, W.G., Coffey, M.T., Hannigan, J.W., *SPIE—The International Society for Optical Engineering. Proceedings,* 1996, Vol.2830, Optical Spectroscopic Techniques and Instrumentation for Atmospheric and Space Research II. Edited by P.B. Hays and J.Wang, p.34-40, 7 refs.
DLC QC879.4.O68 1996
Measuring instruments, Atmospheric composition, Chemical composition, Stratosphere, Antarctica—McMurdo Station, Antarctica—Arrival Heights, Antarctica—Dumont d'Urville Station
The Network for Detection of Stratospheric Change is a set of high quality ground based observing stations which, combined with satellite observations, is intended to provide the earliest possible warning of changes in the chemistry and dynamics of the stratosphere as well as data to understand the causes of the change. There will be five primary stations, some distributed among several sites, and numerous complementary sites. Each primary station will have the same complement of instruments, including UV/visible, infrared, and microwave spectrometers, lidars for temperature, aerosol, and ozone measurements, ozonesondes, and instruments for measuring UV-B irradiance. Each primary station and many complementary sites will have a high resolution FTIR spectrometer observing atmospheric absorption using the sun, and possibly the moon, as a source. The network includes 3 northern polar sites and 3 sites in Antarctica: at McMurdo Station, Arrival Heights and D. d'Urville Station. (Auth. mod.)

52-1861
Ground-based remote sensing of atmospheric O_3, N_2O, HNO_3 and CH_4 with a tunable diode laser heterodyne spectrometer at Syowa Station, Antarctica.
Koide, M., Taguchi, M., Fukunishi, H., Okano, S., *SPIE—The International Society for Optical Engineering. Proceedings,* 1996, Vol.2830, Optical Spectroscopic Techniques and Instrumentation for Atmospheric and Space Research II. Edited by P.B. Hays and J.Wang, p.41-51, 9 refs.
DLC QC879.4.O68 1996
Measuring instruments, Atmospheric composition, Ozone, Chemical composition, Antarctica—Showa Station
Using the third version of tunable diode laser heterodyne spectrometers developed by the Tohoku University optical group, infrared absorption spectra of atmospheric O_3, N_2O, CH_4 and HNO_3 were observed at Showa Station from Aug. 1994 to Jan. 1995. This portable spectrometer has an ultra high spectral resolution of 0.0013 cm^4 and a signal-to-noise ratio of 500 for 10-min scan time. From ozone absorption spectra obtained in early spring, the height profiles of ozone concentration up to 30 km were retrieved at intervals of 10 minutes. These profiles showed extremely low ozone concentration in the altitude range of 15-20 km, which is a typical feature of the antarctic ozone hole. Furthermore, these profiles demonstrated the existence of rapid variations of ozone concentration in the altitude range of 20-30 km. From the potential vorticity analysis using the objective analysis data provided by the Japanese meteorological agency, it was concluded that these variations were caused by a passage of westward traveling waves produced at the polar vortex boundary. (Auth.)

52-1862
Sensitivity of boreal forest carbon balance to soil thaw.
Goulden, M.L., et al, *Science,* Jan. 9, 1998, 279(5348), p.214-217, Refs. and notes p.216-217.
Ground thawing, Frozen ground chemistry, Forest soils, Climate, Thaw depth, Carbon, Canada—Manitoba

52-1863
Ecological and physiological characterization of *Humicola marvinii*, a new psychrophilic fungus from fellfield soils in the maritime Antarctic.
Weinstein, R.N., Palm, M.E., Johnstone, K., Wynn-Williams, D.D., *Mycologia,* Sep.-Oct. 1997, 89(5), p.706-711, 28 refs.
Fungi, Plant physiology, Soil microbiology, Antarctica—Jane Col
Fungi were isolated from fellfield soils at Signy I. between Dec. 1994 and Feb. 1995 in order to study their role in colonization processes. A psychrophilic species of *Humicola* was isolated that differs physiologically and morphologically from *Humicola fuscoatra,* to which it bears a resemblance. Based on these characteristics it is described herein as a new species, *Humicola marvinii.* (Auth.)

52-1864
Tundra plants and climate change: the International Tundra Experiment (ITEX).
Henry, G.H.R., Molau, U., *Global change biology,* Dec. 1997, 3(Sup.1), p.1-9, Refs. p.7-9.
Climatology, Global warming, Tundra vegetation, Phenology, Tundra climate, Alpine landscapes, Research projects, Environmental tests, Simulation

52-1865
Systematics of the ITEX species.
Murray, D.F., *Global change biology,* Dec. 1997, 3(Sup.1), p.10-19, Refs. p.17-19.
Tundra climate, Tundra vegetation, Plant ecology, Research projects, Classifications, Terminology, Accuracy

52-1866
Open-top designs for manipulating field temperature in high-latitude ecosystems.
Marion, G.M., et al, MP 5058, *Global change biology,* Dec. 1997, 3(Sup.1), p.20-32, 33 refs.
Tundra climate, Global warming, Ecosystems, Tundra vegetation, Environmental tests, Air temperature, Temperature measurement, Temperature control, Simulation, Structures, Design, Performance
This paper examines the performance of 4 open-top chambers for altering temperature at 6 sites in the Arctic and Antarctic. Most of the heating effect was due to daytime warming above ambient. The mean daily temperatures at four arctic sites were generally increased by 1.2-1.8°C; at the antarctic site, mean daily soil temperatures were increased by +2.2°C. Wind speed had a generally negative impact on mean daily temperature. The effect of chambers on snow accumulation was variable. Selection of a passive temperature-enhancing system requires balancing the temperature enhancement desired against potential unwanted ecological effects. Open-top chambers alter temperature significantly and minimize most unwanted ecological effects; as a consequence, these chambers are a useful tool for studying the response of high-latitude ecosystems to warming. (Auth. mod.)

52-1867
Arctic soils and the ITEX experiment.
Marion, G.M., Bockheim, J.G., Brown, J., MP 5059, *Global change biology,* Dec. 1997, 3(Sup.1), p.33-43, 27 refs.
Tundra soils, Soil analysis, Arctic landscapes, Ecosystems, Global warming, Soil classification, Chemical properties, Organic soils, Soil water, Geochemistry, Nutrient cycle
The objectives of this paper are broadly to examine arctic soils and specifically to examine soil properties at ITEX sites. The Arctic is dominated by cold, wet, shallow soils often characterized by surficial organic horizons. Seven of 11 soil taxonomic orders are present in the circumarctic and alpine zones of the ITEX Project. Soil organic matter is highly correlated to soil carbon, soil moisture, and soil nitrogen. Because of these vital roles, soil organic matter is a keystone that will influence the future response of arctic ecosystems to climate change.

52-1868
Response of *Saxifraga oppositifolia* L. to simulated climate change at three contrasting latitudes.
Stenström, M., Gugerli, F., Henry, G.H.R., *Global change biology,* Dec. 1997, 3(Sup.1), p.44-54, 36 refs.
Tundra vegetation, Tundra climate, Climatic changes, Global warming, Phenology, Growth, Temperature effects, Simulation

52-1869
Effects of experimental warming on arctic willows (*Salix* ssp.): a comparison of responses from the Canadian High Arctic, Alaskan Arctic, and Swedish Subarctic.
Jones, M.H., Bay, C., Nordenhäll, U., *Global change biology,* Dec. 1997, 3(Sup.1), p.55-60, 29 refs.
Plant ecology, Trees (plants), Tundra vegetation, Global warming, Simulation, Phenology, Growth, Pollen, Temperature effects, Canada, United States—Alaska, Sweden

52-1870
Responses of *Dryas octopetala* to ITEX environmental manipulations: a synthesis with circumpolar comparisons.
Welker, J.M., Molau, U., Parsons, A.N., Robinson, C.H., Wookey, P.A., *Global change biology,* Dec. 1997, 3(Sup.1), p.61-73, 38 refs.
Tundra vegetation, Ecosystems, Tundra climate, Global warming, Simulation, Phenology, Growth, Photosynthesis, Temperature effects, Seasonal variations

52-1871
Response to simulated climatic change in an alpine and subarctic pollen-risk strategist, *Silene acaulis*.
Alatalo, J.M., Totland, Ø., *Global change biology,* Dec. 1997, 3(Sup.1), p.74-79, 30 refs.
Plant ecology, Alpine landscapes, Subarctic landscapes, Phenology, Growth, Global warming, Temperature effects, Simulation, Statistical analysis

52-1872

Controls on seed production and seed germinability in *Eriophorum vaginatum*.

Molau, U., Shaver, G.R., *Global change biology,* Dec. 1997, 3(Sup.1), p.80-88, 34 refs.

Tundra vegetation, Tundra climate, Global warming, Phenology, Growth, Nutrient cycle, Simulation, Temperature effects, Seasonal variations

52-1873

Responses of the clonal sedge, *Carex bigelowii*, to two seasons of simulated climate change.

Stenström, A., Jónsdóttir, I.S., *Global change biology,* Dec. 1997, 3(Sup.1), p.89-96, 29 refs.

Plant ecology, Subarctic landscapes, Global warming, Simulation, Phenology, Growth, Seasonal variations, Statistical analysis, Temperature effects

52-1874

Responses to natural climatic variation and experimental warming in two tundra plant species with contrasting life forms: *Cassiope tetragona* and *Ranunculus nivalis*.

Molau, U., *Global change biology,* Dec. 1997, 3(Sup.1), p.97-107, 38 refs.

Tundra vegetation, Tundra climate, Global warming, Phenology, Growth, Biomass, Seasonal variations, Simulation, Temperature effects

52-1875

Short-term effects of simulated environmental change on phenology leaf traits, and shoot growth of alpine plants on a temperate mountain, northern Japan.

Suzuki, S., Kudo, G., *Global change biology,* Dec. 1997, 3(Sup.1), p.108-115, 33 refs.

Plant ecology, Alpine landscapes, Global warming, Phenology, Growth, Biomass, Simulation, Temperature effects, Seasonal variations, Japan

52-1876

Response to experimental warming in a population of *Papaver radicatum* in Greenland.

Mølgaard, P., Christensen, K., *Global change biology,* Dec. 1997, 3(Sup.1), p.116-124, 35 refs.

Plant ecology, Phenology, Growth, Global warming, Simulation, Microclimatology, Temperature control, Temperature measurement, Frost, Wind factors, Biomass, Greenland

52-1877

Phenological and growth responses of *Papaver radicatum* along altitudinal gradients in the Canadian High Arctic.

Lévesque, E., Henry, G.H.R., Svoboda, J., *Global change biology,* Dec. 1997, 3(Sup.1), p.125-145, 55 refs.

Plant ecology, Arctic landscapes, Phenology, Growth, Microclimatology, Altitude, Ground thawing, Degree days, Temperature effects, Lithology, Canada—Northwest Territories—Ellesmere Island

52-1878

Exsertion, elongation, and senescence of leaves of *Eriophorum vaginatum* and *Carex bigelowii* in northern Alaska.

Shaver, G.R., Laundre, J., *Global change biology,* Dec. 1997, 3(Sup.1), p.146-157, 48 refs.

Tundra vegetation, Plant ecology, Plant physiology, Phenology, Growth, Biomass, Nutrient cycle, Seasonal variations, Sampling, United States—Alaska—Toolik Lake

52-1879

Experimental manipulations of snow-depth: effects on nutrient content of caribou forage.

Walsh, N.E., McCabe, T.R., Welker, J.M., Parsons, A.N., *Global change biology,* Dec. 1997, 3(Sup.1), p.158-164, 38 refs.

Tundra vegetation, Tundra climate, Global warming, Biomass, Plant tissues, Decomposition, Snow depth, Snow cover effect, Snowmelt, Simulation, Seasonal variations, Ecology

52-1880

Study into the processes of pollutant spreading in tidal mouths of northern rivers.

Brekhovskikh, V.F., Debol'skaia, E.I., Debol'skiĭ, V.K., Mordasov, M.A., *Water resources,* Sep.-Oct. 1997, 24(5), p.490-494, Translated from Vodnye resursy. 3 refs.

River flow, Reservoirs, Waste disposal, Dispersions, Turbulent diffusion, Water pollution, River ice, Ice cover effect, Mathematical models, Hydrodynamics

52-1881

Stochastic estimate of the ice cover strength during the ice break in rivers.

Ginzburg, B.M., Poliakova, K.N., *Water resources,* Sep.-Oct. 1997, 24(5), p.495-498, Translated from Vodnye resursy. 9 refs.

River ice, Ice breakup, Ice push, Ice water interface, Ice cover strength, Forecasting, Statistical analysis

52-1882

Mountain lakes as indicators of air pollution.

Moĭseenko, T.I., Dauvalter, V.A., Kagan, L.IA., *Water resources,* Sep.-Oct. 1997, 24(5), p.556-564, Translated from Vodnye resursy. 21 refs.

Limnology, Subpolar regions, Air pollution, Water pollution, Aerosols, Ecosystems, Environmental impact, Algae, Bottom sediment, Metals, Sampling

52-1883

^{36}Cl and ^{129}I in the Yenisei, Kolyma, and Mackenzie Rivers.

Beasley, T.M., Cooper, L.W., Grebmeier, J.M., Kilius, L.R., Synal, H.A., *Environmental science & technology,* June 1997, 31(6), p.1834-1836, 23 refs.

Watersheds, Rivers, Estuaries, Radioactive wastes, Waste disposal, Radioactive isotopes, Sampling, Environmental tests, Spectroscopy, Statistical analysis, Russia—Kolyma River, Russia—Yenisey River, Canada—Northwest Territories—Mackenzie River

52-1884

Airborne pollutants along a roadside: assessment using snow analyses and moss bags.

Viskari, E.L., Rekilä, R., Roy, S., Lehto, O., Ruuskanen, J., Kärenlampi, L., *Environmental pollution,* Oct. 24, 1997, 97(1-2), p.153-160, 40 refs.

Vehicles, Roads, Air pollution, Snow composition, Snow impurities, Aerosols, Hydrocarbons, Mosses, Wind factors, Sampling, Ion density (concentration), Environmental tests

52-1885

Inverse scattering problem for mixed-phase and ice clouds. I. Numerical simulation of particle sizing from phase-function measurements.

Oshchepkov, S., Isaka, H., *Applied optics,* Nov. 20, 1997, 36(33), p.8765-8774, 23 refs.

Cloud physics, Supercooled clouds, Microstructure, Light scattering, Ice crystal optics, Ice crystal structure, Cloud droplets, Particle size distribution, Indexes (ratios), Mathematical models

52-1886

Integral light-scattering and absorption characteristics of large, nonspherical particles.

Kokhanovskiĭ, A.A., Macke, A., *Applied optics,* Nov. 20, 1997, 36(33), p.8785-8790, 21 refs.

Cloud physics, Light scattering, Particles, Ice optics, Ice models, Radiation absorption, Refractivity, Analysis (mathematics)

52-1887

Pollen deposition in arctic mosses from the Severnya Zemlya archipelago, Franz-Joseph Land and from Novaya Zemlya.

Linskens, H.F., *Royal Netherlands Academy of Arts and Sciences. Proceedings,* June 17, 1996, 99(1-2), p.71-84, 38 refs.

Ecosystems, Plant ecology, Mosses, Pollen, Sedimentation, Subpolar regions, Palynology, Sediment transport, Dispersions, Distribution, Wind factors, Russia—Novaya Zemlya, Russia—Franz Josef Land, Russia—Severnaya Zemlya

52-1888

Calculation of densities of aqueous electrolyte solutions at subzero temperatures.

Mironenko, M.V., Grant, S.A., Marion, G.M., MP 5060, *Journal of solution chemistry,* May 1997, 26(5), p.433-460, 30 refs.

Solutions, Sea water freezing, Dielectric properties, Ion density (concentration), Solubility, Temperature effects, Low temperature tests, Thermodynamic properties, Mathematical models, Computer programs

The authors developed a FORTRAN program based on the Pitzer equations to calculate densities of electrolyte solutions at subzero temperatures. Data from the published literature were used to calculate the Pitzer-equation parameters and to evaluate model performance. Three approaches to estimating the molar volume of the solute at infinite dilution were evaluated: (1) extrapolation of apparent molar volumes to zero square-root ionic strength; (2) calculation with the Tanger and Helgeson model; and (3) global fit of the data in which the molar volume of the solute at infinite dilution was estimated along with the Pitzer-equation parameters. Pitzer-equation parameters estimated for subzero temperatures should be viewed as conditional until improved measurements of single-electrolyte solution densities at subzero temperatures are made.

52-1889

Pliocene environment of Antarctica.

Quilty, P.G., *Royal Society of Tasmania. Papers and proceedings,* Nov. 1996, 130(Part 2), p.1-8, Refs. p.7-8.

DLC Q93.T2 1996

Glacial geology, Paleoecology, Geochronology, Ice sheets, Stability, Algae, Antarctica—Transantarctic Mountains

In the debate about the environment of Antarctica during intervals in the Pliocene (5.2-1.8 Ma) two schools of thought—dynamic versus stable ice sheet—have developed. One hypothesis calls for the antarctic ice sheet to vary dramatically, for Antarctica at times to be vegetated and for circum-antarctic waters to be significantly warmer than at present. The other calls for a stable ice sheet, no vegetation and water temperatures much less varied. The key issue remains the age of the Sirius Group in the Transantarctic Mountains and the source of its contained diatoms. Diatoms of Pliocene age have been recovered from the Sirius Group but also from modern ice, and this raises the question of whether the Sirius Group diatoms are actually *in situ.* (Auth. mod.)

52-1890

Southern Hemisphere glacial record—Antarctica and New Zealand.

Chinn, T.J., *Royal Society of Tasmania. Papers and proceedings,* Nov. 1996, 130(Part 2), p.17-24, Refs. p.23-24.

DLC Q93.T2 1996

Geochronology, Glacial geology, Ice sheets, Stability, Antarctica—McMurdo Dry Valleys

The New Zealand terrestrial glacial record and that of the Dry Valleys area in Antarctica are compared in a chronological table of events. The antarctic chronology given is that of a stable East Antarctic Ice Sheet hypothesis, while an alternative postulates a Pliocene collapse of the ice sheet. Whereas the New Zealand record commences at about 2.5 Ma, the antarctic record commences in detail at 15 Ma. The New Zealand Pleistocene concludes with a rapid warming which heralded the demise of the huge Pleistocene glaciers, while in Antarctica the end of the Pleistocene is marked by the disappearance of marine Ross Sea ice. (Auth. mod.)

52-1891

Late Quaternary history of sedimentation on the Mac. Robertson Shelf, East Antarctica: problems with ^{14}C-dating of marine sediment cores.

Harris, P.T., O'Brien, P.E., Sedwick, P., Truswell, E.M., *Royal Society of Tasmania. Papers and proceedings,* Nov. 1996, 130(Part 2), p.47-53, 23 refs.

DLC Q93.T2 1996

Geochronology, Glacial geology, Sedimentation, Marine geology, Paleobotany, Ice sheets, Antarctica—Mac. Robertson Land

Stratigraphic information concerning the retreat of the antarctic ice sheet from the continental shelf after the Last Glacial Maximum is reviewed and compared with new results from a shelf valley off Mac. Robertson Land. Radiocarbon dates and detailed lithostratigraphic logs indicate that the onset of open-marine conditions over shallow shelf banks (<200 m water depth) was achieved prior to 7000 yr BP and over deep (ca. 1000 m) middle to outer shelf valleys; open-marine conditions were achieved prior to 5400 yr BP. Radiocarbon dating of bulk-organic carbon in some diatom oozes by the AMS method demonstrates problems of contamination. Jurassic pollen, spores and organic matter have been eroded and incorporated into Holocene diatom ooze, causing anomalously old ^{14}C dates. (Auth. mod.)

52-1892
Record of Holocene palaeoclimate change along the Antarctic Peninsula: evidence from glacial marine sediments, Lallemand Fjord.
Shevenell, A.E., Domack, E.W., Kernan, G.M., *Royal Society of Tasmania. Papers and proceedings,* Nov. 1996, 130(Part 2), p.55-64, 31 refs.
DLC Q93.T2 1996
Glacial geology, Marine geology, Sedimentation, Paleoclimatology, Climatic changes, Paleoecology, Sea ice distribution, Antarctica—Antarctic Peninsula, Antarctica—Lallemand Fjord
In light of recent warming and environmental changes observed on the Antarctic Peninsula, an increased knowledge of regional palaeoclimatic trends may provide an improved understanding of the expected response of the antarctic glacial, oceanic and biotic systems to continued warming. Sedimentologic and geochemical analyses of a 5.5 m long, high-resolution sediment core (PD92 GC-1), collected in Lallemand Fjord, represent the most detailed record of Holocene climate change, to date, in Antarctica. Deglaciation of Lallemand Fjord is believed to have occurred prior to 8000 yr BP, followed by a period of open marine conditions with variable extent of sea ice between 8000 and 2700 ^{14}C yr BP. A climatic optimum is recognized between 4200 and 2700 yr BP. The Müller Ice Shelf, now present in the fjord, advanced approximately 400 years ago, coincident with the Little Ice Age. These results indicate environmental variability throughout the Holocene that was consistent across most portions of the maritime Antarctic Peninsula. (Auth. mod.)

52-1893
Meromictic antarctic lakes as recorders of climate change: the structures of Ace and Organic lakes, Vestfold Hills, Antarctica.
Gibson, J.A.E., Burton, H.R., *Royal Society of Tasmania. Papers and proceedings,* Nov. 1996, 130(Part 2), p.73-78, 12 refs.
DLC Q93.T2 1996
Limnology, Glacial lakes, Glacial hydrology, Climatic changes, Paleoclimatology, Geochemistry, Antarctica—Vestfold Hills
The meromictic lakes that occur in closed, rocky basins of the Vestfold Hills provide records of local climate change. From a consideration of the physical structure of these stratified lakes it is apparent that maximum winter under-ice water salinity (associated with minimum water temperatures) is a function of the water level for a particular lake. The structure of the lakes will also be affected by changes in water balance. An increase in water level will result in a lens of fresher water and warmer winter temperatures at the surface of the lake, whereas a decrease will result in increased salinity, colder temperatures and deeper epilimnetic mixing. Evidence of periods of low water level is retained by the lakes as intervals of near isopycnal water within the water column, which can be used to calculate minimum paleolevels. Changes in the structures of Organic Lake and Ace Lake between 1975 and 1995 are used in this article to illustrate these points. (Auth.)

52-1894
Patterns of glacial erosion and deposition in Prydz Bay and the past behaviour of the Lambert Glacier.
O'Brien, P.E., Harris, P.T., *Royal Society of Tasmania. Papers and proceedings,* Nov. 1996, 130(Part 2), p.79-85, Refs. p.85.
DLC Q93.T2 1996
Glacial erosion, Glacial deposits, Marine geology, Glacial geology, Glacier flow, Antarctica—Prydz Bay, Antarctica—Lambert Glacier
Styles of glacial sedimentation and erosion in Prydz Bay respond to glacial and interglacial cycles and fall into three zones; an inner zone of net erosion, a middle zone of subglacially eroded and deformed transitional glacial marine deposits and an outer zone of subglacial till deposition and shelf progradation. The inferred build up of ice on the Ingrid Christensen Coast may have been responsible for the development of the western ice stream that flowed in Prydz Channel. The geometry of seismic sequences in Prydz Channel suggests that this ice stream and its associated trough mouth fan developed after a major episode of shelf and slope erosion during the Pliocene. (Auth. mod.)

52-1895
Climatic role of Southern Hemisphere extratropical cyclones and their relationship with sea ice.
Simmonds, I., *Royal Society of Tasmania. Papers and proceedings,* Nov. 1996, 130(Part 2), p.95-100, 29 refs.
DLC Q93.T2 1996
Sea ice distribution, Paleoclimatology, Ice air interface, Climatic factors, Atmospheric disturbances
Transient atmospheric systems play a central role in determining the climate of the high southern latitudes. Accordingly, the variability of these features and the mechanisms which cause it are important considerations for the (paleo)climatologist. One element which might have been expected to be intimately tied up with cyclonic activity is the extent of sea ice encircling the antarctic continent. The authors refer to studies which suggest relationships between sea ice and cyclones on synoptic time-scales, but in which these become very weak when interannual relationships are considered. It is suggested that the intuitive appeal of an ice-cyclone connection has an implicit and characteristic time-scale (of a few hours or days) associated with it. However, the same reasoning cannot be applied to longer periods, because of the nonlinearities in the links between the two factors. (Auth. mod.)

52-1896
USACRREL river ice guide.
White, K.D., MP 5061, *U.S. Army Cold Regions Research and Engineering Laboratory. Ice engineering information exchange bulletin,* Jan. 1977, No.15, 2p.
River ice, Terminology

52-1897
Geology of the Utukok-Corwin region, northwestern Alaska. Exploration of Naval Petroleum Reserve No.4 and adjacent areas, northern Alaska, 1944-53. Part 3, areal geology.
Chapman, R.M., Sable, E.G., *U.S. Geological Survey. Professional paper,* 1960, No.303-C, 2 vols., 49 refs. Vol.1: main report, 167p. Vol.2: maps in separate folder.
Geological surveys, Geophysical surveys, Exploration, Stratigraphy, Geologic structures, Lithology, Crude oil, Coal, United States—Alaska—North Slope

52-1898
Numerical study on ice transport in vicinity of Niagara River hydropower intakes.
Su, J.S., Shen, H.T., Crissman, R.D., *Journal of cold regions engineering,* Dec. 1997, 11(4), p.255-270, 17 refs.
Electric power, Water intakes, River flow, River ice, Drift, Ice jams, Ice control, Flow control, Mathematical models, Hydrodynamics, United States—New York—Niagara River

52-1899
Linear elastic and viscoelastic deformation behavior of ice.
Schapery, R.A., *Journal of cold regions engineering,* Dec. 1997, 11(4), p.271-290, Refs. p.288-290.
Ice mechanics, Ice physics, Ice deformation, Ice elasticity, Viscoelasticity, Ice creep, Analysis (mathematics), Shear modulus, Forecasting

52-1900
Prediction of temperature and moisture changes in pavement structures.
Simonsen, E., Janoo, V.C., Isacsson, U., MP 5062, *Journal of cold regions engineering,* Dec. 1997, 11(4), p.291-307, 22 refs.
Pavements, Bituminous concretes, Permeability, Cold weather tests, Frost heave, Thaw weakening, Settlement (structural), Soil temperature, Water content, Freeze thaw cycles, Simulation, Mathematical models, Forecasting
In this study, a coupled mass and heat transfer model, FROSTB, developed by the U.S. Army Cold Regions Research and Engineering Laboratory was tested and evaluated with respect to parameters critical to thaw weakening. With the main focus on soil moisture and temperature, the results were compared with data from an instrumented test road. The results indicate the soil temperature is predicted very well and soil moisture relatively well during freezing and thawing. Although a time lag was observed between observed and predicted start of thaw, the results suggest that the FROSTB model may serve as a good tool for many engineering purposes involving the freezing and thawing of pavement structures in cold regions.

52-1901
Prediction of pavement response during freezing and thawing using finite element approach.
Simonsen, E., Janoo, V.C., Isacsson, U., MP 5063, *Journal of cold regions engineering,* Dec. 1997, 11(4), p.308-324, 18 refs.
Pavements, Bituminous concretes, Subgrades, Thaw weakening, Freeze thaw cycles, Seasonal freeze thaw, Cold weather tests, Loads (forces), Deformation, Computer programs, Structural analysis, Forecasting
In this study, an initial attempt to implement a commercially available finite element code in an analysis procedure for pavements in seasonal frost areas is presented. The results, compared with data from an extensively instrumented test road, show that surface deflections and the relative change in pavement stiffness, indicated by the subgrade strength index, are predicted very accurately. Although a time lag between maximum measured and predicted surface deflection is observed during thawing, the procedure is found to be promising and further research is warranted.

52-1902
Frost susceptibility of crushed glass used as construction aggregate.
Henry, K.S., Morin, S.H., MP 5064, *Journal of cold regions engineering,* Dec. 1997, 11(4), p.326-333, 14 refs.
Construction materials, Aggregates, Mechanical properties, Pavements, Abrasion, Frost resistance, Frost penetration, Grain size, Standards, Mechanical tests, Design criteria
The frost susceptibility for 100% glass cullet specimens and 30% by weight glass cullet-aggregate specimens was determined using ASTM D 5918. The cullet has negligible to very low frost susceptibility, and it did not increase the frost susceptibility of the aggregate. Based on a comparison of grain size distributions of the cullet and aggregates with the work of others, it is concluded that the material tested represents typical cullet for which other engineering properties have been determined; therefore, this information can be added to the current body of knowledge about the engineering properties of glass cullet.

52-1903
Pliocene-Pleistocene climatic change recorded in fluviolacustrine sediments in central China.
Han, J., Fyfe, W.S., Longstaffe, F.J., Palmer, H.C., Yan, F.H., Mai, X.S., *Palaeogeography, palaeoclimatology, palaeoecology,* Dec. 5, 1997, 135(1-4), p.27-39, 39 refs.
Pleistocene, Paleoclimatology, Climatic changes, Lacustrine deposits, Quaternary deposits, Loess, Stratigraphy, Palynology, Paleoecology, Carbon isotopes, Isotope analysis, Geochronology, China—Guanzhong Basin

52-1904
Surface textural analysis of quartz sand grains from ODP Site 918 off the southeast coast of Greenland suggests glaciation of southern Greenland at 11 Ma.
Helland, P.E., Holmes, M.A., *Palaeogeography, palaeoclimatology, palaeoecology,* Dec. 5, 1997, 135(1-4), p.109-121, 31 refs.
Pleistocene, Quaternary deposits, Marine deposits, Glaciation, Ice rafting, Sands, Surface properties, Scanning electron microscopy, Radioactive age determination, Drill core analysis, Greenland

52-1905
Kinetic and product study of the hydrolysis of $ClONO_2$ on type Ia polar stratospheric cloud materials at 185 K.
Barone, S.B., Zondlo, M.A., Tolbert, M.A., *Journal of physical chemistry,* Nov. 11, 1997, 101(46), p.8643-8652, 48 refs.
Climatology, Atmospheric composition, Cloud physics, Polar stratospheric clouds, Aerosols, Heterogeneous nucleation, Ice crystal growth, Simulation, Spectroscopy, Ice vapor interface
To study the chemical properties of polar stratospheric clouds, a Knudsen cell reactor equipped with FTIR reflection-absorption spectroscopy has been used to study the hydrolysis of chlorine nitrate ($ClONO_2$) on thin nitric acid trihydrate (NAT) and nitric acid dihydrate (NAD) films. Results suggest that this reaction may have a temperature dependence that is not currently addressed in atmospheric models. For water saturation ratios $S \geq 1.5$, nucleation and growth of crystalline ice was observed to occur in the aqueous HNO_3 surface layer on top of the reactant NAD and NAT films. (Auth. mod.)

52-1906
Coexistence approach—a method for quantitative reconstructions of Tertiary terrestrial palaeoclimate data using plant fossils.
Mosbrugger, V., Utescher, T., *Palaeogeography, palaeoclimatology, palaeoecology,* Nov. 1997, 134(1-4), p.61-86, Refs. p.85-86.
Paleoclimatology, Climatic changes, Temperature variations, Pleistocene, Paleoecology, Fossils, Classifications, Statistical analysis, Theories, Correlation

52-1907
Surface wind climate during the Younger Dryas in Europe as inferred from aeolian records and model simulations.
Isarin, R.F.B., Renssen, H., Koster, E.A., *Palaeogeography, palaeoclimatology, palaeoecology,* Nov. 1997, 134(1-4), p.127-148, Refs. p.144-148.
Paleoclimatology, Climatic changes, Eolian soils, Landforms, Atmospheric circulation, Wind direction, Wind factors, Sediment transport, Models, Statistical analysis

52-1908
Seismicity of the Bering Strait region: evidence for a Bering block.
Mackey, K.G., et al, *Geology,* Nov. 1997, 25(11), p.979-982, 25 refs.
Tectonics, Marine geology, Seismic surveys, Subpolar regions, Earth crust, Geological maps, Continental drift, Bering Strait

52-1909
Terrestrial record of Laurentide ice sheet reorganization during Heinrich events.
Mooers, H.D., Lehr, J.D., *Geology,* Nov. 1997, 25(11), p.987-990, 29 refs.
Pleistocene, Glacial geology, Ice sheets, Glacier oscillation, Glacial deposits, Ice rafting, Ice edge, Glacier flow, Lithology

52-1910
Erosional origin of hummocky terrain in south-central Alberta, Canada.
Munro, M., Shaw, J., *Geology,* Nov. 1997, 25(11), p.1027-1030, 22 refs.
Pleistocene, Glacial geology, Geomorphology, Hummocks, Glacial erosion, Subglacial observations, Lithology, Origin, Canada—Alberta

52-1911
Mechanisms of crustal accretion in Iceland.
Hardarson, B.S., Fitton, J.G., *Geology,* Nov. 1997, 25(11), p.1043-1046, 22 refs.
Earth crust, Subpolar regions, Magma, Rock properties, Geologic processes, Geochemistry, Geomagnetism, Age determination, Models, Iceland

52-1912
Late glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. New York, Oxford University Press, 1997, 343p., Refs. passim. For selected papers see 52-1913 through 52-1924.
DLC QE697.L2945 1997
Pleistocene, Quaternary deposits, Glacial geology, Tectonics, Glacier oscillation, Sedimentation, Geomorphology, Geochronology, Paleoclimatology, Climatic changes

52-1913
Northern hemisphere (Laurentide) deglaciation: processes and responses of ice sheet/ocean interactions.
Andrews, J.T., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.9-27, Refs. p.24-27.
DLC QE697.L2945 1997
Pleistocene, Glacial geology, Ice sheets, Ice volume, Grounded ice, Glacier oscillation, Air ice water interaction, Quaternary deposits, Radioactive age determination

52-1914
Last Scandinavian ice sheet and its down-wasting.
Lundqvist, J., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.28-52, Refs. p.47-52.
DLC QE697.L2945 1997
Pleistocene, Ice sheets, Glacial geology, Glacier oscillation, Ice edge, Glacial deposits, Moraines, Geomorphology, Scandinavia

52-1915
Environment and climate of Sartan maximum and Late Glacial in Siberia.
Arkhipov, S.A., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.53-60, Refs. p.58-60.
DLC QE697.L2945 1997
Pleistocene, Ice sheets, Glaciation, Glacier oscillation, Glacial geology, Paleoecology, Theories, Russia—Siberia

52-1916
Termination of the Pleistocene and Holocene changes in South America and other glaciated parts of the southern hemisphere.
Clapperton, C.M., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.61-78, Refs. p.76-78.
DLC QE697.L2945 1997
Pleistocene, Glaciation, Distribution, Ice sheets, Glacier oscillation
This paper outlines the estimated extent of glaciers in South America and some other parts of the Southern Hemisphere prior to Termination 1, and traces glacial fluctuations during both the transition to interglacial conditions and the Holocene. The discussion focuses on the Andes of South America, the Southern Alps of New Zealand, islands in the southern ocean and the Subantarctic, and West Antarctica. (Auth. mod.)

52-1917
Sediment deformation beneath the Laurentide ice sheet.
Clark, P.U., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.81-97, Refs. p.94-97.
DLC QE697.L2945 1997
Pleistocene, Ice sheets, Glacial geology, Ice solid interface, Sediment transport, Glacier beds, Deformation, Shear stress, Subglacial observations, Theories

52-1918
Megafloods and glaciation.
Baker, V.R., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.98-108, Refs. p.106-108.
DLC QE697.L2945 1997
Pleistocene, Quaternary deposits, Ice sheets, Glacial hydrology, Glacial lakes, Sediment transport, Flooding, Subglacial drainage, Water erosion, Theories, Detection

52-1919
Glacial-postglacial transition in the Late Paleozoic basins of southern South America.
López-Gamundi, O.R., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.147-168, Refs. p.163-168.
DLC QE697.L2945 1997
Pleistocene, Glacial geology, Glacier oscillation, Continental drift
This paper provides an up-to-date review of the glacial-postglacial transition in the late Paleozoic basins of southern South America, presenting information not only from South American basins but also from South Africa. This permits the assessment of the influence of the Gondwana ice sheet, probably centered between South Africa and Antarctica during most of its existence, on the late Paleozoic basins of southern South America. (Auth. mod.)

52-1920
Upper Paleozoic glacial and postglacial deposits, central Transantarctic Mountains, Antarctica.
Isbell, J.L., Seegers, G.M., Gelhar, G.A., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.230-242, Refs. p.240-242.
DLC QE697.L2945 1997
Pleistocene, Glacial geology, Stratigraphy, Glacial deposits, Sedimentation, Glacier oscillation, Antarctica—Transantarctic Mountains
Within the central Transantarctic Mountains, both glaciomarine and terrestrial glacial deposits occur. These rocks provide insight into deglaciation in marine and terrestrial settings and record a change from glacial to postglacial to peat-forming conditions as Antarctica drifted over the south pole in the Late Carboniferous and the Permian. This review outlines the depositional framework during glacial and postglacial times and speculates on the controls that influenced deposition of these rocks. (Auth. mod.)

52-1921
Tectonic and glacioeustatic controls on postglacial stratigraphy: Proterozoic examples.
Young, G.M., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.249-267, Refs. p.265-267.
DLC QE697.L2945 1997
Pleistocene, Glaciation, Glacial geology, Glacial deposits, Glacier oscillation, Isostasy, Tectonics, Continental drift, Stratigraphy

52-1922
Interpreting glacial climate from detrital minerals in sediments.
Dutta, P., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.271-275, 9 refs.
DLC QE697.L2945 1997
Paleoclimatology, Glacial deposits, Glacial geology, Rock properties, Mineralogy, Geochemistry, Weathering

52-1923
Paleosols of the northern part of North America: their features and significance as indicators of past climates.
Tarnocai, C., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.276-293, Refs. p.290-293.
DLC QE697.L2945 1997
Pleistocene, Quaternary deposits, Paleoclimatology, Soil analysis, Soil formation, Soil classification, Distribution, Geochronology

52-1924
Cold-temperate peats and coals: their sedimentology and composition.
Bustin, R.M., Late Glacial and postglacial environmental changes. Quaternary, Carboniferous-Permian, and Proterozoic. Edited by I.P. Martini, New York, Oxford University Press, 1997, p.294-310, Refs. p.308-310.
DLC QE697.L2945 1997
Peat, Classifications, Wetlands, Coal, Sedimentation, Soil formation, Organic soils, Quaternary deposits, Geomorphology, Paleoecology

52-1925
Winterization and winter operation of automotive and construction equipment.
Diemand, D., TD 92-01, *U.S. Army Cold Regions Research and Engineering Laboratory. Technical digest,* Sep. 1992, 28p., 16 refs.
Motor vehicles, Engines, Engine starters, Antifreezes, Lubricants, Winter maintenance, Cold weather operation

52-1926
Basic physical phenomena in the freezing and thawing of plant and animal tissues.
Reid, D.S., Frozen food technology. Edited by C.P. Mallett, Cambridge, Chapman & Hall, 1993, p.1-19, 36 refs.
DLC TP372.3.F77 1993
Freezing, Phase transformations, Ice water interface, Thermodynamics, Mass transfer, Plant tissues, Polymers, Colloids, Permeability, Damage, Computerized simulation

52-1927
Earth dams being constructed in the northern construction-climatic zone.
IAgin, V.P., *Hydrotechnical construction,* Mar. 1997(Pub. Sep. 97), 31(3), p.185-188, Translated from Gidrotekhnicheskoe stroitel'stvo. 12 refs.
Cold weather construction, Electric power, Earth dams, Clay soils, Earth fills, Drainage, Frozen ground mechanics, Frost protection, Russia

52-1928
Construction of heated drainage in earth dams in northern construction-climatic zone.
Pekhtin, V.A., *Hydrotechnical construction,* Mar. 1997(Pub. Sep. 97), 31(3), p.189-193, Translated from Gidrotekhnicheskoe stroitel'stvo. 8 refs.
Cold weather construction, Electric power, Earth dams, Soil stabilization, Earth fills, Frozen rocks, Drainage, Heating, Seepage, Thermal expansion, Design, Russia

52-1929
Mechanical properties and durability of high-strength concrete for prestressed bridge girders.
Mokhtarzadeh, A., Kriesel, R., French, C., Snyder, M., *Transportation research record,* July 1995, No.1478, p.20-29, 7 refs.
Bridges, Concrete durability, Concrete strength, Prestressed concretes, Concrete aggregates, Cement admixtures, Mechanical properties, Permeability, Freeze thaw tests, Mechanical tests

52-1930
Study of supercooling phenomenon and freezing probability of water inside horizontal cylinders.
Chen, S.L., Lee, T.S., *International journal of heat and mass transfer,* Feb.-Mar. 1998, 41(4-5), p.769-783, 9 refs.
Air conditioning, Cold storage, Pipes (tubes), Liquid cooling, Supercooling, Cooling rate, Nucleation, Ice solid interface, Ice growth, Dendritic ice, Mechanical tests, Mathematical models

52-1931
Hydrate melting in soil around hot conductor.
Briaud, J.L., Chaouch, A., *Journal of geotechnical and geoenvironmental engineering,* July 1997, 123(7), p.645-653, 16 refs.
Hydrates, Ocean bottom, Soil temperature, Latent heat, Clathrates, Ice melting, Ground thawing, Hot oil lines, Pile structures, Stability, Simulation, Frozen ground thermodynamics

52-1932
Monthly snowmelt modelling for large-scale climate change studies using the degree day approach.
Semádeni-Davies, A., *Ecological modelling,* Aug. 15, 1997, 101(2-3), p.303-323, Refs. p.321-323.
Precipitation (meteorology), Climatology, Climatic changes, Snow hydrology, Snowmelt, Degree days, Snow water equivalent, Runoff forecasting, Mathematical models, Seasonal variations

52-1933
Chronology of the Austerdalen glacier foreland, Norway.
Petch, J.R., Whittaker, R.J., *Zeitschrift für Geomorphologie,* Sep. 1997, 41(3), p.309-317, With German and French summaries. 13 refs.
Glacial geology, Moraines, Geomorphology, Lichens, Age determination, Correlation, Norway—Austerdalsbreen

52-1934
Storm surges in the region of western Alaska.
Blier, W., Keefe, S., Shaffer, W.A., Kim, S.C., *Monthly weather review,* Dec. 1997, 125(12), p.3094-3108, 12 refs.
Storms, Subpolar regions, Shores, Synoptic meteorology, Marine meteorology, Water level, Turbulent boundary layer, Air water interactions, Wind factors, Forecasting, Simulation, United States—Alaska, Bering Sea

52-1935
Polar-low development over the Bering Sea: analysis, numerical simulation, and sensitivity experiments.
Bresch, J.F., Reed, R.J., Albright, M.D., *Monthly weather review,* Dec. 1997, 125(12), p.3109-3130, 41 refs.
Climatology, Synoptic meteorology, Marine atmospheres, Fronts (meteorology), Turbulent boundary layer, Atmospheric disturbances, Atmospheric pressure, Wind direction, Air ice water interaction, Ice cover effect, Mathematical models, Bering Sea

52-1936
Effects of drying and freeze/thaw cycling probed by ^{1}H-NMR.
Gran, H.C., Hansen, E.W., *Cement and concrete research,* Sep. 1997, 27(9), p.1319-1331, 32 refs.
Cement admixtures, Hydrates, Porosity, Frost action, Degradation, Water content, Freeze thaw cycles, Freeze thaw tests, Nuclear magnetic resonance

52-1937
Aeromagnetic results and the presence of an extinct rift zone in western Iceland.
Kristjánsson, L., Jónsson, G., *Journal of geodynamics,* Jan.-Mar. 1998, 25(1-2), p.99-108, 22 refs.
Earth crust, Subpolar regions, Tectonics, Subsidence, Magma, Geological surveys, Geomagnetism, Magnetic anomalies, Bedrock, Age determination, Iceland

52-1938
Abrupt changes in the seasonal cycle of North American snow cover.
Leathers, D.J., Robinson, D.A., *Journal of climate,* Oct. 1997, 10(10), p.2569-2585, 31 refs. For another version see 51-1190.
Climatology, Snow surveys, Spaceborne photography, Sensor mapping, Charts, Snow cover distribution, Snowmelt, Snow accumulation, Atmospheric circulation, Seasonal variations, Statistical analysis

52-1939
Technical solution for preventing drift, anchor-ice, and ice complications at the intakes of the Khabarovsk-3 thermal electric power plant on the Amur River.
Karnovich, V.N., Vasilevskiĭ, A.G., Shatalina, I.N., Tregub, G.A., Veksler, A.B., Donenberg, V.M., *Hydrotechnical construction,* May 1997(Pub. Nov. 97), 31(5), p.294-296, Translated from Gidrotekhnicheskoe stroitel'stvo.
Electric power, Channels (waterways), Water intakes, Ice accretion, Drift, Bottom ice, Ice control, Covering, Design, Russia—Amur River

52-1940
Natural freezing survival in animals.
Storey, K.B., Storey, J.M., *Annual review of ecology and systematics,* 1996, Vol.27, p.365-386, 81 refs.
DLC QH540.A53 1996
Cryobiology, Animals, Frost resistance, Cold weather survival, Ice crystal growth, Ice control, Cold tolerance, Desiccation, Chemical analysis

52-1941
Partitioning between chlorine reservoir species deduced from observations in the arctic winter stratosphere.
Engel, A., Schmidt, U., Stachnik, R.A., *Journal of atmospheric chemistry,* June 1997, 27(2), p.107-126, Refs. p.124-126.
Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Degradation, Aerosols, Turbulent diffusion, Profiles, Sounding, Statistical analysis

52-1942
High-latitude springtime photochemistry. Part I: NO_x, PAN and ozone relationships.
Beine, H.J., Jaffe, D.A., Herring, J.A., Kelley, J.A., Krognes, T., Stordal, F., *Journal of atmospheric chemistry,* June 1997, 27(2), p.127-153, Refs. p.150-153.
Climatology, Polar atmospheres, Air pollution, Atmospheric composition, Aerosols, Turbulent diffusion, Decomposition, Ozone, Photochemical reactions, Sampling, Diurnal variations, Statistical analysis

52-1943
High-latitude springtime photochemistry. Part II: sensitivity studies of ozone production.
Herring, J.A., Jaffe, D.A., Beine, H.J., Madronich, S., Blake, D.R., *Journal of atmospheric chemistry,* June 1997, 27(2), p.155-178, Refs. p.176-178.
Climatology, Polar atmospheres, Atmospheric boundary layer, Air pollution, Ozone, Aerosols, Decomposition, Photochemical reactions, Ultraviolet radiation, Photometry, Models, Seasonal variations

52-1944
Measurement of carbon dioxide emissions plumes from Prudhoe Bay, Alaska oil fields.
Brooks, S.B., Crawford, T.L., Oechel, W.C., *Journal of atmospheric chemistry,* June 1997, 27(2), p.197-207, 14 refs.
Climatology, Subpolar regions, Atmospheric boundary layer, Tundra climate, Pipelines, Crude oil, Air pollution, Carbon dioxide, Turbulent diffusion, Aerial surveys, Sampling, Environmental tests, United States—Alaska—Prudhoe Bay

52-1945
Hydrology of a small drainage basin with polar oasis environment, Fosheim Peninsula, Ellesmere Island, Canada.
Woo, M.K., Young, K.L., *Permafrost and periglacial processes,* July-Sep. 1997, 8(3), p.257-277, With French summary. 40 refs.
Water balance, Arctic landscapes, River basins, Snow hydrology, Snowmelt, Evapotranspiration, Runoff, Stream flow, Seasonal variations, Indexes (ratios), Canada—Northwest Territories—Ellesmere Island

52-1946
Hydrologic analysis and modelling of river icing growth, North Fork Pass, Yukon Territory, Canada.
Hu, X.G., Pollard, W.H., *Permafrost and periglacial processes,* July-Sep. 1997, 8(3), p.279-294, With French summary. 34 refs.
Hydrology, Icing, River ice, Ice growth, Stratification, Ice dams, Freezeup, Phase transformations, Mathematical models, Simulation, Ice cover effect, Canada—Yukon Territory—North Fork Pass

52-1947
Cold-climate aeolian sand-sheet formation in north-western Europe (*c.* 14-12.4 ka); a response to permafrost degradation and increased aridity.
Kasse, C., *Permafrost and periglacial processes,* July-Sep. 1997, 8(3), p.295-311, With French summary. 70 refs.
Pleistocene, Periglacial processes, Climatic changes, Geomorphology, Soil formation, Sands, Eolian soils, Permafrost transformation, Stratigraphy, Wind factors, Europe

52-1948
Permafrost distribution and temperatures in Europe during the Younger Dryas.
Isarin, R.F.B., *Permafrost and periglacial processes,* July-Sep. 1997, 8(3), p.313-333, With French summary. Refs. p.327-331.
Pleistocene, Paleoclimatology, Air temperature, Temperature variations, Periglacial processes, Permafrost indicators, Permafrost distribution, Thermal regime, Geochronology, Periglacial processes, Frost mounds, Cryoturbation, Europe

52-1949
Radiocarbon dating and oxygen isotope variations in Late Pleistocene syngenetic ice-wedges, northern Siberia.
Vasil'chuk, IU.K., Vasil'chuk, A.C., *Permafrost and periglacial processes,* July-Sep. 1997, 8(3), p.335-345, With French summary. 27 refs.
Pleistocene, Quaternary deposits, Geocryology, Periglacial processes, Sediments, Permafrost dating, Ice wedges, Carbon isotopes, Oxygen isotopes, Radioactive age determination, Statistical analysis, Russia—Siberia

52-1950
Slow mass movement in the Taisetsu Mountains, Hokkaido, Japan.
Sato, T., Kurashige, Y., Hirakawa, K., *Permafrost and periglacial processes,* July-Sep. 1997, 8(3), p.347-357, With French summary. 26 refs.
Periglacial processes, Mountain soils, Alpine landscapes, Mass flow, Soil creep, Solifluction, Frost action, Freeze thaw cycles, Diurnal variations, Mechanical tests, Strain tests, Japan—Taisetsu Mountains

52-1951

Historical biogeography of fire: circumpolar taiga.

Wein, R.W., Dahlem Workshop, Berlin, Germany, Mar. 15-20, 1992. Report. Fire in the environment: the ecological, atmospheric, and climatic importance of vegetation fires. ESR Report ES 13. Edited by P.J. Crutzen and J.G. Goldammer, Chichester, John Wiley & Sons, 1993, p.267-276, Refs. p.274-276.

DLC QH545.F5 D34 1993

Forest ecosystems, Taiga, Forest fires, Biogeography, Biomass, Organic soils, Geochemical cycles, Environmental impact

52-1952

Phytoplankton in fjords and coastal waters of northern Norway: environmental conditions and dynamics of the spring bloom.

Hegseth, E.N., Svendsen, H., Von Quillfeldt, C.H., Ecology of fjords and coastal waters, Tromsø, Norway, Dec. 5-9, 1994. Proceedings. Edited by H.R. Skjoldal, C. Hopkins, K.E. Erikstad and H.P. Leinaas, Amsterdam, Elsevier Science B.V., 1995, p.45-72, 56 refs. For other papers from this conference see 50-4128 through 50-4139.

DLC QH541.5.F56 M37 1994

Marine biology, Subpolar regions, Shores, Plankton, Biomass, Seasonal variations, Heat flux, Water temperature, Wind factors, Norway

52-1953

Modelling the onset of phytoplankton blooms: a new approach.

Hansen, G.A., Eilertsen, H.C., Ecology of fjords and coastal waters, Tromsø, Norway, Dec. 5-9, 1994. Proceedings. Edited by H.R. Skjoldal, C. Hopkins, K.E. Erikstad and H.P. Leinaas, Amsterdam, Elsevier Science B.V., 1995, p.73-83, 38 refs. For other papers from this conference see 50-4128 through 50-4139.

DLC QH541.5.F56 M37 1994

Marine biology, Biomass, Plankton, Subpolar regions, Ocean currents, Heat flux, Meteorological factors, Mathematical models

52-1954

Zooplankton dynamics in Balsfjorden, northern Norway.

Barthel, K.G., Ecology of fjords and coastal waters, Tromsø, Norway, Dec. 5-9, 1994. Proceedings. Edited by H.R. Skjoldal, C. Hopkins, K.E. Erikstad and H.P. Leinaas, Amsterdam, Elsevier Science B.V., 1995, p.113-126, 27 refs. For other papers from this conference see 50-4128 through 50-4139.

DLC QH541.5.F56 M37 1994

Marine biology, Shores, Plankton, Biomass, Ecosystems, Hydrography, Seasonal variations, Sampling, Classifications, Norway

52-1955

Impact of advective processes on displacement of zooplankton biomass in a north Norwegian fjord system: a comparison between spring and autumn.

Falkenhaug, T., Nordby, E., Svendsen, H., Tande, K., Ecology of fjords and coastal waters, Tromsø, Norway, Dec. 5-9, 1994. Proceedings. Edited by H.R. Skjoldal, C. Hopkins, K.E. Erikstad and H.P. Leinaas, Amsterdam, Elsevier Science B.V., 1995, p.195-217, 48 refs. For other papers from this conference see 50-4128 through 50-4139.

DLC QH541.5.F56 M37 1994

Marine biology, Oceanography, Shores, Biomass, Plankton, Ecosystems, Distribution, Advection, Tidal currents, Hydrography, Seasonal variations, Sampling, Norway

52-1956

Baseline Russian investigations of the bottom fauna in the southeastern part of the Barents Sea.

Denisenko, S.G., Denisenko, N.V., Dahle, S., Ecology of fjords and coastal waters, Tromsø, Norway, Dec. 5-9, 1994. Proceedings. Edited by H.R. Skjoldal, C. Hopkins, K.E. Erikstad and H.P. Leinaas, Amsterdam, Elsevier Science B.V., 1995, p.293-302, 32 refs. For other papers from this conference see 50-4128 through 50-4139.

DLC QH541.5.F56 M37 1994

Oceanographic surveys, Marine biology, Ocean bottom, Biomass, Biogeography, Climatic factors, Barents Sea

52-1957

Papers.

International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996, Whillans, I.M., ed, *Annals of glaciology,* 1997, Vol.24, 433p., Refs. passim. For individual papers see 52-1958 through 52-2028.

Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier flow, Glacier thickness, Glacier mass balance, Glacial meteorology, Glacial hydrology, Glacier surfaces, Glacier surges, Glacier friction, Subglacial drainage, Calving, Global warming

52-1958

Cambridge Austerdalsbreen expeditions, 1954-63.

Nye, J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.1-5, 15 refs.

Expeditions, Glacier surveys, Mountain glaciers, Glacier flow, Icefalls, Norway

52-1959

Accurate mapping of arctic glaciers over 50 years ago.

Wright, J.W., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.6-10, 12 refs.

Expeditions, History, Glacier surveys, Glacier oscillation, Mapping, Photogrammetry, Iceland, Norway—Svalbard, Greenland, Canada—Northwest Territories—Ellesmere Island

52-1960

Greatest Holocene advance of Glaciar Pio XI, Chilean Patagonia: possible causes.

Warren, C.R., Rivera, A., Post, A., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.11-15, 33 refs.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier flow, Glacier surges, Glacial lakes, Calving, Chile—Patagonia

52-1961

Predicted response of the calving glacier Svartisheibreen, Norway, and outbursts from it, to future changes in climate and lake level.

Kennett, M., Laumann, T., Kjøllmoen, B., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.16-20, 10 refs.

Glacier surveys, Glacial meteorology, Glacial hydrology, Glacier oscillation, Subglacial drainage, Calving, Glacial lakes, Water level, Lake bursts, Flood forecasting, Norway

52-1962

Sediment deformation and basal dynamics beneath a glacier surge front: Bakaninbreen, Svalbard.

Porter, P.R., Murray, T., Dowdeswell, J.A., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.21-26, 20 refs.

Glacier surveys, Glacier flow, Glacier beds, Glacial erosion, Basal sliding, Glacier surges, Norway—Svalbard

52-1963

Rate of chemical weathering beneath a quiescent, surge-type, polythermal-based glacier, southern Spitsbergen, Svalbard.

Wadham, J.L., Hodson, A.J., Tranter, M., Dowdeswell, J.A., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.27-31, 20 refs.

Glacial hydrology, Subglacial drainage, Meltwater, Water chemistry, Hydrogeochemistry, Glacier beds, Moraines, Glacial till, Outwash, Weathering, Atmospheric composition, Carbon dioxide, Norway—Spitsbergen

52-1964

Glacier thermal regime and suspended-sediment yield: a comparison of two high-arctic glaciers.

Hodson, A.J., Tranter, M., Dowdeswell, J.A., Gurnell, A.M., Hagen, J.O., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.32-37, 20 refs.

Glacier surveys, Glacial hydrology, Glacier heat balance, Glacier ice, Ice temperature, Thermal regime, Subglacial drainage, Runoff, Meltwater, Suspended sediments, Outwash, Norway—Svalbard

52-1965

Thinning and retreat of Glaciar Upsala, and an estimate of annual ablation changes in southern Patagonia.

Naruse, R., Skvarca, P., Takeuchi, Y., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.38-42, 21 refs.

Glacier surveys, Glacial meteorology, Glacier flow, Glacier thickness, Glacier oscillation, Glacier ablation, Calving, Patagonia

52-1966

Large-scale rheology of the Ross Ice Shelf, Antarctica, computed by a control method.

Rommelaere, V., MacAyeal, D.R., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.43-48, 15 refs.

Glacier surveys, Ice surveys, Ice shelves, Glacier flow, Viscous flow, Glacier friction, Ice friction, Ice deformation, Ice models, Mathematical models, Computerized simulation, Antarctica—Ross Ice Shelf

Measurements made during the Ross Ice Shelf Geophysical and Glaciological Survey (RIGGS, 1973-78) are used to determine the large-scale rheological conditions of the Ross Ice Shelf. The method used includes a numerical ice-shelf model based on the stress-equilibrium equations and control theory. A few tests were performed on simplified geometries to investigate the precision of the method. Results consist of a map of the depth-averaged viscosity of the central part of the Ross Ice Shelf to within an uncertainty of 20%. The viscosity variations are consistent with Glen's flow law. Application of a more realistic flow law in this study provides little enhancement of ice-shelf model accuracy until uncertainties associated with basal melting conditions and with temperature profiles at inflow boundaries are addressed. Finally, the results suggest a strong viscosity anomaly in the west-central part of the ice shelf, which is interpreted to be associated with changes in the dynamics of Ice Stream A or B at least 1000 years ago. This feature conforms to the prevailing notion that the West Antarctic ice streams are unsteady. (Auth. mod.)

52-1967

Effect of extension rate on terminus position, Columbia Glacier, Alaska, U.S.A.

Venteris, E.R., Whillans, I.M., Van der Veen, C.J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.49-53, 18 refs.

Mountain glaciers, Glacier surveys, Glacier flow, Glacier thickness, Glacier oscillation, Glacier tongues, Calving, United States—Alaska—Columbia Glacier

52-1968
Equilibrium line and mean annual mass balance of Finsterwalderbreen, Spitsbergen, determined by in situ and laboratory gamma-ray measurements of nuclear test deposits.
Pinglot, J.F., Pourchet, M., Lefauconnier, B., Creseveur, M., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.54-59, 14 refs.
Glacier surveys, Glacier mass balance, Glacier alimentation, Glacier oscillation, Ice cores, Ice composition, Dust, Fallout, Norway—Spitsbergen

52-1969
Changes in areal extent, elevation and volume of Athabasca Glacier, Alberta, Canada, as estimated from a series of maps produced between 1919 and 1979.
Reynolds, J.R., Young, G.J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.60-65, 7 refs.
Mountain glaciers, Glacier surveys, Glacier thickness, Glacier oscillation, Ice volume, Photogrammetric surveys, Topographic maps, Canada—Alberta—Athabasca Glacier

52-1970
20th-century advance of Glaciar Pio XI, Chilean Patagonia.
Rivera, A., Lange, H., Aravena, J.C., Cassasa, G., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.66-71, 9 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacial meteorology, Glacier flow, Calving, Chile—Patagonia

52-1971
Comparison of satellite-derived with ground-based measurements of the fluctuations of the margins of Vatnajökull, Iceland, 1973-92.
Williams, R.S., Jr., Hall, D.K., Sigurdsson, O., Chien, J.Y.L., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.72-80, 41 refs.
Glacier surveys, Glacier oscillation, Glacier tongues, Spaceborne photography, Iceland

52-1972
Dynamics of mountain ice caps during glacial cycles: the case of Patagonia.
Hulton, N., Sugden, D., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.81-89, 15 refs.
Alpine glaciation, Mountain glaciers, Glacier oscillation, Glacial meteorology, Glacier formation, Glacier melting, Topographic effects, Ice age theory, Paleoclimatology, Computerized simulation, Patagonia

52-1973
Monitoring and prediction of shrinkage of a small glacier in the Nepal Himalaya.
Kadota, T., Fujita, K., Seko, K., Kayastha, R.B., Ageta, Y., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.90-94, 12 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, Glacier thickness, Glacier flow, Glacier melting, Mathematical models, Nepal

52-1974
Spatial, temporal and kinematic characteristics of surges of Variegated Glacier, Alaska.
Lawson, W., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.95-101, 21 refs.
Mountain glaciers, Glacier surveys, Glacier surges, Glacier flow, Glacier surfaces, Moraines, United States—Alaska—Variegated Glacier

52-1975
Retreat of Wurtenkees, European East Alps, since 1850.
Schöner, W., Auer, I., Böhm, R., Hammer, N., Wiesinger, T., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.102-105, 8 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier ablation, Global warming, Austria

52-1976
Century-long recession record of Glaciar O'Higgins, Chilean Patagonia.
Casassa, G., Brecher, H., Rivera, A., Aniya, M., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.106-110, 13 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier ablation, Calving, Glacial lakes, Global warming, Chile—Patagonia

52-1977
Statistical modelling of equilibrium-line altitudes of Hintereisferner, central Alps, Austria, 1859-present.
Kerschner, H., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.111-115, 18 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, Snow line, Statistical analysis, Austria

52-1978
Calving processes at a grounded ice cliff.
Kirkbride, M.P., Warren, C.R., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.116-121, 14 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier flow, Calving, Glacial lakes, New Zealand

52-1979
Structures within the surge front at Bakaninbreen, Svalbard, using ground-penetrating radar.
Murray, T., Gooch, D.L., Stuart, G.W., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.122-129, 32 refs.
Glacier surveys, Glacier beds, Glacier flow, Glacier surges, Glacial erosion, Sediment transport, Subglacial observations, Radio echo soundings, Electromagnetic prospecting, Norway—Spitsbergen

52-1980
Glacial variations on a meso-scale: examples from glaciers in the Aurland Mountains, southern Norway.
Tvede, A.M., Laumann, T., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.130-134, 9 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial meteorology, Glacier alimentation, Snow ice interface, Norway

52-1981
Glacier geomorphometry—an approach for analyzing long-term glacier surface changes using grid-based digital elevation models.
Etzelmüller, B., Sollid, J.L., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.135-141, 22 refs.
Glacier surveys, Glacier surfaces, Glacier oscillation, Glacier mass balance, Glacier flow, Glacier surges, Topographic maps, Photogrammetry, Image processing, Mathematical models, Norway—Spitsbergen

52-1982
Modern and Little Ice Age glaciers in "humid" and "arid" areas of the Tien Shan, Central Asia: two different patterns of fluctuation.
Savoskul, O.S., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.142-147, 35 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Snow line, Paleoclimatology, Climatic changes, Tien Shan

52-1983
Use of the total input and output of ions to measure meltwater runoff time through a glacier's accumulation area.
Raben, P., Theakstone, W.H., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.148-151, 4 refs.
Mountain glaciers, Glacier surveys, Glacial hydrology, Snow composition, Snow ice interface, Glacier alimentation, Subglacial drainage, Meltwater, Glacial rivers, Water chemistry, Runoff forecasting, Norway

52-1984
Investigation of a possible crevasse near the main airstrip on McMurdo Ice Shelf, Antarctica.
Whillans, I.M., Merry, C.J., Hamilton, G.S., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.152-156, 8 refs.
Ice shelves, Ice runways, Ice surface, Glacier surfaces, Glacier flow, Ice strength, Ice deterioration, Ice breakup, Ice forecasting, Calving, Crevasse detection, Spaceborne photography, Antarctica—McMurdo Ice Shelf
A dark line appears on a recent satellite image of McMurdo Ice Shelf. It is parallel to the calving front. Initial thoughts were that the line marks an opening crevasse associated with an impending major calving event. The feature was studied by means of a strain and surface-elevation grid that was surveyed twice, 25 d apart, using global positioning system techniques. Results show that the dark line is not due to an opening crevasse. The feature is probably the surface expression of firn collapse over sea water soaking horizontally into the ice shelf. (Auth.)

52-1985
Kinematic GPS survey of geometry changes on Svalbard glaciers.
Eiken, T., Hagen, J.O., Melvold, K., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.157-163, 11 refs.
Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier flow, Glacier surfaces, Height finding, Geodetic surveys, Spaceborne photography, Norway—Spitsbergen

52-1986
Eastern Alpine glacier activity and climatic records since 1860.
Kuhn, M., Schlosser, E., Span, N., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.164-168, 16 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier oscillation, Climatic factors, Statistical analysis, Alps

52-1987
Longitudinal coupling in ice flow across a subglacial ridge.
Jansson, P., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.169-174, 19 refs.
Mountain glaciers, Glacier surveys, Glacier beds, Bottom topography, Basal sliding, Glacier flow, Glacial hydrology, Subglacial drainage, Sweden

52-1988
Glacial lake drainage: a stability analysis.
Szilder, K., Lozowski, E.P., Sharp, M.J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.175-180, 11 refs.
Glacial hydrology, Subglacial drainage, Glacial lakes, Icebound lakes, Ice dams, Lake bursts, Flood forecasting, Mathematical models

52-1989
Experimental studies on the transformation from firn to ice in the wet-snow zone of temperate glaciers.
Kawashima, K., Yamada, T., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.181-185, 31 refs.
Glacier alimentation, Snow ice interface, Snow compression, Firn, Glacier ice, Ice formation, Ice pressure, Ice density, Mathematical models

52-1990
Influence of superimposed-ice formation on the sensitivity of glacier mass balance to climate change.
Woodward, J., Sharp, M.J., Arendt, A., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.186-190, 28 refs.
Glacial meteorology, Glacier alimentation, Glacier mass balance, Glacier oscillation, Snow ice interface, Snow water equivalent, Ice formation, Global warming, Computerized simulation

52-1991
Seasonal variation in the apparent height of the East Antarctic ice sheet.
Yi, D., Bentley, C.R., Stenoien, M.D., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.191-198, 37 refs.
Ice sheets, Glacier surveys, Glacier surfaces, Glacier thickness, Glacier mass balance, Glacier oscillation, Seasonal variations, Radio echo soundings, Height finding, Spaceborne photography, Statistical analysis, Antarctica—East Antarctica
A satellite radar altimeter can be used to monitor surface elevation change over polar ice sheets. Thirty-five months of Geosat Exact Repeat Mission (ERM) data from Nov. 1986 to Sep. 1989 over a section of East Antarctica have been used in this study. A model that considers both surface and volume scattering was used to retrack the altimeter waveforms. Surface elevations for each month after the first three were compared to the average elevations for the first 3 months through a crossover method. The averaged crossover elevation difference changed with time in a way that suggests a yearly cycle in surface elevation. The average amplitude of the cycle is about 0.6 m. The authors strongly suspect that orbit error plays a major role in producing the variations. The quasi-periodic variations obscure any evidence of a moderate secular change in surface height, if there is one, but a dramatic lowering at rates approaching 1 m/a, such as are known elsewhere in Antarctica, can definitely be ruled out. (Auth. mod.)

52-1992
Numerical simulation of fluctuations of Hintereisferner, Ötztal Alps, since AD 1850.
Schlosser, E., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.199-202, 11 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier thickness, Glacier mass balance, Glacier friction, Glacier flow, Climatic changes, Mathematical models, Austria

52-1993
Modelling the mass balance of northwest Spitsbergen glaciers and responses to climate change.
Fleming, K.M., Dowdeswell, J.A., Oerlemans, J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.203-210, 31 refs.
Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier oscillation, Snow line, Climatic changes, Global warming, Computerized simulation, Norway—Spitsbergen

52-1994
Areal melt and discharge modelling of Storglaciären, Sweden.
Hock, R., Noetzli, C., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.211-216, 24 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier heat balance, Glacial hydrology, Meltwater, Runoff forecasting, Mathematical models, Sweden

52-1995
Predicted response of Storglaciären, Sweden, to climatic warming.
Brugger, K.A., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.217-222, 15 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier oscillation, Global warming, Mathematical models, Computerized simulation, Sweden

52-1996
Modelling of Last Glacial Maximum ice sheets using different accumulation parameterizations.
Fabre, A., Ritz, C., Ramstein, G., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.223-228, 19 refs.
Glaciation, Ice sheets, Glacial meteorology, Glacier oscillation, Ice age theory, Ice models, Isostasy, Paleoclimatology, Atmospheric circulation, Global change, Computerized simulation

52-1997
Coupling between the atmospheric circulation and extremes of the mass balance of Storglaciären, northern Scandinavia.
Pohjola, V.A., Rogers, J.C., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.229-233, 23 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier oscillation, Marine atmospheres, Atmospheric circulation, Climatic changes, Statistical analysis, Sweden

52-1998
Numerical modelling of the historic front variation and the future behaviour of the Pasterze glacier, Austria.
Zuo, Z., Oerlemans, J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.234-241, 27 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier flow, Glacier mass balance, Glacier oscillation, Global warming, Computerized simulation, Austria

52-1999
Flow simulation of a firn-covered cold glacier.
Gagliardini, O., Meyssonnier, J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.242-248, 17 refs.
Mountain glaciers, Glacier surveys, Firn stratification, Glacier thickness, Glacier flow, Glacier friction, Ice density, Ice dating, Ice creep, Mathematical models, Computerized simulation, France

52-2000
Quiescent-phase changes in velocity and geometry of Finsterwalderbreen, a surge-type glacier in Svalbard.
Nuttall, A.M., Hagen, J.O., Dowdeswell, J.A., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.249-254, 26 refs.
Glacier surveys, Glacier flow, Glacier friction, Glacier mass balance, Glacier thickness, Glacier surfaces, Glacier oscillation, Glacier surges, Norway—Spitsbergen

52-2001
Visible and near-infrared digital images for determination of ice velocities and surface elevation during a surge on Osbornebreen, a tidewater glacier in Svalbard.
Rolstad, C., Amlien, J., Hagen, J.O., Lundén, B., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.255-261, 17 refs.
Glacier surveys, Glacier flow, Glacier oscillation, Glacier surges, Glacier surfaces, Crevasses, Topographic surveys, Photogrammetry, Spaceborne photography, Aerial surveys, Image processing, Statistical analysis, Norway—Spitsbergen

52-2002
Comparison of radio-echo sounding (30-1000 MHz) and high-resolution borehole-temperature measurements at Finsterwalderbreen, southern Spitsbergen, Svalbard.
Ødegård, R.S., Hagen, J.O., Hamran, S.E., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.262-267, 28 refs.
Glacier surveys, Glacier thickness, Glacial hydrology, Glacier mass balance, Glacier heat balance, Glacier flow, Glacier oscillation, Glacier surges, Ice temperature, Boreholes, Radio echo soundings, Norway—Spitsbergen

52-2003
Dynamic behavior of Glaciar Perito Moreno, southern Patagonia.
Skvarca, P., Naruse, R., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.268-271, 22 refs.
Mountain glaciers, Glacier surveys, Glacier thickness, Glacier flow, Glacier oscillation, Basal sliding, Glacial lakes, Calving, Argentina—Patagonia

52-2004
Effect of continentality on glacier response and mass balance.
Holmlund, P., Schneider, T., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.272-276, 21 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier oscillation, Atmospheric circulation, Climatic changes, Statistical analysis, Norway, Sweden

52-2005
Borehole video observation of englacial and basal ice conditions in a temperate valley glacier.
Copland, L., Harbor, J., Sharp, M.J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.277-282, 45 refs.
Mountain glaciers, Glacier surveys, Glacial hydrology, Glacier ice, Ice structure, Subglacial observations, Borehole instruments, Photographic equipment, Switzerland

52-2006
Changes in Eurasian glaciation during the past century: glacier mass balance and ice-core evidence.
Mikhalenko, V.N., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.283-287, 26 refs.
Glaciation, Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier oscillation, Ice cores, Ice temperature, Climatic changes, Global warming

52-2007
Interaction between water pressure in the basal drainage system and discharge from an alpine glacier before and during a rainfall-induced subglacial hydrological event.
Barrett, A.P., Collins, D.N., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.288-292, 10 refs.
Mountain glaciers, Glacial hydrology, Rain, Boreholes, Meltwater, Water pressure, Water level, Water storage, Basal sliding, Subglacial drainage, Suspended sediments, Outwash, Switzerland

52-2008
Airborne measurement of glacier surface elevation by scanning laser altimeter.
Kennett, M., Eiken, T., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.293-296, 9 refs.
Glacier surveys, Glacier thickness, Glacier surfaces, Topographic surveys, Aerial surveys, Lidar, Height finding

52-2009
100 years of ice dynamics of Hintereisferner, Central Alps, Austria, 1894-1994.
Span, N., Kuhn, M.H., Schneider, H., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.297-302, 18 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier flow, Glacier friction, Basal sliding, Austria

52-2010
Advances in ice radar studies of a temperate alpine glacier, South Cascade Glacier, Washington, U.S.A.
Fountain, A.G., Jacobel, R.W., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.303-308, 17 refs.
Mountain glaciers, Glacier surveys, Glacier thickness, Glacier beds, Glacial hydrology, Subglacial drainage, Subglacial observations, Radio echo soundings, Electromagnetic prospecting, United States—Washington—South Cascade Glacier

52-2011
Mathematical modeling of temporal changes in snow-firn properties in the cold season.
Guseva-Lozinski, E., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.309-313, 17 refs.
Snow ice interface, Snow compression, Metamorphism (snow), Firn, Glacier ice, Ice structure, Ice density, Ice temperature, Glacial meteorology, Glacier heat balance, Mathematical models

52-2012
Monitoring glacier changes using a global positioning system in differential mode.
Jacobsen, F.M., Theakstone, W.H., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.314-319, 7 refs.
Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier oscillation, Glacier surfaces, Topographic surveys, Geodetic surveys, Photogrammetry, Norway

52-2013
Surface-velocity and strain-rate variations at the glacier Austre Okstindbreen, Okstindan, Norway, 1976-95.
Jacobsen, F.M., Theakstone, W.H., Knudsen, N.T., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.320-325, 13 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier flow, Glacier friction, Icefalls, Glacier tongues, Norway

52-2014
Kinematic global positioning system to monitor small antarctic glaciers.
Gandolfi, S., Meneghel, M., Salvatore, M.C., Vittuari, L., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.326-330, 8 refs.
Glacier surveys, Glacier oscillation, Glacier thickness, Glacier surfaces, Topographic surveys, Geodetic surveys, Height finding, Antarctica—Terra Nova Bay
Results from analysis of kinematic global positioning system (GPS) surveying in Antarctica are examined to evaluate the feasibility of this technique for monitoring small glaciers. The experiment focuses on GPS field methods and a comparison of profiles surveyed in different years. Kinematic GPS has proved to be a useful method of monitoring glacier surfaces. (Auth.)

52-2015
Use of borehole inclinometry in determining basal sliding and internal deformation at Haut Glacier d'Arolla, Switzerland.
Copland, L., Harbor, J., Minner, M., Sharp, M.J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.331-337, 43 refs.
Mountain glaciers, Glacier surveys, Glacier flow, Glacier friction, Basal sliding, Ice deformation, Boreholes, Switzerland

52-2016
Fluctuations of unstable mountain glaciers: scale and character.
Kotliakov, V.M., Osipova, G.B., Tsvetkov, D.G., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.338-343, 12 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier flow, Glacier surges, Glacier surfaces, Topographic surveys, Pamirs

52-2017
Changes of the equilibrium-line altitude in the tropical Cordillera Blanca, Peru, 1930-50, and their spatial variations.
Kaser, G., Georges, C., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.344-349, 26 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Snow line, Peru

52-2018
Signals of 20th-century warming from the glaciers in the central Italian Alps.
Pelfini, M., Smiraglia, C., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.350-354, 15 refs.
Alpine glaciation, Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Climatic changes, Global warming, Statistical analysis, Italy

52-2019
Using ground-penetrating radar to image previous years' summer surfaces for mass-balance measurements.
Kohler, J., Moore, J., Kennett, M., Engeset, R., Elvehøy, H., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.355-360, 12 refs.
Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier oscillation, Glacier alimentation, Snow ice interface, Snow stratigraphy, Snow depth, Radio echo soundings, Electromagnetic prospecting, Norway

52-2020
Volumetric variations of Glacier de Sarennes, French Alps, during the last two centuries.
Valla, F., Piedallu, C., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.361-366, 11 refs.
Mountain glaciers, Glacier surveys, Glacier thickness, Glacier mass balance, Glacier oscillation, Glacier melting, France—Alps

52-2021
Effects of weather events on X-SAR returns from ice fields: case-study of Hielo Patagónico Sur, South America.
Forster, R.R., Smith, L.C., Isacks, B.L., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.367-374, 13 refs.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacial hydrology, Glacier surfaces, Snowstorms, Snow ice interface, Snow cover effect, Synthetic aperture radar, Spaceborne photography, Patagonia

52-2022
Structural evolution of a surge-type polythermal glacier: Hessbreen, Svalbard.
Hambrey, M.J., Dowdeswell, J.A., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.375-381, 39 refs.
Glacier surveys, Glacier oscillation, Glacier flow, Glacier friction, Glacier surges, Glacier surfaces, Crevasses, Ice structure, Ice deformation, Norway—Spitsbergen

52-2023
Flowline model for Nigardsbreen, Norway: projection of future glacier length based on dynamic calibration with the historic record.
Oerlemans, J., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.382-389, 17 refs.
Mountain glaciers, Glacial meteorology, Glacier mass balance, Glacier flow, Glacier oscillation, Global warming, Computerized simulation, Norway

52-2024
Stick-slip sliding behaviour at the base of a glacier.
Fischer, U.H., Clarke, G.K.C., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.390-396, 31 refs.
Mountain glaciers, Glacier surveys, Glacial hydrology, Glacier flow, Glacier friction, Glacier beds, Basal sliding, Mathematical models, Canada—Yukon Territory—St. Elias Mountains

52-2025
Interpretation of borehole impulse tests at Haut Glacier d'Arolla, Switzerland.
Kulessa, B., Hubbard, B., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.397-402, 22 refs.
Mountain glaciers, Glacier surveys, Glacial hydrology, Subglacial drainage, Subglacial observations, Boreholes, Meltwater, Water level, Water pressure, Switzerland

52-2026
Topography and dynamics of Austfonna, Nordaustlandet, Svalbard, from SAR interferometry.
Unwin, B., Wingham, D., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.403-408, 19 refs.
Glacier surveys, Glacier oscillation, Glacier thickness, Glacier surfaces, Glacier flow, Topographic surveys, Height finding, Synthetic aperture radar, Spaceborne photography, Norway—Nordaustlandet

52-2027

Actively surging West Antarctic ice streams and their response characteristics.

Bindschadler, R., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.409-414, 19 refs.

Ice sheets, Glacier flow, Glacier friction, Glacier thickness, Glacier mass balance, Glacier oscillation, Glacier surges, Ice age theory, Ice models, Mathematical models, Antarctica—West Antarctica

Ice Streams B,D and E, West Antarctica, all show a longitudinal pattern of ice thickness change that is consistent with ongoing surge behavior modeled for glaciers. The measured pattern is not consistent with model response of any other scenario such as accumulation-rate change or changes on the ice shelf. Inland migration of the ice-stream onset is a requirement of this behavior pattern. If such a surge is presently taking place, the remaining lifetime of the West Antarctic ice sheet is 1200-6000 years. A complete surge period lasting 50,000-120,000 years is hypothesized, with a relatively brief surge phase (lasting 16,000-21,000 years) required to completely remove the West Antarctic ice sheet from its maximum extent. Applying classic glacier response theory demonstrates that the diffusive component of response is much faster for ice streams than for glaciers, making the identification of either kinematic waves or localized responses on ice streams unlikely. (Auth.)

52-2028

Reaction of mountain glaciers to climatic change under continental conditions.

Kunakhovich, M.G., Sokal'skaia, A.M., *Annals of glaciology,* 1997, Vol.24, International Symposium on Changing Glaciers, Fjærland, Norway, June 24-27, 1996. Papers. Edited by I.M. Whillans, p.415-420, 10 refs.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacial hydrology, Glacier oscillation, Glacier mass balance, Runoff forecasting, Tien Shan

52-2029

Cold weather injuries among U.S. soldiers in Alaska: a five-year review.

Candler, W.H., *Military medicine,* Dec. 1997, 162(12), p.788-791, 11 refs.

Military operation, Cold weather operation, Cold exposure, Physiological effects, Frostbite, Health, United States—Alaska

52-2030

Satellite and ground passive microwave remote sensing studies of ice and snow on and near Lake Superior.

Pilant, A.N., Houghton, Michigan Technological University, 1996, 149p., University Microfilms order No.9723976, Ph.D. thesis. Refs. passim.

Lake ice, Ice surveys, Ice conditions, Ice cover thickness, Ice surface, Ice temperature, Ice heat flux, Snow surveys, Snow surface temperature, Snow heat flux, Radiometry, Spaceborne photography, Computer programs, Superior, Lake

52-2031

Texture segmentation of SAR sea ice imagery.

Clausi, D.A., Waterloo, Ontario, University, 1996, 176p., Ph.D. thesis. 109 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice edge, Terrain identification, Synthetic aperture radar, Backscattering, Spaceborne photography, Image processing, Mathematical models, Computer applications

52-2032

Radiation climatology of the Greenland ice sheet.

Stroeve, J.C., Boulder, University of Colorado, 1996, 176p., University Microfilms order No.9717644, Ph.D. thesis. Refs. p.151-159.

Ice sheets, Glacier surveys, Glacial meteorology, Glacier heat balance, Glacier surfaces, Surface temperature, Albedo, Radiation balance, Polar atmospheres, Atmospheric circulation, Global warming, Radiometry, Spaceborne photography, Greenland

52-2033

Coupled ice/ocean modeling of Baffin Bay and the formation of the North Water polynyas.

Heinrichs, J.F., Boulder, University of Colorado, 1996, 136p., University Microfilms order No.9717590, Ph.D. thesis. Refs. p.129-136.

Polynyas, Sea ice distribution, Ice conditions, Ice forecasting, Air ice water interaction, Ice water interface, Upwelling, Wind factors, Atmospheric circulation, Ocean currents, Ice heat flux, Ice models, Computerized simulation, Mathematical models, Baffin Bay

52-2034

Adsorption and desorption processes of polar molecules at the ice/water interface.

Bouchez, C.M., Washington, D.C., Georgetown University, 1996, 156p., University Microfilms order No.9720762, Ph.D. thesis. Refs. passim.

Antifreezes, Organic nuclei, Cryobiology, Ice crystal growth, Ice crystal structure, Ice crystal optics, Ice spectroscopy, Ice composition, Ice water interface, Molecular structure, Molecular energy levels

52-2035

Satellite oceanography of sea-ice variability over the Greenland shelf and sea-level adjustment to Gulf Stream motions in the Middle Atlantic Bight.

Böhm, E., Raleigh, North Carolina State University, 1997, 114p., University Microfilms order No.9720853, Ph.D. thesis. Refs. passim.

Oceanographic surveys, Ice surveys, Sea ice distribution, Ice conditions, Polynyas, Air ice water interaction, Ice heat flux, Ocean currents, Sea level, Spaceborne photography, Greenland Sea

52-2036

Modelling Laurentide ice stream thermomechanics.

Marshall, S.J., Vancouver, University of British Columbia, 1996, 316p., Ph.D. thesis. Refs. p.238-248.

Ice sheets, Glaciation, Glacial geology, Glacial meteorology, Glacial hydrology, Glacier heat balance, Glacier mass balance, Glacier beds, Glacier friction, Glacier flow, Glacier surges, Paleoclimatology, Ice age theory, Mathematical models, Computer programs

52-2037

Portable asphalt stress and strain measuring device.

Walsh, M.R., MP 5065, *U.S. Patent Office. Patent,* Sep. 28, 1993, n.p., USP-5,248,200.

Pavements, Bitumens, Thermal stresses, Strain measuring instruments, Road maintenance

52-2038

Towable all-terrain snowplow. [Bogserbar snöplog för terrängkörning]

Walsh, M.R., MP 5066, *Sweden Patent Office. Patent,* June 23, 1997, n.p., No.9302987-4, In Swedish.

Snow removal equipment, All terrain vehicles, Tracked vehicles, Tractors, Road maintenance

52-2039

Trailable snow plow for off road use.

Walsh, M.R., MP 5067, *U.S. Patent Office. Patent,* Sep. 21, 1993, n.p., USP-5,245,771.

Snow removal equipment, All terrain vehicles, Tracked vehicles, Tractors, Road maintenance

52-2040

Highland Bowl.

Heinecken, K., *Avalanche review,* Dec. 1997, 16(2), p.4-5.

Avalanches, Accidents, Snow cover stability, Snow stabilization, Avalanche forecasting, Avalanche triggering, Safety, Land development, United States—Colorado

52-2041

Facet layer of November 1996.

Jamieson, B., Johnston, C., *Avalanche review,* Dec. 1997, 16(2), p.6-7, 5 refs.

Snow cover structure, Snow crust, Snow cover stability, Snow slides, Avalanches, Avalanche formation, Meteorological factors, Canada—British Columbia—Coast Mountains, Canada—British Columbia—Columbia Mountains

52-2042

Northwest Weather and Avalanche Center.

Ferber, G., *Avalanche review,* Dec. 1997, 16(2), p.8-9.

Organizations, Weather stations, Weather forecasting, Avalanche forecasting, Data transmission, Cost analysis, United States—Washington, United States—Oregon

52-2043

It's El Niño time again: should you care.

Williams, K., *Avalanche review,* Dec. 1997, 16(2), p.10-11.

Atmospheric circulation, Snowfall, Snowstorms, Precipitation (meteorology), Air temperature, Long range forecasting

52-2044

Chair Peak, Christmas 1996.

Barker, J., *Avalanche review,* Dec. 1997, 16(2), p.12.

Avalanches, Accidents, United States—Washington

52-2045

Utah Avalanche Forecast Center: our philosophy, Utah—a different kind of place.

Tremper, B., *Avalanche review,* Autumn 1997, 16(1), p.1,7.

Avalanche forecasting, Safety, United States—Utah

52-2046

Summer avalanche in Colorado kills one.

Atkins, D., *Avalanche review,* Autumn 1997, 16(1), p.5.

Avalanches, Accidents, United States—Colorado

52-2047

Avalanche control and avalanche research in Austria since World War II.

Höller, P., *Avalanche review,* Autumn 1997, 16(1), p.6-7, 23 refs.

Avalanches, Accidents, Avalanche forecasting, Avalanche engineering, Safety, Research projects, Austria

52-2048

Dredging contaminated sediments at an active impact range: an ordnance avoidance success.

Walsh, M.R., MP 5068, *U.S. Army Engineering and Support Center, Huntsville, AL. Ordnance and explosives environment newsletter,* Jan.-Mar. 1997, 4(1), p.4-5.

Military facilities, Explosives, Soil pollution, Water pollution, Estuaries, Dredging, Waste disposal, Land reclamation, United States—Alaska—Fort Richardson

52-2049

Permafrost.

Simpson, S., *Alaska,* Dec. 1997/Jan. 1998, 63(10), p.28-33.

Permafrost beneath structures, Permafrost beneath roads, Permafrost preservation, Thermokarst, Frozen ground settling, United States—Alaska

52-2050

Extreme science: locked in an arctic ice floe, a ship full of scientists drifts for a year.

Gibbs, W.W., *Scientific American,* Jan. 1998, 278(1), p.24,28.

Icebreakers, Oceanographic ships, Drift stations, Research projects

52-2051

Comparison of environmental chemical results for split samples analyzed in different laboratories.

Grant, C.L., Jenkins, T.F., Mudambi, A.R., MP 5069, *Association of Official Analytical Chemists (AOAC) International. Journal,* 1997, 80(5), p.1129-1138, 10 refs.

Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis, Statistical analysis

Data comparisons were made for split or co-located samples analyzed in contract laboratories and quality assurance (QA) laboratories during environmental studies directed by the U.S. Army Corps of Engineers. Archived results were analyzed statistically as concentration ratios (contract laboratory/QA laboratory). Concentrations ratios were found to be lognormally distributed, and this was the model used for comparisons. For metals in soils and volatile organic compounds (VOCs) in groundwater, 10.2% of metal ratios in soils and 5.6% of VOC ratios in groundwater exceeded limits of 0.40-2.50. For VOCs, total petroleum hydrocarbons (TPHs), and explosives in soils, limits of 0.25-4.00 are suggested with the understanding that large improvements are badly needed. Even with these wide limits, approximately 42% of VOCs, 14% of TPHs, and 11% of explosives contract laboratory/QA laboratory ratios were outside these limits.

52-2052

Guidelines for mapping vegetation on military lands.

O'Neil, J., Hill, A., Campbell, M., Racine, C.H., Dubois, P., Woodson, W., MP 5070, Tri-Service Environmental Technology Workshop, St. Louis, MO, June 10-12, 1997. Proceedings, Aberdeen Proving Ground, MD, U.S. Army Environmental Center, 1997, p.123-127.

Military facilities, Site surveys, Vegetation patterns, Mapping, Data processing

52-2053

Sampling strategy for site characterization at explosives-contaminated sites.

Jenkins, T.F., et al, MP 5071, Tri-Service Environmental Technology Workshop, St. Louis, MO, June 10-12, 1997. Proceedings, Aberdeen Proving Ground, MD, U.S. Army Environmental Center, 1997, p.321-329, 6 refs.

Military facilities, Explosives, Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis, Statistical analysis

This study assessed sampling strategies for characterization of explosives-contaminated sites as impacted by substantial short- and mid-range spatial heterogeneity of analyte distribution. Soil samples were collected and analyzed individually and as composites by colorimetric and immunoassay-based on-site methods, as well as standard laboratory protocols. Short-range heterogeneity was assessed at 10 sampling sites on four installations contaminated with TNT, DNT, HMX, or ammonium picrate. Mid-range heterogeneity was investigated at an active antitank range contaminated with residues of HMX and TNT. In all cases, results from on-site analysis were compared with those from laboratory analysis to assess how well sites could be characterized using on-site methods. An active antitank range was characterized for explosives concentrations using a combination of "area-integrated" sampling, in-field sample homogenization, compositing to produce representative grid samples, and on-site analysis. The depth of contamination and the dimensions of sampling grids were determined using on-site methods. Overall this approach appears to be an efficient, cost-effective means of providing representative data for making remediation decisions at sites contaminated with residues of high explosives.

52-2054

Scattering from groove patterns in a perfectly conducting surface.

Schiavone, G.A., O'Neill, K., Paulsen, K.D., MP 5072, *Optical Society of America. Journal A,* Sep. 1997, 14(9), p.2212-2222, 28 refs.

Scattering, Backscattering, Radar echoes, Polarization (waves), Wave propagation, Image processing, Mathematical models

Electromagnetic scattering is investigated for assemblages of parallel open cavities recessed in a perfectly conducting ground plane. Cavities of a variety of shapes are treated, with cross-sectional dimensions of the order of one or two electromagnetic wavelengths. Under the assumption that the cavities form grooves of effectively infinite length, a two-dimensional analysis treats transverse incidence under both E- and H-polarized illumination (E and H fields parallel to groove axis, respectively). For the most part, any coupling between cavity responses on the surface produces negligible effects on far-field diffraction patterns, even when cavities are extremely close together and when induced currents flow between adjacent cavities. Thus one may usually construct diffraction patterns for assemblages of grooves by simply superposing responses calculated for each cavity in isolation. Despite possibly substantial differences among the individual scattering patterns from contributing cavities, regularly spaced arrangements of two or more cavities produced grating-type diffraction patterns. This allows inference of the distance between grooves, based on separation between the pattern's peaks and troughs.

52-2055

Sampling error associated with collection and analysis of soil samples at explosives-contaminated sites.

Jenkins, T.F., et al, MP 5073, Specialty Conference on Field Analytical Methods for Hazardous Wastes and Toxic Chemicals, Las Vegas, NV, Jan. 29-31, 1997. Proceedings, Pittsburgh, Air & Waste Management Association, 1997, p.85-94, 8 refs.

Explosives, Waste disposal, Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis, Statistical analysis

This study assessed short-range spatial heterogeneity of explosives concentrations in surface soils. Samples collected 61 cm apart were analyzed individually and as composites by both colorimetric on-site methods and standard laboratory protocols. Ten locations were sampled at four installations and the results were used to estimate the relative contributions of analytical and sampling error. The major contaminant at seven of the ten sampling locations was TNT while 2,4-DNT, HMX, and ammonium picrate were each the major contaminant at one of the other three. Results from colorimetric on-site analysis were in excellent agreement with laboratory results, particularly for TNT and HMX. Site characterization was substantially improved using a composite sampling strategy. Overall, characterization of explosives-contaminated sites using a combination of composite sampling, in-field sample homogenization, and on-site colorimetric analysis is an efficient method of obtaining accurate and precise results that are representative of the area sampled.

52-2056

Field screening of soils contaminated with explosives using ion mobility spectrometry.

Atkinson, D.A., Crockett, A.B., Jenkins, T.F., MP 5074, Specialty Conference on Field Analytical Methods for Hazardous Wastes and Toxic Chemicals, Las Vegas, NV, Jan. 29-31, 1997. Proceedings, Pittsburgh, Air & Waste Management Association, 1997, p.308-316, 3 refs.

Explosives, Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

This study involved the comparison of IMS screening with EPA's standard method for explosives, Method 8330. The U.S. Army Corps of Engineers provided a large number of soil samples that had been collected from three locations at each of three explosive contaminated installations. The samples had been dried, ground, homogenized and analyzed in duplicate by Method 8330. Duplicate two gram aliquots of these samples were extracted with 10 mL of acetone by shaking for three minutes, allowed to settle, then analyzed by IMS for Method 8330 compounds. Half of the extracts from one location have also been analyzed in duplicate by IMS for TNT. Results from TNT contaminated soils look extremely promising. Correlation between IMS and EPA Method 8330 results was very high (r=0.99). Based on these results, the intention is to further develop and evaluate IMS for simultaneously quantifying multiple analytes. IMS throughput and cost per sample makes it an attractive technique. The ultimate objective is to provide adequate validation data to EPA for inclusion of the method as a screening procedure in SW-846.

52-2057

Rapid method for estimating the total concentration of volatile organic compounds in soil samples.

Hewitt, A.D., Lukash, N.J.E., MP 5075, Specialty Conference on Field Analytical Methods for Hazardous Wastes and Toxic Chemicals, Las Vegas, NV, Jan. 29-31, 1997. Proceedings, Pittsburgh, Air & Waste Management Association, 1997, p.386-392, 10 refs.

Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

This report describes an on-site method of estimating the total concentration of volatile organic compounds (VOCs) in soil, relative to a site-specific 0.2 mg/kg standard. The purpose of this decision tool is to allow on-site sampling activities to incorporate the appropriate soil sample collection and handling protocols necessary for high- and low-level gas chromatography/mass spectrometry analysis. Combining rapid on-site analysis with sampling procedures that limit substrate disaggregation and exposure improves efforts to achieve site-representative estimates for vadose zone contamination.

52-2058

Passive soil vapor versus grab samples for determining volatile organic compound concentrations.

Hewitt, A.D., MP 5076, Specialty Conference on Field Analytical Methods for Hazardous Wastes and Toxic Chemicals, Las Vegas, NV, Jan. 29-31, 1997. Proceedings, Pittsburgh, Air & Waste Management Association, 1997, p.393-397, 11 refs.

Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

The GORE-SORBER Module, a passive soil vapor method, and the mean of two colocated grab samples handled and analyzed using an in-vial method were compared for estimating volatile organic compound contamination in the near-surface vadose zone. The strong semi-log correlation between these two methods (r^2=0.944) and equally strong linear correlation for grab samples taken 15 cm apart (r^2=0.957) indicate a fairly homogeneous distribution existed for this contaminant, and that this passive soil vapor technology offers a promising means of estimating subsurface concentrations in locations where grab samples cannot be easily obtained.

52-2059

Unevaluated site characterization "toolbox".

Stutz, M.H., Jenkins, T.F., Robitaille, G., MP 5077, Specialty Conference on Field Analytical Methods for Hazardous Wastes and Toxic Chemicals, Las Vegas, NV, Jan. 29-31, 1997. Proceedings, Pittsburgh, Air & Waste Management Association, 1997, p.658-663.

Soil pollution, Soil tests, Soil analysis, Cost analysis

In todays economic environment, many facilities do not have the wherewithal to perform a traditional characterization in order to determine whether their site is contaminated. In addition, they may not have personnel with adequate knowledge as to what procedures to use or even the capability to determine what technologies are available. Many sites, either previously ignored or thought to be uncontaminated are now becoming subject to regulatory review, possibly as a result of changes in proposed use or reuse. With the tremendous advances in field portable technologies that can generate real-time measurement data as well as the development of innovative field analytical, sampling, and sample handling techniques, the tools are now available, or will soon be available, to allow for comparatively inexpensive site characterizations that meet regulatory requirements. The objective of this effort was to provide the procedures necessary to enhance a performer's ability to determine contamination in a cost effective manner. It takes the form of a series of steps that include: the performance of a preliminary assessment, the decision making process for selecting the appropriate options, the more detailed description of the options, and what to do with the results.

52-2060

Effects of frost action on compacted clay barriers.

Chamberlain, E.J., Erickson, A.E., Benson, C.H., MP 5078, Geoenvironment 2000: characterization, containment, remediation, and performance in environmental geotechnics. Vol.1. Geotechnical special publication, No.46, New York, American Society of Civil Engineers, 1995, p.702-717, 17 refs. Proceedings of a specialty conference, New Orleans, Feb. 24-26, 1995.

DLC TD796.7.G46 1995

Waste disposal, Linings, Earth fills, Clay soils, Frost action, Frost resistance, Freeze thaw tests, Soil water migration, Permeability, Seepage, Cold weather performance

Laboratory tests were conducted to determine the effect of frost action on the hydraulic conductivity of soils from two compacted clay covers. Test specimens were taken from field test sections before, during, and after freezing and thawing. Hydraulic conductivity tests were conducted on laboratory prepared specimens before and after freeze-thaw cycling. Test results obtained using laboratory freeze-thaw permeameters showed large increases (three to four orders of magnitude) in the hydraulic conductivity of clay materials after freeze-thaw cycling. Flexible-wall permeameter tests performed on specimens cored during freezing and on block specimens taken after thawing showed similar increases. Hydraulic conductivities of specimens obtained with thin-wall tubes after thawing were less than one order of magnitude greater than those measured before thawing. Thin sections of frozen core materials showed ice lenses and ice-filled shrinkage cracks. Thin sections of the laboratory frozen specimens showed similar features but in a much finer, more differentiated soil structure. The discontinuities left by the ice lenses and the ice-filled shrinkage cracks are the cause for the large increase in hydraulic conductivity after thawing.

52-2061

Influence of stiffness increase on a wavy single fiber composite.

Dutta, P.K., Madhukar, M.S., MP 5079, International Conference on Composite Materials (ICCM), 11th, Gold Coast, Australia, July 14-18, 1997. Proceedings. Vol.4, 1997, p.623-632, 4 refs.

Composite materials, Tensile properties, Stress strain diagrams, Cracking (fracturing), Low temperature tests

Experiments were conducted by using composite specimens containing a single carbon fiber embedded in an epoxy matrix. The fibers were cast in curved geometries, and the specimens were loaded in tension. Increasing the tensile load on the single fiber-epoxy specimens broke the embedded fiber into small fragments. Specimens with higher matrix stiffness had long matrix cracks at the broken fiber ends, which were perpendicular to the fiber axis. These matrix cracks tend to propagate perpendicular to the fiber axis, increasing the composite's cold sensitivity. The major conclusions are as follows: 1) when fibers are wavy, they are not loaded to their

full capacity because of premature interfacial debonding started by the interfacial shear stresses and the transverse tensile stresses. The transverse tensile stresses at the interface are not present in the straight fiber specimens. 2) At higher stiffness and lower toughness values, the matrix cracks emanating at the broken fiber ends make the composite weaker. These two sources lower the strength of unidirectional composites at low temperatures.

52-2062
Creep study of FRP composite rebars for concrete.
Dutta, P.K., Hui, D., MP 5080, International Conference on Composite Materials (ICCM), 11th, Gold Coast, Australia, July 14-18, 1997. Proceedings. Vol.4, 1997, p.944-955, 36 refs.
Reinforced concretes, Composite materials, Polymers, Creep, Strain tests, Low temperature tests
Fiber-reinforced plastic (FRP) rebars, containing by volume about 55% E-glass fiber and about 45% thermoset resin, have been successfully applied as concrete reinforcement in many construction applications. However, creep, fatigue, and corrosion from alkaline environment of concrete are areas of concern for any large-scale application. In this investigation the creep study was limited to determine whether the commercially available FRP rebars would creep under a sustained tensile load over a wide range of temperatures: low temperature (-23°C, -10°F), room temperature (21°C, 70°F), and high temperature (49°C, 120°F). For the room temperature test, strain was measured for 1800 hours (75 days) and over this period the strain did not show any trend to continue to increase. The low temperature test was continued for 3,552 hours and again no discernible trend of increasing strain was observed. The high temperature test was performed for 3,792 hours (158 days), in which a very small trend of increasing strain could be observed.

52-2063
Effects of cold regions environment on structural composites.
Dutta, P.K., Hui, D., MP 5081, International Conference on Advanced Technology in Experimental Mechanics, Wakayama, Japan, 1997. Proceedings, Tokyo, Japan Society of Mechanical Engineers, 1997, p.61-64, 2 refs.
Composite materials, Polymers, Low temperature tests, Thermal stresses, Cold weather construction
Effects of cold regions environment on structural composites are discussed. Low temperature induces thermal stresses in the matrix and interfaces of polymer composites which may degrade its performance, durability, and reliability. Moisture absorption at room temperature has opposite effects but at subzero temperature may accelerate the degradation. The micromechanical processes involved are summarized, and a number of investigations to show these effects are briefly presented.

52-2064
Reducing damage to low-volume roads by using trucks with reduced tire pressures.
Kestler, M.A., Berg, R.L., Moore, T.L., MP 5082, *Transportation research record,* 1997, No.1589, p.9-18, 16 refs.
Pavements, Thaw weakening, Tires, Highway planning, Road maintenance, Cold weather operation, Computerized simulation
Heavy-volume highways in seasonal frost areas are designed to resist the effects of spring thaw. However, timber access roads, county roads, and other low-volume roads with thin bituminous surfaces can be quite susceptible to pavement damage during midwinter- and spring-thaw periods. To reduce damage to low-volume roads, towns, cities, and states typically either post reductions in allowable load or completely prohibit hauling during damage-susceptible periods. Associated economic impact can be significant. To evaluate the effects of tire pressure on cumulative road damage, a mechanistic pavement design procedure developed by the U.S. Army Corps of Engineers for use in seasonal frost areas was used on a matrix of tire pressures, low-volume pavement cross sections, and environmental conditions. A series of computer simulations showed (a) trucks operating with conventional tire pressures can cause excessive damage, particularly in the form of cracking, to low-volume roads with thin bituminous surfaces during relatively short thaw periods; (b) pavement damage could be reduced substantially by restricting hauling to trucks operating with reduced tire pressures; and (c) there are "threshold" tire pressures under which only minimal damage occurs, even during critical spring thaw. These results could influence guidelines for hauling restrictions and, in turn, associated economics.

52-2065
Vøring Plateau diapir fields and their structural and depositional settings.
Hjelstuen, B.O., Eldholm, O., Skogseid, J., *Marine geology,* Dec. 1997, 144(1-3), p.33-57, Refs. p.55-57.
Marine geology, Pleistocene, Subpolar regions, Bottom topography, Tectonics, Seismic surveys, Profiles, Boreholes, Stratigraphy, Sedimentation, Norway—Vøring Plateau

52-2066
^{10}Be records from sediments of the Arctic Ocean covering the past 350 ka.
Aldahan, A.A., Shi, N., Possnert, G., Backman, J., Boström, K., *Marine geology,* Dec. 1997, 144(1-3), p.147-162, 32 refs.
Pleistocene, Oceanographic surveys, Marine geology, Paleoclimatology, Bottom sediment, Drill core analysis, Isotope analysis, Geochronology, Radioactive age determination, Lithology, Statistical analysis, Arctic Ocean

52-2067
Glacial northeast Atlantic surface water p_{CO2}: productivity and deep-water formation.
Maslin, M.A., Thomas, E., Shackleton, N.J., Hall, M.A., Seidov, D., *Marine geology,* Dec. 1997, 144(1-3), p.177-190, Refs. p.188-190.
Pleistocene, Marine geology, Paleoecology, Biomass, Plankton, Bottom sediment, Drill core analysis, Meltwater, Geochemical cycles, Carbon dioxide, Carbon isotopes, Isotope analysis, Atlantic Ocean

52-2068
Earth's field nuclear magnetic resonance apparatus suitable for pulsed gradient spin echo measurements of self-diffusion under antarctic conditions.
Callaghan, P.T., Eccles, C.D., Seymour, J.D., *Review of scientific instruments,* Nov. 1997, 68(11), p.4263-4270, 24 refs.
Geophysical surveys, Portable equipment, Probes, Nuclear magnetic resonance, Geomagnetism, Sea water, Brines, Ice cores, Self diffusion, Attenuation, Performance, Antarctica—McMurdo Sound
The authors describe an earth's field nuclear magnetic resonance apparatus which can be used to carry out pulsed gradient spin echo (PGSE) diffusion measurements. The instrument is portable and incorporates automated process control. The analysis of PGSE data under the conditions of a weak detection field is discussed and measurements of diffusion are presented under both New Zealand and antarctic conditions. The antarctic results include an example of restricted diffusion of brine water in McMurdo Sound sea ice. (Auth. mod.)

52-2069
How to plan for better winter maintenance. *Better roads,* Oct. 1997, 67(10), p.21-22.
Road maintenance, Winter maintenance, Snow removal, Snow removal equipment, Logistics, Forecasting, Cold weather performance

52-2070
Anti-icer works well, protects bridges. *Better roads,* Oct. 1997, 67(10), p.32-34.
Road maintenance, Bridges, Winter maintenance, Chemical ice prevention, Solutions, Chemical composition, Cold weather performance, Temperature effects

52-2071
Pump system for improving runoff records during winter.
Bonta, J.V., *American Water Resources Association. Journal,* Oct. 1997, 33(5), p.1023-1031, 3 refs.
Hydrologic cycle, Runoff forecasting, Stream flow, Dams, Flow measurement, Flow control, Ice formation, Pumps, Ice prevention, Turbulent diffusion, Performance, Statistical analysis

52-2072
Canada's commercial remote sensing model: paying dividends in marine applications.
Tack, R.E., Nazarenko, D., *Marine Technology Society. Journal,* Winter 1996-1997, 30(4), p.57-61.
Remote sensing, Spaceborne photography, Synthetic aperture radar, Sea ice, Ice floes, Ice reporting, Ice forecasting, Radar tracking, Ice detection, Image processing, Canada

52-2073
CIP segments keep project on schedule. *Better roads,* Nov. 1997, 67(11), p.22-23.
Cold weather construction, Bridges, Construction materials, Superstructures, Concrete slabs, Concrete placing, Heating, Temperature control

52-2074
Freeze-thaw response of CFRP wrapped concrete.
Soudki, K.A., Green, M.F., *Concrete international,* Aug. 1997, 19(8), p.64-67, 7 refs.
Bridges, Winter maintenance, Concrete strength, Concrete piles, Corrosion, Countermeasures, Freeze thaw tests, Composite materials, Covering

52-2075
Dump truck tops state equipment choices. *Better roads,* Aug. 1997, 67(8), p.18-20.
Road maintenance, Winter maintenance, Cold weather operation, Vehicles, Snow removal equipment

52-2076
FWHA evaluates anti-icing liquids. *Better roads,* Aug. 1997, 67(8), p.28-30.
Road maintenance, Winter maintenance, Chemical ice prevention, Liquids, Classifications, Chemical properties, Temperature effects, Performance

52-2077
Calcium chloride deicing proves effective. *Better roads,* Aug. 1997, 67(8), p.30.
Road maintenance, Winter maintenance, Chemical ice prevention, Liquids, Performance

52-2078
Frost de-icing salt resistance of high strength concrete. [Frost-Tausalz-Widerstand von hochfestem Beton]
Stark, J., Chelouah, N., *Betonwerk + Fertigteil-Technik,* Apr. 1997, 63(4), p.94-99, In German and English with French and German summaries. 11 refs.
Concrete durability, Concrete aggregates, Chemical composition, Water content, Corrosion, Phase transformations, Salting, Mechanical tests, Freeze thaw tests, Frost resistance

52-2079
RILEM recommendation for test method for the freeze-thaw resistance of concrete—tests with sodium chloride solution (CDF). [CDF-Test—Prüverfahren des Frost-Tau-Widerstands von Beton—Prüfung mit Taumittel-Lösung (CDF) RILEM Recommendation]
Setzer, M.J., Fagerlund, G., Janssen, D.J., *Betonwerk + Fertigteil-Technik,* Apr. 1997, 63(4), p.100-106, In German and English. Refs. passim.
Concrete durability, Concrete strength, Mechanical tests, Frost resistance, Freeze thaw cycles, Freeze thaw tests, Corrosion, Antifreezes, Solutions, Laboratory techniques, Standards

52-2080
Arctic research of the United States, Vol.11. Fall/winter 1997.
Myers, C.E., ed, Haugh, J., ed, Cate, D.W., ed, MP 5083, 76p.
Research projects, Geophysical surveys, Polar atmospheres, Environmental tests, Climatology, Oceanography, Organizations, Legislation

52-2081
Bidimensional inverse Stefan problem: identification of boundary value.
Ang, D.D., Pham Ngoc Dinh, A., Thanh, D.N., *Journal of computational and applied mathematics,* May 5, 1997, 80(2), p.227-240, 4 refs.
Stefan problem, Boundary value problems, Ice water interface, Ice melting, Heat flux, Phase transformations, Water temperature, Liquid phases, Analysis (mathematics)

52-2082
Elliptical diagnostics of stratospheric polar vortices.
Waugh, D.W., *Royal Meteorological Society. Quarterly journal B,* July 1997, 123(542), p.1725-1748, Refs. p.1746-1748.
Climatology, Polar atmospheres, Structural analysis, Atmospheric circulation, Wave propagation, Stratosphere, Aerosols, Seasonal variations, Mathematical models
Diagnostics based on the spatial moments of isopleths of a long-lived tracer, or of potential vorticity, are presented that enable the structure and evolution of stratospheric polar vortices to be concisely summarized and quantified. The diagnostics show and quantify several dif-

ferences between the arctic and antarctic vortices. The arctic vortex moves further off the pole, is generally more elongated, and has a more complicated vertical structure than the antarctic vortex. (Auth. mod.)

52-2083

Geophysical investigations of cryolithozone; transactions; issue 2. [Geofizicheskie issledovaniia kriolitozony; nauchnye trudy; Vypusk 2]

Frolov, A.D., ed, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, 141p., In Russian with Russian-English title page, English summary and table of contents. Refs. passim. For individual papers see 52-2084 through 52-2096.

Geocryology, Geophysical surveys, Frozen ground, Electric power

52-2084

Velocity of elastic waves in frozen and thawed soil foundations of dams based on data from seismic prospecting. [Skorosti uprugikh voln v merzlykh i talykh neskal'nykh osnovaniiakh plotin po dannym seĭsmorazvedki]

Voronkov, O.K., Motorin, G.A., Mikhaĭlovskiĭ, G.V., Kuntsevich, S.P., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.7-25, In Russian. 10 refs.

Seismic surveys, Geocryology, Frozen ground physics, Elastic waves, Velocity, Dams, Foundations, Ground thawing

52-2085

Study of the dynamics of the geocryological conditions at the hydrotechnical structures of the Anadyr' Thermoelectric Power Center based on electrometric data. [Izuchenie dinamiki geokriologicheskikh uslovii na gidrotekhnicheskikh sooruzheniiakh Anadyrskoĭ TETs po dannym elektrometrii]

Krivonogova, N.F., Shubin, A.B., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.26-33, In Russian. 3 refs.

Geocryology, Electric power, Cold weather operation, Russia—Anadyr' River

52-2086

Estimating the influence of the dam form on the results of electrometric studies of its ridge. [Otsenka vliianiia formy plotiny na rezul'taty elektrometricheskikh rabot, vypolniaemykh s ee grebnia]

Shubin, A.B., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.34-46, In Russian. 12 refs.

Earth dams, Electrical measurement, Reservoirs, Design, Electrical properties, Analysis (mathematics)

52-2087

Using comprehensive geological-geophysical methods to study the properties and state of the granite foundation of the Adychansk Hydroelectric Station. [Primenenie kompleksa geologo-geofizicheskikh metodov dlia izucheniia svoĭstv i sostoianiia granitnogo osnovaniia Adychanskoĭ GES]

Lavrova, L.D., Gorshkov, IU.M., Stepanov, M.I., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.47-52, In Russian. 3 refs.

Electric power, Foundations, Geophysical surveys, Geological surveys, Hydraulic structures, Frozen rocks, Frozen ground, Russia—Siberia, Russia—Adycha River

52-2088

Characteristics of forecasting seismic effects under cryolithozone conditions. [Osobennosti prognoza seĭsmicheskikh vozdeĭstviĭ v usloviiakh kriolitozony]

Dzhurik, V.I., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.53-59, In Russian. 7 refs.

Seismic surveys, Geocryology, Forecasting, Frozen ground mechanics, Regional planning, Earthquakes

52-2089

Detailed geophysical studies of an upper cross section containing frozen rocks. [Detal'nye geofizicheskie issledovaniia verkhneĭ chasti razreza, soderzhashcheĭ merzlye porody]

Khachaĭ, O.A., Novgorodova, E.N., Bodin, V.V., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.60-69, In Russian. 5 refs.

Geophysical surveys, Electromagnetic prospecting, Frozen rocks, Seismic surveys

52-2090

Space-time variability in the geocryological section of the coastal zone of the Vilyuy River Hydroelectric Station No. 3. [O prostranstvenno-vremennoĭ izmenchivosti geokriologicheskogo razreza beregovoĭ zony Viliuĭskoĭ GES-III]

Boĭkov, S.A., Snegirev, A.M., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.70-82, In Russian. 1 ref.

Electric power, Reservoirs, Geocryology, Shores, Thermal regime, Terraces, Active layer, Electrical properties, Frozen rocks, Russia—Vilyuy River

52-2091

Basic characteristics of phase transformations in saline frozen soils. [Osnovnye osobennosti fazovykh preobrazovaniĭ v zasolenykh merzlykh gruntakh]

Frolov, A.D., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.83-98, In Russian. 20 refs.

Frozen ground, Saline soils, Phase transformations, Salinity, Ion density (concentration), Dielectric properties, Freezing points, Temperature effects

52-2092

Dynamic elasticity moduli of saline frozen soils. [Dinamicheskie moduli uprugosti zasolennykh merzlykh gruntov]

Chervinskaia, O.P., Zykov, IU.D., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.98-107, In Russian. 3 refs.

Saline soils, Frozen ground, Elastic properties, Temperature effects, Water content, Salinity

52-2093

Correlation between geophysical parameters and the properties of saline frozen soils. [Sviaz' geofizicheskikh parametrov s kharakteristikami zasolennosti merzlykh gruntov]

Zykov, IU.D., Chervinskaia, O.P., Krasovskiĭ, A.G., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.108-114, In Russian. 7 refs.

Geophysical surveys, Saline soils, Frozen ground, Salinity, Temperature effects

52-2094

Characteristics of the structure and elastic properties of fresh and saline ice, accreted on solid bodies. [Osobennosti stroeniia i uprugikh svoĭstv presnogo i solenogo l'da, namerzaiushchego na tverdykh telakh]

Golubev, V.N., Frolov, A.D., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.115-122, In Russian. 7 refs.

Ice solid interface, Ice accretion, Ice elasticity, Ice structure, Ice crystals, Ice salinity, Liquid phases, Temperature effects

52-2095

Anomalous polarization and fractal models of frozen ground. [Anomal'naia poliarizuemost' i fraktal'nye modeli merzloty]

Krylov, S.S., Bobrov, N.IU., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.123-135, In Russian. 11 refs.

Frozen ground physics, Polarization (charge separation), Fractals

52-2096

Rapid estimate of unfrozen water content in frozen rocks based on specific electrical resistivity. [Ekspress-otsenka soderzhaniia nezamerzsheĭ vody v merzloĭ porode po znacheniiam udel'nogo elektricheskogo soprotivleniia]

Bogoliubov, A.N., Bogoliubova, N.P., Geofizicheskie issledovaniia kriolitozony. Nauchnye trudy (Geophysical investigations of the cryolithozone. Transactions). Vol. 2. Edited by A.D. Frolov, Moscow, RAN Ob"edinennyĭ nauchnyĭ sovet po kriologii zemli, 1996, p.136-141, In Russian. 3 refs.

Unfrozen water content, Electrical resistivity, Frozen rocks, Rock properties

52-2097

Lithium in waters of a polar desert.

Lyons, W.B., Welch, K.A., *Geochimica et cosmochimica acta,* Oct. 1997, 61(20), p.4309-4319, 62 refs.

Deserts, Geochemistry, Lake ice, Limnology, Antarctica—Victoria Land, Antarctica—McMurdo Dry Valleys, Antarctica—Bonney, Lake

Lithium (Li^+) concentrations were measured in a series of stream and lake samples from a cold, dry desert, the McMurdo Dry Valleys (MDV) in southern Victoria Land. Li^+ geochemistry has been of great interest and utility, in part, because of its solubility and mobility during rock-water interactions. In general, the values determined for the streams and the dilute lake waters in this polar desert environment are similar to those found in temperate streams and lakes. The source of Li^+ to these waters is a combination of marine aerosol and crustal weathering within the stream channels. The hypersaline hypolimnion of Lake Bonney has extremely high concentrations of Li^+ which has been concentrated via a previous drawdown of the lake and its subsequent evapoconcentration. The different distributions of Li^+ within the lakes is also due to past climatic changes and their effects on the chemical evolution of the lakes. The high relative mobility of Li^+ controls its distribution within the aquatic systems of this cold, desert environment. (Auth.)

52-2098

Proceedings. Volume IV. Arctic/polar technology.

International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996, Nixon, W.A., ed, Sodhi, D.S., ed, Kennedy, K.P., ed, Yamaguchi, H., ed, Bugno, W., ed, MP 5084, New York, American Society of Mechanical Engineers, 1996, 123p., Refs. passim. For individual papers see 51-2189, and 52-2099 through 52-2112.

Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice elasticity, Ice deformation, Ice breaking, Ice solid interface, Offshore structures

52-2099
Analysis of selected atmospheric icing events on test cables.
Druez, J., McComber, P., Laflamme, J., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.1-9, 8 refs.
Power line icing, Ice accretion, Ice loads, Ice storms, Snowstorms, Glaze, Wind pressure, Icing rate, Cold weather tests, Environmental tests, Statistical analysis

52-2100
Wave model tests for a TLP modified with ice-breaking collars.
Bol'shev, A.S., Frolov, S.A., Christensen, F.T., Karna, T., Rogachko, S.I., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.11-21, 6 refs.
Offshore structures, Floating structures, Moorings, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice breaking, Ice control

52-2101
Brittle compressive failure of microcracked ice.
Wimmer, S.A., Karr, D.G., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.23-28, 19 refs.
Ice cover strength, Ice deformation, Ice microstructure, Ice cracks, Ice breaking, Ice loads, Ice pressure, Ice elasticity, Crack propagation, Mathematical models

52-2102
On the transient response of a floating ice cover to an advancing ship.
Valanto, P., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.29-40, 7 refs.
Icebreakers, Ice navigation, Metal ice friction, Ice cover strength, Ice loads, Ice deformation, Ice breaking, Environmental tests, Computerized simulation

52-2103
Preliminary investigations into mooring forces on a semisubmersible and a turret moored tanker in pack ice, current and waves.
Murray, J.J., Spencer, D., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.41-54, 4 refs.
Tanker ships, Moorings, Ice solid interface, Ice loads, Ice pressure, Metal ice friction, Ice cover strength, Ice control, Ocean waves, Environmental tests

52-2104
Spongy icing in the marine environment.
Lozowski, E.P., Blackmore, R.Z., Forest, T.W., Shi, J., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.55-61, 14 refs.
Sea spray, Spongy ice, Ice accretion, Ship icing, Ice heat flux, Icing rate, Unfrozen water content, Water films, Environmental tests, Ice models

52-2105
Depression of soil moisture freezing point.
Fedorov, V.I., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.63-66, 6 refs.
Clay soils, Soil freezing, Soil water, Unfrozen water content, Soil strength, Frozen ground thermodynamics, Frozen ground temperature, Freezing points

52-2106
Stabilization of a sea-ice transition by freezing: McMurdo Station, Antarctica.
Barthelemy, J.L., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.67-73, 5 refs.
Stations, Logistics, Ice runways, Ice roads, Snow roads, Ice deterioration, Artificial freezing, Ice (construction material), Trafficability, Road maintenance, Antarctica—McMurdo Station
The U.S. Antarctic Program uses a seasonal sea-ice runway at McMurdo to support heavy-haul, wheeled aircraft during the short resupply season. Typically, air operations are diverted to a subordinate skiway around mid-Dec. when the strength and integrity of the ice runway are compromised. During the past several seasons deterioration of the strategic transition that links the ice road to the snow road on the Ross Ice Shelf has forced premature closure of the seasonal runway. Melt pockets and wet ice uncovered during repeated excavation of the transition area prompted this study. The Naval Facilities Engineering Service Center is considering consolidating and thickening subsurface ice within the transition zone using a self-powered heat transfer device known as the freezing cell. Freezing cells are passive, one-way heat exchangers that combine conduction and convection heat transfer to "short circuit" the insulating properties of an ice sheet, accelerating the rate of growth and freezeback on the underside. Rather than pepper the entire transition roadway with these devices, an area that may cover 30 m by 15 m, an alternate application is to reinforce just strategic strips of roadway—strips spaced, for example, to the gauge of a LGP D-8 bulldozer track or trailing cargo sled runner. (Auth. mod.)

52-2107
Hysteretic behavior in ice under fatigue loading.
Weber, L.J., Nixon, W.A., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.75-81, 17 refs.
Ice strength, Ice deformation, Ice loads, Ice pressure, Ice friction, Internal friction, Ice cracks, Crack propagation, Strain tests

52-2108
Spatial and temporal variations of local ice pressures.
Matskevich, D.G., Jordaan, I.J., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.83-91, 28 refs.
Ice islands, Ice cover strength, Ice loads, Ice pressure, Ice deformation, Ice elasticity, Ice breaking, Stress concentration, Impact tests, Penetration tests, Mathematical models

52-2109
Self-excited oscillations in sea ice and evaluation of the ice forces.
Smirnov, V.N., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.93-96, 8 refs.
Ice strength, Ice deformation, Ice loads, Ice pressure, Ice friction, Icequakes, Ice elasticity, Elastic waves, Wave propagation

52-2110
Global first-year ice load measurements in the Arctic.
Blanchet, D., Kennedy, K.P., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.103-113, 34 refs.
Offshore structures, Artificial islands, Caissons, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice pileup, Ice deformation, Ice breaking, Design criteria

52-2111
Ice loads consensus study update.
Croasdale, K.R., Kennedy, K.P., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.115-118, 2 refs.
Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice friction, Research projects, Design criteria

52-2112
Experimental study on attenuation of random waves under ice sheet.
Sakai, S., Sasamoto, M., Liu, X.D., Katayama, J., Kanada, S., Izumiyama, K., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 15th, Florence, Italy, June 16-20, 1996. Proceedings. Vol.4. Edited by W.A. Nixon, D.S. Sodhi, K.P. Kennedy, H. Yamaguchi, and W. Bugno, New York, American Society of Mechanical Engineers, 1996, p.119-122, 10 refs.
Ocean waves, Ice edge, Ice bottom surface, Ice water interface, Ice cover effect, Wave propagation, Damping, Attenuation

52-2113
Calving glaciers: report of a workshop February 28-March 2, 1997.
Van der Veen, C.J., ed, *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, 194p., Refs. passim. Part I, p.1-42, contains workshop recommendations for further research. Part II contains the individual papers for which see 52-2114 through 52-2132.
Calving, Glacier oscillation, Glacier flow, Glacier friction, Glacier beds, Glacier tongues, Glacier surges, Glacier surveys, Icebergs

52-2114
Water, sediment and tidewater glaciers: simplistic review and weakly constrained speculations.
Alley, R.B., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.51-55, 17 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.
Glacier flow, Glacier beds, Glacier friction, Glacial hydrology, Subglacial drainage

52-2115
Tidal forcing of basal seismicity of ice stream C, West Antarctica, observed far inland.
Anandakrishnan, S., Alley, R.B., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.57-59, Extended abstract. 8 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.
Ice sheets, Ice shelves, Glacier flow, Glacier beds, Glacier friction, Tides, Icequakes, Earthquakes, Seismic velocity, Antarctica—West Antarctica
The seismicity rate beneath the downglacier 85 km of ice stream C, West Antarctica is modulated by the tide. The tide beneath the Ross Ice Shelf modifies the force balance of the ice stream basal environment enough to change the rate of basal microearthquake generation by an order of magnitude. This tidal forcing travels up the ice stream as an attenuating wave at approximately 1.6 m/s and is detectable 85 km from the grounding line. (Auth. mod.)

52-2116

Late Holocene advance and retreat of tidewater glaciers in Yakutat Bay and Icy Bay, Gulf of Alaska.

Barclay, D., Gloss, J., Calkin, P., Wiles, G., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.61-66, 8 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Calving, Glacier surges, Glacial geology, Marine geology, Paleoclimatology, United States—Alaska—Yakutat Bay, United States—Alaska—Icy Bay

52-2117

Le Conte Glacier, Alaska: surface elevation changes and calving retreat.

Echelmeyer, K., Motyka, R.J., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.67-70, 1 ref. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier surveys, Glacier oscillation, Glacier thickness, Glacier surfaces, Calving, Aerial surveys, United States—Alaska—Frederick Sound

52-2118

Synthetic aperture radar (SAR) observations of calving glaciers.

Forster, R.R., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.71-76, 15 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier surveys, Glacier oscillation, Glacier thickness, Glacier surfaces, Glacier flow, Calving, Topographic surveys, Synthetic aperture radar, Spaceborne photography

52-2119

Relationship between calving rates, ice velocities and water depths.

Hughes, T.J., Fastook, J.L., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.77-84, 11 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Volcanoes, Cirque glaciers, Glacier flow, Glacier surges, Glacier friction, Glacier tongues, Ice creep, Crevasses, Basal sliding, Calving, Mathematical models, Antarctica—Deception Island

Volcanic eruptions occurred on Deception I., a collapsed volcanic caldera off the Antarctic Peninsula, in 1967, 1969, and 1970. The 1970 eruption produced several craters, one of which was 300-500 m in diameter, with a calving ice wall from 50-100 m high at the terminus of a glacier about 1500 m long which calved into the crater lake. Between austral summer 1972-73 and 1973-74, the upglacier ice wall advanced 200 m into the crater and lowered from 100 m to about 60 m. The calving rates and ice velocities vary with the water depths of the crater lake.

52-2120

Tidewater terminus dynamics in Glacier Bay, Alaska.

Hunter, L.E., MP 5085, *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.85-94, 23 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier surveys, Glacier oscillation, Glacier flow, Glacier friction, Glacier beds, Glacier tongues, Calving, Sediment transport, Moraines, United States—Alaska—Glacier Bay

Asynchronous and complex behavior of glaciers with tidewater termini can often be attributed to the glacier's response to calving. Any external forcing that can cause the balance between the terminal ice flux and calving flux to shift can influence advance, retreat and stillstand phases. Recent studies in Glacier Bay, Alaska, document periods of terminus stabilization and moraine formation. In this paper, the recent histories of Grand Pacific and Muir glaciers are presented. Grand Pacific Glacier advanced through most of the last half century while Muir Glacier only recently stabilized after 100 years of retreat. Their dynamics appear unrelated to climatic forcing, but instead reflect internal adjustments to calving and glacier dynamics.

52-2121

Hans Glacier—a tidewater glacier in southern Spitsbergen: summary of some results.

Jania, J., Kaczmarska, M., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.95-104, 17 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier flow, Glacier tongues, Glacier surges, Calving, Norway—Spitsbergen

52-2122

Documentation of the retreat of Columbia Glacier, Alaska.

Krimmel, R.M., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.105-108, Extended abstract. 4 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier surveys, Glacier oscillation, Glacier flow, Calving, United States—Alaska—Columbia Glacier

52-2123

Iceberg discharge process: observations and inferences drawn from the study of Columbia Glacier.

Meier, M.F., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.109-114, 20 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier surveys, Glacier oscillation, Glacier flow, Glacier tongues, Calving, Icebergs, United States—Alaska—Columbia Glacier

52-2124

Deep-water calving at Le Conte Glacier, Southeast Alaska.

Motyka, R.J., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.115-118, Extended abstract. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier tongues, Calving, Icebergs, United States—Alaska—Frederick Sound

52-2125

Taku Glacier, Alaska: advance and growth of a tidewater glacier.

Motyka, R.J., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.119-120, Extended abstract. 3 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Glacier flow, Glacier tongues, Calving, United States—Alaska—Glacier Bay

52-2126

Passive and active iceberg producing glaciers.

Post, A., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.121-135, 6 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier flow, Glacier friction, Glacier surges, Calving, Icebergs

52-2127

Seasonal variations in terminus position of Jakobshavn Glacier, West Greenland.

Sohn, H.G., Jezek, K.C., Van der Veen, C.J., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.137-140, 11 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Glacier flow, Glacier tongues, Calving, Icebergs, Seasonal variations, Greenland

52-2128

Using low-altitude meteorological observations to calculate the mass balance of Alaska's Columbia Glacier and relate it to calving and speed.

Tangborn, W.V., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.141-161, 24 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Glacial meteorology, Glacial hydrology, Glacier mass balance, Glacier flow, Calving, Subglacial drainage, Runoff, Computerized simulation, United States—Alaska—Columbia Glacier

52-2129

Controls on the position of iceberg-calving fronts.

Van der Veen, C.J., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.163-172, 16 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Glacial meteorology, Glacial hydrology, Glacier mass balance, Glacier flow, Glacier tongues, Calving, Icebergs

52-2130

Backstress: what it is and how it affects glacier flow.

Van der Veen, C.J., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.173-180, 9 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Glacier flow, Glacier beds, Glacier friction, Glacier tongues, Ice shelves, Calving, Mathematical models, Antarctica—Ross Ice Shelf, Antarctica—Antarctic Peninsula

On ice shelves, backstress includes all resistance to flow associated with lateral and basal drags, whereas on grounded glaciers, backstress is associated with resistance to flow from gradients in longitudinal stress. Measurements of surface velocity indicate that the flow of the Ross Ice Shelf is largely controlled by backstress emanating from the sides where the shelf is bordered by the Transantarctic Mountains. On the smaller ice shelves in the Antarctic Peninsula, backstress from pinning points and ice rises appears to be important in (temporarily) stabilizing the calving terminus. (Auth. mod.)

52-2131

Evidence for bottom crevasse formation on Columbia Glacier, Alaska, U.S.A.

Venteris, E.R., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.181-185, 10 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Glacier flow, Glacier friction, Glacier beds, Crevasses, Subglacial caves, Calving, United States—Alaska—Columbia Glacier

52-2132

Backstress on Columbia Glacier.

Whillans, I.M., Venteris, E.R., *Ohio State University. Byrd Polar Research Center. BPRC report,* 1997, No.15, Calving glaciers. Edited by C.J. Van der Veen, p.187-194, 7 refs. Presented at a workshop, Feb. 28-Mar. 2, 1997.

Glacier oscillation, Glacier flow, Glacier friction, Glacier beds, Glacier surges, Glacier tongues, Calving, United States—Alaska—Columbia Glacier

52-2133

^{10}Be and dust.

Baumgartner, S., et al, *Nuclear instruments & methods in physics research B,* Mar. 1997, 123(1-4), International Conference on Accelerator Mass Spectrometry, 7th, Tucson, AZ, May 20-24, 1996. Proceedings, p.296-301, 18 refs.

Pleistocene, Sediment transport, Dust, Metals, Aerosols, Ice cores, Ice composition, Adsorption, Precipitation (meteorology), Isotope analysis, Solubility

52-2134

Integration of Landsat TM, SPOT PLA, and ERS-1 C-band SAR for coastal studies in the Mackenzie River delta, NWT, Canada: a preliminary assessment.

Tittley, B., Solomon, S.M., Bjerkelund, C., Thematic Conference on Remote Sensing for Marine and Coastal Environments, 2nd, New Orleans, LA, Jan. 31-Feb. 2, 1994. Proceedings. Needs, solutions, and applications, Vol.1, Ann Arbor, Environmental Research Institute of Michigan, 1994, p.I-225-I-236, 13 refs.

DLC GC1081.T47 1994 Vol.1

Remote sensing, Spaceborne photography, Geophysical surveys, Permafrost surveys, Arctic landscapes, Synthetic aperture radar, LANDSAT, Shore erosion, Deltas, Image processing, Classifications, Canada—Northwest Territories—Mackenzie Delta

52-2135

Use of satellite imagery for conducting scientific drilling operations in the Arctic.

Pollard, E.C., Jr., Grout, R.M., Rabinowitz, P.D., Francis, T.J.G., Baldauf, J.G., Thematic Conference on Remote Sensing for Marine and Coastal Environments, 2nd, New Orleans, LA, Jan. 31-Feb. 2, 1994. Proceedings. Needs, solutions, and applications, Vol.1, Ann Arbor, Environmental Research Institute of Michigan, 1994, p.I-306-I-322, 13 refs.

DLC GC1081.T47 1994 Vol.1

Offshore drilling, Subpolar regions, Geophysical surveys, Sea ice distribution, Ice detection, Ice navigation, Spaceborne photography, Exploration, Arctic Ocean

52-2136

Operational real-time airborne electromagnetic measurement of sea ice thickness.

Holladay, J.S., Stewart, C.J., Thematic Conference on Remote Sensing for Marine and Coastal Environments, 2nd, New Orleans, LA, Jan. 31-Feb. 2, 1994. Proceedings. Needs, solutions, and applications, Vol.1, Ann Arbor, Environmental Research Institute of Michigan, 1994, p.I-356-I-367, 11 refs.

DLC GC1081.T47 1994 Vol.1

Geophysical surveys, Sea ice, Ice surveys, Ice cover thickness, Helicopters, Sounding, Sensors, Performance, Specifications

52-2137

U.S. Coast Guard's initial use of a modern environmental satellite receiving system on polar icebreakers.

Jendro, L.M., Bernstein, R.L., Thematic Conference on Remote Sensing for Marine and Coastal Environments, 2nd, New Orleans, LA, Jan. 31-Feb. 2, 1994. Proceedings. Needs, solutions, and applications, Vol.2, Ann Arbor, Environmental Research Institute of Michigan, 1994, p.II-201-II-212, 2 refs.

DLC GC1081.T47 1994 Vol.2

Spaceborne photography, Sea ice distribution, Ice surveys, Ice navigation, Ice reporting, Telemetering equipment, Icebreakers, Resolution

52-2138

Normal temperature and ice cover of the Great Lakes.

Schneider, K., Assel, R.A., Croley, T.E., II, Thematic Conference on Remote Sensing for Marine and Coastal Environments, 2nd, New Orleans, LA, Jan. 31-Feb. 2, 1994. Proceedings. Needs, solutions, and applications, Vol.2, Ann Arbor, Environmental Research Institute of Michigan, 1994, p.II-325-II-335, 25 refs.

DLC GC1081.T47 1994 Vol.2

Climatology, Atmospheric boundary layer, Surface temperature, Lake ice, Mapping, Ice air interface, Computer programs, Spaceborne photography, Image processing, Correlation, United States—Great Lakes

52-2139

RADARSAT simulations of sea ice monitoring image products.

Ramsay, B., Manore, M., Porter, K., Bretz, T., Clark, K., Thematic Conference on Remote Sensing for Marine and Coastal Environments, 2nd, New Orleans, LA, Jan. 31-Feb. 2, 1994. Proceedings. Needs, solutions, and applications, Vol.2, Ann Arbor, Environmental Research Institute of Michigan, 1994, p.II-371-II-380, 7 refs.

DLC GC1081.T47 1994 Vol.2

Spaceborne photography, Synthetic aperture radar, Geophysical surveys, Sea ice distribution, Ice surveys, Ice navigation, Image processing, Simulation, Resolution

52-2140

Estimating seasonal values of thermal diffusivity in thawed and frozen soils using temperature time series.

Hinkel, K.M., *Cold regions science and technology,* Sep. 1997, 26(1), p.1-15, 23 refs.

Frozen ground thermodynamics, Thermal regime, Thermal diffusion, Active layer, Ground thawing, Thaw depth, Permafrost thermal properties, Soil temperature, Temperature measurement, Temperature variations, Accuracy

52-2141

Numerical simulation of ice transport over the Lake Erie-Niagara River ice boom.

Shen, H.T., Lu, S., Crissman, R.D., *Cold regions science and technology,* Sep. 1997, 26(1), p.17-33, 16 refs. For another version see 51-1375.

River flow, River ice, Ice booms, Cables (ropes), Ice solid interface, Ice loads, Floating structures, Ice control, Hydrodynamics, Performance, Design, Mathematical models, Erie, Lake, United States—New York—Niagara River

52-2142

Modern Alpine ski.

Glenne, B., DeRocco, A., Vandergrift, J., *Cold regions science and technology,* Sep. 1997, 26(1), p.35-38, 12 refs.

Skis, Performance, Mechanical properties, Snow mechanics, Ice solid interface, Loads (forces), Design, Modification

52-2143

Influence of variable-thickness ice on the loads exerted on sloping structures.

Timco, G.W., Cornett, A.M., *Cold regions science and technology,* Sep. 1997, 26(1), p.39-53, 8 refs. For another version see 51-3187.

Sea ice, Ice loads, Ice mechanics, Loads (forces), Offshore structures, Ice solid interface, Ice override, Topographic effects, Ice cover thickness, Flexural strength, Mechanical tests, Forecasting

52-2144

Eccentric impact of an ice feature: non-linear model.

Matskevitch, D.G., *Cold regions science and technology,* Sep. 1997, 26(1), p.55-66, 6 refs.

Ice mechanics, Icebergs, Offshore structures, Ice solid interface, Ice loads, Fracture zones, Impact strength, Dynamic loads, Topographic effects, Mathematical models

52-2145

On creep deformation at plane contact problems.

Larsson, P.L., *Cold regions science and technology,* Sep. 1997, 26(1), p.67-82, 22 refs.

Icebergs, Ice mechanics, Offshore structures, Ice solid interface, Stress concentration, Ice creep, Ice deformation, Mathematical models, Rheology, Theories

52-2146

Analysis of primary creep of S2 fresh-water and saline ice.

Abdel-Tawab, K., Rodin, G.J., *Cold regions science and technology,* Sep. 1997, 26(1), p.83-96, 41 refs.

Floating ice, Ice mechanics, Ice creep, Ice deformation, Ice microstructure, Ice crystal structure, Orientation, Stresses, Elastic properties, Mathematical models

52-2147

Isotopic composition of vent discharge from the Matanuska Glacier, Alaska: implications for the origin of basal ice.

Titus, D.D., East Lansing, Michigan State University, 1997, 35p., University Microfilms order No.1385103, M.S. thesis. 25 refs.

Mountain glaciers, Glacier surveys, Glacial hydrology, Glacier beds, Glacial till, Glacier alimentation, Regelation, Glacier ice, Ice composition, Subglacial drainage, Meltwater, Water chemistry, Isotope analysis, United States—Alaska—Matanuska Glacier

52-2148

Photogrammetric examination of the calving dynamics of Jakobshavns Isbræ, Greenland.

Prescott, P.R., Orono, University of Maine, 1995, 107p., University Microfilms order No.9533879, Ph.D. thesis. Refs. p.94-101.

Ice sheets, Glacier surveys, Glacier flow, Glacier friction, Glacier tongues, Calving, Icebergs, Paleoclimatology, Global change, Photogrammetric surveys, Mathematical models, Statistical analysis, Greenland

52-2149

Neoglacial fluctuations of terrestrial, tidewater, and calving lacustrine glaciers, Blackstone-Spencer Ice Complex, Kenai Mountains, Alaska.

Crossen, K.J., Seattle, University of Washington, 1997, 208p., University Microfilms order No.9736255, Ph.D. thesis. Refs. p.148-161.

Glacier surveys, Mountain glaciers, Alpine glaciation, Glacial geology, Glacial meteorology, Glacier oscillation, Moraines, Soil dating, Paleobotany, Paleoclimatology, Geochronology, United States—Alaska—Kenai Mountains

52-2150

Operational experience and expertise of hulls reliability of "Samotlor" type polar tankers.

Kulesh, V.A., Vorontsov, I.A., Popova, N.IU., Mostovoĭ, V.V., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Supplement, New York, American Society of Mechanical Engineers, 1997, p.1-14, 5 refs.

Tanker ships, Ice navigation, Ice loads, Metal ice friction, Ice pressure, Safety, Design criteria

52-2151

Interaction between landfast sea ice and a drilling platform.

Smirnov, V.N., Shushlebin, A.I., Sheĭkin, I.B., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Supplement, New York, American Society of Mechanical Engineers, 1997, p.15-20, 4 refs.

Offshore structures, Fast ice, Ice solid interface, Ice loads, Ice pressure, Ice friction, Stress strain diagrams, Russia, Barents Sea

52-2152

Cyclic effects in sea ice floes.

Smirnov, V.N., Sheĭkin, I.B., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Supplement, New York, American Society of Mechanical Engineers, 1997, p.21-26, 22 refs.

Offshore structures, Ice floes, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice deformation, Dynamic loads

52-2153

Proceedings. Volume IV. Arctic/polar technology.

International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997, Yamaguchi, H., ed, Izumiyama, K., ed, Sodhi, D.S., ed, Nixon, W.A., ed, Kitagawa, H., ed, MP 5086, New York, American Society of Mechanical Engineers, 1997, 478p., Refs. passim. For individual papers see 52-2154 through 52-2213.

Ice loads, Ice pressure, Ice friction, Ice solid interface, Ice cover strength, Ice deformation, Ice breaking, Ice navigation, Metal ice friction, Icebreakers, Ships, Offshore structures

52-2154

Future joint conference.

Sodhi, D.S., MP 5087, International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.1, Abstract only.

Research projects, Organizations, International cooperation, Meetings, Ice mechanics

52-2155

POAC and Northern Sea Route.

Kitagawa, H., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.3-7, 11 refs.

Research projects, International cooperation, Meetings, Route surveys, Ice navigation, Ice routing, Northern Sea Route

52-2156

Northern Sea Route ice monitoring by satellite radar data.

Johannessen, O.M., Sandven, S., Pettersson, L.H., Miles, M.W., Melent'ev, V.V., Bobylev, L.P., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.9-17, 7 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice forecasting, Ice reporting, Ice navigation, Ice routing, Synthetic aperture radar, Spaceborne photography, Northern Sea Route

52-2157

Statistical modeling of reliability and risk of shipping in ice along the NSR.

Buzuev, A.IA., Fediakov, V.E., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.19-23, 9 refs.

Ice navigation, Ice routing, Ice reporting, Ice forecasting, Ice conditions, Statistical analysis, Northern Sea Route

52-2158

R&D project of the ice-breaking cargo ship for the Northern Sea Route.

Izumiyama, K., Uto, S., Tamura, K., Kishi, S., Ishikawa, S., Yamaguchi, H., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.25-32, 9 refs.

Ships, Icebreakers, Ice navigation, Ice loads, Metal ice friction, Design criteria, Environmental tests, Northern Sea Route

52-2159

Perspectives of underwater transport system and underwater technologies for the Arctic.

Kuteĭnikov, A.V., Chernousov, V.V., Dronov, B.F., Tsagarely, D.V., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.33-42, 9 refs.

Submarines, Subglacial navigation, Marine transportation, Petroleum transportation, Petroleum industry, Economic development, Russia

52-2160

Application of an empirical-statistical model of ship motion in ice to new types of icebreakers and ships.

Brovin, A.I., Kliachkin, S.V., Bhat, S.U., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.43-49, 12 refs.

Icebreakers, Tanker ships, Petroleum transportation, Ice navigation, Ice loads, Metal ice friction, Design criteria, Statistical analysis, Russia

52-2161

Influence of bow shape on icebreaking resistance in low speed range.

Yamaguchi, H., Suzuki, Y., Uemura, O., Kato, H., Izumiyama, K., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.51-61, 22 refs.

Ships, Ice navigation, Ice solid interface, Metal ice friction, Ice cover strength, Ice loads, Ice deformation, Ice cracks, Ice breaking, Environmental tests, Mathematical models, Design

52-2162

On the icebreaking forces and resistance of a ship advancing in level ice.

Valanto, P., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.63-71, 8 refs.

Ships, Ice navigation, Ice solid interface, Ice loads, Metal ice friction, Ice cover strength, Ice deformation, Ice breaking, Mathematical models

52-2163

On the ship resistance under the design waterline in the continuous mode of icebreaking in level ice.

Puntigliano, F.M., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.73-82, 9 refs.

Icebreakers, Ice breaking, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Environmental tests, Mathematical models

52-2164

Development of a 60,000 DWT arctic tanker hull form.

Kato, K., Kumakura, Y., Toyota, M., Forse'n, A.C., Wilkman, G., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.83-89, 3 refs.

Icebreakers, Tanker ships, Ice breaking, Ice navigation, Metal ice friction, Ice loads, Environmental tests, Design criteria

52-2165

Investigation of ice load-carrying capacity of ship hull ice belt framing in elastic-plastic stage.

Babtsev, V.A., Kul'tsep, A.V., Triaskin, V.N., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.91-97, 1 ref.

Ships, Ice navigation, Ice solid interface, Ice loads, Ice pressure, Metal ice friction, Structural analysis, Plastic deformation, Ultimate strength, Design criteria

52-2166

On the structural analysis of icebreaker midship shell structure.

Furness, P.A., Aksu, S., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.99-108, 9 refs.

Icebreakers, Ice solid interface, Metal ice friction, Ice loads, Ice cover strength, Ice deformation, Ice breaking, Structural analysis, Mathematical models, Design criteria

52-2167

Experimental approach to the interaction between nozzle-propeller and ice block.

Tamura, K., Kato, H., Yamaguchi, H., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.109-118, 13 refs.

Ships, Propellers, Ice navigation, Ice solid interface, Metal ice friction, Ice loads, Ice pressure, Ice cover strength, Ice breaking, Hydrodynamics, Cavitation, Impact tests

52-2168

Predictions of hydrodynamic and ice contact loads on ice-class screw propellers.

Veitch, B., Bose, N., Meade, C., Liu, P.F., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.119-125, 25 refs.

Ships, Propellers, Ice navigation, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Hydrodynamics, Cavitation, Computerized simulation

52-2169

Effect of ice drift angle on a mooring hawser.

Spencer, D.S., Jones, S.J., Jolles, W.H., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.127-133, 4 refs.

Tanker ships, Moorings, Ice floes, Drift, Ice solid interface, Ice loads, Ice control, Environmental tests

52-2170

Simulation model for a turret moored tanker in pack ice cover.

Murray, J.J., Spencer, D.S., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.135-146, 5 refs.

Tanker ships, Moorings, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Ocean waves, Hydrodynamics, Computerized simulation

52-2171

Estimate of the probability of Kara ice occurrence in the vicinity of the Prirazlomnoye oil field in the Pechora Sea.

Mironov, E.U., Lebedev, A.A., Tiuriakov, A.B., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.147-150, 6 refs.

Ice surveys, Sea ice distribution, Ice cover thickness, Ice conditions, Drift, Ice forecasting, Atmospheric circulation, Ocean currents, Statistical analysis, Russia—Kara Sea, Barents Sea

52-2172

Influence of porosity on mechanical strength of hummocks.

Rogachko, S.I., Evdokimov, G.N., Mel'nikov, M.V., Kärnä, T., Lehmus, E., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.151-157, 9 refs.

Ice cover strength, Ice deformation, Ice loads, Ice pressure, Pressure ridges, Hummocks, Ice density, Porosity

52-2173

Probabilistic model of ice loads on Russian arctic offshore structures.

Bol'shev, A.S., Chasovskikh, E.V., Frolov, S.A., Shkhinek, K.N., Kärnä, T., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.159-164, 5 refs.

Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice deformation, Building codes, Design criteria, Mathematical models, Statistical analysis, Russia

52-2174

Metocean parameters of the Barents and Kara Seas—an overview.

Strass, P., Løset, S., Shkhinek, K.N., Gudmestad, O.T., Kärnä, T., Mikhalenko, E.B., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.165-172, 15 refs.

Marine meteorology, Ocean currents, Ocean waves, Wind velocity, Wind direction, Air temperature, Barents Sea, Russia—Kara Sea

52-2175

Ice conditions in the Barents and Kara Seas.

Løset, S., Shkhinek, K.N., Strass, P., Gudmestad, O.T., Mikhalenko, E.B., Kärnä, T., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.173-181, 38 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Icebergs, Pressure ridges, Fast ice, Drift, Barents Sea, Russia—Kara Sea

52-2176

Potential structures for the Russian arctic offshore.

Shkhinek, K.N., et al, International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.183-190, 8 refs.

Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice breaking, Ice control, Barents Sea, Russia—Kara Sea

52-2177

Model tests in ice of a Submerged Turret Loading (STL) concept.

Løset, S., Kanestrøm, Ø., Pytte, T., Evers, K.U., Jochmann, P., Sandvik, P.C., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.191-200, 9 refs.

Tanker ships, Moorings, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Ice cover strength, Ice breaking, Environmental tests

52-2178

Full scale experiments of patrol vessels of Japan Maritime Safety Agency in the Okhotsk Sea ice.

Kano, T., Majima, T., Uto, S., Izumiyama, K., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.201-208, 11 refs.

Ships, Icebreakers, Ice navigation, Ice breaking, Japan—Hokkaido, Okhotsk Sea

52-2179

On the evaluation of resistance of vessels in level ice through stopping performance tests.

Kano, T., Majima, T., Uto, S., Izumiyama, K., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.209-215, 4 refs.

Ships, Icebreakers, Ice navigation, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Performance

52-2180

Measurement of sea ice conditions and maneuvrability of icebreaker "PLH Soya" at the Sea of Okhotsk.

Shimoda, H., Uto, S., Yoshida, M., Koyama, K., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.217-224, 12 refs.

Ships, Ice navigation, Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Japan—Hokkaido, Okhotsk Sea

52-2181

Model-ship comparison of propulsive performance of icebreaker "PM Teshio" in continuous icebreaking mode.

Uto, S., Shimoda, H., Izumiyama, K., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.225-232, 9 refs.

Icebreakers, Propellers, Ice navigation, Ice breaking, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Environmental tests, Mathematical models

52-2182

Ramming performance of the patrol icebreaker "PM Teshio" in full scale and model scale.

Kishi, S., Kawashima, Y., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.233-238, 14 refs.

Icebreakers, Ships, Ice navigation, Ice solid interface, Ice loads, Metal ice friction, Ice pressure, Ice breaking

52-2183

Technique of determination of design parameters of hummocks.

Beketskiĭ, S.P., Astaf'ev, V.N., Bogdanchikov, S.M., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.239-244, 2 refs.

Ice cover strength, Ice cover thickness, Ice deformation, Ice loads, Ice pressure, Pressure ridges, Hummocks, Offshore structures, Design criteria, Russia—Sakhalin Island, Okhotsk Sea

52-2184

Indentation test with vertically placed ice sheet.

Kamesaki, K., Tsukuda, H., Yamauchi, Y., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.245-250, 8 refs.

Ice solid interface, Ice cover strength, Ice loads, Ice friction, Ice pressure, Ice deformation, Ice breaking, Offshore structures, Environmental tests

52-2185

Comparison of compressive strength of columnar natural sea ice parallel and perpendicular to the C-axis.

Lehmus, E., Kärnä, T., Tanabe, A., Yoshizawa, M., Ishibashi, Y., Sackinger, W., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.251-256, 21 refs.

Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Strain tests

52-2186

Tensile strength of natural sea ice in horizontal loading parallel to the C-axis.

Lehmus, E., Kärnä, T., Tanabe, A., Yoshizawa, M., Ishibashi, Y., Sackinger, W., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.257-261, 9 refs.

Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Strain tests

52-2187

Modelling of the fracture surface of an ice block failing against a structure.

Tuhkuri, J.A., Gol'dshteĭn, R.V., Osipenko, N.M., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.263-269, 17 refs.

Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Ice cracks, Crack propagation, Mathematical models

52-2188

Bulk salinity of arctic and antarctic sea ice versus thickness.

Kovacs, A., MP 5088, International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.271-281, 84 refs.

Sea water freezing, Ice water interface, Ice structure, Ice composition, Ice growth, Ice cover thickness, Ice salinity, Core samplers, Brines, Mathematical models, Statistical analysis

Mathematical expressions have been established for estimating the bulk salinity of arctic and antarctic sea ice vs. ice floe thickness. The ice salinity vs. thickness relationships are based on data for over 400 sea ice cores compiled from numerous sources. The results show that the bulk salinity of first-year sea ice decreases in an exponential trend with ice sheet thickness. A similar trend reoccurs as the winter ice passes through the melt season. The expression for the bulk salinity S_B in per mill for first-year sea ice from 10 to 200 cm thick is $S_B=4.606+91.603/T_F$, where T_F is the ice floe thickness in centimeters. (Auth.)

52-2189

Strain measurements in ice roads.

Fransson, L.Å., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.283-288, 9 refs.

Ice roads, Ice (construction material), Ice strength, Trafficability, Stress strain diagrams, Strain tests

52-2190

Experience of a new model ice (MARC FG) material at the Krylov Shipbuilding Research Institute (KSRI) ice basin.

Wilkman, G.W., Mattsson, T.C., Ponomarev, A.V., Beliashov, V.A., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.289-295, 4 refs.

Artificial ice, Ice strength, Icebreakers, Ships, Ice breaking, Laboratories, Organizations, Test chambers, Environmental tests, International cooperation, Finland, Russia

52-2191

Interfacial fracture energy of spray ice.

Nixon, W.A., Shi, Z., Wei, Y.C., Whelan, A.E., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.297-300, 10 refs.

Ice solid interface, Ice accretion, Ice adhesion, Spray freezing, Ice strength, Ice removal, Ice breaking, Strain tests

52-2192

Seismic response of offshore platforms in ice-covered seas. Part 1: dynamic ice-structure interaction.

Adachi, H., Yashima, N., Nakanishi, M., Sato, K., Takada, Y., Okamoto, N., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.301-306, 24 refs.

Offshore structures, Ice solid interface, Ice loads, Ice cover effect, Earthquakes, Hydrodynamics, Damping, Mathematical models

52-2193

Seismic response of offshore platforms in ice-covered seas. Part 2: seismic response analysis of offshore platforms.

Adachi, H., et al, International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.307-312, 20 refs.

Offshore structures, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Earthquakes, Ice cover effect

52-2194

Study of ice-induced vibrations using a segmented, elastic model of the Molikpaq.

Timco, G.W., Cornett, A.M., Singh, S.K., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.313-320, 10 refs.

Offshore structures, Caissons, Ice solid interface, Ice loads, Ice pressure, Ice friction, Dynamic loads, Structural analysis, Environmental tests

52-2195

Low temperature fatigue crack propagation behaviour of offshore structural steel A131 under random ice loadings.

Duan, M.L., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.321-328, 22 refs.

Offshore structures, Steel structures, Steels, Ice solid interface, Ice loads, Ice pressure, Ice friction, Fatigue (materials), Cracking (fracturing), Crack propagation, Computerized simulation, Design criteria

52-2196

Modelling the forces exerted by pack ice consisting of small floes.

McKenna, R.F., Spencer, D.S., Lau, M., Walker, D., Crocker, G.B., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.329-338, 17 refs.

Pack ice, Ice floes, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Mathematical models, Computerized simulation

52-2197

Experimental measurements of ice loads and ice-induced moments on an arctic structure.

Kato, K., Kishimoto, H., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.339-345, 7 refs.

Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice friction, Environmental tests, Mathematical models

52-2198

Modelling unconsolidated rubble forces on a cylindrical structure.

McKenna, R.F., Bruneau, S.E., Guzzwell, J.A., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.347-353, 12 refs.

Offshore structures, Ice pileup, Pressure ridges, Ice solid interface, Ice loads, Ice pressure, Ice friction, Environmental tests

52-2199

Ice rubble build-up on conical structures during ridge interactions.

McKenna, R.F., Bruneau, S.E., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.355-364, 16 refs.

Offshore structures, Piers, Ice pileup, Pressure ridges, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Environmental tests

52-2200

Numerical simulation of ridge and sheet ice loads on a proposed faceted conical structure.

Wang, Z.G., Muggeridge, D.B., Jones, S.J., Swamidas, A.S.J., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.365-372, 13 refs.

Offshore structures, Pressure ridges, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice breaking, Computerized simulation

52-2201

Refined ice/structure interaction model based on observations in the Gulf of Bothnia.

Engelbrektson, A., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.373-376, 2 refs.

Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice friction, Bothnia, Gulf

52-2202

Steel gravity-based structures for iceberg-infested waters.

Fitzpatrick, J., Kennedy, K.P., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.377-391, 6 refs.

Offshore structures, Steel structures, Icebergs, Ice solid interface, Ice loads, Ice pressure, Ice friction, Mathematical models, Design criteria, Cost analysis, Canada—Newfoundland—Grand Banks

52-2203

Model development of vessel approach and mooring operations at arctic loading terminals.

Jolles, W.H., Browne, R.P., Keinonen, A.J., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.393-400, 11 refs.

Tanker ships, Icebreakers, Offshore structures, Moorings, Ice navigation, Ice solid interface, Ice loads, Ice pressure, Metal ice friction, Environmental tests

52-2204

Ice conditions of navigation in the central Arctic Ocean.

Frolov, S.V., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.401-406, 10 refs.

Icebreakers, Ice navigation, Ice routing, Route surveys, Ice conditions, Sea ice distribution, Ice cover thickness

52-2205

Cantilever beam testing of freshwater ice in a centrifuge.

Barrette, P.D., Phillips, R., Clark, J.I., Crocker, G.B., Jones, S.J., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.407-413, 23 refs.

Artificial ice, Ice cover strength, Ice loads, Ice elasticity, Flexural strength, Test equipment, Strain tests, Environmental tests

52-2206

Pack ice pressure forecasting for arctic and subarctic regions.

Abdelnour, R., Comfort, G., Singh, S., Paterson, B., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.415-422, 27 refs.

Pack ice, Ice cover strength, Ice cover thickness, Ice loads, Ice pressure, Ice friction, Pressure ridges, Ice forecasting, Mathematical models, Computerized simulation

52-2207

Correlation of ice crushing forces in segments of an indentor.

Sodhi, D.S., MP 5089, International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.423-430, 22 refs.

Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Penetration tests, Impact tests, Environmental tests, Mathematical models, Statistical analysis

Indentation tests were conducted by pushing segmented indentors into the edges of freshwater ice sheets at different velocities. Ice crushing forces were measured independently in each segment. The results of these tests indicate that there is simultaneous generation of forces on all segments during low-velocity indentation, whereas there is a non-simultaneous force acting on the segments during high-velocity indentation. For brittle crushing of ice at a high indentation rate, the effective pressures measured during these tests are in the range of pressures measured in the field during the impact of ice floes against large structures. Under the assumption that the size of crushing zones becomes small with increasing indentation speed, a statistical model is used to determine the correlation between the forces measured in different segments in terms of a correlation length parameter. Comparing the trends in the plots of experimental data with theoretical results shows that the correlation length parameter decreases as the reciprocal of the indentation velocity. Under the assumption of the similarity principle, according to replica modeling, an estimate of the correlation length parameter is empirically obtained in terms of ice thickness and indentation velocity.

52-2208

Ice loading on a compliant indentor.

Izumiyama, K., Uto, S., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.431-436, 15 refs.

Ice solid interface, Ice loads, Ice pressure, Ice friction, Damping, Penetration tests, Impact tests, Environmental tests

52-2209

Model tests of non-uniform ice interacting with an upward breaking slope.

Timco, G.W., Cornett, A.M., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.437-442, 10 refs.

Ice solid interface, Ice cover strength, Ice cover thickness, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Strain tests, Environmental tests

52-2210

API and CSA design ice forces.

Nevel, D.E., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.443-450.

Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice friction, Design criteria, Mathematical models, Statistical analysis

52-2211
On a choice of rheological relations for equations of the ice cover dynamics.
Gol'dshteĭn, R.V., Marchenko, A.V., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.451-460, 13 refs.
Ice cover strength, Ice deformation, Ice loads, Ice pressure, Ice friction, Ice elasticity, Ice plasticity, Ice creep, Mathematical models

52-2212
Influence of floe shape on behavior of ice floes around a structure.
Yamaguchi, H., et al, International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.461-468, 24 refs.
Ice floes, Ice solid interface, Ice loads, Ice pressure, Ice friction, Drift, Ice deformation, Computerized simulation, Environmental tests

52-2213
Ice tank tests on marginal ice zone rheology.
Hansen, E.H., Tuhkuri, J., International Conference on Offshore Mechanics and Arctic Engineering (OMAE), 16th, and International Conference on Port and Ocean Engineering Under Arctic Conditions (POAC), 14th, Yokohama, Japan, Apr. 13-17, 1997. Proceedings. Vol.4. Edited by H. Yamaguchi, K. Izumiyama, D.S. Sodhi, W.A. Nixon, and H. Kitagawa, New York, American Society of Mechanical Engineers, 1997, p.469-475, 20 refs.
Ice edge, Ice floes, Ice loads, Ice pressure, Ice friction, Ice override, Ice deformation, Environmental tests, Computerized simulation

52-2214
Expeditions ANTARKTIS XIII/1-2 of the Research Vessel *Polarstern* in 1995-1996. [Die Expeditionen ANTARKTIS XIII/1-2 des Forschungsschiffes *Polarstern* 1995-96]
Bathmann, U., ed, Lucas, M., ed, Smetacek, V., ed, *Berichte zur Polarforschung,* 1997, No.221, 136p., In English and German. Refs. passim.
Sea ice, Icebergs, Marine biology, Plankton, Biomass, Bacteria, Ice floes, —South Atlantic Ocean, Antarctica—Neumayer Station, Antarctica—Weddell Sea
The Cruise Report comprises overviews of the Expedition from the perspectives of the ship's Captain, the science leaders, and 23 summaries of specific programs by the investigators. Strong winds and heavy seas en route from Bremerhaven, to abeam of the Iberian Peninsula, and into the South Atlantic, limited the deep ocean science programs while heavy sea ice in the southerly regions brought delays in scheduled activities which resulted in a considerable portion of the programs being deferred to later Expeditions. In spite of these setbacks, substantial amounts of data were obtained in hydrography, biology, primary productivity, water chemistry, and photosynthesis, among others.

52-2215
Expedition ANTARKTIS XIII/3 (EASIZ I) of *Polarstern* to the eastern Weddell Sea in 1996.
Arntz, W., ed, Gutt, J., ed, *Berichte zur Polarforschung,* 1997, No.249, 148p., Refs. passim.
Icebergs, Marine biology, Ice scoring, Antarctica—Weddell Sea, Antarctica—Atka Iceport, Antarctica—Norwegia, Cape
Polarstern cruise ANT XIII/3, as the first cruise of the EASIZ (Ecology of the Sea ice Zone) program, was planned to make a contribution to the ecological study of the high antarctic shelf of the Weddell Sea. From the proposals of the participants several focal research themes emerged: resilience of antarctic benthic communities following disturbance by iceberg scouring; pelago-benthic coupling and the role of suspension feeders; population dynamics, reproductive biology and ecophysiology of benthic fish and fish key species; biodiversity within high antarctic benthic communities from ROV sequences and trawl samples; occurrence and characteristics of meiobenthic drift fauna; and food availability and characteristics of pelagic food for Weddell seals and Emperor penguins in the Drescher Inlet area. (Auth.mod.)

52-2216
Annual report 1996-97.
Australia. Cooperative Research Centre for the Antarctic and Southern Ocean Environment. (Antarctic CRC), Hobart, Tasmania, 1997, 80p., Refs. p.44-53.
Research projects, International cooperation, Sea ice, Global change, Climatic changes
This report describes the Antarctic CRC's research activities and objectives, its structure and management, the aims and progress in southern ocean processes research and the research sub-programs, commercialization, scholarships provided to students of the Institute of Antarctic and Southern Ocean Studies and to other higher degree students, and cooperative linkages. The report also provides information on the Antarctic CRC's staffing and administration, publications, public presentations, public relations and communication, its grants and awards, performance indicators, financial reports, and the audit report for the year ended June 30, 1997.

52-2217
Newsletter, No.49, June 1997.
Antarctic Society of Australia, Pymble, New South Wales, 1997, 20p.
Ozone, Polar atmospheres, Environmental protection, Global warming
This issue opens with comments on Australia's Antarctic Program in the 21st century. It continues with reviews on poultry virus infection in antarctic penguins; the toothfish "plunder" in the Subantarctic; further confirmation of global warming; more bad news on ozone depletion; greater protection of Larsemann Hills environment; tourism and miscellaneous news, including a list of forthcoming events.

52-2218
Determination of heavy metals in polar snow and ice by laser excited atomic fluorescence spectrometry with electrothermal atomization in a graphite cup.
Bolshov, M.A., Rudnev, S.N., Rudneva, A.A., Boutron, C., Hong, S.M., *Spectrochimica acta,* July 30, 1997, 52B(9-10), European Furnace Symposium, 2nd, St. Petersburg, Russia, May 1996. Selected papers, p.1535-1544, 24 refs.
Air pollution, Environmental tests, Chemical analysis, Lasers, Ice cores, Ice spectroscopy, Snow impurities, Snow composition, Aerosols, Volcanic ash, Microelement content, Sampling, Laboratory techniques

52-2219
Infrared properties of isolated water ice.
Ehrenfreund, P., Schutte, W.A., Gerakines, P., ESO Astrophysics Symposia and ESO Workshop on the Role of Dust in the Formation of Stars, Garching, Germany, Sep. 11-14, 1995. Proceedings. Edited by H.U. Käufl and R. Siebenmorgen, Berlin, Springer-Verlag, 1996, p.309-312, 11 refs.
DLC QB806.E78 1995
Extraterrestrial ice, Cosmic dust, Remote sensing, Water, Detection, Ice optics, Ice spectroscopy, Infrared spectroscopy, Radiation absorption, Spectra, Solutions, Simulation

52-2220
Laboratory experiments on CO and CO_2 ices.
Palumbo, M.E., Strazzulla, G., ESO Astrophysics Symposia and ESO Workshop on the Role of Dust in the Formation of Stars, Garching, Germany, Sep. 11-14, 1995. Proceedings. Edited by H.U. Käufl and R. Siebenmorgen, Berlin, Springer-Verlag, 1996, p.321-324, 17 refs.
DLC QB806.E78 1995
Extraterrestrial ice, Cosmic dust, Simulation, Ice physics, Carbon dioxide, Solutions, Ionization, Infrared radiation, Phase transformations, Chemical composition

52-2221
Formaldehyde and methanol dominated ices toward GL 2136.
Schutte, W.A., Gerakines, P.A., Geballe, T.R., Van Dishoeck, E.F., Greenberg, J.M., ESO Astrophysics Symposia and ESO Workshop on the Role of Dust in the Formation of Stars, Garching, Germany, Sep. 11-14, 1995. Proceedings. Edited by H.U. Käufl and R. Siebenmorgen, Berlin, Springer-Verlag, 1996, p.325-328, 10 refs.
DLC QB806.E78 1995
Extraterrestrial ice, Cosmic dust, Chemical composition, Hydrocarbons, Infrared spectroscopy, Remote sensing, Ice detection, Spectra

52-2222
Ice cocktails in molecular cloud cores.
Teixeira, T.C., Emerson, J.P., Pijpers, F.P., ESO Astrophysics Symposia and ESO Workshop on the Role of Dust in the Formation of Stars, Garching, Germany, Sep. 11-14, 1995. Proceedings. Edited by H.U. Käufl and R. Siebenmorgen, Berlin, Springer-Verlag, 1996, p.329-332, 8 refs.
DLC QB806.E78 1995
Extraterrestrial ice, Cosmic dust, Remote sensing, Ice detection, Chemical composition, Spectra, Chemical analysis

52-2223
Approximate solution of the inverse-Stephan problem in Cartesian, cylindrical and spherical geometries.
Rabin, Y., Advances in heat and mass transfer in biotechnology. Edited by L.J. Hayes. HTD-Vol.322. BED-Vol.32, New York, American Society of Mechanical Engineers, 1995, p.1-4, 7 refs.
DLC TJ260.A362 1995
Cryobiology, Frozen liquids, Phase transformations, Freezing rate, Liquid solid interfaces, Cooling rate, Stefan problem, Analysis (mathematics), Enthalpy

52-2224
Fluorometric analysis of transient solute redistribution fields during freezing of aqueous solutions.
Shabana, M.D., Rhodes, D.R., McGrath, J.J., Advances in heat and mass transfer in biotechnology. Edited by L.J. Hayes. HTD-Vol.322. BED-Vol.32, New York, American Society of Mechanical Engineers, 1995, p.75-76, 3 refs.
Cryobiology, Solutions, Freezing, Ice growth, Solubility, Phase transformations, Luminescence, Freezing front

52-2225
On the effects of microwave irradiation during cryopreservation.
Jackson, T.H., Ungan, A., Gao, D.Y., Critser, J.K., Advances in heat and mass transfer in biotechnology. Edited by L.J. Hayes. HTD-Vol.322. BED-Vol.32, New York, American Society of Mechanical Engineers, 1995, p.77-83, 13 refs.
DLC TJ260.A362 1995
Cryobiology, Solutions, Ice crystal growth, Ice prevention, Microwaves, Hydrogen bonds, Homogeneous nucleation, Nucleation rate, Molecular energy levels, Mathematical models, Theories

52-2226
Moving grid finite element model for the freezing of tissue.
Hayes, L.J., Vemaganti, K.S., Advances in heat and mass transfer in biotechnology. Edited by L.J. Hayes. HTD-Vol.322. BED-Vol.32, New York, American Society of Mechanical Engineers, 1995, p.165-177, 7 refs.
DLC TJ260.A362 1995
Cryobiology, Frozen liquids, Solutions, Salt water, Phase transformations, Liquid solid interfaces, Mathematical models, Thermal conductivity, Freezing front

52-2227
Ground freezing effects on soil erosion of Army training lands; Part 1: Initial test results.
Gatto, L.W., SR 97-15, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Aug. 1997, 32p., ADA-331 845, Refs. p.29-32.
Soil erosion, Soil freezing, Military operation, Runoff, Soil compaction, Freeze thaw cycles
Military maneuvers damage vegetation and compact and rut soils on training lands, thereby increasing the likelihood of hillslope runoff and soil erosion. Soil Freeze-Thaw (FT) processes can change the hydraulic geometry and roughness of vehicular ruts and reduce soil compaction, which often partially restores the water infiltration rate that existed before compaction. The efficiency of these FT-induced "repairs" depends on soil water content and FT intensity. Initial tests showed that 1) an experimental soil bin designed and constructed for rut experiments allows acceptable simulation of field soil FT, and 2) the hydraulic geometry of a rectangular rill in a fine silt soil with an initial volumetric water content of 36% changes dramatically due to rill sideslope slumping during thaw. Future experiments will compare differences in the response of natural rills and vehicular ruts to FT-induced soil failure, and investigate the effects of FT on soil erodibility and the influences of snow cover on soil erosion processes in the spring.

52-2228

Geophysical investigations at a buried disposal site on Fort Richardson, Alaska.

Delaney, A.J., Strasser, J.C., Lawson, D.E., Arcone, S.A., Evenson, E.B., CR 97-04, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Sep. 1997, 14p., ADA-331 135, 7 refs.

Waste disposal, Pollution, Radar echoes, Geophysical surveys, Electromagnetic prospecting, United States—Alaska—Fort Richardson

The Poleline Road Disposal Area, located on Fort Richardson, AK, was a U.S. Army dump in the early 1950s. In 1990 it was identified as an area potentially contaminated with volatile organic compounds. CRREL conducted extensive geophysical investigations that delineated anomalous responses in many areas of burial within glacial outwash deposits. Ground penetrating radar and electromagnetic induction surveys were used prior and subsequent to excavation. Geophysical data collected on a 5 m grid defined locations for several anomalous areas containing both dispersed and large, discrete targets. Radar defined anomalous areas by the concentration of strong diffractions. The induction survey differentiated metallic from nonmetallic contaminations. The interpreted maximum depth of debris was 4 m. Uncontaminated areas were generally defined by continuous, horizontal radar reflections, suggesting undisturbed or compacted soil horizons. The anomaly maps produced from these surveys guided an excavation that removed hazardous material. The removed material included munitions, mustard gas cylinders, medical waste, steel drums, and other trash. The radar and electromagnetic surveys were repeated using a more closely spaced grid to verify that the excavated areas were clean and to define more precisely anomalies in the areas not excavated. That survey shows many targets of potential or present contamination that should be removed.

52-2229

Bibliography on northern pipelines in the former Soviet Union.

Smallidge, E.R., SR 97-17, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Aug. 1997, 25p., ADA-330 750, Refs. p.4-25.

Bibliographies, Pipelines, Data processing, Gas pipelines, Crude oil, Cold weather operation, Cold weather construction, Safety, Accidents, Russia, CIS

In 1993 a pilot project between the Defense Technical Information Center and the U.S. Army Cold Regions Research and Engineering Laboratory resulted in a proposal to conduct a state-of-the-art review of technology and techniques for building, operating, and maintaining arctic natural gas and liquid petroleum pipelines in the former Soviet Union. This bibliography was compiled to meet the objectives of the pipeline review. References were compiled on dates of construction, location, route conditions, design, construction, maintenance, environmental impact, accidents, and production management. The bibliography is divided into three sections: Oil and Gas Pipelines, Construction of Oil and Gas Pipelines, and Accidents; it was compiled using commercially available databases. Subjects searched included information on pipelines in the former Soviet Union, primarily in the eastern and western areas of Siberia. References were eliminated that were not of direct interest to the pipeline study.

52-2230

Soil remediation demonstration project: biodegradation of heavy fuel oils.

Reynolds, C.M., Bhunia, P., Koenen, B.A., SR 97-20, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Aug. 1997, 8p., ADA-331 246, 7 refs.

Soil pollution, Oil spills, Land reclamation, Cold weather operation, Crude oil, Fuels, Agriculture, Cost analysis

Treatment of oil-contaminated soils is necessary to protect water supplies, human health, and environmental quality; but because of limited funds, cleanup costs are often prohibitive. High costs are exacerbated in cold regions such as Alaska, where spills are often in areas inaccessible to heavy equipment and where there is limited infrastructure. Owing to the lack of infrastructure, widespread fuel distribution systems, and the need for heating in the cold climate, there are numerous small-scale oil spills. Low-cost treatments applicable to small-scale spills are needed. The object of this CPAR project was to examine using cost-effective, on-site bioremediation techniques for heavy-oil-contaminated soil in cold regions. Both heavy-oil and diesel-contaminated soils were used to compare landfarming, a low-intensity treatment, to pile bioventing, a costlier treatment. For each soil-contaminant combination, nutrient additions were compared to a control with no nutrient additions. Under the conditions of this study, landfarming with nutrient additions was as effective for treating diesel-contaminated soil as was bioventing with nutrient additions. For heavy oils, landfarming with nutrients resulted in lower soil concentrations after one year, but differences among treatments were not statistically significant. Because landfarming does not require pumps, electricity, or plumbing, all costs are less than for bioventing. The minimal requirements for infrastructure also make landfarming attractive in remote sites typical of cold regions.

52-2231

On-site analysis of explosives in soil: evaluation of thin-layer chromatography for confirmation of analyte identity.

Nam, S.I., SR 97-21, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Aug. 1997, 14p., ADA-330 616, 34 refs. For another version see 51-5537.

Military facilities, Explosives, Waste disposal, Soil pollution, Soil tests, Soil chemistry, Soil analysis, Chemical analysis

Two colorimetric-based methods are commonly used for on-site analysis of explosives in soil. For the TNT method, acetone soil extracts are reacted with base to produce reddish-colored Janowsky ions. For RDX, acetone extracts are acidified and reacted with zinc to reduce RDX to nitrous acid, and the nitrous acid is determined by reacting the resulting solution with a Griess reagent. The TNT method is subject to interference from the presence of other polynitroaromatic compounds such as TNB, tetryl, and the isomers of DNT. Likewise, the RDX method is interfered with by the presence of other nitramines such as HMX and tetryl, and organonitrate esters such as NG, PETN, and NC. This study investigates the use of thin-layer chromatography (TLC) as a simple on-site method to confirm the identity of analytes detected using colorimetric on-site methods. Separations using both laboratory-grade and locally available solvents were developed. The major limitation of this method is detection capability, which was estimated to be about 0.1 μg of analyte. This corresponds to a concentration of 17 μg/g when using 30 μL of spotting volume, or 500 μg/g when using 1 μL of spotting volume.

52-2232

Increasing cold weather masonry construction productivity.

Korhonen, C.J., Thomas, R.D., Cortez, E.R., SR 97-16, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Aug. 1997, 53p., ADA-330 536, 5 refs.

Cold weather construction, Thermal insulation, Antifreezes, Freeze thaw cycles, Mortars, Admixtures, Standards

The thermal protection requirements for cold weather masonry, as established in current industry specifications, were evaluated. Experiments were conducted to define the most relevant factors in the process of freezing of newly placed mortar. The effect of unit absorption on the moisture content of mortar during the first hours after assembly was assessed. Correlations of moisture content with time were developed for mortar in contact with masonry units. Frost immunity thresholds in terms of mortar moisture content and in terms of maturity were determined. The test results provided the basis for new proposed guidance on when fresh mortar can be safely exposed to freezing temperatures. Test methods for evaluation of the freeze-thaw resistance of masonry units were evaluated. A new test was proposed and adopted by ASTM as a new standard test for the freeze-thaw testing of masonry units. In addition, several chemicals were evaluated for their potential as antifreeze admixtures for masonry mortar. Antifreeze admixtures were first developed for use in concrete, but the practicality of using antifreeze admixtures in masonry mortars was demonstrated in a field application in Michigan during the winter.

52-2233

Effects of temperature on germination of eleven *Festuca* cultivars.

Palazzo, A.J., Brar, G.S., SR 97-19, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Aug. 1997, 6p., ADA-330 578, 23 refs.

Temperature effects, Plant physiology, Plants (botany)

Many studies have shown that water potential at planting affects the germination rate and final germination of *Festuca* cultivars. Limited information is available about the extent of variability in temperature-dependence of germination among different *Festuca* cultivars. The objective of the authors was to study germination at five temperatures for a wide range of *Festuca* cultivars. *Festuca* seeds were screened for germination during 28 days in polyethylene growth pouches held at constant temperatures of 10, 15, 20, 25, or 30°C. The germination percentage significantly ($p<0.05$) increased as the temperature increased from 10 to 15°C, when averaged across the cultivars, and decreased thereafter. The cultivar "Clemfine" tall fescue *(Festuca arundinacea* Schreb.) had the greatest germination percentage, and "Arctared" red fescue (*Festuca rubra* L.) had the least when averaged across the five temperatures. Conversely, the average time to germination (A_{tg}) was greatest at 10°C and least at 30°C. Reaching a germination level of 80% or more of the seeds required 14 days at 10°C, 9 d at 15°C, 8 d at 20°C, and 7 d at 25 or 30°C. Base temperatures required for germination of *Festuca* species were 3.2°C for rapid germinators, 3.6 to 6°C for medium germinators, and 4 to 6°C for poor germinators. Heat units (growing degree-days>10°C) calculated for the rapid germinators were 129°C-d, 120 to 140°C-d for medium germinators, and 135 to 191°C-d for the poor germinators. Germination decreased as heat units were increased.

52-2234

Site remediation via dispersion by chemical reaction (DCR).

Marion, G.M., Payne, J.R., Brar, G.S., SR 97-18, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Aug. 1997, 21p., ADA-330 681, 52 refs.

Land reclamation, Soil pollution, Waste disposal, Waste treatment, Soil analysis, United States—Pennsylvania—Palmerton, United States—Alaska—Shemya Island, United States—Colorado—Denver

The DCR (Dispersion by Chemical Reaction) technologies are a group of patented waste treatment processes using CaO (quicklime) for the immobilization of heavily oiled sludges, oil-contaminated soils, acid-tars, and heavy metals in $Ca(OH)_2$ and $CaCO_3$ matrices. The objectives of this project were to 1) evaluate the DCR process for remediating soils contaminated with pesticides, petroleum hydrocarbons (oils and fuels), and heavy metals in cold regions and 2) evaluate DCR-treated oil-contaminated soil as a non-frost-susceptible (NFS) construction material. Three major studies evaluated the DCR process to remediate 1) hydrocarbons at Eareckson Air Force Station on Shemya in the Aleutians, 2) pesticide-contaminated soils from Rocky Mt. Arsenal, and 3) heavy-metal contaminated soils from a former zinc smelter site at Palmerton, PA. The DCR process was successful in stabilizing liquid organics and heavy metals in contaminated soils. The chemical properties of soils contaminated by solid organics (asphalt tar and pesticides) were not generally improved by the DCR process, but even in these cases, the physical properties were improved for potential reuse as construction materials. Following laboratory verification for a specific waste, the DCR process for the field remediation of liquid organics and heavy-metal-contaminated materials can be recommended.

52-2235

Assessment of sampling error associated with collection and analysis of soil samples at a firing range contaminated with HMX.

Jenkins, T.F., et al, SR 97-22, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Sep. 1997, 52p., ADA-330 661, 19 refs.

Explosives, Soil pollution, Military operation, Soil analysis, Soil tests, Soil chemistry

Short-range and mid-range (grid size) spatial heterogeneity in explosives concentrations within surface soils was studied at an active antitank firing range at the Canadian Force Base-Valcartier, Val-Bélair, Quebec. The range has been in use for over 20 years. Sixteen grids were installed. Four area-integrated surface samples were formed into piles, one in each quadrant of each grid, using a circular pattern that included about 10% of the top 5 cm of the quadrant. After *in-situ* homogenization of a pile, several random aliquots were combined to form a representative sample. Replicates were collected to assess the representativeness achieved. In addition, grid composites were prepared by combining equal portions of the four subgrid samples for each of 16 grids. In nine of the subgrids, a second area integrated sample was prepared. On-site analysis showed concentrations of HMX ranging from as high as 1640 mg/kg near one target to 2.1 mg/kg at a distance of 15 m from the target. On the other hand, TNT concentrations were much lower than would be expected based on the 70:30 composition ratio of HMX to TNT in the melt-cast explosive used on site. A colorimetric method, originally developed to analyze for RDX, was found to provide concentration estimates for HMX that were in excellent agreement with laboratory results. Spatial heterogeneity of HMX concentrations was large on both short- and mid-range scales and this factor dominated the overall uncertainty associated with site characterization. Relatively minor uncertainties were due to analytical error.

52-2236

Snow mechanics: review of the state of knowledge and applications.

Shapiro, L.H., Johnson, J.B., Sturm, M., Blaisdell, G.L., CR 97-03, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Aug. 1997, 35p., ADA-330 695, Refs. p.14-20.

Snow mechanics, Mechanical properties, Classifications, Snow electrical properties, Snow deformation, Microstructure, Snow strength, Snow hardness, Snow permeability, Avalanches, Snow roads, Runways, Snow (construction material)

A review of snow mechanics indicates that, with the exception of avalanche studies, it is seldom used. In this report the authors give their interpretation of why this is the case, and suggest ways to help expand the range of problems to which snow mechanics can be applied. Until the late 1960s, most experimental work in snow mechanics was devoted to finding values of the parameters for equations of linear elasticity, viscosity, and viscoelasticity. In about 1970, work on that approach stopped and since then the emphasis has been on 1) the development of nonlinear theories to describe the deformation and fracture of snow, and 2) attempts to develop constitutive relationships based on the study of the microstructural aspects of snow deformation. It is believed that the best hope of encouraging more applications for snow mechanics in the near term lies in improving and expanding the database on the response of snow to applied loads, and organizing it in a manner that makes it easy for potential users to determine the anticipated deformational behavior of snow in any particular application. It is suggested that a classifica-

tion of snow based on physical properties and index parameters that give information about the bonding and microstructure be developed. Mechanical properties, constitutive relations under various loading conditions, and other relevant information can then be associated with each class.

52-2237

Circum-Arctic map of permafrost and ground-ice conditions.

Brown, J., ed, Ferrians, O.J., Jr., ed, Heginbottom, J.A., ed, Mel'nikov, E.S., ed, Circum-Pacific map series: Map CP-45, Reston, VA, U.S. Geological Survey, 1997, 1 fold. map, 47 refs.

Maps, Permafrost distribution, Ground ice, Ice conditions

52-2238

Ecological, ultrastructural and physiological features of antarctic microalgae.

Andreoli, C., et al, Meeting on Antarctic Biology, 3rd, Santa Margherita Ligure, Italy, Dec. 13-15, 1996. Proceedings. Edited by G. di Prisco, S. Focardi and P. Luporini, Camerino, Camerino University Press, [1997], p.275-285, With Italian summary. Refs. p.284-285.

Ice cover effect, Algae, Plant ecology, Sea ice, Limnology, Photosynthesis, Microbiology, Marine biology, Antarctica—Terra Nova Bay, Antarctica—Wood Bay

Studies on pico-phytoplankton samples collected in ice-covered and ice-free sea (Wood Bay and Terra Nova Bay) and fresh waters during the summer 1993-94, are reported. Ultrastructural and physiological studies on some microalgae in cultures were also carried out. All the environments showed the presence of photoautotrophic picoplankton which, in the lakes, unlike the sea, was the major component of the phytoplankton population. Phycoerythrin-rich cyanobacteria (PEC) were abundant in pack-ice and in ice-covered sea and fresh waters. In ice-free waters, red-fluorescing cells prevailed over PEC. The presence of these microalgae both in pack-ice and in ice-covered waters reflected their adaptation to low light intensity. This was confirmed by the growth in cultures of two antarctic microalgae, one freshwater and one seawater, at a very low light intensity. (Auth.)

52-2239

Electric heating systems for combating icing problems on metal roofs.

Buska, J., Tobiasson, W., Greatorex, A., Fyall, W., MP 5090, International Symposium on Roofing Technology, 4th, Sep. 17-19, 1997. Proceedings. Challenges of the 21st century, Rosemont, IL, National Roofing Contractors Association, 1997, p.153-162, 6 refs.

Buildings, Roofs, Icicles, Ice prevention, Snow melting, Artificial melting, Electric heating, Ventilation, Drainage, Cold weather construction

Icicles and ice dams may develop on metal roofs that drain to cold eaves. Meltwater that backs up behind such icings may leak into buildings, causing serious damage. Large icings are also a safety hazard. Electric heating systems may be needed to provide a path for meltwater to drain safely off such roofs.

52-2240

Effect of UV-radiation on DMSP content and DMS formation of *Phaeocystis antarctica*.

Yang, H.F., Kirst, G.O., *Polar Biology,* Dec. 1997, 18(6), p.402-409, Refs. p.408-409.

Algae, Photochemical reactions, Solar radiation, Photosynthesis, Microbiology, Ozone

DMSP (dimethyl sulphonium propionate) contents produced by *Phaeocystis antarctica* (Prymnesiophyta), which were incubated under light conditions with radiations of different UV wavebands, were measured by gas chromatography after various exposure times. Full light (UV-B + UV-A + PAR) caused the strongest decrease in the production of DMSP in the alga. A marked depression of DMSP content was also observed with short UV-B and UV-A wavebands after 3 h. It is hypothesized that DMSP production in *P. antarctica* is inhibited by UV radiation. There was a negative correlation on change of DMSP contents under UV radiation with exposure times. The conversion rate of DMSP dissolved to DMS (dimethyl sulphide) was significantly increased with UV radiation. The possibility could not be excluded that a high concentration of free chemical radicals in seawater due to UV radiation resulted in an increase of DMSP cleavage in seawater. (Auth. mod.)

52-2241

Neutron-scattering studies of ice prepared by different thermobaric treatments.

Kolesnikov, A.I., Sinitsyn, V.V., Poniatovskiĭ, E.G., Natkaniec, I., Smirnov, L.S., Li, J.C., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6082-6086, 24 refs.

Ice physics, Phase transformations, Heating, Amorphous ice, Cubic ice, Deuterium oxide ice, High pressure ice, Molecular energy levels, Vibration, Spectra, Defects, Ice spectroscopy, Neutron diffraction

52-2242

Lattice dynamical calculations of ice VIII.

Dong, S., Kolesnikov, A.I., Li, J.C., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6087-6089, 17 refs.

Ice physics, Ice models, Ice crystal structure, Molecular structure, Hydrogen bonds, Latticed structures, Neutron scattering, Spectra, Vibration, Molecular energy levels, Statistical analysis

52-2243

Factors controlling the electrical conductivity of ice from the polar regions—a summary.

Wolff, E.W., Miners, W.D., Moore, J.C., Paren, J.G., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6090-6094, 30 refs.

Ice physics, Glaciology, Ice sheets, Ice cores, Ice electrical properties, Ice dielectrics, Chemical composition, Electrical resistivity, Profiles, Theories, Greenland—Summit, Antarctica—Dolleman Island

Data on the relationship between the electrical conductivity and the chemistry of ice cores from Antarctica and Greenland are summarized. The electrical conductivity measurement is used as a proxy for dc conductivity, while dielectric profiling gives high-frequency conductivity. The dc conductivity seems to be controlled entirely by the acidity of the ice, with a secondary effect of the accompanying anion. There is no positive response when huge excesses of sea salt, ammonium, or calcium are present, except in ice where brine is present. (Auth. mod.)

52-2244

Vibrational spectroscopy and modeling of the surface and subsurface of ice and of ice-adsorbate interactions.

Devlin, J.P., Buch, V., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6095-6098, 9 refs.

Ice physics, Ice spectroscopy, Infrared spectroscopy, Ice crystal structure, Molecular structure, Adsorption, Hydrogen bonds, Hydrates, Phase transformations, Ice relaxation

52-2245

High strain-rate compression tests on ice.

Jones, S.J., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6099-6101, 9 refs.

Ice physics, Sea ice, Ice mechanics, Mechanical tests, Loads (forces), Strain tests, Ice deformation, Ice strength, Ice solid interface, Salinity

52-2246

Temperature dependence of dislocations in notched ice crystals.

Hu, X., Baker, I., Dudley, M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6102-6104, 11 refs.

Ice physics, Ice mechanics, Ice crystal structure, Strain tests, Ice deformation, Dislocations (materials), Temperature effects, X ray analysis, Phase transformations, Brittleness

52-2247

Effect of the thermal history of ice crushed at 77 K on its surface structure as determined by adsorption of CH_4 at low surface coverage.

Chaix, L., Dominé, F., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6105-6108, 22 refs.

Ice physics, Surface structure, Ice crystal structure, Adsorption, Ice vapor interface, Natural gas, Isotherms, Thermodynamic properties, Temperature effects

52-2248

Effect of bubbles on grain growth in ice.

Arena, L., Nasello, O.B., Levi, L., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6109-6112, 25 refs.

Ice physics, Glacier ice, Artificial ice, Ice crystal growth, Grain size, Bubbles, Migration, Ice vapor interface, Simulation

52-2249

Acoustic emission in single crystals of ice.

Weiss, J., Grasso, J.R., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6113-6117, 20 refs.

Ice physics, Ice acoustics, Sound waves, Wave propagation, Mechanical tests, Shear stress, Ice crystal structure, Ice deformation, Ice creep, Dislocations (materials), Plastic deformation

52-2250

Preparation and preliminary study of structure-controlled S2 columnar ice.

Plé, O., Meyssonnier, J., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6118-6122, 20 refs.

Ice physics, Ice mechanics, Mechanical tests, Ice crystal structure, Ice crystal growth, Ice deformation, Orientation, Anisotropy, Thin sections, Laboratory techniques, Strain tests

52-2251

Evidence for molecular translational diffusion during the crystallization of amorphous solid water.

Smith, R.S., Huang, C., Kay, B.D., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6123-6126, 29 refs.

Ice physics, Amorphous ice, Ice crystal growth, Molecular structure, Water structure, Phase transformations, Molecular energy levels, Diffusion, Isotope analysis

52-2252

Diffusion of HDO into single-crystal $H_2{}^{16}O$ ice multilayers: comparison with $H_2{}^{18}O$.

Livingston, F.E., Whipple, G.C., George, S.M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6127-6131, 42 refs.

Ice physics, Mass transfer, Diffusion, Migration, Oxygen isotopes, Ice solid interface, Probes, Lasers, Models

52-2253

Natural convection, solute trapping, and channel formation during solidification of saltwater.

Worster, M.G., Wettlaufer, J.S., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6132-6136, 18 refs.

Ice physics, Sea ice, Ice growth, Sea water freezing, Ice bottom surface, Ice cover thickness, Ice water interface, Brines, Drainage, Convection, Solidification, Simulation, Analysis (mathematics)

52-2254

Premelting dynamics: geometry and interactions.

Wettlaufer, J.S., Worster, M.G., Wilen, L.A., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6137-6141, 16 refs.

Ice physics, Water films, Ice water interface, Unfrozen water content, Frost heave, Interfacial tension, Molecular energy levels, Pressure, Analysis (mathematics), Simulation, Thermodynamics

52-2255

Single-crystal neutron diffraction studies of the structure of ice XI.

Jackson, S.M., Nield, V.M., Whitworth, R.W., Oguro, M., Wilson, C.C., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6142-6145, 22 refs.

Ice physics, Ice spectroscopy, Neutron diffraction, Ice crystal structure, Molecular structure, Doped ice, Profiles, Phase transformations, Low temperature tests

52-2256

Ab-initio total energy studies of the static and dynamical properties of ice Ih.

Morrison, I., Li, J.C., Jenkins, S., Xantheas, S.S., Payne, M.C., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6146-6150, 16 refs.

Ice physics, Hydrogen bonds, Ice crystal structure, Molecular structure, Proton transport, Molecular energy levels, Orientation, Spectra, Dynamic properties, Ice models

52-2257

Crystal shape of high-pressure ice I_h in water and roughening transition of the (1010) plane.

Maruyama, M., Nishida, T., Sawada, T., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6151-6153, 7 refs.

Ice physics, Ice crystal structure, High pressure ice, High pressure tests, Ice water interface, Temperature effects, Phase transformations

52-2258

Elastic constants of ice III, V, and VI by Brillouin spectroscopy.

Tulk, C.A., Kiefte, H., Clouter, M.J., Gagnon, R.E., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6154-6157, 26 refs.

Ice physics, Ice spectroscopy, Ice crystal structure, Ice elasticity, Elastic properties, Indexes (ratios), Statistical analysis

52-2259

Observation of dislocations in ice.

Baker, I., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6158-6162, 39 refs.

Ice physics, Mechanical properties, Ice crystal structure, Defects, Dislocations (materials), Imaging, Resolution, Replicas, Scanning electron microscopy, X ray analysis

52-2260

Anisotropy in molecular-scaled growth kinetics at ice-water interfaces.

Nada, H., Furukawa, Y., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6163-6166, 16 refs.

Ice physics, Ice water interface, Ice crystal structure, Ice crystal growth, Molecular structure, Orientation, Anisotropy, Simulation

52-2261

Anisotropic surface melting of an ice crystal and its relationship to growth forms.

Furukawa, Y., Nada, H., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6167-6170, 22 refs.

Ice physics, Snow crystal growth, Ice crystal structure, Molecular structure, Surface structure, Ice water interface, Ice melting, Anisotropy, Self diffusion, Simulation

52-2262

Pattern formation of ice crystals during free growth in supercooled water.

Shimada, W., Furukawa, Y., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6171-6173, 12 refs.

Ice physics, Ice crystal growth, Ice crystal structure, Ice water interface, Supercooling, Dendritic ice, Optical phenomena, Stability, Anisotropy

52-2263

Solute distribution in front of an ice/water interface during directional growth of ice crystals and its relationship to interfacial patterns.

Nagashima, K., Furukawa, Y., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6174-6176, 13 refs.

Ice physics, Ice water interface, Ice crystal growth, Solutions, Diffusion, Distribution, Optical phenomena

52-2264

Thermally-stimulated depolarization studies of the ice XI-ice Ih phase transition.

Jackson, S.M., Whitworth, R.W., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6177-6179, 13 refs.

Ice physics, Ice dielectrics, Ice crystal structure, Molecular structure, Orientation, Doped ice, Phase transformations, Polarization (charge separation), Charge transfer, Temperature effects

52-2265

Crystal-orientation dependence of Raman spectra of natural air hydrate single crystal.

Ikeda, T., Fukazawa, H., Mae, S., Hondoh, T., Langway, C.C., Jr., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6180-6183, 27 refs.

Ice physics, Ice spectroscopy, Ice crystal structure, Molecular structure, Anisotropy, Orientation, Hydrates, Clathrates, Polarization (waves), Backscattering, Spectra

52-2266

Raman spectra of translational lattice vibrations in polar ice.

Fukazawa, H., Suzuki, D., Ikeda, T., Mae, S., Hondoh, T., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6184-6187, 26 refs.

Ice physics, Ice cores, Ice sheets, Light scattering, Ice spectroscopy, Molecular structure, Ice dating, Ice temperature, Vibration, Spectra, Greenland, Antarctica

Raman spectra of Mizuho and Nansen ice recovered from Antarctica and Dye-3 ice recovered from Greenland were measured to observe the translational lattice vibrations in polar ice. The ages of the ice Ih range from 4.6 to 100 kyr. The ice temperatures at the depth it was located range from 231 to 260 K. The results were compared with the measurements taken of the Vostok ice by Fukazawa et al. (Auth. mod.)

52-2267

Analysis of single-crystal neutron diffuse scattering from ice Ih.

Beverley, M.N., Nield, V.M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6188-6191, 17 refs.

Ice physics, Ice spectroscopy, Neutron scattering, Ice crystal structure, Molecular structure, Hydrogen bonds, Statistical analysis, Dislocations (materials)

52-2268

Molecular dynamics calculations for ice Ih.

Burnham, C.J., Li, J.C., Leslie, M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6192-6195, 15 refs.

Ice physics, Molecular structure, Defects, Molecular energy levels, Vibration, Polarization (charge separation), Charge transfer, Spectra, Stability, Statistical analysis, Simulation

52-2269

Surface melting of ice.

Makkonen, L., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6196-6200, 42 refs.

Ice physics, Ice melting, Ice surface, Surface energy, Surface temperature, Temperature variations, Ice water interface, Water films, Melting points, Theories, Thermodynamics

52-2270

Forward modeling of the internal layers in radio echo sounding using electrical and density measurements from ice cores.

Miners, W.D., Hildebrand, A., Gerland, S., Blindow, N., Steinhage, D., Wolff, E.W., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6201-6204, 31 refs.

Ice physics, Glaciology, Ice sheets, Layers, Electrical resistivity, Radio echo soundings, Ice cores, Reflectivity, Wave propagation, Ice density, Profiles, Models

52-2271

Effects of proton motions on the fluorescence from 2-naphthol-doped ice Ih and the proton ordering transition.

Akiyama, T., Sakamaki, M., Abe, K., Shigenari, T., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6205-6207, 18 refs.

Ice physics, Doped ice, Luminescence, Proton transport, Detection, Molecular structure, Defects, Lasers, Temperature effects

52-2272

Experimental study of ice electrolysis under UV irradiation.

Khusnatdinov, N.N., Petrenko, V.F., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6208-6211, 9 refs.

Ice physics, Ice dielectrics, Proton transport, Charge transfer, Ice optics, Ultraviolet radiation, Photochemical reactions, Light effects

52-2273

Electrical properties of the ice/solid interface.

Khusnatdinov, N.N., Petrenko, V.F., Levey, C.G., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6212-6214, 14 refs.

Ice physics, Ice solid interface, Ice electrical properties, Ice dielectrics, Charge transfer, Electrical resistivity, Ions

52-2274

Kinetics of phase transitions induced by shock-wave loading in ice.

Chizhov, V.E., Keller, J., Rodríguez-Romo, S., Nagornov, O., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6215-6218, 31 refs.

Ice physics, Phase transformations, Shock waves, Dynamic loads, Stress concentration, Thermodynamic properties, Wave propagation, Mathematical models

52-2275

Dielectric properties of ice containing ionic impurities at microwave frequencies.

Matsuoka, T., Fujita, S., Mae, S., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6219-6222, 17 refs.

Ice physics, Ice dielectrics, Dielectric properties, Impurities, Ion density (concentration), Temperature effects, Liquid phases, Microwaves, Resonance

52-2276

Dielectric properties and 100 K anomalies in KOH- and HCl-doped ice single crystals.

Kawada, S., Jin, R.G., Abo, M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6223-6225, 8 refs.

Ice physics, Ice dielectrics, Dielectric properties, Ice crystals, Dispersions, Spectra, Doped ice, Ice relaxation, Polarization (charge separation), Temperature effects

52-2277

Nucleation of ice in confined geometry.

Baker, J.M., Dore, J.C., Behrens, P., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6226-6229, 13 refs.

Ice physics, Ice crystal structure, Heterogeneous nucleation, Porous materials, Deuterium oxide ice, Defects, Phase transformations, Neutron diffraction

52-2278

Raman scattering and X-ray diffraction of ice in the megabar range. Occurrence of a symmetric disordered solid above 62 GPa.

Pruzan, P., et al, *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6230-6233, 29 refs.

Ice physics, High pressure ice, Deuterium oxide ice, Molecular structure, X ray diffraction, Ice spectroscopy, Vibration, Defects, Protons, Hydrogen bonds, Phase transformations

52-2279

Dielectric low-frequency dispersion and crossover phenomena of HCl-doped ice.

Takei, I., Maeno, N., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6234-6236, 17 refs.

Ice physics, Ice dielectrics, Dielectric properties, Doped ice, Electrical measurement, Low frequencies, Dispersions, Defects, Temperature effects

52-2280

Effects of potentials on the vibrational dynamics of ice.

Li, J.C., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6237-6242, 24 refs.

Ice physics, Ice models, Water structure, Hydrogen bonds, Molecular structure, Molecular energy levels, Polarization (charge separation), Vibration, Spectra

52-2281

Exact coincidence site lattice in ice Ih.

Gonzalez Kriegel, B.J., Di Prinzio, C.L., Nasello, O.B., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6243-6246, 9 refs.

Ice physics, Ice crystal structure, Molecular structure, Latticed structures, Orientation, Grain size, Indexes (ratios), Statistical analysis

52-2282

Quantum mechanical studies of the energetics of ionic defects in icelike systems.

Plummer, P.L.M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6247-6250, 17 refs.

Ice physics, Ice crystal structure, Molecular structure, Defects, Hydrogen bonds, Water structure, Aggregates, Proton transport, Migration, Molecular energy levels, Models

52-2283

Quantum mechanical investigation of the energetics of proton transfer along hydrogen bonds.

Plummer, P.L.M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6251-6253, 8 refs.

Ice physics, Water structure, Molecular structure, Molecular energy levels, Proton transport, Hydrogen bonds, Aggregates, Ions, Migration, Theories

52-2284

Brittle failure of ice under compression.

Schulson, E.M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6254-6258, 47 refs.

Ice physics, Ice mechanics, Brittleness, Cracking (fracturing), Crack propagation, Ice solid interface, Phase transformations, Strains, Compressive properties, Tensile properties

52-2285

Morphology and surface areas of thin ice films.

Leu, M.T., Keyser, L.F., Timonen, R.S., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6259-6262, 21 refs.

Ice physics, Cloud physics, Polar stratospheric clouds, Aerosols, Ice vapor interface, Adsorption, Heterogeneous nucleation, Ice formation, Scanning electron microscopy, Simulation

52-2286

High-stress ice fracture and friction.

Rist, M.A., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6263-6266, 18 refs.

Ice physics, Ice mechanics, Ice microstructure, Dynamic loads, Ice deformation, Shear stress, Ice friction, Cracking (fracturing), Ice solid interface, Sliding, Brittleness, Mechanical tests

52-2287

Physical mechanisms responsible for ice adhesion.

Ryzhkin, I.A., Petrenko, V.F., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6267-6270, 13 refs.

Ice physics, Ice electrical properties, Dielectric properties, Ice adhesion, Ice solid interface, Proton transport, Defects, Charge transfer, Ice dielectrics, Ice models

52-2288

Uptake and interaction of HI on ice films.

Chu, L.T., Chu, L., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6271-6275, 28 refs.

Ice physics, Cloud physics, Ice vapor interface, Aerosols, Adsorption, Vapor pressure, Heterogeneous nucleation, Thermodynamic properties, Chemical properties, Statistical analysis, Polar stratospheric clouds, Simulation

52-2289

Study of the surface of ice, ice/solid and ice/liquid interfaces with scanning force microscopy.

Petrenko, V.F., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6276-6281, 31 refs.

Ice physics, Ice solid interface, Adhesion, Ice surface, Ice microstructure, Ice dielectrics, Electrical measurement, Capillarity, Mass transfer, Charge transfer

52-2290

Effect of ammonium on anion uptake and dielectric relaxation in laboratory-grown ice columns.

Gross, G.W., Svec, R.K., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6282-6284, 28 refs.

Ice physics, Ions, Doped ice, Aerosols, Heterogeneous nucleation, Solubility, Ice dielectrics, Ice relaxation, Liquid solid interfaces, Electrical measurement, Cloud physics, Simulation

52-2291

Surface states of charge carriers and electrical properties of the surface layer of ice.

Petrenko, V.F., Ryzhkin, I.A., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6285-6289, 30 refs.

Ice physics, Theories, Ice surface, Ice electrical properties, Electrical resistivity, Charge transfer, Ice vapor interface, Ice solid interface, Defects, Mathematical models, Ice models, Temperature effects

52-2292

Dynamic behavior of diatomic guest molecules in clathrate hydrate structure II.

Horikawa, S., Itoh, H., Tabata, J., Kawamura, K., Hondoh, T., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6290-6292, 10 refs.

Ice physics, Hydrates, Clathrates, Latticed structures, Molecular energy levels, Molecular structure, Orientation, Vibration, Spectra, Simulation

52-2293

Structural transformations of ice at normal and high pressures via molecular dynamics simulations.

Hashimoto, T., Sugawara, S., Hiwatari, Y., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6293-6300, 24 refs.

Ice physics, Molecular structure, High pressure ice, Phase transformations, Molecular energy levels, Amorphous ice, Hydrogen bonds, Heating, Simulation

52-2294

Low-energy (5-40 eV) electron-stimulated desorption of atomic hydrogen and metastable emission from amorphous ice.

Kimmel, G.A., Orlando, T.M., Cloutier, P., Sanche, L., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6301-6303, 25 refs.

Ice physics, Deuterium oxide ice, Amorphous ice, Water films, Ionization, Ice spectroscopy, Lasers, Decomposition, Detection, Photochemical reactions

52-2295

Some basic properties of ice dynamics.

Li, J.C., Leslie, M., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6304-6307, 19 refs.

Ice physics, High pressure ice, Neutron scattering, Spectra, Molecular structure, Molecular energy levels, Protons, Polarization (charge separation), Vibration, Ice models

52-2296

HOCl adsorption on ice surfaces.

Brown, A.R., Doren, D.J., *Journal of physical chemistry B,* Aug. 7, 1997, 101(32), International Symposium on the Physics and Chemistry of Ice, Hanover, NH, Aug. 27-31, 1996, p.6308-6312, 24 refs.

Ice physics, Cloud physics, Polar stratospheric clouds, Surface energy, Molecular energy levels, Aerosols, Adsorption, Ice vapor interface, Theories, Ice models, Simulation

52-2297

Glaciers and environments during the Last Glacial Maximum (LGM) on the Tibetan Plateau.

Shi, Y.F., Zheng, B.X., Yao, T.D., *Journal of glaciology and geocryology,* June 1997, 19(2), p.97-113, In Chinese with English summary. 37 refs.

Alpine glaciation, Glacial meteorology, Glacier oscillation, Glacier mass balance, Snow line, Permafrost distribution, Paleoclimatology, Global change, China—Qinghai-Xizang Plateau

52-2298

Holocene megathermal environment in the Tibetan Plateau.

Liu, G.X., Shi, Y.F., Shen, Y.P., Hong, M., *Journal of glaciology and geocryology,* June 1997, 19(2), p.114-123, In Chinese with English summary. 44 refs.

Paleobotany, Vegetation patterns, Revegetation, Global warming, Paleoclimatology, China—Qinghai-Xizang Plateau

52-2299

Permafrost evolution in the northeastern Qinghai-Tibetan Plateau during the last 150 000 years.

Pan, B.T., Chen, F.H., *Journal of glaciology and geocryology,* June 1997, 19(2), p.124-132, In Chinese with English summary. 17 refs.

Permafrost distribution, Permafrost dating, Permafrost indicators, Periglacial processes, Ice wedges, Paleoclimatology, China—Qinghai-Xizang Plateau

52-2300

Change of thaw bulb under asphalt pavement in the region of permafrost on the Tibetan Plateau.

Li, S.X., Wu, Z.W., *Journal of glaciology and geocryology,* June 1997, 19(2), p.133-140, In Chinese with English summary. 4 refs.

Pavements, Permafrost beneath roads, Permafrost depth, Active layer, Ground thawing, Thaw depth, Frozen ground settling, Road maintenance, Mathematical models, China—Qinghai-Xizang Plateau

52-2301

Dynamic strength characteristics and failure criterion of frozen silt.

Shen, Z.Y., Zhang, J.Y., *Journal of glaciology and geocryology,* June 1997, 19(2), p.141-148, In Chinese with English summary. 6 refs.

Frozen ground strength, Soil creep, Internal friction, Dynamic loads, Soil tests, Strain tests, Mathematical models

52-2302

Experimental study on the acoustic wave parameters of artificial frozen soil.

Yang, P., Li, Q., Yu, C.H., *Journal of glaciology and geocryology,* June 1997, 19(2), p.149-153, In Chinese with English summary. 1 ref.

Soil freezing, Artificial freezing, Soil stabilization, Frozen ground strength, Frozen ground compression, Acoustic measurement, Mathematical models

52-2303

Grey prediction method on snowmelt runoff in the Hexi area.

Lan, Y.C., Zeng, Q.Z., *Journal of glaciology and geocryology,* June 1997, 19(2), p.154-160, In Chinese with English summary. 6 refs.

Snow surveys, Snow cover distribution, Snow hydrology, Snowmelt, Runoff forecasting, Statistical analysis, China—Qilian Mountains

52-2304

Estimation of lake evaporation by stable isotopic ratio.

Zhang, X.P., Yao, T.D., *Journal of glaciology and geocryology,* June 1997, 19(2), p.161-166, In Chinese with English summary. 8 refs.

Salt lakes, Precipitation (meteorology), Evaporation, Water balance, Lake water, Water chemistry, Air water interactions, Atmospheric composition, Isotope analysis, Climatic changes, Mathematical models, China—Qinghai Lake

52-2305

Study on AAR of valley glaciers in the steady state.

Wang, N.L., Pu, J.C., Liu, S.Y., Huang, M.H., *Journal of glaciology and geocryology,* June 1997, 19(2), p.167-172, In Chinese with English summary. 13 refs.

Mountain glaciers, Glacier alimentation, Glacier oscillation, Glacier mass balance, Mathematical models

52-2306

Geochemical study on an 8 m depth ice core of Guliya Ice Cap.

Li, Y.F., Yao, T.D., Sheng, W.K., Huang, C.L., Xie, C., *Journal of glaciology and geocryology,* June 1997, 19(2), p.173-179, In Chinese with English summary. 15 refs.

Mountain glaciers, Glacial meteorology, Ice cores, Core samplers, Snow composition, Ice composition, Dust, Atmospheric composition, Atmospheric circulation, Geochemical cycles, China—Kunlun Mountains

52-2307

Principal component analysis of the snow disaster factors in the pastoral Nagqu Prefecture, Tibet region.

Lu, A.X., Feng, X.Z., Zeng, Q.Z., Wang, L.H., *Journal of glaciology and geocryology,* June 1997, 19(2), p.180-185, In Chinese with English summary. 4 refs.

Snowstorms, Weather forecasting, Regional planning, Statistical analysis, China—Xizang

52-2308

Progresses in the researches of environmental and climatic records from trace organic compounds in snow and ice.

Long, J.P., Qin, D.H., *Journal of glaciology and geocryology,* June 1997, 19(2), p.186-192, In Chinese with English summary. 20 refs.

Air pollution, Atmospheric composition, Scavenging, Snow air interface, Snow composition, Snow impurities, Ice composition, Ice cores, Climatic changes

52-2309

Investigation of climatic conditions by the glacier extension in the last glacial maximum.

Ye, B.S., Li, S.J., Shi, Y.F., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.1-9, In Chinese with English summary. 11 refs.

Mountain glaciers, Glacial meteorology, Glacier oscillation, Glacier mass balance, Paleoclimatology, China—Tian Shan

52-2310

Impact of greenhouse effect on runoff in west China.

Lai, Z.M., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.10-16, In Chinese with English summary. 14 refs.

Global warming, Climatic changes, Air temperature, Precipitation (meteorology), Water balance, Stream flow, River flow, Runoff, Statistical analysis, China

52-2311

Research on the mass balance processes of Glacier No.1 at the headwaters of the Urumqi River, Tianshan Mountains.

Liu, C.H., Xie, Z.C., Wang, C.Z., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.17-24, In Chinese with English summary. 6 refs.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, China—Tian Shan

52-2312

Abrupt change detection of glacier mass balance in the Tianshan Mountains.

Cao, M.S., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.25-29, In Chinese with English summary. 6 refs.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, China—Tian Shan

52-2313

Grain size analysis and environmental significance of sediment around the Great Wall Station of China in Antarctica.

Liu, G.N., Cui, Z.J., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.30-38, In Chinese with English summary. 13 refs.

Glacial deposits, Marine deposits, Lacustrine deposits, Alluvium, Periglacial processes, Sands, Soil classification, Soil structure, Grain size, Particle size distribution, Statistical analysis, Antarctica—Great Wall Station

Sediments around the Great Wall Station can be divided into glacial deposit, periglacial deposit, alluvial deposit, lacustrine deposit and coastal deposit according to the origin. Analyses of their fine parts (<3.52 mm) show obvious differences among grain size composition, frequency curve, cumulative curve and scatter diagram of the glacial and periglacial deposits, alluvium and littoral deposit. In the order of periglacial deposit—glacial deposit—alluvial deposit and coastal deposit, sand increases; silt and clay decreases; sorting changes from poor to good; mean grain size is very fine, fine, medium and coarse sand respectively; skewness changes from very positive to near symmetric. (Auth. mod.)

52-2314

Frozen ground and environment in the Zoige Plateau and its surrounding mountains.

Wang, S.L., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.39-46, In Chinese with English summary. 3 refs.

Mountain soils, Meadow soils, Soil temperature, Air temperature, Frost penetration, Steppes, Wetlands, Desiccation, Climatic changes, China—Qinghai-Xizang Plateau

52-2315

Relation between permafrost degradation and *Kobresia* meadow change on the southern piedmont of the Tangula Range.

Yuan, J.Y., Yan, S.Y., Zhao, X.F., Wang, S.L., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.47-51, In Chinese with English summary. 2 refs.

Permafrost distribution, Sporadic permafrost, Ground thawing, Grasses, Plant ecology, Vegetation patterns, Revegetation, Climatic changes, China—Qinghai-Xizang Plateau

52-2316

Monitoring the change of structures in frozen soil in triaxial creep process by CT.

Ma, W., Wu, Z.W., Pu, Y.P., Chang, X.X., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.52-57, In Chinese with English summary. 5 refs.

Frozen ground strength, Frozen ground compression, Soil structure, Soil creep, X ray analysis, Computer applications

52-2317

Photovisoelastic study on the stress of an underground tunnel with circular section.

Wu, J.J., He, L.H., Wang, T.D., Liu, Y.Z., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.58-64, In Chinese with English summary. 3 refs.

Tunnels, Frozen ground strength, Soil creep, Soil freezing, Artificial freezing, Soil stabilization, Viscoelasticity, Mathematical models

52-2318
Quasi-static temperature field and heat engineering parameters of buried petroleum pipelines in seasonally frozen ground regions.
Li, N.S., Li, H.S., Ding, D.W., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.65-72, In Chinese with English summary. 3 refs.
Frozen ground thermodynamics, Soil freezing, Freezing front, Freezing rate, Frost penetration, Underground pipelines, Pipeline freezing, Frost protection, Thermal analysis, Mathematical models

52-2319
Groundwater consuming in original soil during freezing period.
Zhao, D.H., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.73-78, In Chinese with English summary.
Soil freezing, Soil water migration, Ground water, Water table, Vegetation factors

52-2320
Fractal properties of size-frequency distribution of fragments of artificial frozen soil.
Ke, C.S., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.79-83, In Chinese with English summary. 3 refs.
Frozen ground strength, Frozen ground compression, Soil freezing, Artificial freezing, Fracturing, Soil structure, Grain size, Particle size distribution, Statistical analysis

52-2321
Study on the influence of Cl^-/SO_4^{2-} on the engineering behaviours of sulphate salty soil.
Yang, L.Y., Li, B., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.84-89, In Chinese with English summary. 1 ref.
Saline soils, Soil chemistry, Soil composition, Soil strength, Subgrade soils, Soil trafficability

52-2322
Dryness variation in the Guliya Ice Cap region approached by SO_4^{2-} within ice core.
Sheng, W.K., Yao, T.D., Deng, Y.S., *Journal of glaciology and geocryology,* Mar. 1997, 19(1), p.90-94, In Chinese with English summary. 4 refs.
Ice cores, Ice composition, Atmospheric composition, Desiccation, Climatic changes, Paleoclimatology, China—Kunlun Mountains

52-2323
Study on prevention of frost heaving of reinforced soils.
Chen, L., Guo, R.P., Li, G.X., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.297-305, In Chinese with English summary. 3 refs.
Soil freezing, Frost heave, Frozen ground strength, Frozen ground compression, Soil stabilization, Frost resistance, Frost protection, Mathematical models

52-2324
Monitoring the change of structures in frozen soil in uniaxial creep process by CT.
Wu, Z.W., Ma, W., Pu, Y.B., Chang, X.X., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.306-311, In Chinese with English summary. 5 refs.
Frozen ground strength, Soil creep, Soil structure, Soil analysis, X ray analysis, Computer applications

52-2325
Creep photoviscoelastic simulation experiments of frozen soil with a round hole.
Wang, T.D., Wu, J.J., Zhao, X.S., Wu, Z.W., Liu, Y.Z., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.312-318, In Chinese with English summary. 7 refs.
Frozen ground strength, Soil creep, Soil tests, Viscoelasticity, Mathematical models

52-2326
Experimental study on heat-moisture transfer in Lanzhou loess during freezing-thawing processes.
Li, S.X., Cheng, G.D., Liu, J.M., Lin, J.F., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.319-324, In Chinese with English summary. 4 refs.
Loess, Soil freezing, Ground thawing, Thaw depth, Soil water migration, Frozen ground thermodynamics, Permafrost heat transfer, Mathematical models

52-2327
CH_4 and CO_2 emission from permafrost surface in Wudaoliang in the Tibetan Plateau.
Lin, Q., Jin, H.J., Cheng, G.D., Li, N., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.325-330, In Chinese with English summary. 5 refs.
Permafrost surveys, Frozen ground chemistry, Active layer, Soil air interface, Soil chemistry, Atmospheric composition, Nutrient cycle, Carbon dioxide, Global warming, China—Qinghai-Xizang Plateau

52-2328
Application of the repeated aerial photogrammetry to monitoring glacier variation in the drainage area of the Urumqi River.
Chen, J.M., Liu, C.H., Jin, M.X., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.331-336, In Chinese with English summary. 6 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Aerial surveys, Photogrammetric surveys, Mapping, China—Tian Shan

52-2329
Stratigraphic and structural analysis on an ice core to the bedrock in the accumulation area of Glacier No.1 at the headwaters of Urumqi River.
Wang, X.J., Han, J.K., Xie, Z.C., Lluberas, A., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.337-346, In Chinese with English summary. 16 refs.
Mountain glaciers, Ice cores, Glacier ice, Ice structure, Firn stratification, Ice dating, Drill core analysis, China—Tian Shan

52-2330
Outburst conditions of moraine-dammed lakes and their flood estimation in the headwaters of the Nianchu River, Tibet.
Chen, C.J., Liu, M., Zhang, Z., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.347-352, In Chinese with English summary. 3 refs.
Moraines, Glacial lakes, Lake bursts, Flood forecasting, Computerized simulation, China—Xizang, Himalaya Mountains

52-2331
Origins of NO_3^- in the Guliya Ice Cap.
Sheng, W.K., Yao, T.D., Li, Y.F., Deng, Y.S., Xie, C., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.353-359, In Chinese with English summary. 9 refs.
Atmospheric circulation, Atmospheric composition, Air pollution, Dust, Scavenging, Snow impurities, Glacial meteorology, Glacier ice, Ice composition, China—Kunlun Mountains

52-2332
Relations between δD and $\delta^{18}O$ in precipitation at present in the northeast Tibetan Plateau.
Zhang, X.P., Yao, T.D., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.360-365, In Chinese with English summary. 10 refs.
Atmospheric composition, Humidity, Precipitation (meteorology), Oxygen isotopes, Isotope analysis, Statistical analysis, China—Qinghai-Xizang Plateau

52-2333
Study of snow-cover mapping with SAR image in the Tianshan Mountains.
Li, Z., Zeng, Q.Z., Sun, W.X., *Journal of glaciology and geocryology,* Dec. 1996, 18(4), p.366-372, In Chinese with English summary. 7 refs.
Snow surveys, Snow cover distribution, Terrain identification, Mapping, Synthetic aperture radar, Backscattering, Spaceborne photography, Image processing, China—Tian Shan

52-2334
Interferometric estimation of three-dimensional ice-flow using ascending and descending passes.
Joughin, I.R., Kwok, R., Fahnestock, M.A., *IEEE transactions on geoscience and remote sensing,* Jan. 1998, 36(1), p.25-37, 29 refs.
Remote sensing, Glaciology, Spaceborne photography, Synthetic aperture radar, Glacier flow, Glacier surges, Velocity measurement, Topographic effects, Image processing, Accuracy

52-2335
Influence of cloud cover on the radiation budget, physical properties, and microwave scattering coefficient (σ°) of first-year and multiyear sea ice.
Barber, D.G., Thomas, A., *IEEE transactions on geoscience and remote sensing,* Jan. 1998, 36(1), p.38-50, 23 refs.
Spaceborne photography, Atmospheric boundary layer, Sea ice, Surface temperature, Radiation balance, Cloud cover, Microwaves, Scattering, Surface properties, Dielectric properties, Snow ice interface, Snow cover effect, Models

52-2336
Diurnal thermal cycling effects on microwave signatures of thin sea ice.
Nghiem, S.V., et al, MP 5091, *IEEE transactions on geoscience and remote sensing,* Jan. 1998, 36(1), p.111-124, 31 refs.
Sea ice, Surface properties, Remote sensing, Radar echoes, Insolation, Salinity, Ice growth, Diurnal variations, Microwaves, Backscattering, Brightness, Simulation
An experiment to investigate effects of diurnal thermal cycles on C-band polarimetric backscatter and millimeter-wave emission from sea ice was carried out at the outdoor Geophysical Research Facility in the Cold Regions Research and Engineering Laboratory. The ice sheet grew from open sea water to a thickness of 10 cm in 2.5 days. Polarimetric backscatter data was taken with a C-band scatterometer, interlaced with brightness temperature measurements at 90 GHz in conjunction with meteorological and sea ice characterizations. Ice temperature profiles clearly showed the diurnal response in the ice sheet with a lag of 2.5 h behind the time of the maximum short-wave incident solar radiation. The diurnal cycles in backscatter indicated that the dominant scattering mechanism related to thermodynamic processes in sea ice is reversible. This work shows that diurnal effects are important for inversion algorithms to retrieve sea ice geophysical parameters from remote sensing data acquired with a satellite synthetic aperture radar or scatterometer on sun-synchronous orbits.

52-2337
Potential of times series of C-band SAR data to monitor dry and shallow snow cover.
Bernier, M., Fortin, J.P., *IEEE transactions on geoscience and remote sensing,* Jan. 1998, 36(1), p.226-243, 32 refs.
Remote sensing, Snow surveys, Snow optics, Aerial surveys, Synthetic aperture radar, Snow cover structure, Snow water equivalent, Frozen ground temperature, Backscattering, Mathematical models, Profiles, Snow cover effect

52-2338
Automated algorithm for cleaning and ordering the boundary points of a one-dimensional curve in a segmented image.
McDevitt, R.J., Peddada, S.D., *IEEE transactions on geoscience and remote sensing,* Jan. 1998, 36(1), p.307-312, 9 refs.
Synthetic aperture radar, Ice surveys, Sea ice, Ice floes, Ice edge, Detection, Image processing, Data processing, Resolution

52-2339
Antenna beamwidth and antenna pointing-induced errors in topographic monitoring from satellite radar altimeters.
Partington, K.C., *IEEE transactions on geoscience and remote sensing,* Jan. 1998, 36(1), p.312-316, 14 refs.
Remote sensing, Ice sheets, Ice surveys, Spacecraft, Radar echoes, Antennas, Height finding, Topographic effects, Accuracy

52-2340
Microwave remote sensing of snow from a cable car at Chamonix in the French Alps.
Sherjal, I., et al, *IEEE transactions on geoscience and remote sensing,* Jan. 1998, 36(1), p.324-328, 12 refs.
Snow surveys, Remote sensing, Alpine landscapes, Radiometry, Brightness, Snow temperature, Surface temperature, Snow stratigraphy, Snow optics, France—Chamonix

52-2341
On possible interpretations of the anomalous properties of supercooled water.
Bartell, L.S., *Journal of physical chemistry B,* Sep. 18, 1997, 101(38), p.7573-7583, 38 refs.
Water structure, Drops (liquids), Density (mass/volume), Molecular structure, Stability, Aggregates, Thermodynamic properties, Supercooling, Thermal expansion, Temperature effects, Mathematical models

52-2342
Rates and processes of periglacial solifluction: an experimental approach.
Harris, C., Davies, M.C.R., Coutard, J.P., *Earth surface processes and landforms,* Sep. 1997, 22(9), p.849-868, 37 refs.
Periglacial processes, Solifluction, Slope processes, Thermal regime, Freeze thaw cycles, Frozen ground mechanics, Frost heave, Thaw consolidation, Shear strain, Water pressure, Simulation, Cold chambers

52-2343
Pressure dependence of the elastic constants of ice III and ice VI.
Tulk, C.A., Gagnon, R.E., Kiefte, H., Clouter, M.J., *Journal of chemical physics,* Dec. 22, 1997, 107(24), p.10684-10690, 30 refs.
Ice physics, High pressure ice, Elastic properties, Ice spectroscopy, Spectra, Atmospheric pressure, Ice density, Ice crystal optics

52-2344
Heat of fusion and surface tension of solids confined in porous materials derived from a combined use of NMR and calorimetry.
Hansen, E.W., Gran, H.C., Sellevold, E.J., *Journal of physical chemistry B,* Aug. 28, 1997, 101(35), p.7027-7032, 34 refs.
Ice physics, Nuclear magnetic resonance, Temperature measurement, Porous materials, Phase transformations, Ice melting, Ice water interface, Melting points, Enthalpy, Heat flux, Interfacial tension, Mathematical models, Theories

52-2345
Association between the BWA index and winter surface temperature variability over eastern Canada and West Greenland.
Shabbar, A., Higuchi, K., Skinner, W., Knox, J.L., *International journal of climatology,* Sep. 1997, 17(11), p.1195-1210, 39 refs.
Climatology, Climatic changes, Subpolar regions, Surface temperature, Indexes (ratios), Cooling, Seasonal variations, Atmospheric circulation, Temperature measurement, Correlation, Statistical analysis, Greenland, Baffin Bay, Canada

52-2346
Modelling net radiation in a high arctic environment using summer field camp data.
Young, K.L., Woo, M.K., *International journal of climatology,* Sep. 1997, 17(11), p.1211-1229, 52 refs.
Climatology, Polar atmospheres, Radiation balance, Cloud cover, Surface temperature, Surface energy, Albedo, Snowmelt, Snow cover effect, Meteorological factors, Mathematical models

52-2347
Insight into the ice nucleation process via design of crystalline ice nucleators of variable size.
Majewski, J., et al, *Journal of physical chemistry B,* Oct. 30, 1997, 101(44), p.8874-8877, 23 refs.
Ice physics, Heterogeneous nucleation, Ice formation, Monomolecular films, Molecular structure, Hydrocarbons, Solutions, Artificial nucleation, Freezing points

52-2348
Sources of pollution aerosol at Dye 3, Greenland.
Lowenthal, D.H., Borys, R.D., Mosher, B.W., *Atmospheric environment,* Nov. 1997, 31(22), p.3707-3717, 29 refs.
Climatology, Air pollution, Atmospheric composition, Haze, Subpolar regions, Ice sheets, Aerosols, Origin, Atmospheric circulation, Environmental tests, Sampling, Greenland—Dye 3

52-2349
Topographic steering of winds in Vestfjorden, Norway.
Jones, B., Boudjelas, S., Mitchelson-Jacob, E.G., *Weather,* Oct. 1997, 52(10), p.304-311, 5 refs.
Climatology, Subpolar regions, Wind direction, Ocean currents, Marine atmospheres, Air water interactions, Coastal topographic features, Topographic effects, Norway—Vestfjorden

52-2350
Carboniferous age for the East Greenland "Devonian" basin: paleomagnetic and isotopic constraints on age, stratigraphy, and plate reconstructions.
Hartz, E.H., Torsvik, T.H., Andresen, A., *Geology,* Aug. 1997, 25(8), p.675-678, 12 refs.
Pleistocene, Geologic structures, Tectonics, Quaternary deposits, Sedimentation, Stratigraphy, Geomagnetism, Remanent magnetism, Radioactive age determination, Correlation, Greenland

52-2351
Anomalously cold temperatures observed at the base of the gas hydrate stability zone on the U.S. Atlantic passive margin.
Ruppel, C., *Geology,* Aug. 1997, 25(8), p.699-702, 34 refs.
Marine geology, Ocean bottom, Bottom sediment, Hydrates, Clathrates, Natural gas, Ice temperature, Boreholes, Temperature measurement, Stability, Atlantic Ocean

52-2352
Influence of subglacial drainage conditions on the velocity distribution within a glacier cross section.
Harbor, J., Sharp, M., Copland, L., Hubbard, B., Nienow, P., Mair, D., *Geology,* Aug. 1997, 25(8), p.739-742, 29 refs.
Glacial hydrology, Alpine glaciation, Subglacial drainage, Glacier flow, Velocity measurement, Glacier beds, Water pressure, Ice solid interface, Basal sliding, Bottom topography, Topographic effects

52-2353
E-MORB glasses from the Gakkel Ridge, (Arctic Ocean) at 87°N: evidence for the Earth's most northerly volcanic activity.
Mühe, R., Bohrmann, H., Garbe-Schönberg, D., Kassens, H., *Earth and planetary science letters,* Nov. 1997, 152(1-4), p.1-9, 30 refs.
Marine geology, Oceanographic surveys, Bottom sediment, Magma, Sampling, Geochemistry, Drill core analysis, Lithology, Isotope analysis, Arctic Ocean

52-2354
Microchamber for optical observation of freeze-drying phenomena.
Bayard, J., Cléris, H., Varnier, S., *Review of scientific instruments,* Dec. 1997, 68(12), p.4593-4595, 6 refs.
Freeze drying, Vacuum freezing, Instruments, Thermal analysis, Ice sublimation, Performance, Photography, Laboratory techniques

52-2355
Physical aging in supercooled glycerol: evidence for heterogeneous dynamics?
Miller, R.S., MacPhail, R.A., *Journal of physical chemistry B,* Oct. 23, 1997, 101(43), p.8635-8641, 33 refs.
Polymers, Supercooling, Liquid cooling, Spectroscopy, Spectra, Age determination, Statistical analysis, Temperature effects

52-2356
FTIR studies of annealing processes in low temperature pure and mixed amorphous ice samples.
Givan, A., Loewenschuss, A., Nielsen, C.J., *Journal of physical chemistry B,* Oct. 23, 1997, 101(43), p.8696-8706, 57 refs.
Ice physics, Amorphous ice, Ice solid interface, Ice vapor interface, Adsorption, Ice spectroscopy, Infrared spectroscopy, Heating, Ice sublimation, Spectra, Low temperature tests, Temperature effects

52-2357
Periglacial subsurface topography of the west coast of Jutland, Denmark.
Jacobsen, N.K., *Journal of coastal research,* Fall 1997, 13(4), p.1238-1244, 13 refs.
Geomorphology, Coastal topographic features, Periglacial processes, Landforms, Channels (waterways), Littoral zone, Patterned ground, Ice wedges, Permafrost indicators, Sea level, Pingos, Denmark—Jutland

52-2358
Simulated climate change effects on dissolved oxygen characteristics in ice-covered lakes.
Fang, X., Stefan, H.G., *Ecological modelling,* Nov. 17, 1997, 103(2-3), p.209-229, 38 refs.
Climatology, Climatic changes, Global warming, Lake ice, Icebound lakes, Water chemistry, Carbon dioxide, Oxygen, Profiles, Air ice water interaction, Ice cover effect, Mathematical models

52-2359
Distributed mass/discrete floe model for pack ice rheology computation.
Rheem, C.K., Yamaguchi, H., Kato, H., *Journal of marine science and technology,* 1997, 2(2), p.101-121, 17 refs.
Oceanography, Sea ice, Ice mechanics, Pack ice, Ice floes, Drift, Aggregates, Impact strength, Ice solid interface, Offshore structures, Simulation, Mathematical models, Rheology

52-2360
Antarctic meteorology and climatology.
King, J.C., Turner, J., Cambridge, UK, Cambridge University Press, 1997, 409p., Refs. p.386-404.
DLC QC994.9.K56 1997
Measuring instruments, Climate, Atmospheric circulation, Clouds (meteorology), Precipitation (meteorology), Wind (meteorology), Sea ice, Snow
This is a comprehensive survey of the climatology and meteorology of Antarctica. Part 1 reviews the methods by which the antarctic atmosphere can be observed and presents a synthesis of climatological measurements. Part 2 discusses the processes which maintain the observed climate, including large-scale atmospheric circulation, synoptic-scale weather systems, and mesoscale and small-scale processes. Part 3 reviews current knowledge of the variability of the climate and considers changes that may occur in Antarctica as a result of 'greenhouse' warming. Links between the atmosphere and other elements of the antarctic climate system (oceans, sea ice and ice sheets) are stressed and the processes which couple Antarctica with the global climate system are examined. The instruments and platforms used in the studies are discussed (including automatic stations and international data centers), with emphasis on the role of remote sensing from satellites and numerical modelling techniques. (Auth. mod.)

52-2361
Preliminary crystal structure determination of the alkaline protease from the antarctic psychrophile *Pseudomonas aeruginosa*.
Villeret, V., Chessa, J.P., Gerday, C., Van Beeumen, J., *Protein science,* Nov. 1997, 6(11), p.2462-2464, 16 refs.
Bacteria, Ice crystal structure, Microbiology, Antarctica—Dumont d'Urville Station
A cold alkaline protease, isolated from an antarctic *Pseudomonas aeruginosa* strain, has been purified and crystallized. Large crystals have been obtained in the presence of PEG 6000 at pH 7 and pH 8. They belong to the space group $P2_12_12_1$. A complete data set to 2.1 Å resolution has been measured. The structure has been determined by the molecular replacement method using the coordinates of the mesophilic alkaline protease as a model. The molecular replacement solution displays a correlation coefficient of 0.39 and an R-factor of 0.48. Subsequent inspection of the electron density map in the active site region has confirmed the correctness of the solution. Model building and structure refinement will be initiated when the protease sequence becomes fully available. This is the second report, following one on an α-amylase, of the preliminary crystallographic characterization of a psychrophilic enzyme. (Auth.)

52-2362
Diversity and association of psychrophilic bacteria in antarctic sea ice.
Bowman, J.P., McCammon, S.A., Brown, M.V., Nichols, D.S., McMeekin, T.A., *Applied and environmental microbiology,* Aug. 1997, 63(8), p.3068-3078, 60 refs.
Bacteria, Algae, Microbiology, Sea ice, Ice shelves, Ice cores, Antarctica—Vestfold Hills
The bacterial populations associated with sea ice sampled from antarctic coastal areas were investigated. Psychrophilic bacterial diversity was significantly enriched in sea ice samples possessing platelet and bottom ice diatom assemblages. Substantially fewer psychro-

philic isolates were recovered from ice cores with a low or negligible population of ice diatoms or from under-ice seawater samples. The taxonomic distributions of psychrotrophic bacteria isolated from sea ice cores and under-ice seawater were quite similar. Overall, bacterial isolates from antarctic sea ice belong to four phylogenetic groups: the alpha and gamma subdivisions of the *Proteobacteria*, the gram-positive branch, and the *Flexibacter-Bacteroides-Cytophaga* phylum. Most of the sea ice strains examined appeared to be novel taxa, with 45% being psychrophilic. It is proposed that ice diatom assemblages provide niches conducive to the proliferation of a diverse array of psychrophilic bacterial species. (Auth. mod.)

52-2363

Computation of the Moho depths from gravity data in the Ross Sea, Antarctica.

Coren, F., Zanolla, C., Marson, I., Gravity and Geoid, Joint Symposium of the International Gravity Commission and the International Geoid Commission: Symposium No.113, Graz, Austria, Sep. 11-17, 1994. Edited by H. Sünkel and I. Marson, Berlin, Germany, Springer-Verlag, 1995, p.278-285, 12 refs.

DLC QB330.G685 1995

Seismic surveys, Seismic reflection, Seismic refraction, Gravity, Geophysical surveys, Antarctica—Ross Ice Shelf, Antarctica—Ross Sea

The shape of the Moho discontinuity in the Ross Sea area has been reconstructed using a synthesis of German and Italian marine gravity data and the depth to seismic Moho. This reconstruction starts with the integration of the Simple Bouguer Map, compiled by the Osservatorio Geofisico Sperimentale in 1993, with new data from recent cruises. Two-dimensional gravity models have been computed to create a grid accurate enough to produce a 3-D map of Moho depths. Reflection-seismic data have been used to define the shape of the sedimentary units and the upper part of the basement (acoustic) used in the model. Preliminary results indicate smooth trends in depth of the Moho across the Ross Sea. Moho is shallower beneath the basins and deeper under the basement rises. Moho morphology changes from north to south in the Central Trough across a discontinuity which trends northwest-southeast. The new data set serves as a base for the computation of the geoid undulations in the Ross Sea area. (Auth. mod.)

52-2364

Miocene glaciomarine sedimentation in the northern Antarctic Peninsula region: the stratigraphy and sedimentology of the Hobbs Glacier Formation, James Ross Island.

Pirrie, D., Crame, J.A., Riding, J.B., Butcher, A.R., Taylor, P.D., *Geological magazine,* Nov. 1997, 134(6), p.745-762, Refs. p.759-761.

Pleistocene, Quaternary deposits, Glacial geology, Glaciation, Sedimentation, Stratigraphy, Rock properties, Paleobotany, Palynology, Geochronology, Correlation, Antarctica—James Ross Island

In the James Ross I. area, Late Cretaceous sedimentary rocks are unconformably overlain by a unit of diamictites and tuffs, which occur at the base of the James Ross Island Volcanic Group. These rocks are here defined as the Hobbs Glacier Formation, and on the basis of palynological studies are assigned to a Miocene (?Late Miocene) age. The diamictites are interpreted as representing glaciomarine sedimentation close to the grounding line of either a floating ice shelf or a grounded tidewater glacier in a marine basin. Provenance studies indicate that the glacier was flowing from the Antarctic Peninsula towards the southeast. The Hobbs Glacier Formation and overlying James Ross Island Volcanic Group enhance understanding of the Neogene glacial chronology of West Antarctica. (Auth. mod.)

52-2365

Quaternary fluvio-lacustrine deposits of the Lamayuru Basin, Ladakh Himalaya: preliminary multidisciplinary investigations.

Kotlia, B.S., Shukla, U.K., Bhalla, M.S., Mathur, P.D., Pant, C.C., *Geological magazine,* Nov. 1997, 134(6), p.807-812, 27 refs.

Pleistocene, Geomorphology, Quaternary deposits, Paleoecology, Lacustrine deposits, Sedimentation, Stratigraphy, Geomagnetism, Tectonics, India—Ladakh

52-2366

Discussion of glacial or non-glacial origin for the Bigganjargga tillite, Finnmark, northern Norway.

Edwards, M.B., Jensen, P.A., Wulff-Pedersen, E., *Geological magazine,* Nov. 1997, 134(6), p.873-876, 20 refs. For pertinent paper see 50-4395.

Pleistocene, Glacial geology, Moraines, Sediment transport, Substrates, Striations, Glacial deposits, Theories, Norway

52-2367

Attenuation of sunlight by high-latitude clouds: spectral dependence and its physical mechanisms.

Frederick, J.E., Erlick, C., *Journal of the atmospheric sciences,* Dec. 15, 1997, 54(24), p.2813-2819, 6 refs.

Climatology, Polar atmospheres, Solar radiation, Radiance, Attenuation, Cloud cover, Photometry, Upwelling, Antarctica—Palmer Station, Argentina—Ushuaia

Measurements of the ground-level solar irradiance from Palmer Station, and Ushuaia, Argentina, reveal a systematic wavelength dependence in the attenuation provided by cloudy skies. As wavelength increases from 350 to 600 nm, the measured cloudy-sky irradiance, expressed as a fraction of the clear-sky value, decreases. The observed behavior can arise from Rayleigh backscattering of sunlight beneath the cloud, followed by reflection of this upwelling radiation from the cloud base back to the ground. This sequence of events is most effective at short wavelengths and leads to cloudy skies providing less overall attenuation as wavelength decreases. (Auth. mod.)

52-2368

Is there evidence for solar forcing of climate in the GISP2 oxygen isotope record.

Stuiver, M., Braziunas, T.F., Grootes, P.M., Zielinski, G.A., *Quaternary research,* Nov. 1997, 48(3), p.259-266, Refs. p.264-266.

Climatology, Climatic changes, Solar radiation, Ice sheets, Ice cores, Quaternary deposits, Aerosols, Volcanic ash, Oxygen isotopes, Carbon isotopes, Isotope analysis, Profiles, Ice dating, Greenland

52-2369

Implications of Late Pleistocene glaciation of the Tibetan Plateau for present-day uplift rates and gravity anomalies.

Kaufmann, G., Lambeck, K., *Quaternary research,* Nov. 1997, 48(3), p.267-279, 59 refs.

Pleistocene, Glaciation, Glacial geology, Ice sheets, Ice deterioration, Isostasy, Sea level, Gravity anomalies, Ice models, China—Tibet

52-2370

Late Pleistocene glacial events in the Central Apennines, Italy.

Giraudi, C., Frezzotti, M., *Quaternary research,* Nov. 1997, 48(3), p.280-290, 43 refs.

Alpine glaciation, Pleistocene, Paleoclimatology, Glacier oscillation, Glacial geology, Quaternary deposits, Moraines, Snowfall, Stratigraphy, Radioactive age determination, Geochronology, Italy—Apennines

52-2371

Geochronology of Middle and Upper Pleistocene loess sections in Hungary.

Frechen, M., Horváth, E., Gábris, G., *Quaternary research,* Nov. 1997, 48(3), p.291-312, 52 refs.

Pleistocene, Quaternary deposits, Loess, Sedimentation, Sampling, Luminescence, Geochronology, Stratigraphy, Statistical analysis, Hungary

52-2372

Climatic oscillations 10,000-155,000 yr B.P. at Owens Lake, California reflected in glacial rock flour abundance and lake salinity in core OL-92.

Bischoff, J.L., Menking, K.M., Fitts, J.P., Fitzpatrick, J.A., *Quaternary research,* Nov. 1997, 48(3), p.313-325, 35 refs.

Pleistocene, Paleoclimatology, Climatic changes, Quaternary deposits, Glacial geology, Glacier oscillation, Glacial deposits, Lacustrine deposits, Clay minerals, Sampling, Geochemistry, Spectroscopy, Geochronology, United States—California—Owens Lake

52-2373

Lithofacies and seismic-reflection interpretation of temperate glacimarine sedimentation in Tarr Inlet, Glacier Bay, Alaska.

Cai, J., Powell, R.D., Cowan, E.A., Carlson, P.R., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.5-37, Refs. p.34-37.

Marine geology, Glacial geology, Glacial deposits, Marine deposits, Bottom sediment, Sedimentation, Ice rafting, Drill core analysis, Seismic reflection, Profiles, Lithology, Stratigraphy, Correlation, United States—Alaska—Glacier Bay

52-2374

Western Norwegian fjord sediments: age, volume, stratigraphy, and role as temporary depository during glacial cycles.

Aarseth, I., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.39-53, Refs. p.51-53.

Pleistocene, Marine geology, Marine deposits, Glacial deposits, Quaternary deposits, Bottom sediment, Sorting, Seismic surveys, Profiles, Lithology, Stratigraphy, Geochronology, Norway

52-2375

Postglacial sequence stratigraphy of Lake Melville, Labrador.

Syvitski, J.P.M., Lee, H.J., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.55-79, 39 refs.

Pleistocene, Marine geology, Glacial geology, Glacial deposits, Quaternary deposits, Glacier oscillation, Ice edge, Lacustrine deposits, Stratigraphy, Seismic surveys, Profiles, Models, Canada—Labrador—Melville, Lake

52-2376

Effects of the readvance of an ice margin on the seismic character of the underlying sediment.

Lønne, I., Syvitski, J.P.M., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.81-102, Refs. p.100-102.

Marine geology, Quaternary deposits, Marine deposits, Glacial geology, Glacier oscillation, Moraines, Ice solid interface, Ice edge, Grounded ice, Seismic surveys, Stratigraphy, Profiles, Canada—Labrador—Melville, Lake

52-2377

Seismic facies changes along a nearly continuous 24° latitudinal transect: the fjords of Chile and the northern Antarctic Peninsula.

DaSilva, J.L., Anderson, J.B., Stravers, J., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.103-123, Refs. p.121-123.

Glacial geology, Marine geology, Oceanographic surveys, Seismic surveys, Bottom sediment, Glacial deposits, Moraines, Profiles, Stratigraphy, Climatic factors, Antarctica—Antarctic Peninsula, Chile

High-resolution seismic reflection profiles and piston cores from bays, fjords, and straits of the inland passage of Chile and the northern Antarctic Peninsula region were used to examine changes in seismic facies along a nearly continuous 24° latitudinal transect that encompasses temperate, subpolar, and polar climatic regimes. These climatic regimes are characterized by differences in seismic facies. Eight seismic facies are recognized on the basis of reflection character, intensity of acoustic contrast at bounding surfaces, and external shape of the unit. The northern Antarctic Peninsula is a polar climatic setting. The straits, bays, and fjords of the region have been virtually scraped clean of sediments. A thin, draping glacial-marine unit occurs locally in these areas. (Auth. mod.)

52-2378

Multibeam bathymetry of glaciated terrain off southwest Newfoundland.

Shaw, J., Courtney, R.C., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.125-135, 20 refs.

Marine geology, Oceanographic surveys, Glacial geology, Marine deposits, Glacial deposits, Bottom sediment, Moraines, Sounding, Seismic reflection, Imaging, Bottom topography, Geomorphology, Canada—Newfoundland

52-2379

Glacial debris flow deposits on the Baffin Island shelf: seismic facies architecture of till-tongue-like deposits.

Stravers, J.A., Powell, R.D., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.151-168, 30 refs.

Marine geology, Glacial geology, Quaternary deposits, Glacier flow, Glacial deposits, Meltwater, Moraines, Bottom sediment, Seismic reflection, Stratigraphy, Geomorphology, Models, Canada—Baffin Island

52-2380

Late Weichselian deglacial history of the Svyataya (Saint) Anna Trough, northern Kara Sea, arctic Russia.

Polyak, L., Forman, S.L., Herlihy, F.A., Ivanov, G., Krinitskiĭ, P., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.169-188, Refs. p.186-188.

Pleistocene, Marine geology, Glacial geology, Marine deposits, Glacial deposits, Glacier oscillation, Calving, Bottom sediment, Seismic reflection, Stratigraphy, Russia—Kara Sea

52-2381

Late Pleistocene and Holocene depositional environments and paleoceanography of the Barents Sea: evidence from seismic and biostratigraphic data.

Pavlidis, IU.A., Poliakova, E.I., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.189-205, 33 refs.

Marine geology, Glacial geology, Pleistocene, Marine deposits, Glacial deposits, Bottom topography, Landforms, Seismic reflection, Stratigraphy, Profiles, Paleoecology, Correlation, Barents Sea

52-2382

Glacier-influenced Scoresby Sund Fan, East Greenland continental margin: evidence from GLORIA and 3.5 kHz records.

Dowdeswell, J.A., Kenyon, N.H., Laberg, J.S., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.207-221, 36 refs.

Marine geology, Glacial geology, Marine deposits, Sedimentation, Bottom sediment, Glacial deposits, Ice rafting, Bottom topography, Seismic reflection, Acoustic measurement, Profiles, Greenland—Scoresby Sund

52-2383

Substrate control on distribution of subglacial and glaciomarine seismic facies based on stochastic models of glacial seismic facies deposition on the Ross Sea continental margin, Antarctica.

Bartek, L.R., Andersen, J.L.R., Oneacre, T.A., *Marine geology,* Nov. 1997, 143(1-4), COLDSEIS (seismic facies of glacigenic deposits) Workshop, Dartmouth, Nova Scotia, Oct. 1995. Selected papers. Edited by J. Syvitski, A.K. Cooper and M.S. Stoker, p.223-262, Refs. p.260-262.

Pleistocene, Marine geology, Glacial geology, Bottom sediment, Substrates, Glacier flow, Glacier oscillation, Glacial deposits, Seismic reflection, Stratigraphy, Tectonics, Statistical analysis, Models, Antarctica—Ross Sea

A quantitative approach was utilized to establish the nature of spatial and temporal variations of glaciomarine and subglacial seismic facies deposition in the Ross Sea. This paper presents quantitative evidence for a dynamic polar style of glaciation not merely in the Plio-Pleistocene but back to the Late Oligocene. High-resolution seismic data shows evidence of multiple ice sheet grounding events in central and eastern Ross Sea strata, a recipient of both West and East Antarctic ice sheets, from the Late Oligocene until the present. It is suggested that the West and East Antarctic ice sheets are dynamic and have gone through a full spectrum of thermal states (temperate through polar) since the Late Oligocene and not necessarily in any particular preferred temporal order. (Auth. mod.)

52-2384

Climate around Greenland—1996. [Das Klima um Grönland—1996]

Stein, M., *Informationen für die Fischwirtschaft,* 1997, 44(3), p.97-102, In German with English summary. 11 refs.

Climatology, Subpolar regions, Marine atmospheres, Air temperature, Sea ice distribution, Temperature variations, Seasonal variations, Statistical analysis, Greenland

52-2385

Interactions between resources and abiotic conditions control plant performance on subarctic coastal dunes.

Houle, G., *American journal of botany,* Dec. 1997, 84(12), p.1729-1737, 50 refs.

Shores, Subarctic landscapes, Plant ecology, Nutrient cycle, Biomass, Growth, Salinity, Humidity, Simulation, Theories, Vegetation patterns

52-2386

Snowrollers.

Schlatter, T., *Weatherwise,* Dec. 1996-Jan. 1997, 49(6), p.42.

Weather observations, Snow physics, Snow accumulation, Aggregates, Sediment transport, Wind factors, Snow air interface

52-2387

Glacial geology and well drillers.

Riewe, T., *Water well journal,* Feb. 1997, 51(2), p.26-30.

Wells, Water supply, Drilling, Glacial geology, Glacial deposits, Moraines, Outwash, Detection, Engineering geology

52-2388

Climatic adaptation of bud set and frost hardiness in Scots pine (*Pinus sylvestris*).

Hurme, P., Repo, T., Savolainen, O., Pääkkönen, T., *Canadian journal of forest research,* May 1997, 27(5), p.716-723, With French summary. 48 refs.

Trees (plants), Plant physiology, Subarctic landscapes, Frost resistance, Growth, Cold tolerance, Phenology, Cold weather survival, Distribution, Sampling, Correlation

52-2389

Late Paleocene Arctic Ocean shallow-marine temperatures from mollusc stable isotopes.

Bice, K.L., Arthur, M.A., Marincovich, L., Jr., *Paleoceanography,* June 1996, 11(3), p.241-249, 54 refs.

Pleistocene, Oceanography, Water temperature, Runoff, Temperature variations, Paleoecology, Marine deposits, Sampling, Carbon isotopes, Isotope analysis, Radioactive age determination, Arctic Ocean

52-2390

High-resolution (10^4 years) deep-sea foraminiferal stable isotope records of the Eocene-Oligocene climate transition.

Zachos, J.C., Quinn, T.M., Salamy, K.A., *Paleoceanography,* June 1996, 11(3), p.251-266, Refs. p.263-266.

Paleoclimatology, Climatic changes, Glacier oscillation, Quaternary deposits, Paleoecology, Carbon isotopes, Isotope analysis, Geochronology, Stratigraphy

This paper presents high-resolution benthic foraminiferal $\delta^{13}C$ and $\delta^{18}O$ records for the upper Eocene through lower Oligocene of two pelagic sequences, Deep Sea Drilling Project Site 522 in the Angola Basin, South Atlantic Ocean, and Ocean Drilling Program Site 744, Kerguelen Plateau, in the southern Indian Ocean. These records provide improved constraints on both the timing and magnitude of marine oxygen and carbon isotope events from 30 to 35 Ma. The oxygen isotope records indicate that the ubiquitous $\delta^{18}O$ increase, which marks the rapid expansion of continental ice sheets and a minimum of 3-4°C of cooling of bottom waters in the earliest Oligocene (33.6 Ma), occurred in <350 kyr. (Auth. mod.)

52-2391

Magnetic signature of rapidly deposited detrital layers from the deep Labrador Sea: relationship to North Atlantic Heinrich layers.

Stoner, J.S., Channell, J.E.T., Hillaire-Marcel, C., *Paleoceanography,* June 1996, 11(3), p.309-325, 52 refs.

Marine geology, Quaternary deposits, Marine deposits, Drill core analysis, Magnetic properties, Rock magnetism, Lithology, Grain size, Sedimentation, Glacier oscillation, Ice rafting, Geochronology, Labrador Sea

52-2392

Glacier mass balance in high-Asia and its response to climatic change.

Xie, Z.C., Ding, L.F., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.4-11, In Chinese with English summary. 24 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, Climatic changes

52-2393

Characteristics of energy balance and computation on the mass balance change of the high-Asia cryosphere.

Kang, E.S., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.12-22, In Chinese with English summary. 33 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier heat balance, Glacier mass balance, Snow line, Permafrost heat balance, Radiation balance, Climatic changes

52-2394

Variations of glacier mass balance and their response to climatic change.

Ding, Y.J., Bing, H.T., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.23-32, In Chinese with English summary. 23 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, Snow line, Air temperature, Climatic changes

52-2395

Recent variations of the Batura Glacier in the Karakorum Mountains.

Zhang, X.S., Chen, J.M., Wang, W.Y., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.33-45, In Chinese with English summary. 13 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier flow, Glacier surfaces, Glacier thickness, Pakistan—Karakoram Mountains

52-2396
Hydraulic effects in the ablation area of the Hailuogou Glacier.
Huang, M.H., Wang, M.H., Song, G.P., Li, G., Shen, Y., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.46-50, In Chinese with English summary. 6 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Mountain glaciers, Glacial hydrology, Subglacial drainage, Glacier ablation, Glacier flow, Basal sliding, Water pressure, Water level, China—Gongga, Mount

52-2397
Maritime characteristics of Hailuogou Glacier in the Gongga Mountains.
Su, Z., Song, G.P., Cao, Z.T., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.51-59, In Chinese with English summary. 6 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier formation, Glacier alimentation, Glacier flow, Glacier mass balance, Ice temperature, Snow stratigraphy, China—Gongga, Mount

52-2398
Study on changes of the glacier system and its runoff at the north flank of the Tianger Mountain in the Tianshan Mountains.
Kang, E.S., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.60-74, In Chinese with English summary. 15 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacial meteorology, Glacial hydrology, Meltwater, Glacial rivers, Runoff forecasting, Climatic changes, Global warming, Mathematical models, China—Tian Shan

52-2399
Preliminary study on the ion elution of snowpacks over Qinghai-Xizang Plateau.
Hou, S.G., Qin, D.H., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.75-82, In Chinese with English summary. 8 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Mountain glaciers, Ice cores, Glacial meteorology, Scavenging, Snow ice interface, Snow stratigraphy, Snow composition, Snowmelt, Ice composition, Meltwater, Ion density (concentration), China—Qinghai-Xizang Plateau

52-2400
Surface accumulation rate and mass balance of the antarctic ice sheet.
Ren, J.W., Qin, D.H., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.83-89, In Chinese with English summary. 21 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Ice sheets, Glacier surveys, Glacier oscillation, Glacier alimentation, Glacier mass balance
Comparison of spatial distribution of the accumulation rate and its variability of past several decades in the Lambert Glacier basin with those in other areas of the antarctic ice sheet indicates that variations of the accumulation rate both in space and in time are different in various areas on the ice sheet, so that it is difficult to accurately calculate the net accumulation and its change using the update limited data. The accuracy of estimates on iceberg calving and basal melting at present is relatively much lower. Therefore, the current state of mass balance of the ice sheet is still poorly known. Although the recent climatic warming may cause increase in precipitation, mass losses such as the iceberg calving and melting may increase too, and as a result, the ice sheet perhaps is in the negative mass balance. One practical way is to obtain the average state of mass balance over a certain period, e.g. 5 or 10 years, by means of extensive and accurate remote sensing monitoring. It is necessary to combine the mass balance with the ice sheet dynamics and to develop the couple model of ice-ocean-atmosphere for accurate estimate of the mass balance state and its variability. (Auth. mod.)

52-2401
Time series analysis of accumulation rate of MGA snow core from Lambert Glacier, East Antarctica.
Wang, W.T., Ren, J.W., Qin, D.H., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.90-95, In Chinese with English summary. 6 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Glacier surveys, Glacier alimentation, Glacier oscillation, Glacier mass balance, Ice cores, Snow stratigraphy, Firn stratification, Statistical analysis, Antarctica—Lambert Glacier
A 51-year time series of accumulation rate is obtained through the comprehensive analysis of the snow stratigraphy, stable isotopic ratio ($\delta^{18}O$) and electrical conductivity measurement of a 27.50 m ice core from the MGA drilling site on Lambert Glacier. The analysis of time domain of the series indicates that the sampling values appear to be in a right-deviated normal distribution, which is in accordance with the results derived from the ice cores of Qing-Zang (Tibet) Plateau. The analysis of frequency domain of the series shows that there exist both 3-year and 7-year quasi-cycles of accumulation rate. The latter is much closer to the solar double-fluctuation cycle, and the former shows a good correlation to the results of annual accumulation rate of the ice core from Dun-de Glacier, Qilian Mts., China. (Auth. mod.)

52-2402
Glacier fluctuations: comparison between long-term of measurements in China and Switzerland.
Ding, Y.J., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.96-104, In Chinese with English summary. 23 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial meteorology, Global warming, Statistical analysis, China, Switzerland

52-2403
Monitoring snow cover on the high-Asia.
Li, P.J., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.105-114, In Chinese with English summary. 18 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Snow surveys, Snow cover distribution, Snow depth, Spaceborne photography, Climatic changes, Statistical analysis

52-2404
Predicted change trend of snow cover in high-Asia.
Cao, M.S., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.115-122, In Chinese with English summary. 12 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Snow surveys, Snow cover distribution, Snow depth, Global warming, Spaceborne photography, Statistical analysis

52-2405
Study on snowfall variation in the Tianshan Mountains during the recent 30 winters.
Xu, J.R., Qiu, J.Q., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.123-128, In Chinese with English summary. 7 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Snowfall, Snow cover distribution, Snow accumulation, Climatic changes, Meteorological data, Statistical analysis, China—Tian Shan

52-2406
Studies on the processes of thermal exchange, evaporation and sublimation of the snow cover in the Tianshan Mountains, China.
Wei, W.S., Wang, C.N., Jiang, F.Q., Wang, J.Q., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.129-138, In Chinese with English summary. 8 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Snow heat flux, Snow air interface, Snow evaporation, Snow ice interface, Ice sublimation, Glacier heat balance, China—Tian Shan

52-2407
Ground temperature, permafrost distribution and climate warming in northeastern China.
Zhou, Y.W., Wang, Y.X., Gao, X.W., Yue, H.S., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.139-147, In Chinese with English summary. 15 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Permafrost distribution, Permafrost heat balance, Active layer, Frozen ground temperature, Soil air interface, Ground thawing, Permafrost forecasting, Global warming, China

52-2408
Classification of high-Asia periglacial process types and their altitudinal spectrums.
Guo, D.X., Cheng, G.D., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.148-156, In Chinese with English summary. 9 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Mountains, Periglacial processes, Geomorphology, Climatic factors

52-2409
Response of permafrost to climate change in the Qinghai-Xizang Plateau.
Wang, S.L., Zhao, X.F., Guo, D.X., Huang, Y.Z., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.157-165, In Chinese with English summary. 6 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Permafrost distribution, Permafrost depth, Permafrost heat balance, Permafrost forecasting, Frozen ground temperature, Ground thawing, Soil temperature, Air temperature, Soil air interface, Global warming, China—Qinghai-Xizang Plateau

52-2410
Permafrost zonation of ground temperature and stability of engineering constructions in the western region, China.
Tong, C.J., Wu, Q.B., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.166-173, In Chinese with English summary. 12 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Permafrost distribution, Permafrost thickness, Permafrost beneath structures, Frozen ground temperature, Frozen ground strength, Frozen ground settling, Global warming, China

52-2411
Preliminary analysis on the regularity of permafrost degradation, its advantages and disadvantages in the Greater and Lesser Xing'an Mountains.
Wang, C.H., Zhang, B.L., Liu, F.T., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.174-180, In Chinese with English summary. 3 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.
Permafrost distribution, Permafrost thickness, Ground thawing, Permafrost forecasting, Economic development, Environmental impact, Global warming, China—Greater Khingan Range

52-2412

Relationship between permafrost evolution and the formation of gold placers in northern part of the Greater and Lesser Hinggan Mountains since late Pleistocene epoch.

Zhang, B.L., Wang, C.H., Chunyu, S.J., Song, C.C., Wang, R.S., Liu, F.T., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.181-189, In Chinese with English summary. 8 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Placer mining, Gold, Exploration, Alluvium, Geochemistry, Permafrost origin, Permafrost dating, Permafrost weathering, China—Greater Khingan Range

52-2413

Numerical simulation of the future change of thermal regime in the high temperature permafrost of Qinghai-Xizang Plateau under climate warming.

Li, S.X., Cheng, G.D., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.190-196, In Chinese with English summary. 5 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Permafrost heat balance, Permafrost thickness, Active layer, Permafrost forecasting, Frozen ground temperature, Ground thawing, Global warming, Mathematical models, China—Qinghai-Xizang Plateau

52-2414

Analysis and approximate calculation of permafrost evolution.

Li, S.X., Cheng, G.D., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.197-205, In Chinese with English summary. 2 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Permafrost heat balance, Permafrost distribution, Permafrost forecasting, Ground thawing, Global warming, Statistical analysis, Mathematical models, China—Qinghai-Xizang Plateau

52-2415

Statistical forecasting model of the variations in active layer influenced by snow cover, exemplified by a study in northeastern China.

Gao, X.W., Zhou, Y.W., Wang, Y.X., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.206-215, In Chinese with English summary. 8 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Weather stations, Air temperature, Snow air interface, Snow depth, Snow cover effect, Active layer, Soil temperature, Thaw depth, Permafrost forecasting, Global warming, Meteorological data, Statistical analysis, China

52-2416

Water chemical characteristics and the evaluation of water application in the permafrost regions of northeast China.

Wang, C.H., Zhang, W.F., Zhang, B.L., Liu, F.T., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.216-226, In Chinese with English summary. 5 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Permafrost hydrology, Hydrogeochemistry, Ground ice, Ice composition, Lake water, Ground water, Water reserves, Water chemistry, China

52-2417

Effect of gold mining on permafrost and environment.

Wang, C.H., Zhang, B.L., Li, F.H., Liu, F.T., Wang, R.S., Song, C.C., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.227-233, In Chinese with English summary. 2 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Gold, Placer mining, Soil erosion, Soil pollution, Ground thawing, Permafrost preservation, China—Greater Khingan Range

52-2418

Exploration on formation of moraines since late Pleistocene in Zagunao of western Sichuan.

Tang, B.X., Liu, S.J., Liu, S.Q., Huang, C.X., Liang, Y.L., Frenzel, B., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.234-242, In Chinese with English summary. 4 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Geological surveys, Alpine glaciation, Glacial geology, Glacial deposits, Moraines, Glacial till, Quaternary deposits, Soil structure, Grain size, Soil formation, Geomorphology, China—Sichuan Province

52-2419

Discussion on the paleoclimate of late Pleistocene in Zagunao of western Sichuan based on palynological study.

Huang, C.X., Liang, Y.L., Tang, B.X., Liu, S.Q., Liu, S.J., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.243-249, In Chinese with English summary. 3 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Paleobotany, Palynology, Plant ecology, Vegetation patterns, Paleoclimatology, China—Sichuan Province

52-2420

New achievements of studies on the deposits of moraine and glacial debris flow.

Deng, Y.X., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.250-256, In Chinese with English summary. 4 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Glacial erosion, Glacial deposits, Moraines, Glacial till, Mudflows, Sediment transport, Soil structure, Soil formation, Soil classification

52-2421

Block and burst of the water channels inside Hailuogou Glacier.

Lu, R.R., Zhong, X.H., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.257-263, In Chinese with English summary. 3 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Mountain glaciers, Glacial hydrology, Subglacial drainage, Water level, Water flow, Floods, China—Gongga, Mount

52-2422

Surface sampling of vegetation and pollen in the source area of the Urumqi River.

Yan, S., Jia, B.Q., Xu, Y.Q., Yang, Y.L., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.264-273, In Chinese with English summary. 7 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Plant ecology, Vegetation patterns, Grasses, Mosses, Pollen, Palynology, Mountain soils, Meadow soils, China—Tian Shan

52-2423

Environmental effect and ecological construction of the regional periglacial wetlands in China.

Ji, Z.C., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.274-280, In Chinese with English summary. 18 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Wetlands, Tundra vegetation, Plant ecology, Soil conservation, Permafrost preservation, Periglacial processes, China

52-2424

Features of the climate changes in the Qing-Zang Plateau area during the last 40 years.

Kang, X.C., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.281-288, In Chinese with English summary. 3 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Weather stations, Air temperature, Precipitation (meteorology), Climatic changes, Meteorological data, Statistical analysis, China—Qinghai-Xizang Plateau

52-2425

Climate changes in the Qing-Zang Plateau area since the Little Ice Age.

Kang, X.C., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.289-295, In Chinese with English summary. 17 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Air temperature, Climatic changes, Plant ecology, Phenology, Global change, Statistical analysis, China—Qinghai-Xizang Plateau

52-2426

Temporal-spatial distributions and recent changes of precipitation in the northern slopes of the Qilian Mountains.

Zhu, S.S., Wang, Q., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.296-304, In Chinese with English summary. 5 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Weather stations, Precipitation (meteorology), Climatic changes, Meteorological data, Statistical analysis, China—Qilian Mountains

52-2427

Impact of climate changes on the cold region hydrology at the northern slopes of the Qilian Mountains.

Yang, Z.N., Wang, Q., Zhu, S.S., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.305-313, In Chinese with English summary. 8 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Precipitation (meteorology), Air temperature, Climatic changes, Meltwater, Snowmelt, River flow, Stream flow, Water reserves, Runoff forecasting, Meteorological data, Statistical analysis, China—Qilian Mountains

52-2428

Impact of climate variation on the runoff of large rivers in the Tibetan Plateau.

Lai, Z.M., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.314-320, In Chinese with English summary. 7 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Air temperature, Precipitation (meteorology), Global warming, River flow, Stream flow, Runoff forecasting, Meteorological data, Statistical analysis, China—Qinghai-Xizang Plateau

52-2429

Some characteristics of natural disasters in alpine region of the Kuitunhe River source in the Tianshan Mountains.

Deng, X.F., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.321-328, In Chinese with English summary. 3 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Mudflows, Floods, Avalanches, Accidents, Highway planning, China—Tian Shan

52-2430

Microwave remote sensing on freezing/thawing dynamic of terrain soil in Tibetan Plateau of the high-Asia.

Cao, M.S., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.329-335, In Chinese with English summary. 7 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Soil freezing, Ground thawing, Frozen ground thermodynamics, Frozen ground temperature, Terrain identification, Radiometry, Spaceborne photography, China—Qinghai-Xizang Plateau

52-2431

Preliminary study on snow mapping using AVHRR data and GIS techniques.

Ma, H., Qiu, J.Q., Xu, J.R., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.336-343, In Chinese with English summary. 7 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Snow surveys, Snow cover distribution, Terrain identification, Sensor mapping, Radiometry, Spaceborne photography, Image processing, Data processing

52-2432

Model to calculate the net solar radiation over complex terrain based on digital terrain model.

Li, X., Chen, X.Z., Zeng, Q.Z., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.344-353, In Chinese with English summary. 10 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Topographic surveys, Solar radiation, Insolation, Radiation balance, Radiometry, Spaceborne photography, Photogrammetry, Image processing, Computer programs

52-2433

Interchange of information on cryosphere science data set.

Chen, X.Z., Yang, Z.H., Lu, A.X., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.354-358, In Chinese with English summary. 2 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Research projects, International cooperation, Data processing, Data transmission, Computer applications

52-2434

Results of satellite monitoring of snowcover in the Tianshan Mountains.

Qiu, J.Q., Ma, H., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.359-368, In Chinese with English summary. 11 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Snow surveys, Snow cover distribution, Snow depth, Radiometry, Spaceborne photography, Statistical analysis, China—Tian Shan

52-2435

Study of setting up the accumulated snow database system in the GIS of the high-Asia frigid region.

Lu, A.X., Chen, X.Z., Wang, L.H., Li, X., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.369-374, In Chinese with English summary. 3 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Snow surveys, Snow cover distribution, Data processing, Data transmission, Computer applications

52-2436

Development of the hot water jet of model Glacier-2 and its application on the Hailuogou Glacier.

Wang, M.H., Li, G., Shen, Y., Huang, M.H., *Journal of glaciology and geocryology. Special issue,* 1996, Vol.18, p.375-379, In Chinese with English summary. 4 refs. Presented at the Symposium on the Cryosphere and Global Change (Bingdongquan yu quanqiu bianhua xueshu taolunhui), Lanzhou, China, May 5-7, 1995.

Glacier surveys, Glacier thickness, Ice drills, Thermal drills, Hydraulic jets, China—Gongga, Mount

52-2437

Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica.

Priscu, J.C., ed, *American Geophysical Union. Antarctic research series,* 1998, Vol.72, 369p. + CDROM, Refs. passim. For individual papers see A-58544, A-58546, B-58530 through B-58532, B-58534, B-58536 through B-58539, B-58543, B-58545, E-58525, E-58528, E-58533, E-58535, E-58542, F-58527, F-58529, F-58540, F-58541, I-58526 or 52-2438 through 52-2459.

Ecosystems, Glacial geology, Geochemistry, Hydrology, Glaciers, Limnology, Soil surveys, Antarctica—McMurdo Dry Valleys

This volume is arranged in 6 parts. Part 1 presents information on the primary abiotic driving forces and conditions defining the system, also demonstrating how liquid water links the geochemistry of glaciers, streams, and lakes in the region. Parts 2-3 present the hydrology, biogeochemistry, and physics of the perennial streams and permanently ice-covered lakes that are the major sites of organic carbon production in the McMurdo Dry Valleys. Part 4 focuses on the physical, chemical, and biological properties of the dry valley soils. Part 5 defines and formalizes ecosystem organization and linkages in the McMurdo Dry Valleys and discusses the role of environmental management in maintaining scientific and environmental values. A CD-ROM and accompanying text, comprising part 6, includes a detailed set of geospatial data that supports all manuscripts in this book. The information contained on the CD-ROM provides details and scale that should help the reader visualize the McMurdo Dry Valleys from an ecosystem perspective.

52-2438

Composite glacial erosional landscape of the northern McMurdo Dry Valleys: implications for antarctic Tertiary glacial history.

Prentice, M.L., Kleman, J., Stroeven, A.P., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.1-38, Refs. p.35-38.

Glacial geology, Glacial erosion, Glacier flow, Ice sheets, Glaciation, Geomorphology, Polar regions, Antarctica—McMurdo Dry Valleys

The authors reassess glacial versus non-glacial hypotheses for the excavation of the McMurdo Dry Valleys using bedrock geomorphologic evidence. They find 3 glacial erosional landscapes—high, intermediate and low—within the Wright-Victoria Valley system below an elevation of 1300 m. The principal evidence for glacial erosion is the molded asymmetry of paired corners on tributary-valley spurs at trunk-valley intersections. Hanging glacial benches at two different elevations in numerous valley locations coupled with valley floors that exhibit classic glacial morphology delineate the 3 glacial landscapes. The authors propose progressive glacial incision by wet-based ice in separate high, intermediate, and low phases to cut the stepped glacial landscapes. They suggest that the East Antarctic Ice Sheet probably dominated during the low phase. The presence of wet-based alpine glaciers during each phase indicates that the coeval climate was significantly warmer and wetter than at present. (Auth. mod.)

52-2439

Solar radiation in the McMurdo Dry Valleys, Antarctica.

Dana, G.L., Wharton, R.A., Jr., Dubayah, R., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.39-64, Refs. p.63-64.

Solar radiation, Terrain identification, Topographic features, Glaciers, Antarctica—McMurdo Dry Valleys

The authors analyzed 2 years of solar radiation data from 11 meteorological stations positioned on glaciers, lake shores, and lake ice in Taylor, Wright and Victoria Valleys. Average annual incoming solar radiation ranged from 84 to 117 W/m^2 during 1994 and 1995. Average annual net solar radiation was 59 to 76 W/m^2 at the soil-covered sites, while net solar radiation at glacier and lake-ice sites was lower, 18 to 52 W/m^2, due to the high albedo of snow and ice. Terrain obstructions were especially apparent in diurnal time series for Lake Hoare, even in Dec. when the sun is at its highest position. Because of the importance of terrain on solar radiation patterns, the authors applied a topographic solar radiation model to Taylor Valley, using *in situ* pyranometer data to drive the model. Considerable topographic variability in solar radiation occurs over the region, even averaged over a monthly time scale, with north facing slopes receiving more energy than south facing slopes. (Auth. mod.)

52-2440

Glaciers of the McMurdo Dry Valleys, Southern Victoria Land, Antarctica.

Fountain, A.G., Dana, G.L., Lewis, K.J., Vaughn, B.H., McKnight, D.M., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.65-75, Refs. p.74-75.

Glacier ablation, Glacier melting, Glacier mass balance, Glacier surveys, Antarctica—McMurdo Dry Valleys

The glaciers of the McMurdo Dry Valleys are fundamental to the hydrology and biology of the valleys because they are the only significant source of water. Understanding the controls on the glacial extent and meltwater runoff is fundamental to a process-oriented approach to studying the dry valleys ecosystem. The elevation of the equilibrium-line of the alpine glaciers changes dramatically in the dry valleys, probably a result of large gradients in precipitation. Temporally, they have been relatively constant since the Pliocene. Ablation from the glaciers is dominated by sublimation, which accounts for more than 70% of the total mass loss. The cliff faces are crucial for initiating and maintaining stream flow. During melt periods the distribution of glacier area with altitude can control the response of stream flow to temperature variations. (Auth. mod.)

52-2441

Geochemical linkages among glaciers, streams and lakes within the Taylor Valley, Antarctica.

Lyons, W.B., et al, *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.77-92, Refs. p.91-92.

Geochemistry, Limnology, Hydrology, Meltwater, Ice composition, Glaciers, Antarctica—Taylor Valley

The authors have examined the major element chemistry of the 3 largest lake basins in order to investigate the geochemical "continuum" and the geochemical processes occurring within the Taylor Valley. During the summer, meltwater is generated from the glaciers and flows through streams to perennially ice-covered lakes in the valley bottom. As water moves through the system, solute concentrations increase by orders of magnitude. The glacier data suggest that some amount of salt is recycled from the soils and blown by winds onto the glaciers. Dissolution of evaporite salts within the stream channels, as well as the weathering of Si minerals appear to be significant geochemical processes especially in the longer streams. High interannual variability of stream flow has also been observed which leads to differences in the amount of fresh water and solutes entering into the lakes each season. (Auth. mod.)

52-2442

Hydrologic processes influencing streamflow variation in Fryxell Basin, Antarctica.

Conovitz, P.A., McKnight, D.M., MacDonald, L.H., Fountain, A.G., House, H.R., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.93-108, Refs. p.107-108.

Glacier melting, Meltwater, Limnology, Hydrology, Stream flow, Antarctica—Fryxell, Lake

In the McMurdo Dry Valleys, glacial meltwater streams are a critical linkage between the glaciers and the lakes in the valley bottoms. This paper analyzes the physiographic characteristics and 6 years of discharge data from 5 streams in order to better characterize the dynamic inputs into Lake Fryxell, a closed basin in Taylor Valley. These feeder streams typically flow only for 6-8 weeks during the

summer, and streamflow is highly variable on an interannual as well as daily basis. During low flow years, the shorter streams contributed a higher proportion of the total annual inflow into the lake; this pattern may reflect the greater losses to wetting the hyporheic zone. Comparisons of the period of direct sun on the glacier faces with the time of peak flow suggested that solar position and melt from the glacier faces are the dominant controls on the diurnal fluctuations in streamflow. An analysis of streamflow recession showed considerable variability between streams and in some cases, over time. (Auth. mod.)

52-2443

Longitudinal patterns in algal abundance and species distribution in meltwater streams in Taylor Valley, Southern Victoria Land, Antarctica.

McKnight, D.M., Alger, A., Tate, C.M., Shupe, G., Spaulding, S., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.109-127, 16 refs.

Algae, Biomass, Meltwater, Streams, Hydrology, Geochemistry, Plant ecology, Antarctica—Taylor Valley

The abundance and distribution of algal mats were studied in 3 streams flowing into Lake Fryxell. Algal mats were most abundant at sites which have moderate gradients and streambeds composed of large cobbles arranged in a flat stone pavement through periglacial processes; less at high gradient and deltaic sites. Black-, orange-, and green-colored algal mat types occurred at most sites, but red-colored mats occurred in only one of the streams. At all sites, black-colored mats were found near the channel margins and green-colored mats were found on the underside of rocks in the main channel. Orange- and red-colored mats occurred in flowing water habitats. Thus similarities in physical characteristics of the stream habitat appeared to determine the occurrence of the different algal mats rather than differences in water quality. The species composition of the different mat types was consistent among sites. (Auth. mod.)

52-2444

Primary production processes in streams of the McMurdo Dry Valleys, Antarctica.

Hawes, I., Howard-Williams, C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.129-140, Refs. p.139-140.

Microbiology, Biomass, Photosynthesis, Streams, Limnology, Antarctica—McMurdo Dry Valleys

New and published information on production of microbial communities in streams of the McMurdo Dry Valleys is reviewed. The dominant community in many of these streams is a thick, cohesive cyanobacterial mat. Light-photosynthesis relationships of microbial mat communities from a range of streams tended to show a surprising degree of convergence. Gross rates of photosynthesis typically approached an upper limit of 4 μg C/cm^2/h at ambient temperature (0-8°C), and community light saturation intensities were almost always below incident irradiance during the period when streams were flowing. Net and gross photosynthesis increased with increasing temperature, and analysis supports previous views that temperature is the prime determinant of the rate of net production in these communities. There were generally higher respiration rates in thicker mat communities, resulting in these mats tending toward a zero net gas exchange. Accumulation of new material on exposed surfaces was slow, and most communities were clearly at least 3 to 4 years old. (Auth. mod.)

52-2445

Modeling nitrogen transformations in Dry Valley streams, Antarctica.

Moorhead, D.L., McKnight, D.M., Tate, C.M., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.141-151, Refs. p.150-151.

Microbiology, Biomass, Geochemistry, Hydrology, Streams, Nutrient cycle, Antarctica—Taylor Valley

Concentrations of ammonium, nitrate, and urea decline along a glacial meltwater stream in Taylor Valley. A mathematical model of primary production of microbial mats was used to estimate nitrogen transformation, assuming that nitrogen uptake balanced carbon fixation. Export of organic nitrogen was set equal to inorganic uptake driven by net primary production, based on the assumption of steady-state biomass for mat communities. Model results were comparable to observations although transformation rates generally were lower than observed. The model was sensitive to water retention time in the stream, illustrating the critical importance of accurate assessments of stream geometry and hydrology. Application of this model to 3 other streams feeding Lake Fryxell suggest that dry valley streams have a large potential to transform mineral nitrogen into organic forms. (Auth mod.)

52-2446

Physical limnology of the McMurdo Dry Valleys lakes.

Spigel, R.H., Priscu, J.C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.153-187, Refs. p.184-187.

Limnology, Frozen lakes, Water chemistry, Water temperature, Turbulence, Antarctica—McMurdo Dry Valleys

The authors present high-resolution measurements of conductivity and temperature made from Jan. 1990 to Dec. 1993 in the east and west lobes of Lake Bonney and in lakes Vanda, Hoare, Fryxell, Joyce, and Miers. These measurements were used to calculate profiles of density and stability, and thereby infer mechanisms and strengths of mixing in the water columns of the lakes. Transects along the length of Lake Bonney allowed estimates of horizontal exchanges in and between the two lobes of that lake and help to explain some of the characteristics of single profiles measured in other lakes. The distinctive and relatively invariant shapes of the density of profiles in the different lakes is due to distinctive distributions of salts in the water columns of these lakes. Temperatures in the McMurdo Dry Valleys lakes, in contrast to salinities, do respond to changes in weather, climate, and water levels on a seasonal and annual basis. (Auth. mod.)

52-2447

Optical properties of the McMurdo Dry Valley Lakes, Antarctica.

Howard-Williams, C., Schwarz, A.M., Hawes, I., Priscu, J.C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.189-203, Refs. p.202-203.

Limnology, Ice cover effect, Optical properties, Lake ice, Light transmission, Snow cover effect, Attenuation, Antarctica—McMurdo Dry Valleys

The optical properties of the ice and water columns of lakes of the McMurdo Dry Valleys are described. Attenuation of light is dominated by the effects of the permanent ice cover, which reduces incident irradiance between 78 and 99%. The ice cover also imparts a strong blue to blue-green bias to its spectral distribution. Attenuation by ice can be highly variable over short time and distance scales. Within the water columns, most attenuation is due to water itself. The lakes typically have extremely low concentrations of dissolved yellow substances. In some strata, phytoplankton and suspended sediments can make significant impacts on water clarity. Overall, the lakes of the McMurdo Dry Valleys can be characterized as being extreme shade environments, with what light there is being in the blue or blue-green portion of the spectrum. The demands that this environment imposes on phototrophs is briefly discussed. (Auth. mod.)

52-2448

Cobalt cycling and fate in Lake Vanda.

Green, W.J., Canfield, D.E., Nixon, P., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.205-215, Refs. p.214-215.

Limnology, Geochemistry, Antarctica—Vanda, Lake

Lake Vanda is a closed-basin, permanently ice-covered lake in the Wright Valley. Its 68 m watercolumn has been stratified for some 1200 years. This has resulted in the evolution of distinct layers, ranging from cool, fresh, oxygen-rich, moderately basic surface waters beneath the ice to warm, saline, sulfide-bearing, acidic waters at depth. The authors present the first detailed vertical profiles for dissolved and total cobalt in the Vanda watercolumn. In the well-oxygenated upper waters, dissolved cobalt concentrations are found to be less than 0.2 nM. Significant concentrations begin to appear at 55 m, with the onset of manganese oxide dissolution. A cobalt maximum (13 nM) is observed at 61 m, near the top of the anoxic zone. Beneath this depth, cobalt concentrations begin to decrease in response to increasing sulfide levels. Cobalt distributions and residence times are discussed in terms of the apparent role played by manganese oxide phases in both the transport and release of cobalt. (Auth.)

52-2449

Abundance of ammonium-oxidizing bacteria in Lake Bonney, Antarctica determined by immunofluorescence, PCR and in situ hybridization.

Voytek, M.A., Ward, B.B., Priscu, J.C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.217-228, Refs. p.226-228.

Limnology, Microbiology, Geochemistry, Bacteria, Antarctica—Bonney, Lake

This study examines 3 techniques for the determination of abundance of nitrifying bacteria in Lake Bonney. Applying a polymerase chain reaction (PCR) assay developed for the detection of ammonium-oxidizing bacteria belonging to the beta and gamma subclasses of the Proteobacteria, immunofluorescent antibody assay (IFA) and fluorescent probe *in situ* hybridization (FISH) techniques, the distribution and relative abundance of ammonium-oxidizers was examined. In general, nitrifiers were detected at depths above the pycnocline and usually associated with decreasing concentrations of NH_4+ and increasing concentrations of NO_3- or NO_2-. These data are consistent with the chemical distributions and the role of nitrifying bacteria in determining the distribution of nitrogen compounds in this lake. (Auth. mod.)

52-2450

Pigment analysis of the distribution, succession, and fate of phytoplankton in the McMurdo Dry Valley lakes of Antarctica.

Lizotte, M.P., Priscu, J.C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.229-239, Refs. p.238-239.

Limnology, Geochemistry, Algae, Biomass, Antarctica—McMurdo Dry Valleys

The authors sampled suspended particulate matter from the lakes Bonney, Fryxell, Hoare, and Vanda for analysis of algal pigments by high-performance liquid chromatographic methods. Fresh waters beneath ice cover in all lakes were dominated by cryptophyte algae, based on alloxanthin-dominated pigment signatures. Deeper, more saline waters in Lake Bonney were dominated by chrysophytes and chlorophytes. Comparisons with cell counts from Lake Bonney and with published reports of species composition from all the lakes imply that cryptophytes and chrysophytes may have been underestimated by previous microscopic cell counts of preserved water samples. Temporal trends in Lake Bonney showed all 3 chlorophyll maxima contained significant quantities of pigments at the onset of light in Sep. and sequential development of deeper phytoplankton populations through the spring growth season. (Auth. mod.)

52-2451

Fluorescence quenching in phytoplankton of the McMurdo Dry Valley lakes (Antarctica): Implications for the structure and function of the photosynthetic apparatus.

Neale, P.J., Priscu, J.C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.241-253, Refs. p.252-253.

Limnology, Photosynthesis, Plankton, Antarctica—McMurdo Dry Valleys

The authors have studied the structure and function of the photosynthetic apparatus of phytoplankton in lakes Bonney, Fryxell, and Hoare using a variety of methods. Some photosynthetic characteristics of phytoplankton in the dry valley lakes indicate low-light acclimation, including a low irradiance for the onset of light saturation of photosynthesis and high sensitivity to photoinhibition. Other characteristics seem contrary to expectations for an extreme shade environment. Overall the results are consistent with photosynthetic acclimation to minimize excitation pressure, i.e., an energetic imbalance between photochemical sources and metabolic sinks. Acclimation of the dry valley phytoplankton assemblages is constrained by a strikingly narrow irradiance range from low to high excitation pressure. The authors hypothesize that optimum light harvesting subject to maintenance of low excitation pressure is possible because of the constant shade environment. (Auth. mod.)

52-2452

Protozooplankton and microzooplankton ecology in lakes of the Dry Valleys, southern Victoria Land.

James, M.R., Hall, J.A., Laybourn-Parry, J., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.255-267, Refs. p.265-267.

Limnology, Plankton, Ecology, Microbiology, Antarctica—McMurdo Dry Valleys

There have been several studies of the phytoplankton community structure and distribution in McMurdo Dry Valley lakes, but very little is known of the protozoo- and microzooplankton communities in these lakes. This chapter combines published data from limited studies to date with new distribution and experimental data on lakes Vanda and Bonney describing the physical and chemical features which influence their distribution and trophic interactions. Diversity and abundance of ciliated protozoa was greatest in the more productive lakes (Bonney and Fryxell). New data on seasonal distribution of protozoa in Lake Vanda showed there was a small overwintering population dominated by *Euplotes* and *Askenasia.* Observations in Lake Vanda suggest the structure and vertical stratification of protozoan communities are principally determined by food resources, but low abundance and grazing rates suggest they do not control phytoplankton or bacterial populations. (Auth. mod.)

52-2453

Permanent ice covers of the McMurdo Dry Valleys lakes, Antarctica: liquid water contents.

Fritsen, C.H., Adams, E.E., McKay, C.P., Priscu, J.C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.269-280, Refs. p.279-280.

Limnology, Frozen lakes, Lake ice, Ice temperature, Ice melting, Ice air interface, Sedimentation, Antarctica—Hoare, Lake, Antarctica—Bonney, Lake

Ice temperature records from Lake Hoare and Lake Bonney were studied to estimate vertical distributions of liquid water in the perennial ice covers at the end of summer melting seasons. Three years of ice temperature data at Lake Bonney (1993-1995) show that the ice contained 20% liquid water located at 1 to 2.5 m below the ice surface near the end of all 3 melting seasons. Liquid water fractions at Lake Hoare were low (<15%) throughout the ice column in 1986. In 1987 and 1988 liquid water fractions increased to a maxima of 70% at depths between 1.5 and 2.5 m. Maxima in liquid water content for both lakes were coincident with layers of bubbles having arching morphologies which were predominantly associated with pockets of sedimentary material (silts, sand, and gravel). It is suggested that the majority (>90%) of the liquid water in the ice is generated when visible radiation is absorbed by lithogenic matter within the ice during the austral summer. (Auth. mod.)

52-2454

Permanent ice covers of the McMurdo Dry Valley lakes, Antarctica: bubble formation and metamorphism.

Adams, E.E., Priscu, J.C., Fritsen, C.H., Smith, S.R., Brackman, S.L., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.281-295, Refs. p.294-295.

Limnology, Lake ice, Frozen lakes, Ice temperature, Sedimentation, Bubbles, Gas inclusions, Ice formation, Antarctica—McMurdo Dry Valleys

The permanent ice covers of liquid water based lakes in the McMurdo Dry Valleys are thermodynamically active and display a well defined but transitory stratigraphy. The authors discuss the annual development of the physical structure of the ice based on field measurements, data gathered during the austral winter and spring of 1994 and 1995, laboratory experiments, and quantitative analysis. In general, the ice growth takes place on the bottom of the ice cover with ablation from the top. Sediment deposited on the ice surface by aeolian processes migrates downward through the ice. A complex ice stratigraphy is produced as the result of top down freezing of the liquid water in the ice during fall and winter. Inverted teardrop shaped bubbles with diameter generally under 5 mm are produced in the upper meter of the ice. The bubbles, fractures, and sediment configuration influence light transmission/absorption, heat flux, and mass transport, all of which are important to the biogeochemical processes in the lake. (Auth. mod.)

52-2455

Soil environment of the McMurdo Dry Valleys, Antarctica.

Campbell, I.B., Claridge, G.G.C., Campbell, D.I., Balks, M.R., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.297-322, Refs. p.320-322.

Desert soils, Geocryology, Geochemistry, Soil pollution, Frozen ground temperature, Radiation balance, Human factors, Antarctica—McMurdo Dry Valleys

The soils in the McMurdo Dry Valleys region are a key component of the polar desert ecosystem. Although climatic conditions are extreme, there is considerable variation in the soil environment. At the macro-scale, 5 distinct soil regions are identified, broadly corresponding with temperature differences across the dry valley region. At the microscale, appreciable variations occur over short distances as a result of parent material and site differences which affect the radiational and thermal properties of the soils. Surface albedo and air temperature are key factors influencing the soil thermal regime and moisture availability. Soil salinity is important in determining the occurrence of ice cement and, to an extent, the variation in soil temperature extremes. Because of the great age and stability of the soils and the extremely slow rate at which soil processes operate, the soils of the McMurdo Dry Valleys are very susceptible to damage from human activities. (Auth. mod.)

52-2456

Soil biodiversity and community structure in the McMurdo Dry Valleys, Antarctica.

Freckman, D.W., Virginia, R.A., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.323-335, Refs. p.333-335.

Ecology, Deserts, Environments, Animals, Desert soils, Soil surveys, Antarctica—McMurdo Dry Valleys

A conceptual model is proposed that defines the soil and environmental conditions determining suitable and unsuitable habitats for soil biota in the McMurdo Dry Valley ecosystem of Antarctica. The majority of soils sampled across the valleys (65%) support up to 3 soil invertebrate taxa (tardigrades, rotifers, nematodes). The rest of the soils are presumed to be unsuitable habitats as none of the target organisms were found. Nematodes are more abundant and more widely distributed than either tardigrades or rotifers. The species diversity of nematodes is very low (n=3), with only *Scottnema lindsayae,* a microbial feeder, occurring throughout the dry valleys. The unusually low diversity of low functional redundancy of the dry valley soils suggest that these systems will be highly disrupted by the loss or decline of even a single species that is sensitive to environmental change. (Auth. mod.)

52-2457

Science and environmental management in the McMurdo Dry Valleys, southern Victoria Land, Antarctica.

Harris, C.M., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.337-350, 19 refs.

Environmental impact, Environmental protection, International cooperation, Research projects, Waste disposal, Antarctica—McMurdo Dry Valleys

Scientific research is the principal human activity in the McMurdo Dry Valleys. Concerns have been expressed recently that with an increasing level of activity, and the advent of tourism into the region, there is a need for more formal approaches to environmental management. A recent United States National Science Foundation workshop called for developing a management plan, utilizing zoning to manage human uses, and for developing a Geographical Information System to archive and make accessible an up-to-date record of environmental data for the area. The support of the science community for these proposals is critical to sustain the long-term scientific and environmental values of the region. (Auth.)

52-2458

McMurdo Dry Valley ecosystem: organization, controls, and linkages.

Moorhead, D.L., Priscu, J.C., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.351-363, Refs. p.360-363.

Ecology, Biomass, Cryobiology, Microbiology, Plankton, Desert soils, Antarctica—McMurdo Dry Valleys

The McMurdo Dry Valleys comprise one of the coldest and driest ecosystems on our planet. Despite these extremes, a variety of life exists in their soils, streams, lakes, glacial and lake ice meltwater pools, and rocks. The biota generally are dominated by prokaryotes, with eukaryotes restricted to the less stressful sites. Higher life forms include bryophytes, rotifers, tardigrades, and nematodes; vascular plants, insects, and vertebrates are lacking. Key conditions limiting life are liquid water and energy. In the presence of liquid water, radiant energy drives photoautotrophic production that provides heterotrophic communities with a carbon and energy supply. Spatio-temporal linkages between landscape components augment productivity of some communities and permit others to exist in places and at times that otherwise would be impossible. (Auth. mod.)

52-2459

Digital geospatial datasets pertaining to the McMurdo Dry Valleys of Antarctica: the SOLA/AGU CDROM.

Hastings, J.T., *American Geophysical Union. Antarctic research series,* 1998, Vol.72, Ecosystem dynamics in a polar desert: the McMurdo Dry Valleys, Antarctica. Edited by J.C. Priscu, p.365-369, 1 ref.

Data processing, Data transmission, Antarctica—McMurdo Dry Valleys

The CDROM included with this volume contains a selection of maps and images, remote-sensing data, aerial and ground photography, GIS-based simulation model output, tabular data and descriptive documents, all related to the McMurdo Dry Valleys of Antarctica. All the basic cartographic materials on the CDROM are in the public domain, having been obtained from government sources, both United States and international. (Auth. mod.)

52-2461

Effects of the alternate freezing and thawing cycles on the pore structure of cementitious composites modified by MHEC and PVA.

Klemm, A.J., Klemm, P., *Building and environment,* Nov. 1997, 32(6), p.509-512, 6 refs.

Mortars, Cement admixtures, Polymers, Construction materials, Composite materials, Microstructure, Porosity, Frost resistance, Freeze thaw cycles, Freeze thaw tests, Desiccation, Water retention

52-2462

Real truth about the effects of deicers.

Perenchio, W.F., *Concrete construction,* Dec. 1997, 42(12), p.997-999.

Road icing, Concrete pavements, Ice removal, Salting, Concrete durability, Damage, Chemical composition, Freeze thaw cycles, Water pressure, Freezing points

52-2463

Seasonal variations in the geochemistry of shallow groundwater hosted in granitic till.

Land, M., Öhlander, B., *Chemical geology,* Dec. 8, 1997, 143(3-4), p.205-216, 19 refs.

Hydrogeochemistry, Watersheds, Runoff, Stream flow, Hydrography, Chemical composition, Snowmelt, Meltwater, Seepage, Diffusion, Sampling, Seasonal variations, Sweden

52-2464

Numerical solutions of the Stefan problem by the enthalpy method and the heat balance integral method.

Caldwell, J., Chan, C.C., *Numerical heat transfer B,* Jan.-Feb. 1998, 33(1), p.99-117, 14 refs.

Phase transformations, Stefan problem, Enthalpy, Heat balance, Liquid solid interfaces, Freezing, Solid phases, Mathematical models, Boundary value problems

52-2465

Monophyly of Erebonasteridae, with the description of *Centobnaster severnicus* sp. n. (Copepoda: Poecilostomatoida) from the Laptev Sea (Arctic Ocean).

Martínez Arbizu, P., *Zoologischer Anzeiger,* June 1997, 235(3-4), p.263-270, 11 refs.

Marine biology, Biomass, Structural analysis, Classifications, Sampling, Russia—Laptev Sea

52-2466

Partition coefficients of fuel system icing inhibitors: semiempirical molecular orbital calculations.

Trohalaki, S., Pachter, R., *Energy & fuels,* May-June 1997, 11(3), p.647-655, 37 refs.

Aircraft icing, Fuels, Chemical ice prevention, Chemical composition, Molecular structure, Solubility, Admixtures, Modification, Environmental protection, Models, Thermodynamic properties

52-2467

Aerosol and cloud particles in tropical cirrus anvil: importance to radiation balance.

Pueschel, R.F., et al, *Journal of aerosol science,* Oct. 1997, 28(7), p.1123-1136, Refs. p.1134-1136.

Climatology, Cloud physics, Cloud cover, Ice crystal optics, Haze, Aerosols, Condensation nuclei, Radiation balance, Attenuation, Particle size distribution, Spectra, Spectroscopy

52-2468

Electromagnetic scattering calculated from pair distribution functions retrieved from planar snow sections.

Zurk, L.M., Tsang, L., Shi, J.C., Davis, R.E., MP 5092, *IEEE transactions on geoscience and remote sensing,* Nov. 1997, 35(6), p.1419-1428, 29 refs.

Remote sensing, Snow physics, Microstructure, Scattering, Particles, Aggregates, Particle size distribution, Analysis (mathematics), Statistical analysis, Simulation

Electromagnetic wave scattering in dense media, such as snow, depends on the three-dimensional (3-D) pair distribution function of particle positions. In snow, two-dimensional (2-D) stereological data can be obtained by analyzing planar sections. In this paper, the volume 3-D pair distribution functions are calculated from the 2-D stereological data by solving Hanisch's integral equation. Monte Carlo simulations for multisize particles are used to verify the procedure. The procedure is also applied to available planar snow sections. A

family of 3-D pair distribution functions are derived and substituted into dense media scattering theory to calculate scattering. The computed scattering rates are comparable to those calculated under the Percus-Yevick approximation of pair distribution functions of multiple sizes.

52-2469

Effects of precipitation and cloud ice on brightness temperature in AMSU moisture channels.

Burns, B.A., Wu, X.Q., Diak, G.R., *IEEE transactions on geoscience and remote sensing,* Nov. 1997, 35(6), p.1429-1437, 24 refs.

Remote sensing, Radiometry, Spacecraft, Cloud cover, Turbidity, Water vapor, Profiles, Ice crystals, Brightness, Attenuation, Accuracy, Simulation

52-2470

ARMAR observations of the melting layer during TOGA COARE.

Durden, S.L., et al, *IEEE transactions on geoscience and remote sensing,* Nov. 1997, 35(6), p.1453-1456, 12 refs.

Precipitation (meteorology), Airborne radar, Rain, Ice melting, Ice detection, Radar echoes, Reflectivity, Stratification, Altitude, Profiles, Statistical analysis

52-2471

Joining of two ice-rock bodies in plane flow through porous media.

Alimov, M.M., Mukhamadullina, G.I., *Fluid dynamics,* July-Aug. 1997(Pub. Jan. 98), 32(4), p.529-540, Translated from Rossiĭskaia akademiia nauk. Izvestiia. Mekhanika zhidkosti i gaza. 18 refs.

Soil freezing, Artificial freezing, Frozen rocks, Surface structure, Ice solid interface, Porous materials, Phase transformations, Temperature control, Boundary value problems, Mathematical models

52-2472

Flexural-gravity wave diffraction at linear irregularities in sheet ice.

Marchenko, A.V., *Fluid dynamics,* July-Aug. 1997(Pub. Jan. 98), 32(4), p.548-560, Translated from Rossiĭskaia akademiia nauk. Izvestiia. Mekhanika zhidkosti i gaza. 17 refs.

Sea ice, Ice water interface, Ice mechanics, Fluid dynamics, Pressure ridges, Hummocks, Gravity waves, Wave propagation, Attenuation, Spectra, Elastic properties, Mathematical models

52-2473

Physical properties of Reykjanes Ridge sediments and their linkage to high-resolution Greenland Ice Sheet Project 2 ice core data.

Moros, M., Endler, R., Lackschewitz, K.S., Wallrabe-Adams, H.J., Mienert, J., Lemke, W., *Paleoceanography,* Oct. 1997, 12(5), p.687-695, 42 refs.

Pleistocene, Paleoclimatology, Ocean currents, Air temperature, Marine geology, Marine deposits, Drill core analysis, Remanent magnetism, Ice sheets, Ice cores, Stratigraphy, Correlation, Greenland, Atlantic Ocean—Reykjanes Ridge

52-2474

Thermohaline instability in the North Atlantic during meltwater events: stable isotope and ice-rafted detritus records from core SO75-26KL, Portuguese margin.

Zahn, R., Schönfeld, J., Kudrass, H.R., Park, M.H., Erlenkeuser, H., Grootes, P., *Paleoceanography,* Oct. 1997, 12(5), p.696-710, Refs. p.708-710.

Oceanography, Pleistocene, Paleoecology, Ocean currents, Ventilation, Marine deposits, Sediment transport, Ice rafting, Meltwater, Salinity, Drill core analysis, Isotope analysis, Radioactive age determination, North Atlantic Ocean

52-2475

Ice shelf mechanism for Heinrich layer production.

Hulbe, C.L., *Paleoceanography,* Oct. 1997, 12(5), p.711-717, 27 refs.

Pleistocene, Oceanography, Ice shelves, Ice rafting, Marine deposits, Sediment transport, Ice water interface, Ice bottom surface, Ice melting, Meltwater, Regelation, Climatic changes, Mathematical models, Theories, Labrador Sea

52-2476

Correlations of climate and streamflow in three Minnesota streams.

Kletti, L.L., Stefan, H.G., *Climatic change,* Dec. 1997, 37(4), p.575-600, 29 refs.

Watersheds, Stream flow, Hydrography, Climatic changes, Precipitation (meteorology), Snowmelt, Snow accumulation, Seasonal variations, Statistical analysis, Correlation, Runoff forecasting, United States—Minnesota

52-2477

Opposing southern ocean climate patterns as revealed by trends in regional sea ice coverage.

Stammerjohn, S.E., Smith, R.C., *Climatic change,* Dec. 1997, 37(4), p.617-639, Refs. p.636-639.

Climatology, Climatic changes, Surface temperature, Sea ice distribution, Air ice water interaction, Atmospheric circulation, Seasonal variations, Statistical analysis, Antarctica—Ross Sea, Antarctica—Amundsen Sea, Antarctica—Bellingshausen Sea, —Indian Ocean

The 16.8-year sea ice record (Nov. 1978-Aug. 1995) derived from satellite passive microwave data shows evidence of contrasting climate patterns in the southern ocean as indicated by persistent opposing trends in regional sea ice coverage. The data are compiled from three successive passive microwave sensors from which two separate time-series are analyzed. The overall pattern of contrasting trends has important implications for the Southern Hemisphere heat budget and surface albedo as well as for marine ecosystems associated with various sea ice habitats. The persistent opposition in southern ocean regional ice coverage may better define potential positive and negative feedbacks for global change scenarios. (Auth. mod.)

52-2478

Impact of sediment-laden snow and sea ice in the Arctic on climate.

Ledley, T.S., Pfirman, S., *Climatic change,* Dec. 1997, 37(4), p.641-664, Refs. p.662-664.

Climatology, Sea ice, Ice volume, Snow cover, Albedo, Surface temperature, Sediments, Snow cover effect, Ice cover effect, Heat balance, Models, Thermodynamics, Arctic Ocean

52-2479

Model computations on the effects of elevating temperature and atmospheric CO_2 on the regeneration of Scots pine at the timber line in Finland.

Kellomäki, S., Väisänen, H., Kolström, T., *Climatic change,* Dec. 1997, 37(4), p.683-708, Refs. p.706-708.

Climatology, Global warming, Forest lines, Trees (plants), Growth, Revegetation, Carbon dioxide, Soil freezing, Temperature effects, Mathematical models, Forecasting, Finland

52-2480

Modelling fluxes of momentum, sensible heat and latent heat over heterogeneous snow cover.

Essery, R., *Royal Meteorological Society. Quarterly journal A,* Oct. 1997, 123(543), p.1867-1883, 20 refs.

Climatology, Atmospheric boundary layer, Turbulent exchange, Snow air interface, Heat flux, Radiation balance, Surface temperature, Snow cover effect, Surface roughness, Mathematical models, Profiles, Vegetation factors

52-2481

Clay mineral transformations in podzolized tills in central Finland.

Righi, D., Räisänen, M.L., Gillot, F., *Clay minerals,* Dec. 1997, 32(4), p.531-544, 28 refs.

Soil formation, Soil chemistry, Subpolar regions, Clay minerals, Podsol, Moraines, Quaternary deposits, Age determination, Chemical analysis, X ray diffraction, Finland

52-2482

Periodic Hartree-Fock calculation of the A_{1g} (T_z) and E_g (T_x, T_y) phonon modes in ice VIII.

Silvi, B., Beltrán, A., Andrés, J., *Journal of molecular structure,* Dec. 15, 1997, Vol.436-437, p.443-449, 115 refs.

Ice physics, Molecular structure, Molecular energy levels, High pressure ice, Hydrogen bonds, Dispersions, Vibration, Statistical analysis, Ice models

52-2483

Examination of the carbon balance hypothesis of alpine treeline location in Glacier National Park, Montana.

Cairns, D.M., Malanson, G.P., *Physical geography,* Mar.-Apr. 1997, 18(2), p.125-145, Refs. p.141-145.

Plant ecology, Forest lines, Migration, Altitude, Alpine landscapes, Geochemical cycles, Carbon dioxide, Water balance, Microclimatology, Theories, Models, United States—Montana—Glacier National Park

52-2484

Origin of fossil rock glaciers, La Sal Mountains, Utah.

Nicholas, J.W., Garcia, J.E., *Physical geography,* Mar.-Apr. 1997, 18(2), p.160-175, Refs. p.172-175.

Periglacial processes, Landforms, Geomorphology, Rock glaciers, Rock properties, Soil creep, Permafrost mass transfer, Permafrost indicators, Lithology, Origin, Classifications, United States—Utah—La Sal Mountains

52-2485

Synergism of ice-forming compounds in their combined use.

Arkharov, A.V., Turov, A.V., Adamenko, V.V., Kozlov, I.S., *Russian journal of applied chemistry,* Apr. 1997, 70(4), p.538-541, Translated from Zhurnal prikladnoĭ khimii. 5 refs.

Aerosols, Artificial nucleation, Cloud seeding, Organic nuclei, Ice crystal growth, Ice sublimation, Microstructure, Phase transformations, Scanning electron microscopy, Simulation

52-2486

Are the laboratory and field conditions observations of acute mountain sickness related.

Savourey, G., Guinet, A., Besnard, Y., Garcia, N., Hanniquet, A.M., Bittel, J., *Aviation, space, and environmental medicine,* Oct. 1997, 68(10), p.895-899, 25 refs.

Altitude, Acclimatization, Physiological effects, Health, Cold weather survival

52-2487

Impact of UV radiation of different wavebands on pigments and assimilation of ^{15}N-ammonium and ^{15}N-nitrate by natural phytoplankton and ice algae in Antarctica.

Döhler, G., *Journal of plant physiology,* Nov. 1997, 151(5), p.550-555, Refs. p.554-555.

Marine biology, Algae, Sea ice, Plankton, Solar radiation, Ozone, Antarctica—Weddell Sea

The effects of UV radiation of different wavebands on pigments and assimilation of ^{15}N-ammonium and ^{15}N-nitrate of natural phytoplankton and sea-ice algae were studied during the *Polarstern* cruise (ANT X/7) in the Weddell Sea (Dec. 3, 1992 to Jan. 22, 1993). Chlorophyll *a* biosynthesis was more affected by UV-B radiation than chlorophyll *c*. Uptake of ^{15}N-ammonium and ^{15}N-nitrate by ice-algae was less reduced by UV-B than that of the phytoplankton samples. The inhibitory effect was dependent on the applied UV fluence rate and the species composition of the assemblages. Patterns of ^{15}N-labelled free amino acids and the pools varied in dependence on the wavebands of UV irradiance and the species composition as well. Results are discussed with reference to the different UV targets and the key enzymes of nitrogen metabolism.

52-2488

Regional evaluation of snow pack quality in Slovakia: hydrogeochemical aspects.

Vrana, K., Bodiš, D., Lopašovský, K., Rapant, S., Girman, J., IAHS publication No.222 and International Conference on Future Groundwater Resources at Risk, Helsinki, Finland, June 13-16, 1994. Proceedings. Edited by J. Soveri and T. Suokko, Wallingford, International Association of Hydrological Sciences, 1994, p.105-113, 9 refs.

DLC GB1001.2.F87 1994

Snow surveys, Precipitation (meteorology), Aerosols, Snow impurities, Chemical composition, Meltwater, Hydrogeochemistry, Ion density (concentration), Sampling, Slovakia

52-2489
Effect of the use of urea and glycol on groundwater in the vicinity of certain Finnish airports.
Britschgi, R., International Conference on Future Groundwater Resources at Risk, Helsinki, Finland, June 13-16, 1994. Poster papers. Edited by T. Suokko and J. Soveri, Helsinki, Academy of Finland, 1994, p.239-244, 6 refs.
DLC GB1001.2.F872 1994
Ground water, Water pollution, Runways, Antifreezes, Snow removal, Chemical ice prevention, Runoff, Sampling, Environmental impact, Environmental protection, Finland

52-2490
Arctic air pollution: a case study of continent-to-ocean-to-continent transport.
Barrie, L.A., NATO Advanced Research Workshop on the Long-Range Atmospheric Transport of Natural and Contaminant Substances from Continent to Ocean and Continent to Continent, St. Georges, Bermuda, Jan. 10-17, 1988. Proceedings. Edited by A.H. Knap and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.297, Dordrecht, Kluwer Academic Publishers, 1990, p.137-148, 12 refs.
DLC TD881.N37 1988
Climatology, Air pollution, Environmental impact, Polar atmospheres, Atmospheric composition, Aerosols, Origin, Atmospheric circulation, Seasonal variations

52-2491
Modeling of millimeter wave backscatter of time-varying snowcover—summary.
Shih, S.E., et al, MP 5093, *Journal of electromagnetic waves and applications,* Sep. 1997, 11(9), p.1289-1298, 18 refs.
Remote sensing, Snow surveys, Snow cover structure, Snow surface temperature, Snow air interface, Metamorphism (snow), Radar echoes, Backscattering, Simulation, Models
This paper applies a model of cohesive spherical particles to account for the clustering feature of snow grains, and takes into account the reflection and refraction at snow-snow interfaces by using appropriate boundary conditions, quadrature points and weights to solve the multilayer DMRT (dense medium radiation transfer) equations. A dynamic scattering model of snowcover, with a more realistic snow microstructure, based on DMRT and SNTHERM, is developed. This coupled model is then applied to enable the simulation of temporal radar response of snowcover under changing environmental conditions.

52-2492
Economic evaluation of snow-removal systems in an urban area with heavy snowfall. Part 3: economic evaluation of the snow-removing channel system in Tokamachi-city.
Morohashi, K., Umemura, T., *Seppyo,* Jan. 1997, 59(1), p.3-10, In Japanese with English summary. 8 refs.
Snow removal, Urban planning, Road maintenance, Cost analysis, Japan

52-2493
Role of antarctic ice sheet related to global change. [Nankyoku hyosho hendo shisutemu no kenkyu]
Nishio, F., Kodama, Y., Kameda, T., Furukawa, T., Osada, K., Japanese Society of Snow and Ice. Polar Snow and Ice Section. Future Projects Commmittee (Kyokuchi seppyo bunkakai Shorai keikaku iinkai), *Seppyo,* Jan. 1997, 59(1), p.11-21, In Japanese. 50 refs.
Ice sheets, Glacier oscillation, Glacier mass balance, Glacier flow, Glacial meteorology, Ice cores, Paleoclimatology, Sea level, Global warming, Research projects, Antarctica
This paper presents a general review of research on past fluctuations in the mass balance of the antarctic ice sheet, particularly from ice core data, and recommends future research projects to forecast the effect of global warming on the ice sheet, particularly catastrophic surges or global rise in sea level.

52-2494
Study on snow transport rate in snow removal channel with a mild slope.
Fukushima, Y., *Seppyo,* Jan. 1997, 59(1), p.23-32, In Japanese. 14 refs.
Snow removal, Channels (waterways), Drains, Water flow, Flow rate, Mathematical models

52-2495
Study on mechanized snow removal and snow removal channel system in spread area of city.
Sugimori, M., *Seppyo,* Jan. 1997, 59(1), p.33-40, In Japanese. 24 refs.
Snow removal, Urban planning, Road maintenance, Drains, Channels (waterways)

52-2496
Recent studies on gas hydrates—gas hydrates as energy resources.
Matsumoto, R., *Seppyo,* Jan. 1997, 59(1), p.41-44, In Japanese. 11 refs.
Exploration, Offshore drilling, Hydrates, Clathrates, Fuels, Molecular structure

52-2497
Some more words on snow countermeasures for National Highway 17 (Part 5). [Kokudo 17-go yuki taisaku yowa (sono 5)]
Abe, T., *Seppyo,* Jan. 1997, 59(1), p.60-62, In Japanese.
Snowstorms, Snow removal, Safety, Road maintenance, Japan

52-2498
Epilithic algae in a glacial stream at Hope Bay (Antarctica).
Izaguirre, I., Pizarro, H., *Polar biolcgy,* Jan. 1998, 19(1), p.24-31, Refs. p.30-31.
Algae, Ecology, Water chemistry, Meltwater, Glacier melting, Antarctica—Hope Bay
The epilithic algal community of a glacial stream of Hope Bay was studied during the summer period of 1995. Major hydrological changes, which affected the main physical and chemical features, were observed in the stream according to the meltwater pulses. The enrichment of the stream by seabird inputs was evident from the high nutrient concentrations and their increase downstream. The presence of a snowbank in the middle reach produced a major discontinuity, influencing the main variables analyzed. The stream showed a similar algal composition to other water courses of Hope Bay, with *Prasiola crispa, Hydrurus foetidus, Phaeogloea mucosa* and *Phormidium fragile* as the dominant species. Chlorophyll *a* concentrations taken from natural substrata (stones) ranged from undetectable to 48.4 mg/m^2, with the maximum concentrations associated with algal mats dominated by *P. crispa.* (Auth.)

52-2499
Activity and biomass of the small benthic biota under permanent ice-coverage in the central Arctic Ocean.
Soltwedel, T., Schewe, I., *Polar biology,* Jan. 1998, 19(1), p.52-62, Refs. p. 61-62.
Microbiology, Ice cover effect, Biomass, Marine biology, Ocean bottom

52-2500
Composition and distribution of zooplankton in the Laptev Sea and adjacent Nansen Basin during summer, 1993.
Kosobokova, K.N., Hanssen, H., Hirche, H.J., Knickmeier, K., *Polar biology,* Jan. 1998, 19(1), p.63-76, Refs. p.75-76.
Plankton, Marine biology, Biomass, Salinity, Russia—Laptev Sea

52-2501
Natural remanent magnetization of dirt-ice layers collected from Antarctica.
Funaki, M., Sakai, H., *Seppyo,* Mar. 1997, 59(2), p.95-100, In Japanese. 6 refs.
Glacier ice, Ice composition, Impurities, Dust, Volcanic ash, Remanent magnetism, Ice dating, Soil dating, Sediment transport, Antarctica—Allan Hills, Antarctica—Sør Rondane Mountains, Antarctica—Queen Fabiola Mountains
This paper presents a general discussion on the processes of natural remanent magnetization (NRM) as illustrated by examples of NRM in dirt layers of ice from the Allan Hills, the Sør Rondane Mountains, and the Queen Fabiola Mountains (called the Yamato Mountains by the Japanese). The authors suggest that NMR data may be used as indicators of the source material of the dirt layers, such as volcanic ash; the age of the dirt layers; the wind conditions, and temperature at the time of deposition of the dirt layers; and the direction of flow of the ice.

52-2502
Evidence for snow patch shrinkage in the medieval warm period, on Mt. Zarumori, Oou Mountains, northeastern Japan. Part 1: age, distribution and depositional environment of the buried peat layers.
Daimaru, H., Ikeda, S., Saito, T., Kajimoto, T., Okamoto, T., Seki, T., *Seppyo,* Mar. 1997, 59(2), p.101-110, In Japanese with English summary. 34 refs.
Snow cover distribution, Snow melting, Snow cover effect, Plant ecology, Vegetation patterns, Phenology, Mountain soils, Meadow soils, Peat, Soil composition, Soil profiles, Climatic changes, Japan

52-2503
Recent activities in arctic glaciology.
Watanabe, O., *Seppyo,* Mar. 1997, 59(2), p.111-114, In Japanese. 3 refs.
Research projects, Polar atmospheres, Global warming, Paleoclimatology, Glacier surveys, Glacial meteorology, Ice cores, International cooperation

52-2504
Polymorphism of amorphous ice.
Mishima, O., *Seppyo,* Mar. 1997, 59(2), p.115-118, In Japanese. 19 refs.
High pressure ice, Amorphous ice, Ice density, Phase transformations, Solid phases

52-2505
Ice X: ice crystal with a minimum hydrogen bond. [Kori X: ikkyokusho suiso ketsugo hyokessho]
Kawada, S., *Seppyo,* Mar. 1997, 59(2), p.124-125, In Japanese. 2 refs.
High pressure ice, Ice crystal structure, Hydrogen bonds

52-2506
Some more words on snow countermeasures for National Highway 17 (Part 6). [Kokudo 17-go yuki taisaku yowa (sono 6)]
Abe, T., *Seppyo,* Mar. 1997, 59(2), p.130-132, In Japanese.
Avalanche triggering, Blasting, Avalanche engineering, Road maintenance, Japan

52-2507
Effects of explosives detonation inside snow cover.
Morisue, H., Takeuchi, N., Hayakawa, N., *Seppyo,* July 1997, 59(4), p.235-246, In Japanese with English summary. 13 refs.
Avalanche triggering, Avalanche mechanics, Blasting, Explosives, Explosion effects, Detonation waves, Snow acoustics, Snow strength, Mathematical models

52-2508
Development of machines for hydraulic transportation of snow. Part 5: a snow feeder for communal use.
Umemura, T., Sawamoto, K., Kuno, K., Murayama, K., Mitsumoto, M., Hanada, Y., *Seppyo,* July 1997, 59(4), p.247-255, In Japanese with English summary. 6 refs.
Snow removal equipment, Snow compaction, Drains, Water pipes, Channels (waterways), Design criteria

52-2509
Radio-echo soundings of the Ushkovsky ice cap, Kamchatka, Russia.
Matsuoka, K., et al, *Seppyo,* July 1997, 59(4), p.257-262, In Japanese with English summary. 11 refs.
Volcanoes, Mountain glaciers, Glacier surveys, Glacier thickness, Radio echo soundings, Electromagnetic prospecting, Russia—Kamchatka Peninsula

52-2510
Some more words on snow countermeasures for National Highway 17 (Part 8). [Kokudo 17-go yuki taisaku yowa (sono 8)]
Abe, T., *Seppyo,* July 1997, 59(4), p.273-278, In Japanese. 2 refs.
Snow loads, Snow fences, Road maintenance, Safety, Japan

52-2511
Development of artificial soil freezing for construction.
Ohrai, T., *Seppyo,* May 1997, 59(3), p.159-167, In Japanese. 18 refs.
Soil freezing, Frost heave, Artificial freezing, Soil stabilization, Frozen ground strength, Frozen ground compression

52-2512
Structure of supercooled water and liquid-liquid phase transition.
Tanaka, H., *Seppyo,* May 1997, 59(3), p.168-170, In Japanese. 6 refs.
High pressure ice, Amorphous ice, Water structure, Supercooling, Liquid phases

52-2513
In-situ measurement of tensile strength of snow layer.
Takeuchi, N., Morisue, H., Yada, K., *Seppyo,* May 1997, 59(3), p.171-180, In Japanese with English summary. 13 refs.
Snow cover stability, Snow strength, Snow hardness, Snow survey tools, Strain tests

52-2514
Dating of seasonal snow layers at Murodo, Mt. Tateyama, Japan.
Kido, M., et al, *Seppyo,* May 1997, 59(3), p.181-188, In Japanese with English summary. 24 refs.
Snow air interface, Scavenging, Snow stratigraphy, Snow compression, Snow composition, Snow impurities, Salinity, Dust, Japan

52-2515
Snow avalanche chute experiments II: impact characteristics of snow blocks against walls, posts and disks.
Abe, O., Nakamura, H., Sato, A., Nakamura, T., *Seppyo,* May 1997, 59(3), p.189-199, In Japanese with English summary. 14 refs.
Avalanche modeling, Avalanche mechanics, Snow loads, Impact tests

52-2516
Some more words on snow countermeasures for National Highway 17 (Part 7). [Kokudo 17-go yuki taisaku yowa (sono 7)]
Abe, T., *Seppyo,* May 1997, 59(3), p.207-210, In Japanese. 1 ref.
Snowstorms, Accidents, Road maintenance, Japan

52-2517
Dynamics of powder snow avalanches occurred at Yokokura and Ohara in Katsuyama City, Fukui Prefecture in 1996.
Sugimori, M., Kitagawa, H., Ito, F., Umeda, M., Fukushima, Y., *Seppyo,* Sep. 1997, 59(5), p.319-330, In Japanese with English summary. 10 refs.
Avalanches, Accidents, Avalanche mechanics, Avalanche tracks, Avalanche deposits, Mathematical models, Japan

52-2518
Bedrock topography and internal structures of ice sheet in the Shirase Glacier drainage area revealed from radio-echo soundings.
Maeno, H., Uratsuka, S., Kamiyama, K., Furukawa, T., Watanabe, O., *Seppyo,* Sep. 1997, 59(5), p.331-339, In Japanese with English summary. 10 refs.
Ice sheets, Glacier surveys, Glacier thickness, Glacier beds, Subglacial observations, Firn stratification, Ice structure, Bottom topography, Radio echo soundings, Electromagnetic prospecting, Antarctica—Shirase Glacier
A newly developed radio-echo sounder mounted on an oversnow-vehicle was used in the Shirase Glacier drainage area in 1992. A maximum ice thickness of 3520 m was measured around the ice divide at Dome Fuji (Dome F). The bedrock topography of the summit area of Dome F was basin-like and internal ice distortion was not discernible because layer structures were parallel to both the ice sheet surface and the bedrock surface. The bedrock topography and internal structure were also measured from Dome F to the coast (Station S16). The elevation of bedrock in the inland area was about 500 m a.s.l. and the ice layers were parallel to the bedrock; between S16 and MD164 the bedrock elevation was nearly at the sea level and the internal ice structure was complex. (Auth. mod.)

52-2519
Some more words on snow countermeasures for National Highway 17 (Part 9). [Kokudo 17-go yuki taisaku yowa (sono 9)]
Abe, T., *Seppyo,* Sep. 1997, 59(5), p.354-360, In Japanese.
Snowstorms, Road icing, Weather forecasting, Warning systems, Safety, Road maintenance, Japan

52-2520
Studies on energy balance and formation of sun crust in snow.
Ozeki, T., *Seppyo,* Nov. 1997, 59(6), p.387-395, In Japanese. 22 refs.
Snow crust, Snow surface, Snow air interface, Snow heat flux, Depth hoar, Snow melting

52-2521
Snow injury of crops as influenced by melt water.
Fukuta, N., *Seppyo,* Nov. 1997, 59(6), p.431-433, In Japanese. 9 refs.
Snow cover effect, Snowmelt, Physiological effects, Plant physiology, Plant ecology, Agriculture

52-2522
From Antarctica to space: use of telepresence and virtual reality in control of a remote underwater vehicle.
Stoker, C., *SPIE—International Society for Optical Engineering. Proceedings,* 1995, Vol.2352, Mobile Robots IX. Edited by W.J. Wolfe and W.H. Chun, p.288-299, This paper also appeared in the proceedings of the 18th Space Simulation Conference, Baltimore MD, 1994. 18 refs.
DLC TJ211.415.M63 no.9 1994
Submarines, Sea ice, Electronic equipment, Subglacial observations, Antarctica—McMurdo Sound
An experiment is described which simulated many aspects of control of a remote vehicle on another planetary surface. A telepresence-controlled, remotely operated underwater vehicle (TROV) was developed and was used to perform scientific exploration in an ice-covered manned environment near McMurdo Station. The TROV was operated both locally, from a habitat building located on the sea ice above a dive hole through which it was launched, and remotely over a satellite communications link from a control room at NASA's Ames Research Center. The TROV was operated in Antarctica nearly continuously using both local and remote control for 7 weeks. The results of the experiments suggest that surface rovers using control technology with real time telepresence could vastly expand the range of human exploration from a human base on the moon or Mars. (Auth. mod.)

52-2523
Satellite-based climatology of UV-B irradiance for antarctic coastal regions.
Nunez, M., Michael, K., Turner, D., Wall, M., Nilsson, C., *International journal of climatology,* Aug. 1997, 17(10), p.1029-1054, 48 refs.
Ultraviolet radiation, Clouds (meteorology), Albedo, Snow, Ice, Models, Antarctica—Oates Coast, Antarctica—George V Coast, Antarctica—Adélie Coast
A technique is described to map surface UV-B irradiance for a section of the antarctic coast bounded by latitudes 54°-69°S; 140°-160°E. Daily NOAA/AVHRR images have been acquired for this region over four consecutive seasons starting in 1990. A model is applied to estimate cloudless erythemal irradiances using cosine estimates from TOMS and surface albedo from NOAA/AVHRR. Cloudy irradiances are estimated as the product of the cloudless irradiance and a cloud transmittance derived from satellite imagery. Depletion by clouds is significant and is larger than interannual variability in ozone depletion. The effect of clouds is minimum at 55°S and increases polewards to reach maximum values at the edge of the pack ice. Further to the south, cloud depletion decreases due to the moderating effect of the high surface albedo for snow and ice. (Auth. mod.)

52-2524
Climate variability in the Amundsen and Bellingshausen Seas.
Jacobs, S.S., Comiso, J.C., *Journal of climate,* Apr. 1997, 10(4), p.697-709, Refs. p.707-709.
Climatic changes, Remote sensing, Sea ice distribution, Seasonal ablation, Antarctica—Amundsen Sea, Antarctica—Bellingshausen Sea
Satellite data reveal a 20% decline in sea ice extent in the Amundsen and Bellingshausen Seas in the two decades following 1973. This change is negatively correlated with surface air temperatures on the west side of the Antarctic Peninsula, which have increased ca. 0.5°C/decade since the mid-1940s. The recession was strongest during summer, when monthly average minima in 1991-92 removed much of the incipient multiyear ice over the continental shelf. A review of atmospheric forcing shows winds consistent with mean and extreme ice extents, and suggests links to larger-scale circulation changes in the South Pacific. Historical ocean measurements are sparse in this sector, but mixed-layer depths and upper pycnoclines beneath the sea ice resemble those in the Weddell Sea. Weaker surface currents or changes in the upwelling of Circumpolar Deep Water on the continental shelf could have contributed to the anomaly persistence. (Auth.)

52-2525
Faecal pollution indicators in the Terra Nova Bay (Ross Sea, Antarctica).
Bruni, V., Maugeri, T.L., Monticelli, L., *Marine pollution bulletin,* Nov. 1997, 34(11), p.908-912, 18 refs.
Sea water, Water pollution, Bacteria, Environmental impact, Antarctica—Terra Nova Bay, Antarctica—Evans Cove
The occurrence of faecal bacteria indicators (total coliforms, faecal coliforms and streptococci) in pristine waters and near Italian base stations of Terra Nova Bay was investigated. High bacterial densities were found at the station near the outfall of the sewage disposal plant and when the population at Base was more abundant. In all other stations further from the outfall, the bacterial indicators were absent or present in very small numbers. Faecal bacteria were not detected in samples collected at Penguin Bay and Evans Cove except for only 1 enterococcus/100 ml at Evans Cove. In seawater samples in which faecal coliforms and faecal streptococci were found, the latter were generally more abundant and in 4 samples only streptococci were isolated, although in low number. This could suggest that faecal streptococci are more suitable bacteria for investigation of the human impact on the antarctic marine environment. (Auth.)

52-2526
Snow loads on gable roofs.
O'Rourke, M., Auren, M., *Journal of structural engineering,* Dec. 1997, 123(12), p.1645-1651, 11 refs.
Roofs, Snow loads, Snowdrifts, Topographic effects, Wind factors, Snow depth, Height finding, Forecasting, Statistical analysis, Design criteria, Standards

52-2527
Aircraft ice accretion measurement: a Phase I, SBIR study using millimeter wave radar (MMWR).
Lightfoot, F.M., Milligan, R.E., *IEEE aerospace and electronic systems magazine,* Aug. 1997, 12(8), p.3-9, 8 refs.
Aircraft icing, Tests, Ice accretion, Ice solid interface, Ice detection, Ice cover thickness, Sensors, Radar echoes, Radiometry, Research projects, Laboratory techniques, Design

52-2528
Measurement of interfacial free energy for ice/water system.
Hillig, W.B., *Journal of crystal growth,* Jan. 1998, 183(3), p.463-468, 14 refs.
Ice physics, Ice water interface, Freezing front, Freezing points, Melting points, Homogeneous nucleation, Bubbles, Thermodynamics, Simulation

52-2529
Ice cores.
Cutlip, K., *Weatherwise,* Oct.-Nov. 1997, 50(5), p.10.
Research projects, Paleoclimatology, Climatic changes, Global change, Mountain glaciers, Ice cores, Drill core analysis, Bolivia

52-2530
Snowballs from space.
Rosenfeld, J., *Weatherwise,* Aug.-Sep. 1997, 50(4), p.10-11.
Climatology, Atmospheric composition, Water content, Extraterrestrial ice, Ice melting, Hydrologic cycle, Climatic factors, Theories

52-2531
Surface sensitive studies of reactive uptake of chlorine nitrate on ice.
Berland, B.S., Tolbert, M.A., George, S.M., *Journal of physical chemistry A,* Dec. 18, 1997, 101(51), p.9954-9963, 59 refs.
Climatology, Cloud physics, Polar stratospheric clouds, Atmospheric composition, Degradation, Aerosols, Ice vapor interface, Adsorption, Temperature effects, Simulation, Ice spectroscopy

52-2532

On the adhesion of oil and ice.

Liukkonen, S., Rytkönen, J., Al'khimenko, A., Kniazeva, E., *International journal of offshore and polar engineering,* Dec. 1997, 7(4), p.246-253, 17 refs. For another version see 51-5737.

Oceanography, Oil spills, Crude oil, Drops (liquids), Dispersions, Liquid solid interfaces, Surface energy, Surface properties, Sea ice, Ice bottom surface, Adhesion, Temperature effects, Simulation, Environmental tests

52-2533

Variability of AVHRR-derived clear-sky surface temperature over the Greenland ice sheet.

Stroeve, J., Steffen, K., *Journal of applied meteorology,* Jan. 1998, 37(1), p.23-31, 27 refs.

Climatology, Remote sensing, Radiometry, Ice sheets, Surface temperature, Snow surface temperature, Brightness, Snow cover effect, Topographic effects, Seasonal variations, Snow air interface, Greenland

52-2534

Freezing rain: an observational and theoretical study.

Zerr, R.J., *Journal of applied meteorology,* Dec. 1997, 36(12), p.1647-1661, 34 refs.

Precipitation (meteorology), Classifications, Rain, Freezing, Snow pellets, Radar echoes, Sounding, Ice water interface, Temperature effects, Ice melting, Recrystallization, Supercooling, Mathematical models, Theories

52-2535

Seasonal variations in the heat and water balances for nonvegetated surfaces.

Kondo, J., Xu, J.Q., *Journal of applied meteorology,* Dec. 1997, 36(12), p.1676-1695, 21 refs.

Climatology, Water balance, Heat balance, Hydrologic cycle, Ground water, Soil air interface, Evaporation, Snow hydrology, Snowmelt, Snow cover effect, Albedo, Seasonal variations, Mathematical models

52-2536

Calculations of aircraft contrail formation critical temperatures.

Schrader, M.L., *Journal of applied meteorology,* Dec. 1997, 36(12), p.1725-1729, 10 refs.

Cloud physics, Condensation trails, Ice formation, Ice vapor interface, Heterogeneous nucleation, Vapor pressure, Freezing points, Turbulent diffusion, Forecasting

52-2537

Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Transport and chemical transformation of pollutants in the troposphere. Vol.5, Berlin, Springer-Verlag, 1997, 286p., Refs. passim. For selected papers see 52-2538 through 52-2547.

DLC QC924.E85 C56

Precipitation (meteorology), Cloud physics, Atmospheric boundary layer, Air pollution, Aerosols, Snowfall, Scavenging, Snow composition, Impurities, Alpine landscapes, Sampling, Environmental tests, Austria—Alps, Switzerland—Alps

52-2538

Pollution levels in high alpine areas. Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.177-199, 54 refs.

DLC QC924.E85 C56

Climatology, Air pollution, Cloud physics, Atmospheric composition, Aerosols, Glacier surfaces, Snow composition, Scavenging, Hoarfrost, Sampling, Seasonal variations, Austria—Sonnblick

52-2539

Accumulation of pollutants and nutrients in the snow pack at high altitudes along a north-south transect in the eastern Alps.

Kuhn, M., Nickus, U., Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.203-209, 3 refs.

DLC QC924.E85 C56 1997

Climatology, Air pollution, Alpine landscapes, Snow composition, Snow impurities, Ion density (concentration), Aerosols, Sampling, Altitude, Environmental tests, Austria—Alps

52-2540

Stable isotope ratio of sulfur, nitrogen and carbon as pollution tracers for atmospheric constituents.

Pichlmayer, F., Blochberger, K., Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.210-218, 15 refs.

DLC QC924.E85 C56 1997

Climatology, Air pollution, Alpine landscapes, Snow composition, Snow impurities, Aerosols, Sampling, Isotope analysis, Environmental tests, Atmospheric circulation, Austria—Sonnblick

52-2541

Accumulation of acidic components in two snowfields in the Sonnblick region.

Staudinger, M., Schöner, W., Puxbaum, H., Böhm, R., Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.219-224, 8 refs.

DLC QC924.E85 C56 1997

Climatology, Air pollution, Alpine landscapes, Snow composition, Snow impurities, Sampling, Aerosols, Ion density (concentration), Seasonal variations, Atmospheric circulation, Environmental tests, Austria—Sonnblick

52-2542

Retrospective and present state of anthropogenic aerosol deposition at a high altitude alpine glacier (Colle Gnifetti, 4450 m a.s.l.).

Wagenbach, D., et al, Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.225-233, 22 refs.

DLC QC924.E85 C56 1997

Climatology, Air pollution, Alpine landscapes, Aerosols, Glacier surfaces, Ice cores, Snow composition, Snow impurities, Sampling, Ion density (concentration), Periodic variations, Switzerland—Monte Rosa

52-2543

Segregation of hydrometeors.

Berner, A., Kruisz, C., Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.235-240, 7 refs.

DLC QC924.E85 C56 1997

Climatology, Atmospheric boundary layer, Mountains, Atmospheric composition, Cloud physics, Sampling, Samplers, Aerosols, Water content, Performance, Mathematical models

52-2544

Transport, scavenging and deposition studies of air pollutants at high-alpine sites.

Gäggeler, H.W., Schwikowski, M., Baltensperger, U., Jost, D.T., Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.241-249, 20 refs.

DLC QC924.E85 C56 1997

Climatology, Atmospheric boundary layer, Alpine landscapes, Air pollution, Aerosols, Snow composition, Snow impurities, Scavenging, Sampling, Snow water content, Ion density (concentration), Seasonal variations, Environmental tests, Switzerland—Jungfraujoch, Switzerland—Weissfluhjoch, Austria—Sonnblick

52-2545

Alpine aerosol and snow chemistry study at the Sonnblick Observatory (Austria, 3106 m a.s.l.).

Puxbaum, H., et al, Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.250-257, 25 refs.

DLC QC924.E85 C56 1997

Climatology, Cloud physics, Mountains, Atmospheric composition, Aerosols, Heterogeneous nucleation, Snowfall, Snow water content, Ion density (concentration), Scavenging, Sampling, Austria—Sonnblick

52-2546

Aerosol and hydrometeor concentrations and their chemical composition during winter precipitation along a mountain slope (Mt. Rigi, Switzerland).

Staehelin, J., Waldvogel, A., Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.258-262, 15 refs.

DLC QC924.E85 C56 1997

Climatology, Air pollution, Precipitation (meteorology), Cloud physics, Mountains, Atmospheric boundary layer, Scavenging, Aerosols, Ice formation, Environmental tests, Sampling, Switzerland—Rigi, Mount

52-2547

Meteorological support study (SNOWMET).

Kromp-Kolb, H., Seibert, P., Schöner, W., Transport and chemical transformation of pollutants in the troposphere. Vol.5. Cloud multi-phase processes and high alpine air and snow chemistry. Ground-based cloud experiments and pollutant deposition in the high Alps. Edited by S. Fuzzi and D. Wagenbach, Berlin, Springer-Verlag, 1997, p.263-270, 11 refs.

DLC QC924.E85 C56 1997

Climatology, Atmospheric boundary layer, Mountains, Cloud physics, Aerosols, Air pollution, Snow composition, Sampling, Atmospheric circulation, Environmental tests, Switzerland—Alps, Austria—Alps

52-2548

Deficiencies in the diatom evidence for a Pliocene reduction of the East Antarctic Ice Sheet.

Burckle, L.H., Stroeven, A.P., Bronge, C., Miller, U., Wasell, A., *Paleoceanography,* Aug. 1996, 11(4), p.379-389, Refs. p.387-389.

Glacial geology, Paleobotany, Sediments, Ice sheets, Ice volume, Polar regions, Antarctica—Transantarctic Mountains

Evidence for Pliocene reduction of the East Antarctic Ice Sheet (EAIS) has been inferred from the presence of Pliocene planktic marine diatoms in tills of the Sirius Group now exposed along the slopes of the Transantarctic Mountains. The authors highlight deficiencies in this diatom evidence. They examine what diatom habitats are left behind by a retreating ice sheet, in this case the Fennoscandian Ice Sheet (FIS), and find that diatoms should occur in planktic and benthic marine, brackish water, freshwater, and terrestrial habitats. It is expected that during former reexpansions, these diverse diatom assemblages were picked up by the advancing FIS and depos-

ited in tills. This is shown to be the case. If there was a reduction of the EAIS during the Pliocene followed by renewed glaciation, diatoms from many different habitats should be found in the resulting tills of the Sirius Group. This is not the case. Only marine planktic diatoms and a few freshwater forms are reported. (Auth. mod.)

52-2549

Effects of a rapid, unseasonal rewetting event on mineral location in Antarctic lichens.

Hovenden, M., *New phytologist,* Oct. 1997, 137(2), p.241-246, 16 refs.

Lichens, Plant tissues, Plant physiology, Acclimatization, Frost resistance, Microclimatology, Antarctica—Windmill Islands

During the middle of the 1992 austral winter in the northern Windmill Is., a highly unusual climatic event occurred in which the air temperature exceeded 0°C for some 60 h, at the end of which there was a significant rain shower before the ambient temperature returned to subzero conditions. This event caused most of the snow cover to melt and refreeze as clear ice. Lichens were thus rehydrated in the dark, in some places completely inundated, then frozen in ice. The effect that these conditions had on the distribution of K, Na, Mg and Ca within the thallus was estimated for two of the dominant macrolichen species, *Umbilicaria decussata* (Vill.) Zahlbr. and *Usnea sphacelata* R.Br. Despite persistent differences between species and the various sites, there was no overall effect of the climatic event on the membrane integrity of either lichen species. (Auth. mod.)

52-2550

Results of the South African cloud-seeding experiments using hygroscopic flares.

Mather, G.K., Terblanche, D.E., Steffens, F.E., Fletcher, L., *Journal of applied meteorology,* Nov. 1997, 36(11), p.1433-1447, 18 refs.

Precipitation (meteorology), Weather modification, Storms, Cloud physics, Cloud seeding, Hygroscopic nuclei, Artificial nucleation, Coalescence, Radar echoes, Experimentation, South Africa

52-2551

Calculations pertaining to hygroscopic seeding with flares.

Cooper, W.A., Bruintjes, R.T., Mather, G.K., *Journal of applied meteorology,* Nov. 1997, 36(11), p.1449-1469, 56 refs.

Precipitation (meteorology), Weather modification, Cloud seeding, Cloud physics, Cloud droplets, Hygroscopic nuclei, Condensation nuclei, Artificial nucleation, Coalescence, Particle size distribution, Analysis (mathematics)

52-2552

Simulation approach for validation of a bright-band correction method.

Borga, M., Anagnostou, E.N., Krajewski, W.F., *Journal of applied meteorology,* Nov. 1997, 36(11), p.1507-1518, 48 refs.

Precipitation (meteorology), Synthetic aperture radar, Radar echoes, Reflectivity, Scattering, Ice detection, Snowflakes, Snow melting, Profiles, Mathematical models, Dielectric properties, Weather forecasting

52-2553

Proceedings.

International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995, Watanabe, O., ed, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, 398p., Refs. passim. For individual papers see 52-2554 through 52-2587.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Glacial meteorology, Ice cover effect, Ecology, Biomass, Air pollution, Global warming, Environmental impact

52-2554

Review of the development of international science cooperation in the Arctic with a focus on IASC activities and its science priority projects.

Rogne, O., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.1-5.

Organizations, Research projects, International cooperation, Regional planning

52-2555

Environmental research in arctic Canada: bringing global and local science together.

Roots, E.F., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.7-24, Refs. p.20-24.

Research projects, Regional planning, Environmental impact, Environmental protection, Canada

52-2556

Brief history of sea ice biota studies at Syowa Station and its vicinity.

Hoshiai, T., Watanabe, K., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.25-31, 46 refs.

Sea ice, Ice cover effect, Ecosystems, Ecology, Cryobiology, Marine biology, Algae, Nutrient cycle, Biomass, Antarctica—Showa Station

A history of sea ice biota studies which were carried out at Showa Station and its vicinity is outlined. The process of the surface community formation in ice floes, the bimodal proliferation of ice algae in the bottom layer of fast ice and the algae-copepod-fish link associated with fast ice were mainly investigated. Based on the results obtained from the Showa Station area and those from other locations, the distribution of ice algal communities, the seasonality in formation of the ice algal community and the food chain associated with sea ice are discussed. Finally, a need for comparative research on arctic and antarctic ecosystems is suggested. (Auth.)

52-2557

ENSO-like periodicities in the arctic cryosphere.

Ono, N., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.33-39, 10 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Air ice water interaction, Sea ice distribution, Glacial meteorology, Glacier mass balance, Glacier oscillation, Global warming

52-2558

Food web structure and biogenic carbon export on the continental shelves of the Arctic Ocean.

Legendre, L., Rivkin, R.B., Michel, C., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.41-65, Refs. p.60-65.

Marine biology, Cryobiology, Ecology, Ecosystems, Ice cover effect, Nutrient cycle, Biomass

52-2559

Study of the water and energy cycle and land surface processes in Siberia (GAME/Siberia).

Ohata, T., Fukushima, Y., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.67-70, 2 refs. GAME is an acronym for the GEWEX (Global Energy and Water Experiment) Asian Monsoon Experiment.

Permafrost distribution, Permafrost hydrology, Permafrost heat balance, Tundra climate, River basins, Radiation balance, Hydrologic cycle, Atmospheric circulation, Global warming, Research projects, International cooperation, Russia—Siberia

52-2560

Effects of snowmelt timing on reproductive phenology and pollination process of alpine plants.

Kudo, G., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.71-82, 27 refs.

Snow hydrology, Snowmelt, Snow cover effect, Alpine tundra, Tundra vegetation, Plant ecology, Vegetation patterns, Phenology, Japan—Hokkaido

52-2561

Some vegetation indications of climate warming as detected on the forest-tundra border in the continental Canadian Arctic.

Sweda, T., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.83-89, 10 refs.

Forest lines, Forest tundra, Plant ecology, Vegetation patterns, Trees (plants), Plant tissues, Plant physiology, Growth, Biomass, Carbon dioxide, Geochemical cycles, Global warming, Canada—Richardson Mountains

52-2562

Monogonont composition in different freshwater habitats on Spitsbergen (Arctic) and King George Island (Antarctica).

Janiec, K., Salwicka, K., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.91-98, 21 refs.

Ecology, Biogeography, Ponds, Limnology, Antarctica—King George Island, Norway—Spitsbergen

The monogonont composition of Spitsbergen and King George I. is compared. Four different freshwater habitats (moss banks, moraine ponds, nearshore ponds and thaw ponds) were surveyed. Twenty monogonont species on Spitsbergen and 11 species on King George I. were found. *Euchlanis dilatata* and *Notholca salina* were the most numerous monogononts in both regions. The maximum number of species on Spitsbergen was observed in nearshore ponds (19), while on King George in thaw ponds (8). In each habitat species diversity was higher on Spitsbergen than on King George I. Species composition was different because of different sources of colonization. longer colonization on Spitsbergen than on King George I., better developed tundra habitat on Spitsbergen with more abundant flora, and smaller geographical isolation of Spitsbergen from the place of colonizers origin. (Auth.)

52-2563

Algal diversity, seasonality and abundance in, and along glacial stream in Sverdrup Pass, 79°N, central Ellesmere Island, Canada.

Elster, J., Svoboda, J., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.99-118, 25 refs.

Subglacial drainage, Glacial rivers, Meltwater, Moraines, Algae, Bacteria, Ecology, Biomass, Canada—Northwest Territories—Ellesmere Island

52-2564

Climate change and carbon flux in the Barents Sea: 3-D simulations of ice-distribution, primary production and vertical export of particulate organic carbon.

Slagstad, D., Wassmann, P., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.119-141, 49 refs.

Sea ice distribution, Ice edge, Ice cover effect, Marine atmospheres, Marine biology, Ecology, Plankton, Biomass, Nutrient cycle, Geochemical cycles, Atmospheric circulation, Ocean currents, Global warming, Mathematical models, Barents Sea

52-2565

Primary production of phytoplankton in high arctic Kongsfjorden, Svalbard.

Yamaguchi, Y., Miyahara, T., Matsuda, O., Kudoh, S., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.143-151, 24 refs.

Ice cover effect, Ice melting, Marine biology, Ecology, Plankton, Chlorophylls, Biomass, Norway—Spitsbergen

52-2566

Report on atmospheric science observations at Ny-Ålesund, Svalbard.

Yamanouchi, T., Aoki, S., Morimoto, S., Wada, M., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.153-163, 21 refs.

Weather stations, Polar atmospheres, Marine atmospheres, Atmospheric composition, Ozone, Cloud cover, Precipitation (meteorology), Radiation balance, Global change, Norway—Spitsbergen, Antarctica—Showa Station

Observations of atmospheric variables at Ny-Ålesund, Svalbard were started in 1991 at the Rabben observation station, in order to increase understanding of global atmospheric change in the Arctic. The measured atmospheric components are the variations of greenhouse gases, clouds, precipitation and radiation; these are then compared to observations in the Antarctic. Observations of greenhouse gases, such as CO_2 and CH_4, are conducted by air sampling at the site once a week. Large seasonal variation and north-south difference in the annual mean between Ny-Ålesund and Showa Station of about 4 ppmv are observed for the CO_2 concentration. CH_4 also shows a large seasonal variation and large north-south difference. Surface ozone concentration is measured continuously at the station; clear seasonal variation and some drastic destruction at the polar sunrise have been revealed. The surface ozone concentration at Showa Station is about 10 ppbv lower on average than at Ny-Ålesund. (Auth. mod.)

52-2567

Impact of arctic circulation on trace gas measurements at Alert, Canada.

Trivett, N.B.A., Higuchi, K., Yuen, C.W., Worthy, D.E.J., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.165-176, 11 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Carbon dioxide, Canada—Northwest Territories—Alert

52-2568

Polar vortex meandering and stratospheric aerosol distribution: lidar measurements at Fairbanks, Alaska.

Iwasaka, Y., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.177-188, 23 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Stratosphere, Aerosols, Air pollution, Lidar, United States—Alaska—Fairbanks, Norway—Spitsbergen

52-2569

Variability of ozone and aerosols in the polar atmosphere.

Gernandt, H., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.189-215, 49 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Ozone, Aerosols, Air pollution, Polar stratospheric clouds, Global change

Since 1980 the appearance of spring ozone depletion directly caused by chemical removal has significantly changed the pattern of vertical ozone distribution in the antarctic stratosphere, and has become a principal feature of a changing atmosphere. In recent years chemical ozone loss has also been found in the arctic stratosphere. Transient events like the presence of volcanic aerosols can additionally remove ozone in the lower polar stratosphere. Balloon-borne ozone observations and sun photometer measurements performed in the Antarctic and Arctic as well as satellite data are used to review interannual and seasonal changes in the polar stratosphere. Tropospheric ozone and aerosol variations in the arctic region are briefly discussed. Some features of polar ozone and the impact of aerosols are discussed using original results. (Auth.)

52-2570

Lidar observed polar stratospheric clouds over Svalbard in mid-December 1994.

Shibata, T., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.217-223, 28 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Ozone, Aerosols, Lidar, Norway—Spitsbergen

52-2571

Observations of ozone profiles in the upper stratosphere using a UV sensor on board a light-weight high-altitude balloon.

Okano, S., Okabayashi, M., Gernandt, H., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.225-231, 5 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Ozone, Balloons, Ultraviolet radiation, Norway—Spitsbergen

52-2572

Concentrations of ^{210}Pb and ^{210}Po in the atmosphere of Ny-Ålesund, Svalbard.

Suzuki, T., Nakayama, N., Igarashi, M., Kamiyama, K., Watanabe, O., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.233-237, 6 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Aerosols, Air pollution, Radioactive isotopes, Norway—Spitsbergen

52-2573

Variation of monthly precipitation and frequency of radar echo existence at some altitudes in Ny-Ålesund, Svalbard, Arctic.

Wada, M., Konishi, H., Yamanouchi, T., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.239-246, 10 refs.

Weather stations, Polar atmospheres, Cloud cover, Precipitation (meteorology), Snowfall, Meteorological instruments, Radio echo soundings, Norway—Spitsbergen

52-2574

Ice crystals observed at Cambridge Bay and Inuvik in arctic Canada.

Yamashita, A., Arakawa, T., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.247-253, 7 refs.

Airports, Ice fog, Ice crystal structure, Ice crystal size, Canada—Northwest Territories—Cambridge Bay, Canada—Northwest Territories—Inuvik

52-2575

Characteristics of heat balance during the snowmelt season in Ny-Ålesund, Spitsbergen Island.

Nakabayashi, H., Kodama, Y., Takeuchi, Y., Ozeki, T., Ishikawa, N., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.255-266, 10 refs.

Snow air interface, Snow heat flux, Snow hydrology, Snow melting, Snowmelt, Radiation balance, Tundra climate, Norway—Spitsbergen

52-2576

Arctic Ocean in the global climate system.

Alekseev, G.V., Ivanov, V.V., Zakharov, V.F., IAnes, A.V., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.267-276, 20 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Air ice water interaction, Sea ice distribution, Ice cover effect, Water temperature, Salinity, Global warming

52-2577

European Subpolar Ocean Programme (ESOP)—investigations of the role of sea ice in Greenland Sea convection.

Wadhams, P., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.277-297, 40 refs.

Oceanographic surveys, Ice water interface, Ice heat flux, Sea ice distribution, Drift, Ice cover effect, Ocean currents, Water transport, Salinity, Water temperature, Convection, Global warming, Greenland Sea

52-2578

Carbon dioxide variations in the Greenland Sea.

Aoki, S., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.299-306, 16 refs.

Polar atmospheres, Marine atmospheres, Atmospheric composition, Air water interactions, Sea water, Water chemistry, Carbon dioxide, Geochemical cycles, Global change, Greenland Sea

52-2579

Recent changes in arctic ocean thermohaline structure: results from the Canada/U.S. Arctic Ocean section.

Jones, E.P., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.307-315, 12 refs.

Oceanographic surveys, Polar atmospheres, Marine atmospheres, Air water interactions, Ocean currents, Water transport, Water temperature, Salinity, Global warming

52-2580

Heat budget of Kongsfjorden.

Ito, H., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.317-327, 5 refs.

Polar atmospheres, Marine atmospheres, Air water interactions, Water transport, Water temperature, Salinity, Heat balance, Heat transfer, Global warming, Norway—Spitsbergen

52-2581

Japanese glaciological activities in the arctic region.

Watanabe, O., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.329-336, 3 refs.

Research projects, Glacier surveys, Glacier oscillation, Glacial meteorology, Ice cores, Air pollution, Climatic changes, Global change

52-2582

Scientific research collaboration efforts for Greenland ice core studies.

Clausen, H.B., Gundestrup, N.S., Shoji, H., Watanabe, O., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.337-342, 14 refs.

Glacier surveys, Ice sheets, Ice cores, Ice coring drills, Research projects, International cooperation, Greenland

52-2583

Recent trends in the mass balance of glaciers in Scandinavia and Svalbard.

Hagen, J.O., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.343-354, 20 refs.

Glacier surveys, Glacial meteorology, Glacier oscillation, Glacier mass balance, Climatic changes, Norway, Sweden, Norway—Spitsbergen

52-2584

Longitudinal variations of temperature, wind and ablation in Brøggerbreen, Svalbard.

Enomoto, H., Takahashi, S., Kobayashi, S., Goto-Azuma, K., Watanabe, O., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.355-364, 6 refs.

Glacier surveys, Glacial meteorology, Glacier ablation, Air temperature, Wind velocity, Norway—Spitsbergen

52-2585

Vertical distributions of low molecular weight dicarboxylic acids in the Greenland ice core.

Kawamura, K., Yokoyama, K., Fujii, Y., Watanabe, O., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.365-375, 24 refs.

Ice cores, Glacial meteorology, Ice composition, Impurities, Atmospheric composition, Geochemical cycles, Climatic changes, Global change, Greenland

52-2586

Ice core analyses and borehole temperature measurements at the drilling site on Åsgårdfonna, Svalbard, in 1993.

Uchida, T., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.377-386, 7 refs.

Ice cores, Glacial meteorology, Firn stratification, Ice temperature, Ice dating, Paleoclimatology, Climatic changes, Norway—Spitsbergen

52-2587

Internal layering detected by microwave ice-radar in the arctic ice cap.

Uratsuka, S., Maeno, H., Suitz, T., Fisher, D.A., Goto-Azuma, K., Mae, S., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1996, No.51, International Symposium on Environmental Research in the Arctic, Tokyo, July 19-21, 1995. Proceedings. Edited by O. Watanabe, p.387-394, 10 refs.

Glacier surveys, Radio echo soundings, Electromagnetic prospecting, Ice electrical properties, Ice dielectrics, Ice structure, Ice composition, Volcanic ash, Ice dating, Paleoclimatology, Canada—Northwest Territories—Ellesmere Island

52-2588

Microfossil and stable-isotope evidence for changes in Late Holocene palaeoproductivity and palaeoceanographic conditions in the Prydz Bay region of Antarctica.

Rathburn, A.E., Pichon, J.J., Ayress, M.A., De Deckker, P., *Palaeogeography, palaeoclimatology, palaeoecology,* July 1997, 131(3-4), p.485-510, Refs. p.507-510.

Algae, Fossils, Marine biology, Climatic changes, Glacial geology, Paleoecology, Paleoclimatology, Sea ice distribution, Antarctica—Prydz Bay

Microfaunal and microfloral data from two gravity cores, and stable-isotope results from one of these cores taken on Fram Bank near Prydz Bay indicate changes in sea-ice patterns and oceanographic conditions which may have been linked to regional and global climate changes that occurred over the past 8000 yr. Modern diatom assemblages indicative of ice free conditions 1-2 months of the year, and dominated by *Nitzschia* species became prevalent some time around 2000-2700 yr B.P. The occurrence of *Chaetoceros* spp. diatom spore-dominated assemblages, and increased abundances of benthic and planktonic foraminifera, ostracods, and diatoms, coupled with carbon- and oxygen-isotope changes around 2700-3400 yr B.P. strongly suggests that this area of the shelf experienced conditions conducive to increased productivity during this time period. (Auth. mod.)

52-2589

Vibrational motion of arctic pack ice.

Dugan, J.P., Morris, W.D., Williams, Z., Arlington, VA, Areté Associates, Sep. 1997, 7p. + figs., ARE-571-002-TR, 14 refs.

Pack ice, Ice floes, Ice acoustics, Drift, Ice friction, Ice pressure, Ice deformation, Pressure ridges, Ice cracks, Wind factors, Noise (sound), Wave propagation

52-2590

Joint research reports for 1993 on field tests of solar power for public facilities. [Kokyo shisetsu to yo taiyoko hatsuden firudo tesuto jigyo Heisei 5 nendo kyodo kenkyu seika hokokusho], Tokyo, Shin enerugi sangyo gijutsu sogo kaihatsu kiko (New Energy and Industrial Technology Development Organization, NEDO), 1994, n.p., In Japanese.

Electric power, Heat sources, Heating, Solar radiation, Fuels, Cold weather tests, Japan

52-2591

Modeling studies of binding sea raven type II antifreeze protein to ice.

Wierzbicki, A., Madura, J.D., Salmon, C., Sönnichsen, F., *Journal of chemical information and computer sciences,* Nov.-Dec. 1997, 37(6), p.1006-1010, 28 refs.

Antifreezes, Marine biology, Molecular structure, Ice water interface, Surface roughness, Adsorption, Hydrogen bonds, Classifications, Structural analysis, Models, Computerized simulation

52-2592

Experimental studies of vapor-deposited water-ice films using grazing-angle FTIR-reflection absorption spectroscopy.

Zondlo, M.A., et al, *Journal of physical chemistry B,* Dec. 11, 1997, 101(50), p.10887-10895, 35 refs.

Ice physics, Molecular structure, Amorphous ice, Porosity, Ice spectroscopy, Infrared spectroscopy, Absorption, Ice water interface, Temperature effects, Spectra, Diffusion

52-2593

~3710 and ≥3790 Ma volcanic sequences in the Isua (Greenland) supracrustal belt; structural and Nd isotope implications.

Nutman, A.P., Bennett, V.C., Friend, C.R.L., Rosing, M.T., *Chemical geology,* Sep. 25, 1997, 141(3-4), p.271-287, Refs. p.285-287.

Tectonics, Subpolar regions, Earth crust, Stratigraphy, Geochronology, Lithology, Magma, Isotope analysis, Geochemistry, Greenland

52-2594

Three-level model of defect accumulation during ice formation from liquid water.

Shavlov, A.V., *Journal of structural chemistry,* May-June 1997(Pub. Nov. 97), 38(3), p.422-425, Translated from Zhurnal strukturnoĭ khimii. 8 refs.

Ice physics, Ice water interface, Ice formation, Freezing front, Phase transformations, Molecular structure, Defects, Impurities, Thermodynamic properties, Mathematical models

52-2595

Fluctuation of local order and connectivity of water molecules in two phases of supercooled water.

Tanaka, H., *Physical review letters,* Jan. 5, 1998, 80(1), p.113-116, 21 refs.

Water structure, Liquid phases, Molecular structure, Defects, Density (mass/volume), Molecular energy levels, Supercooling, Hydrogen bonds, Thermodynamics, Analysis (mathematics)

52-2596

Modeling the sound field received by a vertical array in an arctic waveguide.

Kudriashov, V.M., *Acoustical physics,* Nov.-Dec. 1997, 43(6), p.706-711, Translated from Akusticheskiĭ zhurnal. 12 refs.

Oceanography, Underwater acoustics, Sound transmission, Wave propagation, Velocity measurement, Scattering, Ice water interface, Ice cover effect, Mathematical models, Detection

52-2597

Dynamic ice surface in the polar stratosphere.

George, S.M., Livingston, F.E., *Surface review and letters,* Aug. 1997, 4(4), p.771-780, 32 refs.

Climatology, Ice physics, Cloud physics, Polar stratospheric clouds, Aerosols, Heterogeneous nucleation, Vapor diffusion, Adsorption, Ice vapor interface, Simulation

Heterogeneous reactions on polar stratospheric clouds are important for an understanding of the production of active chlorine species and antarctic ozone depletion. This review focuses on recent measurements of H_2O adsorption kinetics on ice, H_2O desorption kinetics from ice, H_2O surface diffusion on ice and H_2O diffusion into ice. These measurements reveal that the ice surface is extremely dynamic under polar stratospheric conditions. The dynamic nature of the ice surface may significantly affect the adsorption, solvation, diffusion and reaction of the chlorine reservoir molecules. (Auth. mod.)

52-2598

Binary interactions between polar lows.

Renfrew, I.A., Moore, G.W.K., Clerk, A.A., *Tellus,* Oct. 1997, 49A(5), p.577-594, 31 refs.

Climatology, Polar atmospheres, Marine meteorology, Atmospheric circulation, Atmospheric pressure, Atmospheric disturbances, Turbulent boundary layer, Wind direction, Convection, Models

52-2599

Numerical simulation of the Valentine's day storm during the 1990 winter icing and storms project.

Haines, P.A., Chern, J.D., Sun, W.Y., *Tellus,* Oct. 1997, 49A(5), p.595-612, 35 refs.

Precipitation (meteorology), Cloud physics, Storms, Aircraft icing, Weather forecasting, Ice forecasting, Ice water interface, Ice crystal growth, Fluid dynamics, Supersaturation, Mathematical models, Remote sensing, United States—Colorado—Denver

52-2600

Canada Basin, Arctic Ocean: evidence against a rotational origin.

Lane, L.S., *Tectonics,* June 1997, 16(3), p.363-387, Refs. p.384-387.

Pleistocene, Geological surveys, Marine geology, Tectonics, Earth crust, Theories, Continental drift, Subsidence, Geomagnetism, Correlation, Models, Arctic Ocean

52-2601

Survival, height and health status of 20-year-old *Pinus sylvestris* and *Pinus contorta* after different scarification treatments in a harsh boreal climate.

Hansson, P., Karlman, M., *Scandinavian journal of forest research,* 1997, 12(4), p.340-350, Refs. p.349-350.

Plant ecology, Trees (plants), Revegetation, Growth, Plant tissues, Fungi, Damage, Cold weather survival, Simulation, Snow cover effect

52-2602

Tertiary tectonics of the Sea of Okhotsk, Russia: far-field effects of the India-Eurasia collision.

Worrall, D.M., Krugliak, V., Kunst, F., Kuznetsov, V., *Tectonics,* Aug. 1996, 15(4), p.813-826, Refs. p.825-826.

Pleistocene, Marine geology, Geological surveys, Subpolar regions, Tectonics, Continental drift, Shear stress, Geological maps, Stratigraphy, Okhotsk Sea, Russia—Sakhalin Island

52-2603

Deformation partitioning in a slow spreading ridge undergoing oblique extension: Mohns Ridge, Norwegian Sea.

Dauteuil, O., Brun, J.P., *Tectonics,* Aug. 1996, 15(4), p.870-884, 43 refs.

Pleistocene, Marine geology, Geological surveys, Subpolar regions, Tectonics, Earth crust, Fracture zones, Magnetic anomalies, Deformation, Sounding, Norwegian Sea

52-2604

Leveling survey on East Ongul Island, Antarctica and its implications.

Kaminuma, K., Kimura, I., NIPR Symposium on Antarctic Geosciences, Proceedings. No.10, Tokyo, National Institute of Polar Research, Oct. 1997, p.19-25, 11 refs.

Glacial geology, Marine geology, Tectonics, Isostasy, Tides, Sea level, Beaches, Topographic surveys, Leveling, Height finding, Antarctica—Showa Station, Antarctica—East Ongul Island

52-2605

Stratigraphy of the late Quaternary raised beach deposits in the northern part of Langhovde, Lützow-Holm Bay, East Antarctica.

Maemoku, H., Miura, H., Saigusa, S., Moriwaki, K., NIPR Symposium on Antarctic Geosciences, Proceedings. No.10, Tokyo, National Institute of Polar Research, Oct. 1997, p.178-186, 19 refs.

Ice sheets, Glaciation, Glacial geology, Glacier oscillation, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Beaches, Sea level, Stratigraphy, Fossils, Geochronology, Antarctica—Lützow-Holm Bay

52-2606

Principles for concrete frost resistance. [Principer för betongs frostbeständighet]

Fagerlund, G., *Nordisk betong,* 1981, No.2, p.5-13, In Swedish with English summary. 24 refs.

Concrete freezing, Concrete durability, Frost action, Frost resistance, Water cement ratio

52-2607

Role of excitons and substrate temperature in low-energy (5-50 eV) electron-stimulated dissociation of amorphous D_2O ice.

Orlando, T.M., Kimmel, G.A., *Surface science,* Nov. 18, 1997, 390(1-3), International Workshop on Desorption Induced by Electronic Transitions, 7th, Ambleside, UK, Apr. 8-11, 1997. Proceedings, p.79-85, 29 refs.

Ice physics, Amorphous ice, Deuterium oxide ice, Ice spectroscopy, Ionization, Decomposition, Scattering, Substrates, Molecular energy levels, Temperature effects

52-2608

Electron-stimulated desorption of $D^-(H^-)$ from condensed D_2O (H_2O) films.

Simpson, W.C., Parenteau, L., Smith, R.S., Sanche, L., Orlando, T.M., *Surface science,* Nov. 18, 1997, 390(1-3), International Workshop on Desorption Induced by Electronic Transitions, 7th, Ambleside, UK, Apr. 8-11, 1997. Proceedings, p.86-91, 32 refs.

Ice physics, Deuterium oxide ice, Ice spectroscopy, Water films, Monomolecular films, Ionization, Scattering, Resonance, Hydrogen bonds, Decomposition, Spectra

52-2609

Effect of surface roughness on the electron-stimulated desorption of D^+ from microporous D_2O ice.

Sieger, M.T., Orlando, T.M., *Surface science,* Nov. 18, 1997, 390(1-3), International Workshop on Desorption Induced by Electronic Transitions, 7th, Ambleside, UK, Apr. 8-11, 1997. Proceedings, p.92-96, 21 refs.

Ice physics, Surface structure, Amorphous ice, Deuterium oxide ice, Ice spectroscopy, Porosity, Decomposition, Ionization, Models

52-2610

Study of ion desorption induced by a resonant core-level excitation of condensed H_2O using Auger electron photo-ion coincidence (AEPICO) spectroscopy combined with synchrotron radiation.

Mase, K., et al, *Surface science,* Nov. 18, 1997, 390(1-3), International Workshop on Desorption Induced by Electronic Transitions, 7th, Ambleside, UK, Apr. 8-11, 1997. Proceedings, p.97-101, 29 refs.

Ice physics, Ice spectroscopy, Amorphous ice, Ionization, Decomposition, Molecular energy levels, Resonance, Spectra, Photochemical reactions

52-2611

Bed design for a building constructed with local freezing of soils.

Maksimenko, E.S., *Soil mechanics and foundation engineering,* Jan.-Feb. 1997(Pub. July 97), 34(1), p.28-33, Translated from Osnovaniia, fundamenty i mekhanika gruntov. 12 refs.

Permafrost beneath structures, Permafrost bases, Cold weather construction, Frost heave, Foundations, Soil freezing, Soil stabilization, Artificial freezing, Design criteria, Standards, Analysis (mathematics)

52-2612

Concept of gelic materials in the new gelisol order for permafrost-affected soils.

Bockheim, J.G., Tarnocai, C., Kimble, J.M., Smith, C.A.S., *Soil science,* Dec. 1997, 162(12), p.927-939, 31 refs.

Geocryology, Permafrost physics, Permafrost structure, Frozen ground mechanics, Active layer, Soil classification, Mechanical properties, Cryoturbation, Periglacial processes

52-2613

Snowmelt modeling at small Alaskan arctic watershed.

Kane, D.L., Gieck, R.E., Hinzman, L.D., *Journal of hydrologic engineering,* Oct. 1997, 2(4), p.204-210, 24 refs.

Snow hydrology, Snowmelt, Seasonal ablation, Runoff forecasting, Watersheds, Surface energy, Heat transfer, Radiation balance, Degree days, Snow water equivalent, Mathematical models, United States—Alaska

52-2614

Measurement of flow under ice covers in North America.

Walker, J.F., Wang, D.P., *Journal of hydraulic engineering,* Nov. 1997, 123(11), p.1037-1040, 13 refs.

Stream flow, River ice, Flow measurement, Velocity measurement, Ice water interface, Hydrography, Profiles, Statistical analysis, Accuracy, United States

52-2615

Wheat *wcs120* gene family. A useful model to understand the molecular genetics of freezing tolerance in cereals.

Sarhan, F., Ouellet, F., Vazques-Tello, A., *Physiologia plantarum,* Oct. 1997, 101(2), p.439-445, 49 refs.

Plant physiology, Grasses, Frost resistance, Cold tolerance, Acclimatization, Plant tissues, Chemical composition, Molecular structure, Chemical analysis, Classifications, Models

52-2616

Density current intrusions in an ice-covered urban lake.

Ellis, C.R., Champlin, J., Stefan, H.G., *American Water Resources Association. Journal,* Dec. 1997, 33(6), p.1363-1374, 8 refs.

Limnology, Hydrogeochemistry, Icebound lakes, Snow hydrology, Snowmelt, Runoff, Ice cover effect, Isotherms, Water temperature, Density (mass/volume), Salinity, Stratification, Sampling

52-2617

Precipitation and snow budget over the southwestern United States during the 1994-1995 winter season in a mesoscale model simulation.

Kim, J.W., *Water resources research,* Dec. 1997, 33(12), p.2831-2839, 34 refs.

Climatology, Precipitation (meteorology), Snow accumulation, Seasonal variations, Atmospheric circulation, Moisture transfer, Snowmelt, Runoff, Snow cover effect, Simulation, Statistical analysis, Correlation, United States

52-2618

Numerical sensitivity study of rainband precipitation and evolution.

Takahashi, T., Kawano, T., *Journal of the atmospheric sciences,* Jan. 1, 1998, 55(1), p.57-87, 46 refs.

Clouds (meteorology), Precipitation (meteorology), Cloud physics, Rain, Supercooled clouds, Ice nuclei, Ice water interface, Ice crystal growth, Hail, Snow pellets, Latent heat, Convection, Mathematical models

52-2619

Hybrid quantum and classical mechanical Monte Carlo simulations of the interaction of hydrogen chloride with solid water clusters.

Estrin, D.A., Kohanoff, J., Laria, D.H., Weht, R.O., *Chemical physics letters,* Dec. 5, 1997, 280(3-4), p.280-286, 28 refs.

Climatology, Cloud physics, Stratosphere, Heterogeneous nucleation, Ice vapor interface, Aerosols, Adsorption, Solubility, Degradation, Molecular structure, Molecular energy levels, Hydrogen bonds, Simulation, Models

52-2620

Zoological erosion in permafrost environments: a possible origin of dells?

Hall, K., *Polar geography,* Jan.-Mar. 1997, 21(1), p.1-9, 16 refs.

Geomorphology, Valleys, Permafrost transformation, Soil erosion, Vegetation factors, Animals, Ice wedges, Patterned ground, Environmental impact, Canada—Northwest Territories—Ellesmere Island

52-2621

Analysis of climatic cycles from deep-hole data from Vostok Station, Antarctica.

Kotliakov, V.M., Lorius, C., *Polar geography,* Jan.-Mar. 1997, 21(1), p.34-50, Refs. p.48-50.

Paleoclimatology, Climatic changes, Surface temperature, Ice sheets, Ice cores, Lake ice, Boreholes, Aerosols, Oxygen isotopes, Isotope analysis, Statistical analysis, Antarctica—Vostok Station

The results of processing of an antarctic ice core to a depth of 2,755 m, which encompasses the last two climatic cycles, are examined. Data on deuterium content in the ice are analyzed, as are paleotemperature, content of continental dust in the ice, and change in the isotopic composition of atmospheric oxygen extracted from the ice core. The problems involved in completing hole drilling are discussed and in this connection the characteristics of a large under-ice lake in the vicinity of the Vostok Station are described. (Auth. mod.)

52-2622
Arguments for and against a Pleistocene tundra-steppe.
Kozhevnikov, IU.P., Ukraintseva, V.V., *Polar geography,* Jan.-Mar. 1997, 21(1), p.51-69, Refs. p.65-69.
Pleistocene, Paleoecology, Geography, Subarctic landscapes, Tundra terrain, Tundra vegetation, Plains, Vegetation patterns, Classifications, Terminology, Theories, Eurasia

52-2623
Impact of global warming on climatic severity in northern and eastern Russia during the 1980s.
Vinogradova, V.V., *Polar geography,* Jan.-Mar. 1997, 21(1), p.70-77, 7 refs.
Climatology, Climatic changes, Global warming, Air temperature, Temperature variations, Indexes (ratios), Distribution, Statistical analysis, Russia

52-2624
Genesis of 'hummocky moraines' by thrusting glacier ice: evidence from Svalbard and Britain.
Hambrey, M.J., Huddart, D., Bennett, M.R., Glasser, N.F., *Journal of the Geological Society, London,* 1997, Vol.154, p.623-632, 62 refs.
Hummocks, Moraines, Glacier ice, Geomorphology, Norway—Svalbard, United Kingdom

52-2625
Russian outpost readies for otherworldly quest.
Stone, R., *Science,* Jan. 30, 1998, 279(5351), p.658-661.
Ice sheets, Glacial geology, Limnology, Antarctica—Vostok Station
In this examination of the history of Vostok, Russia's principal antarctic station, the main concern which emerges is the preservation of a recently discovered lake beneath the surface at a depth slightly below 3700 m. This is Lake Vostok. It covers a surface area of 1,400 km^2, approximately the size of Lake Ontario. It is presumed to be uncontaminated by civilization and its guardians are determined to keep it that way before, during, and following the scientific effort to bring the lake to life.

52-2626
Changes in the west antarctic ice sheet since 1963 from declassified satellite photography.
Bindschadler, R., Vornberger, P., *Science,* Jan. 30, 1998, 279(5351), p.689-692, 18 refs.
Ice sheets, Ablation, Spaceborne photography, Antarctica—West Antarctica, Antarctica—Transantarctic Mountains
Comparison of declassified satellite photography taken in 1963 with more recent satellite imagery reveals that large changes have occurred in the region where an active ice stream enters the Ross Ice Shelf. Ice stream B has widened by 4 km, at a rate much faster than suggested by models, and has decreased in speed by 50%. The ice ridge between ice streams B and C has eroded 14 km. These changes, along with changes in the crevassing around Crary Ice Rise, imply that this region's velocity field shifted during this century.

52-2627
Penny Ice Cap cores, Baffin Island, Canada, and the Wisconsinan Foxe Dome connection: two states of Hudson Bay ice cover.
Fisher, D.A., et al, *Science,* Jan. 30, 1998, 279(5351), p.692-695, 32 refs.
Ice sheets, Ice cores, Ice cover, Pingos, Canada—Northwest Territories—Baffin Island, Canada—Northwest Territories—Penny Ice Cap, Canada—Northwest Territories—Foxe Dome, Canada—Hudson Bay

52-2628
Effect of UVB radiation on utilization of inorganic nitrogen by antarctic microalgae.
Döhler, G., *Photochemistry and photobiology,* Dec. 1997, 66(6), p.831-836, 24 refs.
Marine biology, Microbiology, Algae, Plant physiology, Sea ice, Ultraviolet radiation, Acclimatization, Plankton, Antarctica—Weddell Sea
The impact of UVB radiation on uptake of ^{15}N-ammonium and ^{15}N-nitrate of marine phytoplankton and sea ice-algae was studied during the Polarstern Cruise to the Weddell Sea in 1989. Uptake rates of $^{15}NH_4+$ were higher and more affected by UVB radiation than those of $^{15}NO_3$-. Pool sizes of the main amino acids changed in response to the used inorganic nitrogen source and UV exposure. Pools of glutamine, serine and glycine decreased, whereas those of alanine, asparagine and glutamate increased after UVB irradiation. The ^{15}N-incorporation into the amino acids was reduced as a result of UVB exposure of phytoplankton and ice algae. Results are discussed with reference to an inhibitory effect on the enzymes of both carbon and nitrogen metabolism as well as to adaptation strategies. (Auth.)

52-2629
Wiley Glacier complex, Antarctic Peninsula: pluton growth by pulsing of granitoid magmas.
Wareham, C.D., Vaughan, A.P.M., Millar, I.L., *Chemical geology,* Nov. 17, 1997, 143(1-2), p.65-80, Refs. p.79-80.
Glacial geology, Geochemistry, Geochronology, Antarctica—Antarctic Peninsula
Early Cretaceous gabbro, quartz-diorite-granodiorite, and tonalite-granodiorite plutons of the Willey Glacier complex, in the Antarctic Peninsula magmatic arc, were emplaced in a zone of syn-magmatic extensional shearing. The oldest component pluton is the Creswick Gap quartz-diorite-granodiorite pluton and this is cut by slightly younger hornblende gabbro of the Moore Point pluton. These plutons form the wall rock to the Burns Bluff tonalite-granodiorite pluton, the youngest component of the complex. The Burns Bluff pluton comprises tonalite-granodiorite sheets which, at the plutons margins, are interleaved with screens of mylonite wall rock. The chemical and isotopic compositions of the Burns Bluff plutons constituent tonalite sheets and its dyke-like internal structure suggest that it grew incrementally via the addition of melt batches from a variety of crustal and mantle sources. (Auth. mod.)

52-2630
'EMAC-95' data acquisition and preliminary results.
Mason, P., Wooding, M., Attema, E., *Earth observation quarterly,* Sep. 1996, No.53, p.10-13.
Geophysical surveys, Remote sensing, Spaceborne photography, Research projects, Radiometry, Snow surveys, Glacier surveys, Snow water equivalent, Glacier surfaces, Wet snow, Sweden, Finland, Norway

52-2631
Snow monitoring using EMISAR and ERS-1 data.
Guneriussen, T., Johnsen, H., *Earth observation quarterly,* Sep. 1996, No.53, p.13-16, 9 refs.
Remote sensing, Spaceborne photography, Snow surveys, Glacier surveys, Synthetic aperture radar, Snow cover distribution, Snow water equivalent, Classifications, Backscattering, Profiles, Finland, Norway

52-2632
Use of SAR data to study active volcanoes in Alaska.
Dean, K.G., Engle, K., Lu, Z., Eichelberger, J., Neal, T., Doukas, M., *Earth observation quarterly,* Sep. 1996, No.53, p.21-23, 3 refs.
Volcanoes, Explosion effects, Geological surveys, Spaceborne photography, Synthetic aperture radar, Landforms, Glacier ice, Glacier melting, Ice detection, United States—Alaska

52-2633
Studies of migrating birds in Greenland supported by ERS-1 SAR data.
Mosbech, A., Boertmann, D., Thomsen, B.B., Gudmandsen, P., *Earth observation quarterly,* Sep. 1996, No.53, p.25-27.
Ecology, Biomass, Migration, Aerial surveys, Spaceborne photography, Synthetic aperture radar, Oceanographic surveys, Ice surveys, Ice conditions, Sea ice distribution, Greenland

52-2634
Alaska SAR facility: radar data from the extreme north-west of the Americas. *Earth observation quarterly,* Sep. 1996, No.53(suppl), 3p.
Research projects, Organizations, Spaceborne photography, Synthetic aperture radar, Subpolar regions, Sea ice distribution, Ice surveys, Telecommunication, Data processing, United States—Alaska

52-2635
Digital terrain modelling of the surface and bed topography of the glacier Austre Okstindbreen, Okstindan, Norway.
Theakstone, W.H., Jacobsen, F.M., *Geografiska annaler,* 1997, 79A(4), p.201-214, 44 refs.
Glaciology, Glacier surveys, Photogrammetric surveys, Radio echo soundings, Glacier oscillation, Glacier mass balance, Glacier surfaces, Glacier beds, Topographic features, Profiles, Models, Climatic changes, Norway—Okstindan

52-2636
Elevation, age, soil development, and chemical weathering at Storbreen, Jotunheimen, Norway.
Darmody, R.G., Thorn, C.E., *Geografiska annaler,* 1997, 79A(4), p.215-222, 17 refs.
Glacial geology, Moraines, Periglacial processes, Quaternary deposits, Sampling, Soil dating, Soil chemistry, Organic soils, Soil formation, Weathering, Altitude, Norway—Storbreen

52-2637
Erosion of bedrock by subglacial meltwater, Soya Coast, East Antarctica.
Sawagaki, T., Hirakawa, K., *Geografiska annaler,* 1997, 79A(4), p.223-238, 52 refs.
Glacial geology, Bedrock, Landforms, Geomorphology, Glacial erosion, Meltwater, Water erosion, Subglacial drainage, Topographic features, Classifications, Landscape development, Antarctica—Lützow-Holm Bay
The formation of the glacial erosional bedforms at the Soya Coast of Lützow-Holm Bay, East Antarctica is discussed. The streamlined bedforms in the studied area are classified into crescentic transverse ridges and tadpole rocks, and these bedforms are accompanied by small erosional marks (s-forms) which support the interpretation of subglacial meltwater erosion. Observations and interpretations of these bedforms are used to reconstruct the historical development of the glacial erosional bedforms, and to draw attention to the significance and implications of subglacial meltwater erosion on the marginal area of the antarctic ice sheet in the past. (Auth. mod.)

52-2638
Morphological and morphometric analyses of drumlin bedforms in the Omagh Basin, north central Ireland.
Knight, J., *Geografiska annaler,* 1997, 79A(4), p.255-266, 26 refs.
Pleistocene, Glacial geology, Glacial deposits, Glacial erosion, Subglacial observations, Bedrock, Landforms, Classifications, Distribution, Geomorphology, Statistical analysis, Ireland

52-2639
Contemporary and post-glacial rates of aeolian deposition in the Coast Mountains of British Columbia, Canada.
Owens, P.N., Slaymaker, O., *Geografiska annaler,* 1997, 79A(4), p.267-276, 45 refs.
Alpine landscapes, Tundra terrain, Tundra vegetation, Sedimentation, Sediment transport, Eolian soils, Fallout, Quaternary deposits, Sampling, Lithology, Particle size distribution, Periodic variations, Canada—British Columbia—Coast Mountains

52-2640
Molecular beam studies of kinetic processes in nanoscale water films.
Smith, R.S., Kay, B.D., *Surface review and letters,* Aug. 1997, 4(4), p.781-797, 91 refs.
Ice physics, Amorphous ice, Ice microstructure, Water films, Molecular energy levels, Ice solid interface, Ice spectroscopy, Condensation, Adhesion, Ice sublimation, Diffusion, Spectra

52-2641
Effect of soil freezing on the survival of winter-sown white lupins (*Lupinus albus* L.).
Leach, J.E., Stevenson, H.J., Scott, T., Milford, G.F.J., *Annals of applied biology,* June 1997, 130(3), p.561-567, 6 refs.
Plant physiology, Cold tolerance, Cold weather survival, Roots, Soil freezing, Low temperature tests, Damage, Growth, Temperature effects, Frost forecasting

52-2642
Age-related growth and reproduction in *Diapensia lapponica*, an arctic-alpine cushion plant.
Molau, U., *Nordic journal of botany,* 1997, 17(3), p.225-234, 31 refs.
Alpine landscapes, Plants (botany), Plant ecology, Tundra vegetation, Growth, Age determination, Cold weather survival, Cold weather tests, Statistical analysis, Seasonal variations, Sweden—Lapland

52-2643

Axial capacity of offshore piles in dense North Sea sands.

Jardine, R.J., Overy, R.F., Chow, F.C., *Journal of geotechnical and geoenvironmental engineering,* Feb. 1998, 124(2), p.171-178, 30 refs.

Offshore structures, Pile structures, Foundations, Soil mechanics, Grain size, Bearing strength, Pile driving, Pile load tests, Design criteria, Tensile properties, Statistical analysis, North Sea

52-2644

Fourth Avenue landslide during 1964 Alaskan earthquake.

Stark, T.D., Contreras, I.A., *Journal of geotechnical and geoenvironmental engineering,* Feb. 1998, 124(2), p.99-109, 39 refs.

Mass movements (geology), Landslides, Earthquakes, Clay soils, Soil strength, Soil mechanics, Slope processes, Stability, Shear strength, Water pressure, Mechanical tests, Statistical analysis, United States—Alaska—Anchorage

52-2645

Effects of sedimentation, tectonics, and glacio-eustasy on depositional sequences, Pennsylvanian Minturn Formation, north-central Colorado.

Houck, K.J., *AAPG bulletin,* Sep. 1997, 81(9), p.1510-1533, Refs. p.1531-1533.

Pleistocene, Geological surveys, Quaternary deposits, Sedimentation, Tectonics, Sea level, Stratigraphy, Stratification, Subsidence, Deltas, Correlation, Hydrocarbons, Reservoirs, United States—Colorado

52-2646

Spray-freezing freeze substitution (SFFS) of cell suspensions for improved preservation of ultrastructure.

Fields, S.D., Strout, G.W., Russell, S.D., *Microscopy research and technique,* Aug. 1, 1997, 38(3), p.315-328, Refs. p.327-328.

Cryogenics, Microbiology, Spray freezing, Laboratory techniques, Preserving, Scanning electron microscopy, Microscope slides, Solutions

52-2647

Forcings and chaos in interannual to decadal climate change.

Hansen, J., et al, *Journal of geophysical research,* Nov. 27, 1997, 102(D22), p.25,679-25,720, Refs. p.25,718-25,720.

Climatology, Atmospheric physics, Climatic changes, Global change, Oscillations, Periodic variations, Surface temperature, Temperature variations, Sea ice, Albedo, Ice cover effect, Models, Forecasting

52-2648

Modified Lagrangian-mean diagnostics of the stratospheric polar vortices. 2. Nitrous oxide and seasonal barrier migration in the cryogenic limb array etalon spectrometer and SKYHI general circulation model.

Nakamura, N., Ma, J., *Journal of geophysical research,* Nov. 27, 1997, 102(D22), p.25,721-25,735, 45 refs.

Climatology, Atmospheric circulation, Atmospheric composition, Aerosols, Migration, Permeability, Stratosphere, Fluid dynamics, Turbulent diffusion, Spectroscopy, Statistical analysis, Seasonal variations

The Lagrangian-mean transport and mixing properties associated with the life cycle of the stratospheric polar vortices are analyzed using nitrous oxide as a tracer, both observed by the cryogenic limb array etalon spectrometer (CLAES) and simulated by the Geophysical Fluid Dynamics Laboratory SKYHI general model. Both CLAES and SKYHI identify two major barriers to horizontal mixing in both hemispheres: a perennial subtropical barrier and an annual polar barrier. The barriers are in general collocated with a tracer edge, but larger gradients do not necessarily translate to a greater barrier. For example, at the arctic vortex edge, where the tracer gradients are greater than at the antarctic vortex edge, the barrier is actually weaker. (Auth. mod.)

52-2649

Characteristics of stratospheric winds and temperatures produced by data assimilation.

Coy, L., Swinbank, R., *Journal of geophysical research,* Nov. 27, 1997, 102(D22), p.25,763-25,781, 38 refs.

Climatology, Wind (meteorology), Atmospheric circulation, Polar atmospheres, Stratosphere, Air temperature, Gravity waves, Wind velocity, Turbulent diffusion, Meteorological data, Models

52-2650

Elevational changes in meteorological variables along a midlatitude glacier during summer.

Greuell, W., Knap, W.H., Smeets, P.C., *Journal of geophysical research,* Nov. 27, 1997, 102(D22), p.25,941-25,954, 24 refs.

Glacial meteorology, Turbulent boundary layer, Glacier mass balance, Altitude, Ice air interface, Wind velocity, Wind direction, Humidity, Surface energy, Radiation balance, Albedo, Thermodynamics, Austria—Pasterze Glacier

52-2651

Arctic boundary layer in the fall season over open and frozen sea.

Paluch, I.R., Lenschow, D.H., Wang, Q., *Journal of geophysical research,* Nov. 27, 1997, 102(D22), p.25,955-25,971, 31 refs.

Climatology, Atmospheric boundary layer, Polar atmospheres, Oceanographic surveys, Sounding, Sea ice, Ice edge, Ice openings, Air temperature, Stratification, Turbulent exchange, Ice air interface, Spectra, Arctic Ocean

52-2652

Timing of abrupt climate change at the end of the Younger Dryas interval from thermally fractionated gases in polar ice.

Severinghaus, J.P., Sowers, T., Brook, E.J., Alley, R.B., Bender, M.L., *Nature,* Jan. 8, 1998, 391(6663), p.141-146, 47 refs.

Ice cores, Ice composition, Ice dating, Bubbles, Gas inclusions, Isotope analysis, Paleoclimatology, Global warming, Greenland

52-2653

Assessment of climate change impact on snow cover, glacier and permafrost in China. [Qihou bianhua dui Zhongguo jixue, bingchuan he dongtu de yingxiang pinggu]

Cheng, G.D., ed, Lanzhou, Gansu wenhua chubanshe (Gansu Culture Press), 1997, 108p., In Chinese. Refs. p.102-108.

Snow cover distribution, Snow depth, Snowfall, Snow line, Snow hydrology, Glacial meteorology, Glacier oscillation, Glacier mass balance, Glacial hydrology, Permafrost distribution, Permafrost depth, Permafrost heat balance, Permafrost hydrology, Global warming, China

52-2654

Proceedings. Creativity, lighting the poles: collaborative solutions to common problems.

Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996, Braund-Allen, J., ed, Innes-Taylor, C., ed, Anchorage, University of Alaska, 1997, 146p. + append., Refs. passim. For selected papers see 52-2655 through 52-2672 or A-58626 through A-58632. The appendix consists of partial proceedings of the 6th Northern Libraries Colloquy, Fairbanks, AK, July 12-15, 1976.

Organizations, Research projects, Bibliographies, Data processing, International cooperation

Most of the papers in this conference deal with databases for arctic research only, but seven of the papers are explicitly pertinent to the Antarctic or to both polar regions. Those papers deal with journal coverage in the *Cold Regions Bibliography*; decline in the number of Russian-language publications; history of the American Polar Society; history of the German Society of Polar Research; the Italian Antarctic Project; Australian research in Antarctica; and the Antarctica Retrospective of the Scott Polar Research Institute.

52-2655

FYI: information projects at Canada's Department of Indian Affairs and Northern Development.

Finn, J., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.9-12, 2 refs.

Organizations, Research projects, Regional planning, Bibliographies, Data processing, Canada

52-2656

Arctic Science and Technology Information System: creative funding of a northern information service in the 1990s.

Goodwin, R., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.13-18, 5 refs.

Organizations, Research projects, Bibliographies, Data processing, Cost analysis, Canada

52-2657

Journal coverage in the *Cold Regions Bibliography.*

Hibben, S.G., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.19-22.

Organizations, Research projects, Data processing, Bibliographies

Regular serial journals are the largest single source of publications in the *Cold Regions Bibliography* which consists of Antarctic and CRREL (Cold Regions Research and Engineering Laboratory) items. This article reviews the methodology used for exploiting journals, evaluates its success, and indicates some of the problems in the process. Ways of improving journal coverage are suggested, including better acquisition of foreign journals. (Auth. mod.)

52-2658

Bringing the Russian Far East online: the challenges of *PolarPac4.*

Lehman, L.M., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.23-26, 9 refs.

Organizations, Research projects, Bibliographies, Data processing, International cooperation, Russia

52-2659

Gray literature database on Russian research in the Arctic.

Markusova, V.A., Vlasova, I.G., Tsvetkova, L.A., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.27-30, 2 refs.

Organizations, Research projects, Bibliographies, Data processing, Russia

52-2660

Is publishing perishing? Reflections on publishing in polar science.

Andrews, M., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.33-36, 3 refs.

Bibliographies, Data processing, Research projects

While searching the CD-ROM *Arctic & Antarctic Regions* (NISC 1996) for another purpose, the author observed a decline in numbers of publications per year beginning in 1985. Various types of data collected from this CD are analyzed, with a view to determining the reasons for this decline in the number of publications per year (as distinct from the number of records indexed by the database producers per year). While no definitive conclusion can be reached without further research, it appears, on the basis of the numbers analyzed, that this decrease is caused by a large decline in the number of records indexed by one of the databases, by a significant decline in the number of Russian-language entries, by some decline in publications about Canada, and by what is possibly a very large decline in indexing of publications about oil and gas pipelines and related topics. (Auth.)

52-2661

Alaska Natural Resources Library Group: adapt, migrate, or die.

Braund-Allen, J., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.37-39.

Organizations, Education, Regional planning, Data processing, United States—Alaska

52-2662

American Polar Society: past, present, and future.

Goerler, R.E., Lay, L., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.40-45, 10 refs.

Organizations, Research projects, Expeditions, History, Education, Data processing, Antarctica

Founded in 1935, the American Polar Society (APS) developed from popular interest in the events of exploration and discovery in the Polar Regions. During its more than 6 decades, the Society has served as a clearinghouse of information through its *Polar Times*, which was for many years the only central source of information to guide polar scientists and explorers. At the same time, the Society has benefited from and stimulated popular interest in the Polar Regions. It has engaged its membership and readership in the work of sharing information about the polar environment and polar accomplishments. This presentation includes the Society's social and historical context, the origins of APS, and APS in recent years. (Auth. mod.)

52-2663

Organizational creativity: historical/cultural publications of selected northern municipalities, native organizations, and institutions.

Inouye, R.K., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.46-51.

Organizations, Regional planning, Bibliographies, Data processing, United States—Alaska

52-2664

History of Polar Research Specialist Group of the German Society of Polar Research.

Lüdecke, C., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.52-58.

Organizations, Research projects, Expeditions, History, International cooperation, Bibliographies

The program of the History of Polar Research Specialist Group of the German Society of Polar Research is described. Special emphasis is made to present German polar research in an international context. Several examples are given of German promoters of polar research and international cooperation before and after the turn of the century. A chronological survey of polar expeditions and a detailed description of the international society Aeroarctic are also given. With this contribution the Society hopes to foster future international and interdisciplinary work. (Auth.)

52-2665

Needs of Russian polar scientists and possibilities of organising mutually beneficial exchanges.

Warren, I.M.T., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.62-66.

Organizations, Research projects, International cooperation, Bibliographies, Data processing, Cost analysis, Russia

52-2666

Interdisciplinary? Multiple authorship? Collaboratory? What are the current trends in research at universities.

Young, M., Ryan, P., Minion, R., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.67-74, 4 refs.

Education, Research projects, Organizations, Data processing, Canada

52-2667

Italian Antarctic Project: policy for antarctic information dissemination.

Bacigalupi, L., Pignocchi, A., Alesi, D., Morani, E., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.75-78, 4 refs.

Organizations, Research projects, Legislation, Bibliographies, Data processing, Cost analysis

Descriptions are given of the Programma Nazionale di Ricerche in Antartide (Italian National Antarctic Research Program) and of the Italian Antarctic Project's policy for information dissemination and its library. Available polar bibliographic resources and the role of polar libraries in information sharing and acquisition are discussed. (Auth.)

52-2668

Australia in Antarctica: information initiatives.

Davies, L.M., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.91.

Organizations, Research projects, Bibliographies, Data processing

The author provides the World Wide Web (WWW) addresses of four databases on Australian antarctic research: Database of International Marine Treaties (http://www.antcrc.utas.edu.au/antcrc.html); Directory of Expertise: Antarctica and the Southern Ocean (http://www.antcrc.utas.edu.au/iasos.html); Australian National Antarctic Data Centre (http://www.antdiv.gov.au/); and Australian Collection of Antarctic Microorganisms, ACAM (http://www.antcrc.utas.edu.au/antcrc.html).

52-2669

Elements of the *Nature Conservation Thesaurus*.

Dobrynina, N.G., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.92-94.

Ecology, Environmental protection, Dictionaries, Terminology, Russia

52-2670

International Permafrost Association contributions to the Polar Libraries Colloquy.

Heginbottom, J.A., Van Everdingen, R., Kreig, R., Leibman, M., Brown, J., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.99-100, Includes recommended formats for citing IPA publications.

Permafrost, Frozen ground, Organizations, Research projects, International cooperation, Meetings, Bibliographies, Data processing

52-2671

Creating reference works from the Cambridge Arctic Shelf Programme's information resources.

Lesk, E.L., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.106-107, 5 refs.

Organizations, Research projects, Bibliographies, Data processing

52-2672

Antarctica Retrospective—a comprehensive resource for the history of Antarctica and the southern ocean.

Mills, W.J., Polar Libraries Colloquy, 16th, Anchorage, AK, June 17-22, 1996. Proceedings. Edited by J. Braund-Allen and C. Innes-Taylor, Anchorage, University of Alaska, 1997, p.114-116, 5 refs.

Organizations, Bibliographies, Data processing, History, Expeditions, Antarctica

This paper describes the initial stages of a project designed to develop a comprehensive finding aid to Internet and other resources available for the study of Antarctica's history. Antarctica Retrospective grows out of the earlier Historic Antarctic Bibliography Project funded by the British Antarctic Survey and carried out by the library of the Scott Polar Research Institute. While the objective of the latter project was to compile a comprehensive bibliography to 1961 of literature relating to Antarctica and the southern ocean south of the Antarctic Convergence, the aim of Antarctica Retrospective is to provide access not just to publications, but to the entire range of relevant resources: archives, museum artefacts, inventories of historic sites, directories of relevant organizations, and biographical and expedition information. (Auth.)

52-2673

Relationships between a terrain-based hydrologic model and patch-scale vegetation patterns in an arctic tundra landscape.

Ostendorf, B., Reynolds, J.F., *Landscape ecology*, 1993, 8(4), p.229-237, 36 refs.

Tundra terrain, Tundra vegetation, Plant ecology, Vegetation patterns, Watersheds, Wetlands, Permafrost hydrology, Drainage, Topographic effects, Computerized simulation, United States—Alaska—Philip Smith Mountains

52-2674

Outdoor scale modeling of shrub barriers in drifting snow.

Peterson, T.C., Schmidt, R.A., *Agricultural and forest meteorology*, 1984, 31(2), p.167-181, 32 refs.

Blowing snow, Snowdrifts, Snow hedges, Protective vegetation, Windbreaks, Environmental tests

52-2675

Determination of anti-icing additives in jet fuels.

Bernabei, M., Spila, E., Sechi, G., *Analytical letters*, 1997, 30(11), p.2085-2097, 12 refs.

Aircraft icing, Jet engines, Fuels, Chemical ice prevention, Antifreezes, Chemical analysis

52-2676

Characteristics of permafrost soils along a latitudinal transect in arctic Alaska.

Ping, C.L., *Agroborealis*, Spring 1997, 29(1), p.35-36.

Permafrost surveys, Soil surveys, Tundra soils, Cryogenic soils, United States—Alaska—North Slope

52-2677

On the unstable stratification associated with cloud top entrainment instability over the East China Sea during cold-air outbreak situations.

Kato, K., Koshida, T., Takeda, T., *Meteorological Society of Japan. Journal*, Oct. 1996, 74(5), p.655-671, With Japanese summary. 51 refs.

Marine meteorology, Marine atmospheres, Atmospheric circulation, Clouds (meteorology), Cloud cover, Cloud physics, Air masses, Fronts (meteorology), Synoptic meteorology, East China Sea

52-2678

Structures of cold air during the development of a broad band cloud and a meso-B-scale vortex: simultaneous two-point radiosonde observations.

Fujiyoshi, Y., Kodama, Y., Tsuboki, K., Nishimura, K., Ono, N., *Meteorological Society of Japan. Journal*, June 1996, 74(3), p.281-297, With Japanese summary. 34 refs.

Marine meteorology, Marine atmospheres, Atmospheric circulation, Cloud cover, Clouds (meteorology), Cloud physics, Air masses, Air temperature, Atmospheric disturbances, Okhotsk Sea, Japan—Hokkaido

52-2679

Vegetational pattern near alpine timberline as affected by fire-snowdrift interactions.

Billings, W.D., *Vegetatio*, 1969, 19(1-6), p.192-207, With German summary. 11 refs.

Snowdrifts, Snow cover effect, Forest fires, Forest land, Forest tundra, Forest lines, Plant ecology, Vegetation patterns, Revegetation, United States—Wyoming—Medicine Bow Mountains

52-2680

Snow and meltwater effects in an area of Colorado alpine.

Holway, J.G., Ward, R.T., *American midland naturalist*, 1963, 69(1), p.189-197, 6 refs.

Snow cover effect, Snowmelt, Alpine tundra, Tundra vegetation, Plant ecology, Vegetation patterns, Phenology, United States—Colorado—Rocky Mountain National Park

52-2681
Effects of climatic change on lake ice and water temperature.
Huttula, T., Peltonen, A., Bilaletdin, Ä., Saura, M., *Aqua Fennica,* 1993, 22(2), p.129-142, With Finnish summary. 19 refs.
Lake ice, Ice conditions, Ice heat flux, Ice cover effect, Ice water interface, Lake water, Water temperature, Global warming, Mathematical models, Computerized simulation, Finland

52-2682
Distribution of high mountain vegetation in relation to snow cover: Peñalara, Spain.
Palacios, D., Sánchez-Colomer, M.G., *Catena,* 1997, 30(1), p.1-40, 48 refs.
Snow accumulation, Snow cover distribution, Snow cover effect, Snow erosion, Nivation, Alpine glaciation, Moraines, Geomorphology, Biogeography, Plant ecology, Forest lines, Vegetation patterns, Spain

52-2683
Frost and deicing resistance of high strength concrete. [Frost-Tausalz-Beständigkeit von Hochleistungsbeton]
Nischer, P., *Zement und Beton,* 1996, No.4, p.18-19, In German. 7 refs.
Concrete durability, Concrete admixtures, Concrete pavements, Frost resistance, Salting, Mechanical properties, Cold weather performance

52-2684
Development of conductive polyester concrete for bridge-deck cathodic protection and ice control.
Maggenti, R.G., Carter, R.R., Meline, R., *Transportation research record,* Sep. 1997, No.1597, p.61-69, 8 refs.
Road maintenance, Bridges, Ice control, Concrete admixtures, Reinforced concretes, Steels, Polymers, Electrical resistivity, Electric heating, Protection, Tests

52-2685
Polypeptide interactions at ice and biomineral interfaces are defined by secondary structure-dependent chain orientations.
Reeves, N.J., Evans, J.S., *Journal of physical chemistry B,* Aug. 21, 1997, 101(34), p.6665-6669, 25 refs.
Polymers, Ice physics, Adsorption, Ice solid interface, Molecular structure, Orientation, Latticed structures, Models, Theories, Topographic effects

52-2686
Application of a watershed runoff model to Northeast Pond River, Newfoundland: to study water balance and hydrological characteristics owing to atmospheric change.
Bobba, A.G., Singh, V.P., Jeffries, D.S., Bengtsson, L., *Hydrological processes,* Oct. 15, 1997, 11(12), p.1573-1593, 28 refs.
Climatic changes, Global change, Watersheds, River basins, Surface drainage, Hydrography, Runoff forecasting, Water balance, Snow hydrology, Snowmelt, Snow accumulation, Models, Simulation, Canada—Newfoundland—Northeast Pond River

52-2687
Response characteristics of DOC flushing in an alpine catchment.
Boyer, E.W., Hornberger, G.M., Bencala, K.E., McKnight, D.M., *Hydrological processes,* Oct. 15, 1997, 11(12), p.1635-1647, 18 refs.
Watersheds, Alpine landscapes, Snow hydrology, Snowmelt, Runoff, Ground water, Diffusion, Stream flow, Geochemical cycles, Organic nuclei, Solubility, Hydrogeochemistry, United States—Colorado—Deer Creek

52-2688
Freezing process in methanol-, ethanol-, and propanol-water systems as revealed by differential scanning calorimetry.
Takaizumi, K., Wakabayashi, T., *Journal of solution chemistry,* Oct. 1997, 26(10), p.927-939, 25 refs.
Solutions, Hydrocarbons, Ice water interface, Supercooling, Phase transformations, Freezing, Hydrates, Melting points, Solid phases, Chemical composition, Temperature measurement, Stability, Thermodynamic properties

52-2689
Ice tank tests on compaction of a floating layer of circular ice floes.
Hansen, E.H., Tuhkuri, J., *Helsinki University of Technology. Ship Laboratory. Report,* 1997, M-221, 33p., 16 refs.
Sea ice, Ice mechanics, Ice floes, Ice pileup, Ice rafting, Ice deformation, Compaction, Ice solid interface, Ice loads, Simulation, Rheology, Mechanical tests

52-2690
Surface of ice as viewed from combined spectroscopic and computer modeling studies.
Devlin, J.P., Buch, V., *Journal of physical chemistry,* 1995, 99(45), p.16534-16548, 62 refs.
Ice physics, Molecular structure, Ice surface, Surface structure, Classifications, Amorphous ice, Hydrogen bonds, Adsorption, Ice vapor interface, Spectra, Ice spectroscopy, Infrared spectroscopy, Computerized simulation

52-2691
Mesospheric ozone density profiles in the polar region.
Yamamoto, H., Yajima, K., Sekiguchi, H., Makino, T., *Journal of geomagnetism and geoelectricity,* 1997, 49(5), p.675-688, 33 refs.
Ozone, Atmospheric composition, Polar atmospheres, Mesosphere, Norway—Andøya

52-2692
Spherical harmonic analysis in terms of unevenly distributed observation points and its applications to geomagnetic data.
Mochizuki, E., Yokoyama, Y., Shimizu, I., Hamano, Y., *Journal of geomagnetism and geoelectricity,* 1997, 49(8), p.1013-1033, 25 refs.
Data processing, Geomagnetism
Spherical harmonic expansion is affected by uneven distribution of observation points. A weighting scheme is proposed in order to reduce the effects. The weights of observation points are determined in order to homogenize the distribution. Spherical harmonic expansion of the synthetic geomagnetic data is demonstrated; the weighting works in terms of decrease of truncation error of the expansion. The method is applicable to find a new observation site and to prioritize present geomagnetic observatories. Distribution of the data points included in this analysis extends through 80° in both hemispheres. (Auth. mod.)

52-2693
New European code for snow loads: background document.
Del Corso, R., et al, *Pisa. Università. Istituto di Scienza delle Costruzioni. Atti (Pisa. University. Department of Structural Engineering. Proceedings),* 1995, No.264, 76p., 134 refs.
Snow depth, Snow loads, Buildings, Roofs, Building codes, Design criteria, Cold weather construction

52-2694
Subsurface geologic investigations of New York Finger Lakes: implications for late Quaternary deglaciation and environmental change.
Mullins, H.T., ed, Eyles, N., ed, *Geological Society of America. Special paper,* 1996, No.311, 89p., Refs. passim. For individual papers see 52-2695 through 52-2699.
Glacial lakes, Glacial geology, Glacial erosion, Glacial deposits, Lacustrine deposits, Quaternary deposits, Seismic surveys, Stratigraphy, Global warming, Paleoclimatology, United States—New York—Finger Lakes

52-2695
Seismic stratigraphy of the Finger Lakes: a continental record of Heinrich event H-1 and Laurentide ice sheet instability.
Mullins, H.T., et al, *Geological Society of America. Special paper,* 1996, No.311, Subsurface geologic investigations of New York Finger Lakes: implications for late Quaternary deglaciation and environmental change. Edited by H.T. Mullins and N. Eyles, p.1-35, 76 refs.
Ice sheets, Glaciation, Glacier oscillation, Glacial geology, Glacial erosion, Glacial deposits, Glacial lakes, Lacustrine deposits, Quaternary deposits, Seismic surveys, Stratigraphy, Geochronology, Global warming, Paleoclimatology, United States—New York—Finger Lakes

52-2696
Correlation of drillcore and geophysical results from Canandaigua Lake Valley, New York: evidence for rapid late-glacial sediment infill.
Wellner, R.W., Petruccione, J.L., Sheridan, R.E., *Geological Society of America. Special paper,* 1996, No.311, Subsurface geologic investigations of New York Finger Lakes: implications for late Quaternary deglaciation and environmental change. Edited by H.T. Mullins and N. Eyles, p.37-49, 26 refs.
Ice sheets, Glaciation, Glacial geology, Glacial erosion, Glacial deposits, Glacial lakes, Lacustrine deposits, Quaternary deposits, Stratigraphy, Drill core analysis, Geochronology, Paleoclimatology, United States—New York—Finger Lakes

52-2697
Results of downhole geophysical measurements and vertical seismic profile from the Canandaigua borehole of New York State Finger Lakes.
Nobes, D.C., Schneider, G.W., *Geological Society of America. Special paper,* 1996, No.311, Subsurface geologic investigations of New York Finger Lakes: implications for late Quaternary deglaciation and environmental change. Edited by H.T. Mullins and N. Eyles, p.51-63, 13 refs.
Glacial lakes, Glacial geology, Glacial erosion, Glacial deposits, Lacustrine deposits, Quaternary deposits, Seismic surveys, Boreholes, Well logging, United States—New York—Finger Lakes

52-2698
Late Pleistocene-Holocene lake-level fluctuations and paleoclimates at Canandaigua Lake, New York.
Wellner, R.W., Dwyer, T.R., *Geological Society of America. Special paper,* 1996, No.311, Subsurface geologic investigations of New York Finger Lakes: implications for late Quaternary deglaciation and environmental change. Edited by H.T. Mullins and N. Eyles, p.65-76, 84 refs.
Glacial lakes, Glacial geology, Glacial deposits, Lacustrine deposits, Quaternary deposits, Drill core analysis, Water level, Stratigraphy, Palynology, Paleobotany, Global warming, Paleoclimatology, United States—New York—Finger Lakes

52-2699
Seismic reflection investigation of Montezuma wetlands, central New York State: evolution of a late Quaternary subglacial meltwater channel system.
Petruccione, J.L., Wellner, R.W., Sheridan, R.E., *Geological Society of America. Special paper,* 1996, No.311, Subsurface geologic investigations of New York Finger Lakes: implications for late Quaternary deglaciation and environmental change. Edited by H.T. Mullins and N. Eyles, p.77-89, 30 refs.
Glacial lakes, Glacial geology, Glacial deposits, Subglacial drainage, Outwash, Lacustrine deposits, Quaternary deposits, Wetlands, Seismic surveys, Paleoclimatology, United States—New York—Finger Lakes

52-2700
Scientists participate in arctic study.
Perovich, D.K., MP 5094, *Engineer update,* Jan. 1998, 22(1), p.1.
Research projects, Drift stations, Polar atmospheres, Air ice water interaction, Ice cover effect, Ice heat flux, Heat balance

52-2701
Late Quaternary vegetation and lake level changes in central Alaska.
Bigelow, N.H., Fairbanks, University of Alaska, 1997, 212p., University Microfilms order No.9722773, Ph.D. thesis. Refs. p.194-212.
Plant ecology, Vegetation patterns, Revegetation, Paleobotany, Quaternary deposits, Lacustrine deposits, Water level, Stratigraphy, Palynology, Soil dating, Paleoclimatology, Global warming, United States—Alaska

52-2702

Land surface process/radiobrightness models for northern prairie.

Liou, Y.A., Ann Arbor, University of Michigan, 1996, 249p., University Microfilms order No.9635554, Ph.D. thesis. 132 refs.

Soil temperature, Frozen ground temperature, Frozen ground thermodynamics, Soil air interface, Atmospheric circulation, Soil water, Moisture detection, Moisture transfer, Heat flux, Radiometry, Mathematical models, Computer programs

52-2703

Hydrology, hydraulics, and geomorphology of the Bonneville Flood.

O'Connor, J.E., *Geological Society of America. Special paper,* 1993, No.274, 83p., Refs. p.80-83.

Geological surveys, Lake bursts, Floods, Water erosion, Sediment transport, Geomorphology, Lacustrine deposits, Alluvium, Quaternary deposits, Paleoclimatology, United States—Utah—Great Salt Lake, United States—Idaho—Snake River

52-2704

Smoothed particle hydrodynamics for the simulation of broken-ice fields: Mohr-Coulomb-type rheology and frictional boundary conditions.

Gutfraind, R., Savage, S.B., *Journal of computational physics,* July 1997, 134(2), p.203-215, 24 refs.

Ice floes, Ice edge, Drift, Ice friction, Ice plasticity, Ice deformation, Hydrodynamics, Rheology, Viscous flow, Plastic flow, Mathematical models

52-2705

Eva Interglaciation Forest Bed, unglaciated east-central Alaska: global warming 125,000 years ago.

Péwé, T.L., Berger, G.W., Westgate, J.A., Brown, P.M., Leavitt, S.W., *Geological Society of America. Special paper,* 1997, No.319, 54p., With German, French, Russian, and Chinese summaries. Refs. p.51-54.

Geological surveys, Stratigraphy, Paleobotany, Vegetation patterns, Loess, Permafrost indicators, Fossils, Soil dating, Global warming, Paleoclimatology, United States—Alaska

52-2706

Apoplastic sugars, fructans, fructan exohydrolase, and invertase in winter oat: responses to second-phase cold hardening.

Livingston, D.P., III, Henson, C.A., *Plant physiology,* Jan. 1998, 116(1), p.403-408, 32 refs.

Plant physiology, Grasses, Cold tolerance, Frost resistance, Plant tissues, Electrical resistivity, Chemical analysis, Acclimatization, Temperature effects, Cold weather tests

52-2707

Middle Triassic paleosols and paleoclimate of Antarctica.

Retallack, G.J., Alonso-Zarza, A.M., *Journal of sedimentary research,* Jan. 1998, 68(1), p.169-184, Refs. p.182-184.

Paleoclimatology, Climatic changes, Paleoecology, Paleobotany, Sediments, Fossils, Soil composition, Stratigraphy, Correlation, Antarctica—Victoria Land

The combined evidence of fossil roots and soils sampled at the Lashly Formation in the Allan Hills of southern Victoria Land indicates a paleoclimate unusual for such a high latitude. Temperate paleotemperature is indicated by roots, logs, and leaves of woody plants and the degree of chemical weathering and clay formation within the paleosols. Diverse broadleaf plants, and noncalcareous paleosols, indicate a humid climate anomalous for the interior of the supercontinent of Pangea, and such a warm and mildly seasonal climate is anomalous for such high latitudes. Paleoclimatic variables calculated here may be useful for recalibrating global paleoclimatic models for the middle Triassic. (Auth. mod.)

52-2708

Coplanar waveguide technique for measurement of dielectric constant or thickness of dielectric films.

Waldo, M.K., Kaufman, I., El-Ghazaly, S., IEEE MTT-S International Microwave Symposium, Denver, CO, June 8-13, 1997. Digest, Vol.3. High frequencies in high places. Edited by G.A. Koepf, Piscataway, NJ, Institute of Electrical and Electronic Engineers, Inc., 1997, p.1339-1342, 4 refs.

DLC TK7876.I18a V3 1997

Sensors, Ice solid interface, Dielectric properties, Electrical measurement, Resonance, Ice detection, Ice cover thickness, Aircraft icing, Models

52-2709

Runoff modelling for snow-affected catchments in the Australian alpine region, eastern Victoria.

Schreider, S.Y., Whetton, P.H., Jakeman, A.J., Pittock, A.B., *Journal of hydrology,* Dec. 15, 1997, 200(1-4), p.1-23, 30 refs.

Snow hydrology, Precipitation (meteorology), River basins, Stream flow, Runoff forecasting, Alpine landscapes, Snowmelt, Snow accumulation, Snow water equivalent, Mathematical models, Australia—Victoria

52-2710

Numerical analysis of simultaneous heat and mass transfer during infiltration into frozen ground.

Zhao, L.T., Gray, D.M., Male, D.H., *Journal of hydrology,* Dec. 15, 1997, 200(1-4), p.345-363, 25 refs.

Frozen ground mechanics, Frozen ground thermodynamics, Heat transfer, Mass transfer, Soil temperature, Ice formation, Latent heat, Snowmelt, Seepage, Phase transformations, Ice water interface, Mathematical models

52-2711

Radiometric measurements of snow and ice surfaces in Antarctica.

Zilioli, E., Cagnati, A., *SPIE—The International Society for Optical Engineering. Proceedings,* Sep. 1995, Vol.2585, Remote sensing for agriculture, forestry, and natural resources. Edited by E.T. Engman, G. Guyot and C.M. Marino, p.156-165, 21 refs.

DLC S494.5.R4 R45 1995

Remote sensing, Radiometry, Glacier surveys, Snow optics, Glacier surfaces, Surface structure, Albedo, Sensor mapping, Spectra, Antarctica—Victoria Land

First results of a ground radiometric campaign carried out in Antarctica during the last Italian scientific expedition in winter 1994-95 are presented here. The measurements were collected by means of a 4-channel radiometer. More than 100 measurements were taken in different sites, concerning three main categories: snow cover, continental ice and marine ice. The investigation consisted of the collection of radiance information accompanied by observations of physical properties of the surfaces according to the standards by the International Glaciological Society. (Auth. mod.)

52-2712

Snowmelt runoff forecast using satellite data in high mountainous Italian Alps.

Narayana Swamy, A., Brivio, P.A., *SPIE—The International Society for Optical Engineering. Proceedings,* Sep. 1995, Vol.2585, Remote sensing for agriculture, forestry, and natural resources. Edited by E.T. Engman, G. Guyot and C.M. Marino, p.166-177, 14 refs.

DLC S494.5.R4 R45 1995

Remote sensing, Spaceborne photography, Snow surveys, Sensor mapping, Alpine landscapes, Snow hydrology, Snowmelt, Degree days, Runoff forecasting, Image processing, Mathematical models, Correlation, Italy—Alps

52-2713

Improving alpine-region spectral mixture analysis estimates of snow-covered-area.

Painter, T.H., Roberts, D.A., Green, R.O., Dozier, J., *SPIE—The International Society for Optical Engineering. Proceedings,* Sep. 1995, Vol.2585, Remote sensing for agriculture, forestry, and natural resources. Edited by E.T. Engman, G. Guyot and C.M. Marino, p.323-333, 13 refs.

DLC S494.5.R4 R45 1995

Remote sensing, Spaceborne photography, Infrared reconnaissance, Snow surveys, Alpine landscapes, Snow cover distribution, Sensor mapping, Snow cover structure, Grain size, Image processing, Reflectivity, Spectra, Correlation, United States—California—Mammoth Mountain

52-2714

Lead-210 age dating of three peat cores in the Jura Mountains, Switzerland.

Appleby, P.G., Shotyk, W., Fankhauser, A., *Water, air, and soil pollution,* Dec. 1997, 100(3-4), p.223-231, 16 refs.

Climatology, Air pollution, Mountain soils, Peat, Metals, Fallout, Drill core analysis, Isotope analysis, Radioactive age determination, Profiles, Periodic variations, Switzerland—Jura Mountains

52-2715

Changing concentrations of Cu, Zn, Cd and Pb in a high altitude peat bog from Bolivia during the past three centuries.

Espi, E., et al, *Water, air, and soil pollution,* Dec. 1997, 100(3-4), p.289-296, 32 refs.

Climatology, Air pollution, Aerosols, Metals, Alpine landscapes, Peat, Drill core analysis, Isotope analysis, Periodic variations, Statistical analysis, Environmental tests, Bolivia—Andean Royal Belt

52-2716

Lead in three peat bog profiles, Jura Mountains, Switzerland: enrichment factors, isotopic composition, and chronology of atmospheric deposition.

Shotyk, W., Cheburkin, A.K., Appleby, P.G., Fankhauser, A., Kramers, J.D., *Water, air, and soil pollution,* Dec. 1997, 100(3-4), p.297-310, Refs. p.309-310.

Climatology, Air pollution, Aerosols, Metals, Sedimentation, Mountain soils, Peat, Drill core analysis, Profiles, Isotope analysis, Radioactive age determination, Environmental tests, Switzerland—Jura Mountains

52-2717

Atmospheric lead deposition from 12,400 to ca. 2,000 yrs BP in a peat bog profile, Jura Mountains, Switzerland.

Weiss, D., Shotyk, W., Cheburkin, A.K., Gloor, M., Reese, S., *Water, air, and soil pollution,* Dec. 1997, 100(3-4), p.311-324, Refs. p.323-324.

Paleoclimatology, Air pollution, Metals, Aerosols, Sedimentation, Mountain soils, Peat, Drill core analysis, Profiles, Neutron activation analysis, Environmental tests, Switzerland—Jura Mountains

52-2718

Estimating active-layer thickness over a large region: Kuparuk River basin, Alaska, U.S.A.

Nelson, F.E., Shiklomanov, N.I., Mueller, G.R., Hinkel, K.M., Walker, D.A., Bockheim, J.G., *Arctic and alpine research,* Nov. 1997, 29(4), p.367-378, Refs. p.376-378.

Permafrost surveys, Geophysical surveys, River basins, Active layer, Thaw depth, Degree days, Tundra terrain, Vegetation patterns, Spaceborne photography, Sensor mapping, Sampling, Correlation, United States—Alaska—Kuparuk River

52-2719

Mass balance of mountain and subpolar glaciers: a new global assessment for 1961-1990.

Diurgerov, M.B., Meier, M.F., *Arctic and alpine research,* Nov. 1997, 29(4), p.379-391, Refs. p.389-391.

Glaciology, Glacier oscillation, Mass balance, Classifications, Mountain glaciers, Glacier surveys, Global change, Statistical analysis, Periodic variations

The goals of this article are to combine mass balance measured data on more than 200 glaciers, check the quality of the data, digitize, and compile these for the period 1945-1993, and to perform a review and analysis of this compilation. The glacier area of mountain and subpolar glaciers (including local glaciers around Greenland and antarctic ice sheets) is taken to be about 680×10^3 km^2. (Auth. mod.)

52-2720

Year-to-year fluctuations of global mass balance of small glaciers and their contribution to sea-level changes.

Diurgerov, M.B., Meier, M.F., *Arctic and alpine research,* Nov. 1997, 29(4), p.392-402, Refs. p.400-402.

Glaciology, Climatic changes, Global warming, Glacier oscillation, Glacier mass balance, Global change, Sea level, Correlation, Statistical analysis, Seasonal variations

This study estimates the means and the interannual variability during the last 30 yr of the mass balances of the small glaciers of the world (all glaciers except for the two large ice sheets), as well as the influence of these mass balance changes on fluctuations of sea level and their relation to climate. The mass balance data base was enriched by data for glaciers of the arctic islands, Antarctica, and mountainous areas of Siberia, central Asia, and the Caucasus, which have not been included in previous compilations. The global mean mass balance as a function of time was calculated three ways: the arithmetic mean for all glaciers, arithmetic mean for a group of representative glaciers with long-term mass balance records, and an area-weighted mean. (Auth. mod.)

52-2721

Snow distribution and melt in central Tien Shan, Susamir valley.

Aižen, B.V., Aižen, E.M., Melack, J.M., *Arctic and alpine research,* Nov. 1997, 29(4), p.403-413, 33 refs.

Snow surveys, Synoptic meteorology, River basins, Alpine landscapes, Snow cover distribution, Snow accumulation, Snowmelt, Snow water equivalent, Statistical analysis, Analysis (mathematics), Radiation balance, Tajikistan—Tien Shan, Kyrgyzstan—Susamyr Valley

52-2722

Stratigraphic features of firn as proxy climate signals at the summit ice cap of Ushkovsky volcano, Kamchatka, Russia.

Shiraiwa, T., Murav'ev, IA.D., Yamaguchi, S., *Arctic and alpine research,* Nov. 1997, 29(4), p.414-421, 15 refs.

Climatology, Climatic changes, Mountain glaciers, Glacier oscillation, Glacial meteorology, Glacier mass balance, Firn stratification, Snow temperature, Volcanic ash, Ice cores, Sampling, Russia—Kamchatka Peninsula

52-2723

Sr isotopic composition of suspended particulate material (SPM) of East Siberian rivers: sediment transport to the Arctic Ocean.

Rachold, V., Eisenhauer, A., Hubberten, H.W., Hansen, B., Meyer, H., *Arctic and alpine research,* Nov. 1997, 29(4), p.422-429, 38 refs.

Oceanography, Subpolar regions, Estuaries, River basins, Surface drainage, Sediment transport, Suspended sediments, Sampling, Isotope analysis, Statistical analysis, Russia—Siberia, Russia—Lena River, Russia—Yana River, Russia—Khatanga River, Arctic Ocean

52-2724

Diatom-based paleohydrological model for the Mackenzie Delta, Northwest Territories, Canada.

Hay, M.B., Smol, J.P., Pipke, K.J., Lesack, L.F.W., *Arctic and alpine research,* Nov. 1997, 29(4), p.430-444, Refs. p.441-443.

Limnology, Paleoecology, Hydrology, River flow, Floodplains, Lacustrine deposits, Deltas, Sampling, Statistical analysis, Biomass, Plankton, Classifications, Canada—Northwest Territories—Mackenzie Delta

52-2725

Vegetation changes and timberline fluctuations in the Central Alps as indicators of Holocene climatic oscillations.

Wick, L., Tinner, W., *Arctic and alpine research,* Nov. 1997, 29(4), p.445-458, Refs. p.456-458.

Paleoclimatology, Paleobotany, Palynology, Lacustrine deposits, Climatic changes, Alpine landscapes, Forest lines, Revegetation, Biogeography, Vegetation patterns, Radioactive age determination, Statistical analysis, Correlation, Switzerland—Alps

52-2726

Retrospective analysis of growth and reproduction in *Cassiope tetragona* and relation to climate in the Canadian high arctic.

Johnstone, J.F., Henry, G.H.R., *Arctic and alpine research,* Nov. 1997, 29(4), p.459-469, 50 refs.

Plant ecology, Tundra vegetation, Growth, Biomass, Climatic factors, Plant tissues, Sampling, Age determination, Statistical analysis, Canada—Northwest Territories—Ellesmere Island

52-2727

Nitrogen fixation by free-living cyanobacteria from different coastal sites in a high arctic tundra, Spitsbergen.

Liengen, T., Olsen, R.A., *Arctic and alpine research,* Nov. 1997, 29(4), p.470-477, 53 refs.

Ecosystems, Arctic landscapes, Soil microbiology, Tundra soils, Bacteria, Biomass, Nutrient cycle, Soil chemistry, Vegetation patterns, Shores, Soil air interface, Sampling, Norway—Spitsbergen

52-2728

Effect of electrochemical chloride extraction on concrete properties—investigation of field concrete.

Broomfield, J.P., Buenfeld, N.R., *Transportation research record,* Sep. 1997, No.1597, p.77-81, 5 refs.

Road maintenance, Bridges, Reinforced concretes, Steels, Desalting, Permeability, Ion diffusion, Freeze thaw cycles, Freeze thaw tests, Corrosion, Protection

52-2729

Buildup of the ice sheet in central Greenland.

Souchez, R., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,317-26,323, 25 refs.

Pleistocene, Ice sheets, Ice formation, Bottom ice, Ice cores, Ice composition, Glacier ice, Ground ice, Permafrost indicators, Isotope analysis, Profiles, Greenland—Summit

52-2730

Climatic implications of background acidity and other chemistry derived from electrical studies of the Greenland Ice Core Project ice core.

Wolff, E.W., Moore, J.C., Clausen, H.B., Hammer, C.U., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,325-26,332, 46 refs.

Pleistocene, Paleoclimatology, Ice sheets, Ice cores, Aerosols, Ice composition, Chemical properties, Electrical measurement, Profiles, Ice dielectrics, Greenland—Summit

52-2731

Aspects of climate variability in the North Atlantic sector: discussion and relation to the Greenland Ice Sheet Project 2 high-resolution isotopic signal.

Barlow, L.K., Rogers, J.C., Serreze, M.C., Barry, R.G., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,333-26,344, 30 refs.

Climatology, Climatic changes, Ice sheets, Ice cores, Ice composition, Isotope analysis, Atmospheric circulation, Marine atmospheres, Wind direction, Surface temperature, Seasonal variations, Correlation, Greenland—Summit, Atlantic Ocean

52-2732

Major features and forcing of high-latitude northern hemisphere atmospheric circulation using a 110,000-year-long glaciochemical series.

Mayewski, P.A., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,345-26,366, Refs. p.26,362-26,366.

Paleoclimatology, Climatic changes, Atmospheric circulation, Atmospheric composition, Ion density (concentration), Ice air interface, Insolation, Aerosols, Ice sheets, Ice volume, Ice cores, Ice composition, Correlation, Ice cover effect, Greenland—Summit

52-2733

Visual-stratigraphic dating of the GISP2 ice core: basis, reproducibility, and application.

Alley, R.B., Meese, D.A., Gow, A.J., Elder, B., MP 5095, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,367-26,381, Refs. p.26,379-26,381.

Glaciology, Ice sheets, Ice cores, Ice dating, Accuracy, Ice structure, Stratigraphy, Bubbles, Depth hoar, Brittleness, Seasonal variations, Laboratory techniques, Greenland—Summit

Annual layers are visible in the Greenland Ice Sheet Project 2 ice core from central Greenland, allowing rapid dating of the core. Changes in bubble and grain structure caused by near-surface, primarily summertime formation of hoar complexes provide the main visible annual marker in the Holocene, and changes in "cloudiness" of the ice correlated with dustiness mark Wisconsinan annual cycles. Layer counts are reproducible between different workers and for one worker at different times, with 1% error over century-length times in the Holocene. Cumulative ages from visible stratigraphy are not significantly different from independent ages of prominent events for ice older than the historical record and younger than approximately 50,000 years.

52-2734

Temperature, accumulation, and ice sheet evaluation in central Greenland through the last deglacial transition.

Cuffey, K.M., Clow, G.D., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,383-26,396, 50 refs.

Pleistocene, Paleoclimatology, Surface temperature, Temperature variations, Glacier oscillation, Altitude, Ice sheets, Ice cores, Isotope analysis, Mathematical models, Greenland—Summit

52-2735

$\delta^{18}O$ record along the Greenland Ice Core Project deep ice core and the problem of possible Eemian climatic instability.

Johnsen, S.J., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,397-26,410, Refs. p.26,408-26,410.

Pleistocene, Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Isotope analysis, Oxygen isotopes, Diffusion, Ice deformation, Profiles, Accuracy, Greenland—Summit

52-2736

Greenland Ice Sheet Project 2 depth-age scale: methods and results.

Meese, D.A., et al, MP 5096, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,411-26,423, 46 refs.

Pleistocene, Ice sheets, Ice cores, Ice dating, Glacier thickness, Correlation, Stratigraphy, Aerosols, Isotope analysis, Thin sections, Ice optics, Accuracy, Greenland—Summit

The Greenland Ice Sheet Project 2 (GISP2) depth-age scale is presented based on a multiparameter continuous count approach using parameters never used to this extent. The ice is dated at 110,000 years B.P. with an estimated error ranging from 1-20%. Parameters used to date the core include visual stratigraphy, oxygen isotopic ratios of the ice, electrical conductivity measurements, laser-light scattering from dust, volcanic signals, and major ion chemistry. GISP2 ages for major climatic events agree with independent ages based on varve chronologies, calibrated radiocarbon dates, and other techniques within the combined uncertainties.

52-2737

Climate signal in the stable isotopes of snow from Summit, Greenland: results of comparisons with modern climate observations.

White, J.W.C., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,425-26,439, 27 refs.

Climatology, Climatic changes, Air temperature, Temperature variations, Ice sheets, Ice cores, Snow composition, Isotope analysis, Oxygen isotopes, Sampling, Correlation, Statistical analysis, Accuracy, Greenland—Summit

52-2738

Paleoclimatic variability inferred from the spectral analysis of Greenland and antarctic ice-core data.

Yiou, P., Fuhrer, K., Meeker, L.D., Jouzel, J., Johnsen, S., Mayewski, P.A., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,441-26,454, Refs. p.26,452-26,454.

Paleoclimatology, Climatic changes, Atmospheric circulation, Ice sheets, Ice cores, Isotope analysis, Profiles, Statistical analysis, Spectra, Oscillations, Greenland—Summit, Antarctica—Vostok Station

Recent ice cores from Greenland (Greenland Ice Core Project and Greenland Ice Sheet Project 2) and Antarctica (Vostok) span at least one glacial oscillation and provide many opportunities to investigate climate variations with a very fine resolution. The joint study of cores from both hemispheres allows the distinction between the sources of variability and suggests mechanisms of variations for the different time scales involved. Climate proxies for temperature and chemical species yield an estimate of the polar circulation index. Those data provide time series of climatic variables which indicate the underlying system. Results show some differences between the two hemispheres in the slow variability associated with the astronomical forcing. Common features found in the three ice-core records occur on shorter periods. (Auth. mod.)

52-2739

Oxygen 18/16 variability in Greenland snow and ice with 10^{-3}- to 10^{5}-year time resolution.

Grootes, P.M., Stuiver, M., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,455-26,470, Refs. p.26,468-26,470.

Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Snow composition, Water vapor, Oxygen isotopes, Isotope analysis, Firn, Spectra, Geochronology, Statistical analysis, Correlation, Greenland—Summit

52-2740

Validity of the temperature reconstruction from water isotopes in ice cores.

Jouzel, J., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,471-26,487, Refs. p.26,485-26,487.

Paleoclimatology, Precipitation (meteorology), Surface temperature, Ice temperature, Ice sheets, Ice cores, Snow composition, Isotope analysis, Oxygen isotopes, Statistical analysis, Correlation, Models, Greenland—Summit

52-2741

110,000-year history of change in continental biogenic emissions and related atmospheric circulation inferred from the Greenland Ice Sheet Project ice core.

Meeker, L.D., Mayewski, P.A., Twickler, M.S., Whitlow, S.I., Meese, D.A., MP 5097, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,489-26,504, 39 refs.

Paleoclimatology, Atmospheric circulation, Biomass, Paleoecology, Aerosols, Ice sheets, Ice cores, Ion density (concentration), Ion diffusion, Insolation, Correlation, Statistical analysis, Greenland—Summit

The 110,000-year record of ammonium concentrations from the Greenland Ice Sheet Project 2 (GISP) ice core provides the basis for an analysis of terrestrial biological production and atmospheric circulation patterns involved in the transport of biologically produced ammonium to the Greenland atmosphere. Analysis of the ammonium concentration series shows that maxima in background levels of ammonium in the Greenland atmosphere are strongly related to and synchronous with summer forcing associated with the precessional cycle of insolation. During warmer periods ammonium transport to Greenland is similar to present patterns. Under coldest conditions the low levels of ammonium transported to Greenland are the result of extreme southerly excursions of the predominantly zonal polar circulation. The rapid transitions (≈200 years) between these two climatic conditions appear to be associated with a critical volume or extent of the continental ice sheets.

52-2742

Measurements of in situ ^{14}C concentration in Greenland Ice Sheet Project 2 ice covering a 17-kyr time span: implications to ice flow dynamics.

Lal, D., Jull, A.J.T., Burr, G.S., Donahue, D.J., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,505-26,510, 15 refs.

Pleistocene, Ice sheets, Ice cores, Firn, Ice dating, Carbon isotopes, Carbon dioxide, Isotope analysis, Ice accretion, Glacier flow, Gamma irradiation, Statistical analysis, Greenland—Summit

52-2743

Electrical measurements on the Greenland Ice Sheet Project 2 core.

Taylor, K.C., Alley, R.B., Lamorey, G.W., Mayewski, P.A., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,511-26,517, 25 refs.

Pleistocene, Paleoclimatology, Atmospheric composition, Ice sheets, Ice cores, Aerosols, Dust, Electrical measurement, Electrical resistivity, Stratigraphy, Greenland—Summit

52-2744

Raman spectroscopic and statistical studies on natural clathrates from the Greenland Ice Core Project ice core, and neutron diffraction studies on synthetic nitrogen clathrates.

Pauer, F., Kipfstuhl, J., Kuhs, W.F., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,519-26,526, 21 refs.

Ice sheets, Ice cores, Ice composition, Gas inclusions, Clathrates, Decomposition, Ice spectroscopy, Neutron diffraction, Spectra, Bubbles, Phase transformations, Geochemistry, Greenland—Summit

52-2745

Interlaboratory comparison of techniques for extracting and analyzing trapped gases in ice cores.

Sowers, T., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,527-26,538, 45 refs.

Paleoclimatology, Ice sheets, Ice cores, Ice composition, Gas inclusions, Laboratory techniques, Standards, Sampling, Impurities, Isotope analysis, Standards, Statistical analysis, Accuracy, Greenland

52-2746

CO_2 record between 40 and 8 kyr B.P. from the Greenland Ice Core Project ice core.

Anklin, M., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,539-26,545, 30 refs.

Paleoclimatology, Climatic changes, Atmospheric composition, Carbon dioxide, Ice sheets, Ice cores, Bubbles, Profiles, Hydrates, Chemical analysis, Greenland—Summit, Antarctica—Amundsen-Scott Station, Antarctica—Vostok Station

This paper presents CO_2 measurements performed on an ice core from central Greenland, drilled during the Greenland Ice Core Project (GRIP). This CO_2 profile from GRIP confirms the most prominent CO_2 increase from the last glacial maximum, to the early Holocene. Greenland cores show high CO_2 values for rather mild climatic periods during the last glaciation, whereas CO_2 records from Antarctica do not. The CO_2 values in the early Holocene are about 20-30 ppmv higher in the GRIP record than in antarctic records. The discrepancies between the CO_2 profiles from Greenland and Antarctica can be explained by *in situ* production of excess CO_2 due to interactions between carbonate and acidic species. Since the carbonate concentration in antarctic ice is much lower than in Greenland ice, CO_2 records from Antarctica are less affected by such *in situ*-produced CO_2. (Auth. mod.)

52-2747

CH_4 and $\delta^{18}O$ of O_2 records from antarctic and Greenland ice: a clue for stratigraphic disturbance in the bottom part of the Greenland Ice Core Project and the Greenland Ice Sheet Project 2 ice cores.

Chappellaz, J., Brook, E., Blunier, T., Malaizé, B., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,547-26,557, 33 refs.

Paleoclimatology, Pleistocene, Climatic changes, Ice sheets, Ice cores, Ice dating, Chemical composition, Natural gas, Diffusion, Isotope analysis, Stratigraphy, Correlation, Accuracy, Antarctica—Vostok Station, Greenland—Summit

This paper presents detailed methane records from Vostok Station, GRIP, and GISP2 cores over the relevant intervals. The GRIP and GISP2 data show rapid and large changes in methane concentration, while the Vostok record shows no such variations. Results suggest that ice layers from part of the last interglacial period exist in the lower section of both ice cores and that some of the apparent climate instabilities in the GRIP core would be the result of a mixture of ice from the last interglacial with ice from the beginning of the last glaciation or from the penultimate glaciation. (Auth. mod.)

52-2748

Physical and structural properties of the Greenland Ice Sheet Project 2 ice core: a review.

Gow, A.J., Meese, D.A., Elder, B.C., MP 5098, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,559-26,575, 32 refs.

Paleoclimatology, Pleistocene, Ice sheets, Ice cores, Ice composition, Stratigraphy, Profiles, Bottom ice, Ice microstructure, Ice density, Ice density, Sediments, Diffusion, Thin sections, Permafrost indicators, Greenland—Summit

Substantial data sets have been collected on the relaxation characteristics, density, grain size, *c* axis fabrics, and ultrasonic velocities of the Greenland Ice Sheet Project 2 (GISP2) core to its contact with bedrock at 3053.4 m. Changes in all these properties paralleled closely those found in cores from Byrd Station and Dye 3, Greenland. Beginning at about 2800 m, layers of coarse-grained ice intermixed with the much finer-grained matrix ice are observed. Below 3000 m the ice became very coarse grained. This change, attributed to annealing recrystallization at elevated temperatures in the ice sheet, was accompanied by a dispersed or ring-like redistribution of the *c* axes about the vertical. There is evidence that disturbed structure in the GISP2 cores begins little more than 70% of the way through the ice sheet. This disturbance increases with depth until it becomes large enough to cast suspicion on features lasting centuries or more in the bottom 10% of the ice sheet.

52-2749

CO_2 concentration of air trapped in Greenland Ice Sheet Project 2 ice formed during periods of rapid climatic change.

Smith, H.J., Wahlen, M., Mastroianni, D., Taylor, K., Mayewski, P.A., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,577-26,582, 23 refs.

Paleoclimatology, Pleistocene, Climatic changes, Ice sheets, Ice cores, Carbon dioxide, Bubbles, Chemical composition, Electrical resistivity, Sampling, Accuracy, Greenland—Summit

52-2750

Textures and fabrics in the GRIP ice core.

Thorsteinsson, T., Kipfstuhl, J., Miller, H., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,583-26,599, Refs. p.26,597-26,599.

Glaciology, Pleistocene, Ice sheets, Ice cores, Ice crystal growth, Ice crystal size, Recrystallization, Migration, Thin sections, Ice deformation, Shear stress, Anisotropy, Greenland—Summit

52-2751

New approaches to CO_2 analysis in polar ice cores.

Wilson, A.T., Long, A., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,601-26,606, 24 refs.

Paleoclimatology, Ice sheets, Ice cores, Gases, Atmospheric composition, Ice composition, Correlation, Carbon dioxide, Ice sublimation, Age determination, Sampling, Laboratory techniques, Accuracy, Greenland, Antarctica

Gases trapped in polar ice sheets provide a means of obtaining samples of Earth's atmosphere from times in the past. This paper describes geochemical processes affecting gases trapped in ice and reviews how these mechanisms affect the composition of gas extracted from polar ice cores. Methods for recovering samples of paleo-atmospheres from ice cores and the suitability of each method in different applications is considered. It is concluded that extracting gas by mechanical disintegration (e.g., crushing, grinding, shaving, or milling) is most easily performed on relatively young ice in which the content of the bubbles is still representative of the original atmosphere. (Auth. mod.)

52-2752

Air content along the Greenland Ice Core Project core: a record of surface climatic parameters and elevation in central Greenland.

Raynaud, D., Chappellaz, J., Ritz, C., Martinerie, P., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,607-26,613, 26 refs.

Paleoclimatology, Pleistocene, Climatic changes, Ice sheets, Glacier thickness, Ice cores, Stratigraphy, Age determination, Bubbles, Porosity, Altitude, Ice air interface, Isotope analysis, Correlation, Greenland—Summit

52-2753
Distribution of Ca, Fe, K, and S between soluble and insoluble material in the Greenland Ice Core Project ice core.
Laj, P., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,615-26,623, 41 refs.
Glacial meteorology, Ice sheets, Ice cores, Sediments, Dust, Aerosols, Solubility, Distribution, Ice air interface, Wind factors, X ray analysis, Scanning electron microscopy, Greenland—Summit

52-2754
Volcanic aerosol records and tephrochronology of the Summit, Greenland, ice cores.
Zielinski, G.A., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,625-26,640, Refs. p.26,638-26,640.
Paleoclimatology, Climatic changes, Pleistocene, Ice sheets, Ice cores, Volcanic ash, Volcanoes, Aerosols, Stratification, Geochronology, Statistical analysis, Correlation, Greenland—Summit

52-2755
Continuous dust concentration profile of pre-Holocene ice from the Greenland Ice Sheet Project 2 ice core: dust stadials, interstadials, and the Eemian.
Ram, M., Koenig, G., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,641-26,648, 33 refs.
Pleistocene, Glacier oscillation, Ice sheets, Ice cores, Stratigraphy, Aerosols, Dust, Isotope analysis, Lasers, Light scattering, Profiles, Geochronology, Ice dating, Greenland—Summit

52-2756
Methanesulfonate in the Greenland Ice Sheet Project 2 ice core.
Saltzman, E.S., Whung, P.Y., Mayewski, P.A., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,649-26,657, Refs. p.26,655-26,657.
Paleoclimatology, Pleistocene, Climatic changes, Geochemical cycles, Atmospheric composition, Ice sheets, Ice cores, Aerosols, Paleoecology, Sampling, Age determination, Greenland—Summit

52-2757
Chlorine 36 fallout in the Summit Greenland Ice Core Project ice core.
Baumgartner, S., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,659-26,662, 26 refs.
Pleistocene, Paleoclimatology, Ice sheets, Ice cores, Radioactive isotopes, Gamma irradiation, Fallout, Geochemical cycles, Isotope analysis, Decomposition, Statistical analysis, Greenland—Summit

52-2758
Sulfur-containing species (methanesulfonate and SO_4) over the last climatic cycle in the Greenland Ice Core Project (central Greenland) ice core.
Legrand, M., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,663-26,679, Refs. p.26,677-26,679.
Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Firn, Aerosols, Geochemical cycles, Seasonal variations, Profiles, Statistical analysis, Greenland—Summit

52-2759
Primary aerosol (sea salt and soil dust) deposited in Greenland ice during the last climatic cycle: comparison with east antarctic records.
De Angelis, M., Steffensen, J.P., Legrand, M., Clausen, H.B., Hammer, C.U., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,681-26,698, Refs. p.26,696-26,698.
Paleoclimatology, Climatic changes, Pleistocene, Ice sheets, Ice cores, Aerosols, Geochemical cycles, Profiles, Ion density (concentration), Statistical analysis, Snow accumulation, Correlation, Greenland—Summit, Antarctica—Vostok Station
Ion chromatography data of Ca, Mg, Cl and Ca and particle measurements are used to study the cycle of marine and continental primary aerosol reaching Greenland in relation to climatic changes over the last 150 kyr. A detailed comparison between Greenland (Dome Summit) and Antarctic (Vostok) records provides new insight on a potential link between northern and southern patterns. Vostok profiles strongly suggest that some of the phenomena observed at high northern latitudes are of global concern. The sensitivity of Greenland and antarctic marine input to climate variations of small and large amplitude is compared, and a corresponding estimation is made for the aeolian contribution. Owing to postdepositional phenomena, similar Vostok data must be considered cautiously. Nevertheless, aerosol fractionation seems to have been much more important over the Vostok site, except during glacial extrema. (Auth. mod.)

52-2760
Beryllium 10 concentrations in the Greenland Ice Sheet Project 2 ice core from 3-40 ka.
Finkel, R.C., Nishiizumi, K., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,699-26,706, 44 refs.
Pleistocene, Paleoclimatology, Climatic changes, Atmospheric composition, Snow accumulation, Ice sheets, Ice cores, Radioactive isotopes, Gamma irradiation, Isotope analysis, Radioactive age determination, Statistical analysis, Greenland—Summit

52-2761
Comparison of the volcanic records over the past 4000 years from the Greenland Ice Core Project and Dye 3 Greenland ice cores.
Clausen, H.B., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,707-26,723, 42 refs.
Pleistocene, Paleoclimatology, Ice sheets, Ice cores, Drill core analysis, Stratigraphy, Electrical resistivity, Volcanic ash, Volcanoes, Aerosols, Origin, Ion density (concentration), Age determination, Greenland—Summit, Greenland—Dye 3

52-2762
Mineralogy of atmospheric microparticles deposited along the Greenland Ice Core Project ice core.
Maggi, V., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,725-26,734, 37 refs.
Paleoclimatology, Pleistocene, Climatic changes, Ice sheets, Ice cores, Atmospheric composition, Aerosols, Dust, Stratigraphy, Mineralogy, Classifications, Scanning electron microscopy, X ray analysis, Statistical analysis, Greenland—Summit

52-2763
Continental biogenic species in the Greenland Ice Core Project ice core: tracing back the biomass history of the North American continent.
Fuhrer, K., Legrand, M., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,735-26,745, 45 refs.
Pleistocene, Paleoclimatology, Paleoecology, Biomass, Ice sheets, Ice cores, Aerosols, Organic nuclei, Sampling, Statistical analysis, Age determination, Greenland—Summit, North America

52-2764
Chemical composition of cold events within the Eemian section of the Greenland Ice Core Project ice core from Summit, Greenland.
Steffensen, J.P., Clausen, H.B., Hammer, C.U., Legrand, M., De Angelis, M., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,747-26,754, 17 refs.
Pleistocene, Paleoclimatology, Climatic changes, Cooling, Ice sheets, Ice cores, Ion density (concentration), Aerosols, Oxygen isotopes, Profiles, Impurities, Correlation, Greenland—Summit

52-2765
Size distribution of microparticles from selected segments of the Greenland Ice Core Project ice core representing different climatic periods.
Steffensen, J.P., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,755-26,763, 18 refs.
Pleistocene, Paleoclimatology, Climatic changes, Atmospheric composition, Ice sheets, Ice cores, Drill core analysis, Aerosols, Dust, Particle size distribution, Mass transfer, Greenland—Summit

52-2766
Asian provenance of glacial dust (stage 2) in the Greenland Ice Sheet Project 2 ice core, Summit, Greenland.
Biscaye, P.E., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,765-26,781, Refs. p.26,779-26,781.
Pleistocene, Paleoclimatology, Atmospheric circulation, Mass transfer, Ice sheets, Ice cores, Ice composition, Aerosols, Dust, Loess, Clay minerals, Mineralogy, Origin, Statistical analysis, Greenland—Summit, Asia

52-2767
Beryllium 10 in the Greenland Ice Core Project ice core at Summit, Greenland.
Yiou, F., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,783-26,794, 41 refs.
Pleistocene, Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Precipitation (meteorology), Dust, Radioactive isotopes, Isotope analysis, Gamma irradiation, Profiles, Greenland—Summit, Antarctica—Vostok Station, Antarctica—Amundsen-Scott Station
Concentrations of the cosmogenic isotope ^{10}Be have been measured in more than 1350 samples from the Greenland Ice Core Project ice core drilled at Summit, Greenland. Results confirm that the first-order origin of ^{10}Be concentration variations is changes in precipitation rate associated with different climate regimes. The most dramatic flux is a ^{10}Be peak ca. 40,000 years ago, similar to that found in the Vostok ice core, thus permitting a very precise correlation between climate records from arctic and antarctic ice cores. (Auth. mod.)

52-2768
Air-snow exchange investigations at Summit, Greenland; an overview.
Dibb, J.E., Jaffrezo, J.L., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,795-26,807, Refs. p.26,805-26,807.
Climatology, Atmospheric boundary layer, Aerosols, Ice sheets, Drill core analysis, Snow air interface, Snow ice interface, Snow composition, Mass transfer, Particle size distribution, Ion density (concentration), Statistical analysis, Greenland—Summit

52-2769
Lumped parameter model for the atmosphere-to-snow transfer function for hydrogen peroxide.
McConnell, J.R., Bales, R.C., Winterle, J.R., Kuhns, H., Stearns, C.R., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,809-26,818, 23 refs.
Climatology, Atmospheric boundary layer, Snow air interface, Vapor transfer, Aerosols, Snow composition, Ice cores, Profiles, Seasonal variations, Snow accumulation, Models, Statistical analysis, Greenland—Summit

52-2770
Grain-scale processes, folding, and stratigraphic disturbance in the GISP2 ice core.
Alley, R.B., Gow, A.J., Meese, D.A., Fitzpatrick, J.J., Waddington, E.D., Bolzan, J.F., MP 5099, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,819-26,830, 44 refs.
Glaciology, Ice sheets, Drill core analysis, Glacier flow, Ice mechanics, Shear stress, Ice deformation, Ice crystal structure, Orientation, Thin sections, Stratigraphy, Greenland—Summit
Flow disturbances have been shown to alter stratigraphic order in the lower part of the ice sheet in central Greenland. Vertical thin sections of the Greenland Ice Sheet Project 2 ice core show that in the lower 30%, the expected *c* axis-vertical fabric is interrupted by planes of grains ("stripes") with *c* axes oriented approximately in the dip directions of the planes. Stripe-parallel shear produces small-scale folds. The stripes can be explained qualitatively by a simple nucleation-and-growth model based on the strong anisotropy of ice-crystal deformation. Stripes are modeled to affect the ice viscosity, so variations in stripe density may contribute to viscosity contrasts that might produce larger deformational features and loss of stratigraphic order.

52-2771
Flow properties of the ice from the Greenland Ice Core Project ice core: the reason for folds?
Dahl-Jensen, D., Thorsteinsson, T., Alley, R., Shoji, H., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,831-26,840, 44 refs.
Glaciology, Paleoclimatology, Ice sheets, Ice cores, Ice mechanics, Stratification, Ice deformation, Ice crystal size, Strain tests, Climatic factors, Rheology, Greenland—Summit

52-2772

Modeling the signal transfer of seawater $\delta^{18}O$ to the $\delta^{18}O$ of atmospheric oxygen using a diagnostic box model for the terrestrial and marine biosphere.

Leuenberger, M.C., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,841-26,850, 44 refs.

Pleistocene, Paleoclimatology, Paleoecology, Photosynthesis, Biomass, Sea water, Air water interactions, Oxygen isotopes, Isotope analysis, Vapor transfer, Ice sheets, Stratigraphy, Models, Greenland—Summit

52-2773

Ice flow between the Greenland Ice Core Project and Greenland Ice Sheet Project 2 boreholes in central Greenland.

Hvidberg, C.S., Dahl-Jensen, D., Waddington, E.D., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,851-26,859, 45 refs.

Pleistocene, Glaciology, Ice sheets, Ice cores, Glacier flow, Ice mechanics, Boreholes, Shear stress, Ice deformation, Bedrock, Profiles, Models, Greenland—Summit

52-2774

Air mass trajectories to Summit, Greenland: a 44-year climatology and some episodic events.

Kahl, J.D.W., Martinez, D.A., Kuhns, H., Davidson, C.I., Jaffrezo, J.L., Harris, J.M., *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,861-26,875, 37 refs.

Climatology, Air masses, Atmospheric circulation, Wind direction, Ice sheets, Snow air interface, Aerosols, Mass transfer, Meteorological data, Models, Statistical analysis, Seasonal variations, Greenland—Summit

52-2775

Detection and monitoring of stratigraphic markers and temperature trends at the Greenland Ice Sheet Project 2 using passive-microwave remote-sensing data.

Shuman, C.A., et al, *Journal of geophysical research,* Nov. 30, 1997, 102(C12), p.26,877-26,886, 32 refs.

Glaciology, Paleoclimatology, Ice sheets, Glacier surveys, Radiometry, Snow cover structure, Hoarfrost, Snow accumulation, Brightness, Surface temperature, Stratigraphy, Ice cores, Correlation, Greenland—Summit

52-2776

Time-domain reflectometry of water content in portland cement concrete.

Korhonen, C.J., Janoo, V.C., Berini, C.M., SR 97-27, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Nov. 1997, 15p., ADA-333 010, 8 refs.

Water content, Winter concreting, Concretes, Cements, Dielectric properties

Time-domain reflectometry is useful for measuring the moisture content of solids. However, little information exists on its use with portland cement concrete. By monitoring the response from TDR sensors embedded in concrete as the concrete dried, a second-order polynomial equation that relates dielectric constant to moisture content was developed. The study is valid for the specific concrete studied.

52-2777

Floristic inventory and spatial database for Fort Wainwright, interior Alaska.

Racine, C., Lichvar, R., Murray, B., Tande, G., Lipkin, R., Duffy, M., SR 97-23, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Oct. 1997, 68p., ADA-333 255, Refs. p.23-30.

Site surveys, Plants (botany), Mosses, Lichens, Tundra vegetation, Wetlands, Steppes, Grasses, Data processing, Environmental impact, United States—Alaska—Fort Wainwright

An inventory of the vascular and ground-inhabiting cryptogam flora of Fort Wainwright was conducted during the summer of 1995 to support land management needs related to the impact of training. Primary plant collecting, identification and verification were conducted by the Alaska National Heritage Program and the University of Alaska Museum. The work was supervised and the data compiled into a geographic information system by the USA Cold Regions Research and Engineering Laboratory and the USA Waterways Experiment Station. Fort Wainwright covers 370,450 hectares (915,000 acres). Over 100 sites were visited, with habitats ranging from very dry south-facing slopes to forest, floodplains, wetlands, and alpine tundra. Vascular collections represented 491 species, included about 26% of Alaska's vascular flora, and are considered to be relatively complete. The cryptogam collections included 219 species, representing 92 mosses, 117 lichens, and 10 liverworts. The flora is characteristic of the circumpolar boreal forest and wetlands of both North America and Eurasia, but it also contains alpine and dry-grassland and steppe species.

52-2778

Current and proposed practices for nondestructive highway pavement testing.

Kestler, M.A., SR 97-28, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Nov. 1997, 7p., ADA-332 987, 3 refs.

Pavements, Tests, Computer programs

In Sep. 1994 the U.S. Army Cold Regions Research and Engineering Laboratory distributed a short survey on nondestructive testing practices to each of the 50 state Departments of Transportation (DOTs). The compilation of results constituted Phase I of a multiphase effort intended to lead toward the development of a method for optimizing falling weight deflectometer (FWD) test point spacing. Planned spatial statistical analyses on selected data sets will yield (site-specific) optimal FWD test point spacing for road network evaluation and pavement overlay design. Optimal FWD test point spacing reduces conservative overdesign due to undertesting and reduces overtesting. Both of these ultimately reduce expenditures. Although the above effort has not been completed, this interim report outlines the proposed process. Also included (and perhaps of more immediate interest to state DOTs) are direct survey facts and figures, including number of states with nondestructive testing devices, average number of miles of annual overlay design, average number of miles of network/inventory testing, and back-calculation programs and overlay design procedures used. All facts and figures are generic and honor state anonymity.

52-2779

Decontaminating materials used in groundwater sampling devices.

Parker, L.V., Ranney, T.A., SR 97-24, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Oct. 1997, 29p., ADA-332 735, 36 refs.

Ground water, Sampling, Pumps, Cold weather performance, Water pollution

In these studies, the efficiency of various decontamination protocols was tested by using small pieces of materials commonly used in groundwater sampling devices. Three types of materials that ranged in their ability to sorb organic solutes were tested: stainless steel, polyvinyl chloride, and polytetrafluoroethylene (PTFE). Generally, contact times for sorption and desorption were 10 minutes and 24 hours. These results indicate that, generally, organic contaminants are removed from these materials simply by washing with a hot detergent solution and rinsing with hot water. The exceptions were low-density polyethylene tubing that was exposed to a pesticide test solution for 24 hours and allowed to desorb for 24 hours, and PTFE that was exposed to volatile organics for 24 hours. For these, a hot detergent water wash and rinse followed by oven drying at ca. 105°C was the most effective treatment. With this treatment, VOCs were not detected desorbing from the PTFE, and pesticide contamination desorbing from LDPE was substantially reduced. Solvent rinsing did not improve removal of VOCs and only marginally improved removal of pesticides from LDPE.

52-2780

Antifreeze admixtures for concrete.

Korhonen, C.J., Cortez, E.R., Durning, T.A., Jeknavorian, A.A., SR 97-26, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Oct. 1997, 46p., ADA-332 653, 8 refs.

Antifreezes, Concrete admixtures, Winter concreting, Cold weather construction, Thermal insulation, Low temperature tests

The goal of this project was to develop a chemical admixture that would reduce the need for wintertime thermal protection of freshly placed concrete. Chemicals were investigated for their ability to promote strength gain in concrete cured below 0°C. Laboratory strength tests established that 2 prototype admixtures were capable of protecting concrete down to -5°C. Results from other laboratory tests show that the chemicals pose no harm to the concrete or embedded ferrous metals. Concrete containing the prototype admixtures passes standard freeze-thaw tests, does not shrink unusually, does not contain harmful alkalis, and does not produce irregular hydration products. Field tests showed that working with these new admixtures requires no new skills. The concrete can be mixed at lower temperatures, saving energy. The admixtures are easily dosed into the mixing trucks and concrete is finished in the usual manner. Estimates show that the 2 prototype admixtures can extend the construction season by as much as 3 months in the contiguous U.S. The prototype has proved that low-temperature admixtures are possible. The industry partner sees the need to develop admixtures that will work to -10°C before going commercial with this technology.

52-2781

Decontaminating groundwater sampling devices.

Parker, L.V., Ranney, T.A., SR 97-25, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Oct. 1997, 20p., ADA-332 657, 34 refs.

Ground water, Sampling, Pumps, Cold weather performance, Water pollution

These studies are the second part of a two-year project that examines decontaminating groundwater sampling devices. In the first year, the efficiency of various decontamination protocols was tested using small test pieces of materials that are commonly used in groundwater sampling devices. Those tests showed that a hot detergent wash and rinse followed by hot air drying (105°C) was the most effective decontamination protocol. Two groundwater sampling devices, a bailer and a bladder pump, were used to sample groundwater that was contaminated with either trichloroethylene, munitions, or pesticides. These studies showed that a hot detergent wash and hot water rinse followed by hot air drying is an effective method for decontaminating these sampling devices.

52-2782

Ice strength as a function of hydrostatic pressure and temperature.

Fish, A.M., Zaretskiĭ, IU.K., CR 97-06, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Oct. 1997, 14p., ADA-333 030, 24 refs.

Ice strength, Ice melting, Compressive properties, Shear strength, Temperature effects, Pressure, Cohesion, Mathematical models, Internal friction

A temperature model has been developed that describes the ice strength in a multiaxial stress state over a wide spectrum of negative temperatures. The model takes into account the anomalous behavior of ice under high hydrostatic pressure, when its strength reaches a maximum, and then gradually decreases with the pressure increase. It has been shown that strength of ice under high hydrostatic pressure is described by a parabolic yield criterion with only three fundamental parameters, ice cohesion, internal friction angle, and ice melting pressure, which all have a definite physical meaning and are functions of temperature. The model has been verified using test data on the strength of iceberg ice and laboratory-made polycrystalline freshwater ice under triaxial compression at strain rates between 10^{-3} and 10^{-5}/s over the temperature range between -1° and -40°C.

52-2783

FREZCHEM2: a chemical thermodynamic model for electrolyte solutions at subzero temperatures.

Mironenko, M.V., Grant, S.A., Marion, G.M., Farren, R.E., CR 97-05, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Oct. 1997, 40p., ADA-333 040, 14 refs.

Thermodynamics, Mathematical models, Cold weather operation, Computer programs, Data processing, Sea water, Evaporation, Freezing, Ice formation

This report documents a Fortran version of a chemical thermodynamic model for aqueous electrolyte solutions at subzero temperatures, FREZCHEM2, which is a further development of the FREZCHEM model. The model uses thermodynamic data of Spencer-Møller-Weare that permit the calculation of chemical equilibria in the Na-K-Ca-Mg-Cl-SO_4-H_2O system between -60 and 25°C at atmospheric pressure. It applies the Gibbs energy minimization method for chemical equilibrium computation combined with Pitzer equations for activity coefficients and water activity calculation. The model includes both the freezing (melting) reaction pathway at fixed water amount and the evaporation (dilution) pathway at fixed temperature. The FREZCHEM2 model can be extended with respect to independent components, electrolyte species, and solids, and if corresponding thermodynamic data are available, the model may be used to compute chemical equilibria in any systems that include aqueous-solution and/or one-component solid phases.

52-2784

Pole positions.

Dingwall, P.R., Cessford, G., *Ecodecision,* Spring 1996, Vol.20, p.65-68.

Environmental impact, Environmental protection, International cooperation

The booming tourist industry in the Arctic and Antarctic will need to be managed carefully to keep it from causing environmental problems. Elements of a successful approach will include strong and enforceable regulations; rigorous environmental impact reporting and assessment procedures; practical management policies, guidelines, and operational codes; tourist industry self-regulation; improved procedures for reporting and information exchange; research on tourists and their impacts on the area; and improved education and training for tour operators and visitors. Current regulations and protocols are summarized. Two sets of Ecotourism guidelines, one developed by Sweden and the other by the International Association of Antarctic Tour Operators, are listed. (Auth.)

52-2785
Sotkamo ice lake. [Sotkamon jääjärvi]
Saarelainen, J., Vanne, J., *Terra,* 1997, 109(1), p.25-32, In Finnish with English summary. 12 refs.
Geomorphology, Pleistocene, Geological surveys, Computerized simulation, Imaging, Glacial hydrology, Glacial lakes, Glacial deposits, Lacustrine deposits, Glacier oscillation, Finland

52-2786
Grímsvötn flooding as volcanic eruptions cause lake bursts. [Grímsvötnin vedet purkautuvat jökulhlaupina]
Kajuutti, K., *Terra,* 1997, 109(1), p.33-38, In Finnish. 15 refs.
Glacial hydrology, Lake bursts, Glacier melting, Geothermal thawing, Volcanoes, Flooding, Iceland—Grímsvötn

52-2787
Evaluation of deterministic models for near surface soil moisture prediction: an operational off-road trafficability forecasting model. Final technical report.
Cochrane, J.E., Anderson, M.G., London, U.S. Army European Research Office, Oct. 1988, 678p. (2 vols.), Ph.D thesis submitted to the University of Bristol, England. Refs. p.457-468. Pages 501-641 are bound in reverse order in the source. For another version see 48-5377.
Soil water, Soil strength, Soil trafficability, Route surveys, Military operation, Environment simulation, Computer programs, Mathematical models

52-2788
Polar engineering technology.
U.S. Army Cold Regions Research and Engineering Laboratory, MP 5100, Hanover, NH, June 1977, 14p.
Cold weather construction, Cold weather operation, Organizations, Research projects, Cost analysis

52-2789
Concrete construction engineering handbook.
Nawy, E.G., ed, Boca Raton, FL, CRC Press LLC, 1997, Var. p. (Pertinent p.5/33-5/36).
DLC TA681.C743 1997
Winter concreting, Concrete curing, Air entrainment

52-2790
Study of United States arctic research policy and the possible roles of the Naval Arctic Research Laboratory. [1982], 77p. + appends., Unpublished report prepared by an ad hoc study team consisting of members from the U.S. Departments of Interior, Defense, and Energy. 5 refs. In 1983, the management of the Laboratory was turned over to the University of Alaska Fairbanks, where it has remained since.
Organizations, Laboratories, Research projects, Regional planning, Legislation, Cost analysis

52-2791
Cold-weather engineering. Chapters VI to X.
U.S. Department of the Navy. Civil Engineer Corps. Bureau of Yards and Docks, 1949, 148p., 27 refs.
For chapters 1-5 see 01000534.
Cold weather construction, Cold weather operation, Military facilities, Site surveys, Utilities, Logistics, Buildings, Aircraft landing areas, Permafrost beneath structures, Permafrost beneath roads, Moorings

52-2792
Tactical fundamentals for cold weather warfighting. *U.S. Marine Corps. Fleet Marine Force Manual,* 1992, FMFM 7-21, Var. p., 36 refs.
Military operation, Cold weather operation, Cold weather survival, Manuals

52-2793
International Arctic Buoy Program data report 1 January 1995-31 December 1995.
Rigor, I.G., Heiberg, A., *University of Washington, Seattle. Applied Physics Laboratory. Technical memorandum,* May 1997, APL-UW TM 4-97, 173p. + append.
Polar atmospheres, Marine meteorology, Drift stations, Drift, Air temperature, Surface temperature, Atmospheric pressure, Data transmission

52-2794
Facts about the United States of America Antarctic Program.
U.S. National Science Foundation. Division of Polar Programs, Washington, D.C., July 1986, 14p., Refs. p.8-10.
Stations, Research projects, Logistics, Cost analysis, International cooperation
This pamphlet provides a general description of current research at the U.S. year-round stations and summer camps in Antarctica, and of the ship, air, and land transportation used to supply them; a brief history of some former stations; a summary of U.S. federal agencies, especially of the National Science Foundation, administrative responsibilities, of U.S. participation in international activities, and of U.S. policy for Antarctica. The pamphlet also describes an estimated budget of about $115 million for the U.S. Antarctic Program in Fiscal Year 1986. The full text of the Antarctic Treaty is included as an appendix.

52-2795
Special report: the Antarctic Minerals Convention negotiations.
Kimball, L.A., Washington, D.C., International Institute for Environment and Development, Feb. 1988, 23p., Unpublished manuscript.
Exploration, Minerals, Natural resources, Economic development, Environmental protection, International cooperation, Antarctica
This report describes negotiations on the Antarctic Minerals Convention at the next to final session of the Fourth Special Antarctic Treaty Consultative Meeting (ATCM), in Wellington, New Zealand, Jan. 18-19, 1988. The key issues included inspection, liability, dispute settlement, judicial and institutional review, compliance, and area of application of the Convention, that is, how far offshore into the deep seabed the terms of the convention extend. The final session at which the final version of the Convention was adopted, was subsequently also held in Wellington, May 2-June 3, 1988.

52-2796
Carbonates and cementation of glacially derived cohesive soils in New York State and southern Ontario.
Boone, S.J., Lutenegger, A.J., *Canadian geotechnical journal,* Aug. 1997, 34(4), p.534-550, With French summary. Refs. p.547-550.
Soil physics, Engineering geology, Soil strength, Mechanical properties, Glacial geology, Glacial deposits, Soil cement, Clay soils, Soil pressure, Mineralogy, Compressive properties, Shear strength

52-2797
Estimation of frost load in a trench: theory and experiment.
Zhan, C., Rajani, B., *Canadian geotechnical journal,* Aug. 1997, 34(4), p.568-579, With French summary. 15 refs.
Frozen ground mechanics, Pipelines, Frost heave, Loads (forces), Stress concentration, Freezing front, Soil pressure, Earth fills, Mathematical models, Forecasting, Mechanical tests, Theories

52-2798
Design of large-diameter drilled shafts for the Northumberland Strait bridge project.
Walter, D.J., Burwash, W.J., Montgomery, R.A., *Canadian geotechnical journal,* Aug. 1997, 34(4), p.580-587, With French summary. 13 refs.
Bridges, Pile structures, Foundations, Pile load tests, Ice floes, Protection, Design criteria, Bedrock, Rock properties, Engineering geology, Canada—New Brunswick—Northumberland Strait

52-2799
Freeze-thaw stability of epoxy resin emulsions.
Wegmann, A., *Pigment & resin technology,* 1997, 26(3), p.153-160, 10 refs.
Polymers, Colloids, Protective coatings, Chemical composition, Frost resistance, Freeze thaw cycles, Freeze thaw tests, Temperature effects, Coalescence, Stability, Solubility

52-2800
Antifreeze proteins.
Davies, P.L., Sykes, B.D., *Current opinion in structural biology,* Dec. 1997, 7(6), p.828-834, 37 refs.
Ice physics, Antifreezes, Adsorption, Ice water interface, Physical properties, Molecular structure, Classifications, X ray analysis, Nuclear magnetic resonance, Cryobiology, Hydrogen bonds

52-2801
Plane wave scattering on hexagonal cylinders.
Rother, T., Schmidt, K., Wauer, J., *Journal of quantitative spectroscopy & radiative transfer,* May 1997, 57(5), p.669-681, 29 refs.
Clouds (meteorology), Cloud physics, Ice crystal size, Classifications, Ice crystal optics, Light scattering, Wave propagation, Refractivity, Polarization (waves), Ice models, Mathematical models

52-2802
Polyhedral instability—skeletal and dendritic growth.
Nanev, C.N., *Progress in crystal growth and characterization of materials,* Aug. 1997, 35(1), p.1-26, 83 refs.
Crystal growth, Stability, Ice crystal structure, Snowflakes, Dendritic ice, Defects, Theories

52-2803
Evaluation of key microphysical parameters in three-dimensional cloud-model simulations using aircraft and multiparameter radar data.
Brown, P.R.A., Swann, H.A., *Royal Meteorological Society. Quarterly journal B,* Oct. 1997, 123(544), p.2245-2275, 43 refs.
Climatology, Clouds (meteorology), Precipitation (meteorology), Cloud physics, Convection, Ice crystals, Snow pellets, Scavenging, Phase transformations, Heterogeneous nucleation, Particle size distribution, Radar echoes, Reflectivity, Mathematical models

52-2804
Tail in the air.
Owen, D., *Engineering,* Dec. 1997, 283(11), p.28.
Aircraft icing, Ice control, Ice accretion, Air flow, Topographic effects, Ice air interface, Fluid dynamics, Buoyancy, Computerized simulation, Research projects, Flow control

52-2805
Freezing tolerance of bulb scales of lily cultivars: effects of freezing and storage duration and partial dehydration.
Bonnier, F.J.M., Jansen, R.C., Van Tuyl, J.M., *Journal of plant physiology,* Nov. 1997, 151(5), p.627-632, 23 refs.
Plant physiology, Plant tissues, Frost resistance, Cold storage, Desiccation, Supercooling, Freeze thaw tests, Ion diffusion, Electrical resistivity, Viability, Freezing points, Temperature effects

52-2806
Mysterious overnight disappearance of snow.
Baker, K., *Weather,* Dec. 1997, 52(12), p.366-371, 1 ref.
Climatology, Weather observations, Synoptic meteorology, Precipitation (meteorology), Snow cover stability, Snowmelt, Air temperature, Heating, United Kingdom—England

52-2807
Winter's coming—use freeze protection valves to keep lines flowing.
Tallos, N., *Chemical engineering progress,* Oct. 1997, 93(10), p.66-69.
Water pipelines, Winter maintenance, Frost protection, Ice formation, Ice prevention, Valves, Sensors, Thermal expansion, Design

52-2808
Solute diffusion in poly(vinyl alcohol)/poly(acrylic acid) composite membranes prepared by freezing/thawing techniques.
Hickey, A.S., Peppas, N.A., *Polymer,* Nov. 1997, 38(24), p.5931-5936, 64 refs.
Polymers, Solutions, Composite materials, Freeze thaw cycles, Diffusion, Permeability, Porosity

52-2809
United States Geological Survey Alaska Mineral Resource Appraisal Program (AMRAP) geochemical data for Seward quadrangle, Alaska.
Liss, S.A., Wiltse, M.A., *Alaska. Division of Geological and Geophysical Surveys. Public-data file,* June 1993, No.93-39w, 4p., Includes a 3.5" diskette.
Geological surveys, Exploration, Minerals, Geochemistry, United States—Alaska—Seward

52-2810

Preliminary evaluation of static water level declines in wells in the Maddux Park subdivision, Anchorage, Alaska.

Munter, J.A., *Alaska. Division of Geological and Geophysical Surveys. Public-data file,* Aug. 1989, No.89-21, 6p., 12 refs.

Ground water, Water supply, Water reserves, Wells, Water level, Utilities, United States—Alaska—Anchorage

52-2811

Results of an aquifer test at Peters Creek, municipality of Anchorage, Alaska.

Munter, J.A., *Alaska. Division of Geological and Geophysical Surveys. Public-data file,* Aug. 1986, No.86-77, 7p., 1 ref.

Ground water, Water supply, Wells, Soil pollution, Water pollution, Utilities, United States—Alaska—Anchorage

52-2812

Recent well failures in southwest Eagle River, Alaska.

Munter, J.A., *Alaska. Division of Geological and Geophysical Surveys. Public-data file,* May. 1986, No.86-24, 6p. + append., 2 refs.

Ground water, Water supply, Water reserves, Wells, Water level, Utilities, United States—Alaska—Eagle River

52-2813

Evaluation of aquifers near Alpine Woods subdivision, south Anchorage, Alaska.

Munter, J.A., *Alaska. Division of Geological and Geophysical Surveys. Public-data file,* Feb. 1986, No.86-11, 13p., 8 refs. For another version see 52-1806.

Hydrogeology, Ground water, Water supply, Water reserves, Wells, Utilities, United States—Alaska—Anchorage

52-2814

Water-level declines in wells in south Anchorage, Alaska: presentation to the Alaska Water Board.

Munter, J.A., *Alaska. Division of Geological and Geophysical Surveys. Public-data file,* Oct. 1985, No.85-35, 5p.

Wells, Water level, Water supply, Water reserves, Utilities, United States—Alaska—Anchorage

52-2815

Brief résumé of the geology of Anchorage and vicinity.

Updike, R.G., Schmoll, H.R., *Alaska. Division of Geological and Geophysical Surveys. Public-data file,* 1985, No.85-2, 2p.

Geological surveys, Glacial geology, Marine geology, Tectonics, Geologic structures, United States—Alaska—Anchorage

52-2816

Cost-benefit analysis of airborne gamma radiation snow water equivalent measurements made before the February 1985 Fort Wayne flood.

Carroll, T.R., Marshall, R.D., 1985, 15p., Unpublished manuscript. 10 refs. Presented at the 6th Conference on Hydrometeorology, Indianapolis, IN, Oct. 29-Nov. 1, 1985, sponsored by the American Meteorological Society.

Snowstorms, Snow surveys, Snow water equivalent, Floods, Flood forecasting, Aerial surveys, Gamma irradiation, Radiation measurement, Cost analysis, Statistical analysis, United States—Indiana—Fort Wayne

52-2817

Operational airborne snow water equivalent and soil moisture measurements used in water supply and snowmelt flood forecasting.

Carroll, T.R., Vogel, R.M., Gauthier, R.L., 1985, 17p., Unpublished manuscript. 9 refs. Presented at the 5th Remote Sensing Symposium, Remote Sensing Applications for Water Resources Management, Ann Arbor, MI, Oct. 28-30, 1985, sponsored by the U.S. Army Corps of Engineers.

Snow surveys, Snow hydrology, Snow water equivalent, Snowmelt, Soil water, Runoff forecasting, Flood forecasting, Aerial surveys, Gamma irradiation, Radiation measurement

52-2818

High-frequency asymptotic shape of the primary relaxation in supercooled liquids.

Leheny, R.L., Nagel, S.R., *Europhysics letters,* Aug. 15, 1997, 39(4), p.447-452, 13 refs.

Liquid cooling, Polymers, Supercooling, Dielectric properties, Spectra, Statistical analysis

52-2819

Laboratory testing of dispersants under arctic conditions.

Brandvik, P.J., Knudsen, O.Ø., Moldestad, M.Ø., Daling, P.S., Use of chemicals in oil spill response. Edited by P. Lane, Philadelphia, American Society for Testing and Materials, 1995, p.191-206, STP 1252, 15 refs. For another version see 46-5290.

DLC TD427.P4 U84 1995

Oil spills, Oceanography, Dispersions, Viscosity, Salinity, Weathering, Simulation, Low temperature tests, Environmental protection, Performance

52-2820

Carcass of a bowhead whale (*Balaena mysticetus*) found in the lateral moraine of the Jemelianovbreen glacier, eastern Svalbard.

Lønne, I., Fuglei, E., *Polar research,* June 1997, 16(1), p.9-18, 23 refs.

Glaciology, Glacier flow, Glacier oscillation, Moraines, Marine deposits, Glacial deposits, Sediment transport, Biomass, Radioactive age determination, Correlation, Norway—Svalbard

52-2821

Halogenating activity in an arctic population of brown macroalga *Laminaria saccharina* (L.) Lamour.

Mehrtens, G., Laturnus, F., *Polar research,* June 1997, 16(1), p.19-25, 25 refs.

Marine biology, Biomass, Algae, Littoral zone, Plant physiology, Air water interactions, Vapor transfer, Hydrocarbons, Atmospheric composition, Sampling, Norway—Svalbard

52-2822

Video observations of the underside of arctic sea ice—features and morphology on medium and small scales.

Werner, I., Lindemann, F., *Polar research,* June 1997, 16(1), p.27-36, 39 refs.

Sea ice, Ice bottom surface, Surface structure, Ice water interface, Sediments, Biomass, Algae, Photography, Subglacial observations, Photointerpretation, Arctic Ocean

52-2823

Petrochemistry of Jurassic and Cretaceous tholeiites from Kong Karls Land, Svalbard, and their relation to Mesozoic magmatism in the Arctic.

Bailey, J.C., Rasmussen, M.H., *Polar research,* June 1997, 16(1), p.37-62, Refs. p.58-62.

Pleistocene, Marine geology, Subpolar regions, Tectonics, Continental drift, Magma, Geologic processes, Geochemistry, Sampling, Lithology, Statistical analysis, Norway—Svalbard, Arctic Ocean

52-2824

Convergent flow of ice within the Astrolabe subglacial basin, Terre Adélie, East Antarctica: a hypothesis derived from numerical modelling experiments.

Siegert, M.J., Glasser, N.F., *Polar research,* June 1997, 16(1), p.63-72, 28 refs.

Geomorphology, Ice sheets, Glacier flow, Velocity, Bottom ice, Ice melting, Ice solid interface, Topographic effects, Thermal regime, Ice heat flux, Theories, Mathematical models, Antarctica—Adélie Coast

The existence of a large subglacial lake beneath the antarctic ice sheet at Adélie Coast indicates the presence of basal ice at its pressure-melting temperature. A numerical model of the ice-sheet thermal regime is employed using the balance velocity of the ice sheet as an initial model input in order to calculate ice-sheet basal temperatures. The results from this model show the Adélie Coast area to be characterized by basal freezing. These results allow the process of convergent ice flow within a contemporary ice sheet to be quantified. (Auth. mod.)

52-2825

Arctic system science: land/atmosphere/ice interactions. A plan for action.

Arctic Research Consortium of the United States (ARCUS), McCauley, L.L., ed, Meier, M.F., ed, Fairbanks, AK, 1991, 48p., 45 refs. Based on a workshop held in Boulder, CO, Feb. 26-Mar. 3, 1990.

Research projects, Regional planning, Meetings, Polar atmospheres, Human factors, Environmental impact, Global warming

52-2826

Fronts and Atlantic Storm-Track Experiment (FASTEX): a short overview and the GCSS connection.

Joly, A., Lemaitre, Y., *Global Energy and Water Cycle Experiment. GEWEX news,* Nov. 1997, 7(4), p.1,3-5, 3 refs. GCSS is an acronym for GEWEX Cloud System Study.

Marine meteorology, Atmospheric circulation, Atmospheric disturbances, Storms, Cloud cover, Cloud physics, Meteorological data, Data processing, Weather forecasting, Research projects

52-2827

Atmospheric forcing of deep convection in the Labrador Sea.

Moore, G.W.K., *Global Energy and Water Cycle Experiment. GEWEX news,* Nov. 1997, 7(4), p.6-8, 4 refs.

Marine atmospheres, Air water interactions, Atmospheric circulation, Atmospheric pressure, Ocean currents, Water transport, Heat flux, Convection, Labrador Sea

52-2828

Experimental design and preliminary results from PILPS Phase 2(d).

Schlosser, C.A., Pitman, A.J., Slater, A.G., Henderson-Sellers, A., *Global Energy and Water Cycle Experiment. GEWEX news,* Nov. 1997, 7(4), p.9-11, 8 refs. PILPS is an acronym for Project for the Intercomparison of Land-surface Parameterization Schemes.

Snow hydrology, Snow water equivalent, Snow heat flux, Snow air interface, Soil air interface, Evaporation, Runoff forecasting, Computerized simulation

52-2829

Wastewater treatment method by atomizing and freezing.

White, J.A., *European Patent Office. Patent,* Apr. 16, 1997, 13p., EP 0 768 278 A1, 9 refs.

Water treatment, Sewage treatment, Sanitary engineering, Artificial freezing, Spray freezing, Water pollution, Water chemistry

52-2830
Problems and possibilities of Asian ice core dating method, including bioglaciological approach.
Seko, K., Yoshimura, Y., Kohshima, S., IGBP-PAGES/PEP-II (International Geosphere-Biosphere Programme—Past Global Changes/Protocol for Environmental Protection) Symposium, Nagoya, Japan, Nov. 28-Dec. 1, 1995. Proceedings, Nagoya, University, 1996, p.242-247, 6 refs.
Mountain glaciers, Ice cores, Glacial meteorology, Ice composition, Isotope analysis, Dust, Algae, Soil microbiology, Soil dating, Ice dating, Paleoclimatology, Global change, Nepal, China—Qinghai-Xizang Plateau

52-2831
Multiple-mode airborne laser terrain, wave and ice profiling system.
Jepsky, J., Salem, MA, Associated Controls & Communications (ACCI), Inc., [1981], 11p., Unpublished manuscript. Presented at the American Society of Photogrammetry/American Congress on Surveying and Mapping (ASP-ACSM) Fall Technical Meeting, Sep. 9, 1981.
Lasers, Lidar, Aerial surveys, Photogrammetry, Terrain identification, Ice detection

52-2832
United States Commitment to arctic research.
National Research Council. Polar Research Board. Ad Hoc Committee on Arctic Research Policy, Roederer, J.G., Johnson, P.L., Pierce, C.M., Roots, E.F., Washburn, A.L., Weeks, W.F., MP 5101, Washington, D.C., National Academy Press, 1982, 17p., 12 refs.
Research projects, Regional planning, International cooperation

52-2833
Interface influences upon ice adhesion to airfoil materials.
Reich, A.D., Washington, D.C., American Institute of Aeronautics and Astronautics, 1994, 8p., AIAA 94-0714, 22 refs. Presented at the 32nd Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 10-13, 1994.
Aircraft icing, Ice accretion, Ice adhesion, Ice solid interface, Ice strength, Ice removal, Protective coatings

52-2834
Laurentian Great Lakes ice cover teleconnections.
Assel, R.A., Rodionov, S.N., Annual Climate Diagnostics and Prediction Workshop, 21st, Huntsville, AL, Oct. 28-Nov. 1, 1996. Proceedings, Washington, D.C., U.S. National Oceanic and Atmospheric Administration, National Weather Service, Climate Prediction Center, 1996, p.122-125, 4 refs.
DLC QC980.C54a 21st 1996
Lake ice, Ice conditions, Ice forecasting, Ice air interface, Atmospheric circulation, Atmospheric pressure, Long range forecasting, Global change, Statistical analysis, Great Lakes

52-2835
Plastic anti-icing and /or de-icing surfaces.
Williams, R.F., Dotson, B.R., Lu, C.I., Annual Technical Conference, 33rd, Atlanta, GA, May 1975, Shawbury, England, RAPRA (Rubber and Plastics Research Association) Technology, Ltd., [1975], p.574-576, 10 refs.
Plastics, Ice solid interface, Ice adhesion, Ice accretion, Chemical ice prevention, Ice removal, Protective coatings

52-2836
Satellite SAR remote sensing of Great Lakes ice cover using RADARSAT.
Leshkevich, G.A., Nghiem, S.V., Kwok, R., International Conference on Remote Sensing for Marine and Coastal Environments, 4th, Orlando, FL, Mar. 17-19, 1997. Proceedings. Vol.1, Ann Arbor, Environmental Research Institute of Michigan, 1997, p.126-134, 6 refs.
Lake ice, Ice surveys, Ice conditions, Ice detection, Synthetic aperture radar, Spaceborne photography, Great Lakes

52-2837
Climatic changes near the Great Lakes inferred from 141 year ice records.
Assel, R.A., Robertson, D.M., International Meeting on Statistical Climatology, 5th, Toronto, Ontario, June 22-26, 1992, Ottawa, Environment Canada, Atmospheric Environment Service, 1992, p.81-85, 9 refs.
Lake ice, Ice conditions, Freezeup, Ice breakup, Ice heat flux, Ice air interface, Climatic changes, Air temperature, Meteorological data, Statistical analysis, United States—Wisconsin—Mendota, Lake, United States—Michigan—Grand Traverse Bay

52-2838
Winter forage selection by barren-ground caribou: effects of fire and snow.
Saperstein, L., *Rangifer. Special issue,* 1996, No.9, North American Caribou Workshop, 6th, Prince George, British Columbia, Mar. 1-4, 1994, p.237-238.
Tundra vegetation, Lichens, Mosses, Animals, Grazing, Ecology, Snow cover effect, Forest fires

52-2839
Links between lake ice and climate variations.
Lindner, B.L., McKay, C.P., Clow, G.D., Conference on Climate Variations, 6th, Nashville, TN, Jan. 23-28, 1994. Preprints, Boston, American Meteorological Society, 1994, p.377-378, 15 refs.
Frozen lakes, Lake ice, Ice air interface, Ice heat flux, Ice cover thickness, Ice melting, Water level, Climatic changes, Global warming, Antarctica—Hoare, Lake
Variations in lake ice thickness and lake levels in the McMurdo Dry Valleys could serve as indicators of short term climate changes, that is, on timescales of less than a hundred years. With global warming, the thickness of the ice cover on the lakes would decrease and the lake levels would rise due to an increased influx of glacial meltwater. Measurements at Lake Hoare have shown that the average ice thickness decreased from about 5.5 m to 2.7 m, 1978-1988, a thinning of about 40%, and the lake level rose an average of about 8 cm/yr, 1972-1982.

52-2840
Dichotomous collective proton dynamics in ice.
Zolotariuk, A.V., Savin, A.V., Economou, E.N., *Physical review B,* Jan. 1, 1998, 57(1), p.234-245, 33 refs.
Ice physics, Ice structure, Molecular structure, Latticed structures, Molecular energy levels, Proton transport, Hydrogen bonds, Ions, Defects, Ice models

52-2841
Stress-separation curves for saline ice using fictitious crack model.
Mulmule, S.V., Dempsey, J.P., *Journal of engineering mechanics,* Aug. 1997, 123(8), p.870-877, 31 refs.
Ice mechanics, Ice cracks, Cracking (fracturing), Crack propagation, Orientation, Salt ice, Sea ice, Ice models, Strains, Stress concentration, Ice elasticity, Simulation, Mathematical models, Correlation

52-2842
Wavelet spectral analysis of the Earth's orbital variations and paleoclimatic cycles.
Liu, H.S., Chao, B.F., *Journal of the atmospheric sciences,* Jan. 15, 1998, 55(2), p.227-236, 35 refs.
Paleoclimatology, Climatic changes, Insolation, Periodic variations, Sediments, Loess, Oxygen isotopes, Remanent magnetism, Sampling, Spectra, Models, Statistical analysis, Correlation

52-2843
Visualization of freezing behaviors in leaf and flower buds of full-moon maple by nuclear magnetic resonance microscopy.
Ishikawa, M., Price, W.S., Ide, H., Arata, Y., *Plant physiology,* Dec. 1997, 115(4), p.1515-1524, 41 refs.
Plant physiology, Trees (plants), Plant tissues, Cold tolerance, Frost resistance, Supercooling, Freezing, Unfrozen water content, Low temperature tests, Nuclear magnetic resonance, Imaging

52-2844
Results of geomagnetic observations—Polish polar station, Hornsund, Spitsbergen, 1994-1995.
Jankowski, J., ed, *Polish Academy of Sciences. Institute of Geophysics. Publications,* 1997, C-64(301), 90p.
Geological surveys, Geomagnetism, Recording, Electrical logging, Seasonal variations, Norway—Spitsbergen

52-2845
Eemian and early Weichselian (140-60 ka) paleoceanography and paleoclimate in the Nordic seas with comparisons to Holocene conditions.
Fronval, T., Jansen, E., *Paleoceanography,* June 1997, 12(3), p.443-462, Refs. p.460-462.
Pleistocene, Paleoclimatology, Heat flux, Paleoecology, Ocean currents, Hydrography, Marine deposits, Isotope analysis, Stratigraphy, Ice rafting, Glacier oscillation, Drill core analysis, Correlation, Norwegian Sea, Iceland Sea, Greenland Sea

52-2846
Spreading of oil spilled under floating broken ice.
Yapa, P.D., Weerasuriya, S.A., *Journal of hydraulic engineering,* Aug. 1997, 123(8), p.676-683, 17 refs.
Oil spills, Floating ice, Liquid solid interfaces, Ice water interface, Dispersions, Seepage, Interfacial tension, Simulation, Mathematical models

52-2847
Arctic environmental protection strategy 1997: guidelines for environmental impact assessment (EIA) in the Arctic. Helsinki, Finnish Ministry of the Environment, 1997, 50p.
Organizations, Regional planning, International cooperation, Environmental protection

52-2848
Annual report 1993.
Arctic Institute of North America, Calgary, Alberta, University, [1994], 23p., Refs. p.14-15.
Organizations, Research projects, Regional planning, Cost analysis

52-2849
Snow and avalanches in the Swiss Alps, winter 1995/96. [Schnee und Lawinen in den Schweizer Alpen, Winter 1995/96], *Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung. Winterbericht,* 1997, No.60, 248p., In German. Ref. passim.
Snow surveys, Snowfall, Snow depth, Snow accumulation, Snow cover stability, Weather stations, Meteorological data, Avalanches, Accidents, Switzerland

52-2850
Deterioration of heat-cured mortars due to the combined effect of delayed ettringite formation and freeze/thaw cycles.
Shao, Y., Lynsdale, C.J., Lawrence, C.D., Sharp, J.H., *Cement and concrete research,* Nov. 1997, 27(11), p.1761-1771, 17 refs.
Mortars, Mechanical properties, Chemical properties, Concrete strength, Frost resistance, Damage, Degradation, Permeability, Freeze thaw cycles, Freeze thaw tests, Scanning electron microscopy

52-2851
Iceland 1986 GPS geodetic survey: tectonic goals and data processing results.
Foulger, G.R., et al, *Bulletin géodésique,* July 1993, 67(3), p.148-172, 49 refs.
Geodetic surveys, Geophysical surveys, Subpolar regions, Spacecraft, Lasers, Tectonics, Earthquakes, Fracture zones, Data processing, Computer programs, Iceland

52-2852
Stress pattern in the double seismic zone beneath Cook Inlet, south-central Alaska.
Ratchkovsky, N.A., Pujol, J., Biswas, N.N., *Tectonophysics,* Nov. 30, 1997, 281(3-4), p.163-171, 37 refs.
Tectonics, Earthquakes, Seismic surveys, Seismic velocity, Geologic structures, Stress concentration, Orientation, United States—Alaska—Cook Inlet

52-2853

Nucleation and growth of ice particles in the upper mesosphere.

Reid, G.C., *Advances in space research,* Sep. 1997, 20(6), COSPAR Symposium on Coupling and Energetics in the Stratosphere-Mesosphere-Thermosphere-Ionosphere System, Birmingham, UK, July 14-21, 1996. Proceedings. Edited by J. Lastovicka, D. Rees and W.E. Ward, p.1285-1291, 25 refs.

Cloud physics, Condensation nuclei, Aerosols, Dust, Ice crystal growth, Heterogeneous nucleation, Ionization, Scavenging, Coagulation, Theories

52-2854

Surface and bulk diffusion of HDO on ultrathin single-crystal ice multilayers on Ru(001).

Livingston, F.E., Whipple, G.C., George, S.M., *Journal of chemical physics,* Feb. 1, 1998, 108(5), p.2197-2207, 70 refs.

Ice physics, Ice crystals, Ice surface, Ice solid interface, Thermal diffusion, Migration, Lasers, Probes, Temperature effects, Thermodynamic properties

52-2855

Gases in ice cores.

Bender, M., Sowers, T., Brook, E., *National Academy of Sciences of the United States of America. Proceedings,* Aug. 5, 1997, 94(16), National Academy of Sciences Colloquim on Carbon Dioxide and Climate Change, Irvine, CA, Nov. 13-15, 1995, p.8343-8349, 46 refs.

Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Bubbles, Gases, Ice air interface, Firn, Carbon dioxide, Atmospheric composition, Sampling

This paper reviews the glaciological processes by which air is trapped in glacial ice and discusses processes that fractionate gases in ice cores relative to the contemporaneous atmosphere. It also summarizes concentration-time records for CO_2 and CH_4 during the last two glacial-interglacial cycles, and their relation to records of global climate change. (Auth. mod.)

52-2856

Short notes on Alaska geology 1995. *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1995, No.117, 116p., Refs. passim. For selected papers see 52-2857 through 52-2862.

Geological surveys, Exploration, Glacial geology, Glacial deposits, Lacustrine deposits, Quaternary deposits, Minerals, Geochemistry, Soil dating, Stratigraphy, Geochronology, United States—Alaska

52-2857

Radiocarbon age of probable Hayes tephra, Kenai Peninsula, Alaska.

Combellick, R.A., Pinney, D.S., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1995, No.117, Short notes on Alaska geology 1995. Edited by R.A. Combellick and F. Tannian, p.1-9, 15 refs.

Geological surveys, Volcanoes, Volcanic ash, Quaternary deposits, Peat, Mineralogy, Soil composition, Soil dating, Radioactive age determination, Stratigraphy, United States—Alaska—Kenai Peninsula

52-2858

Geochemistry of saline lakes of the northeastern Yukon Flats, eastcentral Alaska.

Hawkins, D.B., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1995, No.117, Short notes on Alaska geology 1995. Edited by R.A. Combellick and F. Tannian, p.11-18, 16 refs.

Salt lakes, Lacustrine deposits, Minerals, Geochemistry, Hydrogeochemistry, Water chemistry, United States—Alaska—Yukon Flats

52-2859

Late-Wisconsin events in the upper Cook Inlet region, southcentral Alaska.

Reger, R.D., Combellick, R.A., Brigham-Grette, J., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1995, No.117, Short notes on Alaska geology 1995. Edited by R.A. Combellick and F. Tannian, p.33-45, 39 refs.

Geological surveys, Glaciation, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Moraines, Glacial till, Outwash, Soil dating, Stratigraphy, Geochronology, United States—Alaska—Cook Inlet

52-2860

Stratigraphy and implications of a lakeside section, Glacial Lake, southwestern Kigluaik Mountains, Seward Peninsula, Alaska.

Reger, R.D., Hopkins, D.M., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1995, No.117, Short notes on Alaska geology 1995. Edited by R.A. Combellick and F. Tannian, p.47-52, 16 refs.

Geological surveys, Alpine glaciation, Glacial geology, Glacial lakes, Glacial deposits, Lacustrine deposits, Quaternary deposits, Soil dating, Stratigraphy, Geochronology, United States—Alaska—Kigluaik Mountains

52-2861

Lithofacies, petrology, and petrophysics of the Kemik Sandstone (lower Cretaceous), eastern arctic slope, Alaska.

Reifenstuhl, R.R., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1995, No.117, Short notes on Alaska geology 1995. Edited by R.A. Combellick and F. Tannian, p.53-67, 36 refs.

Geological surveys, Exploration, Crude oil, Natural gas, Natural resources, Well logging, Lithology, Geochemistry, Stratigraphy, United States—Alaska—North Slope

52-2862

Mineralization and zoning of polymetallic veins in the Beaver Mountains volcano-plutonic complex, Iditarod quadrangle, westcentral Alaska.

Szumigala, D., *Alaska. Department of Natural Resources. Division of Geological and Geophysical Surveys. Professional report,* 1995, No.117, Short notes on Alaska geology 1995. Edited by R.A. Combellick and F. Tannian, p.79-95, 48 refs.

Geological surveys, Exploration, Gold, Natural resources, Minerals, Hydrothermal processes, Geochemistry, United States—Alaska—Beaver Mountains

52-2863

Conservation of Arctic Flora and Fauna (CAFF) 1997: co-operative strategy for the conservation of biological diversity in the arctic region. Helsinki, Finnish Ministry of the Environment, 1997, 18p.

Environmental impact, Environmental protection, Regional planning, International cooperation, Ecology, Ecosystems

52-2864

Northumberland Strait ice properties measurements.

Williams, F.M., Crocker, G., Butt, S., *National Research Council Canada. Institute for Marine Dynamics. Test report,* Mar. 1993, TR-1993-06, 15p. + appends., 9 refs.

Ice surveys, Ice conditions, Ice floes, Ice cover thickness, Ice cover strength, Pressure ridges, Ice pileup, Ice temperature, Ice salinity, Canada—Northumberland Strait

52-2865

Plant community classification for alpine vegetation on the Beaverhead National Forest, Montana.
Cooper, S.V., Lesica, P., Page-Dumroese, D., *U.S. Forest Service. Intermountain Research Station, Ogden, UT. General technical report,* Oct. 1997, INT-GTR-362, 61p., 79 refs.
Alpine tundra, Forest tundra, Tundra vegetation, Plant ecology, Vegetation patterns, Plants (botany), Grasses, Mountain soils, United States—Montana—Beaverhead National Forest

52-2866

Water, ice, and meteorological measurements at South Cascade Glacier, Washington, 1996 balance year.
Krimmel, R.M., *U.S. Geological Survey. Water-resources investigations report,* 1997, No.97-4143, 34p., 13 refs.
Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier oscillation, Glacial meteorology, Glacial hydrology, Meltwater, Runoff, United States—Washington—South Cascade Glacier

52-2867

Variability in roadbase layer properties conducting indirect tensile test.
Said, S.F., *Swedish National Road and Transport Research Institute (Statens Väg och Transportforskningsinstitut). VTI särtryck (reprints),* 1997, No.278, 10p., 15 refs. Presented at the 8th International Society for Asphalt Pavements (ISAP) Conference, Seattle, WA, Aug. 10-14, 1997.
Pavements, Bituminous concretes, Subgrades, Tensile properties, Strain tests, Fatigue (materials), Road maintenance

52-2868

Development of deterioration models for cold climate using long-term pavement field data.
Göransson, N.G., Hudson, W.R., Jämsä, H., Spoof, H., Wågberg, L.G., *Swedish National Road and Transport Research Institute (Statens Väg och Transportforskningsinstitut). VTI särtryck (reprints),* 1997, No.277, 14p., 11 refs. Presented at the 8th International Society for Asphalt Pavements (ISAP) Conference, Seattle, WA, Aug. 10-14, 1997.
Pavements, Bituminous concretes, Cold weather tests, Cold stress, Strain tests, Fatigue (materials), Road maintenance, Statistical analysis, Sweden, Finland

52-2869

Moisture content in road pavements: state of the art and development of a simple moisture measurement equipment. [Fuktmätning i väg: en kunskapsöversikt samt utveckling av en enkel fuktmätningsutrustning]
Svensson, J., *Sweden. Statens Väg och Transportforskningsinstitut (National Road and Transport Research Institute). VTI meddelande,* 1997, No.809, 50p., In Swedish with English summary. 58 refs.
Pavements, Subgrade soils, Soil water, Water content, Moisture detection, Moisture meters, Electromagnetic prospecting, Road maintenance, Sweden

52-2870

Glaciological research in Norway, 1994 and 1995. [Glasiologiske undersøkelser i Norge 1994 og 1995]
Elvehøy, H., Haakensen, N., Kennett, M., Kjøllmoen, B., Kohler, J., Tvede, A.M., *Norges vassdrags- og energiverk (NVE) (Norwegian Water Resources and Energy Administration). Publikasjon,* 1997, No.19, 197p. + 2 fold. maps, In Norwegian with English summary. 44 refs.
Glacier surveys, Mountain glaciers, Glacier mass balance, Glacier oscillation, Glacial hydrology, Norway

52-2871

BEARing the European North: the northern dimension and alternative scenarios.
Heininen, L., ed, Langlais, R., ed, *University of Lapland, Rovaniemi, Finland. Arctic Centre. Reports,* 1997, No.23, 194p., Refs. passim. BEAR is an acronym for Barents Euro-Arctic Region.
Regional planning, Economic development, International cooperation, Environmental protection

52-2872
Blue Earth County Finn Road/Oil Gravel Project.
Forsberg, A.T., *Minnesota Department of Transportation. Local Road Research Board. Report,* Apr 1997, MN/RC-97/12, 22p.
Pavements, Bitumens, Gravel, Aggregates, Road maintenance, Cost analysis, United States—Minnesota

52-2873
Biennial report 1995-1996.
Colorado. University. Institute of Arctic and Alpine Research (INSTAAR), Boulder, University of Colorado, [1997], 40p., Refs. passim.
Organizations, Research projects, Education, Cost analysis

52-2874
Annual report academic year 1996-97.
National Snow and Ice Data Center. World Data Center-A for Glaciology, Boulder, University of Colorado, 1997, 93p., Refs. p.66-76.
Organizations, Research projects, Meetings, Data processing, Snow surveys, Ice surveys, Glacier surveys

52-2875
Glimpse of the glacial.
Stocker, T.F., *Nature,* Jan. 22, 1998, 391(6665), p.338-339, 19 refs.
Sea level, Climate, Hydrologic cycle

52-2876
Simulation of modern and glacial climates with a coupled global model of intermediate complexity.
Ganopolski, A., Rahmstorf, S., Petoukhov, V., Claussen, M., *Nature,* Jan. 22, 1998, 391(6665), p.351-356, 46 refs.
Climate, Models, Atmospheric circulation, Ocean currents, Sea ice distribution
A global coupled ocean-atmosphere model of intermediate complexity is used to simulate the equilibrium climate of both today and the Last Glacial Maximum, around 21,000 years ago. The model successfully predicts the atmospheric and oceanic circulations, temperature distribution, hydrological cycle and sea-ice cover of both periods without using 'flux adjustments'. Changes in oceanic circulation, particularly in the Atlantic Ocean, play an important role in glacial cooling. Throughout the paper numerous parameters such as air temperature, precipitation, wind stress, climate, and salinity, among others, are displayed in figures with area coverages into both polar regions. (Auth. mod.)

52-2877
Simulated future sea-level rise due to glacier melt based on regionally and seasonally resolved temperature changes.
Gregory, J.M., Oerlemans, J., *Nature,* Jan. 29, 1998, 391(6666), p.474-476, 15 refs.
Glacier melting, Sea level, Sea water, Thermal expansion, Seasonal variations

52-2878
Structure of a new phase of ice.
Lobban, C., Finney, J.L., Kuhs, W.F., *Nature,* Jan. 15, 1998, 391(6664), p.268-270, 8 refs.
Ice structure, High pressure ice, Ice density, Stability

52-2879
Dependence of horizontal stress magnitude on load dimension in glacial rebound models.
Johnston, P., Wu, P., Lambeck, K., *Geophysical journal international,* Jan. 1998, 132(1), p.41-60, 54 refs.
Pleistocene, Glacial geology, Ice sheets, Ice loads, Glacier thickness, Tectonics, Earthquakes, Isostasy, Stress concentration, Mathematical models, Viscoelasticity, Ice cover effect

52-2880
Magnetic investigation of a Late Quaternary loess/palaeosol record in Siberia.
Chlachula, J., Evans, M.E., Rutter, N.W., *Geophysical journal international,* Jan. 1998, 132(1), p.128-132, 10 refs.
Paleoclimatology, Climatic changes, Quaternary deposits, Loess, Eolian soils, Sediment transport, Remanent magnetism, Soil formation, Profiles, Correlation, Russia—Siberia

52-2881
Paleomagnetism of the Paleoproterozoic Gowganda and Lorrain formations, Ontario: low paleolatitude for Huronian glaciation.
Williams, G.E., Schmidt, P.W., *Earth and planetary science letters,* Dec. 11, 1997, 153(3-4), p.157-169, 42 refs.
Pleistocene, Glaciation, Ice edge, Continental drift, Quaternary deposits, Stratigraphy, Geomagnetism, Remanent magnetism, Rock magnetism, Orientation, Sampling, Canada—Ontario

52-2882
Rift relocation—a geochemical and geochronological investigation of a palaeo-rift in northwest Iceland.
Hardarson, B.S., Fitton, J.G., Ellam, R.M., Pringle, M.S., *Earth and planetary science letters,* Dec. 11, 1997, 153(3-4), p.181-196, 44 refs.
Pleistocene, Tectonics, Subpolar regions, Geologic processes, Magma, Fluid flow, Geochemistry, Geochronology, Geomagnetism, Isotope analysis, X ray analysis, Profiles, Iceland

52-2883
Thermal and chemical structure of the Iceland plume.
Fitton, J.G., Saunders, A.D., Norry, M.J., Hardarson, B.S., Taylor, R.N., *Earth and planetary science letters,* Dec. 11, 1997, 153(3-4), p.197-208, 51 refs.
Pleistocene, Subpolar regions, Marine geology, Geologic structures, Geologic processes, Magma, Origin, Geochemistry, Statistical analysis, Iceland

52-2884
Direct U-Th dating of organic- and carbonate-rich lake sediments from southern Scandinavia.
Israelson, C., Björck, S., Hawkesworth, C.J., Possnert, G., *Earth and planetary science letters,* Dec. 11, 1997, 153(3-4), p.251-263, 35 refs.
Paleoclimatology, Quaternary deposits, Lacustrine deposits, Ground water, Surface drainage, Drill core analysis, Radioactive age determination, Radioactive isotopes, Statistical analysis, Sweden

52-2885
Neutron signature of Mercury's volatile polar deposits.
Feldman, W.C., Barraclough, B.L., Hansen, C.J., Sprague, A.L., *Journal of geophysical research,* Nov. 25, 1997, 102(E11), p.25,565-25,574, 23 refs.
Extraterrestrial ice, Planetary environments, Regolith, Polar regions, Ground ice, Geochemistry, Radar echoes, Neutron scattering, Ice detection, Theories

52-2886
Small-scale polygonal features on Mars: seasonal thermal contraction cracks in permafrost.
Mellon, M.T., *Journal of geophysical research,* Nov. 25, 1997, 102(E11), p.25,617-25,628, 54 refs.
Mars (planet), Extraterrestrial ice, Patterned ground, Geomorphology, Periglacial processes, Permafrost physics, Ice wedges, Frozen ground mechanics, Cracking (fracturing), Thermal stresses, Models

52-2887
Marraat oil discovery on Nuussuaq, West Greenland: evidence for a latest Cretaceous-earliest Tertiary oil prone source rock in the Labrador Sea-Melville Bay region.
Christiansen, F.G., et al, *Bulletin of Canadian petroleum geology,* Mar. 1996, 44(1), p.39-54, With French summary. 61 refs.
Hydrocarbons, Reservoirs, Subpolar regions, Geological surveys, Drill core analysis, Crude oil, Degradation, Lithology, Carbon isotopes, Isotope analysis, Chemical analysis, Greenland—Nuussuaq

52-2888
Characterization of major unconformities by paleothermometric and paleobarometric methods: application to the Mackenzie Plain, Northwest Territories, Canada.
Feinstein, S., Issler, D.R., Snowdon, L.R., Williams, G.K., *Bulletin of Canadian petroleum geology,* Mar. 1996, 44(1), p.55-71, With French summary. 45 refs.
Geological surveys, Geothermal prospecting, Stratigraphy, Sedimentation, Compaction, Porosity, Hydrocarbons, Profiles, Exploration, Canada—Northwest Territories—Mackenzie Plain

52-2889
Cambrian shelf stratigraphy of North Greenland.
Ineson, J.R., Peel, J.S., *Geology of Greenland survey bulletin,* 1997, No.173, 120p., Refs. p.116-120.
Pleistocene, Geological surveys, Subpolar regions, Tectonics, Earth crust, Geologic processes, Stratigraphy, Lithology, Sedimentation, Classifications, Geomorphology, Greenland

52-2890
Safe passage questioned: medical care and safety for the polar tourist.
Levinson, J.M., ed, Ger, E., ed, Centreville, MD, Cornell Maritime Press, 1998, 178p., Refs. p.166-169. Based on a conference, "A Medical Standard for Expedition Travel and Tourism", held at the Scott Polar Research Institute, Cambridge, England, Oct. 29-31, 1995.
Health, Safety, Cold weather operation, Cold exposure, Cold weather survival, Rescue operations
Included are a brief overview of the polar regions, a historical perspective on polar exploration and tourism, a review of various nations' experiences at antarctic bases and how they relate to tourism, a discussion of the concerns about medical care and safety for tourists in the Arctic and Antarctic, a review of the potential hazards on board ships, helicopters, and Zodiac-type boats as well as recommendations for safety and well-being for tourists and the doctors who serve them. Particularly useful to physicians and tourists alike are the discussions of qualifications to be a shipboard physician, medicines and equipment needed for polar tourism, preparations for avoiding or handling disasters, and recommendations for tourists on what they can realistically expect to encounter in polar travel. (Auth. mod.)

52-2891
Overview of scale, pattern, process relationships in geomorphology: a remote sensing and GIS perspective.
Walsh, S.J., Butler, D.R., Malanson, G.P., *Geomorphology,* Jan. 1998, 21(3-4), p.183-205, Refs. p.201-205.
Geomorphology, Geophysical surveys, Remote sensing, Spaceborne photography, Alpine landscapes, Landscape development, Landscape types, Classifications

52-2892
Topographic context of glaciers and perennial snowfields, Glacier National Park, Montana.
Allen, T.R., *Geomorphology,* Jan. 1998, 21(3-4), p.207-216, 40 refs.
Climatology, Geomorphology, Glacier surveys, Mountain glaciers, Glacier oscillation, Classifications, Topographic surveys, Topographic effects, Spaceborne photography, Sensor mapping, Statistical analysis, Snow air interface, United States—Montana—Glacier National Park

52-2893
Scale-dependent analysis of satellite imagery for characterization of glacier surfaces in the Karakoram Himalaya.
Bishop, M.P., Shroder, J.F., Jr., Hickman, B.L., Copland, L., *Geomorphology,* Jan. 1998, 21(3-4), p.217-232, Refs. p.230-232.
Glacier surveys, Mountain glaciers, Glacier surfaces, Surface properties, Moraines, Spaceborne photography, Geomorphology, Spectra, Fractals, Image processing, Statistical analysis, Classifications, Pakistan—Batura Glacier

52-2894

Supervised classification of types of glaciated landscapes using digital elevation data.

Brown, D.G., Lusch, D.P., Duda, K.A., *Geomorphology,* Jan. 1998, 21(3-4), p.233-250, Refs. p.248-250.

Geomorphology, Landscape types, Topographic maps, Glacial geology, Glacial deposits, Quaternary deposits, Landforms, Altitude, Image processing, Classifications, United States—Michigan

52-2895

Automated approach to the classification of the slope units using digital data.

Giles, P.T., Franklin, S.E., *Geomorphology,* Jan. 1998, 21(3-4), p.251-264, Refs. p.262-264.

Geomorphology, Subarctic landscapes, Slope processes, Landscape types, Topographic features, Altitude, Reflectivity, Spaceborne photography, Image processing, Computer programs, Classifications, Correlation, Canada—Yukon Territory—Aishihik Lake

52-2896

Integrated geographic information system approach for modeling the suitability of conifer habitat in an alpine environment.

McGregor, S.J., *Geomorphology,* Jan. 1998, 21(3-4), p.265-280, 44 refs.

Forest ecosystems, Alpine tundra, Tundra vegetation, Forest lines, Vegetation patterns, Growth, Geophysical surveys, Sensor mapping, Spaceborne photography, Image processing, Classifications, Models, Geomorphology, United States—Montana—Glacier National Park

52-2897

Satellite-derived vegetation index and cover type maps for estimating carbon dioxide flux for arctic tundra regions.

Stow, D., Hope, A., Boynton, W., Phinn, S., Walker, D., Auerbach, N., *Geomorphology,* Jan. 1998, 21(3-4), p.313-327, 33 refs.

Spaceborne photography, Geomorphology, Arctic landscapes, Landscape types, Terrain identification, Tundra vegetation, Vegetation patterns, Classifications, Sensor mapping, Carbon dioxide, Geochemical cycles, United States—Alaska—North Slope

52-2898

Methane emissions from wetlands in the zone of discontinuous permafrost: Fort Simpson, Northwest Territories, Canada.

Liblik, L.K., Moore, T.R., Bubier, J.L., Robinson, S.D., *Global biogeochemical cycles,* Dec. 1997, 11(4), p.485-494, 43 refs.

Climatology, Global warming, Geochemical cycles, Wetlands, Discontinuous permafrost, Permafrost transformation, Natural gas, Vapor transfer, Soil air interface, Water table, Vegetation factors, Sampling, Canada—Northwest Territories—Fort Simpson

52-2899

Ecosystem simulation model for methane production and emission from wetlands.

Potter, C.S., *Global biogeochemical cycles,* Dec. 1997, 11(4), p.495-506, Refs. p.505-506.

Geochemical cycles, Global change, Wetlands, Ecosystems, Tundra soils, Thaw depth, Soil temperature, Soil air interface, Natural gas, Vapor transfer, Seasonal variations, Mathematical models, United States—Alaska

52-2900

Contribution of terrestrial sources and sinks to trends in the seasonal cycle of atmospheric carbon dioxide.

Randerson, J.T., Thompson, M.V., Conway, T.J., Fung, I.Y., Field, C.B., *Global biogeochemical cycles,* Dec. 1997, 11(4), p.535-560, Refs. p.558-560.

Climatology, Global change, Tundra vegetation, Biomass, Atmospheric composition, Carbon dioxide, Aerosols, Geochemical cycles, Seasonal variations, Statistical analysis, Vegetation factors

52-2901

Mountain glaciers: recorders of atmospheric water vapor content?

Broecker, W.S., *Global biogeochemical cycles,* Dec. 1997, 11(4), p.589-597, 35 refs.

Pleistocene, Paleoclimatology, Climatic changes, Global change, Cooling, Atmospheric composition, Water vapor, Mountain glaciers, Snow line, Snow composition, Isotope analysis, Correlation

52-2902

Leaching of nitrogen from forested catchments in Finland.

Kortelainen, P., Saukkonen, S., Mattsson, T., *Global biogeochemical cycles,* Dec. 1997, 11(4), p.627-638, 21 refs.

Forest ecosystems, Forestry, Geochemical cycles, Subpolar regions, Organic nuclei, Leaching, Vegetation factors, Sampling, Statistical analysis, Finland

52-2903

Nutrient fluxes in forests of the eastern Sierra Nevada mountains, United States of America.

Johnson, D.W., Susfalk, R.B., Dahlgren, R.A., *Global biogeochemical cycles,* Dec. 1997, 11(4), p.673-681, 49 refs.

Forest ecosystems, Forest soils, Alpine landscapes, Nutrient cycle, Soil chemistry, Snow composition, Streams, Snowmelt, Meltwater, Leaching, Ion diffusion, Snow cover effect, Sampling, Hydrogeochemistry, United States—Nevada—Sierra Nevada Mountains

52-2904

Decade of recovery of understory vegetation buried by volcanic tephra from Mount St. Helens.

Zobel, D.B., Antos, J.A., *Ecological monographs,* Aug. 1997, 67(3), p.317-344, Refs. p.341-343.

Plant ecology, Revegetation, Survival, Vegetation patterns, Mountain soils, Sampling, Explosion effects, Volcanic ash, Snow cover effect, Statistical analysis, United States—Washington—Saint Helens, Mount

52-2905

Proterozoic Thule Supergroup, Greenland and Canada: history, lithostratigraphy and development.

Dawes, P.R., *Geology of Greenland survey bulletin,* 1997, No.174, 150p., Refs. p.143-147.

Pleistocene, Geological surveys, Subpolar regions, Marine geology, Geologic processes, Tectonics, Stratification, Stratigraphy, Lithology, Classifications, Greenland—Thule, Canada—Northwest Territories—Ellesmere Island

52-2906

Ground observations and possible source regions of two types of Pc 1-2 micropulsations at very high latitudes.

Dyrud, L.P., et al, *Journal of geophysical research,* Dec. 1, 1997, 102(A12), p.27,011-27,027, 29 refs.

Geomagnetism, Magnetic surveys

Data from a Canadian magnetometer array and two conjugate antarctic AGOs are used to study ULF waves in the Canadian Arctic. The focus is on the spectral properties and latitudinal and local time distributions of Pc 1-2 events observed during 1994; these are used along with several case studies to infer the source locations of the two major wave types. There is little variation in center-band frequency of the Pc 1-2 waves, but the average bandwidth was wider at stations near 80° MLAT than at stations near 75° MLAT. These multistation observations suggest these two wave types originate in quite different regions near the magnetospheric boundary; the more narrowband waves in the subsolar and postnoon equatorial region, and the more broadband waves in the high-latitude plasma mantle, and possibly at the poleward edge of the cusp. (Auth. mod.)

52-2907

Refraction scattering in the anomalous reflections from icy surfaces.

Hagfors, T., Dahlstrøm, I., Gold, T., Hamran, S.E., Hansen, R., *Icarus,* Dec. 1997, 130(2), p.313-322, 18 refs.

Extraterrestrial ice, Satellites (natural), Radar echoes, Regolith, Ground ice, Ice dielectrics, Ice optics, Refractivity, Backscattering, Polarization (waves), Spectra

52-2908

Limnologic analysis of Gusev crater paleolake, Mars.

Grin, E.A., Cabrol, N.A., *Icarus,* Dec. 1997, 130(2), p.461-474, 50 refs.

Mars (planet), Extraterrestrial ice, Limnology, Geomorphology, Spaceborne photography, Icebound lakes, Ice water interface, Ice cover effect, Channels (waterways), Water level, Hydrogeology, Pit and mound topography, Hydrologic cycle

52-2909

Mystery of Callisto: is it undifferentiated.

McKinnon, W.B., *Icarus,* Dec. 1997, 130(2), p.540-543, 25 refs.

Satellites (natural), Extraterrestrial ice, Geologic structures, Lithology, Ice solid interface, Phase transformations, Indexes (ratios), Models, Theories

52-2910

Correct evaluation of the sublimation rate of dusty ices under solar illumination, and its implication on the properties of P/Halley nucleus.

Crifo, J.F., *Icarus,* Dec. 1997, 130(2), p.549-551, 11 refs.

Extraterrestrial ice, Ice physics, Ice sublimation, Dust, Grain size, Solar radiation, Radiation absorption, Analysis (mathematics), Indexes (ratios), Mass transfer, Vapor transfer

52-2911

Calculation of drainage divides beneath the Svartisen ice-cap using GIS hydrologic tools.

Kennett, M., Rolstad, C., Elvehøy, H., Ruud, E., *Norsk geografisk tidsskrift,* Mar. 1997, 51(1), p.23-28, 12 refs.

Watersheds, Geophysical surveys, Glacial hydrology, Glacier melting, Meltwater, Subglacial drainage, Hydraulics, Glacier beds, Topographic effects, Forecasting, Norway—Svartisen

52-2912

Four-dimensional time-space trend model to be applied in the reconstruction of former sea levels and ice-front recession.

Kjenstad, K., *Norsk geografisk tidsskrift,* Mar. 1997, 51(1), p.29-34, 8 refs.

Glaciology, Glacier oscillation, Sea level, Shoreline modification, Quaternary deposits, Geochronology, Radioactive age determination, Mathematical models, Statistical analysis

52-2913

Landscape regionalization by automatic classification of landform elements.

Sulebak, J.R., Etzelmüller, B., Sollid, J.L., *Norsk geografisk tidsskrift,* Mar. 1997, 51(1), p.35-45, 28 refs.

Geomorphology, Glacial geology, Glacial erosion, Glacial deposits, Landforms, Topographic features, Terrain identification, Altitude, Models, Classifications, Mapping

52-2914

Cartographic generalization of topographic maps—examples from Svalbard.

Amlien, J., *Norsk geografisk tidsskrift,* Mar. 1997, 51(1), p.71-80, 13 refs.

Geography, Mapping, Topographic maps, Subpolar regions, Glacier surfaces, Snow surface, Ice edge, Shores, Channels (waterways), Indexes (ratios), Data processing, Norway—Svalbard

52-2915

Galileo ultraviolet spectrometer observations of atomic hydrogen in the atmosphere of Ganymede.

Barth, C.A., et al, *Geophysical research letters,* Sep. 1, 1997, 24(17), p.2147-2150, 25 refs.

Satellites (natural), Atmospheric composition, Hydrogen, Spectroscopy, Ultraviolet radiation, Extraterrestrial ice, Ground ice, Ice sublimation, Water vapor, Photochemical reactions, Theories

52-2916
Between-year variation in climate-related growth of circumarctic populations of the moss *Hylocomium splendens*.
Callaghan, T.V., Carlsson, B.Å., Sonesson, M., Temesváry, A., *Functional ecology,* Apr. 1997, 11(2), p.157-165, 37 refs.
Plant ecology, Mosses, Arctic landscapes, Subarctic landscapes, Growth, Air temperature, Climatic changes, Global warming, Climatic factors, Growth, Statistical analysis, Correlation

52-2917
Effects of water table manipulation and elevated temperature on the net CO_2 flux of wet sedge tundra ecosystems.
Oechel, W.C., Vourlitis, G.L., Hastings, S.J., Ault, R.P., Jr., Bryant, P., *Global change biology,* Jan. 1998, 4(1), p.77-90, Refs. p.88-90.
Global warming, Wetlands, Tundra vegetation, Ecosystems, Carbon dioxide, Water table, Drainage, Soil temperature, Temperature effects, Evapotranspiration, Geochemical cycles, Simulation, United States—Alaska—Prudhoe Bay

52-2918
Permo-Triassic transition in Spitsbergen: $\delta^{13}C_{org}$ chemostratigraphy, Fe and S geochemistry, facies, fauna and trace fossils.
Wignall, P.B., Morante, R., Newton, R., *Geological magazine,* Jan. 1998, 135(1), p.47-62, Refs. p.60-62.
Pleistocene, Subpolar regions, Marine geology, Rock properties, Sedimentation, Sampling, Paleoecology, Geochemistry, Stratigraphy, Carbon isotopes, Isotope analysis, Norway—Spitsbergen

52-2919
Thermochronological evidence for late Proterozoic (Vendian) cooling in southwest Wedel Jarlsberg Land, Spitsbergen.
Manecki, M., Holm, D.K., Czerny, J., Lux, D., *Geological magazine,* Jan. 1998, 135(1), p.63-69, 23 refs.
Pleistocene, Geological surveys, Subpolar regions, Tectonics, Bedrock, Sedimentation, Geologic processes, Geochronology, Lithology, Isotope analysis, Radioactive age determination, Norway—Spitsbergen

52-2920
Floristical and ecological characterization of the polar desert zone of Greenland.
Bay, C., *Journal of vegetation science,* Nov. 1997, 8(5), p.685-696, 30 refs.
Plant ecology, Ecosystems, Biomass, Arctic landscapes, Deserts, Shores, Soil chemistry, Vegetation patterns, Classifications, Biogeography, Sampling, Greenland

52-2921
Cathodic protection of pipelines in discontinuous permafrost.
Mitchell, C.J., Wright, M.D., Waslen, D.W., *Materials performance,* Oct. 1997, 36(10), p.20-25, 4 refs.
Natural gas, Gas pipelines, Corrosion, Protection, Discontinuous permafrost, Dielectric properties, Freeze thaw cycles, Electrical resistivity, Electric equipment, Design criteria, Canada—Alberta—Zama Lake

52-2922
Effects of labile soil carbon on nutrient partitioning between an arctic graminoid and microbes.
Schmidt, I.K., Michelsen, A., Jonasson, S., *Oecologia,* Dec. 1997, 112(4), p.557-565, 35 refs.
Soil microbiology, Plant ecology, Growth, Subarctic landscapes, Organic soils, Nutrient cycle, Soil chemistry, Modification, Simulation

52-2923
VIL density as a hail indicator.
Amburn, S.A., Wolf, P.L., *Weather and forecasting,* Sep. 1997, 12(3)pt.1, p.473-478, 5 refs.
Precipitation (meteorology), Weather forecasting, Thunderstorms, Water content, Density (mass/volume), Hail, Hailstone structure, Radar echoes, Reflectivity, Correlation

52-2924
Implementation of the cloud prediction scheme in the Eta Model at NCEP.
Zhao, Q.Y., Black, T.L., Baldwin, M.E., *Weather and forecasting,* Sep. 1997, 12(3)pt.2, p.697-712, 25 refs.
Precipitation (meteorology), Clouds (meteorology), Weather forecasting, Cloud physics, Ice water interface, Snowfall, Turbulent diffusion, Ice crystals, Ice sublimation, Hydrologic cycle, Mathematical models

52-2925
Pyrolysis-GC/MS analysis of contaminated soils in Alaska.
White, D.M., Luong, H., Irvine, R.L., *Journal of cold regions engineering,* Mar. 1998, 12(1), p.1-10, 13 refs.
Soil pollution, Oil spills, Hydrocarbons, Organic soils, Sampling, Soil chemistry, Chemical analysis, Origin, Accuracy, Environmental tests, Laboratory techniques, United States—Alaska

52-2926
Thermal ice growth: real-time estimation.
Daly, S.F., MP 5102, *Journal of cold regions engineering,* Mar. 1998, 12(1), p.11-28, 24 refs.
Lake ice, Ice growth, Ice cover thickness, Ice heat flux, Ice water interface, Ice air interface, Mathematical models, Forecasting, Statistical analysis, Accuracy, Thermal conductivity, United States—Alaska—Snowshoe Lake, United States—New Hampshire—Post Pond
The quasi-steady thermal ice growth model was recast in state-space form and used with the Kalman filter to estimate ice thickness and to recursively estimate the model parameters for thermal ice growth. The model was applied to two widely separated sites from which ice thickness measurements were available for a number of winters: Post Pond, NH, and Snowshoe Lake, AK. The parameters required by the Kalman filter were estimated through numerical experiments and were consistent between both locations. The Kalman filter was able to produce better results, as measured by a least-squares criterion, than a model using parameter values that had been determined using all data at each location.

52-2927
Manufacture of biodegradable packaging foams from agar by freeze-drying.
Lee, J.P., Lee, K.H., Song, H.K., *Journal of materials science,* Nov. 1, 1997, 32(21), p.5825-5832, 8 refs.
Cellular plastics, Manufacturing, Freeze drying, Vacuum freezing, Colloids, Solutions, Freezing rate, Ice crystal growth, Porosity, Microstructure, Scanning electron microscopy, Environmental protection

52-2928
Hypervelocity impact experiments on solid CO_2 targets.
Burchell, M.J., Brooke-Thomas, W., Leliwa-Kopystynski, J., Zarnecki, J.C., *Icarus,* Jan. 1998, 131(1), p.210-222, 20 refs.
Extraterrestrial ice, Satellites (natural), Regolith, Ice mechanics, Carbon dioxide, Mechanical properties, Impact tests, Projectile penetration, Pit and mound topography, Sedimentation, Geomorphology, Simulation

52-2929
Peculiarities of the spread of hazardous geocryological processes in the cryolithozone of Russia.
Garagulia, L.S., Gordeeva, G.I., Ershov, E.D., Trush, N.I., *Moscow University geology bulletin,* 1996, 51(4), p.59-73, Translated from Vestnik Moskovskogo universiteta. Geologiia. 22 refs.
Soil surveys, Geocryology, Landscape types, Permafrost distribution, Permafrost transformation, Frozen ground mechanics, Cryogenic soils, Classifications, Distribution, Climatic factors, Engineering geology, Safety, Russia

52-2930
Induction of *kin* genes in cold-acclimating *Arabidopsis thaliana*. Evidence of a role for calcium.
Tähtiharju, S., Sangwan, V., Monroy, A.F., Dhindsa, R.S., Borg, M., *Planta,* Dec. 1997, 203(4), p.442-447, 33 refs.
Plant physiology, Plant tissues, Chemical properties, Cold stress, Cold tolerance, Frost resistance, Acclimatization, Low temperature tests, Simulation, Temperature effects

52-2931
Natural crisis Pleistocene events in northern West Siberia.
Zol'nikov, I.D., *Russian geology and geophysics,* 1996, 37(11), p.23-32, Translated from Geologiia i geofizika. 30 refs.
Pleistocene, Subpolar regions, Subarctic landscapes, Geomorphology, Glacial erosion, Glacier oscillation, Dislocations (materials), Mass movements (geology), Flooding, Forecasting, Russia—Siberia

52-2932
Paleomagnetism and magnetostratigraphy of the Lower Miocene deposits of the Abrosimovka Horizon in West Siberia.
Gnibidenko, Z.N., Geis, V.V., Martynov, V.A., Nikitin, V.P., Semakov, N.N., *Russian geology and geophysics,* 1996, 37(11), p.72-78, Translated from Geologiia i geofizika. 18 refs.
Pleistocene, Geological surveys, Geomagnetism, Subpolar regions, Quaternary deposits, Boreholes, Stratigraphy, Remanent magnetism, Rock magnetism, Geochronology, Correlation, Russia—Siberia

52-2933
Battle of Carson Pass.
Kiester, E., Jr., *Smithsonian,* Mar. 1998, 28(12), p.96-107.
Road maintenance, Winter maintenance, Snowstorms, Snow removal, Cold weather performance, Logistics, Explosives, Avalanche protection, Avalanche triggering, United States—California—Sierra Nevada

52-2934
Complex processing of Kola Peninsula deposits.
Kalinnikov, V.T., *Russian journal of applied chemistry,* May 1997, 70(5), p.671-678, Translated from Zhurnal prikladnoĭ khimii. 47 refs.
Natural resources, Subpolar regions, Sediments, Minerals, Metals, Mining, Economic development, Waste disposal, Environmental protection, Russia—Kola Peninsula

52-2935
Dynamic study of the formation of gas clathrate hydrates: in-situ synchrotron X-ray diffraction and differential scanning calorimetry.
Koh, C.A., et al, *Materials science forum,* 1996, Vol.228-231(pt.1), European Powder Diffraction Conference, 4th, Chester, UK, July 1995. Proceedings. Edited by R.J. Cernik, R. Delhez and E.J. Mittemeijer, p.239-243, 8 refs.
Clathrates, Hydrates, Low temperature research, High pressure tests, Phase transformations, Thermodynamic properties, Ice solid interface, Ice physics, Decomposition, X ray diffraction, Temperature measurement

52-2936
Accretion and evolution of an Archaean high-grade grey gneiss-amphibolite complex: the Fiskefjord area, southern West Greenland.
Garde, A.A., *Geology of Greenland survey bulletin,* 1997, No.177, 115p. + map, Refs. p.95-100.
Geological surveys, Subpolar regions, Earth crust, Sedimentation, Quaternary deposits, Magma, Tectonics, Geologic processes, Rock properties, Geochemistry, Lithology, Greenland

52-2937
Vertical distribution of water content and optical characteristics of continental stratiform clouds.
Mazin, I.P., Monakhova, N.A., Shugaev, V.F., *Russian meteorology and hydrology,* 1996, No.9, p.9-25, Translated from Meteorologiia i gidrologiia. 18 refs.
Climatology, Cloud physics, Sounding, Optical properties, Water content, Profiles, Classifications, Ice crystal optics, Attenuation, Meteorological factors

52-2938
Study of atmospheric ice nuclei over the USSR territory.
Vychuzhaina, M.V., Miroshnichenko, V.I., Plaude, N.O., Potapov, E.I., *Russian meteorology and hydrology,* 1996, No.9, p.26-34, Translated from Meteorologiia i gidrologiia. 24 refs.
Climatology, Cloud physics, Aerosols, Ice nuclei, Condensation nuclei, Aerial surveys, Cloud chambers, Simulation, Seasonal variations, Particle size distribution, Russia

52-2939
Space-time features of relaxation properties of sea ice internal stresses.
Sukhorukov, K.K., *Russian meteorology and hydrology,* 1996, No.11, p.57-65, Translated from Meteorologiia i gidrologiia. 19 refs.
Oceanography, Sea ice, Ice breakup, Ice mechanics, Ice relaxation, Ice plasticity, Stress concentration, Mechanical tests, Simulation, Arctic Ocean, Antarctica—Weddell Sea
As a result of full-scale experimental studies of active dynamic processes in the ice fields of the Arctic and Antarctica in the spring of 1990 and 1992, scale effects of relaxation properties of internal ice stresses were revealed. (Auth.)

52-2940
Phytogeographical study of the vascular plants of West Greenland (62°20'-74°00'N).
Fredskild, B., *Meddelelser om Grønland. Bioscience,* 1996, No.45, 157p., Refs. p.29-30.
Paleoecology, Plants (botany), Quaternary deposits, Biogeography, Vegetation patterns, Mapping, Distribution, Classifications, Palynology, Statistical analysis, Sampling, Greenland

52-2941
***Shewanella gelidimarina* sp.nov. and *Shewanella frigidimarina* sp. nov., novel antarctic species with the ability to produce eicosapentaenoic acid (20:5ω3) and grow anaerobically by dissimilatory Fe (III) reduction.**
Bowman, J.P., et al, *International journal of systematic bacteriology,* Oct. 1997, 47(4), p.1040-1047, 45 refs.
Sea ice, Marine biology, Microbiology, Antarctica—Vestfold Hills, Antarctica—Prydz Bay, Antarctica—Ace Lake
A polyphasic taxonomic study was performed to characterize dissimilatory iron-reducing strains mostly isolated from antarctic sea ice. The strains were isolated from samples of congelated (land-fast) sea ice, grease ice, and ice algal biomass collected from the coastal areas of the Vestfold Hills. A phylogenetic analysis showed that the isolates formed two groups representing novel lineages in the genus *Shewanella.* The whole-cell-derived fatty acid profiles of the sea ice isolates were similar to the profiles obtained for other *Shewanella* species. The omega-3 polyunsaturated fatty acid eicosapentaenoic acid (EPA) was detected in all of the sea ice isolates. EPA was also found at high levels in *Shewanella hanedai* and *Shewanella benthica* but was absent in *Shewanella alga* and *Shewanella putrefaciens.* On the basis of polyphasic taxonomic data, the antarctic iron-reducing strains are placed in two new species, *Shewanella frigidimarina* sp. nov. and *Shewanella gelidimarina* sp. nov. (Auth. mod.)

52-2942
Tundra disturbance studies IV. Species establishment on anthropogenic primary surfaces, Yamal Peninsula, northwest Siberia, Russia.
Forbes, B.C., *Polar geography,* Apr.-June 1997, 21(2), p.79-100, Refs. p.96-100.
Tundra terrain, Continuous permafrost, Tundra vegetation, Roads, Quarries, Damage, Revegetation, Plant ecology, Vegetation patterns, Migration, Environmental impact, Sampling, Russia—Yamal Peninsula

52-2943
Aqueous geochemistry as an indicator of chemical weathering on southeastern Alexander Island, Antarctica.
Meiklejohn, I., Hall, K., *Polar geography,* Apr.-June 1997, 21(2), p.101-112, 25 refs.
Arctic landscapes, Watersheds, Geologic processes, Weathering, Rock properties, Meltwater, Snowmelt, Glacier melting, Streams, Geochemistry, Sampling, Antarctica—Alexander Island
The research presented in this discussion represents investigations to determine the extent of contemporary chemical weathering in an area that hitherto has not been investigated. A glacial outwash stream on southeastern Alexander I. was investigated to determine the extent of active chemical weathering. Data indicate that solution of minerals does take place during the antarctic summer when water is present. Contrary to studies elsewhere in the Antarctic, there is little evidence of maritime or biological influences on the observed weathering regime. Although chemical weathering is active, its relative importance compared to that of physical weathering could not be determined. (Auth. mod.)

52-2944
Periglacial environment of Plateau Mountain: overview of current periglacial research.
Harris, S.A., Prick, A., *Polar geography,* Apr.-June 1997, 21(2), p.113-136, Refs. p.132-136.
Alpine landscapes, Geocryology, Pleistocene, Landscape development, Periglacial processes, Karst, Frost weathering, Sorting, Permafrost bases, Soil temperature, Freeze thaw tests, Canada—Alberta—Plateau Mountain

52-2945
Patterns of frozen ground formation accompanying recent climate changes.
Pavlov, A.V., *Polar geography,* Apr.-June 1997, 21(2), p.137-153, 26 refs.
Climatology, Climatic changes, Global warming, Temperature variations, Geocryology, Frozen ground temperature, Continuous permafrost, Permafrost transformation, Snow cover effect, Temperature effects, Forecasting, Russia

52-2946
New monthly climatology of global radiation for the Arctic and comparisons with NCEP-NCAR reanalysis and ISCCP-C2 fields.
Serreze, M.C., Key, J.R., Box, J.E., Maslanik, J.A., Steffen, K., *Journal of climate,* Feb. 1998, 11(2), p.121-136, 48 refs.
Climatology, Atmospheric boundary layer, Radiation balance, Polar atmospheres, Drift stations, Radiometry, Data processing, Cloud cover, Transmissivity, Seasonal variations, Arctic Ocean

52-2947
Parameterizations for cloud overlapping and shortwave single-scattering properties for use in general circulation and cloud ensemble models.
Chou, M.D., Suarez, M.J., Ho, C.H., Yan, M.M.H., Lee, K.T., *Journal of climate,* Feb. 1998, 11(2), p.202-214, 22 refs.
Climatology, Cloud cover, Cloud physics, Optical properties, Ice crystal optics, Light scattering, Albedo, Spectra, Attenuation, Mathematical models

52-2948
Characteristics of snowfall over the eastern half of the United States and relationships with principal modes of low-frequency atmospheric variability.
Serreze, M.C., Clark, M.P., McGinnis, D.L., Robinson, D.A., *Journal of climate,* Feb. 1998, 11(2), p.234-250, 40 refs.
Climatology, Precipitation (meteorology), Synoptic meteorology, Snowfall, Atmospheric circulation, Seasonal variations, Statistical analysis, Indexes (ratios), Weather observations, United States

52-2949
Homogeneous nucleation of supercooled water: results from a new equation of state.
Jeffery, C.A., Austin, P.H., *Journal of geophysical research,* Nov. 20, 1997, 102(D21), p.25,269-25,279, 49 refs.
Cloud physics, Supercooled clouds, Ice formation, Homogeneous nucleation, Ice water interface, Self diffusion, Nucleation rate, Latent heat, Atmospheric pressure, Thermodynamics, Analysis (mathematics)

52-2950
Distribution of tropospheric methane over Siberia in July 1993.
Tohjima, Y., et al, *Journal of geophysical research,* Nov. 20, 1997, 102(D21), p.25,371-25,382, 30 refs.
Climatology, Tundra terrain, Wetlands, Greenhouse effect, Atmospheric composition, Natural gas, Soil air interface, Turbulent diffusion, Vapor transfer, Aerial surveys, Sampling, Profiles, Russia—Siberia

52-2951
Ozone mass exchange between the stratosphere and troposphere for background and volcanic sulfate aerosol conditions.
Tie, X.X., Hess, P., *Journal of geophysical research,* Nov. 20, 1997, 102(D21), p.25,487-25,500, 61 refs.
Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Volcanic ash, Atmospheric circulation, Ozone, Mass transfer, Seasonal variations, Models
A three-dimensional global chemical/dynamical model is used to study ozone mass exchange between the stratosphere and the troposphere. The ozone budget is calculated in the northern and southern extratropical lowermost stratosphere and in the tropical upper troposphere during both perturbed and background aerosol conditions. In the Southern Hemisphere winter and spring the ozone concentration is already significantly perturbed by the heterogeneous reactions occurring on the surface of polar stratospheric clouds over Antarctica. The further increase in heterogeneous conversion due to the enhanced sulfate aerosol produces a smaller increase in active chlorine than in the Northern Hemisphere, leading to a smaller increase in ozone destruction. (Auth. mod.)

52-2952
Methyl cyanide and hydrogen cyanide measurements in the lower stratosphere: implications for methyl cyanide sources and sinks.
Schneider, J., Bürger, V., Arnold, F., *Journal of geophysical research,* Nov. 20, 1997, 102(D21), p.25,501-25,506, 35 refs.
Climatology, Polar atmospheres, Air pollution, Aerosols, Turbulent diffusion, Stratosphere, Sampling, Aerial surveys, Spectroscopy, Biomass, Environmental tests, Origin, Scandinavia

52-2953
Effect of uncertainties in kinetic and photochemical data on model predictions of stratospheric ozone depletion.
Fish, D.J., Burton, M.R., *Journal of geophysical research,* Nov. 20, 1997, 102(D21), p.25,537-25,542, 18 refs.
Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Degradation, Photochemical reactions, Ozone, Mass transfer, Models, Forecasting, Accuracy

52-2954
Future directions of paleoclimate research.
Broecker, W., *Quaternary science reviews,* Oct. 1997, 16(8), p.821-825, 16 refs.
Paleoclimatology, Theories, Climatic changes, Ice sheets, Glacier oscillation, Research projects, Models

52-2955
Particle and aggregate mobility in till: microscopic evidence of subglacial processes.
Van der Meer, J.J.M., *Quaternary science reviews,* Oct. 1997, 16(8), p.827-831, 22 refs.
Glacial geology, Quaternary deposits, Glacier beds, Deformation, Glacial deposits, Lithology, Soil mechanics, Sediment transport, Particles, Thin sections

52-2956
Origin of the magnetic susceptibility signal in Chinese loess.
Meng, X.M., Derbyshire, E., Kemp, R.A., *Quaternary science reviews,* Oct. 1997, 16(8), p.833-839, 43 refs.
Pleistocene, Paleoclimatology, Quaternary deposits, Loess, Remanent magnetism, Paleoecology, Plant tissues, Decomposition, Sampling, Origin, Vegetation factors, Correlation, China—Loess Plateau

52-2957
Climate and ice-sheet mass balance at the last glacial maximum from the GENESIS version 2 global climate model.
Pollard, D., Thompson, S.L., *Quaternary science reviews,* Oct. 1997, 16(8), p.841-863, Refs. p.860-863.
Paleoclimatology, Pleistocene, Ice sheets, Ice growth, Glacier mass balance, Glacier oscillation, Ice cores, Air ice water interaction, Surface temperature, Models, Simulation, Ice cover effect, Antarctica—Vostok Station, Greenland—Summit
At the glacial maximum about 21 ka BP, the overall mass balance of the Laurentide and Eurasian ice sheets should have been close to zero, since their rate of change of total ice volume was approximately zero at that time. The surface mass balance should have been

zero or positive to balance any iceberg/iceshelf discharge and basal melting, but could not have been strongly negative. This can be tested by global climate model (GCM) simulations with prescribed ice-sheet extents and topography. This paper describes results from a suite of 21 ka BP simulations using a new global climate model (GENESIS version 2.0.a). In common with previous GCM simulations using mixed-layer oceans, substantial cooling over and around Antarctica occurs due to 'normal' GCM dynamics and polar sea-ice feedback, without recourse to changes in thermohaline circulation. The GCM used here is well suited for ice-sheet mass-balance studies because: the surface can be represented at a finer resolution than the atmospheric GCM; an elevation correction accounts for spectral distortions of the atmospheric GCM topography; a simple post-processing correction for refreezing of meltwater is applied; and the model's precipitation and mass balances for present-day Greenland and Antarctica are realistic. (Auth. mod.)

52-2958

Trough mouth fans—palaeoclimate and ice-sheet monitors.

Vorren, T.O., Laberg, J.S., *Quaternary science reviews,* Oct. 1997, 16(8), p.865-881, Refs. p.879-881.

Pleistocene, Paleoclimatology, Ice sheets, Marine geology, Ocean bottom, Geomorphology, Deltas, Glacial deposits, Quaternary deposits, Glacial geology, Sedimentation, Stratigraphy, Norwegian Sea, Greenland Sea

52-2959

Site response as a function of near-surface geology in the South Iceland seismic zone.

Atakan, K., Brandsdóttir, B., Halldórsson, P., Fridleifsson, G.O., *Natural hazards,* May 1997, 15(2-3), p.139-164, Refs. p.162-164.

Tectonics, Subpolar regions, Bedrock, Seismic surveys, Earthquakes, Spectra, Indexes (ratios), Statistical analysis, Detection, Forecasting, Safety, Iceland

52-2960

Ionic defects on a hydrogen-bonded chain.

Howard, I.A., Mittal, R., *Physical review B,* Jan. 1, 1998, 57(1), p.45-48, 11 refs.

Ice physics, Hydrogen bonds, Molecular structure, Defects, Ions, Proton transport, Molecular energy levels, Charge transfer, Ice models

52-2961

Periphyton community structure and dynamics in a subarctic lake.

Maltais, M.J., Vincent, W.F., *Canadian journal of botany,* Sep. 1997, 75(9), p.1556-1569, With French summary. 42 refs.

Limnology, Littoral zone, Ecosystems, Microbiology, Biomass, Algae, Bacteria, Classifications, Photosynthesis, Structural analysis, Sampling, Canada—Quebec—Lac à l'Eau Claire

52-2962

Combined effects of acid mist and frost on the water status of young spruce trees (*Picea abies*).

Esch, A., Mengel, K., *Chemosphere,* Feb. 1998, 36(4-5), International Meeting for Specialists in Air Pollution Effects on Forest Ecosystems, 17th, Florence, Italy, Sep. 14-19, 1996. Edited by E. Paoletti, p.645-650, 10 refs.

Plant physiology, Trees (plants), Plant tissues, Freezing, Water vapor, Water content, Transpiration, Cold tolerance, Frost resistance, Simulation, Temperature effects, Scanning electron microscopy

52-2963

Laboratory testing to evaluate changes in hydraulic conductivity of compacted clays caused by freeze-thaw: state-of-the-art.

Othman, M.A., Benson, C.H., Chamberlain, E.J., Zimmie, T.F., MP 5103, Symposium on Hydraulic Conductivity and Waste Contaminant Transport in Soil, San Antonio, TX, Jan. 21-22, 1993. Edited by D.E. Daniel and S.J. Trautwein, Philadelphia, PA, American Society for Testing and Materials (ASTM), 1994, p.227-254, 35 refs. For another version see 48-1110.

DLC TD878.H95 1994

Waste disposal, Earth fills, Clay soils, Soil compaction, Linings, Soil stabilization, Soil water migration, Seepage, Permeability, Frost resistance, Freeze thaw tests

Several laboratory studies have shown that the hydraulic conductivity of compacted clay may increase up to three orders of magnitude when subjected to freeze-thaw. In this paper, methods to freeze and thaw specimens of compacted clay are reviewed and compared. Methods to measure the hydraulic conductivity of the specimens are also reviewed. Only naturally formed clay soils are considered; soil-bentonite mixtures and other amended soils are not included. A review of testing conditions present during freeze-thaw and their effect on hydraulic conductivity is also included. Testing conditions that are addressed include availability of an external supply of water (closed vs. open system), dimensionality of freezing (one-dimensional vs. three-dimensional), rate of freezing, ultimate temperature, number of freeze-thaw cycles, and state of stress. The rate of freezing, number of freeze-thaw cycles, and state of stress appear to have the largest effect on hydraulic conductivity.

52-2964

Fluid friction in flow under ice.

Dolgopolova, E.N., *Water resources,* Nov.-Dec. 1997, 24(6), p.644-648, Translated from Vodnye resursy. 26 refs.

Hydrodynamics, River flow, River ice, Ice water interface, Ice bottom surface, Friction, Fluid flow, Velocity, Ice cover effect, Surface roughness, Analysis (mathematics), Russia—Moskva River

52-2965

Southern oceanic oscillation.

Xie, S.M., Bao, C.L., Xue, Z.H., Zhang, L., Hao, C.J., *Chinese science bulletin,* May 1996, 41(9), p.749-753, 3 refs.

Climatology, Air ice water interaction, Sea ice distribution, Ice growth, Atmospheric circulation, Periodic variations, Correlation, Statistical analysis, Antarctica—Weddell Sea, Antarctica—Ross Sea

In this note, the interaction between antarctic sea ice and an ENSO (El Ninõ Southern Oscillation) event, specifically the impact of antarctic sea ice on a later ENSO event and the impact of ENSO event on antarctic sea ice, is studied. The purpose is to deduce the variation rule of the interaction and to understand its physical mechanism. (Auth. mod.)

52-2966

Modelling the short-term response of the Greenland ice-sheet to global warming.

Van de Wal, R.S.W., Oerlemans, J., *Climate dynamics,* Oct. 1997, 13(10), p.733-744, 22 refs.

Climatology, Global warming, Ice sheets, Glacier mass balance, Ice heat flux, Glacier ablation, Sea level, Ice air interface, Temperature effects, Basal sliding, Forecasting, Mathematical models, Greenland

52-2967

Variability in annual mean circulation in southern high latitudes.

Connolley, W.M., *Climate dynamics,* Oct. 1997, 13(10), p.745-756, 37 refs.

Climatology, Polar atmospheres, Atmospheric pressure, Atmospheric circulation, Seasonal variations, Spectra, Models, Statistical analysis, Correlation, Antarctica—Orcadas Station, Antarctica—Faraday Station

Using a hierarchy of climate models together with observations from gridded analyses, the author examines the atmosphere-only and coupled ocean-atmosphere variability in the general circulation for the region south of 40°S. The variability in mean sea level pressure (MSLP) is well simulated by the coupled models. The temporal variation in MSLP in southern high latitudes has a white spectrum consistent with "random" forcing by weather events and a decoupling from oceanic "integration". In contrast, the spatial pattern of MSLP variability shows large-scale structure that is consistent between observations and various models, even without interannual variation in SSTs. (Auth. mod.)

52-2968

Finnish research programme on climate change—final report.

Roos, J., ed, Academy of Finland. Publication 4/96, Helsinki, 1996, 505p., Refs. passim. For selected papers see 52-2969 through 52-2992.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Subarctic landscapes, Forest ecosystems, Sea ice, Lake ice, Ice melting, Global warming, Hydrologic cycle, Temperature effects, Growth, Models, Forecasting, Finland

52-2969

Evidence on Holocene temperature variations derived from pine tree rings in the subarctic areas of Fennoscandia.

Eronen, M., Zetterberg, P., Lindholm, M., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.13-18, 8 refs.

DLC QC981.8.C5 H45 1996

Paleoclimatology, Climatic changes, Paleoecology, Subarctic landscapes, Trees (plants), Age determination, Vegetation patterns, Forest lines, Quaternary deposits, Sampling, Geochronology, Finland, Norway

52-2970

Carbon isotopes in tree rings of recent and subfossil Scots pines from northern Finland.

Sonninen, E., Jungner, H., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.19-24, 18 refs.

DLC QC981.8.C5 H45 1996

Paleoclimatology, Climatic changes, Atmospheric composition, Paleoecology, Trees (plants), Radioactive age determination, Quaternary deposits, Isotope analysis, Statistical analysis, Correlation, Finland

52-2971

Precipitation correction, annual water balance components and snow cover periods in Finland 1961-1990.

Solantie, R., et al, Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.29-34, 3 refs.

DLC QC981.8.C5 H45 1996

Precipitation (meteorology), Water balance, Snow hydrology, Snow cover distribution, Snowmelt, Runoff, Seasonal variations, Statistical analysis, Accuracy, Finland

52-2972

Climatic changes in northern Europe.

Heino, R., Tuomenvirta, H., Drebs, A., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.35-40, 10 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Air temperature, Research projects, Meteorological data, Statistical analysis, Correlation, Finland

52-2973

Chemical and physical conversion in cold atmosphere and the effect of radiation.

Kulmala, M., Aalto, P., Korhonen, P., Laaksonen, A., Vesala, T., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.50-55, 17 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic factors, Cloud physics, Optical properties, Polar stratospheric clouds, Aerosols, Ozone, Cloud droplets, Heterogeneous nucleation, Hygroscopic nuclei, Cloud chambers, Models

52-2974

Formation of the natural sulfate aerosol.

Kerminen, V.M., Hillamo, R., Mäkinen, M., Virkkula, A., Mäkelä, T., Pakkanen, T., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.56-61, 16 refs.

DLC QC981.8.C5 H45 1996

Climatology, Subpolar regions, Marine atmospheres, Air water interactions, Cloud physics, Vapor transfer, Atmospheric composition, Aerosols, Climatic factors, Finland

52-2975

Microclimatic models—estimation of components of the energy balance over land surfaces.

Heikinheimo, M., Venäläinen, A., Tourula, T., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.62-67, 7 refs.

DLC QC981.8.C5 H45 1996

Microclimatology, Subpolar regions, Atmospheric composition, Aerosols, Optical properties, Radiation balance, Surface energy, Insolation, Aerosols, Evaporation, Seasonal variations, Models, Sweden

52-2976

Soil-vegetation-atmosphere transfer modeling.

Ikonen, J.P., Sucksdorff, Y., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.68-73, 14 refs.

DLC QC981.8.C5 H45 1996

Microclimatology, Atmospheric composition, Soil air interface, Subarctic landscapes, Forest canopy, Vegetation factors, Climatic factors, Evapotranspiration, Models, Finland

52-2977

Behaviour of stratospheric and upper tropospheric ozone in high and mid latitudes; the role of ozone as a climate gas.

Kyrö, E., Rummukainen, M., Kivi, R., Turunen, T., Karhu, J., Taalas, P., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.77-82, 14 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Atmospheric composition, Ozone, Stratosphere, Aerosols, Degradation, Seasonal variations, Statistical analysis, Models, Finland

52-2978

Ultraviolet radiation in Finland.

Taalas, P., Koskela, T., Kyrö, E., Damski, J., Supperi, A., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.83-91, 9 refs.

DLC QC981.8.C5 H45 1996

Climatology, Subpolar regions, Radiation balance, Ultraviolet radiation, Damage, Radiometry, Spectra, Models, Environmental tests, Seasonal variations, Finland

52-2979

Photochemical processes and ozone production in Finnish conditions.

Laurila, T., Hakola, H., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.92-97, 14 refs.

DLC QC981.8.C5 H45 1996

Climatology, Subpolar regions, Atmospheric boundary layer, Atmospheric composition, Photochemical reactions, Ozone, Fallout, Aerosols, Degradation, Seasonal variations, Sampling, Finland

52-2980

Calibration of the solar UV radiometers in Finland.

Leszczynski, K., Jokela, K., Visuri, R., Ylianttila, L., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.98-103, 8 refs.

DLC QC981.8.C5 H45 1996

Climatology, Solar radiation, Ultraviolet radiation, Measuring instruments, Meteorological instruments, Radiometry, Performance, Accuracy, Finland

52-2981

Effect of climate change on the hydrology of a forested catchment in southern Finland.

Kivinen, Y., Lepistö, A., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.114-118, 7 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Precipitation (meteorology), Watersheds, Subarctic landscapes, Forest ecosystems, Hydrology, Runoff, Snowmelt, Hydrologic cycle, Models, Topographic effects, Finland

52-2982

Estimation of climate change effect on the runoff: improved SOIL model application to Rudbäcken catchment.

Roos, J., Ahonen, J., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.119-123, 3 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Watersheds, Snowmelt, Runoff forecasting, Ground water, Water level, Models, Seasonal variations, Finland—Siuntio

52-2983

Climate change and water resources in Finland.

Vehviläinen, B., Huttunen, M., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.124-129, 2 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Watersheds, Lakes, Water level, Evaporation, Surface drainage, Subarctic landscapes, Water supply, Snowmelt, Models, Finland

52-2984

Effects of climatic change on a small polyhumic lake.

Saura, M., Frisk, T., Bilaletdin, A., Huttula, T., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.163-166, 8 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Limnology, Icebound lakes, Ice breakup, Surface temperature, Biomass, Ecosystems, Hydrogeochemistry, Models, Finland

52-2985

Effects of climatic changes on ice conditions and temperature regime in Finnish lakes (sensitivity analysis of wind forcing and other climatic variables).

Huttula, T., Peltonen, A., Kaipainen, H., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.167-172, 8 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Limnology, Lake ice, Icebound lakes, Ice breakup, Thermal regime, Water temperature, Wind factors, Turbulent exchange, Mathematical models, Ice air interface, Finland

52-2986

Modelling the effects of climate change on nutrient transport from large drainage basins.

Bilaletdin, A., Frisk, T., Vehviläinen, B., Kallio, K., Huttunen, M., Kaipainen, H., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.173-178, 7 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Nutrient cycle, Watersheds, Forest soils, Soil freezing, Mass transfer, Runoff, Mathematical models, Hydrogeochemistry, Finland

52-2987

Effect of climate change on temperature regime and algal biomass in the Gulf of Finland.

Inkala, A., Podsetchine, V., Bilaletdin, A., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.179-184, 5 refs.

DLC QC981.8.C5 H45 1996

Oceanography, Estuaries, Climatology, Climatic changes, Water temperature, Nutrient cycle, Biomass, Plankton, Hydrodynamics, Mathematical models, Wind factors, Finland, Gulf

52-2988

Effects of climate change on the temperature conditions of a lake.

Virta, J., Elo, A.R., Pulkkinen, K., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.185-189, 9 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Limnology, Lake ice, Ice growth, Ice melting, Water temperature, Simulation, Seasonal variations, Finland

52-2989

Climate model for the Baltic Sea ice season.

Leppäranta, M., Haapala, J., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.190-195, 13 refs.

DLC QC981.8.C5 H45 1996

Climatology, Climatic changes, Oceanography, Surface temperature, Sea ice, Seasonal freeze thaw, Ice cover thickness, Air ice water interaction, Mathematical models, Thermodynamics, Baltic Sea

52-2990

Effects of the climatic changes to the hydrography of the Baltic Sea.

Alenius, P., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.215-220, 13 refs.

DLC QC981.8.C5 H45 1996

Oceanographic surveys, Climatology, Climatic changes, Hydrography, Salinity, Water temperature, Surface temperature, Baltic Sea

52-2991

Physiological and genetical adaptation of forest trees to climatic changes.

Beuker, E., Häggman, J., Koski, V., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.281-286, 9 refs.

DLC QC981.8.C5 H45 1996

Forest ecosystems, Plant physiology, Growth, Forest lines, Climatic changes, Global warming, Frost resistance, Temperature effects, Models, Finland

52-2992

Response of northern forest plants to atmospheric changes.

Laine, K., Huttunen, S., Kauppi, M., Ohtonen, R., Lähdesmäki, P., Finnish research programme on climate change—final report. Publication 4/96. Edited by J. Roos, Helsinki, Academy of Finland, 1996, p.309-323, 14 refs.

DLC QC981.8.C5 H45 1996

Climatology, Global warming, Forest ecosystems, Subarctic landscapes, Temperature effects, Air pollution, Growth, Survival, Acclimatization, Research projects, Environmental impact

52-2993

Parallel implementation of the CIS Sea-Ice Motion Tracking Algorithm for coarse-grained multicomputers.

Lee, F., Ottawa, Ontario, Carleton University, 1997, 68p., University Microfilms order No.19485, M.S. thesis. 32 refs.

Ice reporting, Ice forecasting, Sea ice distribution, Ice conditions, Drift, Radar tracking, Spaceborne photography, Image processing, Data transmission, Computer programs, Canada

52-2994

Seasonal structure of the Gulf of St. Lawrence upper-layer thermohaline fields during the ice-free months.

Doyon, P., Montreal, Quebec, McGill University, 1996, 166p. + appends., University Microfilms order No.19807, M.S. thesis. With French summary. Refs. p.155-166.

Oceanographic surveys, Marine atmospheres, Air water interactions, Heat flux, Surface waters, Surface temperature, Sea water, Water temperature, Salinity, Statistical analysis, Canada—Saint Lawrence, Gulf

52-2995

Granular dynamics simulations of wind-driven, broken ice fields.

Renaut, N., Montreal, Quebec, McGill University, 1995, 94p., University Microfilms order No.19698, M.Eng. thesis. With French summary. Refs. passim.

Ice forecasting, Ice floes, Ice cover strength, Ice water interface, Ice air interface, Wind pressure, Drift, Ice deformation, Ice friction, Ice elasticity, Mathematical models

52-2996

Mapping the seasonal evolution of sea ice albedo using ERS-1 SAR signatures of multi-year ice.

Thomas, A., Winnipeg, University of Manitoba, 1996, 238p., University Microfilms order No.16331, M.A. thesis. Refs. p.219-224.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice heat flux, Albedo, Radiometry, Synthetic aperture radar, Spaceborne photography, Image processing, Statistical analysis

52-2997

Texture estimation and texture classification of the SAR image of sea ice.

Huang, J., Calgary, Alberta, University, 1996, 86p., University Microfilms order No.18800, M.S. thesis. Refs. p.82-86.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice surface, Ice detection, Ice edge, Terrain identification, Synthetic aperture radar, Image processing, Statistical analysis

52-2998

On the permeability of frozen silt to organic contaminants.

Winnicky, K.L., Ottawa, Ontario, Carleton University, 1995, 95p., University Microfilms order No.08935, M.A. thesis. Refs. p.90-95.

Oil spills, Waste disposal, Soil pollution, Frozen ground chemistry, Permafrost hydrology, Permafrost preservation, Soil structure, Permeability, Land reclamation

52-2999

Eastern-western arctic sea ice analysis 1993.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1994, n.p., ADA-292 786, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean

52-3000

Eastern-western arctic sea ice analysis 1992.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1993, n.p., ADA-292 105, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3001

Eastern-western arctic sea ice analysis 1991.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1992, n.p., ADA-293 387, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3002

Eastern-western arctic sea ice analysis 1987.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1988, n.p., ADA-205 477, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3003

Eastern-western arctic sea ice analysis 1984.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1985, n.p., ADA-159 906, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3004

Eastern-western arctic sea ice analysis 1983.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1984, n.p., ADA-146 133, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3005

Eastern-western arctic sea ice analysis 1982.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1983, n.p., ADA-132 410, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3006

Eastern-western arctic sea ice analysis 1981.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1982, n.p., ADA-118 893, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3007

Eastern-western arctic sea ice analysis 1980.

U.S. Naval Polar Oceanography Center, Washington, D.C., 1981, n.p., ADA-098 667, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3008

Eastern-western arctic sea ice analyses 1976.

U.S. Navy Fleet Weather Facility, Suitland, MD, [1977], n.p., ADA-043 353, Consists entirely of ice charts.

Ice surveys, Ice reporting, Sea ice distribution, Ice conditions, Ice edge, Maps, Charts, Arctic Ocean, Great Lakes

52-3009

Seasonal skid resistance variations.

Dahir, S.H., Henry, J.J., Meyer, W.E., *Pennsylvania Department of Transportation. Report,* Aug 1979, FHWA/PA-80/75-10, 167p., PB80-222441, 17 refs.

Pavements, Skid resistance, Road maintenance, United States—Pennsylvania

52-3010

Fractal geometry of snowpacks during ablation.

Shook, K., Saskatoon, University of Saskatchewan, 1993, 178p., M.S. thesis. 40 refs.

Snow hydrology, Snow melting, Snowmelt, Snow cover distribution, Snow heat flux, Snow water equivalent, Runoff forecasting, Mathematical models, Computer programs

52-3011

Analysis of data collected during the North Dakota Tracer Experiment: studies of precipitation and hail development in northern Great Plains convective storms.

North Dakota Atmospheric Resource Board, Bismarck, ND, Dec. 1997, 74p., Refs. p.61-74.

Hail clouds, Hailstone growth, Hail prevention, Cloud physics, Cloud seeding, Weather modification, Weather forecasting, United States—North Dakota

52-3012

Alternative snow and ice control methods field evaluation. Final report.

Parker, R., *Oregon Department of Transportation. Research Unit. Report,* Sep. 1997, FHWA-OR-RD-98-03, 34p. + appends., PB98-100852, 20 refs.

Road icing, Chemical ice prevention, Salting, Sanding, Snow removal, Road maintenance, Cost analysis, United States—Oregon

52-3013

Flexural rigidity of Fennoscandia inferred from the postglacial uplift.

Fjeldskaar, W., *Tectonics,* Aug. 1997, 16(4), p.596-608, 37 refs.

Glacial geology, Isostasy, Ice cover thickness, Ice loads, Models, Pressure, Finland, Norway, Sweden

52-3014

Latest neoproterozoic basin inversion of the Beardmore Group, central Transantarctic Mountains, Antarctica.

Goodge, J.W., *Tectonics,* Aug. 1997, 16(4), p.682-701, 81 refs.

Tectonics, Lithology, Geologic structures, Antarctica—Transantarctic Mountains, Antarctica—Cobham Range, Antarctica—Kon-Tiki Nunatak, Antarctica—Nimrod Glacier

New structural data contrast with earlier suggestions that Beardmore rocks record two orogenic deformations, one of the early Paleozoic Ross orogeny and a distinct earlier tectonic event of presumed Neoproterozoic age referred to as the Beardmore orogeny. It is suggested that Beardmore shortening may be related to tectonic inversion of east antarctic marginal-basin strata because of localized compression during proto-Pacific seafloor spreading. The term "Beardmore orogeny" has little meaning as an event of orogenic status, and it should be abandoned. Recognition of this latest Neoproterozoic history reinforces the view that the broader Ross orogeny was not a single event but rather was a long-lived postrifting tectonic process along the east antarctic margin of Gondwanaland. (Auth. mod.)

52-3015

Danish Eulerian hemispheric model—a three-dimensional air pollution model used for the Arctic.

Christensen, J.H., *Atmospheric environment,* Dec. 1997, 31(24), p.4169-4191, Refs. p.4189-4191.

Climatology, Air pollution, Polar atmospheres, Turbulent boundary layer, Aerosols, Atmospheric circulation, Mass transfer, Turbulent diffusion, Fallout, Wind direction, Origin, Seasonal variations, Mathematical models, Arctic Ocean

52-3016

Studies on zooplankton in two acidified high mountain lakes in the Alps.

Cammarano, P., Manca, M., *Hydrobiologia,* Oct. 10, 1997, Vol.356, p.97-109, 43 refs.

Limnology, Alpine landscapes, Ecosystems, Plankton, Biomass, Hydrogeochemistry, Impurities, Ice melting, Ice cover effect, Classifications, Environmental tests, Italy—Alps

52-3017

Onset of Pleistocene glaciation in the Barents Sea: implications for glacial isostatic adjustment.

Kaufmann, G., *Geophysical journal international,* Nov. 1997, 131(2), p.281-292, 35 refs.

Pleistocene, Marine geology, Glacial geology, Glaciation, Isostasy, Sea level, Gravity anomalies, Mathematical models, Ice cover effect, Theories, Barents Sea

52-3018
High-resolution magnetostratigraphy of four sediment cores from the Greenland Sea. I. Identification of the Mono Lake excursion, Laschamp and Biwa I/Jamaica geomagnetic polarity events.
Nowaczyk, N.R., Antonow, M., *Geophysical journal international,* Nov. 1997, 131(2), p.310-324, Refs. p.322-324.
Pleistocene, Quaternary deposits, Marine geology, Marine deposits, Geomagnetism, Remanent magnetism, Drill core analysis, Stratigraphy, Isotope analysis, Radioactive age determination, Greenland Sea

52-3019
High-resolution magnetostratigraphy of four sediment cores from the Greenland Sea. II. Rock magnetic and relative palaeointensity data.
Nowaczyk, N.R., *Geophysical journal international,* Nov. 1997, 131(2), p.325-334, 32 refs.
Pleistocene, Marine geology, Marine deposits, Geochemistry, Geomagnetism, Rock magnetism, Remanent magnetism, Orientation, Polarization (charge separation), Periodic variations, Drill core analysis, Greenland Sea

52-3020
Rapid stabilization of thawing soils: field experience and applications.
Shoop, S.A., Kestler, M.A., Stark, J.A., Ryerson, C.C., MP 5104, European ISTVS Conference, 7th, Ferrara, Italy, Oct. 8-10, 1997. Proceedings, Hanover, NH, International Society for Terrain-Vehicle Systems (ISTVS), 1997, p.69-76, 12 refs.
Ground thawing, Thaw weakening, Soil trafficability, Soil stabilization, Soil cement, Liming, Road maintenance, Military operation
Thawing soils can severely restrict vehicle travel on unpaved surfaces. However, a variety of materials and construction techniques can be used to stabilize thawing soils to reduce immobilization problems. The U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) and the Wisconsin National Guard evaluated several stabilization techniques in a field demonstration project during spring thaw at Fort McCoy, WI, in 1995. Additional tests on chemical stabilizing techniques were conducted at CRREL in Hanover, NH. The results of these test programs were expressed as a decision matrix for stabilizing thawing ground, which was used during the deployment of U.S. troops in Bosnia during Jan. and Feb. of 1996. This paper is an overview of the stabilization work conducted by CRREL and its application. Although the experiments were performed with military vehicles in mind, the techniques are suitable for many civilian applications such as forestry, construction, mining, and oil exploration.

52-3021
Using reduced tire pressures to reduce thaw damage to low-volume roads: background, design, construction, and demonstration project test plan.
Kestler, M.A., MP 5105, International Symposium on Thin Pavements, Surface Treatments, and Unbound Roads, Fredericton, New Brunswick, June 24-25, 1997. Proceedings, Fredericton, University of New Brunswick, 1997, p.257-264, 12 refs.
Pavements, Thaw weakening, Tires, Highway planning, Road maintenance, Cold weather operation, Computerized simulation
Low volume roads with thin bituminous surfaces are highly susceptible to damage during spring thaw. To reduce road damage, towns, cities and states typically post load restrictions. However, the resulting economic impact can be significant. The benefits of using reduced tire pressures to reduce damage to unsurfaced and gravel-surfaced low volume roads have been extensively investigated. Although similar work for bituminous-surfaced low volume roads has been limited, results look extremely promising. Using the U.S. Army Corps of Engineers mechanistic pavement design procedure for areas of seasonal frost, the U.S. Army Cold Regions Research and Engineering Laboratory computed cumulative pavement damage from trucks operating with variable tire pressures during spring thaw. Computer simulations showed that for thin pavements, using trucks with reduced tire pressures could significantly decrease damage to thin, bituminous-surfaced pavements and increase pavement life.

52-3022
Attic ventilation guidelines to minimize icings at eaves.
Tobiasson, W., Buska, J., Greatorex, A., MP 5106, *Interface,* Jan. 1998, 16(1), p.17-24, 8 refs.
Buildings, Roofs, Icicles, Ice prevention, Ventilation, Cold weather construction
In cold regions, icicles and ice dams may develop on roofs that slope to cold eaves. Ventilating the space below the snow-covered roof with outdoor air to create a "cold" ventilated roof is often an effective way to avoid such problems. Several buildings in northern New York were instrumented to determine how their attic temperature influenced icing. The authors observed that problematic icings developed very slowly, if at all, when the outside temperature was above 22°F. Such icings can be avoided by sizing natural, and if necessary, mechanical attic ventilation systems to maintain an attic temperature of 30°F when the outside temperature is 22°F.

52-3023
Army engineers combat northeastern ice storm.
Engineer update, Feb. 1998, 22(2), p.1.
Ice storms, Accidents, Rescue operations, United States—New York, United States—Vermont, United States—New Hampshire

52-3024
Soil Moisture Strength Prediction Model Version II (SMSP II).
Sullivan, P.M., et al, MP 5107, *U.S. Army Waterways Experiment Station, Vicksburg, MS. Geotechnical Laboratory. Technical report,* Aug. 1997, GL-97-15, 104p., 49 refs.
Soil water, Soil strength, Soil trafficability, Precipitation (meteorology), Evaporation, Snow cover effect, Frost penetration, Thaw depth, Mathematical models, Computer programs
Soil strength is a crucial terrain parameter in the prediction of a vehicle's potential for immobilization. The Soil Moisture Strength Prediction Model Version II and its cold regions counterpart, the Cold Regions Soil Moisture Strength Prediction Model, were developed as first-generation models designed to accept a minimal set of weather and terrain data to make a prediction of soil strength based on soil moisture. This effort consolidates the myriad submodules available to process weather and terrain data into one system which allows users to have all of the necessary climatic and terrain data needed for any scenario. Additionally, these models incorporate default inference techniques to account for the absence of daily climatic records and the remote evaluation of site characteristics.

52-3025
Colorado Avalanche Information Center.
Logan, N., Williams, K., *Avalanche review,* Jan. 1998, 16(3), p.1-3.
Avalanche forecasting, Safety, Organizations, Weather stations, Weather forecasting, Data processing, United States—Colorado

52-3026
Use of bomb dogs for misfire searches.
Winder, J., *Avalanche review,* Jan. 1998, 16(3), p.6, 2 refs.
Avalanche triggering, Blasting, Explosives, Safety, Animals, Rescue operations

52-3027
WCB guidelines for avalanche control blasting.
British Columbia Workers' Compensation Board, Victoria, *Avalanche review,* Jan. 1998, 16(3), p.7-9.
Avalanche triggering, Blasting, Explosives, Safety, Legislation, Canada—British Columbia

52-3028
Avalanche notes, courtesy the Westwide Avalanche Network. *Avalanche review,* Jan. 1998, 16(3), p.10-12.
Avalanches, Avalanche triggering, Accidents, United States—Alaska, United States—Utah

52-3029
Gallatin National Forest Avalanche Center.
Birkeland, K., *Avalanche review,* Feb. 1998, 16(4), p.1,3.
Avalanche forecasting, Safety, Organizations, Weather stations, Weather forecasting, Data processing, United States—Montana

52-3030
Route finding in avalanche terrain.
Gallagher, D.C., *Avalanche review,* Feb. 1998, 16(4), p.4,6.
Avalanche forecasting, Avalanche tracks, Safety, Route surveys, Traverses

52-3031
"Safe skiing": backcountry skiing in avalanche terrain.
Meiklejohn, B., *Avalanche review,* Feb. 1998, 16(4), p.5,7,8.
Avalanche forecasting, Avalanche tracks, Safety, Route surveys, Traverses

52-3032
Alta Avalanche Study Center. Miscellaneous report, No.6. Man-made nominal wind action area. Part II (winter 1962-63).
Stillman, R.M., *Avalanche review,* Feb. 1998, 16(4), p.9.
Snow fences, Precipitation gages, United States—Utah

52-3033
Preparedness of the Icelandic Meteorological Office in response to potential avalanche danger.
Magnússon, M.M., *Avalanche review,* Feb. 1998, 16(4), p.10-11, 4 refs.
Avalanche forecasting, Avalanches, Accidents, Organizations, Legislation, Safety, Iceland

52-3034
Artificial snow: a necessary complement. [Neige de culture: un complément nécessaire]
Forget, C., *Neige et avalanches,* Dec. 1997, No.80, p.2-10,32, In French with English summary.
Artificial snow, Snow manufacturing, Cost analysis, France

52-3035
Rescue material for avalanche victims: some innovations. [Appareils de secours pour victimes d'avalanches: quelques nouveautés]
Sivardière, F., *Neige et avalanches,* Dec. 1997, No.80, p.11-13,32, In French with English summary.
Avalanches, Accidents, Rescue equipment, Radio beacons

52-3036
Lessons of avalanche accidents. [Leçons d'accidents d'avalanches]
Guirkinger, G., *Neige et avalanches,* Dec. 1997, No.80, p.14-18,32, In French with English summary. 1 ref.
Avalanches, Avalanche forecasting, Accidents, Safety, Rescue operations, Switzerland

52-3037
Winter of 1996-97 in France. [Aspects de l'hiver 1996-97]
Météo France, *Neige et avalanches,* Dec. 1997, No.80, p.19-23,32, In French with English summary.
Snowfall, Snow cover distribution, Meteorological data, France

52-3038
Avalanche accidents during the 1996-97 year in France. [Bilan des accidents d'avalanches 1996-97]
Sivardière, F., *Neige et avalanches,* Dec. 1997, No.80, p.24-27,32, In French with English summary.
Avalanches, Accidents, France

52-3039
Thermal ice loads on structures.
Azarnejad, A., Edmonton, University of Alberta, 1996, 279p., University Microfilms order No.18014, Ph.D. thesis. Refs. p.273-279.
Ice solid interface, Ice cover strength, Ice deformation, Ice loads, Ice pressure, Ice push, Ice thermal properties, Thermal expansion, Thermal stresses, Mathematical models, Computer programs

52-3040
Neural network-based system for tracking sea-ice floes.
James, Z.D., Montreal, Quebec, McGill University, 1996, 71p., University Microfilms order No.19823, M.S. thesis. With French summary. 22 refs.
Ice surveys, Sea ice distribution, Ice floes, Drift, Ice reporting, Ice forecasting, Synthetic aperture radar, Radar tracking, Spaceborne photography, Image processing, Computerized simulation, Computer programs

52-3041

Electrical conductivity measurements on ice cores from the Canadian Arctic: an analysis of signal variation within and between ice cores.

Zheng, J.C., Ottawa, Ontario, University, 1996, 109p., University Microfilms order No.15690, M.S. thesis. With French summary. Refs. p.94-109.

Ice cores, Glacial meteorology, Glacier oscillation, Glacier ice, Ice composition, Ice electrical properties, Ice dating, Paleoclimatology, Global warming, Statistical analysis, Canada—Northwest Territories—Ellesmere Island

52-3042

Under-ice methane accumulation in Mackenzie Delta lakes and potential flux to the atmosphere at ice-out.

Pipke, K.J., Burnaby, British Columbia, Simon Fraser University, 1996, 198p., University Microfilms order No.17055, M.S. thesis. Refs. p.134-142.

Deltas, Wetlands, Tundra, Lake ice, Ice cover effect, Ice breakup, Flooding, Water chemistry, Hydrogeochemistry, Microbiology, Biomass, Nutrient cycle, Geochemical cycles, Atmospheric composition, Canada—Northwest Territories—Mackenzie Delta

52-3043

Peatland methane emissions and influencing environmental factors in the southern fringe of the discontinuous permafrost zone, Fort Simpson, Northwest Territories.

Liblik, L.K., Montreal, Quebec, McGill University, 1996, 108p., University Microfilms order No.19829, M.S. thesis. With French summary. Refs. p.101-108.

Tundra, Wetlands, Peat, Discontinuous permafrost, Permafrost hydrology, Soil air interface, Plant physiology, Soil microbiology, Soil chemistry, Nutrient cycle, Geochemical cycles, Atmospheric composition, Global warming, Canada—Northwest Territories—Fort Simpson

52-3044

On the development of antarctic katabatic winds and their impact on ocean and ice processes in the coastal southern ocean with implications for primary productivity.

Goodrick, S.L., Huntsville, University of Alabama, 1997, 176p., University Microfilms order No.9729015, Ph.D. thesis. Refs. p.170-176.

Polar atmospheres, Marine atmospheres, Atmospheric composition, Air ice water interaction, Ice cover effect, Ice heat flux, Polynyas, Wind factors, Marine biology, Plankton, Biomass, Nutrient cycle, Geochemical cycles, Mathematical models, Antarctica

A coupled mesoscale atmosphere ocean-sea ice model is described and used to examine the interaction of antarctic katabatic winds with coastal ocean and sea ice processes. These winds are a dominant factor in shaping the climatology of Antarctica, particularly during the austral winter. Phytoplankton blooms in the southern ocean are typically linked to the retreat of the seasonal ice cover. As the sea ice melts the associated input of fresh water stabilizes the surface layer of the ocean limiting the depth of turbulent mixing. In early spring, sea ice coverage, incoming solar irradiance and wind stress are shown to be the major factors contributing to early bloom development. Polynyas are shown to provide a favorable environment for bloom development even in the absence of fresh water input. (Auth. mod.)

52-3045

Investigation of the scaling laws for centrifuge modeling of frost heave.

Yang, D., College Park, University of Maryland, 1997, 233p., University Microfilms order No.9736669, Ph.D. thesis. Refs. p.228-233.

Soil freezing, Frost heave, Frost penetration, Frost resistance, Frost forecasting, Frozen ground thermodynamics, Frozen ground strength, Soil tests, Environmental tests, Mathematical models, Computerized simulation, Statistical analysis

52-3046

Density and index of refraction of water ice films vapor deposited at low temperatures.

Westley, M.S., Baratta, G.A., Baragiola, R.A., *Journal of chemical physics,* Feb. 22, 1998, 108(8), p.3321-3326, 64 refs.

Ice physics, Amorphous ice, Ice density, Ice optics, Water films, Ice solid interface, Refractivity, Indexes (ratios), Ice microstructure, Porosity, Low temperature tests

52-3047

Polarimetric method for ice water content determination.

Ryzhkov, A.V., Zrnic, D.S., Gordon, B.A., *Journal of applied meteorology,* Feb. 1998, 37(2), p.125-134, 24 refs. For another version see 51-2440.

Precipitation (meteorology), Cloud physics, Snowstorms, Ice optics, Ice crystal size, Ice crystal structure, Classifications, Water content, Radar echoes, Polarization (waves), Scattering, Mathematical models

52-3048

Evaluation of an AVHRR cloud detection and classification method over the central Arctic Ocean.

Lubin, D., Morrow, E., *Journal of applied meteorology,* Feb. 1998, 37(2), p.166-183, 24 refs.

Climatology, Cloud cover, Polar atmospheres, Marine atmospheres, Spaceborne photography, Detection, Classifications, Radiometry, Sea ice, Ice cover effect, Image processing, Arctic Ocean

52-3049

Modeling of submillimeter passive remote sensing of cirrus clouds.

Evans, K.F., Walter, S.J., Heymsfield, A.J., Deeter, M.N., *Journal of applied meteorology,* Feb. 1998, 37(2), p.184-205, 30 refs.

Climatology, Cloud physics, Radiometry, Detection, Light scattering, Upwelling, Ice crystal optics, Ice crystal structure, Brightness, Particle size distribution, Theories, Mathematical models

52-3050

Observations in nonurban heat islands.

Hogan, A.W., Ferrick, M.G., MP 5108, *Journal of applied meteorology,* Feb. 1998, 37(2), p.232-236, 9 refs.

Climatology, Surface temperature, Profiles, Temperature variations, Temperature measurement, Snow cover effect, Landscape types, Buildings, River ice, Ice growth, Ice heat flux, Enthalpy, Ice air interface, Analysis (mathematics), United States—New Hampshire—Hanover

A data field containing more than 100 individual winter morning air temperature measurement points was examined for areas characteristically warmer than surrounding areas. The very small "downtown" of Hanover, NH, was found to be 1-2°C warmer than nearby open areas at the same elevation. The same technique was applied to examine the morning air temperature within nearby hamlet consisting of about 60 wooden buildings. The bulk of observations and observations stratified by snow and sky cover showed no systematic difference between hamlet air temperatures and those obtained in surrounding terrain. Morning air temperatures along a freezing river were measured and found to be systematically warmer than nearby air temperatures for several days, until a significant snowfall diminished the ice growth rate. A thorough examination of temperature profiles near the river showed that the increase in air temperature beneath the overnight inversion during this freezing period was proportional to the heat release resulting from river ice growth.

52-3051

Flow climatology in the alpine region as simulated by a simple shallow water model.

Harlander, U., *Contributions to atmospheric physics,* Nov. 1997, 70(4), p.285-299, With German summary. 36 refs.

Climatology, Climatic changes, Alpine landscapes, Turbulent boundary layer, Stratification, Synoptic meteorology, Wind direction, Climatic factors, Topographic effects, Mathematical models, Alps

52-3052

Improvements in radiosonde humidity profiles using RS80/RS90 radiosondes of Vaisala.

Leiterer, U., Dier, H., Naebert, T., *Contributions to atmospheric physics,* Nov. 1997, 70(4), p.319-336, With German summary. 32 refs.

Meteorological instruments, Aerial surveys, Radio echo soundings, Atmospheric composition, Vapor pressure, Humidity, Profiles, Ice cover effect, Ice formation, Sensors, Accuracy

52-3053

Overview of environmental and hydrogeologic conditions at seven Federal Aviation Administration facilities in interior Alaska.

Hogan, E.V., Dorava, J.M., *U.S. Geological Survey. Open-file report,* 1995, No.95-341, 53p. + append., 57 refs.

Water supply, Water reserves, Hydrogeology, Hydrogeochemistry, Water chemistry, Water pollution, Soil pollution, Airports, United States—Alaska—Alaska Range, United States—Alaska—Talkeetna Mountains

52-3054

Overview of environmental and hydrogeologic conditions at Kotzebue, Alaska.

Dorava, J.M., Brekken, J.M., *U.S. Geological Survey. Open-file report,* 1995, No.95-349, 11p. + appends., 21 refs.

Water supply, Water reserves, Hydrogeology, Hydrogeochemistry, Water chemistry, Water pollution, Soil pollution, Airports, United States—Alaska—Kotzebue

52-3055

Overview of environmental and hydrogeologic conditions at Deadhorse, Alaska.

Alcorn, M.G., Dorava, J.M., *U.S. Geological Survey. Open-file report,* 1995, No.95-437, 10p. + append., 35 refs.

Water supply, Water reserves, Hydrogeology, Hydrogeochemistry, Water chemistry, Water pollution, Soil pollution, Airports, United States—Alaska—Prudhoe Bay

52-3056

Overview of environmental and hydrogeologic conditions at Lake Minchumina and Skwentna, Alaska.

Hall, J.D., *U.S. Geological Survey. Open-file report,* 1995, No.95-438, 17p. + appends., 30 refs.

Water supply, Water reserves, Hydrogeology, Hydrogeochemistry, Water chemistry, Water pollution, Soil pollution, Airports, United States—Alaska—Minchumina, Lake, United States—Alaska—Skwentna

52-3057

Late winter snow and ice characteristics of first-year floes in the Amundsen and Ross Seas, Antarctica: results of investigations during R.V. *Nathaniel B. Palmer* Cruise NBP 94-5 in September and October 1994.

Jeffries, M.O., Hurst-Cushing, B., Li, S.S., Jaña, R., Krouse, H.R., *Alaska. University. Geophysical Institute. Report,* May 1997, UAG R-326, 61p. + append., 65 refs.

Ice surveys, Sea ice distribution, Ice cover thickness, Ice floes, Snow ice interface, Snow stratigraphy, Ice growth, Ice structure, Ice salinity, Ice temperature, Snow samplers, Core samplers, Statistical analysis, Antarctica—Amundsen Sea, Antarctica—Ross Sea

In Sep. and Oct. 1994, the RV *Nathaniel B. Palmer* operated for 23 days in the pack ice of the western Amundsen and eastern Ross seas supporting a sea ice research program. The objective was to improve the knowledge of ice thickness variability and the conditions and processes that contribute to first-year ice development in this region. The investigation included measurements of snow depth, ice thickness, draft and freeboard, ice core structure and stable isotopic composition ($\delta^{18}O$), and snow salinity, temperature and $\delta^{18}O$. This report describes the results of the 1994 investigation. The total amount of snow ice, and the thickness of individual snow ice layers showed that, by late winter, snow ice formation had made a greater contribution than either congelation ice or frazil ice formation to the thermodynamic thickening of all the floes. Frazil ice and congelation ice thickened primarily by dynamic processes, i.e., rafting and ridging. The snow ice layers comprised 14% snow, which amounted to 5.5% of the total ice mass. (Auth. mod.)

52-3058

Glaciated continental margins: an atlas of acoustic images.

Davies, T.A., ed, et al, London, Chapman & Hall, 1997, 315p., Refs. passim.

Glacial geology, Glaciation, Glacial erosion, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Bottom topography, Ice scoring, Stratigraphy, Geological surveys, Seismic surveys

This book consists mainly of 85 seismic profiles of glacimarine sediments and topographic features on glaciated continental margins, mostly in the Northern Hemisphere, but a few in Chile and New Zealand, and 20 in Antarctica. Each of the profiles contains a brief descriptive text, references, and reproduction of the profile. There are also some descriptions of the methods used, overviews, and a glossary at the end.

52-3059

Glacial world according to Wally.

Broecker, W.S., Palisades, NY, Columbia University, Lamont-Doherty Earth Observatory, 1995, 318p. + appends., Refs. p.276-312.

Glaciation, Glacial geology, Glacial meteorology, Glacier oscillation, Marine geology, Atmospheric circulation, Ocean currents, Air water interactions, Ice age theory, Paleoclimatology, Global change

This book presents a theory to explain the global cycle of glacial and interglacial periods over the last million years: why ice ages which peaked after thousands of years of gradual cooling, apparently ended abruptly within a few decades worldwide. The author suggests that there is an ocean conveyor in which warm, salty surface water flowing northward in the Atlantic is chilled by cold arctic air near Iceland. The water sinks to form even colder, denser, and saltier deep water, releasing enormous quantities of heat to the atmosphere. The deep water is conveyed southward, some as far as Antarctica where it mixes with deep water which is formed in the Antarctic Circumpolar Current. If during an interglacial period, the conveyor is turned off, i.e., if the deep water does not sink so deep or is not formed at such high latitudes, and if there is less evaporation and therefore less water vapor (the most efficient greenhouse gas) in the atmosphere, there will be global cooling. If during a glacial period, the conveyor is turned on, there will be global warming.

52-3060

Frost hardening and photosynthetic performance of Scots pine (*Pinus sylvestris* L.) needles. I. Seasonal changes in the photosynthetic apparatus and its function.

Vogg, G., Heim, R., Hansen, J., Schäfer, C., Beck, E., *Planta,* Feb. 1998, 204(2), p.193-200, 48 refs.

Plant physiology, Trees (plants), Frost resistance, Cold weather survival, Plant tissues, Chlorophylls, Photosynthesis, Light effects, Chemical analysis, Seasonal variations, Temperature effects

52-3061

Frost hardening and photosynthetic performance of Scots pine (*Pinus sylvestris* L.). II. Seasonal changes in the fluidity of thylakoid membranes.

Vogg, G., Heim, R., Gotschy, B., Beck, E., Hansen, J., *Planta,* Feb. 1998, 204(2), p.201-206, 24 refs.

Plant physiology, Trees (plants), Photosynthesis, Frost resistance, Plant tissues, Chemical composition, Viscosity, Chlorophylls, Seasonal variations, Electron paramagnetic resonance, Cold weather survival

52-3062

NMR studies on the dynamics of intercalated water in Li-saponite.

Ishimaru, S., Ikeda, R., *Zeitschrift für Naturforschung A,* Dec. 1997, 52(12), p.863-866, 19 refs.

Soil physics, Water structure, Clay minerals, Hydrates, Low temperature tests, Hygroscopic water, Ion exchange, Nuclear magnetic resonance, Spectra, Simulation

52-3063

Dual-polarization radar to identify drizzle, with applications to aircraft icing avoidance.

Reinking, R.F., Matrosov, S.Y., Martner, B.E., Kropfli, R.A., *Journal of aircraft,* Nov.-Dec. 1997, 34(6), p.778-784, 28 refs.

Aircraft icing, Precipitation (meteorology), Rain, Cloud droplets, Ice crystals, Radar echoes, Ice detection, Polarization (waves), Scattering, Analysis (mathematics), Classifications

52-3064

Novel nacelle thermal anti-icing exhaust grill for enhanced mixing.

Gillan, M.A., Farren, R., *Journal of aircraft,* Nov.-Dec. 1997, 34(6), p.811-813, 6 refs.

Aircraft icing, Jet engines, Covering, Valves, Air flow, Ice prevention, Turbulent diffusion, Composite materials, Damage, Countermeasures, Temperature control, Design

52-3065

Simulations of turbulent droplet dispersion in wind-tunnel icing clouds.

DeAngelis, B.C., Loth, E., Lankford, D., Bartlett, C.S., *Journal of aircraft,* Mar.-Apr. 1997, 34(2), p.213-219, 13 refs.

Aircraft icing, Simulation, Cloud chambers, Drops (liquids), Fluid dynamics, Air flow, Dispersions, Turbulent flow, Water content, Ice accretion, Mathematical models, Experimentation

52-3066

Rayleigh lidar system for middle atmosphere research in the Arctic.

Thayer, J.P., Nielsen, N.B., Warren, R.E., Heinselman, C.J., Sohn, J., *Optical engineering,* July 1997, 36(7), p.2045-2061, 49 refs.

Climatology, Polar atmospheres, Atmospheric density, Aerosols, Air temperature, Meteorological instruments, Lidar, Backscattering, Design, Performance, Data processing, Analysis (mathematics), Greenland—Kangerlussuaq

52-3067

Drift composition and glacial dispersal trains, Baker Lake area, District of Keewatin, Northwest Territories.

Klassen, R.A., *Canada. Geological Survey. Bulletin,* 1995, No.485, 68p., With French summary. Refs. p.54-55.

Geological surveys, Subarctic landscapes, Pleistocene, Glacial geology, Glacial erosion, Glacier flow, Glacial deposits, Bedrock, Striations, Lithology, Geochemistry, Mapping, Drill core analysis, Canada—Northwest Territories—Baker Lake

52-3068

Notes on the geology and micropaleontology of the Proterozoic Thule Group, Ellesmere Island, Canada, and north-west Greenland.

Hofmann, H.J., Jackson, G.D., *Canada. Geological Survey. Bulletin,* 1996, No.495, 26p., With French summary. Refs. p.22-24.

Arctic landscapes, Subpolar regions, Geological surveys, Sediments, Lithology, Stratigraphy, Paleoecology, Fossils, Microbiology, Classifications, Structural analysis, Greenland—Thule, Canada—Northwest Territories—Ellesmere Island

52-3069

Track detectors in radiation monitoring of the sunken submarine "Komsomolets".

Nikolaev, V.A., Gromov, A.V., Stepanov, A.V., *Radiation measurements,* 1997, 28(1-6), International Conference on Nuclear Tracks in Solids, 18th, Cairo, Egypt, Sep. 1-5, 1996. Proceedings. Edited by R. Ilić, P. Vater and M.A. Kenawy, p.381-384, 6 refs.

Oceanography, Submarines, Ocean bottom, Bottom sediment, Radioactive wastes, Radioactive isotopes, Sampling, Detection, Environmental tests, Subpolar regions, Norwegian Sea

52-3070

Climate change during the last deglaciation in the Little Youerdusi Basin of the Tianshan Mountains, Xinjiang.

Ye, W., Mu, G.J., Xu, Y.Q., Zhao, X.Y., Wang, S.J., *Chinese journal of arid land research,* 1997, 10(3), p.183-190, 10 refs.

Paleoclimatology, Climatic changes, Mountain soils, Quaternary deposits, Lithology, Paleoecology, Palynology, Sampling, Radioactive age determination, Geochronology, Correlation, China—Tian Shan

52-3071

Origin and age of the hummocky deposit outside the mouth of the Tailan River in the Tianshan Mountains.

Mu, G.J., *Chinese journal of arid land research,* 1997, 10(3), p.191-198, 10 refs.

Geomorphology, Quaternary deposits, River basins, Glacial deposits, Hummocks, Outwash, Lithology, Age determination, Origin, China—Tian Shan

52-3072

Environmental significance of Quaternary sporopollen records in the northeast margin of the Qinghai-Xizang Plateau.

Pan, A.D., Li, J.J., *Chinese journal of arid land research,* 1997, 10(3), p.225-231, 8 refs.

Paleoclimatology, Climatic changes, Paleoecology, Quaternary deposits, Sampling, Loess, Palynology, Geochemistry, Remanent magnetism, Radioactive age determination, China—Qinghai-Xizang Plateau

52-3073

Younger Dryas termination and North Atlantic Deep Water formation: insights from climate model simulations and Greenland ice cores.

Fawcett, P.J., Ágústsdóttir, A.M., Alley, R.B., Shuman, C.A., *Paleoceanography,* Feb. 1997, 12(1), p.23-38, Refs. p.36-38.

Pleistocene, Paleoclimatology, Climatic changes, Surface temperature, Ocean currents, Advection, Storms, Heat flux, Air water interactions, Ice sheets, Ice cores, Models, Greenland

52-3074

High-resolution stable isotope records from southwest Sweden: the drainage of the Baltic Ice Lake and Younger Dryas ice margin oscillations.

Bodén, P., Fairbanks, R.G., Wright, J.D., Burckle, L.H., *Paleoceanography,* Feb. 1997, 12(1), p.39-49, Refs. p.48-49.

Geomorphology, Glacier oscillation, Glacier melting, Glacial lakes, Ice dams, Drainage, Glacial deposits, Quaternary deposits, Sedimentation, Isotope analysis, Radioactive age determination, Sweden

52-3075

Marine core evidence for reduced deep water production during Termination II followed by a relatively stable substrate 5e (Eemian).

Oppo, D.W., Horowitz, M., Lehman, S.J., *Paleoceanography,* Feb. 1997, 12(1), p.51-63, 49 refs.

Pleistocene, Oceanography, Paleoclimatology, Climatic changes, Surface temperature, Ocean currents, Glacier oscillation, Paleoecology, Marine deposits, Drill core analysis, Isotope analysis, Correlation, Atlantic Ocean

52-3076

Late Quaternary paleoceanography in the Fram Strait.

Hebbeln, D., Wefer, G., *Paleoceanography,* Feb. 1997, 12(1), p.65-78, Refs. p.77-78.

Pleistocene, Oceanography, Subpolar regions, Ocean currents, Advection, Marine deposits, Quaternary deposits, Ice rafting, Drill core analysis, Stratigraphy, Radioactive age determination, Arctic Ocean, Fram Strait

52-3077

Changes in the Western Boundary Undercurrent outflow since the Last Glacial Maximum, from smecticte/illite ratios in deep Labrador Sea sediments.

Fagel, N., Hillaire-Marcel, C., Robert, C., *Paleoceanography,* Feb. 1997, 12(1), p.79-96, Refs. p.95-96.

Pleistocene, Oceanography, Ocean currents, Subpolar regions, Marine deposits, Clay minerals, Drill core analysis, Mineralogy, Isotope analysis, Geochronology, Atlantic Ocean, Labrador Sea

52-3078
Numerical modeling of late Glacial Laurentide advance of ice across Hudson Strait: insights into terrestrial and marine geology, mass balance, and calving flux.
Pfeffer, W.T., et al, *Paleoceanography,* Feb. 1997, 12(1), p.97-110, Refs. p.109-110.
Glacial geology, Ice sheets, Glacier oscillation, Glacier mass balance, Basal sliding, Icebergs, Calving, Geochronology, Correlation, Mathematical models, Canada—Northwest Territories—Hudson Strait

52-3079
Arctic ice-ocean modeling with and without climate restoring.
Zhang, J.L., Hibler, W.D., III, Steele, M., Rothrock, D.A., *Journal of physical oceanography,* Feb. 1998, 28(2), p.191-217, 59 refs.
Oceanography, Climatic factors, Sea ice, Ocean currents, Surface temperature, Salinity, Ice growth, Heat loss, Ice water interface, Ice air interface, Ice cover effect, Mathematical models, Thermodynamics, Theories, Arctic Ocean

52-3080
Multiple equilibria and transitions in a coupled ocean-atmosphere box model.
Kravtsov, S.V., Dewar, W.K., *Journal of physical oceanography,* Feb. 1998, 28(2), p.389-397, 22 refs.
Oceanography, Paleoclimatology, Climatic changes, Air water interactions, Ocean currents, Glacier melting, Sea level, Meltwater, Salinity, Turbulent diffusion, Mathematical models, Theories

52-3081
Surface temperature in NW Europe during the Younger Dryas: AGCM simulation compared with temperature reconstructions.
Renssen, H., Isarin, R.F.B., *Climate dynamics,* Jan. 1998, 14(1), p.33-44, 75 refs.
Pleistocene, Paleoclimatology, Climatic changes, Cooling, Air temperature, Surface temperature, Temperature gradients, Seasonal variations, Sea ice distribution, Ice cover effect, Simulation, Models, Europe

52-3082
Radiative forcing and response of a GCM to ice age boundary conditions: cloud feedback and climate sensitivity.
Hewitt, C.D., Mitchell, J.F.B., *Climate dynamics,* Nov. 1997, 13(11), p.821-834, 36 refs.
Paleoclimatology, Climatic changes, Heat balance, Carbon dioxide, Insolation, Albedo, Sea ice, Ice cover effect, Mathematical models, Greenhouse effect

52-3083
Contribution of glacier melt to sea-level rise since AD 1865: a regionally differentiated calculation.
Zuo, Z., Oerlemans, J., *Climate dynamics,* Dec. 1997, 13(12), p.835-845, 28 refs.
Climatology, Ice sheets, Glacier surveys, Glacial hydrology, Sea level, Glacier melting, Glacier mass balance, Air temperature, Temperature variations, Distribution, Mathematical models, Correlation

52-3084
Cell-zonal textures of tinguaites from the Kola Peninsula.
Voitsekhovskiĭ, Y.L., Shpachenko, A.K., Skiba, V.I., *Geologische Rundschau,* Oct. 1997, 86(3), p.531-538, 8 refs.
Rock properties, Geologic processes, Subpolar regions, Magma, Microstructure, Cracking (fracturing), Fractals, Structural analysis, Russia—Kola Peninsula

52-3085
Frost tolerance of winter wheat plants grown on acidic soil.
Vunkova-Radeva, R., Ianeva, I., *Russian journal of plant physiology,* Sep.-Oct. 1997, 44(5), p.607-613, Translated from Fiziologiia rasteniĭ. 41 refs.
Plant physiology, Grasses, Frost resistance, Acclimatization, Plant tissues, Metals, Admixtures, Soil composition, Modification, Protection, Cold weather tests

52-3086
Continental snow cover and climate variability.
Walsh, J.E., Natural climate variability on decade-to-century time scales. Edited by D.G. Martinson et al, Washington, D.C., National Academy Press, 1995, p.49-59, Refs. p.151-163. Addendum by D.A. Robinson. Includes discussion.
DLC QC981.8.C5 N42 1995
Climatology, Climatic changes, Climatic factors, Snow accumulation, Snow cover effect, Surface temperature, Snow air interface, Hydrologic cycle, Albedo, Mathematical models

52-3087
Decadal variations of snow cover.
Robinson, D.A., Natural climate variability on decade-to-century time scales. Edited by D.G. Martinson et al, Washington, D.C., National Academy Press, 1995, p.60-66, Refs. p.151-163.
DLC QC981.8.D5 N42 1995
Climatology, Snow cover distribution, Seasonal variations, Periodic variations, Snow surveys, Space-borne photography

52-3088
Variability and trends of precipitation and snowfall over North America.
Groĭsman, P.IA., Easterling, D.R., Natural climate variability on decade-to-century time scales. Edited by D.G. Martinson et al, Washington, D.C., National Academy Press, 1995, p.67-79, Refs. p.151-163. Commentary by D.A. Robinson. Includes discussion.
DLC QC981.8.D5 N42 1995
Climatology, Precipitation (meteorology), Snowfall, Snow accumulation, Periodic variations, Seasonal variations, Statistical analysis, Meteorological data, North America

52-3089
Marine surface data for analysis of climatic fluctuations on interannual-to-century time scales.
Parker, D.E., et al, Natural climate variability on decade-to-century time scales. Edited by D.G. Martinson et al, Washington, D.C., National Academy Press, 1995, p.241-252, Refs. p.328-335. Includes discussion.
DLC QC981.8.D5 N42 1995
Climatology, Marine atmospheres, Surface temperature, Wind direction, Sea ice distribution, Ice edge, Periodic variations, Statistical analysis, Air ice water interaction

52-3090
Decadal-scale variability of ice cover and climate in the Arctic Ocean and Greenland and Iceland Seas.
Mysak, L.A., Natural climate variability on decade-to-century time scales. Edited by D.G. Martinson et al, Washington, D.C., National Academy Press, 1995, p.253-263, Refs. p.328-335. Commentary by D.G. Martinson. Includes discussion.
DLC QC981.8.D5 N42 1995
Climatology, Climatic changes, Oceanography, Surface temperature, Sea ice distribution, Salinity, Advection, Periodic variations, Statistical analysis, Correlation, Climatic factors, Arctic Ocean, Iceland Sea, Greenland Sea

52-3091
Salinity decrease in the Labrador Sea over the past thirty years.
Lazier, J.R.N., Natural climate variability on decade-to-century time scales. Edited by D.G. Martinson et al, Washington, D.C., National Academy Press, 1995, p.295-304, Refs. p.328-335. Commentary by L.D. Talley. Includes discussion.
DLC QC981.8.E5 N42 1995
Oceanography, Subpolar regions, Water chemistry, Salinity, Ocean currents, Hydrography, Water temperature, Profiles, Turbulent diffusion, Periodic variations, Labrador Sea

52-3092
Ice cores as archives of decade-to-century-scale climate variability.
Grootes, P.M., Natural climate variability on decade-to-century time scales. Edited by D.G. Martinson et al, Washington, D.C., National Academy Press, 1995, p.544-554, Refs. p.583-597. Includes discussion.
DLC QC981.8.E5 N42 1995
Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Ice composition, Chemical properties, Distribution, Isotope analysis, Sampling, Greenland
Ice cores form a unique archive of past climatic and atmospheric conditions, whether from arctic, antarctic or non-polar regions, because they can record these conditions continuously, with annual resolution, and may preserve them over very long times. The information that can be deduced from an ice core includes temperature fluctuations, derived from stable-isotope ratios of hydrogen and oxygen in the ice; chemistry and dust content, reflecting availability in the source area or biospheric activity, as well as atmospheric transport; and volcanic eruptions, recorded as high non-sea-salt sulfate concentrations and sometimes as volcanic ash. (Auth. mod.)

52-3093
Antarctic region: geological evolution and processes.
Ricci, C.A., ed, International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995, Siena, Italy, Terra Antartica Publication, 1997, 1206p., Refs. passim. For individual papers see B-58797; C-58829; E-58687-58739, 58742-58745, 58747-58750, 58752-58758, 58768-58770, 58776-58788, 58791, 58794-58796, 58798-58804, 58806-58816, 58828, 58834-58836, 58838-58845, 58847, 58848; F-58790, 58792, 58793, 58805; J-58789; L-58740, 58741, 58746, 58751, 58759-58767, 58771-58775, 58817-58827, 58830-58833, 58837, 58846 or 52-3094 through 52-3137.
Continental drift, Tectonics, Glacial geology, Geological surveys, Marine geology, Geomagnetism, Sedimentation, Fossils, Glaciology, Geophysical surveys
This volume consists of 162 papers, organized in 11 chapters and covering not only the antarctic continent but also the peri-antarctic seas and the surrounding oceanic regions. Marine, terrestrial, glaciological and atmospheric realms are all addressed, and the role of Antarctica in the global system, from Archean through Holocene time is considered. Beside the classical themes of geological and geophysical exploration, new topics in the antarctic earth sciences, such as the meaning of the 500 Ma events in East Antarctica and the stable versus the unstable behavior of the antarctic ice sheets are presented in this volume.

52-3094
Geological map of the Campbell Glacier High-Grade Metamorphic Complex (Wilson Terrane, northern Victoria Land, Antarctica).
Colombo, F., Talarico, F., Castelli, D., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.173-180, 13 refs.
Glacial geology, Stratigraphy, Geochemistry, Geological maps, Antarctica—Campbell Glacier
The Campbell Glacier High-Grade Metamorphic Complex of Wilson Terrane consists of polydeformed migmatite gneiss and granulite facies rocks, and has been extensively intruded by the Palaeozoic Granite Harbour Intrusives. Detailed mapping along the west side of the Campbell Glacier (Deep Freeze Range) integrated with available petrological and geochemical data suggests that Neoproterozoic fragments of the East Antarctic Craton were reworked in the Early Paleozoic Ross Orogen. (Auth.)

52-3095
Geology and regional significance of the Cox Peaks roof pendant, central Scott Glacier area, Antarctica.
Stump, E., Fitzgerald, P.G., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.209-212, 14 refs.
Geological maps, Glacial geology, Tectonics, Antarctica—Cox Peaks
The Cox Peaks roof pendant is composed of La Gorce Formation and Wyatt Formation, engulfed by intrusive rocks of the Queen Maud-Wisconsin Range batholith. The La Gorce Formation is a turbidite sequence, as seen elsewhere, but at this locality also contains a considerable component of conglomerate. The implication is that the source of the La Gorce Formation may have been located outboard of the East Antarctic craton. The La Gorce Formation is folded and cleaved. The Wyatt and La Gorce Formations are in contact across a

northwest-trending fault exhibiting right-lateral, strike-slip movement. Relationships suggest changing directions of convergence during the evolution of the Ross orogen in the central Transantarctic and Queen Maud Mountains. (Auth.)

52-3096

Synorogenic alkaline and carbonatitic magmatism in the Transantarctic Mountains of south Victoria Land, Antarctica.

Cooper, A.F., Worley, B.A., Armstrong, R.A., Price, R.C., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.245-252, Refs. p.252.

Glacial geology, Geochronology, Geochemistry, Tectonics, Antarctica—Transantarctic Mountains

In the Pipecleaner Glacier area of south Victoria Land, Koettlitz Group basement gneisses are intruded by small plutons of nepheline syenite. Dismal Syenite is mineralogically layered with rock types including nepheline syenite, feldspathic ijolite, melteigite and alkali-pryoxenite. In south Victoria Land, the Ross Orogeny is defined by intense deformation, metamorphism and granitoid intrusion along the lower Paleozoic margin of the East Antarctic craton. Absolute timing of orogenesis is constrained by the emplacement of calc-alkaline, Cordilleran I-type granitoids between 551 and 490 Ma. The Pipecleaner alkaline plutons are coeval with regional granitic magmatism and deformation. Although the extent of the alkaline igneous province in the Koettlitz Glacier area is imperfectly known, the regional geology and petrogenetic affinity of the alkaline plutons reported here suggest emplacement of magmas in an extensional jog associated with the obliquely convergent Lower Paleozoic margin of the East Antarctic craton. (Auth. mod.)

52-3097

Geodynamic models of the Weddell Sea embayment in view of new geophysical data.

Jokat, W., Fechner, N., Studinger, M., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.453-459, 21 refs.

Glacial geology, Ice shelves, Seismic surveys, Geophysical surveys, Continental drift, Bottom topography, Antarctica—Filchner Ice Shelf, Antarctica—Ronne Ice Shelf, Antarctica—Antarctic Peninsula

New high quality seismic reflection and refraction data were collected along the Filchner-Ronne Ice Shelf during the austral summer 1994-95. Seismic refraction data provide the first detailed P-wave velocity information at the transition of the Antarctic Peninsula to the Filchner-Ronne Basin. The velocity data document the change from a normal to a strongly stretched continental crust in this area. The preliminary results are compared to predicted structures from paleomagnetic reconstructions. While the latter include subduction related and strike slip features at the western and eastern margins of the Filchner-Ronne Shelf, the data show in most areas only extensional features in the sedimentary units and the crustal composition. The existing data support the presence of a failed rift below the Filchner-Ronne Shelf, although its location and shape could not be resolved. (Auth.)

52-3098

Optimum seismic shooting and recording parameters and a preliminary crustal model for the Byrd Subglacial Basin, Antarctica.

Clarke, T.S., Burkholder, P.D., Smithson, S.B., Bentley, C.R., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.485-493, Refs. p.493.

Seismic surveys, Geophysical surveys, Ice sheets, Earth crust, Subglacial observations, Antarctica—West Antarctica

A crustal-scale seismic refraction/wide-angle-reflection experiment was undertaken near the southern edge of the Byrd Subglacial Basin during the 1994-95 summer. The program comprised a series of wave tests to ascertain optimum shooting and recording parameters on an ice sheet, followed by the completion of a reversed 235-km long profile. The wave tests showed that explosion-to-ice sheet energy coupling increased twenty-five-fold across the firn-ice transition, that the seismographs could be separated by up to 200 m without aliasing crustal refractions and wide-angle reflections, and that a digitizing rate of 500 Hz was required for accurate recording of the high-frequency direct arrivals through the ice sheet and the near-vertical-incidence reflections. Preliminary results indicate a 30 km crustal thickness and a highly reflective lower crust, both of which are typical of extended continental terrain. (Auth. mod.)

52-3099

Geophysical evidence for Late Cenozoic subglacial volcanism beneath the West Antarctic ice sheet and additional speculation as to its origin.

Behrendt, J.C., Blankenship, D.D., Damaske, D., Cooper, A.K., Finn, C., Bell, R.E., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.539-546, Refs. p.545-546.

Geophysical surveys, Geomagnetism, Marine geology, Subglacial observations, Glaciology, Glacial geology, Ice sheets, Ice shelves, Antarctica—West Antarctica, Antarctica—Ross Ice Shelf

Aeromagnetic surveys over the Ross Sea, northwestern Ross Ice Shelf, and the west antarctic ice sheet reveal linear magnetic rift fabric and numerous, high amplitude anomalies. Most of these anomalies have sources that probably resulted from Late Cenozoic volcanism. Some volcanic structures penetrate Neogene sediments beneath the deglaciated continental shelf and are present at the base of the grounded ice sheet and beneath the ice shelf. Geophysical data indicate two widely-separated, youthful volcanic edifices beneath the sea and ice cover in the west antarctic rift system. In contrast, the authors suggest glacial removal of edifices of volcanic sources of many more anomalies. They infer that glacial "removal" of the associated Late Cenozoic volcanic edifices (probably debris, comprising pillow breccias, and hyaloclastites) has occurred essentially concomitantly with their subglacial eruption. (Auth. mod.)

52-3100

Uplift-denudation of the Transantarctic Mountains between the David and the Mariner Glaciers, northern Victoria Land (Antarctica): constraints by apatite fission-track analysis.

Balestrieri, M.L., Bigazzi, G., Ghezzo, C., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.547-554, Refs. p.554.

Geochronology, Geological maps, Glacial geology, Tectonics, Mineralogy, Antarctica—Transantarctic Mountains

Fission-track analysis of apatite samples from four vertical profiles and two horizontal sections elucidate the tectonic evolution of the Transantarctic Mountains in the region between the Mariner and the David Glaciers. The Mt. Gibbs and the Mt. Matz profiles confirm the presence of a Late Cretaceous uplift-denudation phase in northern Victoria Land, already recognized in a vertical profile at Mt. Nansen. Mt. Burrows apatite ages and confined track length distribution characteristics are indicative of fast cooling, likely corresponding to the Early Cenozoic uplift-denudation period extensively recognized in Victoria Land. At Mt. Monteagle, in the coastal area, ages of samples from elevations >1500 m have almost the same age (around 38 Ma) as the Cenozoic intrusion which outcrops near the top, whereas ages of the lower samples correlate with elevation. (Auth. mod.)

52-3101

Crustal segmentation of the Transantarctic Mountains rift shoulder along the David Glacier lineament, Victoria Land (Antarctica).

Mazzarini, F., Della Vedova, B., Salvini, F., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.565-569, Refs. p.568-569.

Geomorphology, Tectonics, Structural analysis, Glacier surfaces, Antarctica—Transantarctic Mountains, Antarctica—David Glacier

The Transantarctic Mountains are characterized by several transverse physiographic features, which regionally mark changes in direction and offset of the rift shoulder escarpment of the West Antarctic Rift system and locally control the onset of major glacier outlets. These major features correspond to regional tectonic structures and are interpreted as the surface expression of crustal/lithospheric segmentation affecting both the edge of the east antarctic craton and the adjacent West Antarctic Rift System. The focus is on the David Glacier transverse feature, which separates northern Victoria Land from southern Victoria Land. Available geological and geophysical data suggest that the David Glacier lineament is a major transfer structure across the Transantarctic Mountains, accommodating different kinematic histories along the margin of the east antarctic craton during late Mesozoic and Cenozoic rifting-uplift events. (Auth.)

52-3102

Evidence for Mesozoic-Early Cenozoic tectonic lineations in the Ross Sea and Transantarctic Mountains, Antarctica.

Coren, F., Delisle, G., Rolf, C., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.577-584, Refs. p.584.

Tectonics, Subglacial observations, Bedrock, Topographic surveys, Glaciers, Glacial geology, Marine geology, Antarctica—Ross Sea, Antarctica—Transantarctic Mountains

The paleomagnetic record of Jurassic Ferrar Dolerites was reset along a NE-SW trending zone, in which evidence of past hydrothermal action was observed. Ferrar Dolerite samples from 8 sites yield anomalous virtual geomagnetic poles (VGP) compatible only with the Cretaceous segment of the polar wander path (PWP) for Antarctica. VGP's of samples of Jurassic and Ordovician age, taken to the east and west of this zone, fall, as expected, into the Jurassic and Ordovician segments of the PWP, respectively. Mapping of the subice topography in Victoria Land revealed NE-SW trending subglacial valleys. A major fault along the Hollingsworth Glacier, developed during a regional block faulting episode, trends again NE-SW. The authors take all these observations as indications of activity along the NE-SW fault zones in the Late Mesozoic and possibly Early Cenozoic, which produced extensional tectonics along the Rennick Graben and in the Ross Sea. (Auth. mod.)

52-3103

Gravity and ice thickness surveys in Victoria Land, Antarctica, during the ACRUP experiment.

Reitmayr, G., et al, International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.619-626, 17 refs.

Earth crust, Gravity, Ice cover thickness, Isostasy, Experimentation, Subglacial observations, Topographic surveys, Seismic surveys, Antarctica—Victoria Land, Antarctica—Ross Sea

A detailed gravity survey, carried out along some 250 km, from the Ross Sea coast up to the Polar Plateau crossing the Transantarctic Mountains (TAM) is reported. Radio Echo Sounding (RES) at many points supplied ice thickness information. In addition, a regional airborne RES survey was performed along profiles of more than 2500 km. A detailed map of the subice topography, which allows a 3-dimensional ice thickness correction of the gravity data was obtained. Simple isostatic models were developed from topographic, ice and sediment thickness, and bathymetric information. Model calculations were carried out to explain the gravity anomalies. Seismic results from the Ross Sea area were used to constrain the gravity models. The gravity data show the thickening of the crust to be about 22 km in the Ross Sea area and about 35 to 37 km beneath the TAM. (Auth. mod.)

52-3104

Seismic reflection investigation of George VI Sound, Antarctic Peninsula.

King, E.C., Bell, A.C., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.697-703, Refs. p.703.

Seismic reflection, Sediments, Bottom topography, Marine geology, Antarctica—George VI Sound

George VI Sound is a steep-sided, linear trough, bounded to the east by the Antarctic Peninsula and to the west by Alexander I. It is occupied by an ice shelf beneath which the seabed reaches depths greater than 1000 m. Fore-arc basin sedimentary rocks of the Fossil Bluff Group are exposed in the western coastal cliffs; volcanic and magmatic rocks of the former arc outcrop on the eastern side. A seismic reflection survey was conducted across the sound using a conventional planted geophone array and explosive shots, on a line between the mouth of Uranus Glacier and the Batterbee Mountains. The aim was to determine the relationship between the fore-arc basin and the arc, the origin of the trough and the presence or absence of sediments beneath the ice shelf. The data have been interpreted as showing that the Fossil Bluff Group extends eastwards to about halfway across the sound. Normal faulting of the Fossil Bluff Group and the presence of significant lower crustal reflectivity indicate an extensional rather than an erosional origin for the sound. There are pockets and lenses of post-rift sediments beneath the seabed which are at least 250 m thick. (Auth.)

52-3105

High resolution terrigenous sedimentary record of a sediment drift on the Antarctic Peninsula Pacific margin (initial results of the 'SEDANO' program).

Camerlenghi, A., Rebesco, M., Pudsey, C.J., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.705-710, 11 refs.

Sediments, Marine geology, Geomorphology, Seismic surveys, Stratigraphy, Antarctica—Antarctic Peninsula

Initial results are presented of the SEDANO-1 cruise of R/V *OGS-Explora*, (Jan.-Feb. 1995) which investigated the sediment drifts off the Pacific margin of the Antarctic Peninsula using multichannel seismics, gravity coring, and deployment of two moorings with current meter and sediment traps at the bottom. Seismic profiles provide information on the shape and internal structure of the distal depositional system on the outer continental rise, where sedimentary units thin progressively towards the abyssal plain. Sediment waves and normal faulting have been identified. Coring revealed the very fine-grained nature of the drift sediments; alternations of brown hemipelagic and grey laminated terrigenous sediment intervals reflect glacial-interglacial cyclicity. Correlation between cores is made by lithostratigraphic analysis and the magnetic susceptibility record. (Auth.)

52-3106

Tectonic and sedimentary architecture of the Bellingshausen and Amundsen Sea basins, SE Pacific, by seismic profiling.

Gohl, K., et al, International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.719-723, 13 refs.

Glacial geology, Bottom topography, Seismic surveys, Sedimentation, Marine geology, Tectonics, Glacial deposits, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea

The basins of the Bellingshausen and Amundsen Seas play a key role in reconstructing the glacial history of West Antarctica by identifying traces of glaciation and deglaciation in the sedimentary sequences of the shelf, slope and continental rise. Recent multichannel seismic surveys of RV *Polarstern* across the shelf, slopes and parts of the continental rise and abyssal plains have yielded valuable data to help contain the glacial-marine deposition as well as provide new models of the tectonic development of that SE Pacific sector. A characteristic feature of the Bellingshausen Sea margin is the dominant sequence of alternating prograding and aggrading sedimentary layers on the outer shelf and slope. Compressional tectonic forces caused eastward-directed interplate subduction, forming a large basement step within the Bellingshausen Sea basin, which focussed subsequent drift deposits. The seismic observation of this tectonic event has far-reaching consequences for the Neogene crustal evolution of the SE Pacific. Data from the Amundsen Sea basin also reveal evidence for tectonic activity until Quaternary times. (Auth. mod.)

52-3107

Sirius Group of Antarctica: age and environments.

Stroeven, A.P., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.747-761, Refs. p.754-757.

Glacial geology, Glacial deposits, Ice sheets, Paleobotany, Marine geology, Tectonics, Paleoecology, Sediments, Paleoclimatology, Antarctica—Transantarctic Mountains

An important ice sheet reconstruction for the early Pliocene period of global warmth favors a much reduced antarctic ice sheet. In this reconstruction, early Pliocene marine sediments were deposited in low-lying basins on the antarctic craton. The timing of ice sheet reduction comes from the presence of early Pliocene marine diatoms and diatomaceous sediment microclasts in the matrix of tills deposited by the East Antarctic Ice Sheet in the Transantarctic Mountains. From this observation stems the assumption that the marine diatoms were also eroded, transported, and deposited by this ice sheet. In this paper, data have been compiled that can be used to evaluate the two key assumptions underlying this reconstruction. The first assumption is that the Sirius Group was deposited by the East Antarctic Ice Sheet and the second assumption is that marine diatoms in its matrix were not emplaced into this strata after the till had been deposited. (Auth. mod.)

52-3108

Distribution of siliceous microfossils on Mount Feather, Antarctica, and the age of the Sirius Group.

Barrett, P.J., Bleakley, N.L., Dickinson, W.W., Hannah, M.J., Harper, M.A., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.763-770, Refs. p.770.

Glacial geology, Paleobotany, Sediments, Glacial deposits, Geochronology, Ice sheets, Antarctica—Transantarctic Mountains

In this study, the authors sampled 3 sites in the till of the Sirius Group to a depth of 17 to 37 cm (base of the freeze-thaw horizon above the permafrost). They also sampled the surface of the adjacent Permian sandstone bedrock and modern snow both on Mount Feather and nearby Mount Crean. They found extremely low diatom abundances, but a varied flora of both marine and non-marine forms totalling 36 taxa from a little under 400 identifiable specimens. Abundance varies greatly from site to site. Most of the diatom taxa recovered are long-ranging Cenozoic or late Neogene forms and are still extant. The most common form found in Sirius till, though absent from the Antarctic today, is the freshwater genus *Aulacoseira*. It is also the most common form in snow both at Mount Feather and at Mount Crean. It is concluded that most diatoms in the high level terrestrial tills of the Sirius Group in the Dry Valleys region, and possibly elsewhere in the Antarctic, are transported through the atmosphere from the antarctic margin and beyond, and hence are not useful for biostratigraphically dating sediments of this type. (Auth. mod.)

52-3109

Smectite concentrations and crystallinities: indications for Eocene age of glaciomarine sediments in the CIROS-1 drill hole, McMurdo Sound, Antarctica.

Ehrmann, W.U., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.771-780, Refs. p.779-780.

Glaciation, Glacial geology, Glacial deposits, Geochronology, Marine geology, Geochronology, Antarctica—McMurdo Sound

Sediments of the CIROS-1, CIROS-2 and MSSTS-1 drill cores from the McMurdo Sound shelf have been investigated for their clay mineral assemblages, especially the smectite concentrations and smectite crystallinities. Highest smectite amounts and best crystallinities occur below 425-445 m in CIROS-1, indicating deposition of sediments during a time when chemical weathering on the nearby antarctic continent prevailed. At deep-sea sites around Antarctica the shift from smectite-dominated to smectite-poor and illite-rich assemblages is well dated as earliest Oligocene and documents the onset of continental glaciation in East Antarctica. The CIROS-1 results therefore support the Eocene age for strata below 455 m, argued by Hannah (1994) from dinoflagellate data. (Auth.)

52-3110

Seismic sequences and Late Cenozoic glacial history in the Ross Sea.

De Santis, L., Brancolini, G., Busetti, M., Marchetti, A., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.781-790, Refs. p.789-790.

Paleoecology, Marine geology, Glacial geology, Glacial deposits, Ice sheets, Glaciation, Seismic surveys, Tectonics, Antarctica—Ross Sea

Until Late Oligocene, the Ross Sea was underlain by many subsiding basins separated by ridges that outcropped above sea-level. The exposed ridges, as well as the Transantarctic Mountains, hosted valley glaciers that calved at sea. In Early Miocene, the combined effects of eustatic changes and tectonic subsidence produced a relative sea-level rise and the onset of open marine conditions over most of the shelf. During the Miocene the depositional environment was generally glacio-marine, although some sea-level drops caused the episodic outcrop of large portions of the continental shelf. Outcrops were particularly widespread in the central Ross Sea. During these periods, ice caps nucleated from the emerged area and strongly influenced the depositional environment of the surrounding basins. The first well documented advance of the antarctic ice sheet to the shelf edge occurred during Early Pliocene, about 4 ma. A prominent erosional unconformity and a sudden change in seismic character marks this event. (Auth. mod.)

52-3111

Cenozoic sedimentation on the Wilkes Land continental rise, Antarctica.

Escutia, C., Eittreim, S.L., Cooper, A.K., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.791-795, 18 refs.

Glacial geology, Marine geology, Sedimentation, Bottom topography, Seismic surveys, Ice sheets, Antarctica—Wilkes Land

Three sedimentary units are recognized on the Wilkes Land continental rise above an unconformity believed to represent the onset of glacial conditions. Above the unconformity, the change in seismic facies is interpreted to reflect the response of sedimentation to the increased glaciation trend on the Wilkes Land margin. Development of the uppermost sedimentary unit is dominated by turbidite fans and bottom current deposition. Wilkes Land fans are characterized by unusually high-relief (up to 900 m) channels. Large size channels are interpreted to result from the high-volume of unsorted sediment fed to the slope canyons and the fans by ice-streams grounded at the shelf edge. Bottom current deposition on the Wilkes Land rise is apparent in large (up to 1000 m) sediment mounds that develop between the fan channels. Wilkes Land sediment mounds resemble other mounded deposits around Antarctica, suggesting a common set of processes in their development likely associated with the evolution of the Antarctic Ice Sheet. (Auth. mod.)

52-3112

Review of geomorphological research in Bunger Hills and expansion of the East Antarctic Ice Sheet during the Last Glacial Maximum.

Colhoun, E.A., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.801-807, Refs. p.806-807.

Geomorphology, Glacial geology, Paleoclimatology, Ice sheets, Glaciation, Glaciers, Weathering, Geochronology, Antarctica—Bunger Hills

Geomorphological investigations at Bunger Hills suggest that much of the region was glaciated by a northwestward expansion of the margin of the antarctic ice sheet which occurred during the Last Glacial Maximum (LGM), before the eastward expansions of the Edisto and Apfels glaciers into the western parts of the oasis. Weathering phenomena on the highest Taylor I. suggests it may not have been glaciated at the LGM. The widespread occurrences of ventifacts, tafoni, grussified boulders an iron-oxidized rock surfaces show that chemical weathering and strong wind erosion have occurred at Bunger Hills for a long time. Shoreline features occur in Bunger Hills perhaps as high as 40 m. The lower beaches up to a maximum of 10.5 m were formed during the Early-Middle Holocene transgression, and are younger than 7.7 kyr in age. Uplift during the Middle to Late Holocene was 1.4 m/kyr. Maximum ice thickness on the inner shelf and coastal region was not more than ca. 500-600 m at the LGM. (Auth. mod.)

52-3113

Late Pleistocene and Holocene environmental history of Bunger Hills, East Antarctica, as revealed by fresh-water and epishelf lake sediments.

Melles, M., Kulbe, T., Verkulich, S.R., Pushina, Z.V., Hubberten, H.W., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.809-820, Refs. p.819-820.

Limnology, Marine geology, Sediments, Geochemistry, Geochronology, Paleoclimatology, Lake ice, Pleistocene, Glaciers, Antarctica—Bunger Hills

Marine and lacustrine sediment cores from Bunger Hills show systematic differences in the composition of postglacial sediment successions in fresh-water lakes, epishelf lakes, and anoxic basins within the epishelf lakes. Radiocarbon ages of organic matter incorporated into overconsolidated tills at the core bases indicate that unglaciated areas existed prior to the Late Weichselian. During the Late Weichselian, presumably the entire oasis was inundated by grounded ice masses. Deglaciation, starting close to the Pleistocene/Holocene boundary, was very rapid, probably favored by both a marine transgression and climatic warming. The sea-level rise presumably exceeded 12 m in the southern part of Bunger Hills during the Early or Middle Holocene. Glacier expansions at the western oasis border during Middle and Late Holocene were triggered by sea-level falls rather than by climate changes. Variations in the aquatic primary production in the central part of the oasis indicate a step-wise increase in temperatures between ca. 4.7 and 2.0 kyr BP, followed by a short-term cooling, and intermediate temperatures until present. (Auth. mod.)

52-3114

Constraints on the former antarctic ice sheet from sea-level observations and geodynamic modelling.

Zwartz, D., Lambeck, K., Bird, M., Stone, J., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.821-828, Refs. p.827-828.

Ice models, Rheology, Ice volume, Sea level, Ice melting, Limnology, Sediments, Geochronology, Ice sheets, Isostasy, Antarctica—Vestfold Hills

Sediment cores from low-lying lakes in the Vestfold Hills contain marine sediments, indicating that the lakes were formerly connected to the sea and have subsequently been isolated as sea level fell relative to the land, from about 7.5 m at 8000 years ago to a height of 9 m above present sea level around 6000 years ago. These results were compared with the predictions of numerical glacio-hydro-isostatic calculations for various simplified models of melting at the ice sheet margin. The results indicate that at the Last Glacial Maximum the East Antarctic Ice Sheet margin at various sites extended from 25 to 110 km beyond its present position, and that 500-1100 m of ice thinning occurred at sites now on the coast. If these values are representative of the entire eastern antarctic margin, and no ice volume changes occur within the interior of the ice sheets, then the total east antarctic contribution to eustatic sea level since the Last Glacial Maximum is about 3-5.5 m. (Auth. mod.)

52-3115

Deglaciation of the Vestfold Hills, East Antarctica: preliminary evidence from exposure dating of three subglacial erratics.

Fabel, D., Stone, J., Fifield, L.K., Cresswell, R.G., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.829-834, Refs. p.834.

Ice sheets, Subglacial observations, Pleistocene, Ice volume, Radioactive age determination, Geochronology, Glaciation, Glacial geology, Ice cover thickness, Ice melting, Antarctica—Vestfold Hills

Cosmogenic isotope measurements on 2 subglacially derived erratics from the Vestfold Hills indicate retreat of the continental ice margin from a position at least 5 km west of its present location, around 12-9 ka. These ages are similar to ^{14}C dates on the oldest organic sediment in lakes around the Hills, suggesting that biological colonization of lake basins coincided with glacial retreat. Whether this indicates recession of ice that extended across the entire Vestfold Hills, or an amelioration of climate that simply thawed lakes and melted a much less extensive ice cover cannot be established from the results so far. Recession appears to have continued recently, with results from a third sample indicating emergence of a small nunatak, Ultima Bluff, within the past 2 ka. (Auth.)

52-3116

Regional contrasts in weathering and glacial sediments suggests long term subaerial exposure of Vestfold Hills, East Antarctica.

Gore, D.B., Colhoun, E.A., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.835-839, 22 refs.

Glacial geology, Glacial deposits, Weathering, Subglacial observations, Geochronology, Ice sheets, Glaciation, Antarctica—Vestfold Hills

The Vestfold Hills exhibits marked contrasts in the weathering surface and glacial sediments between the eastern and western parts. The boundary between these zones coincides with a regional chemical boundary termed the 'salt line'. The area west of the salt line is saturated with marine-derived halite and thenardite that are particularly aggressive agents of rock weathering. In contrast, the area east of the salt line exhibits significantly fewer deposits of these salts. Rock surfaces west of the salt line are characterized by well-developed weathering forms, while glacial polish and striae are largely absent. In contrast, rock surfaces to the east commonly retain glacial polish and striae. In places, differential weathering has caused thin basaltic dykes and felsic veins to stand above the surrounding gneiss. Glacial sediments are much more abundant, coarser and better sorted northwest of the salt line than to the southeast. (Auth. mod.)

52-3117

Larsemann Hills: not heavily glaciated during the Last Glacial Maximum.

Burgess, J., Carson, C., Head, J., Spate, A., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.841-843, 6 refs.

Glaciation, Weathering, Ice volume, Ice cover thickness, Sediments, Limnology, Ice edge, Geomorphology, Antarctica—Larsemann Hills

The Larsemann Hills is a small icefree area on the Ingrid Christensen Coast. Some evidence has been advanced which suggests that during the last glacial maximum (LGM) continental ice between 200-500 m thick covered the area including the offshore islands. It was postulated that the area started to become icefree about 10,000-12,000 BP with the edge of the continental ice reaching its present position in the last 200 years. It is suggested here, from analysis of lake sediment sequences, collected from the shore of a present lake less than 2 km from the edge of the continental ice, that at least part of the area was icefree throughout the LGM. Morphological and weathering evidence (tafoni) from close to the present ice edge suggests that the present position of the continental ice along parts of the coast is little different now than during the LGM although localized advance and retreat is evident. (Auth.)

52-3118

Glacial history of the Vestfjella and Heimefrontfjella nunatak ranges in western Dronning Maud Land, Antarctica.

Lintinen, P., Nenonen, J., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.845-852, Refs. p.851-852.

Ice cover thickness, Ice volume, Ice sheets, Glaciation, Glacial geology, Geochronology, Weathering, Glacial deposits, Antarctica—Kraul Mountains, Antarctica—Heimefront Range

Striations and weathering characteristics of surficial deposits, including erratics, basal till, and regolith in the Kraul Mountains and the Heimefront Range indicate 2 glacial stages differing in age. The younger one, the deposits from which are characterized by only slight weathering, most probably covered the whole area in recent times. Radiocarbon-dated semi-lithified snow petrel nesting sites indicate that the area was ice-free since 8200 BP. During the last glacial expansion the ice sheet was at least 700 m thicker near the present day grounding-line in northern Kraul Mountains, while the change in thickness in Heimefront Range, about 150 km inland, has been less than 200 m. (Auth. mod.)

52-3119

Late Quaternary environmental fluctuations based on diatoms from Yanou Lake, King George Island, Fildes Peninsula, Antarctica.

Yang, S., Harwood, D.M., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.853-859, Refs. p.859.

Paleobotany, Paleoecology, Limnology, Paleoclimatology, Climatic changes, Ice melting, Glacial geology, Antarctica—Fildes Peninsula

Diatom data from a lacustrine core on Fildes Peninsula provide high-resolution information on Holocene climate and environmental change. Twelve diatom zones are determined, based on changes in diatom assemblages and statistical analysis. Environmental changes during the Holocene Climatic Optimum are reflected in the diatom assemblage zones. Rich assemblages of marine and freshwater diatoms in this core enable the reconstruction of paleoenvironment and paleoclimate through the Late Quaternary. Diatom assemblages show 3 main environmental stages through the Holocene. The first stage is characterized by freshwater diatoms, which reflect the formation of a shallow, meltwater lake fed by the deglaciation of a local ice cap. The second stage is marked by the occurrence of marine diatoms, corresponding to the Climatic Optimum of the Holocene with relatively warmer climate and higher sea-level than today. The youngest stage is indicated by the disappearance of marine diatoms and the return of freshwater diatoms. (Auth. mod.)

52-3120

Holocene uplift in the South Shetland Islands: evaluation of tectonics and glacio-isostasy.

Pallàs, R., James, T.S., Sàbat, F., Vilaplana, J.M., Grant, D.R., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.861-868, 22 refs.

Tectonics, Geomorphology, Glacial geology, Isostasy, Marine geology, Ice volume, Ice cover thickness, Ice models, Antarctica—South Shetland Islands

Analysis of the Miocene-Pleistocene emerged marine platforms present in the South Shetland Is. indicates a maximum tectonic uplift rate of 0.4 m/ka. This explains 16% or less of the observed emergence since 6.4 ka BP and, as a consequence, indicates that most of the observed Holocene uplift of the islands is due to glacial eustasy. The relative-sea-level variations predicted by the ICE-3G model of glacio-hydro-isostatic deformation suggest that the South Shetland Is. are not only affected by variations in local ice-loads but also by variations in the Antarctic Peninsula ice-loads. The comparison of the ICE-3G relative-sea-level predictions with the available geological data from the South Shetland Is. suggests that the maximum Holocene inundation in the South Shetland Is. would have been 30 m. (Auth. mod.)

52-3121

Biostratigraphy and paleoecology of the bottom sediments in Prydz Bay.

Pushina, Z.V., Kolobov, D.D., Druzhinina, N.I., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.869-874, 14 refs.

Marine geology, Glacial geology, Paleobotany, Paleoecology, Sediments, Antarctica—Prydz Bay

Bottom sediments of Prydz Bay were investigated by complex lithological, geochemical and micropaleontological methods. Two distinct lithological units with different groups of microfossils are described. Unit II is characterized by a calcareous foraminifera overlaying sediments of Unit I which contain siliceous microfossils subdivided into 3 layers of diatoms. These correspond to changes of diatom flora. The development of rich diatom flora reflects the open-marine conditions in the Prydz Bay during Holocene and allows reconstruction of history of sedimentation in the area. (Auth. mod.)

52-3122

Epifaunal distributions at antarctic marine-ending glaciers: influences of ice dynamics and sedimentation.

Dawber, M., Powell, R.D., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.875-884, Refs. p.883-884.

Marine biology, Ocean bottom, Bottom sediment, Animals, Biomass, Glacier tongues, Antarctica—McMurdo Sound, Antarctica—Mackay Glacier Tongue, Antarctica—Blue Glacier, Antarctica—Granite Harbor

Three environmental settings have been investigated in McMurdo Sound using a submersible, remotely operated vehicle: the grounding-line environments of the floating Mackay Glacier Tongue and of the grounded tidewater cliff of Blue Glacier; and a site undisturbed by glaciers for several thousand years in Granite Harbour. Beyond the margins of Mackay Glacier Tongue and at the site undisturbed for several thousand years, density and species richness of benthic epifauna are similar and comparable with those at other sites in McMurdo Sound and elsewhere on the antarctic continental shelf. Sessile suspension feeders are particularly abundant on numerous ice-rafted boulders. The pectinid, *Adamussium colbecki* is locally very abundant beyond the margins of Mackay Glacier Tongue. Epifauna colonizing iceberg scours and seafloor scoured by the Mackay Glacier Tongue is dominated by a few taxa which have motile adult forms and several of which have pelagic larvae. *Homaxinella* sponges which have been observed to colonize disturbed seafloor in southeast McMurdo Sound, are common only in scoured areas. (Auth. mod.)

52-3123

Geotechnical, sedimentological characteristics and seismic stratigraphy of northern Joides Basin, (Ross Sea—Antarctica): preliminary results.

Corradi, N., Fierro, G., Mirabile, L., Ferrari, M., Ivaldi, R., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.885-888, Refs. p.888.

Glacial geology, Marine geology, Bottom topography, Glacial deposits, Glacier oscillation, Paleoclimatology, Antarctica—Ross Sea

A sedimentological and geotechnical survey was carried out in the northern Joides Basin of the Ross Sea continental shelf. The research aimed at identifying the extension of glacial tongues in a period coinciding with the Late Pleistocene. The advance and retreat of the West Antarctic Ice Sheet along the antarctic sea bottom is verified by geophysical information. A survey conducted in this area made it possible to identify existing erosion surfaces caused by the grounded ice sheets. The sedimentological and geotechnical investigations of cores retrieved from the Joides basin showed a very wide textural heterogeneity of glaciomarine sediments overlain by a marine sequence containing a large biogenic component. Geotechnical characterization of the sediments also highlights the sedimentation environment. The presence of overconsolidated layers in the lower units may indicate oscillations of the ice sheet. (Auth. mod.)

52-3124

Modelization of the dynamics of Hells Gate ice shelf, northern Victoria Land, Antarctica.

De Dosso, L., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.953-956, 7 refs.

Mathematical models, Ice models, Ice shelves, Velocity measurement, Rheology, Antarctica—Hells Gate

A numerical model for flow of the Hells Gate ice shelf has been developed considering force balance equations written for one unit volume of ice and a non-linear flow law. A set of partial elliptic differential equations has been solved in terms of finite differences on a 100 x 100 m grid, and an iterative relaxation method has been applied. Interpolated thickness field and velocity profiles have been entered as input. Model results have been compared with measured velocities inferred from aerial photograph analysis and from field survey. They show a peculiar behavior of the Hells Gate ice shelf, especially with regard to the rheological ice features and boundary conditions at the contact between ice and rock. (Auth.)

52-3125

Non sorted polygons in the Terra Nova Bay area (Victoria Land, Antarctica).

Bondesan, A., Meneghel, M., Salvatore, M.C., Stenni, B., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.957-963, Refs. p.962-963.

Patterned ground, Geocryology, Cryogenic structures, Soil creep, Ice dating, Ice sheets, Glacial geology, Permafrost, Polygonal topography, Antarctica—Victoria Land

In the Terra Nova Bay region, where large areas are ice-free, fields of periglacial polygons are common. They develop on flat or gently sloping surfaces covered by a mantle of loose etherometric material, mainly of glacial origin. Three sites were chosen at different elevation, exposure, and geomorphological context. The polygons have been described by topography, morphology and grain size analysis. A sample of clean ice found under a polygon was submitted to stable isotope analysis, and gave no indication that refreezing processes altered the original isotopic value. Measurements of present processes have been made to monitor the slow soil movement. A Digital Elevation Model was developed from the close topographical survey performed on two polygons in the Northern Foothills. Field data and interpretation suggest that the polygon fields are still covering ice bodies which represent the vanishing stage of previous larger glaciers, probably of Wisconsinian age. (Auth.)

52-3126

Detection of permafrost and buried ice in ice-free areas of the northern Victoria Land (Antarctica) with the vertical electrical soundings (V.E.S.).

Guglielmin, M., Biasini, A., Dramis, F., Smiraglia, C., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.965-971, Refs. p.970-971.

Permafrost, Electromagnetic prospecting, Periglacial processes, Glacial geology, Rock glaciers, Glacial deposits, Antarctica—Victoria Land

Twenty vertical electrical soundings were carried out on principal ice-free features in the Terra Nova Bay area. The soundings performed included raised beaches and coastal deposits, debris-covered glaciers, rock glaciers, a glacial drift, esker deposits at Tarn Flat, and a frozen lake. The geophysical investigation also included the description of trenches dug in surficial permafrost, where permafrost ice and massive ice underlying the sounding sites were sampled. Landforms defined as "rock glaciers" on the basis of geomorphological evidence, show different internal structures of different origins. "Ice-cemented rock glaciers" of periglacial origin and "ice-cored rock glaciers" of glacial origin were identified. Many raised beaches show a structure characterized by saline permafrost underlying a thin continental permafrost. (Auth. mod.)

52-3127

Cenozoic glacial-marine sediments from the Fisher Massif (Prince Charles Mountains).

Laiba, A.A., Pushina, Z.V., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.977-984, 17 refs.

Glacial geology, Marine geology, Glacial deposits, Paleobotany, Paleoecology, Antarctica—Fisher Massif

A sequence of lithified coarse-grained sediments, interpreted as glacial-marine deposits was identified and examined at Fisher Massif during 1990-1991. This sequence consists of predominantly interbedded strata which are diamictites with angular debris of metavolcanic rocks eroded from the Fisher Massif and tillites containing rounded clastic material from other provenances. Thin beds and lenses of siltstone occur within the sequence. The base of the sequence is at 360 m above sea level and total thickness ranges to 320 m. A diatom assemblage is present in thin bands of indurated clay intercalated within a body of siltstone in the lower part of sequence at approximately 70 m above the base of the section. *In situ* Miocene diatoms reveal the conditions of the nearshore zone in the Lambert-Amery paleobasin. (Auth.)

52-3128

Integrated diatom biostratigraphy of Late Neogene drillholes in southern Victoria Land and correlation to southern ocean records.

Winter, D.M., Harwood, D.M., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.985-992, Refs. p.992.

Glacial geology, Stratigraphy, Geochronology, Glacial deposits, Algae, Biomass, Marine biology, Sea ice, Paleobotany, Antarctica—Victoria Land

The composite upper Miocene to Pleistocene sequences of the DVDP-10, DVDP-11, and CIROS-2 drillholes provide valuable reference for the coastal biostratigraphy of Antarctica. These 3 drillcores record the influence of marine and glacial environments and comprise a total thickness of more than 240 m, with a composite correlated thickness of more than 160 m. The diatoms in these cores provide age control for marine and glacial events and enable correlation between the cores. This correlation, along with magnetostratigraphy and calibration by a radiometric dating, provides for an improved coastal diatom chronostratigraphy for antarctic shelf basins. A biostratigraphic zonal scheme of 6 zones is proposed and correlated to the well-established southern ocean diatom zonal framework. In contrast to modern shelf sediments, the diatom assemblage associated with sea-ice is rare to absent in the upper Miocene to Pliocene of these cores. This points to a significantly reduced sea-ice cover in the Late Neogene, relative to today. Distinct intervals of diatom productivity, separated by diatom-poor glacial deposits reflect significant fluctuation in the extent of Late Neogene glacial influence on the southern Victoria Land margin. (Auth.)

52-3129

Paleoclimate of Permo-Triassic Antarctica.

Collinson, J.W., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1029-1034, Refs. p.1033-1034.

Glacial geology, Climatic changes, Paleoclimatology, Glacial deposits, Glaciation, Meteorological factors, Models

Mild climates suggested by geologic data from high latitudes generally contradict predictions of global climate models. Paleoclimate indicators in Permo-Triassic sedimentary sequences in Antarctica suggest evolution from a cold glacial to a cool humid climate in the Permian and to a warm climate with seasonal moisture in the Triassic. Widespread glacial deposits indicate that a major ice sheet covered Antarctica in earliest Permian. Coldwater turbidities and compositionally immature sandstones in post-glacial sequences suggest that cold arid conditions continued for a while. The *Glossopteris/Gangamopteris* flora and coal deposits suggest cool, humid conditions by late Early Permian and throughout the Late Permian. In Early Triassic the lack of coal and the occurrence of green/red fine-grained stream deposits suggest seasonal water input. At times, perhaps during the warmest part of the Milankovich cycle, reptiles and amphibians of the *Lystrosaurus* and *Cynognathus* faunas migrated into Antarctica. (Auth. mod.)

52-3130

Geophysical observatory at Neumayer Station, Antarctica.

Eckstaller, A., Müller, C., Nixdorf, U., Rogenhagen, J., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1039-1048, 9 refs.

Stations, Geomagnetism, Geophysical surveys, Seismology, Gravity, Ice melting, Measurement, Instruments, Data processing, Antarctica—Neumayer Station, Antarctica—Ekström Ice Shelf

The geophysical observatory at the new German antarctic research station "Neumayer" on the Ekström Ice Shelf is now operating. It continues the observatory program carried out at the former "Georg-von-Neumayer Station" which had to be closed in 1992. The observatory was completely modernized and most of the electronics were replaced by new instruments. The digital data acquisition was totally changed and is now based on a network of several SUN-workstations. The main tasks of the observatory are still related to seismology, geomagnetism and tidal observations. In 1993, two other long-term experiments were added to the observatory program which are related more to oceanography and glaciology. Points of highest priority are still geomagnetic and sesimologic observations. Currently there are 4 other short-period stations installed on the ice shelf at distances between 5 and 15 km from the Neumayer. Two more remote stations are located on grounded ice near the top of distant ice rises. (Auth. mod.)

52-3131

Chemical variations of fumarolic gases in Deception Island, South Shetland Islands, Antarctica.

Villegas, M.T., Ortiz, R., Caselli, A., Cohen, M., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1077-1082, 21 refs.

Seismology, Volcanoes, Chemical analysis, Gases, Glacier melting, Ground water, Antarctica—Deception Island

Fumaroles at Fumarole Bay, one of the major fumarolic fields at Deception I., are considered to be hydrothermal, since they are vapor-dominated at a low pressure system. Samples of the fumarole F2 have been collected during the summers of 93-94 and 94-95 and analyzed hours later. S/C (sulphur/carbon) ratios and vapor content of samples are studied here in correlation with the recorded seismicity during the same periods. An increase in the S/C values seems to coincide with an increase in seismicity: a seismic event is registered and an increase in the S/C is observed. The increase in the S/C ratio is related to the increase of water in the aquifer system as a result of the seasonal melting of the upper ice layers. This causes an increase in the number of seismic tremors on the island. Both effects are present at Deception I. (Auth. mod.)

52-3132

Geologic mapping from Landsat TM imagery: examples from the Transantarctic Mountains in southern Victoria Land.

Bradford, S.C., Wilson, T.J., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1117-1122, Refs. p.1122.

Imaging, Spaceborne photography, Image processing, Geological maps, Data processing, Antarctica—Transantarctic Mountains

LANDSAT-4 Thematic Mapper image of the Transantarctic Mountains has been digitally processed to extract different types of geological information. The authors have identified some processing techniques that provide the best results given the unique characteristics of antarctic imagery. Filtered or "edge-enhanced" images are very useful for defining structural trends, and reveal large-scale structural lineaments that could not be otherwise identified, even in this relatively well exposed area of the mountains. Principal component imagery, presented in false color composite format, greatly enhances the degree of discrimination between different geologic materials, and thus is particularly useful for geologic mapping from satellite imagery. Satellite imagery remains an underutilized resource for geologic studies in Antarctica. (Auth.)

52-3133

Gravity field of the southern Weddell Sea from GEOSAT and ERS-1.

Schöne, T., Schenke, H.W., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1123-1128, 23 refs.

Remote sensing, Height finding, Gravity anomalies, Bottom topography, Sea ice, Antarctica—Weddell Sea

Since its launch in 1991, the European Remote-sensing Satellite ERS-1 has supplied satellite radar altimetry data with full coverage between ±82° latitude. Now for the first time it is possible to determine a high quality gravity field in the southern Weddell Sea. Permanent sea ice coverage of this region causes outliers and a high signal-to-noise ratio which requires improved algorithms for blunder detection and a special adjustment procedure for the determination of sea surface heights. Based on a newly developed two-step adjustment process, the standard ERS-1 Ocean Products and complete GEOSAT data south of 60°S were used for the determination of gravity anomalies for the entire Weddell Sea. Comparison with marine gravity as well as bathymetric data demonstrates the good quality of the derived gravity field. (Auth.)

52-3134

Analysis of bedrock geology and thermal gradients using geophysical ground measurements on glaciated terrain in Queen Maud Land, Antarctica.

Ruotoistenmäki, T., Lehtimäki, J., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1149-1152, 7 refs.

Bedrock, Geological surveys, Permafrost thermal properties, Ground water, Gravity, Geophysical surveys, Ice cover thickness, Antarctica—Queen Maud Land

Gravity, magnetic and electromagnetic measurements were carried out in western Queen Maud Land. Based on gravity and magnetic field observations and the petrophysical properties of the rock samples, the underlying rocks can be interpreted as predominantly basalts. The high density and susceptibility contrasts between ice and bedrock dominates the gravity and magnetic anomalies. The most significant magnetic feature is a 10 km long circular anomaly, 100 nT in amplitude. According to the modeling, the source is a large buried lensoid body interpreted as a gabroid intrusion, possibly representing a former magma chamber. Electromagnetic soundings revealed significant conductors in the bedrock beneath the ice. Correlation analysis between ice thickness and the depth of the conductor in the bedrock leads to the conclusion that the conductors are not sedimentary rock layers but rather salty groundwater in which salinity has been enhanced by permafrost processes. From the regression curve it is also possible to estimate that the 0° (i.e. 'wet') ice base is expected at depths of ca. 700 m and the base of permafrost in outcropping bedrock is at ca. 1 km. (Auth. mod.)

52-3135

Geomorphological map of the area between Mount Emison and Mills Peak (Victoria Land, Antarctica), mapped using aerial photographs.

Salvatore, M.C., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1179-1182, 11 refs.

Geomorphology, Geological maps, Spaceborne photography, Topographic maps, Glacial geology, Antarctica—Victoria Land

Morphological mapping of northern Victoria Land supports glaciological and paleoclimatic research. The Operative Unit GLA 23 of the Italian Antarctic Research Program is investigating the morphological characteristics of Victoria Land and preparing thematic maps. In this note the techniques used to create a geomorphological map at 1:25,000 from aerial photographs are discussed. The map sheet is located in the Terra Nova Bay area: two ice flows fed by the Tourmaline Plateau ice cap limit the mapped area to the north; to the south are the high peaks of Mount Emison, and to the east is Campbell Glacier.

52-3136

Use of a digital base of LANDSAT imagery on a 1:250 000 scale geological map of the Bunger Hills/Denman Glacier region, East Antarctica.

Tingey, R.J., Sheraton, J.W., Bierwirth, P., Highet, L., Kennedy, D., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1183-1185, 11 refs.

Geological maps, Glacier surfaces, LANDSAT, Image processing, Mapping, Glacial geology, Antarctica—Bunger Hills, Antarctica—Denman Glacier

Geologists of the Australian Geological Survey Organisation have used LANDSAT Multi-Spectral Scanner satellite imagery as an aid to mapping the bedrock geology of East Antarctica. A map of the Bunger Hills/Denman Glacier region is presented. Image processing and map compilation and production are described.

52-3137

Geomorphological map of Byers Peninsula, Livingston Island, South Shetland Islands.

López-Martínez, J., Martínez de Pisón, E., Serrano, E., Arche, A., International Symposium on Antarctic Earth Sciences, 7th, Siena, Italy, Sep. 10-15, 1995. Proceedings. Antarctic region: geological evolution and processes, edited by C.A. Ricci, Siena, Italy, Terra Antartica Publication, 1997, p.1199-1200, 5 refs.

Geomorphology, Glacial geology, Glacial erosion, Glacial deposits, Periglacial processes, Antarctica—Byers Peninsula

The extension and variety of landforms and deposits existing on Byers Peninsula make this area particularly adequate and interesting for geomorphological mapping, especially in view of the fact that such extensive ice-free areas are quite rare in the Antarctic Peninsula region. This first detailed geomorphological map of the peninsula at 1:25,000 scale has been drawn using a recently published topographical map of the same area as a base. Different colors have been used to indicate the landforms and deposits related to each of the different geomorphological processes: structural, fluvial, glacial, periglacial and marine.

52-3138

Geomagnetic modulation of the ^{36}Cl flux in the GRIP ice core, Greenland.

Baumgartner, S., Beer, J., Masarik, J., Wagner, G., Meynadier, L., Synal, H.A., *Science,* Feb. 27, 1998, 279(5355), p.1330-1332, 26 refs.

Ice cores, Isotopes, Cosmogenic isotopes, Greenland

52-3139

Sensitivity to stress in the bivalve *Macoma balthica* from the most northern (arctic) to the most southern (French) populations: low sensitivity in arctic populations because of genetic adaptations?

Hummel, H., et al, *Hydrobiologia,* Oct. 3, 1997, Vol.355, p.127-138, 53 refs.

Marine biology, Biomass, Stresses, Ice cover effect, Physiological effects, Chemical properties, Acclimatization, Migration, Theories, Sampling, Barents Sea, Russia—White Sea

52-3140

Pedosedimentary events in loess of China and Quaternary climatic cycles.

Guo, Z.T., Ding, Z.L., Liu, D.S., *Chinese science bulletin,* July 1996, 41(14), p.1189-1193, 6 refs.

Paleoclimatology, Climatic changes, Quaternary deposits, Sedimentation, Loess, Eolian soils, Soil composition, Remanent magnetism, Geochronology, Stratigraphy, Correlation, China—Loess Plateau

52-3141

Preliminary study on the summer monsoon climate of Chinese Loess Plateau during the last interglacial period.

Sun, D.H., Zhou, J., Jiang, F.C, Porter, S.C., *Chinese science bulletin,* Feb. 1996, 41(4), p.321-325, 7 refs.

Paleoclimatology, Climatic changes, Atmospheric circulation, Quaternary deposits, Loess, Eolian soils, Sampling, Remanent magnetism, Isotope analysis, Radioactive age determination, Statistical analysis, Correlation, China—Loess Plateau

52-3142

Petroleum geological activities onshore West Greenland in 1996, and drilling of a deep exploration well.

Christiansen, F.G., et al, *Geology of Greenland survey bulletin,* 1997, No.176, p.17-23, 14 refs.

Hydrocarbons, Exploration, Reservoirs, Sediments, Geophysical surveys, Subpolar regions, Sampling, Boreholes, Greenland

52-3143

Palaeo-oil field in a Silurian carbonate buildup, Wulff Land, North Greenland: project 'Resources of the sedimentary basins of North and East Greenland'.

Stemmerik, L., Sønderholm, M., Bojesen-Koefoed, J.A., *Geology of Greenland survey bulletin,* 1997, No.176, p.24-28, 14 refs.

Hydrocarbons, Geophysical surveys, Exploration, Reservoirs, Sediments, Pleistocene, Sampling, Geochemistry, Greenland—Wulff Land

52-3144

Petroleum geological investigations in East Greenland: project 'Resources of the sedimentary basins of North and East Greenland'.

Stemmerik, L., et al, *Geology of Greenland survey bulletin,* 1997, No.176, p.29-38, 24 refs.

Geological surveys, Exploration, Hydrocarbons, Tectonics, Subpolar regions, Pleistocene, Sedimentation, Stratigraphy, Geochemistry, Greenland

52-3145

Role of bacteria in degradation of exposed massive sulphides at Citronen Fjord, North Greenland: project 'Resources of the sedimentary basins of North and East Greenland'.

Langdahl, B.R., Elberling, B., *Geology of Greenland survey bulletin,* 1997, No.176, p.39-43, 7 refs.

Geological surveys, Subpolar regions, Minerals, Mining, Environmental impact, Sediments, Microbiology, Bacteria, Degradation, Sampling, Greenland—Citronen Fjord

52-3146

Ore geological studies of the Citronen Fjord zinc deposit, North Greenland: project 'Resources of the sedimentary basins of North and East Greenland'.

Kragh, K., Jensen, S.M., Fougt, H., *Geology of Greenland survey bulletin,* 1997, No.176, p.44-49, 13 refs.

Geological surveys, Subpolar regions, Exploration, Minerals, Sedimentation, Stratigraphy, Isotope analysis, Greenland

52-3147

Seismic investigation of the East Greenland volcanic rifted margin.

Dahl-Jensen, T., et al, *Geology of Greenland survey bulletin,* 1997, No.176, p.50-54, 20 refs.

Geological surveys, Marine geology, Subpolar regions, Seismic surveys, Seismic reflection, Earth crust, Tectonics, Magma, Continental drift, Greenland

52-3148
Age determination of Precambrian rocks from Greenland: past and present.
Kalsbeek, F., *Geology of Greenland survey bulletin,* 1997, No.176, p.55-59, 26 refs.
Geological surveys, Subpolar regions, Pleistocene, Earth crust, Rock properties, Magma, Radioactive age determination, Isotope analysis, Sampling, Greenland

52-3149
Metasedimentary rocks, intrusions and deformation history in the south-east part of the c. 1800 Ma Ketilidian orogen, South Greenland: Project SUPRASYD 1996.
Garde, A.A., Chadwick, B., Grocott, J., Swager, C., *Geology of Greenland survey bulletin,* 1997, No.176, p.60-65, 14 refs.
Geological surveys, Subpolar regions, Earth crust, Tectonics, Sedimentation, Magma, Rock properties, Deformation, Lithology, Greenland

52-3150
Mafic igneous rocks and mineralisation in the Palaeoproterozoic Ketilidian orogen, South-East Greenland: project SUPRASYD 1996.
Stendal, H., Mueller, W., Birkedal, N., Hansen, E.I., Østergaard, C., *Geology of Greenland survey bulletin,* 1997, No.176, p.66-74, 15 refs.
Geological surveys, Subpolar regions, Tectonics, Sedimentation, Minerals, Magma, Rock properties, Hydrothermal processes, Gold, Exploration, Greenland

52-3151
Airborne geophysical surveys in Greenland—1996 update.
Stemp, R.W., *Geology of Greenland survey bulletin,* 1997, No.176, p.75-79, 6 refs.
Geophysical surveys, Magnetic surveys, Geomagnetism, Subpolar regions, Earth crust, Aerial surveys, Geological maps, Electromagnetic prospecting, Greenland

52-3152
Macrofossil studies of Holocene lake sediments from Jameson Land, East Greenland.
Bennike, O., Funder, S., *Geology of Greenland survey bulletin,* 1997, No.176, p.80-83, 10 refs.
Geological surveys, Subpolar regions, Quaternary deposits, Paleoecology, Lacustrine deposits, Drill core analysis, Lithology, Geochronology, Radioactive age determination, Greenland—Jameson Land

52-3153
Pleistocene sedimentary record of the Falsterselv area, Jameson Land, East Greenland.
Hansen, L.A., Jensen, J.B., Terkelsen, M., *Geology of Greenland survey bulletin,* 1997, No.176, p.84-88, 9 refs.
Pleistocene, Geological surveys, Radar echoes, Subpolar regions, Sedimentation, Stratigraphy, Glacial geology, Glacial deposits, Profiles, Greenland—Jameson Land

52-3154
Holocene lake sediments in West Greenland and their palaeoclimatic and palaeoecological implications.
Anderson, N.J., Bennike, O., *Geology of Greenland survey bulletin,* 1997, No.176, p.89-94, 22 refs.
Geological surveys, Subpolar regions, Limnology, Paleoclimatology, Paleoecology, Lacustrine deposits, Quaternary deposits, Salinity, Drill core analysis, Greenland

52-3155
Nioghalvfjerdsfjorden glacier project, North-East Greenland: a study of ice sheet response to climate change.
Thomsen, H.H., et al, *Geology of Greenland survey bulletin,* 1997, No.176, p.95-103, 13 refs.
Glacier surveys, Ice sheets, Climatology, Climatic changes, Glacier oscillation, Glacier mass balance, Glacier tongues, Ice water interface, Greenland—Nioghalvfjerdsfjorden

52-3156
'Open system pingo' near Kangerlussuaq (Søndre Strømfjord), West Greenland.
Scholz, H., Baumann, M., *Geology of Greenland survey bulletin,* 1997, No.176, p.104-108, 21 refs.
Permafrost hydrology, Subpolar regions, Continuous permafrost, Moraines, Pingos, Detection, Outwash, Springs (water), Greenland—Søndre Strømfjord

52-3157
Tropospheric ozone at high latitudes in clean and polluted air masses, a climatological study.
Solberg, S., Stordal, F., Hov, Ø., *Journal of atmospheric chemistry,* Nov. 1997, 28(1-3), p.111-123, 14 refs.
Climatology, Polar atmospheres, Air masses, Air pollution, Atmospheric boundary layer, Atmospheric composition, Atmospheric circulation, Ozone, Aerosols, Seasonal variations, Sampling, Environmental tests, Statistical analysis, Norway

52-3158
European VOC emission estimates evaluated by measurements and model calculations.
Hov, O., et al, *Journal of atmospheric chemistry,* Nov. 1997, 28(1-3), p.173-193, Refs. p.191-193.
Climatology, Air pollution, Atmospheric boundary layer, Subpolar regions, Atmospheric composition, Aerosols, Hydrocarbons, Classifications, Seasonal variations, Computerized simulation, Sampling, Sweden, Norway, Finland

52-3159
Reactive nitrogen compounds at Spitsbergen in the Norwegian Arctic.
Solberg, S., et al, *Journal of atmospheric chemistry,* Nov. 1997, 28(1-3), p.209-225, Refs. p.223-225.
Climatology, Atmospheric composition, Polar atmospheres, Air masses, Air flow, Aerosols, Turbulent diffusion, Photochemical reactions, Seasonal variations, Sampling, Norway—Spitsbergen

52-3160
Sedimentary records of climatic and oceanographic changes northwest of Kerguelen (southern Indian Ocean) during the last 620 000 years. [Enregistrements sédimentologiques des changements climatiques et océanographiques au nord-ouest de Kerguelen (océan Indien sud) pendant les dernières 620 000 années]
Gendron-Badou, A., Pichon, J.J., Fröhlich, F., *Académies des sciences, Paris. Comptes rendus. Série II,* Sep. 1997, 325(5), p.343-349, In French with English summary. Refs. p.349.
Pleistocene, Paleoclimatology, Sediments, Marine biology, Stratigraphy, —Indian Ocean
The comparison of carbonate and biogenic silica content with the past sea surface temperature, estimated by the siliceous flora in a sediment core from the northwest of Kerguelen (located just southwards of the Subantarctic Front) during the Late Quaternary, is presented. The interglacial stages correspond to the carbonate maxima and include a subantarctic assemblage of siliceous phytoplankton, while the glacial stages of biogenic silica maxima are characterized by flora typical of the area south of the Antarctic Convergence (AC). By comparing this data, it is shown that the AC has migrated at least 4° northwards during the glacial periods. (Auth.)

52-3161
***Psychroserpens burtonensis* gen. nov., sp. nov., and *Gelidibacter algens* gen. nov., sp. nov., psychrophilic bacteria isolated from antarctic lacustrine and sea ice habitats.**
Bowman, J.P., McCammon, S.A., Brown, J.L., Nichols, P.D., McMeekin, T.A., *International journal of systematic bacteriology,* July 1997, 47(3), p.670-677, 53 refs.
Microbiology, Bacteria, Sea ice, Ice cores, Antarctica—Ellis Fjord, Antarctica—Vestfold Hills
Psychrophilic, yellow-pigmented, seawater-requiring bacteria isolated from the pycnocline of meromictic Burton Lake and from sea ice cores obtained in the Vestfold Hills were characterized. Phenotypic analysis showed that the strains isolated formed two distinct taxa. A 16S ribosomal DNA (rDNA) sequence analysis revealed that the two antarctic taxa formed related but distinct lineages within the *[Flexibacter] maritimus* rRNA branch of the family *Flavobacteriaceae.* The whole-cell lipid profiles of the antarctic strains mainly comprised branched and unbranched monounsaturated C_{15} to C_{17} fatty acids. The presence of significant levels of the lipids a15:1ω10c and a17:1ω7c appeared to be useful biomarkers for the new antarctic taxa and for differentiating these organisms from other members of the family *Flavobacteriaceae.* On the basis of polyphasic taxonomic data the authors propose that the new taxa are novel bacterial species designated *Psychroserpens burtonensis* gen. nov., sp. nov. (type strain, ACAM 188) and *Gelidibacter algens* gen. nov., sp. nov. (type strain, ACAM 536). (Auth. mod.)

52-3162
Changing magmatic and tectonic styles along the paleo-Pacific margin of Gondwana and the onset of early Paleozoic magmatism in Antarctica.
Encarnación, J., Grunow, A., *Tectonics,* Dec. 1996, 15(6), p.1325-1341, 74 refs.
Glacial geology, Tectonics, Antarctica—Victoria Land, Antarctica—Scott Glacier
Presented here are new concordant zircon and titanite U-Pb ages for these magmatic rocks in southern Victoria Land and the Scott Glacier area. The lack of definite arc magmatism prior to ca. 530 Ma suggests that deformation may have been associated with a strike or oblique-slip regime, although shallow subduction without significant arc magmatism cannot be ruled out. The oldest and most voluminous magmatic rocks were emplaced after ca. 530 Ma. This magmatism has been associated with active subduction, and suggests a fundamental change in the plate boundary at ca. 530 Ma. Ductile shearing of plutons and contractional deformation of supracrustal rocks after ca. 530 Ma may have been due to transpressional tectonics in an oblique subduction-setting and/or a collision. Compressional deformation associated with the Ross orogeny may have ceased by ca. 500 Ma along the southern Victoria Land-Scott Glacier segment of the antarctic margin, as indicated by undeformed magmatic rocks of this age, although magmatic activity continued to at least ca. 485 Ma. (Auth. mod.)

52-3163
Patterns of late Cenozoic volcanic and tectonic activity in the west antarctic rift system revealed by aeromagnetic surveys.
Behrendt, J.C., et al, *Tectonics,* June 1996, 15(3), p.660-676, 63 refs.
Sea ice, Tectonics, Volcanoes, Geomagnetism, Aerial surveys, Ice shelves, Ice sheets, Antarctica—Ross Island, Antarctica—Ross Ice Shelf
Aeromagnetic surveys, spaced ≤5 km, over widely separated areas of the largely ice- and sea-covered West Antarctic rift system, reveal similar patterns of 100- to 1700-nT, shallow-source magnetic anomalies interpreted as evidence of extensive Late Cenozoic volcanism. Aeromagnetic data are used to extend the volcanic rift interpretation over West Antarctica starting with anomalies over: exposures of highly magnetic, Late Cenozoic volcanic rocks several kilometers thick in the McMurdo-Ross Island area and elsewhere; volcanoes and subvolcanic intrusions directly beneath the Ross Sea continental shelf defined by marine magnetic and seismic reflection data and aeromagnetic data; volcanic structures interpreted beneath the Ross Ice Shelf partly controlled by seismic reflection determinations of seafloor depth; and an area of similar magnetic pattern over the West Antarctic Ice Sheet, where interpretations of Late Cenozoic volcanic rocks at the base of the ice are controlled in part by radar ice sounding. (Auth. mod.)

52-3164
Neoglacial glacier changes around Storstrømmen, north-east Greenland.
Weidick, A., Andreasen, C., Oerter, H., Reeh, N., *Polarforschung,* 1996, 64(3), p.95-108, With German summary. 36 refs.
Glacial geology, Ice sheets, Glacier oscillation, Ice edge, Subpolar regions, Moraines, Quaternary deposits, Profiles, Geochronology, Statistical analysis, Greenland—Storstrømmen

52-3165
Growth and collapse history of pingos, Kuganguaq, Disko Island, Greenland.
Yoshikawa, K., Nakamura, T., Igarashi, Y., *Polarforschung,* 1996, 64(3), p.109-113, With German summary. 15 refs.
Pleistocene, Geomorphology, Geophysical surveys, Pingos, Ice growth, Continuous permafrost, Frozen ground mechanics, Sampling, Geochronology, Radioactive age determination, Greenland—Disko Island

52-3166
Plant formations and their bio-products from western Banks Island (N.W.T., Canada).
Kuc, M., *Polarforschung,* 1996, 64(3), p.115-122, With German summary. 44 refs.
Plant ecology, Arctic landscapes, Ecosystems, Tundra vegetation, Tundra terrain, Vegetation patterns, Growth, Classifications, Geobotanical interpretation, Canada—Northwest Territories—Banks Island

52-3167

Dynamics of the littoral zone of arctic seas (state of the art and goals).

Are, F.E., *Polarforschung,* 1996, 64(3), p.123-131, With German summary. 43 refs.

Oceanography, Geomorphology, Shores, Littoral zone, Sea ice, Ice scoring, Ice cover effect, Sediment transport, Shore erosion, Shoreline modification, Arctic Ocean

52-3168

Algorithm for approximate paleotemperature calculations of mountain rock from temperature measurements in deep bore holes.

Khrutskiĭ, S.F., Baranova, N.A., *Polarforschung,* 1996, 64(3), p.133-134, With German summary. 9 refs.

Paleoclimatology, Surface temperature, Frozen rock temperature, Boreholes, Thermal conductivity, Temperature measurement, Profiles, Mathematical models, Computer programs, Accuracy

52-3169

Reconstruction of past climates from stable isotope records of palaeo-precipitation preserved in continental archives.

Rozanski, K., Johnsen, S.J., Schotterer, U., Thompson, L.G., *Hydrological sciences journal,* Oct. 1997, 42(5), p.725-745, With French summary. Refs. p.741-745.

Paleoclimatology, Climatic changes, Climatic factors, Precipitation (meteorology), Sediments, Ice sheets, Glacier ice, Ice cores, Ice dating, Isotope analysis, Sampling, Statistical analysis

The potential of stable isotope ratios ($^{2}H/^{1}H$ and $^{18}O/^{16}O$) of water as a modern tool for palaeoclimatic reconstructions on continents is reviewed. Examples of stable isotope records of palaeo-precipitation preserved in various continental archives (polar ice sheets, mid- and low latitude glaciers, lacustrine deposits, groundwater) are presented, and the methodology of their interpretation in terms of climatic changes is briefly discussed. (Auth. mod.)

52-3170

Deterioration of concrete bridge piers in Iceland.

Gudmundsson, G., Symposium on Mechanisms of Chemical Degradation of Cement-based Systems, Boston, MA, Nov. 27-30, 1995. Proceedings. Edited by K.L. Scrivener and J.F. Young, Suffolk, E & FN Spon, 1997, p.201-208, 6 refs.

DLC TA445.S87 1995

Bridges, Concrete structures, Piers, Littoral zone, Cements, Frost action, Damage, Degradation, Freeze thaw cycles, Chemical composition, Coring, Sampling, Scanning electron microscopy

52-3171

Annually re-forming miniature sorted patterned ground in the high Drakensberg, southern Africa.

Grab, S.W., *Earth surface processes and landforms,* Aug. 1997, 22(8), p.733-745, Refs. p.743-745.

Alpine landscapes, Geocryology, Periglacial processes, Patterned ground, Sorting, Indexes (ratios), Frost action, Freeze thaw cycles, Frozen ground mechanics, Soil analysis, South Africa

52-3172

Characteristics of aeolian grain transport over a fluvio-glacial lacustrine braid delta, Lake Tekapo, New Zealand.

McGowan, H.A., Sturman, A.P., *Earth surface processes and landforms,* Aug. 1997, 22(8), p.773-784, 41 refs.

Alpine landscapes, Deltas, Sediment transport, Eolian soils, Dust, Grain size, Wind factors, Sampling, Physical properties, New Zealand—Tekapo, Lake

52-3173

Crescentic dunes at Schiermonnikoog, The Netherlands.

Hesp, P.A., Arens, S.M., *Earth surface processes and landforms,* Aug. 1997, 22(8), p.785-788, 10 refs.

Beaches, Landforms, Topographic features, Migration, Topographic effects, Soil air interface, Frozen ground mechanics, Wind erosion, Eolian soils, Sediment transport, Netherlands—Schiermonnikoog

52-3174

Rhizosphere and nutrient effects of remediating subarctic soils.

Reynolds, C.M., Koenen, B.A., Carnahan, J.B., Walworth, J.L., Bhunia, P., MP 5109, International In Situ and On-site Bioremediation Symposium, 4th, New Orleans, LA, Apr. 28-May 1, 1997. Collected papers, Vol.1, Columbus, Battelle Press, 1997, p.297-302, 10 refs.

DLC TD192.5.I56 1997 Vol.1

Soil pollution, Attenuation, Subarctic landscapes, Hydrocarbons, Soil microbiology, Grasses, Roots, Nutrient cycle, Environmental protection, Soil tests, Chemical analysis, Sampling, United States—Alaska

Increased microbial activity in rhizosphere soil may be useful in enhancing bioremediation rates and endpoints. Rhizosphere-based remediation systems would be inexpensive to implement and maintain, and applicable to remote or permafrost sites. Field data that compare rhizosphere-enhanced bioremediation rates to other alternatives are needed for evaluating the acceptability of rhizosphere-based treatment systems. A field study was conducted in Fairbanks, AK, to compare the effects of nutrients and vegetation on rhizosphere-enhanced bioremediation of soils contaminated with either diesel or crude oil. Replicate soil samples were taken prior to fertilization and seeding and at the end of the first growing season. Soil extracts were analyzed for total petroleum hydrocarbon by gas chromatography. The greatest total petroleum hydrocarbon reduction rates during the initial 54 days were from Annual Ryegrass and Arctared Fescue with nutrients.

52-3175

Benthic faunal associations on soft substrates at Potter Cove, King George Island, Antarctica.

Sahade, R., Tatián, M., Kowalke, J., Kühne, S., Esnal, G.B., *Polar biology,* Feb. 1998, 19(2), p.85-91, Refs. p.90-91.

Bottom ice, Icebergs, Marine biology, Antarctica—Potter Cove

Associations of benthic invertebrates from Potter Cove were defined from phototransects. Density, percentage cover, species richness S', diversity index H', evenness index J' and mean-size estimations were studied in relation to a water depth of 30 m. A clear bathymetric pattern was evident, with two different communities at 15 and 30 m, and a transition area between 20 and 25 m. At 15 m a small number of taxa and a high percentage of bare substratum (95%) were observed. The dominant species were pennatulids and the bivalve *Laternula elliptica.* From 20 to 30 m the dominant species was the ascidian *Molgula pedunculata* and there was a slight increase in S', H' and J', as well as in the mean size of individuals, especially in *M. pedunculata,* while the proportion of bare substratum showed a constant decrease with depth. Ice impact seems to be the major regulating factor of benthic assemblages in shallow waters. (Auth. mod.)

52-3176

Microclimatic conditions, meltwater moistening, and the distributional pattern of *Buellia frigida* on rock in a southern continental Antarctic habitat.

Kappen, L., Schroeter, B., Green, T.G.A., Seppelt, R.D., *Polar biology,* Feb. 1998, 19(2), p.101-106, Refs. p.105-106.

Lichens, Ecology, Biomass, Climatic factors, Snowmelt, Antarctica—Geology, Cape

The importance of snowmelt as a source of moisture for the crustose lichen *Buellia frigida* in the early austral summer was investigated at Cape Geology. Surface and air temperatures and irradiance were recorded on a slightly inclined granite boulder for 5 weeks. Observations were made of lichen thallus hydration during a 5-day period. The results confirmed the strong warming effect of high irradiance. Since water condensation on the rock surface (dew or hoarfrost) was not possible during that period, the thalli were moistened by meltwater from a small area of snow pack and from occasional snowfalls. The distribution of lichen thalli on the rock surface can be explained by the frequency and duration of meltwater moistening. Despite the very high irradiance while moist, the lichens seem well adapted to the combination of hydration, low temperatures and strong light. (Auth. mod.)

52-3177

Characterization of a small eutrophic Antarctic lake (Otero Lake, Cierva Point) on the basis of algal assemblages and water chemistry.

Mataloni, G., Tesolín, G., Tell, G., *Polar biology,* Feb. 1998, 19(2), p.107-114, Refs. p.113-114.

Limnology, Algae, Biomass, Plankton, Lake ice, Acclimatization, Antarctica—Cierva Cove

Otero Lake is the main water body of Cierva Cove in which during the 1992-93 and 1994-95 seasons, abiotic parameters and the structure and dynamics of the phytoplankton were studied. Algal assemblages, from the phytoplankton, from algal clumps encased in the lake ice and from the benthic algal felt, were compared. Low Jaccard similarity indices between these 3 assemblages suggest different survival strategies. The higher species richness of phytoplankton also suggests that external propagule inputs can heavily influence the structure of this community. High levels of phosphate, nitrate and ammonium indicate that they do not limit summer growth of the phytoplankton community. Blooms of *Chlamydomonas subcaudata* Wille are characteristic. This group of features define Otero Lake as a highly eutrophic water body, in which outflow seems to be the main cause of phytoplankton loss during summer. (Auth. mod.)

52-3178

CO and CO_2 isotopic composition in Spitsbergen during the 1995 ARCTOC campaign.

Röckmann, T., Brenninkmeijer, C.A.M., *Tellus,* Nov. 1997, 49B(5), p.455-465, 38 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.

Climatology, Polar atmospheres, Atmospheric boundary layer, Atmospheric composition, Gases, Carbon dioxide, Turbulent diffusion, Carbon isotopes, Isotope analysis, Sampling, Norway—Spitsbergen

52-3179

Hydrocarbon measurements in the spring arctic troposphere during the ARCTOC 95 campaign.

Ramacher, B., Rudolph, J., Koppmann, R., *Tellus,* Nov. 1997, 49B(5), p.466-485, 35 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.

Climatology, Air pollution, Polar atmospheres, Degradation, Atmospheric boundary layer, Hydrocarbons, Aerosols, Turbulent diffusion, Ozone, Sampling, Environmental tests, Statistical analysis, Norway—Spitsbergen

52-3180

Aerosol chemical composition during tropospheric ozone depletion at Ny Ålesund/Svalbard.

Lehrer, E., Wagenbach, D., Platt, U., *Tellus,* Nov. 1997, 49B(5), p.486-495, 28 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.

Climatology, Polar atmospheres, Atmospheric boundary layer, Air masses, Atmospheric composition, Aerosols, Ions, Ozone, Degradation, Sampling, Norway—Svalbard

52-3181

Measurements of arctic sunrise surface ozone depletion events at Kangerlussuaq, Greenland (67°N, 51°W).

Miller, H.L., Weaver, A., Sanders, R.W., Arpag, K., Solomon, S., *Tellus,* Nov. 1997, 49B(5), p.496-509, 32 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.

Climatology, Polar atmospheres, Air masses, Atmospheric boundary layer, Atmospheric composition, Degradation, Ozone, Spectroscopy, Turbulent diffusion, Seasonal variations, Greenland—Kangerlussuaq

52-3182

Analysis of tropospheric ozone measurements in Greenland.

Rasmussen, A., Kiilsholm, S., Sørensen, J.H., Mikkelsen, I.S., *Tellus,* Nov. 1997, 49B(5), p.510-521, 14 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.

Climatology, Atmospheric boundary layer, Polar atmospheres, Marine atmospheres, Atmospheric composition, Ozone, Degradation, Air masses, Atmospheric circulation, Sampling, Meteorological factors, Correlation, Greenland

52-3183
Modeling the chemistry of ozone, halogen compounds and hydrocarbons in the arctic troposphere during spring.
Sander, R., Vogt, R., Harris, G.W., Crutzen, P.J., *Tellus,* Nov. 1997, 49B(5), p.522-532, 47 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.
Climatology, Air pollution, Polar atmospheres, Atmospheric boundary layer, Degradation, Aerosols, Ozone, Hydrocarbons, Scavenging, Chemical analysis, Mathematical models

52-3184
DOAS-observation of halogen radical-catalysed arctic boundary layer ozone destruction during the ARCTOC-campaigns 1995 and 1996 in Ny-Ålesund, Spitsbergen.
Tuckermann, M., et al, *Tellus,* Nov. 1997, 49B(5), p.533-555, Refs. p.553-555. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.
Climatology, Atmospheric boundary layer, Polar atmospheres, Air pollution, Atmospheric composition, Degradation, Ozone, Aerosols, Advection, Spectroscopy, Seasonal variations, Statistical analysis, Norway—Spitsbergen

52-3185
NO_x during ozone depletion events in the arctic troposphere at Ny-Ålesund, Svalbard.
Beine, H.J., et al, *Tellus,* Nov. 1997, 49B(5), p.556-565, 27 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.
Climatology, Atmospheric boundary layer, Polar atmospheres, Atmospheric composition, Degradation, Ozone, Aerosols, Atmospheric circulation, Hydrocarbons, Sampling, Luminescence, Statistical analysis, Norway—Svalbard

52-3186
FT-IR product study of the gas-phase Br-initiated oxidation of *trans*-2-butene under atmospheric conditions between 246 and 298 K.
Bierbach, A., Barnes, I., Becker, K.H., *Tellus,* Nov. 1997, 49B(5), p.566-582, Refs. p.580-582. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.
Climatology, Atmospheric boundary layer, Polar atmospheres, Degradation, Atmospheric composition, Aerosols, Hydrocarbons, Photochemical reactions, Molecular structure, Models, Simulation, Infrared spectroscopy

52-3187
Trichloroethene and tetrachloroethene: tropospheric probes for Cl- and Br-atom reactions during the polar sunrise.
Ariya, P.A., Catoire, V., Sander, R., Niki, H., Harris, G.W., *Tellus,* Nov. 1997, 49B(5), p.583-591, 33 refs. Presented at European Geophysical Society Symposium on Arctic Tropospheric Chemistry, The Hague, The Netherlands, May 6-10, 1996. Edited by L. Barrie and U. Platt.
Climatology, Atmospheric boundary layer, Polar atmospheres, Air pollution, Hydrocarbons, Aerosols, Ozone, Degradation, Ultraviolet radiation, Photochemical reactions, Simulation, Sampling

52-3188
Mid-Pleistocene climate transition: a deep sea carbon isotopic perspective.
Raymo, M.E., Oppo, D.W., Curry, W., *Paleoceanography,* Aug. 1997, 12(4), p.546-559, Refs. p.557-559.
Pleistocene, Paleoclimatology, Climatic changes, Ocean currents, Water chemistry, Marine deposits, Drill core analysis, Carbon isotopes, Isotope analysis, Ice volume, Correlation

52-3189
Regional differences in Quaternary subantarctic nutrient cycling: link to intermediate and deep water ventilation.
Ninnemann, U.S., Charles, C.D., *Paleoceanography,* Aug. 1997, 12(4), p.560-567, 35 refs.
Pleistocene, Oceanography, Ocean currents, Paleoecology, Biomass, Nutrient cycle, Geochemical cycles, Carbon isotopes, Isotope analysis, Drill core analysis, Geochronology, Atlantic Ocean, Pacific Ocean
Several fundamental issues regarding carbon cycling in the glacial oceans rest on the development of reliable descriptions of high southern latitude surface waters. This paper compares new subantarctic planktonic foraminiferal $\delta^{13}C$ records with previously published records to demonstrate two distinct regional patterns over glacial cycles: a low-amplitude signal that also dominates the Pacific and a higher-amplitude signal that is confined to the Atlantic and western Indian sectors. The new observations from the Southeast Pacific, a primary region of Antarctic Intermediate Water (AAIW) formation, strengthen the suggestion that intermediate water acted as a conduit for transferring $\delta^{13}C$ variability to low latitudes. (Auth. mod.)

52-3190
Trade wind forcing of upwelling, seasonality, and Heinrich events as a response to sub-Milankovitch climate variability.
Little, M.G., Schneider, R.R., Kroon, D., Price, B., Summerhayes, C.P., Segl, M., *Paleoceanography,* Aug. 1997, 12(4), p.568-576, Refs. p.574-576.
Pleistocene, Paleoclimatology, Paleoecology, Ocean currents, Upwelling, Moisture transfer, Air ice water interaction, Wind factors, Icebergs, Ice sheets, Ice growth, Glacier oscillation, Drill core analysis

52-3191
Timing of major climate transitions.
Raymo, M.E., *Paleoceanography,* Aug. 1997, 12(4), p.577-585, 39 refs.
Paleoclimatology, Climatic changes, Ice sheets, Glacier oscillation, Marine deposits, Sedimentation, Insolation, Oxygen isotopes, Isotope analysis, Radioactive age determination, Statistical analysis, Correlation, Ice age theory

52-3192
Barium accumulation in the Atlantic sector of the southern ocean: results from 190,000-year records.
Nürnberg, C.C., Bohrmann, G., Schlüter, M., Frank, M., *Paleoceanography,* Aug. 1997, 12(4), p.594-603, Refs. p.601-603.
Pleistocene, Paleoecology, Biomass, Geochemistry, Water chemistry, Marine deposits, Chemical analysis, Drill core analysis, Statistical analysis, Correlation, Antarctica—Weddell Sea
Extensive investigations of sedimentary barium were performed in the southern South Atlantic in order to assess the reliability of the barium signal in antarctic sediments as a proxy for paleoproductivity. Maximum accumulation rates of excess barium were calculated for the antarctic zone south of the polar front where silica accumulates at high rates. The correspondence between barium and opal supports the applicability of barium as a proxy for productivity. (Auth. mod.)

52-3193
Snow chemistry of Agassiz Ice Cap, Ellesmere Island, Northwest Territories, Canada.
Goto-Azuma, K., Koerner, R.M., Nakawo, M., Kudo, A., *Journal of glaciology,* 1997, 43(144), p.199-206, 21 refs.
Snow composition, Chemical composition, Snow stratigraphy, Snow accumulation, Sampling, Snow erosion, Drift, Wind factors, Ion density (concentration), Seasonal variations, Canada—Northwest Territories—Ellesmere Island

52-3194
Basal hydraulic system of a West Antarctic ice stream: constraints from borehole observations.
Engelhardt, H., Kamb, B., *Journal of glaciology,* 1997, 43(144), p.207-230, 51 refs.
Glacial hydrology, Glacier flow, Subglacial drainage, Meltwater, Hydraulics, Glacier beds, Ice solid interface, Water pressure, Water level, Boreholes, Antarctica—West Antarctica
Pressure and tracer measurements in boreholes drilled to the bottom of Ice Stream B, West Antarctica, are used to obtain information about the basal water conduit system in which high water pressures are developed. These high pressures presumably make possible the rapid movement of the ice stream. Pressure in the system is indicated by the borehole water level once connection to the conduit system is made. The conduit system can be modelled as a continuous or somewhat discontinuous gap between ice and bed. The gap-conduit model is, however, ruled out by the way a pressure pulse injected into the basal water system at breakthrough propagates outward from the injection hole, and also by the large hole-to-hole variation in measured basal pressure. An alternative model that avoids these objections, called the "gap opening" model, involves opening a gap as injection proceeds. Evaluated quantitatively, the gap-opening model accounts for the volume of water that the basal water system accepts on breakthrough, which obviates the gap-conduit model. A diurnal pressure fluctuation, intermittently observed, may possibly be caused by the ocean tide in the Ross Sea. The lack of any observed variation in ice-stream motion, when large percentagewise variations in basal effective pressure were occurring, suggests that the observed pressure variations are sufficiently local, and so randomly variable from place to place, that they are averaged out in the process by which the basal motion of the ice stream is determined by an integration over a large area of the bed. (Auth. mod.)

52-3195
Role of lateral drag in the dynamics of Ice Stream B, Antarctica.
Whillans, I.M., Van der Veen, C.J., *Journal of glaciology,* 1997, 43(144), p.231-237, 19 refs.
Glacier surveys, Ice sheets, Ice mechanics, Glacier flow, Velocity measurement, Ice friction, Ice deformation, Shear stress, Ice solid interface, Photogrammetry, Antarctica—West Antarctica
The partitioning of resistive force between the bed and sides of Ice Stream B is obtained for three large areas that have been measured using repeat aerial photogrammetry. Problems associated with data errors and local variations in ice strength and velocity are reduced by considering the areally averaged budget of forces for each photo block. Results indicate that the bed under Ice Stream B must be very weak and unable to provide much resistance. Mechanical control on this ice stream emanates almost entirely from the lateral margins. (Auth.)

52-3196
Flow and internal structure of a rock glacier.
Elconin, R.F., LaChapelle, E.R., *Journal of glaciology,* 1997, 43(144), p.238-244, 41 refs.
Glacial geology, Rock glaciers, Talus, Periglacial processes, Rock properties, Ice solid interface, Ice structure, Sediment transport, Rheology, Structural analysis, United States—Alaska—Fireweed Mountain

52-3197
Variations in basal conditions on Rutford Ice Stream, West Antarctica.
Smith, A.M., *Journal of glaciology,* 1997, 43(144), p.245-255, 42 refs.
Glacial geology, Glacier beds, Glacier flow, Basal sliding, Ice solid interface, Sediments, Deformation, Porosity, Seismic velocity, Seismic reflection, Antarctica—Rutford Ice Stream
Seismic reflection data from two lines on Rutford Ice Stream are presented and are compared with data already published from a third line on the ice stream. The amplitude and phase of the reflections have been used to investigate the properties of the sub-ice material. Using acoustic impedance as an indicator of subglacial porosity, some areas of the ice-stream bed are interpreted as dilatant water-saturated sediments undergoing pervasive deformation. In other areas, the bed is not deforming and basal sliding may be a more important process. The proportion of the ice-stream width over which bed deformation occurs increases downstream. (Auth. mod.)

52-3198
Depositional models for moraine formation in East Antarctic coastal oases.
Fitzsimons, S.J., *Journal of glaciology,* 1997, 43(144), p.256-264, 41 refs.
Glacial geology, Moraines, Classifications, Geomorphology, Sedimentation, Lithology, Meltwater, Ice solid interface, Models, Antarctica—East Antarctica
This paper examines the origin of moraine ridges in East Antarctic coastal oases and derives depositional models appropriate for the reconstruction of Quaternary history. On the basis of morphology, structure and sedimentology, four principal types of ridge may be identified: type A moraines form when the basal debris zone crops out near an ice margin; type B moraines form when large recumbent folds develop in the basal debris zone; type C moraines are ice-contact screes and fans which form when debris accumulates at steep or cliffed ice margins; and type D moraines are thrust-block moraines that form when unconsolidated sediment is entrained by freezing, shearing and thrusting of sediment blocks at the base of the glacier. Constructing models to explain the origin of the moraines is an important part of reconstructing the Quaternary history of antarctic coastal oases, because the models provide a basis for reconstructing the position and behavior of the ice sheet during advance and retreat. (Auth. mod.)

52-3199
Altimetric observations of surface characteristics of the antarctic ice sheet.
Legrésy, B., Rémy, F., *Journal of glaciology,* 1997, 43(144), p.265-275, 36 refs.
Glacier surveys, Geophysical surveys, Topographic surveys, Ice sheets, Surface structure, Spaceborne photography, Height finding, Radar echoes, Backscattering, Surface roughness, Simulation, Antarctica—Adélie Coast
The aim of this paper is to investigate the geophysical characteristics of the antarctic ice sheet using radar altimetric observations. The authors used an altimetric waveform simulator, in situ observations, ERS-1 (European remote-sensing satellite) data and SPOT (Satellite pour l'observation de la terre) images. The small-scale study takes place at Dome C, Adélie Coast. The effect of undulations on the waveform parameters is found to be dominant. The height measurement is very sensitive to the altimeter technical or orbital characteristics and is not reproducible from one mission to another. The continental-scale study shows coherent patterns. Even if both surface and subsurface components affect the altimetric observation, the large-scale signal is mostly controlled by surface backscattering variations. The surface or near-subsurface characteristics of the snowpack may then be reached by altimetric observations. (Auth. mod.)

52-3200
Effects of glacier retreat on the outbursts of Goēsvatnet, southwest Spitsbergen, Svalbard.
Schöner, W., Schöner, M., *Journal of glaciology,* 1997, 43(144), p.276-282, 22 refs.
Glacial hydrology, Glacier oscillation, Glacier flow, Geomorphology, Glacial lakes, Tunnels, Ice dams, Lake bursts, Analysis (mathematics), Aerial surveys, Topographic surveys, Norway—Spitsbergen

52-3201
Fennoscandian palaeoglaciology reconstructed using a glacial geological inversion model.
Kleman, J., Hättestrand, C., Borgström, I., Stroeven, A., *Journal of glaciology,* 1997, 43(144), p.283-299, Refs. p.298-299.
Pleistocene, Glacial geology, Geomorphology, Ice sheets, Glacier flow, Orientation, Landforms, Landscape types, Classifications, Models, Mapping, Fennoscandia

52-3202
Search in north Greenland for a new ice-core drill site.
Dahl-Jensen, D., et al, *Journal of glaciology,* 1997, 43(144), p.300-306, 31 refs.
Glaciology, Pleistocene, Ice sheets, Ice cores, Drilling, Glacier thickness, Bedrock, Profiles, Ice dating, Accuracy, Site surveys, Greenland

52-3203
Large-scale ice-sheet modelling as a means of dating deep ice cores in Greenland.
Greve, R., *Journal of glaciology,* 1997, 43(144), p.307-310, 14 refs.
Pleistocene, Paleoclimatology, Ice sheets, Glacier oscillation, Ice cores, Ice temperature, Topographic features, Ice dating, Profiles, Mathematical models, Greenland

52-3204
Statistical characteristics for the type and length of deformation-induced cracks in columnar-grain ice.
Gold, L.W., *Journal of glaciology,* 1997, 43(144), p.311-320, 28 refs.
Ice mechanics, Cracking (fracturing), Classifications, Crack propagation, Ice deformation, Ice solid interface, Ice crystal structure, Grain size, Anisotropy, Strain tests, Mechanical tests, Statistical analysis

52-3205
Response of two Icelandic glaciers to climatic warming computed with a degree-day glacier mass-balance model coupled to a dynamic glacier model.
Jóhannesson, T., *Journal of glaciology,* 1997, 43(144), p.321-327, 26 refs.
Climatology, Global warming, Glacier oscillation, Glacier melting, Runoff forecasting, Glacier mass balance, Ice volume, Degree days, Models, Correlation, Iceland

52-3206
Relationship between subglacial water pressure and velocity of Findelengletscher, Switzerland, during its advance and retreat.
Iken, A., Truffer, M., *Journal of glaciology,* 1997, 43(144), p.328-338, 32 refs.
Glacial hydrology, Glacier oscillation, Glacier flow, Meltwater, Subglacial drainage, Velocity measurement, Water pressure, Basal sliding, Ice solid interface, Shear stress, Analysis (mathematics), Switzerland—Findelengletscher

52-3207
Temperature measurements and heat transfer in near-surface snow at the South Pole.
Brandt, R.E., Warren, S.G., *Journal of glaciology,* 1997, 43(144), p.339-351, 43 refs.
Glaciology, Ice sheets, Snow temperature, Temperature measurement, Heat transfer, Thermal conductivity, Snow heat flux, Wind factors, Snow air interface, Models, Antarctica—Amundsen-Scott Station
To study near-surface heat flow on the antarctic ice sheet, snow temperatures were measured at Amundsen-Scott Station to a depth of 3 m at 15 min intervals during most of 1992. A finite-difference model, with conduction as the only heat-transfer mechanism and measured temperatures as the upper and lower boundary conditions, was applied to four sets of three thermistors each. The thermal conductivity was estimated as that which minimized the difference between modeled and measured 15 min changes in temperatures at the center thermistor. The difference between modeled and measured temperature changes decreased with depth. The discrepancies between model and observation correlated more strongly with the air-snow temperature difference than with the product of that difference with the square of the wind speed, suggesting that the residual errors are due more to non-vertical conduction and to sub-grid-scale variability of the conductivity than to windpumping. (Auth. mod.)

52-3208
Modelling ice-divide dynamics by perturbation methods.
Vilichinskiĭ, A.V., Chugunov, V.A., *Journal of glaciology,* 1997, 43(144), p.352-358, 14 refs.
Glacier flow, Ice mechanics, Ice creep, Velocity, Glacier surfaces, Ice surface, Boundary layer, Profiles, Shear stress, Analysis (mathematics)

52-3209
Estimation of permafrost thickness using ground geophysical measurements, and its usage for defining vertical temperature variations in continental ice and underlying bedrock.
Ruotoistenmäki, T., Lehtimäki, J., *Journal of glaciology,* 1997, 43(144), p.359-364, 27 refs.
Permafrost thickness, Permafrost hydrology, Ice sheets, Permafrost bases, Sounding, Electrical measurement, Ice temperature, Bedrock, Ground water, Profiles, Antarctica—Queen Maud Land
The relation between ice and permafrost thicknesses and approximations of the melting temperature of saline waters combined with the average annual temperature at the surface can be used to estimate temperature variations within both the bedrock and the ice, and for estimating the temperature values at the ice base. The method was developed for interpreting two geophysical field profiles measured on continental ice in western Queen Maud Land. Gravity, magnetic and electromagnetic profiles were measured between the nunataks Basen and Plogen and Basen and Fossilryggen. The significant correlation between the ice thickness and the depth of the conductor in the bedrock strongly suggests that the conductors are not sedimentary rock layers but rather saline groundwater in which salinity has been enhanced by permafrost processes. In the Basen-Plogen profile, conductors were detected only in the beginning of the profile, where ice thickness was below 650 m. In the main part of the profile where the ice thickness exceeds 650 m, no conductors were observed. In those areas it is proposed that the ice base is "warm" and no saline waters enriched by permafrost are present. (Auth. mod.)

52-3210
Low-cost electrical conductivity profiler for glacier boreholes.
Smart, C.C., Ketterling, D.B., *Journal of glaciology,* 1997, 43(144), p.365-369, 15 refs.
Glaciology, Glacial hydrology, Measuring instruments, Boreholes, Stratigraphy, Electrical measurement, Electrical resistivity, Sounding, Profiles, Design, Performance

52-3211
Estimate of ice-surface velocity over a 4 year period on Glaciar Arenales, Hielo Patagónico Norte, Chile.
Winchester, V., Harrison, S., *Journal of glaciology,* 1997, 43(144), p.370-372, 12 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Aerial surveys, Photointerpretation, Glacier flow, Velocity measurement, Seasonal variations, Chile—Hielo Patagónico Norte

52-3212
Reference overlooked in "Determination of timing and location of water movement and ice-layer formation by temperature measurements in subfreezing snow" by Pfeffer and Humphrey.
Pfeffer, W.T., Humphrey, N.F., *Journal of glaciology,* 1997, 43(144), p.372, 2 refs. For pertinent paper see 51-2118.
Snow hydrology, Snow cover structure, Ice water interface, Water flow, Temperature measurement, Accuracy

52-3213
Comments on "Temperate ice permeability, stability of water veins and percolation of internal meltwater" by L. Lliboutry.
Nye, J., Lliboutry, L., *Journal of glaciology,* 1997, 43(144), p.372-373, 7 refs. Includes replies. For pertinent paper see 51-2109.
Glacial hydrology, Glacial lakes, Lake bursts, Capillarity, Permeability, Meltwater, Ice water interface, Heat flux, Accuracy

52-3214
Late Pleistocene pollen flora with *Larix* from till-covered esker at Hietamäki Ostrobothnia, western Finland.
Eriksson, B., Kujansuu, R., *Finland. Geological Society. Bulletin,* 1994, 66(pt.2), p.53-66, 41 refs.
Pleistocene, Quaternary deposits, Geological surveys, Subarctic landscapes, Sediments, Organic soils, Paleoecology, Palynology, Spectra, Sampling, Finland—Hietamäki

52-3215
Microfossil sequences in Ilponlampi, a small lake in northern Russian Karelia.
Huttunen, A., Huttunen, R.L., Ekman, I., Eskonen, K., Koutaniemi, L., Vasari, Y., *Finland. Geological Society. Bulletin,* 1994, 66(pt.2), p.67-80, 34 refs.
Geological surveys, Subarctic landscapes, Limnology, Paleoecology, Palynology, Classifications, Lacustrine deposits, Radioactive age determination, Vegetation patterns, Biogeography, Drill core analysis, Russia—Karelia

52-3216
Holocene forest history of the Pöyrisjärvi area north of the coniferous tree line in western Finnish Lapland: a pollen stratigraphical study.
Mäkelä, E., Sarmaja-Korjonen, K., Hyvärinen, H., *Finland. Geological Society. Bulletin,* 1994, 66(pt.2), p.81-94, 17 refs.
Paleoecology, Palynology, Arctic landscapes, Forest lines, Vegetation patterns, Quaternary deposits, Lacustrine deposits, Stratigraphy, Radioactive age determination, Statistical analysis, Drill core analysis, Finland—Lapland

52-3217
Growing season thermal climate reconstructed at six pine stands in northern Lapland.
Lindholm, M., Meriläinen, J., *Finland. Geological Society. Bulletin,* 1994, 66(pt.2), p.95-106, 18 refs.
Plant ecology, Forest lines, Growth, Subpolar regions, Climatic factors, Sampling, Age determination, Statistical analysis, Correlation, Temperature effects, Sweden—Lapland, Norway—Lapland

52-3218

Evidence on climatic variability and prehistoric human activities between 165 B.C. and A.D. 1400 derived from subfossil Scots pines (*Pinus sylvestris* L.) found in a lake in Utsjoki, northernmost Finland.

Zetterberg, P., Eronen, M., Briffa, K.R., *Finland. Geological Society. Bulletin,* 1994, 66(pt.2), p.107-124, Refs. p.122-124.

Paleoecology, Paleobotany, Paleoclimatology, Arctic landscapes, Lacustrine deposits, Forest lines, Vegetation patterns, Trees (plants), Age determination, Geochronology, Correlation, Finland—Utsjoki

52-3219

European pollen database: a brief review.

Hicks, S., Grönlund, E., *Finland. Geological Society. Bulletin,* 1994, 66(pt.2), p.129-136, 8 refs.

Paleoecology, Pollen, Palynology, Quaternary deposits, Classifications, Terminology, Standards, Computer programs, Data processing

52-3220

Last glacial maximum paleochemistry and deep-water circulation in the southern ocean: evidence from foraminiferal cadmium.

Rosenthal, Y., Boyle, E.A., Labeyrie, L., *Paleoceanography,* Dec. 1997, 12(6), p.787-796, 64 refs.

Oceanography, Ocean currents, Paleoclimatology, Ocean bottom, —South Atlantic Ocean, —South Indian Ocean

South Atlantic benthic foraminiferal Cd/Ca shows no glacial-interglacial variation, suggesting that the glacial contribution of North Atlantic Deep Water to the southern ocean was not much different than at present. In contrast, Cd/Ca in southeast Indian Ridge cores show lower glacial bottom water Cd, comparable to levels in intermediate depths of the North Atlantic and significantly lower than in the deep South Atlantic. Low glacial Cd/Ca was also recorded in planktonic foraminifera, suggesting a substantial decrease in the nutrient concentration of subantarctic surface water during the glacial maximum which most likely was caused by increased biological productivity. The Cd data are inconsistent with low glacial benthic foraminiferal $\delta^{13}C$ which suggest higher nutrient concentration. The authors propose that the low Cd/Ca in the Southeast Indian Ridge records reflects a local source of nutrient-depleted deepwater, formed during the last glacial maximum by open-ocean convection near the Antarctic Polar Front, downstream of the Kerguelen Plateau. (Auth. mod.)

52-3221

Polar and alpine tundra.

Wielgolaski, F.E., ed, Ecosystems of the world, No.3, Amsterdam, Elsevier Science B.V., 1997, 920p., Refs. passim. For individual papers see 52-3222 through 52-3242.

DLC QH541.5.T8P65 1997

Tundra vegetation, Vegetation patterns, Plant ecology, Ecosystems, Alpine tundra, Arctic landscapes, Forest lines, Forest tundra, Biomass, Nutrient cycle, Acclimatization

52-3222

Introduction.

Wielgolaski, F.E., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.1-5, 14 refs.

DLC QH541.5.T8P65 1997

Tundra vegetation, Tundra climate, Alpine tundra, Snow line, Forest lines, Vegetation patterns

52-3223

Adaptation in plants.

Wielgolaski, F.E., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.7-10, 15 refs.

DLC QH541.5.T8P65 1997

Tundra vegetation, Plant ecology, Vegetation patterns, Acclimatization

52-3224

Adaptations to the alpine environment in insects and other terrestrial arthropods.

Sømme, L., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.11-25, 113 refs.

DLC QH541.5.T8P65 1997

Alpine tundra, Forest lines, Ecology, Acclimatization, Cryobiology, Cold tolerance, Cold weather survival

52-3225

Fennoscandian tundra.

Wielgolaski, F.E., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.27-83, Refs. p.73-83.

DLC QH541.5.T8P65 1997

Alpine tundra, Forest lines, Tundra vegetation, Plant ecology, Vegetation patterns, Ecosystems, Wetlands, Biomass, Nutrient cycle, Norway, Sweden, Finland

52-3226

Tundra ecosystems of Iceland.

Thórhallsdóttir, T.E., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.85-96, 40 refs.

DLC QH541.5.T8P65 1997

Tundra vegetation, Plant ecology, Vegetation patterns, Ecosystems, Iceland

52-3227

High-mountain ecosystems of the Alps.

Grabherr, G., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.97-121, Refs. p.116-121.

DLC QH541.5.T8P65 1997

Alpine tundra, Tundra vegetation, Plant ecology, Forest lines, Vegetation patterns, Ecosystems, Human factors, Biomass, Alps

52-3228

Structure and function of subalpine ecosystems in the Carpathians.

Malinovskiĭ, K.A., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.123-131, 7 refs.

DLC QH541.5.T8P65 1997

Forest lines, Forest tundra, Forest ecosystems, Vegetation patterns, Plant ecology, Litter, Biomass, Nutrient cycle, Ukraine—Carpathian Mountains

52-3229

Geography and organization of high-mountain ecosystems in the former USSR.

Zlotin, R.I., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.133-159, 26 refs.

DLC QH541.5.T8P65 1997

Alpine tundra, Steppes, Tundra vegetation, Plant ecology, Vegetation patterns, Ecosystems, Biomass, Kyrgyzstan—Tien Shan

52-3230

Alpine vegetation types of the central Himalaya.

Miehe, G., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.161-184, 32 refs.

DLC QH541.5.T8P65 1997

Alpine tundra, Forest tundra, Forest lines, Tundra vegetation, Vegetation patterns, Plant ecology, Ecosystems, Grazing, Himalaya Mountains

52-3231

High-mountain areas of tropical Africa.

Hedberg, O., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.185-197, 51 refs.

DLC QH541.5.T8P65 1997

Alpine tundra, Vegetation patterns, Plant ecology, Mountains, Ecosystems, Diurnal variations, Kenya, Uganda, Tanzania, Ethiopia

52-3232

Alpine tundra of southern Africa.

Killick, D.J.B., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.199-209, 25 refs.

DLC QH541.5.T8P65 1997

Alpine tundra, Tundra vegetation, Vegetation patterns, Plant ecology, Wetlands, Ecosystems, Grazing, Soil erosion, South Africa, Lesotho

52-3233

North American alpine ecosystems.

Campbell, J.S., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.211-261, Refs. p.255-261.

DLC QH541.5.T8P65 1997

Alpine tundra, Tundra vegetation, Forest lines, Mountain soils, Vegetation patterns, Plant ecology, Plant physiology, Acclimatization, Biomass, Forest lines, Ecosystems, Snow cover effect

52-3234

Ecology of South American páramos with emphasis on the fauna of the Venezuelan páramos.

Díaz, A., Péfaur, J.E., Durant, P., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.263-310, Refs. p.304-310.

DLC QH541.5.T8P65 1997

Alpine tundra, Tundra soils, Tundra vegetation, Plant ecology, Vegetation patterns, Ecosystems, Animals, Venezuela

52-3235

New Zealand alpine ecosystems.

Mark, A.F., Dickinson, J.K.M., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.311-345, Refs. p.341-345.

DLC QH541.5.T8P65 1997

Alpine tundra, Tundra vegetation, Vegetation patterns, Plant ecology, Forest lines, Snow cover effect, Ecosystems, Biomass, Nutrient cycle, New Zealand

52-3236

Tundra diversity and ecological characteristics of Svalbard.

Elvebakk, A., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.347-359, 59 refs.

DLC QH541.5.T8P65 1997

Tundra vegetation, Tundra soils, Vegetation patterns, Plant ecology, Arctic landscapes, Deserts, Wetlands, Ecosystems, Grazing, Norway—Svalbard

52-3237

Arctic ecosystems in Russia.

Chernov, IU.I., Matveeva, N.V., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.361-507, Refs. p.495-507.

DLC QH541.5.T8P65 1997

Tundra vegetation, Tundra climate, Tundra soils, Vegetation patterns, Plant ecology, Arctic landscapes, Forest tundra, Deserts, Steppes, Wetlands, Biomass, Phenology, Ecosystems, Russia

52-3238

Live and dead reserves and primary production in polar desert, tundra and forest tundra of the former Soviet Union.

Bazilevich, N.I., Tishkov, A.A., Vil'chek, G.E., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.509-539, Refs. p.536-539.

DLC QH541.5.T8P65 1997

Tundra vegetation, Tundra soils, Vegetation patterns, Plant ecology, Arctic landscapes, Deserts, Forest tundra, Wetlands, Litter, Biomass, Nutrient cycle, Russia

52-3239

Chemical elements in plants of the polar belt of Russia.

Bazilevich, N.I., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.541-549, 18 refs.

DLC QH541.5.T8P65 1997

Tundra vegetation, Vegetation patterns, Plant ecology, Plant tissues, Plant physiology, Forest tundra, Biomass, Nutrient cycle, Russia

52-3240

Arctic ecosystems of North America.

Bliss, L.C., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.551-683, Refs. p.669-683.

DLC QH541.5.T8P65 1997

Tundra vegetation, Tundra climate, Tundra soils, Vegetation patterns, Plant ecology, Arctic landscapes, Ecosystems, Forest tundra, Deserts, Wetlands, Taiga, Plant physiology, Acclimatization, Paleobotany, Canada—Northwest Territories, United States—Alaska

52-3241

Greenland.

Böcher, J., Petersen, P.M., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.685-720, Refs. p.715-720.

DLC QH541.5.T8P65 1997

Tundra vegetation, Vegetation patterns, Plant ecology, Arctic landscapes, Subarctic landscapes, Wetlands, Snow cover effect, Ecosystems, Biomass, Greenland

52-3242

Antarctic terrestrial ecosystems.

Kanda, H., Komárková, V., Polar and alpine tundra. Ecosystems of the world, No.3. Edited by F.E. Wielgolaski, Amsterdam, Elsevier Science B.V., 1997, p.721-761, Refs. p.745-761.

DLC QH541.5.T8P65 1997

Tundra vegetation, Vegetation patterns, Plant ecology, Ecosystems, Biomass, Soil microbiology, Nutrient cycle, Antarctica

This paper presents an overview of the terrestrial ecosystems in Antarctica as found in the ice-free areas on islands, in narrow strips along the coasts, in dry valleys and on nunataks. The diversity of terrestrial life is low, even in comparison to the corresponding latitudes in the Arctic. The taxa of organisms include bacteria, fungi and algae. The larger plants are dominated by mosses and lichens. The only two vascular plants are *Colobanthus quitensis* and *Deschampsia antarctica*. The protozoa include amoeba, ciliates and flagellates. The only truly terrestrial antarctic animals are tiny invertebrates. There are no amphibians or reptiles. Though seals and birds, especially penguins and albatrosses, breed on land, they spend most of their time at sea and cannot be considered terrestrial animals. The authors recommend that the whole of Antarctica including the surrounding ocean and nearby islands be established as a world park to preserve the ecosystems.

52-3243

Selected papers.

International Symposium on Snow Removal and Ice Control Technology, 4th Reno, NV, Aug. 11-16, 1996, *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, 164p., Refs. passim. For individual papers see 52-3244 through 52-3264.

Road icing, Road maintenance, Chemical ice prevention, Salting, Snow removal, Skid resistance, Weather forecasting, Safety, Warning systems

52-3244

Winter maintenance in the Netherlands.

Noort, M., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.3-11.

Road icing, Chemical ice prevention, Salting, Snow removal, Weather forecasting, Safety, Highway planning, Road maintenance, Netherlands

52-3245

Weather-related traffic management in the E18 Finnish test area.

Pilli-Sihvola, Y., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.12-15.

Highway planning, Road maintenance, Safety, Weather forecasting, Warning systems, Data transmission, Finland

52-3246

Model experiment and field observation of a snow avalanche deflector.

Fujisawa, K., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.19-26, 1 ref.

Avalanche engineering, Avalanche mechanics, Avalanche modeling, Snow retention, Snow fences

52-3247

Cost-benefit analysis of snow-removing channels in an urban area with heavy snowfall.

Morohashi, K., Umemura, T., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.27-32, 1 ref.

Snow removal, Road maintenance, Urban planning, Channels (waterways), Drains, Cost analysis, Japan

52-3248

Winter maintenance on porous asphalt.

Noort, M., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.33-40, 2 refs.

Pavements, Bitumens, Road maintenance, Road icing, Skid resistance, Netherlands

52-3249

Guidance for successful anti-icing operations based on U.S. experience.

Blackburn, R.R., Ketcham, S.A., Minsk, L.D., MP 5110, *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.43.

Road icing, Chemical ice prevention, Snow removal, Road maintenance, Manuals, United States

52-3250

Anti-icing field evaluation.

Ketcham, S.A., Minsk, L.D., MP 5111, *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.44-52, 4 refs. For another source see 51-2733.

Road icing, Chemical ice prevention, Salting, Sanding, Snow removal, Snowstorms, Ice storms, Rubber ice friction, Rubber snow friction, Road maintenance, Manuals, United States

Anti-icing is the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. This definition derives from U.S. snow and ice control practice observed in anti-icing field evaluations for the Strategic Highway Research Program and FHWA. The FHWA project and the implications of its results for implementation of an anti-icing program are described. This definition and the diversity of operations that can lead to anti-icing success are the focus of this paper. A framework for communication and technology transfer among practitioners is provided to complement guidance contained in the project's manual of practice.

52-3251

Test and evaluation of calcium magnesium acetate-sodium chloride mixtures in Sweden.

Ihs, A., Gustafson, K., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.53-59, 8 refs.

Road icing, Chemical ice prevention, Salting, Skid resistance, Road maintenance, Sweden

52-3252

Production of low-cost acetate deicers from biomass and industrial wastes.

Yang, S.T., Jin, Z.W., Chollar, B.H., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.60-69, 29 refs.

Road icing, Chemical ice prevention, Biomass, Waste disposal, Fungi, Bacteria, Microbiology, Road maintenance, Cost analysis

52-3253

Active microwave remote sensing of road surface conditions.

Tapkan, B.I., Yoakum-Stover, S., Kubichek, R.F., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.73-80, 11 refs.

Pavements, Road icing, Ice detection, Moisture detection, Frost forecasting, Weather forecasting, Sensors, Warning systems, Road maintenance, Computerized simulation

52-3254

Theoretical background for use of a road weather information system.

Bogren, J., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.81-84, 5 refs.

Road icing, Weather forecasting, Safety, Warning systems, Data transmission

52-3255

Predicting slipperiness of road surface in winter with a neural-Kalman filter.

Fujiwara, T., Nakatsuji, T., Onodera, Y., Hagiwara, T., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.85-91, 10 refs.

Pavements, Road icing, Skid resistance, Safety, Weather forecasting, Warning systems, Road maintenance, Computerized simulation

52-3256

Variable slip friction measurement techniques for snow and ice operations.

Fleege, E.J., Wambold, J.C., Radó, Z., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.92-100, 3 refs.

Pavements, Road icing, Skid resistance, Rubber ice friction, Rubber snow friction, Warning systems, Sensors, Road maintenance

52-3257

Effects of studded tire regulation on road environments and traffic conditions in Hokkaido.

Takagi, H., Onuma, H., Shimojo, A., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.103-110, 3 refs.

Road icing, Tires, Air pollution, Health, Environmental protection, Skid resistance, Accidents, Safety, Legislation, Road maintenance, Japan—Hokkaido

52-3258
Influence of deicing salt on vegetation, groundwater, and soil along two highways in Sweden.
Bäckman, L., Folkeson, L., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.111-117, 4 refs.
Road icing, Salting, Soil pollution, Environmental impact, Physiological effects, Plant physiology, Environmental protection, Road maintenance, Sweden

52-3259
Application of a road weather information system.
Gustavsson, T., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.121-124, 5 refs.
Road icing, Ice forecasting, Frost forecasting, Weather forecasting, Warning systems, Safety, Data transmission, Road maintenance, Sweden

52-3260
Field test of road weather information systems and improvement of winter road maintenance in Hokkaido.
Matsuzawa, M., Kajiya, Y., Ishimoto, K., Takeuchi, M., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.125-130, 1 ref.
Road icing, Ice forecasting, Frost forecasting, Weather forecasting, Skid resistance, Warning systems, Safety, Road maintenance, Japan—Hokkaido

52-3261
Real-time road ice prediction and its improvement in accuracy through a self-learning process.
Shao, J.M., Lister, P.J., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.131-137, 8 refs.
Road icing, Ice forecasting, Frost forecasting, Weather forecasting, Road maintenance, Computerized simulation, Statistical analysis, United Kingdom—England

52-3262
Benefit-cost comparison of salt-only versus salt-abrasive mixtures used in winter highway maintenance in the United States.
Kuemmel, D.A., Bari, Q., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.141-151, 19 refs.
Road icing, Salting, Sanding, Road maintenance, Safety, Accidents, Cost analysis, United States

52-3263
Socioeconomic calculations for winter tires.
Öberg, G., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.152-155, 12 refs.
Road icing, Tires, Skid resistance, Accidents, Safety, Road maintenance, Highway planning, Cost analysis, Sweden

52-3264
Field test results of intelligent delineator system: intelligent transport system technology research and development for winter traffic.
Kajiya, Y., Fukuzawa, Y., Ishimoto, K., Ishimaru, H., *National Research Council. Transportation Research Board. Conference proceedings,* 1997, No.16, International Symposium on Snow Removal and Ice Control Technology, 4th, Reno, NV, Aug. 11-16, 1996. Selected papers, p.156-161, 1 ref.
Blowing snow, Visibility, Safety, Warning systems, Road maintenance, Japan—Hokkaido

52-3265
Activity report for 1996 and the 96-97 summer season. [Rapport d'activité: année 96 et campagnes d'été 96-97]
Institut Français pour la Recherche et la Technologie Polaires (IFRTP) (French Institute for Polar Research and Technology, Plouzané, Arrondissement Brest, France, 1997, 75p., In French. Refs. passim. For selected papers see B-58900, B-58903, E-58902, J-58901, and L-58899 or 52-3266 and 52-3267.

Organizations, Research projects, Stations, Regional planning, International cooperation, Cost analysis

This brochure describes the activities of the Institut Français pour la Recherche et la Technologie Polaires (IFRTP, French Institute for Polar Research and Technology) in 1996 and the 96-97 summer season in Antarctica. The IFRTP coordinates the polar research of other French institutes and French participation in international research projects, and administers the permanent French presence at the Dumont d'Urville Station. Though some IFRTP activities deal with the Arctic, most deal with the Antarctic.

52-3266
Bioremediation in polar environments: using antarctic microbial populations in the battle against oil spills. [Bioremédiation en milieu polaire: utilisation des populations microbiennes antarctiques dans la lutte contre les marées noires]
Delille, D., Institut Français pour la Recherche et la Technologie Polaires. Rapport d'activité: année 96 et campagnes d'été (French Institute for Polar Research and Technology. Activity report for 1996 and the 96-97 summer season), Plouzané, Arrondissement Brest, France, 1997, p.41-45, In French. 24 refs.

Oil spills, Oil recovery, Water pollution, Waste disposal, Bacteria, Microbiology, Marine biology, Decomposition, Nutrient cycle, Ice water interface, Ice cover effect, —Kerguelen Islands, Antarctica—Dumont d'Urville Station

Tests of controlled spills of crude oil and diesel fuel in the Kerguelen Is. and at Dumont d'Urville Station have found naturally occurring bacterial populations in the sea water and sea ice that feed on hydrocarbons. These bacteria could be effective for bioremediation of accidental spills.

52-3267
Ocean as a CO_2 pump. [L'océan, pompe à CO_2]
Poisson, A., Institut Français pour la Recherche et la Technologie Polaires. Rapport d'activité: année 96 et campagnes d'été (French Institute for Polar Research and Technology. Activity report for 1996 and the 96-97 summer season), Plouzané, Arrondissement Brest, France, 1997, p.46-49, In French. 10 refs.

Oceanographic surveys, Sea water, Water chemistry, Air water interactions, Atmospheric composition, Carbon dioxide, Geochemical cycles

This paper describes shipboard measurements of the CO_2 flux between the ocean and atmosphere, conducted as part of the French Minerve project, a series of cruises in the southern Indian Ocean, 1991-1996.

52-3268
FINNARP-95/96, Weddell Sea Joint Nordic Expedition: scientific progress reports. *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, 66p., Refs. passim. Presented at the Finnish Antarctic Research Program FINNARP-95/96 Workshop, Tvärminne, Finland, Dec. 9-10, 1996. For individual papers see A-58905, F-58907, F-58908, J-58906, J-58909 through J-58912 or 52-3269 through 52-3276.

Research projects, Oceanographic surveys, Marine geology, Marine meteorology, Ice surveys, Air ice water interaction, Antarctica—Weddell Sea

This booklet consists of 8 papers on research conducted by FINNARP-95/96, the Finnish Antarctic Research Program Expedition to the Weddell Sea in Jan. and Feb. 1996. The first paper is a general description of the expedition. The other papers deal with heat exchange over the Weddell Sea; sea ice drift; sea ice thickness and salinities; CTD and ADCP monitoring of convective cold bottom water; sediment sampling off the Riiser-Larsen Ice Shelf; geochemistry of the continental shelf; and cadmium concentrations in the Weddell Sea.

52-3269
FINNARP-95/96 Expedition, Weddell Sea, Antarctic.
Launiainen, J., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.7-14, 4 refs.

Research projects, Oceanographic surveys, Marine geology, Bottom topography, Marine meteorology, Ice surveys, Ice conditions, Sea ice distribution, Ice edge, Air ice water interaction, Antarctica—Weddell Sea

A marine expedition directed to the central and eastern Weddell Sea was carried out as an eight-week-long Joint Nordic Expedition in Jan.-Feb. 1996 by the Finnish Research Vessel *Aranda,* under the Finnish Antarctic Research Program. For navigation and research in the sea ice zone, the vessel carried two helicopters onboard. Scientifically, the expedition was composed of four main research tasks: chemical sampling, ADCP (acoustic Doppler current profiler) measurements; air-sea-ice interaction and marine meteorology, sea ice and remote sensing studies in the marginal ice zone in the central Weddell Sea; marine geological studies, acoustic sounding and drilling in the continental shelf region off the Riiser-Larsen Ice Shelf; and automatic meteorological station maintenance in the Finnish Aboa land base. (Auth. mod.)

52-3270
Marine meteorological conditions and surface exchange processes over the Weddell Sea in 1996.
Vihma, T., Uotila, J., Launiainen, J., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.15-20, 7 refs.

Polar atmospheres, Marine atmospheres, Marine meteorology, Atmospheric boundary layer, Air ice water interaction, Ice edge, Ice cover effect, Ice heat flux, Temperature inversions, Antarctica—Weddell Sea

The surface heat exchange and atmospheric boundary layer structure over the Weddell Sea was studied by the means of meteorological buoys, radiosonde soundings, ship weather station, and turbulence and radiation measurements over the sea ice. The buoy data provide estimates for the turbulent surface fluxes over the ice and leads. Over the ice the sensible and latent heat flux have a moderate magnitude and the direction varies, while over the leads the fluxes are large and upward, the maximum sensible heat flux in winter exceeding 400 W/m^2. Due to the unstable stratification the momentum flux is almost as large over leads as over the sea ice, although the ice roughness is higher. The atmospheric boundary layer structure is characterized by the presence of temperature inversions (in 97% of the data) and low-level jets (50%). Due to the surface heating the inversions are elevated, the base height varying between 40 and 1800 m. (Auth.)

52-3271
Preliminary analysis of the sea ice drift based on the satellite-tracked buoy data.
Uotila, J., Vihma, T., Launiainen, J., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.21-27, 3 refs.

Ice surveys, Sea ice distribution, Ice floes, Drift stations, Drift, Wind velocity, Ocean currents, Antarctica—Weddell Sea

Seven buoys were deployed on drifting ice floes in the Weddell Sea and tracked by satellite, four of them from Feb. to Oct. 1996, and three of them until May 1997. The mean drift velocities were 0.15 m/s in the central Weddell Sea, which decreased to 0.11 m/s in the western Weddell Sea but at times were as fast as 0.3 m/s. The drift velocity usually varied between 2% and 3% of the wind velocity.

52-3272
Remote sensing and sea ice.
Kosloff, P., Kivimaa, S., Grönvall, H., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.28-30.

Ice surveys, Ice cover thickness, Ice salinity, Snow ice interface, Core samplers, Antarctica—Weddell Sea

As part of the FINNARP 95/96 Expedition, cores were drilled in the sea ice to measure ice and snow thicknesses and mean ice salinities. The measurements will provide field data for comparison with data from a laser profiler and videocamera installed on a helicopter and with satellite SAR images.

52-3273

CTD and ADCP measurements.

Purokoski, T., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.31-38, 3 refs.

Oceanographic surveys, Sea water, Water temperature, Salinity, Ocean currents, Underwater acoustics, Sounding, Antarctica—Weddell Sea

This paper describes CTD (conductivity-temperature-depth) and ADCP (acoustic Doppler current profiler) measurements taken in the Weddell Sea during Jan. and Feb. 1996. One of the main objectives was to monitor convective cold bottom water. The final corrected data will be sent to international data banks.

52-3274

Marine geology of the continental shelf off the Riiser-Larsen Ice Shelf, eastern Weddell Sea, Antarctica.

Winterhalter, B., Kotilainen, A., Cato, I., Kjelin, B., Jakobsson, M., Kristoffersen, Y., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.39-54.

Ice shelves, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Bottom topography, Geochemistry, Antarctica—Riiser-Larsen Ice Shelf

This paper describes the preliminary results of acoustic and seismic profiling, sediment sampling and diamond core drilling of the continental shelf off the Riiser-Larsen Ice Shelf in Feb. 1996. Photographs of recent iceberg scours with sponges indicate that recolonization is probably rapid. Tables are included which show the grain size distribution and chemical composition of selected seabed sediment samples.

52-3275

Characteristics of Weddell Sea shelf sediments obtained by diamond core drilling, Antarctica.

Strand, K., Kristoffersen, Y., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.55-62, 12 refs.

Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Stratigraphy, Geochemistry, Soil dating, Geochronology, Antarctica—Weddell Sea

This report deals with the preliminary results of shallow diamond drilling on Weddell Sea Shelf sediments as a part of the broader marine geology activities in the Finnish Antarctic Expedition 1995-96. The objectives were to study sediment deposition on a glaciated continental shelf. The glacial sediments on the shelf off Queen Maud Land may contain indications of the position of the East Antarctic Ice Sheet through time and general input of sediments. The obtained cores were studied for sedimentary composition, grain-size, and samples were taken for geochemical analysis. (Auth. mod.)

52-3276

Cadmium concentrations and budget in the Weddell Sea.

Perttilä, M., Kankaanpää, H., Niemistö, L., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.6, Finnish Antarctic Research Program FINNARP-95/96, Weddell Sea Joint Nordic Expedition, p.63-66, 6 refs.

Sea water, Water chemistry, Suspended sediments, Hydrogeochemistry, Geochemical cycles, Antarctica—Weddell Sea

Cadmium concentrations were measured in the sea water in the transect South Atlantic to the Weddell Sea. Sediment samples were analyzed from the rapid sedimentation area identified earlier. Concentrations in the sea water at surface layer (100 m depth) rise strongly towards the south, being exceptionally high in the Weddell Sea area as compared to ordinary surface layer values reported from open sea surface layer elsewhere, ranging from <0.03 (limit of detection) to 0.20 µg/l. The Cd concentrations in the deep water (1000 m depth) show a variability from 0.03 to 0.31 µg/l, but do not indicate any dependence on the latitude. (Auth.)

52-3277

News from the icing front.

Horne, T.A., *AOPA pilot,* Feb. 1998, 41(2), p.86-90.

Aircraft icing, Accidents, Safety, Ice forecasting, Warning systems, Standards, Supercooled clouds, Cloud droplets, Computerized simulation, Accuracy

52-3278

Ice on the Beech.

Keller, S., *AOPA pilot,* Feb. 1998, 41(2), p.111-112.

Aircraft icing, Safety, Ice prevention, Ice conditions, Ice control, Performance

52-3279

On deck: new icing rules.

Horne, T.A., *AOPA pilot,* Mar. 1998, 41(3), p.90-93.

Aircraft icing, Ice forecasting, Ice accretion, Ice detection, Classifications, Safety, Standards, Performance

52-3280

Wrestling the iceman.

Horne, T.A., *AOPA pilot,* Oct. 1997, 40(10), p.132-137.

Aircraft icing, Safety, Countermeasures, Meteorological data, Ice forecasting, Performance

52-3281

Variation of fracture toughness of asphalt concrete under low temperatures.

Kim, K.W., El Hussein, M., *Construction and building materials,* Oct.-Dec. 1997, 11(7-8), p.403-411, 23 refs.

Construction materials, Bituminous concretes, Concrete aggregates, Concrete durability, Damage, Cracking (fracturing), Loading, Deformation, Mechanical tests, Low temperature tests, Thermal analysis, Temperature effects

52-3282

Modeling and measurements of scattering from road surfaces at millimeter-wave frequencies.

Sarabandi, K., Li, E.S., Nashashibi, A., *IEEE transactions on antennas and propagation,* Nov. 1997, 45(11), p.1679-1688, 26 refs.

Road icing, Bituminous concretes, Concrete pavements, Dielectric properties, Sensors, Radar echoes, Ice detection, Backscattering, Mathematical models, Simulation, Ice cover effect

52-3283

Use of set accelerating admixtures in dry-mix shotcrete.

Jolin, M., Beaupré, D., Pigeon, M., Lamontagne, A., *Journal of materials in civil engineering,* Nov. 1997, 9(4), p.180-184, 9 refs.

Concrete durability, Construction materials, Concrete admixtures, Concrete curing, Chemical composition, Frost resistance, Air entrainment, Mechanical tests, Freeze thaw tests, Cold weather performance

52-3284

Power consumption in disaggregation of permafrost by means of suspended impact devices.

Fedulov, A.I., Ivanov, R.A., *Journal of mining science,* May-June 1997 (Pub. Sep. 97), 33(3), p.234-238, Translated from Fiziko-tekhnicheskie problemy razrabotki poleznykh iskopaemykh.

Permafrost physics, Engineering geology, Frozen ground mechanics, Shear properties, Mining, Machinery, Excavation, Performance, Shear properties

52-3285

Hydrological response of a snowpack under rain-on-snow events: a field study.

Singh, P., Spitzbart, G., Hübl, H., Weinmeister, H.W., *Journal of hydrology,* Dec. 25, 1997, 202(1-4), p.1-20, Refs. p.18-20.

Snow hydrology, Alpine landscapes, Snow cover structure, Precipitation (meteorology), Rain, Ice water interface, Snowmelt, Meltwater, Water flow, Velocity measurement, Water storage, Runoff, Simulation

52-3286

Use of air permeability to estimate infiltrability of frozen soil.

Seyfried, M.S., Murdock, M.D., *Journal of hydrology,* Dec. 25, 1997, 202(1-4), p.95-107, Refs. p.105-107.

Frozen ground mechanics, Soil freezing, Soil water, Hydraulics, Seepage, Ice water interface, Permeability, Vapor diffusion, Porosity, Water content, Forecasting, Simulation

52-3287

Climate change effects on the hydrologic regime within the Churchill-Nelson River Basin.

Westmacott, J.R., Burn, D.H., *Journal of hydrology,* Dec. 25, 1997, 202(1-4), p.263-279, 23 refs.

Watersheds, River basins, Hydrologic cycle, Climatic changes, Snowmelt, Snow hydrology, Stream flow, Runoff forecasting, Mathematical models, Seasonal variations, Canada—Manitoba—Churchill River, Canada—Manitoba—Nelson River

52-3288

Is it possible to detect frozen O_2 and N_2 on interstellar grains.

Strazzulla, G., Brucato, J.R., Palumbo, M.E., Satorre, M.A., *Astronomy and astrophysics,* May 10, 1997, 321(2), p.618-624, 28 refs.

Extraterrestrial ice, Cosmic dust, Oxygen, Carbon dioxide, Ice detection, Ice spectroscopy, Infrared spectroscopy, Ionization, Radiation absorption, Spectra, Simulation

52-3289

Seasonality in exchange of organochlorines between arctic air and seawater.

Hargrave, B.T., Barrie, L.A., Bidleman, T.F., Welch, H.E., *Environmental science & technology,* Nov. 1997, 31(11), p.3258-3266, 43 refs.

Oceanography, Atmospheric composition, Water pollution, Environmental tests, Hydrocarbons, Water chemistry, Air ice water interaction, Vapor diffusion, Ice cover effect, Sampling, Seasonal variations, Arctic Ocean

52-3290

Measurement of the specific surface area of snow with the nitrogen adsorption technique.

Hoff, J.T., Gregor, D., Mackay, D., Wania, F., Jia, C.Q., *Environmental science & technology,* Jan. 1, 1998, 32(1), p.58-62, 29 refs.

Snow physics, Snow surface, Measurement, Snow air interface, Adsorption, Vapor diffusion, Sampling, Simulation, Statistical analysis, Correlation

52-3291

Dynamics of surface reactions induced by low-energy electrons. Oxidation of hydrogen-passivated Si by H_2O.

Klyachko, D.V., Rowntree, P., Sanche, L., *Surface science,* Nov. 6, 1997, 389(1-3), p.29-47, 95 refs.

Ice physics, Ice solid interface, Adsorption, Water films, Monomolecular films, Photochemical reactions, Ion diffusion, Charge transfer, Resonance, Ice spectroscopy, Simulation

52-3292

Natural convection during solidification of an alloy from above with application to the evolution of sea ice.

Wettlaufer, J.S., Worster, M.G., Huppert, H.E., *Journal of fluid mechanics,* Aug. 10, 1997, Vol.344, p.291-316, 33 refs.

Sea ice, Ice formation, Ice physics, Ice water interface, Phase transformations, Solidification, Convection, Brines, Thermal diffusion, Salinity, Solid phases, Simulation, Temperature effects

52-3293

Carbonic acid in the gas phase and its astrophysical relevance.

Hage, W., Liedl, K.R., Hallbrucker, A., Mayer, E., *Science,* Feb. 27, 1998, 279(5355), p.1332-1335, 42 refs.

Ice physics, Extraterrestrial ice, Hydrocarbons, Ice sublimation, Photochemical reactions, Vapor diffusion, Infrared radiation, Simulation, Thermodynamics

52-3294

Abrupt climate events 500,000 to 340,000 years ago: evidence from subpolar North Atlantic sediments.

Oppo, D.W., McManus, J.F., Cullen, J.L., *Science,* Feb. 27, 1998, 279(5355), p.1335-1338, 32 refs.

Paleoclimatology, Pleistocene, Climatic changes, Surface temperature, Glacier oscillation, Marine deposits, Paleoecology, Isotope analysis, Drill core analysis, Spectra, Statistical analysis, Atlantic Ocean

52-3295
Modelling viscoplastic behavior of anisotropic polycrystalline ice with a self-consistent approach.
Castelnau, O., Canova, G.R., Lebensohn, R.A., Duval, P., *Acta materialia,* Nov. 1997, 45(11), p.4823-4834, With French summary. 42 refs.
Ice physics, Ice models, Rheology, Ice deformation, Ice microstructure, Ice crystal structure, Ice plasticity, Plastic deformation, Anisotropy, Mechanical properties, Mathematical models

52-3296
Workshop on Long-Term Monitoring of Glaciers of North America and Northwestern Europe, University of Puget Sound, Tacoma, WA, Sep. 11-13, 1996. Final report.
Williams, R.S., Jr., ed, Ferrigno, J.G., ed, *U.S. Geological Survey. Open-file report,* 1997, No.98-31, 144p., Refs. passim.
Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial meteorology, Glacial hydrology, Spaceborne photography, Data processing, Research projects, Meetings

52-3297
Broad synchrony of a Late-glacial glacier advance and the highstand of palaeolake Tauca in the Bolivian Altiplano.
Clayton, J.D., Clapperton, C.M., *Journal of Quaternary science,* May-June 1997, 12(3), p.169-182, Refs. p.181-182.
Pleistocene, Paleoclimatology, Climatic changes, Mountain glaciers, Glacial geology, Glacier oscillation, Glacial deposits, Lacustrine deposits, Altitude, Deltas, Radioactive age determination, Geochronology, Correlation, Bolivia—Altiplano

52-3298
Periglacial trimlines, former nunataks and the altitude of the last ice sheet in Wester Ross, northwest Scotland.
Ballantyne, C.K., McCarroll, D., Nesje, A., Dahl, S.O., *Journal of Quaternary science,* May-June 1997, 12(3), p.225-238, Refs. p.236-238.
Geomorphology, Pleistocene, Glaciation, Altitude, Glacial geology, Periglacial processes, Bedrock, Glacial erosion, Weathering, Frost shattering, Nunataks, Lithology, United Kingdom—Scotland

52-3299
Icy warning.
Roberts, L.H., *APWA reporter,* Oct. 1997, 64(10), p.10-11.
Road icing, Safety, Warning systems, Sensors, Inflatable structures, Ice detection, Atmospheric pressure

52-3300
Snow and ice removal plans quiet citizen complaints.
Flora, J.G., *APWA reporter,* Oct. 1997, 64(10), p.12-13.
Winter maintenance, Road maintenance, Snow removal, Countermeasures, Logistics, Cold weather performance

52-3301
Model allows testing of frost shields for buried utility lines.
Coutermarsh, B.A., Pfaefflin, S.L., MP 5112, *APWA reporter,* Oct. 1997, 64(10), p.16-17.
Utilities, Water pipelines, Underground pipelines, Frost protection, Covering, Thermal insulation, Soil temperature, Forecasting, Mathematical models, Computerized simulation
Through the University of New Hampshire, the U.S. Army Cold Regions Research and Engineering Laboratory has developed a finite element program to aid in the design of frost shields. The program allows the shield designer to model almost any utility line and insulation configuration in most soils or rock materials under a variety of environmental temperature conditions, and to test several different insulation configurations and assess their effectiveness for existing environmental conditions.

52-3302
Marquette study finds salt superior in terms of safety & cost effectiveness. *APWA reporter,* Oct. 1997, 64(10), p.23.
Winter maintenance, Road maintenance, Ice prevention, Ice control, Salting, Environmental protection, Cost analysis, Statistical analysis

52-3303
Greeley, Colorado has a snow plan...how do your snow control efforts compare.
Sterling, W.A., Pickett, J., *APWA reporter,* Oct. 1997, 64(10), p.24-25.
Snowstorms, Winter maintenance, Road maintenance, Road icing, Snow removal, Ice control, Logistics, Cold weather performance, United States—Colorado—Greeley

52-3304
New anti-icing technologies include automated chemical sprayers on bridges.
Ask, B., *APWA reporter,* Sep. 1996, 63(8), p.21.
Road icing, Bridges, Ice prevention, Ice control, Solutions, Fluid dynamics, Flow control, Computer applications

52-3305
Snow removal: winter storms challenge maintenance crews at O'Hare.
Georgian, A., *APWA reporter,* Feb. 1996, 63(1), p.12-13.
Airports, Aircraft landing areas, Winter maintenance, Cold weather performance, Snowstorms, Snow removal, Snow removal equipment, United States—Illinois—Chicago

52-3306
Convection in ice-covered lakes: effects on algal suspension.
Kelley, D.E., *Journal of plankton research,* Dec. 1997, 19(12), p.1859-1880, 50 refs.
Limnology, Icebound lakes, Microbiology, Plankton, Fluid dynamics, Ice water interface, Turbulent exchange, Convection, Buoyancy, Ice cover effect, Analysis (mathematics)

52-3307
Ice-cover influence on flow structure over dunes.
Smith, B.T., Ettema, R., *Journal of hydraulic research,* 1997, 35(5), p.707-719, With French summary. 18 refs.
Channels (waterways), Hydraulics, Turbulent flow, Bottom topography, Shear stress, Sands, Ice water interface, Surface roughness, Ice cover effect, Simulation

52-3308
Influence of sea-salt on aerosol radiative properties in the southern ocean marine boundary layer.
Murphy, D.M., et al, *Nature,* Mar. 5, 1998, 392(6671), p.62-65, 30 refs.
Aerosols, Climatic changes, Solar radiation, Atmospheric composition
It has been hypothesized that oceanic production of sulphate aerosols from the oxidation of dimethyl sulphide could be a powerful feedback in the climate system. It is generally assumed that marine aerosols smaller than about 1 μm are non-sea-salt sulphate, but a recent review cites indirect evidence that many aerosols in the submicrometer range contain at least some sea-salt. Presented here is direct observational evidence from Macquarie I. that almost all aerosols larger than 0.13 μm in the marine boundary layer contained sea-salt. These sea-salt aerosols had important radiative effects: they were responsible for the majority of aerosol-scattered light, and comprised a significant fraction of the inferred cloud nuclei.

52-3309
Atmospheric CO_2 concentration and millennial-scale climate change during the last glacial period.
Stauffer, B., et al, *Nature,* Mar. 5, 1998, 392(6671), p.59-62, 29 refs.
Atmospheric composition, Climatic changes, Carbon dioxide, Aerosols, Ice salinity, Sea water, Brines, Antarctica—Marie Byrd Land, Greenland
To compare the rapid climate changes recorded in the Greenland ice with the global trends in atmospheric CO_2 concentrations as recorded in the antarctic ice, an accurate common timescale is needed. Such a timescale is provided for the last glacial period using the records of global atmospheric methane concentrations from both Greenland and antarctic ice. The atmospheric concentration of CO_2 generally varied little with Dansgaard-Oeschger events but varied significantly with Heinrich iceberg-discharge events, especially those starting with a long-lasting Dansgaard-Oeschger event. (Auth. mod.)

52-3310
Increased stratospheric ozone depletion due to mountain-induced atmospheric waves.
Carslaw, K.S., et al, *Nature,* Feb. 12, 1998, 391(6668), p.675-678, 27 refs.
Ozone, Polar stratospheric clouds, Chemical composition, Aerosols, Air flow

52-3311
Breakup and conditions for stability of the northern Larsen Ice Shelf, Antarctica.
Doake, C.S.M., Corr, H.F.J., Rott, H., Skvarca, P., Young, N.W., *Nature,* Feb. 19, 1998, 391(6669), p.778-780, 20 refs.
Ice shelves, Ice models, Ablation, Air temperature, Ice mechanics, Antarctica—Antarctic Peninsula, Antarctica—Larsen Ice Shelf
The breakup of ice shelves has been regarded as an indicator of climate change, with observations around the Antarctic Peninsula showing a pattern of gradual retreat, associated with regional atmospheric warming and increased summer melt and fracturing processes. The rapid collapse of the northernmost section of the Larsen Ice Shelf (Larsen A), over a few days in Jan. 1995, indicated that, after retreat beyond a critical limit, ice shelves may disintegrate rapidly. A finite-element numerical model that treats ice as a continuum without fracture is used to examine the breakup history between 1986 and 1997 of the two northern sections of Larsen Ice Shelf from which stability criteria for ice shelves are established. Analysis of ice-shelf configurations reveals characteristic patterns in the strain rates near the ice front which is used to describe the stability of the ice shelf. On Larsen A only the initial and final ice-front configurations show a stable pattern. Larsen B exhibits a stable pattern, but if the ice front were to retreat by a further few kilometers, it too is likely to enter an irreversible retreat phase. (Auth. mod.)

52-3312
Decompression-induced melting of ice IV and the liquid-liquid transition in water.
Mishima, O., Stanley, H.E., *Nature,* Mar. 12, 1998, 392(6672), p.164-168, 33 refs.
High pressure ice, Phase transformations, Ice melting, Experimentation, Asymmetry

52-3313
Tunnelling and zero-point motion in high-pressure ice.
Benoit, M., Marx, D., Parrinello, M., *Nature,* Mar. 19, 1998, 392(6673), p.258-261, 33 refs.
High pressure ice, Ice mechanics, Proton transport, Hydrogen bonds, Ice physics

52-3314
Influence of temperature and total water content on the unfrozen water content below 0° in three model soils.
Koz/bwski, T., *Archives of hydro-engineering and engineering mechanics,* 1995, 42(3-4), p.51-70, 39 refs.
Frozen ground thermodynamics, Unfrozen water content, Freezing points, Ice water interface, Soil tests, Simulation, Temperature measurement, Analysis (mathematics), Temperature effects

52-3315
Origin of carbonatites and related rocks from the Igaliko Dyke Swarm, Gardar Province, South Greenland: field, geochemical and C-O-Sr-Nd isotope evidence.
Pearce, N.J.G., Leng, M.J., *Lithos,* Dec. 1996, 39(1-2), p.21-40, 63 refs.
Lithology, Magma, Classifications, Origin, Hydrothermal processes, Rock properties, Isotope analysis, Geochemistry, Greenland—Gardar Province

52-3316
Petrogenesis of Devonian lamprophyre and carbonatite minor intrusions, Kandalaksha Gulf (Kola Peninsula, Russia).
Beard, A.D., Downes, H., Vetrin, V., Kempton, P.D., Maluski, H., *Lithos,* Dec. 1996, 39(1-2), p.93-119, 49 refs.
Geologic processes, Subpolar regions, Magma, Hydrothermal processes, Mineralogy, Lithology, Isotope analysis, Origin, Radioactive age determination, Correlation, Russia—Kola Peninsula

52-3317
Petrology of recent lava flows, Volcano Mountain, Yukon Territory, Canada.
Trupia, S., Nicholls, J., *Lithos,* Feb. 1996, 37(1), p.61-78, 41 refs.
Subarctic landscapes, Magma, Volcanoes, Mass flow, Fluid flow, Mineralogy, Origin, Thermodynamics, Chemical analysis, Chemical composition, Classifications, Canada—Yukon Territory—Volcano Mountain

52-3318
Crust-mantle interaction in the evolution of the Ilimaussaq Complex, South Greenland: Nd isotopic studies.
Stevenson, R., Upton, B.G.J., Steenfelt, A., *Lithos,* July 1997, 40(2-4), p.189-202, 37 refs.
Pleistocene, Earth crust, Subpolar regions, Magma, Tectonics, Geochemistry, Isotope analysis, Chemical composition, Geologic processes, Models, Hydrothermal processes, Greenland—Ilimaussaq Complex

52-3319
Tracer investigation of nitrogen cycling in a pristine tundra river.
Peterson, B.J., Bahr, M., Kling, G.W., *Canadian journal of fisheries and aquatic sciences,* Oct. 1997, 54(10), p.2361-2367, With French summary. 27 refs.
Limnology, River flow, Tundra terrain, River basins, Surface drainage, Nutrient cycle, Ecosystems, Geochemical cycles, Isotope analysis, United States—Alaska—Kuparuk River

52-3320
Flashover performance of IEEE standard insulators under ice conditions.
Farzaneh, M., Kiernicki, J., *IEEE transactions on power delivery,* Oct. 1997, 12(4), p.1602-1613, 35 refs. Includes discussion.
Power line icing, Electrical insulation, Electrical resistivity, Charge transfer, Glaze, Ice cover effect, Mechanical tests, Stress concentration, Standards, Cold weather performance, Ice solid interface

52-3321
Development of galloping endurance design for extra large 6-conductor bundle spacers by the experience of the full scale 500kV test line.
Nojima, T., Shimizu, M., Ogi, I., Okumura, T., Nagatomi, K., Ito, H., *IEEE transactions on power delivery,* Oct. 1997, 12(4), p.1824-1829, 4 refs.
Power line icing, Electrical resistivity, Stability, Dynamic properties, Countermeasures, Ice cover effect, Design, Simulation, Mechanical tests

52-3322
Recognition of cryoturbation for classifying permafrost-affected soils.
Bockheim, J.G., Tarnocai, C., *Geoderma,* Jan. 1998, 81(3-4), p.281-293, 40 refs.
Soil science, Geocryology, Cryoturbation, Frost action, Ice wedges, Soil classification, Permafrost transformation, Permafrost structure, Frozen ground mechanics

52-3323
Forms of phosphorus in humic and fulvic acids of a toposequence of alpine soils in the northern Caucasus.
Makarov, M.I., Malysheva, T.I., Haumaier, L., Alt, H.G., Zech, W., *Geoderma,* Oct. 1997, 80(1-2), p.61-73, 22 refs.
Soil analysis, Alpine landscapes, Forest soils, Organic soils, Soil chemistry, Snow cover effect, Nuclear magnetic resonance, Spectra, Profiles, Russia—Caucasus Mountains

52-3324
Using inherited cosmogenic ^{36}Cl to constrain glacial erosion rates of the Cordilleran ice sheet.
Briner, J.P., Swanson, T.W., *Geology,* Jan. 1998, 26(1), p.3-6, 19 refs.
Pleistocene, Ice sheets, Glacial geology, Glacial erosion, Bedrock, Abrasion, Sampling, Gamma irradiation, Isotope analysis, Radioactive age determination, Geochronology, United States—Washington—Erie, Mount

52-3325
Tertiary faulting and pseudotachylytes in the East Greenland volcanic rifted margin: seismogenic faulting during magmatic construction.
Karson, J.A., Brooks, C.K., Storey, M., Pringle, M.S., *Geology,* Jan. 1998, 26(1), p.39-42, 27 refs.
Tectonics, Subpolar regions, Earth crust, Marine geology, Magma, Subsidence, Shear stress, Geologic processes, Radioactive age determination, Greenland

52-3326
Application of a distributed blowing snow model to the Arctic.
Pomeroy, J.W., Marsh, P., Gray, D.M., *Hydrological processes,* Sep. 1997, 11(11), p.1451-1464, 38 refs.
Snow hydrology, Turbulent boundary layer, Tundra terrain, Mass transfer, Mass balance, Blowing snow, Snow air interface, Sublimation, Mathematical models, Snow cover distribution, Canada—Northwest Territories—Trail Valley Creek

52-3327
Modelling runoff using optical satellite remote sensing data in a high mountainous alpine catchment of Italy.
Swamy, A.N., Brivio, P.A., *Hydrological processes,* Sep. 1997, 11(11), p.1475-1491, 52 refs.
Snow hydrology, Snow surveys, Snow cover distribution, Alpine landscapes, Watersheds, Snowmelt, Air temperature, LANDSAT, Radiometry, Spaceborne photography, Runoff forecasting, Italy—Alps

52-3328
Holocene glacial history and sea-level changes on James Ross Island, Antarctic Peninsula.
Hjort, C., Ingólfsson, O., Möller, P., Lirio, J.M., *Journal of Quaternary science,* July-Aug. 1997, 12(4), p.259-273, Refs. p.271-273.
Glacial geology, Geomorphology, Quaternary deposits, Sea level, Glacier oscillation, Glacial deposits, Lithology, Stratigraphy, Geochronology, Antarctica—James Ross Island
A reconstruction of deglaciation and associated sea-level changes on northern James Ross I., based on lithostratigraphical and geomorphological studies, shows that the initial deglaciation of presently ice-free areas occurred slightly before 7400 ^{14}C yr BP. Sea-level in connection with the deglaciation was around 30 m a.s.l. A glacier readvance in Brandy Bay, of at least 7 km, with the initial 3 km over land, reached a position off the present coast at ca. 4600 yr BP. The culmination of the advance was of short duration, and by 4300 yr BP the coastal lowlands again were ice-free. (Auth. mod.)

52-3329
Periglacial features of the Subbetic Mountains of southern Spain (Córdoba Province).
Torres-Girón, M.L., Recio-Espejo, J.M., *Journal of Quaternary science,* July-Aug. 1997, 12(4), p.275-282, 32 refs.
Pleistocene, Quaternary deposits, Geomorphology, Periglacial processes, Mountain soils, Clay minerals, Chemical composition, Geochemistry, Radioactive age determination, Sampling, Classifications, Spain—Subbetic Mountains

52-3330
Glacigenic rafting at Castle Hill, Gardenstown, and its significance for the glacial history of northern Banffshire, Scotland.
Peacock, J.D., Merritt, J.W., *Journal of Quaternary science,* July-Aug. 1997, 12(4), p.283-294, 49 refs.
Pleistocene, Glacial geology, Quaternary deposits, Glacial deposits, Tectonics, Sediment transport, Stratigraphy, Lithology, Paleoecology, Age determination, United Kingdom—Scotland

52-3331
Uranium/thorium dating of ferricretes from mid- to late Pleistocene glacial sediments, western Tasmania, Australia.
Augustinus, P.C., Short, S.A., Heijnis, H., *Journal of Quaternary science,* July-Aug. 1997, 12(4), p.295-308, 32 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Weathering, Sampling, Radioactive age determination, Australia—Tasmania

52-3332
Interhemispheric synchrony of Late-glacial climatic instability as recorded in proglacial Lake Mascardi, Argentina.
Ariztegui, D., Bianchi, M.M., Masaferro, J., Lafargue, E., Niessen, F., *Journal of Quaternary science,* July-Aug. 1997, 12(4), p.333-338, 45 refs.
Pleistocene, Paleoclimatology, Climatic changes, Global change, Lacustrine deposits, Quaternary deposits, Ice cores, Glacier oscillation, Radioactive age determination, Correlation, Argentina—Mascardi, Lake

52-3333
Proceedings of the NIPR Symposium on Polar Meteorology and Glaciology, No.11.
Watanabe, O., ed, NIPR Symposium on Polar Meteorology and Glaciology, 19th, Tokyo, July 10-11, 1996, Tokyo, National Institute of Polar Research, 1997, 277p., Refs. passim. For selected papers see F-58924 through F-58927, F-58929, F-58930, F-58933, I-58928, I-58931, I-58932 or 52-3334 through 52-3354.
Glaciology, Ice cores, Ice sheets, Sea ice, Snow, Meteorological data, Antarctica—Showa Station, Antarctica—Dome Fuji Station
This is a collection of papers presented at the 19th Symposium on Polar Meteorology and Glaciology held in Tokyo on July 10-11, 1996. It consists of 21 full-length papers and 37 abstracts; the former were refereed and are arranged in the order of scientific areas of glaciology, meteorology and physical oceanography.

52-3334
Preliminary discussion of physical properties of the Dome Fuji shallow ice core in 1993, Antarctica.
Watanabe, O., et al, NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.1-8, 10 refs.
Ice cores, Ice physics, Depth hoar, Antarctica—Dome Fuji Station
To make a pilot-hole for deep core drilling at Dome Fuji Station, shallow ice core drilling was conducted to a depth of 112.59 m by electro-mechanical drill. Core logging, measurements of impermeability and bulk density were conducted *in situ* and another analysis was done in Japan. Much depth hoar developed at Dome Fuji Station. However, it did not influence the densification rate, which mainly depends on temperature. Air bubble close-off starts from about 90 m depth. Much accumulation at one time occurs during marine cyclones at Dome Fuji Station. (Auth.)

52-3335
Preliminary study of ice core chronology at Dome Fuji Station, Antarctica.
Watanabe, O., et al, NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.9-13, 7 refs.
Ice cores, Ice dating, Antarctica—Dome Fuji Station
A 112.59 m deep ice core was drilled at Dome Fuji Station by JARE-34 in 1993. The ice core chronology was determined by electric conductivity peaks measured in the home laboratory and by field observation-results obtained on the deeper portion of the core. The electric conductivity peak analyses suggest the same 5 volcanic eruptions reported for the ice core of Byrd Camp. Field observations for ECM and crystal size distributions suggest that the 374 m-depth level corresponds to the end of the Wisconsin ice period. The accumulation rate at Dome Fuji Station is between 2.5 and 3.0 cm of water equivalent/year, and the end of the Wisconsin-Holocene transition is found between depths of 340 and 400 m. The depth-age curves for the core at Dome Fuji Station are obtained from the surface to 400 m (at 12,000 years BP). (Auth. mod.)

52-3336
Preliminary report on analyses of melted Dome Fuji ice core obtained in 1993.
Watanabe, O., et al, NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.14-23, 16 refs.
Ice cores, Ice composition, Glacier ice, Electrical resistivity, Microanalysis, Particles, Antarctica—Dome Fuji Station
An ice core from the glacier surface down to 112.59 m depth was obtained in 1993 at Dome Fuji Station. The measurements of numbers of microparticles, electrical conductivity, pH, oxygen isotopic ratio and chemical constituents were carried out in melted ice core samples. In this report, the procedures, the methods for measurements and results are introduced. The preliminary steps on ice core research at Dome Fuji Station should be useful to evaluate the envi-

ronments at the dome in comparison with core analyses at other sites. The vertical distributions of the values obtained are presented, and past climate and environments are discussed. (Auth. mod.)

52-3337

Surface mass balance, sublimation and snow temperatures at Dome Fuji Station, Antarctica, in 1995.

Kameda, T., Azuma, N., Furukawa, T., Ageta, Y., Takahashi, S., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.24-34, 14 refs.

Snow surface, Snow surface temperature, Sublimation, Mass balance, Antarctica—Dome Fuji Station

This paper focuses on first year-round observations of surface mass balance, sublimation and snow temperatures at Dome Fuji Station. It was found that average surface mass balance, by the stake method, was +2.5/gcm^2 from Jan. 25, 1995 to Jan. 30, 1996; 95% of the positive balance was obtained from Feb. to mid-Oct. Sublimation from atmosphere to snow surface was predominant in winter, and sublimation from snow surface to atmosphere was predominant in summer. In the annual balance, sublimation from atmosphere to snow surface prevailed, corresponding to about 6% of the annual surface mass balance. The snow temperature at 10 m depth varied from -57.0 to -57.8°C, and the annual mean 10 m snow temperature was -57.3°C. (Auth. mod.)

52-3338

Meteorological observations along a traverse route from coast to Dome Fuji Station, Antarctica, recorded by automatic weather stations in 1995.

Kameda, T., et al, NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.35-50, 14 refs.

Weather stations, Weather observations, Air temperature, Atmospheric pressure, Wind (meteorology), Snow temperature, Snow surface, Antarctica—Queen Maud Land

This paper focuses on instrumentation and observational results of 8 Automatic Weather Station (AWS) units in Queen Maud Land in 1995. The AWS units were installed at 6 sites on the ice sheet, from the coast to Dome Fuji Station, about 920 km inland at 3810 m altitude. Two types of AWS units (CMOS and ARGOS) were employed. Air temperatures varied from +2.3 to -44.4°C at the coast and -23.3 to -80.1°C at Dome Fuji Station. Monthly mean July temperatures at all the AWS were higher than in June and Aug. During the period of temperature increase in July, atmospheric pressure also increased. Wind speed during the whole period could only be obtained at MD180, at which glazed surface was observed. Prevailing wind (SE) at Relay Point covered 40% of the total wind direction. Atmospheric pressure at Relay Point dropped in May and Sep., and increased in July and Dec. Monthly mean lapse rates on snow surfaces were calculated using AWS data; annual mean lapse rates from the AWS data were systematically lower than those obtained by 10 m snow temperatures on the Mizuho Plateau. (Auth. mod.)

52-3339

Compendium of recent French contribution to polar ice core studies.

Delmas, R.J., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.51-66, Refs. p.63-66.

Research projects, Climatic changes, Low temperature research, Ice cores, Drilling, Ice dating, Ice composition, Paleoclimatology, Polar regions, Antarctica—Vostok Station

Over the last decade, researchers and drillers of Laboratoire de Glaciologie et Géophysique de l'Environnement (LGGE) were involved in four major international projects in Antarctica and Greenland. Vostok data documented the links between major climate changes and the composition of atmospheric gaseous and particulate constituents. A wealth of scientific results were also amassed from shallow and deep ice cores collected from 1989 to 1992 at Summit, Greenland. The strategy adopted successfully in Greenland is now being transferred to the Antarctic for Epica, the great glaciological research project to be developed during the next few years. LGGE is particularly interested in the Dome Concordia drilling operation (the first phase of Epica). A summary of French scientific activities related to these international projects is given. (Auth. mod.)

52-3340

Characteristics of AC-ECM signals obtained by use of the Vestfonna ice core, Svalbard.

Matsuoka, K., Narita, H., Sugiyama, K., Matoba, S., Motoyama, H., Watanabe, O., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.67-75, 12 refs.

Glacier surveys, Ice cores, Ice composition, Impurities, Ice electrical properties, Ice dielectrics, Ice dating, Drill core analysis, Radio echo soundings, Electromagnetic prospecting, Norway—Svalbard

52-3341

Distributions and historical records of aliphatic carboxylic acids in the H15 ice core from Antarctica.

Nishikiori, M., Kawamura, K., Fujii, Y., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.76-86, 24 refs.

Ice cores, Ice composition, Ice dating, Atmospheric composition, Sea ice distribution, Aerosols, Ozone

In an ice core collected from Antarctica (site H15), molecular distributions of normal saturated fatty acids (C_8-C_{18}) showed an even carbon number predominance with a maximum at C_{16} or C_{18}, suggesting that they were mainly derived from marine phytoplankton. The ice core fatty acids have been emitted to the atmosphere from the sea surface microlayers in the southern ocean through a bubble bursting process and subsequently transported long distances over the antarctic ice sheet. Their concentrations fluctuated in the ice core with a range of 1-4110 ng/kg-ice, showing lower values between the 1630s and 1840s and higher values after the 1850s. Concentration ratios of azelaic acid to unsaturated fatty acids in the ice core showed a rapid increase after the 1970s, suggesting that photochemical transformation of organic aerosols in the antarctic atmosphere and/or in the surface of the ice sheet was enhanced after the 1970s. (Auth. mod.)

52-3342

Attempt at deformation tests of deep ice core samples containing cloudy bands.

Miyamoto, A., Shoji, H., Narita, H., Watanabe, O., Clausen, H.B., Hondoh, T., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.87-93, 6 refs.

Ice sheets, Glacier ice, Ice cores, Firn stratification, Ice structure, Ice strength, Ice pressure, Ice deformation, Drill core analysis, Strain tests, Greenland

52-3343

Fluctuation of $\delta^{18}O$ of surface snow with surface hoar and depth hoar formation under radiative cooling.

Hachikubo, A., Motoyama, H., Suzuki, K., Akitaya, E., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.94-102, 5 refs.

Snow air interface, Snow heat flux, Snow temperature, Depth hoar, Snow composition, Isotope analysis

52-3344

***In situ* observation of evaporating ice crystals by laser two-beam interferometry.**

Gonda, T., Matsuura, Y., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.103-107, 10 refs.

Ice crystal growth, Ice crystal structure, Ice crystal replicas, Ice sublimation, Cloud physics, Cloud chambers, Lidar

52-3345

Velocity and angle distributions of drifting snow particles near the loose snow surface.

Sugiura, K., Nishimura, K., Maeno, N., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.108-116, 7 refs.

Blowing snow, Snowdrifts, Snow air interface, Snow erosion, Wind erosion, Wind tunnels

52-3346

Lidar observations above Ny-Ålesund, Svalbard, Norway, during winter 1995/96.

Shiraishi, K., et al, NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.117-126, 7 refs.

Polar atmospheres, Atmospheric composition, Aerosols, Polar stratospheric clouds, Ozone, Lidar, Norway—Spitsbergen

52-3347

Variation of concentrations of sulfate, methanesulfonate and sulfur dioxide at Ny-Ålesund in 1995/96 winter.

Hara, K., Osada, K., Hayashi, M., Matsunaga, K., Iwasaka, Y., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.127-137, 33 refs.

Polar atmospheres, Marine atmospheres, Atmospheric composition, Air pollution, Aerosols, Norway—Spitsbergen

52-3348

Distribution of particulate sulfur in the winter arctic stratosphere: balloon-borne measurements of particle number concentration.

Watanabe, M., et al, NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.138-149, 54 refs.

Polar atmospheres, Polar stratospheric clouds, Atmospheric composition, Air pollution, Aerosols, Geochemical cycles, Particle size distribution, Norway—Spitsbergen

52-3349

Aerosol observations in the Siberian Arctic.

Fukasawa, T., Ohta, S., Murao, N., Yamagata, S., Makarov, V.N., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.150-160, 10 refs.

Polar atmospheres, Atmospheric composition, Air pollution, Aerosols, Haze, Russia—Siberia

52-3350

Seasonal variation of tropospheric ozone and the impact of transport over Syowa Station, Antarctica.

Murayama, S., Yamazaki, K., Aoki, S., Nakazawa, T., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.161-177, Refs. p.175-177.

Ozone, Atmospheric composition, Atmospheric circulation, Wind factors, Stratosphere, Seasonal variations, Antarctica—Showa Station

The seasonal O_3 variations are affected significantly by a combination of the following process: in the upper troposphere over Showa Station, the downward transport of air rich in O_3 from the stratosphere is enhanced, while the transport of air poor in O_3 from lower levels is suppressed from summer to early autumn; in the lower troposphere over Showa, lower tropospheric air poor in O_3 is transported horizontally from lower latitudes and the transport of air with high O_3 mixing ratios from upper levels is reduced from late spring to early autumn; vertical air mixing is enhanced in the antarctic troposphere in cold seasons; and in the middle troposphere, the upward transport of lower tropospheric air takes precedence over air transport from upper levels throughout the year except in summer. (Auth. mod.)

52-3351

Stratospheric sudden warming in 1989 from the viewpoint of atmospheric angular momentum.

Seol, D.I., Yamazaki, K., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.178-198, 21 refs.

Polar atmospheres, Stratosphere, Air temperature, Atmospheric circulation, Atmospheric pressure, Mathematical models

52-3352
Meridional distribution of short-vertical-scale fluctuations in the lower stratosphere revealed by cross-equatorial ozonesonde observations on "Shirase".
Ogino, S.Y., Yamanaka, M.D., Kaneto, S., Yamanouchi, T., Fukao, S., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.199-210, 16 refs.
Ozone, Atmospheric composition, Air temperature, Stratosphere
Meridional distribution of magnitude for short-vertical-scale fluctuations in the lower stratosphere over the wide latitudinal region between 62°S-43°N, roughly along 120°E, is investigated on the basis of vertical wavenumber spectra analyzed from temperature and ozone mixing ratio data observed by ozonesondes on *Shirase* cruises from 1987 to 1990. (Auth. mod.)

52-3353
Characteristics of water in Kongsfjorden, Svalbard.
Ito, H., Kudoh, S., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.211-232, 9 refs.
Glacial hydrology, Meltwater, Sea water, Water temperature, Salinity, Water transport, Norway—Spitsbergen

52-3354
Long-term variation of antarctic sea ice and its prediction possibility.
Bao, C.L., Xie, S.M., Zou, B., NIPR Symposium on Polar Meteorology and Glaciology, Proceedings. No.11, Tokyo, National Institute of Polar Research, 1997, p.233-240, 6 refs.
Sea ice distribution, Variations, Long range forecasting, Ice water interface
The SIGRID antarctic sea ice data (1973-1989) and the satellite microwave radiation data of SMMR and SSM/I (1978-1995) are presented in this paper. Through assimilation-processing, these data sets are combined into a single time series data set (1973-1995). The maximum entropy spectrum analysis method is used to analyze the long-term variation periods of antarctic sea ice; and the interrelationship between sea ice and ENSO events is examined. Based on these results, the forecasting regression equations of long-term variation trend of antarctic sea ice are established to predict the long-term forecasting of sea ice. (Auth.)

52-3355
Late Quaternary palaeoceanography of the North Atlantic margins.
Andrews, J.T., ed, Austin, W.E.N., ed, Bergsten, H., ed, Jennings, A.E., ed, Special publication, No.111, London, Geological Society, 1996, 376p., Refs. passim. For individual papers see 52-3356 through 52-3379.
Glaciation, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Ice rafting, Bottom sediment, Fossils, Drill core analysis, Stratigraphy, Geochronology, Global change, Paleoclimatology

52-3356
Late Quaternary palaeoceanography of North Atlantic margins: an introduction.
Andrews, J.T., Austin, W.E.N., Bergsten, H., Jennings, A.E., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.1-6, 65 refs.
Geological surveys, Marine geology, Glacial geology, Glaciation, Marine deposits, Bottom sediment, Glacial deposits, Quaternary deposits, Stratigraphy, Drill core analysis, Global change, Paleoclimatology

52-3357
Late glacial foraminifera.
Knudsen, K.L., Austin, W.E.N., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.7-10, 11 refs.
Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Fossils, Paleoecology, Paleoclimatology

52-3358
Abrupt changes in marine conditions, Sunneshine Fiord, eastern Baffin Island, NWT during the last deglacial transition: Younger Dryas and H-0 events.
Andrews, J.T., Osterman, L.E., Jennings, A.E., Syvitski, J.P.M., Miller, G.H., Weiner, N., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.11-27, Refs. p.24-27.
Glaciation, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Ice rafting, Drill core analysis, Seismic surveys, Stratigraphy, Geochronology, Global change, Paleoclimatology, Canada—Northwest Territories—Baffin Island

52-3359
Shelf erosion and glacial ice proximity in the Labrador Sea during and after Heinrich events (H-3 or 4 to H-0) as shown by foraminifera.
Jennings, A.E., Tedesco, K.A., Andrews, J.T., Kirby, M.E., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.29-49, 53 refs.
Glaciation, Glacial geology, Glacial erosion, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Ice rafting, Fossils, Stratigraphy, Geochronology, Global change, Paleoclimatology, Labrador Sea

52-3360
Palaeoceanographic information derived from acoustic surveys of glaciated continental margins: examples from eastern Canada.
Syvitski, J.P.M., Lewis, C.F.M., Piper, D.J.W., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.51-76, Refs. p.73-76.
Glaciation, Glacial geology, Glacial erosion, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Bottom topography, Ice rafting, Ice scoring, Seismic surveys, Geochronology, Paleoclimatology, Canada, Labrador Sea

52-3361
Deglaciation of the inner Scotian Shelf, Nova Scotia: correlation of terrestrial and marine glacial events.
Stea, R.R., Boyd, R., Costello, O., Fader, G.B.J., Scott, D.B., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.77-101, Refs. p.98-101.
Glaciation, Glacial geology, Glacial deposits, Moraines, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Bottom topography, Sea level, Seismic surveys, Stratigraphy, Geochronology, Paleoclimatology, Canada—Nova Scotia

52-3362
Rock (mineral)-magnetic properties of post-glacial (16-0.5 ka) sediments from the Emerald Basin (Scotian Shelf), Canada.
Hall, F.R., Reed, S.J., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.103-115, 37 refs.
Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Rock magnetism, Remanent magnetism, Drill core analysis, Lithology, Mineralogy, Soil dating, Geochronology, Paleoclimatology, Canada—Nova Scotia

52-3363
Deep-sea ostracode shell chemistry (Mg:Ca ratios) and late Quaternary Arctic Ocean history.
Cronin, T.M., Dwyer, G.S., Baker, P.A., Rodriguez-Lazaro, J., Briggs, W.M., Jr., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.117-134, 33 refs.
Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Fossils, Isotope analysis, Water temperature, Paleoclimatology

52-3364
Late Quaternary glacial history and short-term ice-rafted debris fluctuations along the East Greenland continental margin.
Stein, R., Nam, S.I., Grobe, H., Hubberten, H., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.135-151, 59 refs.
Glaciation, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Ice rafting, Sediment transport, Bottom sediment, Drill core analysis, Geochronology, Paleoclimatology, Greenland

52-3365
Late Quaternary sedimentation along a fjord to shelf (trough) transect, East Greenland (c.68° N).
Andrews, J.T., Jennings, A.E., Cooper, T., Williams, K.M., Mienert, J., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.153-166, 53 refs.
Glaciation, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Sediment transport, Drill core analysis, Geochronology, Paleoclimatology, Greenland

52-3366
North Atlantic sea surface conditions during the Younger Dryas cold event.
Duplessy, J.C., Labeyrie, L.D., Paterne, M., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.167-175, 48 refs.
Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Fossils, Drill core analysis, Isotope analysis, Water temperature, Salinity, Global change, Paleoclimatology

52-3367
Late glacial-Holocene sea surface temperatures and gradients between the North Atlantic and the Norwegian Sea: implications for the Nordic heat pump.
Koç, N., Jansen, E., Hald, M., Labeyrie, L., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.177-185, 51 refs.
Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Drill core analysis, Water temperature, Surface temperature, Ocean currents, Global change, Paleoclimatology

52-3368
Late glacial sedimentology, foraminifera and stable isotope stratigraphy of the Hebridean Continental Shelf, northwest Scotland.
Austin, W.E.N., Kroon, D., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.187-213, Refs. p.211-213.
Glaciation, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Fossils, Drill core analysis, Isotope analysis, Stratigraphy, Geochronology, Global change, Paleoclimatology, United Kingdom—Scotland

52-3369
Marine molluscan proxy data applied to Scottish late glacial and Flandrian sites: strengths and limitations.
Peacock, J.D., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.215-228, 44 refs.
Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Fossils, Water temperature, Salinity, Paleoclimatology, United Kingdom—Scotland

52-3370
Late glacial sea level and ocean margin environmental changes interpreted from biostratigraphic and lithostratigraphic studies of isolation basins in northwest Scotland.
Shennan, I., Rutherford, M.M., Innes, J.B., Walker, K.J., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.229-244, 35 refs.
Marine geology, Marine deposits, Lacustrine deposits, Quaternary deposits, Bottom sediment, Fossils, Sea level, Isostasy, Geochronology, Global change, Paleoclimatology, United Kingdom—Scotland

52-3371
Late Weichselian environmental changes of the southern Kattegat, Scandinavia, inferred from diatom records.
Jiang, H., Nordberg, K., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.245-260, 48 refs.
Glacial lakes, Lacustrine deposits, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Fossils, Salinity, Geochronology, Paleoclimatology, Kattegat Strait

52-3372
Sedimentological examination of the Late Weichselian sea-level history following deglaciation of northern Denmark.
Richardt, N., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.261-273, 30 refs.
Glaciation, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Sea level, Isostasy, Geochronology, Stratigraphy, Global change, Paleoclimatology, Denmark

52-3373
Palaeoceanography on the European arctic margin during the last deglaciation.
Hald, M., Dokken, T., Hagen, S., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.275-287, 57 refs.
Glaciation, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Fossils, Drill core analysis, Water temperature, Salinity, Geochronology, Paleoclimatology

52-3374
Deglaciation history and palaeoceanography of the western Spitsbergen margin since the last glacial maximum.
Lloyd, J.M., Kroon, D., Laban, C., Boulton, G.S., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.289-301, 40 refs.
Glaciation, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Ice rafting, Fossils, Drill core analysis, Geochronology, Global warming, Paleoclimatology, Norway—Spitsbergen

52-3375
Late glacial air temperature, oceanographic and ice sheet interactions in the southern Barents Sea region.
Vorren, T.O., Laberg, J.S., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.303-321, 58 refs.
Glaciation, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Ice rafting, Bottom sediment, Geochronology, Global change, Paleoclimatology, Barents Sea

52-3376
Post-glacial environments of the southeastern Barents Sea: foraminiferal evidence.
Poliak, L.V., Mikhailov, V., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.323-337, 61 refs.
Glaciation, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Fossils, Stratigraphy, Geochronology, Global warming, Paleoclimatology, Barents Sea

52-3377
Late Weichselian deglaciation of the Barents Sea and low salinity events in the Norwegian Sea.
Punkari, M., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.339-349, 42 refs.
Glaciation, Glacial lakes, Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Meltwater, Salinity, Geochronology, Global warming, Paleoclimatology, Barents Sea, Norwegian Sea

52-3378
Palynology as a tool for land-sea correlation; an example from the eastern Mediterranean region.
Zonneveld, K.A.F., Boessenkool, K.P., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.351-357, 21 refs.
Marine geology, Marine deposits, Quaternary deposits, Bottom sediment, Palynology, Paleobotany, Drill core analysis, Geochronology, Paleoclimatology, Adriatic Sea

52-3379
Earth rotation, ocean circulation and palaeoclimate: the North Atlantic-European example.
Mörner, N.A., Late Quaternary palaeoceanography of the North Atlantic margins. Special publication, No.111. Edited by J.T. Andrews, W.E.N. Austin, H. Bergsten and A.E. Jennings, London, Geological Society, 1996, p.359-370, 39 refs.
Ice age theory, Atmospheric circulation, Ocean currents, Sea level, Global change, Paleoclimatology

52-3380
Cirque glaciers as morphological evidence for a thin Younger Dryas ice sheet in east-central southern Norway.
Dahl, S.O., Nesje, A., Øvstedal, J., *Boreas,* Sep. 1997, 26(3), p.161-180, Refs. p.178-180.
Pleistocene, Paleoclimatology, Glacial geology, Ice sheets, Glaciation, Glacier ablation, Ice edge, Cirque glaciers, Altitude, Moraines, Quaternary deposits, Norway

52-3381
Late Weichselian ostracod assemblages from the southern Kattegat, Scandinavia: a palaeoenvironmental study.
Majoran, S., Nordberg, K., *Boreas,* Sep. 1997, 26(3), p.181-200, 52 refs.
Pleistocene, Paleoecology, Paleoclimatology, Ocean currents, Quaternary deposits, Marine deposits, Glacial lakes, Meltwater, Surface drainage, Sediment transport, Drill core analysis, Radioactive age determination, Kattegat Strait

52-3382
Dynamic sea-level change during the last deglaciation of northern Iceland.
Rundgren, M., Ingólfsson, O., Björck, S., Jiang, H., Haflidason, H., *Boreas,* Sep. 1997, 26(3), p.201-215, 53 refs.
Pleistocene, Sea level, Glacial geology, Isostasy, Lacustrine deposits, Paleoecology, Lithology, Stratigraphy, Sedimentation, Drill core analysis, Radioactive age determination, Iceland

52-3383
Baltic Ice Lake in the southwestern Baltic: sequence-, chrono- and biostratigraphy.
Jensen, J.B., Bennike, O., Witkowski, A., Lemke, W., Kuijpers, A., *Boreas,* Sep. 1997, 26(3), p.217-236, 66 refs.
Pleistocene, Glacial lakes, Geomorphology, Water level, Shoreline modification, Lacustrine deposits, Marine deposits, Stratigraphy, Lithology, Seismic reflection, Paleoecology, Baltic Sea

52-3384
Pleistocene stratigraphy in the Dellen region, central Sweden.
Robertsson, A.M., Svedlund, J.O., Andrén, T., Sundh, M., *Boreas,* Sep. 1997, 26(3), p.237-260, Refs. p.258-260.
Pleistocene, Quaternary deposits, Paleoecology, Palynology, Glacial geology, Glacial deposits, Drill core analysis, Seismic refraction, Stratigraphy, Lithology, Radioactive age determination, Sweden—Dellen

52-3385
Pre-Younger Dryas resurgence of the southwestern margin of the Cordilleran ice sheet, British Columbia, Canada.
Clague, J.J., Mathewes, R.W., Guilbault, J.P., Hutchinson, I., Ricketts, B.D., *Boreas,* Sep. 1997, 26(3), p.261-278, 76 refs.
Pleistocene, Ice sheets, Glacier oscillation, Ice edge, Glacial geology, Glacial deposits, Paleoecology, Vegetation patterns, Stratigraphy, Radioactive age determination, Geochronology, Theories, Canada—British Columbia—Fraser Lowland

52-3386
Late Devensian Lateglacial palaeoenvironmental record from Whitrig Bog, SE Scotland. 1. Lithostratigraphy, geochemistry and palaeobotany.
Mayle, F.E., Lowe, J.J., Sheldrick, C., *Boreas,* Dec. 1997, 26(4), p.279-295, 42 refs.
Pleistocene, Swamps, Paleoecology, Quaternary deposits, Lithology, Stratigraphy, Sedimentation, Geochemistry, Ecosystems, Vegetation patterns, Statistical analysis, United Kingdom—Scotland

52-3387
Late Devensian Lateglacial palaeoenvironmental record from Whitrig Bog, SE Scotland. 2. Chironomidae (Insecta: Diptera).
Brooks, S.J., Lowe, J.J., Mayle, F.E., *Boreas,* Dec. 1997, 26(4), p.297-308, 56 refs.
Pleistocene, Paleoclimatology, Climatic changes, Swamps, Paleoecology, Paleobotany, Quaternary deposits, Stratigraphy, Temperature effects, Statistical analysis, United Kingdom—Scotland

52-3388
Seismic facies and architecture of ice-contact submarine fans in high-relief fjords, Troms, northern Norway.
Lysså, A., Vorren, T.O., *Boreas,* Dec. 1997, 26(4), p.309-328, 42 refs.
Pleistocene, Glacial geology, Marine geology, Moraines, Ice edge, Bottom sediment, Seismic reflection, Profiles, Mapping, Structural analysis, Norway—Troms

52-3389

Postglacial relative sea-level history: sediment and diatom records of emerged coastal lakes, north-central Kola Peninsula, Russia.

Snyder, J.A., Forman, S.L., Mode, W.N., Tarasov, G.A., *Boreas,* Dec. 1997, 26(4), p.329-346, Refs. p.344-346.

Sea level, Lacustrine deposits, Quaternary deposits, Shoreline modification, Glacier oscillation, Drill core analysis, Paleoecology, Stratigraphy, Lithology, Radioactive age determination, Geochronology, Russia—Kola Peninsula

52-3390

New middle Holocene varve diagram from the river Ångermanälven, northern Sweden: indications for a possible error in the Holocene varve chronology.

Wohlfarth, B., Björck, S., Cato, I., Possnert, G., *Boreas,* Dec. 1997, 26(4), p.347-353, 29 refs.

Geochronology, Paleoecology, Quaternary deposits, Rivers, Sediments, Sedimentation, Radioactive age determination, Accuracy, Sweden

52-3391

Development of the arctic radionuclide monitoring station.

King, S.E., Aakenes, U.R., McCoy, K., Phillips, G.W., *IEEE transactions on nuclear science,* June 1997, 44(3)pt.1, p.777-782, 8 refs.

Oceanography, Radioactivity, Sea water, Environmental tests, Sampling, Monitors, Gamma irradiation, Drift stations, Subsurface investigations, Design criteria, Sensors, Scintillation, Telemetering equipment, Russia, Arctic Ocean

52-3392

Comparison of AVHRR-derived and in situ surface albedo over the Greenland ice sheet.

Stroeve, J., Nolin, A.W., Steffen, K., *Remote sensing of environment,* Dec. 1997, 62(3), p.262-276, 33 refs.

Remote sensing, Ice sheets, Radiometry, Spacecraft, Albedo, Radiance, Anisotropy, Wet snow, Seasonal variations, Snow optics, Models, Image processing, Greenland

52-3393

Characteristics of ice slurry containing antifreeze protein for ice storage applications.

Grandum, S., Yabe, A., Tanaka, M., Takemura, F., Nakagomi, K., *Journal of thermophysics and heat transfer,* July-Sep. 1997, 11(3), p.461-466, 13 refs.

Heat pumps, Refrigeration, Ice physics, Slush, Polymers, Antifreezes, Viscous flow, Ice prevention, Phase transformations, Enthalpy, Temperature measurement

52-3394

Dirty ice grains in the protoplanetary nebula.

Podolak, M., Mekler, Y., *Planetary and space science,* Nov. 1997, 45(11), p.1401-1406, 9 refs.

Extraterrestrial ice, Cosmic dust, Ice composition, Temperature effects, Ice growth, Grain size, Particle size distribution, Radiation absorption, Ice crystal optics, Mathematical models, Refractivity

52-3395

Surface-induced ferroelectric ice on Pt(111).

Su, X.C., Lianos, L., Shen, Y.R., Somorjai, G.A., *Physical review letters,* Feb. 16, 1998, 80(7), p.1533-1536, 19 refs.

Ice physics, Ice electrical properties, Adsorption, Ice solid interface, Water films, Ice spectroscopy, Water structure, Molecular structure, Hydrogen bonds, Polarization (charge separation), Spectra, Resonance

52-3396

Freeze-thaw cycles increase near-surface aggregate stability.

Lehrsch, G.A., *Soil science,* Jan. 1998, 163(1), p.63-70, 27 refs.

Soil mechanics, Soil freezing, Soil aggregates, Clay soils, Freeze thaw cycles, Stability, Cohesion, Freeze thaw tests, Moisture, Statistical analysis

52-3397

Upper Laacher See tephra in Lake Geneva sediments: paleoenvironmental and paleoclimatological implications.

Moscariello, A., Costa, F., *Schweizerische Mineralogische und Petographische Mitteilungen,* 1997, 77(2), p.175-185, 55 refs.

Paleoclimatology, Climatic changes, Paleoecology, Aerosols, Volcanic ash, Lacustrine deposits, Stratigraphy, Sedimentation, Geochemistry, Mineralogy, Correlation, Switzerland—Geneva, Lake

52-3398

Traffic-induced building vibrations in Montréal.

Hunaidi, O., Tremblay, M., *Canadian journal of civil engineering.* Oct. 1997, 24(5), p.736-753, With French summary. 37 refs.

Municipal engineering, Buildings, Static stability, Vehicles, Dynamic loads, Vibration, Wave propagation, Frozen ground mechanics, Tensile properties, Damping, Mechanical tests, Canada—Quebec—Montreal

52-3399

Calculation of the periodic temperature field in a concrete dam.

Daoud, M., Galanis, N., Ballivy, G., *Canadian journal of civil engineering,* Oct. 1997, 24(5), p.772-784, With French summary. 22 refs.

Reservoirs, Dams, Foundations, Temperature gradients, Thermal conductivity, Heat transfer, Frost penetration, Snow cover effect, Water temperature, Ice cover thickness, Snow cover effect, Mathematical models

52-3400

Biochemogenic formation of phyllosilicates during hydrothermal alteration of basalts in Iceland.

Geptner, A.R., Petrova, V.V., Sokolova, A.L., Gor'kova, N.V., *Lithology and mineral resources,* May-June 1997, 32(3), p.216-225, Translated from Litologiia i poleznye iskopaemye. 11 refs.

Geologic processes, Subpolar regions, Hydrothermal processes, Ground water, Magma, Clay minerals, Microbiology, Mineralogy, Scanning electron microscopy, Lithology, Iceland

52-3401

Threshold temperature of the carbon balance of the southern tundra.

Zamolodchikov, D.G., Karelin, D.V., Ivashchenko, A.I., *Doklady biological sciences,* Jan.-Feb. 1998, Vol.358, p.89-90, Translated from Doklady Akademii nauk. 15 refs.

Climatology, Global warming, Tundra soils, Ecosystems, Carbon dioxide, Geochemical cycles, Soil temperature, Soil air interface, Vapor transfer, Temperature measurement, Temperature effects, Russia—Khal'mer-Yu, Russia—Tal'nik

52-3402

Memorable snowstorm in Lancaster.

Bowker, D., *Weather,* Feb. 1998, 53(2), p.54-56.

Snowstorms, Weather observations, Atmospheric boundary layer, Fronts (meteorology), United Kingdom—England

52-3403

Growth of ice particles.

Saunders, R.F., Brown, P.R.A., *Weather,* Feb. 1998, 53(2), p.57-59, 2 refs. Includes reply.

Cloud physics, Supercooled fog, Ice crystal growth, Ice crystal structure, Hoarfrost, Ice needles, Wind factors, Ice vapor interface, Weather observations

52-3404

Combined differential scanning calorimeter-optical video microscope for crystallization studies.

Hey, J.M., Mehl, P.M., MacFarlane, D.R., *Journal of thermal analysis,* 1997, 49(2), International Congress on Thermal Analysis and Calorimetry, 11th, Philadelphia, PA. Proceedings. Edited by M.Y. Keating, p.991-998, 8 refs.

Measuring instruments, Scanning electron microscopy, Imaging, Temperature measurement, Solutions, Ice crystal optics, Ice crystal growth, Performance, Design

52-3405

Climatic change and forest fire potential in Russian and Canadian boreal forests.

Stocks, B.J., et al, *Climate change,* Jan. 1998, 38(1), p.1-13, 35 refs.

Climatology, Global warming, Forest fires, Air temperature, Meteorological data, Statistical analysis, Forecasting, Models, Environmental impact, Canada, Russia

52-3406

Physical, chemical and biological features of a cyclonic eddy in the region of 61°10'N 19°50'W in the North Atlantic.

Harris, R.P., Boyd, P., Harbour, D.S., Head, R.N., Pingree, R.D., Pomroy, A.J., *Deep-sea research I,* Nov. 1997, 44(11), p.1815-1839, 51 refs.

Oceanography, Oceanographic surveys, Ocean currents, Marine biology, Subpolar regions, Hydrography, Biomass, Sampling, Water chemistry, Seasonal variations, Atlantic Ocean

52-3407

Particle fluxes, benthic processes and the palaeoenvironmental record in the northern Weddell Sea.

Pudsey, C.J., King, P., *Deep-sea research I,* Nov. 1997, 44(11), p.1841-1876, Refs. p.1873-1876.

Oceanography, Ocean bottom, Ocean currents, Suspended sediments, Sedimentation, Quaternary deposits, Stratification, Biomass, Paleoecology, Sampling, Antarctica—Weddell Sea

At the northern edge of the Weddell Gyre, fine-grained sediments accumulate beneath eastward-flowing Weddell Sea Bottom Water. This paper presents data on sediment trap material and core tops from four sites, with relevant water-column data. In this cold, low-productivity oceanographic setting it is the processes in the benthic nepheloid layer and in the upper few cm of sediment that dominate the palaeoenvironmental record. Biogenic productivity is low and seasonal because of sea-ice cover; terrigenous sediment is supplied by resuspension of Weddell Sea slope and rise sediments and by ice-rafting. AMS ^{14}C dates on organic carbon in sediment traps are 965±50 and 1895±55 radiocarbon years, reflecting the high reservoir age of southern ocean surface waters. Core top ages of particulate organic carbon are 10,500 and 13,000 years B.P. Cores from this area contain a textural record of Weddell Sea Bottom Water flow, but only fragmentary data on palaeo-surface conditions. (Auth. mod.)

52-3408

Nitrogen and oxygen guest molecules in clathrate hydrates: different sites revealed by Raman spectroscopy.

Champagnon, B., Panczer, G., Chazallon, B., Arnaud, L., Duval, P., Lipenkov, V., *Journal of Raman spectroscopy,* Sep. 1997, 28(9), p.711-715, 12 refs.

Ice cores, Ice composition, Chemical analysis, Spectroscopy, Antarctica—Vostok Station

N_2 and O_2 hydrates (clathrates) from a polar ice core (Vostok) were analyzed by high-sensitivity Raman microspectrometry. Three new lines in the region of the stretching modes of N_2 and O_2 guest molecules were observed and were interpreted by considering both small (5^{12}) and large ($5^{12}6^4$) cages in type II clathrates, isotopic effects and the possibility by double occupancy of the large cages. The isotopic effect for N_2 and O_2 guest molecules in clathrates is demonstrated. (Auth.)

52-3409

Accuracy and conservation characteristics of the numerical algorithm in Environment Canada's ONE-D model.

Hicks, F., *Canadian journal of civil engineering,* Aug. 1997, 24(4), p.560-569, With French summary. 12 refs.

Hydrodynamics, Channels (waterways), River flow, Unsteady flow, River ice, Wave propagation, Ice jams, Ice breakup, Mathematical models, Accuracy, Statistical analysis

52-3410

Modelling thermal breakup on the Mackenzie River at the outlet of Great Slave Lake, N.W.T.

Hicks, F., Cui, W., Andres, D., *Canadian journal of civil engineering,* Aug. 1997, 24(4), p.570-585, With French summary. 13 refs.

River ice, Ice breakup, Lake water, Ice water interface, Ice melting, Ice deterioration, Meteorological factors, Forecasting, Mathematical models, Heat transfer coefficient, Heat balance, Canada—Northwest Territories—Mackenzie River, Canada—Northwest Territories—Great Slave Lake

52-3411

Analysis of the icing of test cables.

Druez, J., McComber, P., *Canadian journal of civil engineering,* Aug. 1997, 24(4), p.637-648, With French summary. 9 refs.

Power line icing, Simulation, Mountains, Ice accretion, Classifications, Icing rate, Ice loads, Hoarfrost, Glaze, Meteorological factors, Statistical analysis, Design criteria

52-3412

Thermal damage of mass concrete: experimental and numerical studies on the effect of external temperature variations.

Bouzoubaâ, N., Lachemi, M., Miao, B., Aïtcin, P.C., *Canadian journal of civil engineering,* Aug. 1997, 24(4), p.649-657, With French summary. 11 refs.

Concrete durability, Concrete slabs, Dams, Damage, Thermal conductivity, Tensile properties, Air temperature, Seasonal variations, Frost penetration, Temperature effects, Simulation, Mathematical models

52-3413

High pressure study of ices VII and VIII using synchrotron X-ray diffraction.

Wolanin, E., et al, International Conference on High Pressure Science & Technology, 15th, Warsaw, Poland, Sep. 11-15, 1995. Proceedings. Edited by W.A. Trzeciakowski, Singapore, World Scientific Publishing Co. Pte. Ltd., 1996, p.366-368, 12 refs.

DLC QC280.I57 1995

Ice physics, Molecular structure, Protons, High pressure ice, High pressure tests, X ray diffraction, Phase transformations

52-3414

Neutron spectroscopy of ice III.

Natkaniec, I., Smirnov, L.S., Kolesnikov, A.I., Ivanov, A.N., International Conference on High Pressure Science & Technology, 15th, Warsaw, Poland, Sep. 11-15, 1995. Proceedings. Edited by W.A. Trzeciakowski, Singapore, World Scientific Publishing Co. Pte. Ltd., 1996, p.369-371, 6 refs.

DLC QC280.I57 1995

Ice physics, High pressure ice, Molecular structure, Ice crystal structure, Neutron scattering, High pressure tests, Vibration, Spectra, Phase transformations

52-3415

Water balance model for a subarctic sedge fen and its application to climatic change.

Rouse, W.R., *Climatic change,* Feb. 1998, 38(2), p.207-234, 39 refs.

Climatology, Global warming, Subarctic landscapes, Wetlands, Water balance, Snow depth, Heat flux, Evaporation, Runoff, Seasonal variations, Mathematical models, Canada—Hudson Bay

52-3416

Orbital forcing and endogenous nonlinearity in the Pleistocene: the Greenland ice core.

Richards, G.R., *Climatic change,* Feb. 1998, 38(2), p.235-246, 21 refs.

Pleistocene, Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Oxygen isotopes, Isotope analysis, Insolation, Periodic variations, Spectra, Statistical analysis, Mathematical models, Greenland

52-3417

Frost damage and recovery of Scots pine seedlings at the end of the growing season.

Ryyppö, A., Sutinen, S., Mäenpää, M., Vapaavuori, E., Repo, T., *Canadian journal of forest research,* Sep. 1997, 27(9), p.1376-1382, With French summary. 34 refs.

Plant physiology, Trees (plants), Plant tissues, Frost resistance, Chemical composition, Microstructure, Freezing, Damage, Growth, Temperature effects, Statistical analysis, Low temperature tests

52-3418

Freezing point depression of soil water as a function of mineral composition and physical properties.

Kozłowski, T., *Archives of hydro-engineering and environmental mechanics,* 1994, 41(3-4), p.25-36, 20 refs.

Frozen ground mechanics, Frozen ground thermodynamics, Soil freezing, Soil water, Freezing points, Clay soils, Temperature variations, Unfrozen water content, Physical properties, Forecasting, Analysis (mathematics)

52-3419

Experience in the construction and operation of drainless tailings ponds under conditions of the far north.

Dolgikh, S.N., Maul', V.K., *Hydrotechnical construction,* July 1997 (Pub. Jan. 98), 31(7), p.405-408, Translated from Gidrotekhnicheskoe stroitel'stvo. 3 refs.

Mining, Engineering geology, Permafrost preservation, Waste disposal, Water treatment, Water pipelines, Earth dams, Artificial freezing, Hydraulics, Environmental protection, Cold weather operation, Russia—Yakutia

52-3420

Experience in operating the Sayano-Shushenskoe and Maina hydroelectric stations in winter.

Sulimova, L.I., *Hydrotechnical construction,* July 1997 (Pub. Jan. 98), 31(7), p.417-419, Translated from Gidrotekhnicheskoe stroitel'stvo.

Electric power, Reservoirs, Water level, Ice formation, Ice jams, Flooding, Design, Water temperature, Seasonal variations, Russia—Yenisey River

52-3421

Substantiation of the design of fixed structures on the arctic shelf.

Bellendir, E.N., Glagovskiĭ, V.B., Krivonogova, N.F., Sapegin, D.D., *Hydrotechnical construction,* July 1997 (Pub. Jan. 98), 31(7), p.428-432, Translated from Gidrotekhnichskoe stroitel'stvo. 13 refs.

Engineering geology, Offshore structures, Ocean bottom, Foundations, Bearing strength, Ice floes, Loads (forces), Protection, Design criteria, Arctic Ocean

52-3422

Remote sounding of multilayer cirrus cloud systems using AVHRR data collected during FIRE-II-IFO.

Ou, S.C., Liou, K.N., Caudill, T.R., *Journal of applied meteorology,* Mar. 1998, 37(3), p.241-254, 16 refs.

Cloud physics, Sounding, Spacecraft, Radiometry, Cloud cover, Optical properties, Air temperature, Ice crystal optics, Ice crystal size, Radiance, Upwelling, Models

52-3423

Primer on hydraulics of ice covered rivers.

Davar, K.S., ed, Beltaos, S., ed, Pratte, B., ed, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, 191p., Refs. passim. For individual papers see 51-2063 and 52-3424 through 52-3432.

River ice, Ice breakup, Ice jams, Ice cover strength, Ice forecasting, Ice control, River flow, Flood control

52-3424

Introduction.

Davar, K.S., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.1-11, 12 refs.

River ice, Ice formation, Ice growth, Ice conditions, Ice breakup, Ice jams, Ice control, Flood control

52-3425

River ice processes.

Prowse, T.D., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.12-37, 38 refs.

River ice, Ice formation, Freezeup, Ice heat flux, Ice growth, Ice deterioration, Ice breakup, Mathematical models

52-3426

Conveying capacity of ice covered channels.

Davar, K.S., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.38-55, 12 refs.

Channels (waterways), River ice, Ice water interface, Ice cover effect, River flow, Hydraulics, Mathematical models

52-3427

Breakup, ice jams and related flooding.

Beltaos, S., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.56-78, 22 refs.

River ice, Ice breakup, Ice jams, Ice forecasting, Ice water interface, River flow, Flood forecasting, Mathematical models

52-3428

Numerical modelling.

Petryk, S., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.79-102, 14 refs.

River ice, Ice conditions, Ice cover effect, Ice water interface, River flow, Hydraulics, Hydraulic structures, Flow control, Ice control, Mathematical models, Computer programs

52-3429

Control and mitigative measures.

Hodgins, D.B., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.130-157, 33 refs.

River ice, Ice jams, Ice prevention, Ice control, Ice booms, Bubbling, Flood control

52-3430

Field measurements and instrumentation.

Acres International Limited. Hydraulics Department, Niagara Falls, Ontario, Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.158-176, 8 refs.

River ice, Ice surveys, Ice conditions, Ice cover strength, Ice forecasting

52-3431

Future directions.

Davar, K.S., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.177-180.

River ice, Ice control, Research projects, Education

52-3432

Limitations of ice jam stability theories.

Beltaos, S., Primer on hydraulics of ice covered rivers. Edited by K.S. Davar, S. Beltaos and B. Pratte, Ottawa, Environment Canada, Environmental Citizenship (Écosivisme), 1996, p.181-191, 4 refs.

River ice, Ice jams, Ice cover strength, Ice forecasting, Mathematical models

52-3433

Plugs and plug circles: a basic form of patterned ground, Cornwallis Island, Arctic Canada—origin and implications.

Washburn, A.L., *Geological Society of America. Memoir,* 1997, No.190, 87p., Refs. p.78-83.

DLC GB648.15.W37 1997

Patterned ground, Soil surveys, Permafrost surveys, Soil structure, Frost action, Frost heave, Cryoturbation, Sorting, Frost weathering, Permafrost weathering, Permafrost indicators, Canada—Northwest Territories—Cornwallis Island

52-3434

Analysis of thermal imagery collected at Yuma 1, Yuma, Arizona.

Rivera, S., Jr., MP 5113, *U.S. Army Cold Regions Research and Engineering Laboratory. Smart Weapons Operability Enhancement Joint Test and Evaluation Program Office. SWOE report,* Aug. 1994, No.94-12, 89p. + appends., ADA-286 829, 8 refs.

Infrared reconnaissance, Infrared photography, Terrain identification, Environment simulation, Image processing, Military operation, Military research, United States—Arizona

The purpose of the Smart Weapons Operability Enhancement (SWOE) Joint Test and Evaluation Program is to validate the SWOE synthetic scene generation procedure. Once validated, this procedure will hopefully change the design-test-redesign approach to smart weapons development, test, and evaluation. Using the SWOE process, smart weapons designers will be able to evaluate their sensor algorithms on simulated scenes with a greater degree of variability than is often presented during the test phase of the design process. The SWOE process will also allow for the smart weapons design to be evaluated for different environments without the need for expensive and time-consuming data collection exercises. This report is an analysis of thermal data collected by the U.S. Army Engineer Waterways Experiment Station during the Yuma 1 field program exercise Mar. 15-Apr. 30, 1993. The report aids in understanding variations in terrain features' infrared signatures using image metrics and presents the data in a format that could be used for synthetic scene validation tasks. The report also describes in graphical format the meteorological and terrain data at the time the infrared imagery data were collected.

52-3435

Frozen horizons: the world's largest national park.

Silis, I., Nuuk, Greenland, Atuakkiorfik A/S, 1995, 184p.

Regional planning, Research projects, Environmental protection, Greenland

52-3436

Subglacial ice growth, basal accretion, and debris entrainment at the Matanuska Glacier, Alaska.

Strasser, J.C., MP 5114, Bethlehem, PA, Lehigh University, 1996, 137p., Universtiy Microfilms order No.9629382, Ph.D. thesis. Refs. passim. D.E. Lawson and S.A. Arcone of the U.S. Army Cold Regions Research and Engineering Laboratory, were among the coauthors of papers included as separate chapters.

Glacial hydrology, Subglacial drainage, Glacier beds, Glacier alimentation, Glacier ice, Ice growth, Ice accretion, Regelation, Glacial till, Moraines, Sediment transport, United States—Alaska—Matanuska Glacier

52-3437

Pole positions: the polar regions and the future of the planet.

Snowman, D., London, Hodder & Stoughton, 1993, 192p.

Research projects, Regional planning, Global change, Human factors, Environmental impact, Environmental protection, International cooperation

This book is a personal account of the author's visits to the Arctic and Antarctica, his impressions of the land, his interviews with scientists doing research there, and his plea for international cooperation to preserve the environments of both polar regions, as the engines which drive the global climate system and the places where global changes first occur and are most magnified, and for the benefit and even survival of future generations.

52-3438

Evaluation of commercial enzyme imunoassays for the field screening of TNT and RDX in water.

Thorne, P.G., Myers, K.F., SR 97-32, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Dec. 1997, 15p., ADA-334 972, 14 refs.

Military facilities, Wells, Ground water, Soil pollution, Water pollution, Explosives, Water chemistry, Chemical analysis

Water samples from 44 monitoring wells at three military installations were analyzed for the high explosives TNT and RDX using immunoassay test kits. The accuracy and precision of the kit determinations were compared with results obtained using the RP-HPLC, EPA method 8330. Most of the kits achieved a ±50% relative percent difference criterion over 85% of the time. One of the kits failed this test over half the time. Careful consideration must be given to interferences that may be present and unique for each application.

52-3439

Frost-susceptibility testing and predictions for the Raymark Superfund site.

Janoo, V.C., Barna, L.A., Orchino, S.A., SR 97-31, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Dec. 1997, 16p., ADA-334 935, 8 refs.

Soil pollution, Waste disposal, Earth fills, Land reclamation, Pavements, Subgrade soils, Frost resistance, Frost heave, Freeze thaw tests, Computerized simulation, United States—Connecticut

This project was conducted to assist in predicting the effects of freeze-thaw cycling on Tilcon common granular fill during the freezing season. This material is being used as the subbase material in the proposed pavement structure at the Raymark Superfund site in Stratford, CT. Based on the initial laboratory results of the Tilcon material performed at CRREL, the amount of fines passing the no.200 sieve was found to be in the vicinity of 20%, of which approximately 14% was finer than 0.02 m. Results from the frost heave tests indicate that when the Tilcon material is saturated, based on the rate of heave, the material is classified a high to very high frost-susceptible material. In the saturated condition, the material is classified as a low to medium frost-susceptible material. Computer simulations were run to predict the amount of frost heave and frost penetration that may be expected on this site during the freezing season. Results from the laboratory frost-susceptibility tests and computer simulations were then used to estimate the amount of cumulative damage to the pavement structure during its design life.

52-3440

Composite sampling of sediments contaminated with white phosphorous.

Walsh, M.E., Collins, C.M., Bailey, R.N., Grant, C.L., SR 97-30, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Dec. 1997, 19p., ADA-335 137, 25 refs.

Soil pollution, Water pollution, Explosives, Waste disposal, Land reclamation, Soil tests, Soil chemistry, Chemical analysis, Wetlands, Military facilities, United States—Alaska—Fort Richardson

White phosphorus from exploded munitions is a difficult contaminant to characterize in the environment. Spatial heterogeneity of concentration estimates is extreme, varying over many orders of magnitude for closely spaced discrete samples. To provide cost-effective data upon which decisions may be made, two composite sampling methods were designed to aid in characterizing the site and monitoring the remedial process for an area contaminated by white phosphorus. For each method, closely spaced discrete samples were collected on a grid pattern and pooled to form composites. The composites were then divided by size fractions. Mean white phosphorus concentrations were estimated for the fine-grain-size fraction that was obtained by suspension with water. The presence of highly toxic solid white phosphorus particles, the form that may be ingested by feeding waterfowl, was determined in the coarse-grain-size fraction that was obtained by sieving.

52-3441

Frost resistance of cover and liner materials for landfills and hazardous waste sites.

Chamberlain, E.J., Erickson, A.E., Benson, C.H., SR 97-29, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Dec. 1997, 23p., ADA-335 133, 13 refs.

Waste disposal, Earth fills, Clay soils, Permeability, Seepage, Waterproofing, Soil stabilization, Linings, Geotextiles, Frost resistance, Frost protection, Freeze thaw tests, Cost analysis

The common method of preventing the contamination of groundwater by landfills and hazardous waste is to encapsulate the waste material in a compacted clay liner and cover system. The frost resistance of compacted clay in landfills has been the subject of controversy for many years. Laboratory studies have frequently shown that freezing and thawing significantly increase the hydraulic conductivity of compacted clay soils. However, there has not been any corroborating field evidence. This study more closely examines this problem, and identifies cover and liner materials that would be frost resistant to increase construction productivity and save costs. The effects of freezing and thawing on the hydraulic conductivity of two compacted natural clay soils, one compacted sand-bentonite mixture, and three geosynthetic clay liners (GCLs) were examined. Both field and laboratory tests were performed on these materials. Results showed that freeze-thaw caused large increases (greater than 1000x) in hydraulic conductivity in compacted natural clay, but little measurable change in hydraulic conductivity of the GCLs or the sand-bentonite mixture. GCLs and sand-bentonite mixtures are suitable frost resistant substitutes for compacted clay soils. Considerable cost savings can result if compacted clay soils are replaced with GCLs or sand-bentonite mixtures.

52-3442

Local variation in winter morning air temperature.

Hogan, A.W., Ferrick, M.G., CR 97-09, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Dec. 1997, 37p., ADA-335 124, 44 refs.

Air temperature, Temperature inversions, Snow air interface, Snow cover effect, Weather forecasting, Frost forecasting, Statistical analysis, United States—New Hampshire

Results of temperature measurements, which may be applied to inference of winter temperatures in data-sparse areas, are presented. The morning air temperatures during three winters were measured at 80 places in a 10x30 km area along the Connecticut River. NOAA climatologies show this region to have complex spatial variation in mean minimum temperature. Frequency analysis techniques were applied to evaluate the differences in daily local temperature. Temperature lapse or temperature inversion in the study area was inferred from the difference of surface temperature measurements 100 and 300 m above river level. The frequency of inferred temperature lapse and the inferred lapse rate diminished as snow cover increased. The frequency of inferred temperature inversion and inversion strength increased as snow cover increased. When more than 20 cm of snow covered the ground, an additional surface inversion was frequent in the layer less than 100 m above river level, and two-thirds of river level temperatures less than -20°C occurred concurrent with these conditions. It is proposed that some meteorologically prudent inferences of surface temperature and near-surface temperature lapse or temperature inversion can be made for similar data-sparse areas.

52-3443

Projecting ice-affected streamflow by extended Kalman filtering.

Holtschlag, D.J., Parker, C.T., Grewal, M.S., CR 97-08, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Dec. 1997, 40p., ADA-335 228, 10 refs.

River ice, Ice jams, Ice cover effect, Ice water interface, River flow, Stream flow, Flood forecasting, Statistical analysis, Mathematical models

An extended Kalman filter was developed to automate the real-time projection of ice-affected streamflow, based on routine measurements of stage and air temperature and the relation between stage and flow during open-water conditions. The form accommodates three dynamic modes of ice effects: sudden formation-ablation, stable ice conditions, and final elimination. The filter was applied to historical data from two long-term streamflow-gaging stations. They were stable and parameters converged for both stations, producing estimates that were highly correlated with and linearly related to published streamflow values in a log-transformed metric. At St. John River at Dickey, ME, logarithms of projected streamflow values were within 8% of the logarithms of published values 87.2% of the time and within 15% of published values 96.6% of the time during periods of ice effects. At Platte River at North Bend, NE, logarithms of projected streamflow values were within 8% of the logarithms of published daily values 90.7% of the time and within 15%, 97.7% of the time during ice-affected conditions. This extended Kalman filter allows estimation of ice-affected streamflow at other gaging stations by adjusting filter parameters to site-specific conditions.

52-3444

Unsteady ice jam processes.

Zufelt, J.E., Ettema, R., CR 97-07, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Dec. 1997, 87p., ADA-334 991, 27 refs.

River ice, Ice jams, Freezeup, Ice breakup, Ice cover thickness, Ice mechanics, Ice loads, Ice cover effect, Ice water interface, River flow, Ice forecasting, Flood forecasting, Mathematical models

Ice jams cause flooding in northern temperate-climate areas, usually forming rapidly, often with little warning, constricting water flow and elevating water levels. Consequently, jam formation comprises highly unsteady processes: drifting ice pieces are brought to rest, accumulated ice shoves and thickens, and initial water depths and velocities change. Those processes are even more unsteady when a jam collapses. Prior simulations of ice jams, however, treat them as simply stationary, uniformly thick accumulations of ice pieces. No account is taken of the impact forces exerted by moving ice, an estimation that is further complicated by the need to couple equations describing water flow and ice movement. Under the dynamic conditions attendant to jam formation, water flow and ice movement interactively influence each other. This report evaluates the importance of ice momentum on ice jam thickness and thickness distribution using experiments conducted with laboratory flumes and a numerical model in which the equations of motion for one-dimensional flow of water and ice are solved as fully coupled. In this regard, the model is unique, enabling simulation of the important unsteady interactions of water and ice, and determination of their effects on jam thickness. Ice momentum should be taken into account for most jams because it leads to significantly thicker jams and affects the thickness profile. A useful dimensionless parameter is identified for generalizing this finding.

52-3445
Automated tracer dispersal system for snow accumulation and saltation transport investigations.
Braaten, D.A., Ratzlaff, K.L., *Review of scientific instruments,* Feb. 1998, 69(2), p.572-577, 18 refs.
Meteorological instruments, Snow physics, Snow stratigraphy, Electronic equipment, Computer applications, Snow accumulation, Snow depth, Snow stratigraphy, Blowing snow, Sampling, Design

52-3446
Effects of climate change on the freshwaters of arctic and subarctic North America.
Rouse, W.R., et al, *Hydrological processes,* June 30, 1997, 11(8), Symposium on Regional Assessment of Freshwater Ecosystems and Climate Change in North America, Oct. 24-26, 1994, Leesburg, VA. Selected papers. Edited by M.G. Anderson et al, p.873-902, Refs. 897-902.
Limnology, Climatology, Hydrology, Global warming, Ecosystems, Tundra terrain, Subarctic landscapes, Arctic landscapes, Permafrost transformation, Temperature effects, Nutrient cycle, Environmental impact, North America

52-3447
Assessment of climate change and freshwater ecosystems of the Rocky Mountains, USA and Canada.
Hauer, F.R., et al, *Hydrological processes,* June 30, 1997, 11(8), Symposium on Regional Assessment of Freshwater Ecosystems and Climate Change in North America, Oct. 24-26, 1994, Leesburg, VA. Selected papers. Edited by M.G. Anderson et al, p.903-924, Refs. p.920-924.
Climatology, Global warming, Mountains, Limnology, Ecosystems, Snowmelt, Runoff, Geochemistry, Environmental impact, Environmental protection, Forecasting, Canada—Rocky Mountains, United States—Rocky Mountains

52-3448
Modeling of the draining and freezing of aircraft de-icing and anti-icing fluids.
Zouzou, A., Louchez, P.R., Bernardin, S., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 10p., AIAA-98-0576, 16 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.
Aircraft icing, Chemical ice prevention, Ice removal, Liquid solid interfaces, Air flow, Environment simulation, Computerized simulation, Mathematical models

52-3449
Physical properties of aircraft de-icing and anti-icing fluids.
Louchez, P.R., Bernardin, S., Laforte, J.L., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 11p., AIAA-98-0575, 24 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.
Aircraft icing, Chemical ice prevention, Ice removal, Liquid solid interfaces, Interfacial tension, Mathematical models

52-3450
Aerodynamic acceptance test for commuter aircraft de-icing and anti-icing fluids.
Louchez, P.R., Bernardin, S., Perron, E., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 9p., AIAA-98-0574, 15 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.
Aircraft icing, Chemical ice prevention, Ice removal, Liquid solid interfaces, Air flow, Cold weather tests

52-3451
Icing analysis, flight test and certification of the Gulfstream GV business jet.
Olsen, P., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 11p., AIAA-98-0571, 7 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.
Aircraft icing, Jet engines, Ice accretion, Ice prevention, Ice removal, Environmental tests, Cold weather tests, Standards

52-3452
Quantification of ice accretions for icing scaling evaluations.
Ruff, G.A., Anderson, D.N., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 12p., AIAA-98-0195, 20 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.
Aircraft icing, Ice accretion, Ice forecasting, Computerized simulation

52-3453
Development of the Cox icing research facility.
Al-Khalil, K., Salamon, L., Tenison, G., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 7p., AIAA-98-0097, 2 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.
Aircraft icing, Laboratories, Wind tunnels, Cold chambers, Environmental tests

52-3454
Commercial application of the Electro-Expulsive Deicing System.
Goldberg, J., Wesson, D., Durden, D., Windsor Locks, CT, Dynamic Controls HS. Inc., 1998, 7p., 3 refs. Presented at the 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998, sponsored by the American Institute of Aeronautics and Astronautics (AIAA).
Aircraft icing, Ice prevention, Ice removal, Electric equipment, Electric fields

52-3455
Soil temperature and stability of ice-cemented ground in the McMurdo Dry Valleys, Antarctica.
McKay, C.P., Mellon, M.T., Friedmann, E.I., *Antarctic science,* Mar. 1998, 10(1), p.31-38, 21 refs.
Ice air interface, Permafrost, Soil temperature, Frozen ground, Air temperature, Frozen ground temperature, Antarctica—Asgard Range
Year-round temperature measurements at 1600 m elevation during 1994 in the Asgard Range indicate that the mean annual frost point of the ice-cemented ground, 25 cm below the surface, is -21.7°C and the mean annual frost point of the atmosphere is -27.5°C. The corresponding mean annual temperatures are -24.9°C and -23.3°C. These results imply that there is a net flux of water vapor from the ice to the atmosphere resulting in a recession of the ice-cemented ground by about 0.4-0.6 mm/yr. The level of the ice-cemented permafrost is about 12 cm below the level of dry permafrost. The summer air temperatures would have to increase about 7°C for thawing temperatures to just reach the top of the subsurface ice. Either subsurface ice at this location is evaporating over time or there are sporadic processes that recharge the ice and maintain equilibrium over long timescales. (Auth.)

52-3456
Use of oxygen microelectrodes to determine the net production by an Antarctic sea ice algal community.
McMinn, A., Ashworth, C., *Antarctic science,* Mar. 1998, 10(1), p.39-44, Refs. p.43-44.
Algae, Biomass, Photosynthesis, Fast ice, Sea ice, Antarctica—Davis Station
Oxygen microelectrodes were used to measure the photosynthetic rates of antarctic fast ice algal mats. Using the oxygen flux across the diffusive boundary layer below the fast ice at Davis Station, a productivity range of 0-1.78 mg $C/m^2/h$ was measured. This is at the lower end of fast ice productivity estimates and suggests that conventional ^{14}C techniques may overestimate sea ice algal mat productivity. (Auth. mod.)

52-3457
Determination of HTO content in polar ice/snow samples by low background liquid scintillation technique.
Kamiyama, K., Shimada, W., Kitaoka, K., Izumi, K., Ezumi, S., *Antarctic record,* Nov. 1997, 41(3), p.631-642, In Japanese with English summary. 17 refs.
Ice composition, Snow composition, Atmospheric composition, Chemical analysis
Tritium (T) is a radio isotope of hydrogen element which is produced on earth by atomic reactions in artificial atomic reactors as well as in the upper atmosphere. T occurs in natural water mainly as HTO and the concentration in precipitation shows local and seasonal fluctuations depending on the production and migration processes in the hydrosphere and in the atmosphere. The ratio in water vapor in the atmosphere is not uniform; it is higher in the stratosphere than in the troposphere. A temporal increase was observed in the atmosphere in the 1960s and recorded in polar snow layers, stagnant water basins and ground water. The liquid scintillation method was used for the determination of tritium content in the liquid phase. This paper discusses the method for the determination of HTO content with the liquid scintillation system LSC-LB3 and the significance of the values obtained. (Auth. mod.)

52-3458
Activities of the wintering party of the 36th Japanese Antarctic Research Expedition, 1995-1996.
Meshida, S., *Antarctic record,* Nov. 1997, 41(3), p.673-742, In Japanese with English summary. 3 refs.
Low temperature research, Logistics, Weather observations, Weather stations, Ice cores, Glaciology, Sea ice distribution, Antarctica—Showa Station, Antarctica—Dome Fuji Station
The wintering party at Showa Station, consisting of 31 participants, carried out its observations and logistic work from Feb. 1, 1995 to Jan. 31, 1996. Routine and some specific observations for studies of upper atmosphere physics, meteorology, solid earth geophysics, biology and medical science were performed. A seed plant was discovered near Nurume Lake, Langhovde. It was the first report of a seed plant growing in continental Antarctica. Support work for the wintering party at Dome Fuji Station was one of the principal tasks at Showa Station. A trip to the Dome Fuji Station was carried out to transport supplies and fuel in the austral spring of 1995. The wintering activities at Dome Fuji Station started on Jan. 29, 1995. The wintering party, consisting of 9 personnel, carried out meteorological and glaciological observations together with deep ice core drilling and some construction work. Ice cores of 600 m depth were obtained successfully. (Auth. mod.)

52-3459
Note on the feasibility of establishing snow and ice runways at Japanese antarctic stations—In the context of the East Antarctic Air Network.
Shiraishi, K., Klokov, V., *Antarctic record,* Nov. 1997, 41(3), p.778-790, In Japanese with English summary. 13 refs.
Ice runways, Aircraft landing areas, Cold weather construction, Logistics, Site surveys, Antarctica—Showa Station
This report summarizes the feasibility study to introduce intercontinental air operation for the Japanese Antarctic Research Expedition (JARE) by establishing hard-surface runways near JARE stations. Showa Station and the Yamato Mountains areas were considered to identify favorable sites for runway construction on the basis of historical/meteorological data and glaciological conditions. Techniques and logistic facilities for snow-ice runway construction, and the general characteristics of aircraft that are of practical interest in Antarctica are briefly outlined. International collaboration to improve the East Antarctic Air Network is emphasized. (Auth.)

52-3460
Use of airborne *casi* spatial mode data for mapping of sub-arctic mountain heaths in Pasvik, northern Norway.
Tømmervik, H., Johansen, B., Lauknes, I., *Canadian journal of remote sensing,* Sep. 1997, 23(3), p.230-242, With French summary. 44 refs.
Remote sensing, Subarctic landscapes, Aerial surveys, Sensor mapping, Infrared spectroscopy, Mountains, Vegetation patterns, Landscape types, Lichens, Image processing, Data processing, Correlation, Norway—Pasvik

52-3461
Multicriteria analysis of satellite sensors for tracking snow cover. [Analyse multicritère de capteurs satellitaires pour le suivi du couvert nival]
Martin, D., Bernier, M., *Canadian journal of remote sensing,* Sep. 1997, 23(3), p.264-275, In French with English summary. 43 refs.
Snow surveys, Snow cover distribution, Sensor mapping, Spacecraft, Spaceborne photography, Radiometry, Sensors, Performance, Standards, Classifications

52-3462
Kinetics of the heterogeneous reaction CO + O→CO_2 on inorganic oxide and water ice surfaces: implications for the Martian atmosphere.
Choi, W.Y., Leu, M.T., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.2957-2960, 24 refs.
Mars (planet), Atmospheric composition, Chemical composition, Aerosols, Ice surface, Adsorption, Carbon dioxide, Ice vapor interface, Simulation

52-3463

Topographically generated gravity waves in the Brooks Range, Alaska.

Lynch, A.H., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.2981-2984, 20 refs.

Climatology, Wind velocity, Storms, Turbulent boundary layer, Atmospheric pressure, Gravity waves, Topographic effects, Temperature inversions, Cooling, Mathematical models, United States—Alaska—Brooks Range

52-3464

Effect of interannual meteorological variability on mid-latitude O_3.

Hadjinicolaou, P., Pyle, J.A., Chipperfield, M.P., Kettleborough, J.A., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.2993-2996, 16 refs.

Climatology, Atmospheric composition, Stratosphere, Photochemical reactions, Aerosols, Ozone, Degradation, Polar stratospheric clouds, Mass transfer, Models

52-3465

Evidence for sulfuric acid coated particles in the arctic air mass.

Cantrell, W., Shaw, G., Benner, R., Veazey, D., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.3005-3008, 17 refs.

Climatology, Polar atmospheres, Atmospheric composition, Cloud physics, Aerosols, Condensation nuclei, Carbon black, Chemical properties, Coatings, Simulation, Temperature effects

52-3466

Supercooled cirrus cloud formation modified by nitric acid pollution of the upper troposphere.

Laaksonen, A., Hienola, J., Kulmala, M., Arnold, F., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.3009-3012, 19 refs.

Climatology, Atmospheric composition, Air pollution, Cloud physics, Supercooled clouds, Cloud droplets, Aerosols, Condensation nuclei, Chemical properties, Models

52-3467

Ground-based measurements of tropospheric and stratospheric BrO at Arrival Heights, Antarctica.

Kreher, K., Johnston, P.V., Wood, S.W., Nardi, B., Platt, U., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.3021-3024, 21 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Degradation, Aerosols, Haze, Ozone, Spectroscopy, Antarctica—Arrival Heights

Ground-based measurements of BrO slant column densities were performed using DOAS (Differential Optical Absorption Spectroscopy) during 1995 at Arrival Heights. Results suggest that halogen catalyzed boundary layer ozone depletion not only occurs in the Arctic but also in Antarctica. This has the implication that Arctic Haze and anthropogenic influence is unlikely as a cause for this phenomenon. (Auth. mod.)

52-3468

Ice-age cycles: Earth's rotation instabilities and sea-level changes.

Sabadini, R., Vermeersen, L.L.A., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.3041-3044, 18 refs.

Pleistocene, Ice sheets, Glacier oscillation, Sea level, Rheology, Viscoelasticity, Isostasy, Ice models, Theories

52-3469

Balance velocities of the Greenland ice sheet.

Joughin, I., Fahnestock, M., Ekholm, S., Kwok, R., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.3045-3048, 13 refs.

Glaciology, Ice sheets, Glacier surveys, Glacier mass balance, Glacier flow, Spaceborne photography, Synthetic aperture radar, Topographic features, Greenland

52-3470

Rapid response of greenhouse gas emission to early spring thaw in a subarctic mire as shown by micrometeorological techniques.

Friborg, T., Christensen, T.R., Søgaard, H., *Geophysical research letters,* Dec. 1, 1997, 24(23), p.3061-3064, 31 refs.

Climatology, Global warming, Greenhouse effect, Wetlands, Subarctic landscapes, Ground thawing, Soil air interface, Natural gas, Vapor transfer, Statistical analysis, Diurnal variations, Simulation, Sweden

52-3471

Tree-limit stress and disturbance. A 25-year survey of geoecological change in the Scandes Mountains of Sweden.

Kullman, L., *Geografiska annaler,* 1997, 79A(3), p.139-165, Refs. p.162-165.

Climatology, Climatic changes, Air temperature, Alpine landscapes, Forest lines, Forest ecosystems, Forest canopy, Growth, Degradation, Vegetation patterns, Statistical analysis, Sweden—Scandes Mountains

52-3472

Storsteinsfjellbreen: variations in mass balance from the 1960s to the 1990s.

Kjøllmoen, B., Østrem, G., *Geografiska annaler,* 1997, 79A(3), p.195-200, 10 refs. + map.

Mountain glaciers, Glacier surveys, Aerial surveys, Photography, Glacier mass balance, Glacier oscillation, Mapping, Seasonal variations, Norway—Storsteinsfjellbreen

52-3473

Isopycnic potential vorticity in the confluence zone of the Norwegian and Barents Seas.

Jankowski, A., *Polish Academy of Sciences. Bulletin. Earth sciences,* Dec. 1994, 42(1), p.7-37, 24 refs.

Oceanographic surveys, Subpolar regions, Sounding, Hydrography, Ocean currents, Bottom topography, Fluid dynamics, Analysis (mathematics), Statistical analysis, Barents Sea, Norwegian Sea

52-3474

Physico-chemical characterization of channel types in a glacial floodplain ecosystem (Val Roseg, Switzerland).

Tockner, K., et al, *Archiv für Hydrobiologie,* Oct. 1997, 140(4), p.433-463, Refs. p.460-463.

Geomorphology, Glacial rivers, Floodplains, Channels (waterways), Classifications, Alpine landscapes, Ecosystems, Glacial hydrology, Meltwater, Hydrography, Hydrogeochemistry, Switzerland—Alps

52-3475

Coring a tropical glacier. *Geotimes,* Oct. 1997, 42(10), p.6-7.

Alpine glaciation, Mountain glaciers, Ice cores, Paleoclimatology, Aerosols, Bolivia—Sajama, Mount

52-3476

Mass balance and nitrogen accumulation in hummocks on a South Swedish bog during the late Holocene.

Malmer, N., Svensson, G., Wallén, B., *Ecography,* Dec. 1997, 20(6), p.535-549, Refs. p.547-549.

Paleoecology, Subarctic landscapes, Swamps, Organic soils, Quaternary deposits, Peat, Stratigraphy, Mass balance, Decomposition, Radioactive age determination, Sweden

52-3477

Airborne dispersal of antarctic terrestrial algae and cyanobacteria.

Marshall, W.A., Chalmers, M.O., *Ecography,* Dec. 1997, 20(6), p.585-594, 56 refs.

Ecosystems, Microbiology, Algae, Soil structure, Surface properties, Distribution, Wind factors, Meltwater, Biomass, Sampling, Antarctica—Signy Island

The dispersal of algae and cyanobacteria at three antarctic fellfield sites was investigated using microscopic and culture analysis of samples from active and passive air samplers. Intersite variation in the mean number of large algal propagules sampled was dependent on the niche space available for algal growth and the degree to which soil was exposed to desiccating influences; these factors could be related to the degree of maturity of the site. Dispersal of unicellular chlorophytes was greatest during the summer period and at sites with developed secondary flora, but also occurred at other sites and in association with small thaw events during winter. Cultures were obtained from samples collected while an air mass that had originated in South America deposited material on Signy I. This suggests that algal propagules have the ability to survive long-distance transport and potentially provide inocula for colonization of Antarctica as regional warming continues to expose fresh habitats. (Auth. mod.)

52-3478

Insular patterns of calicioid lichens in a boreal old-growth forest-wetland mosaic.

Kruys, N., Jonsson, B.G., *Ecography,* Dec. 1997, 20(6), p.605-613, 42 refs.

Forest ecosystems, Subarctic landscapes, Wetlands, Lichens, Growth, Distribution, Substrates, Vegetation patterns, Forest strips, Statistical analysis, Microclimatology, Sweden

52-3479

Dependence of the circumnuclear coma structure on the properties of the nucleus I. Comparison between a homogeneous and an inhomogeneous spherical nucleus, with application to P/Wirtanen.

Crifo, J.F., Rodionov, A.V., *Icarus,* June 1997, 127(2), p.319-353, 42 refs.

Extraterrestrial ice, Ice physics, Ice sublimation, Ice composition, Ice vapor interface, Dust, Gases, Mass transfer, Radiation absorption, Mathematical models

52-3480

Near-infrared spectroscopy of simple hydrocarbons and carbon oxides diluted in solid N_2 and as pure ices: implications for Triton and Pluto.

Quirico, E., Schmitt, B., *Icarus,* June 1997, 127(2), p.354-378, 67 refs.

Extraterrestrial ice, Satellites (natural), Regolith, Simulation, Hydrocarbons, Carbon dioxide, Ice spectroscopy, Radiation absorption, Molecular energy levels, Spectra, Laboratory techniques

52-3481

Reevaluation of impact melt production.

Pierazzo, E., Vickery, A.M., Melosh, H.J., *Icarus,* June 1997, 127(2), p.408-423, 36 refs.

Extraterrestrial ice, Satellites (natural), Regolith, Melting, Impact, Projectile penetration, Shock waves, Surface structure, Pit and mound topography, Impact, Ice sublimation, Mathematical models

52-3482

Stages of the contact and hydrothermal authigenic mineral formation in the dike swarms, Iceland.

Geptner, A.R., Petrova, V.V., *Lithology and mineral resources,* Jan.-Feb. 1998, 33(1), p.69-81, Translated from Litologiia i poleznye iskopaemye. 16 refs.

Geologic processes, Earth crust, Subpolar regions, Magma, Mineralogy, Sampling, Scanning electron microscopy, Chemical composition, Iceland

52-3483

Depositional facies of late Pleistocene Heinrich events in the Labrador Sea.

Hesse, R., Khodabakhsh, S., *Geology,* Feb. 1998, 26(2), p.103-106, 29 refs.

Pleistocene, Paleoclimatology, Marine deposits, Bottom sediment, Stratification, Ice sheets, Ice rafting, Sedimentation, Ocean currents, Turbidity, Labrador Sea

52-3484

Pollen record of Holocene climatic changes from the Dunde ice cap, Qinghai-Tibetan Plateau.

Liu, K.B., Yao, Z.J., Thompson, L.G., *Geology,* Feb. 1998, 26(2), p.135-138, 29 refs.

Paleoclimatology, Climatic changes, Precipitation (meteorology), Quaternary deposits, Ice sheets, Ice cores, Meltwater, Palynology, Age determination, China—Qinghai-Tibetan Plateau

52-3485

Ice-contact environment.

Ashley, G.M., Warren, W.P., *Quaternary science reviews,* Sep. 1997, 16(7), p.629-634, 8 refs.

Glacial geology, Glacial hydrology, Glacial lakes, Ice solid interface, Ice edge, Sedimentation, Quaternary deposits, Meltwater, Subglacial drainage

52-3486
Spatial and temporal variability of ice-dammed lake sediments in alpine environments.
Johnson, P.G., *Quaternary science reviews,* Sep. 1997, 16(7), p.635-647, 28 refs.
Geomorphology, Alpine landscapes, Lacustrine deposits, Glacial geology, Glacial hydrology, Glacial lakes, Ice dams, Surface drainage, Deltas, Sedimentation, Stratigraphy, Periodic variations, Canada—Yukon Territory—Kaskawulsh Glacier

52-3487
Development of minor outwash fans at Kötlujökull, Iceland.
Krüger, J., *Quaternary science reviews,* Sep. 1997, 16(7), p.649-659, 21 refs.
Glacial hydrology, Glacial geology, Outwash, Geomorphology, Sedimentation, Glacier oscillation, Subglacial drainage, Meltwater, Pleistocene, Quaternary deposits, Glacial deposits, Lithology, Iceland—Kötlujökull

52-3488
Morphology, stratigraphy and sedimentology of the Carstairs esker, Scotland, U.K.
Thomas, G.S.P., Montague, E., *Quaternary science reviews,* Sep. 1997, 16(7), p.661-674, 30 refs.
Pleistocene, Glacial geology, Glacial deposits, Lacustrine deposits, Glacial lakes, Subglacial drainage, Geomorphology, Pit and mound topography, Stratigraphy, Sedimentation, Boreholes, United Kingdom—Scotland

52-3489
Origin of an esker-like ridge—erosion or channel-fill? Sedimentology of the Monington 'esker' in southwest Wales.
Owen, G., *Quaternary science reviews,* Sep. 1997, 16(7), p.675-684, 25 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Geomorphology, Sedimentation, Outwash, Water erosion, Origin, Theories, United Kingdom—Wales

52-3490
Glaciolacustrine and glaciofluvial deposits defining the margins of uncoupling ice lobes in the southeastern midlands of Ireland.
Glanville, C., *Quaternary science reviews,* Sep. 1997, 16(7), p.685-703, 37 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Lacustrine deposits, Glacier oscillation, Ice edge, Glacial lakes, Outwash, Sedimentation, Lithology, Ireland

52-3491
Depositional history of the Bloomington complex, an ice-contact deposit in the Oak Ridges Moraine, southern Ontario, Canada.
Paterson, J.T., Cheel, R.J., *Quaternary science reviews,* Sep. 1997, 16(7), p.705-719, Refs. p.717-719.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Lacustrine deposits, Glacial lakes, Meltwater, Moraines, Outwash, Sedimentation, Stratification, Canada—Ontario—Oak Ridges Moraine

52-3492
Sedimentation and erosion at the Weichselian ice-marginal zone near Golczewo, northwestern Poland.
Dobracki, R., Krzyszkowski, D., *Quaternary science reviews,* Sep. 1997, 16(7), p.721-740, 42 refs.
Pleistocene, Quaternary deposits, Glacial geology, Moraines, Ice edge, Subglacial drainage, Water erosion, Sedimentation, Geomorphology, Stratigraphy, Poland—Golczewo

52-3493
Glacial and glaciofluvial deposits in the interlobate areas of the Scandinavian ice sheet.
Punkari, M., *Quaternary science reviews,* Sep. 1997, 16(7), p.741-753, 64 refs.
Pleistocene, Quaternary deposits, Glacial geology, Geomorphology, Glacial deposits, Glacier flow, Meltwater, Subglacial drainage, Ice solid interface, Sedimentation, Scandinavia

52-3494
Sedimentology of a glaciofluvial deposit at Ekeby, east central Sweden.
Mokhtari Fard, A., Gruszka, B., Brunnberg, L., Ringberg, B., *Quaternary science reviews,* Sep. 1997, 16(7), p.755-765, 32 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Sedimentation, Stratigraphy, Lithology, Classifications, Grain size, Subglacial drainage, Sweden—Ekeby

52-3495
Pleistocene glaciolacustrine sedimentation at Lago Fagnano, Andes of Tierra del Fuego, southernmost South America.
Bujalesky, G.G., Heusser, C.J., Coronato, A.M., Roig, C.E., Rabassa, J.O., *Quaternary science reviews,* Sep. 1997, 16(7), p.767-778, 33 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Glacier oscillation, Glacial lakes, Lacustrine deposits, Sedimentation, Stratigraphy, Radioactive age determination, Correlation, Argentina—Tierra del Fuego

52-3496
Sedimentology of Late Glacial clays in lacustrine basins, central Ireland.
Van der Meer, J.J.M., Warren, W.P., *Quaternary science reviews,* Sep. 1997, 16(7), p.779-791, 24 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Lacustrine deposits, Glacial lakes, Sedimentation, Clays, Lithology, Drill core analysis, Thin sections, Ireland

52-3497
Jökulhlaup deposits in proglacial areas.
Maizels, J., *Quaternary science reviews,* Sep. 1997, 16(7), p.793-819, Refs. p.816-819.
Geomorphology, Hydraulics, Glacial hydrology, Glacial geology, Ice dams, Lake bursts, Floods, Sedimentation, Outwash, Lithology, Classifications, Models

52-3498
Dynamic strength properties of undisturbed riverbed gravel.
Yasuda, N., Ohta, N., Takahashi, M., *Canadian geotechnical journal,* Oct. 1997, 34(5), p.726-736, With French summary. 13 refs.
Soil mechanics, Soil strength, Soil structure, Gravel, Thixotropy, Sampling, Soil freezing, Artificial freezing, Mechanical tests, Dynamic properties, Shear modulus

52-3499
Ultimate state of reconstituted and intact samples of deltaic sand.
Konrad, J.M., Pouliot, N., *Canadian geotechnical journal,* Oct. 1997, 34(5), p.737-748, With French summary. 27 refs.
Soil science, Soil tests, Noncohesive soils, Sands, Sampling, Soil freezing, Artificial freezing, Ultimate strength, Shear strength, Freeze thaw tests, Thaw consolidation, Mechanical tests, Laboratory techniques

52-3500
Protection against icing: a comprehensive overview. *Flight safety digest,* Jan.-Sep. 1997, Special issue, 237p., Refs. passim. For selected papers see 52-3501 through 52-3504.
Aircraft icing, Safety, Ice control, Ice prevention, Ice detection, Accidents, Antifreezes, Solutions, Specifications, Countermeasures, Standards, Organizations, Manuals

52-3501
Deicing/anti-icing industry update and operational principles.
Posta, J., *Flight safety digest,* June-Sep. 1997, Special issue, p.1-4.
Aircraft icing, Airports, Safety, Antifreezes, Solutions, Specifications, Standards, Organizations

52-3502
Manual of aircraft ground de/anti-icing operations.
International Civil Aviation Organization, *Flight safety digest,* June-Sep. 1997, Special issue, p.43-54, 7 refs.
Aircraft icing, Airports, Safety, Ice removal, Ice prevention, Antifreezes, Solutions, Ice cover effect, Standards, Manuals, Education

52-3503
Recommendations for de-icing/anti-icing of aircraft on the ground.
Association of European Airlines, *Flight safety digest,* June-Sep. 1997, Special issue, p.113-133.
Aircraft icing, Airports, Ice removal, Ice prevention, Snow removal, Antifreezes, Solutions, Chemical composition, Safety, Specifications, Standards

52-3504
Inflight aircraft icing plan.
U.S. Federal Aviation Administration, *Flight safety digest,* June-Sep. 1997, Special issue, p.185-197.
Aircraft icing, Safety, Countermeasures, Ice forecasting, Ice prevention, Ice detection, Ice removal, Standards

52-3505
Isotopic variability in arctic precipitation as a climatic indicator.
Moorman, B.J., Michel, F.A., Drimmie, R.J., *Geoscience Canada,* Dec. 1996, 23(4), p.189-204, With French summary. Refs. p.202-204.
Paleoclimatology, Precipitation (meteorology), Snow composition, Firn, Ice sheets, Ice cores, Oxygen isotopes, Isotope analysis, Seasonal variations, Correlation, Accuracy, Canada—Northwest Territories

52-3506
Geomorphological changes and permafrost dynamics: key factors in changing arctic ecosystems. An example from Bylot Island, Nunavut, Canada.
Allard, M., *Geoscience Canada,* Dec. 1996, 23(4), p.205-212, With French summary. 27 refs.
Permafrost surveys, Geomorphology, Ecosystems, Arctic landscapes, Landforms, Permafrost transformation, Frozen ground temperature, Quaternary deposits, Frozen ground mechanics, Patterned ground, Radioactive age determination, Canada—Northwest Territories—Bylot Island

52-3507
Terrestrial record of postglacial vegetation and climate from the arctic/subarctic of eastern Canada and West Greenland.
Mode, W.N., *Geoscience Canada,* Dec. 1996, 23(4), p.213-216, With French summary. 28 refs.
Paleoclimatology, Paleoecology, Quaternary deposits, Lacustrine deposits, Palynology, Tundra vegetation, Vegetation patterns, Greenland, Canada—Northwest Territories—Baffin Island

52-3508
Climatic change in Nunavut.
Hardy, D.R., Bradley, R.S., *Geoscience Canada,* Dec. 1996, 23(4), p.217-224, With French summary. 29 refs.
Paleoclimatology, Climatic changes, Subpolar regions, Lacustrine deposits, Ice cores, Sampling, Correlation, Canada—Northwest Territories

52-3509
Long-term environmental monitoring in arctic lakes and ponds using diatoms and other biological indicators.
Smol, J.P., Doublas, M.S.V., *Geoscience Canada,* Dec. 1996, 23(4), p.225-230, With French summary. 68 refs.
Paleoclimatology, Climatic changes, Arctic landscapes, Limnology, Paleoecology, Algae, Lacustrine deposits, Ecosystems, Tundra climate, Tundra vegetation, Environmental protection, Monitors, Canada

52-3510

Sensitivity of high-latitude freshwater ecosystems to global change: temperature and solar ultraviolet radiation.

Vincent, W.F., Pienitz, R., *Geoscience Canada,* Dec. 1996, 23(4), p.231-236, With French summary. 56 refs.

Limnology, Ecosystems, Tundra climate, Global change, Global warming, Air temperature, Solar radiation, Ultraviolet radiation, Environmental impact, Canada

52-3511

Arctic atmosphere: sulphur and trace metals.

Wadleigh, M.A., *Geoscience Canada,* Dec. 1996, 23(4), p.237-244, With French summary. 48 refs.

Climatology, Polar atmospheres, Atmospheric composition, Fronts (meteorology), Aerosols, Haze, Air pollution, Environmental impact, Sampling, Isotope analysis, Seasonal variations, Canada

52-3512

Vegetation succession and disturbance on a boreal forest floodplain, Susitna River, Alaska.

Helm, D.J., Collins, W.B., *Canadian field-naturalist,* Oct.-Dec. 1997, 111(4), p.553-566, 41 refs.

Plant ecology, Revegetation, Floodplains, Flooding, Ice scoring, Subarctic landscapes, Vegetation patterns, Damage, Classifications, Sampling, Models, United States—Alaska—Susitna River

52-3513

Northernmost extension of the moss *Pleurozium shreberi* (Brid.) Mitt. in the Canadian High Arctic.

Kuc, M., *Canadian field-naturalist,* Oct.-Dec. 1997, 111(4), p.630-633, 14 refs.

Plants (botany), Plant ecology, Subpolar regions, Mosses, Distribution, Vegetation patterns, Canada—Northwest Territories—Alexandra Fiord

52-3514

Monitoring land-surface snow conditions from SSM/I data using an artificial neural network classifier.

Sun, C.Y., Neale, C.M.U., McDonnell, J.J., Cheng, H.D., *IEEE transactions on geoscience and remote sensing,* July 1997, 35(4), p.801-809, 29 refs.

Precipitation (meteorology), Snow surveys, Snow cover structure, Classifications, Forest land, Radiometry, Brightness, Statistical analysis, Computer programs, Accuracy, Vegetation factors

52-3515

Neural network algorithm for sea ice edge classification.

Alhumaidi, S.M., Jones, W.L., Park, J.D., Ferguson, S.M., *IEEE transactions on geoscience and remote sensing,* July 1997, 35(4), p.817-826, 14 refs.

Oceanographic surveys, Spacecraft, Radar echoes, Backscattering, Sea ice distribution, Ice edge, Ice detection, Classifications, Models, Data processing, Computer programs

Algorithms based on neural network technology have been developed to classify ice-free ocean surfaces. Algorithm skill in locating the sea ice edge around Antarctica is experimentally evaluated using backscatter data from the Seasat-A Satellite Scatterometer that operated in 1978. Comparisons between the algorithms demonstrate a slight advantage of combined polarization and multi-look over using co-polarized backscatter alone. Classification skill is evaluated by comparisons with surface truth (sea ice maps), subjective ice classification, and independent over lapping scatterometer measurements (consecutive revolutions). (Auth. mod.)

52-3516

Freeze/thaw classification for prairie soils using SSM/I radiobrightness.

Judge, J., Galantowicz, J.F., England, A.W., Dahl, P., *IEEE transactions on geoscience and remote sensing,* July 1997, 35(4), p.827-832, 13 refs. For another version see 51-2515.

Remote sensing, Geophysical surveys, Plains, Spacecraft, Radiometry, Brightness, Frozen ground, Soil classification, Seasonal freeze thaw, Data processing, Spectra, United States—Great Plains

52-3517

Radar backscatter from a dense discrete random medium.

Chuah, H.T., Tjuatja, S., Fung, A.K., Bredow, J.W., *IEEE transactions on geoscience and remote sensing,* July 1997, 35(4), p.892-900, 17 refs.

Remote sensing, Radar echoes, Polarization (waves), Backscattering, Snow optics, Snow physics, Snow cover structure, Mathematical models, Simulation, Correlation

52-3518

Microwave technique for mapping ice temperature in the arctic seasonal sea ice zone.

St. Germain, K.M., Cavalieri, D.J., *IEEE transactions on geoscience and remote sensing,* July 1997, 35(4), p.946-953, 13 refs. For another version see 51-2843.

Remote sensing, Spaceborne photography, Radiometry, Sensor mapping, Sea ice distribution, Ice conditions, Classifications, Air temperature, Ice temperature, Brightness, Correlation, Models, Arctic Ocean

52-3519

Robust threshold retracking algorithm for measuring ice-sheet surface elevation change from satellite radar altimeters.

Davis, C.H., *IEEE transactions on geoscience and remote sensing,* July 1997, 35(4), p.974-979, 20 refs.

Remote sensing, Ice sheets, Glacier surfaces, Height finding, Spacecraft, Radar echoes, Topographic surveys, Mathematical models, Accuracy, Data processing, Statistical analysis

52-3520

Stable carbon isotope variations in northwest Europe during the last glacial-interglacial transition.

Turney, C.S.M., Beerling, D.J., Harkness, D.D., Lowe, J.J., Scott, E.M., *Journal of quaternary science,* July-Aug. 1997, 12(4), p.339-344, 28 refs.

Paleoecology, Paleoclimatology, Lacustrine deposits, Carbon isotopes, Isotope analysis, Quaternary deposits, Ice cores, Statistical analysis, Correlation, Norway—Kråkenes, United Kingdom—Scotland, United Kingdom—Wales

52-3521

Optimization of hull form for future arctic tankers, Phase I.

Luce, M.P., Baker, D., Sneyd, A.R., Taylor, A., *Transport Canada. Transportation Development Centre, Montreal. Publication,* Sep. 1989, TP 10045E, 5 vols., Vol.1: MIC 93-04657, With French summary. Refs. passim.

Tanker ships, Icebreakers, Ice navigation, Ice breaking, Metal ice friction, Ice loads, Environmental tests, Cold weather tests, Design criteria, Structural analysis

52-3522

Finite element and physical modelling of post yield stability of icebreaker structure.

Bond, J.E., Srinivasan, J., Basu, R.I., Kennedy, S.J., *Transport Canada. Transportation Development Centre, Montreal. Publication,* July 1995, TP 12528E, 2 vols., MIC 96-07498, With French summary. 5 refs.

Icebreakers, Ice navigation, Ice solid interface, Ice loads, Metal ice friction, Environmental tests, Standards, Design criteria, Structural analysis, Cost analysis

52-3523

Loading of tankers from arctic platforms.

Danielewicz, B.W., et al, *Transport Canada. Transportation Development Centre, Montreal. Publication,* Oct. 1995, TP 12531E, 185p. + appends., With French summary. 33 refs.

Tanker ships, Icebreakers, Offshore structures, Moorings, Ice navigation, Ice control, Ice solid interface, Ice loads, Ice pressure, Ice friction, Environmental tests, Computer programs

52-3524

Seasonal change of ice algal assemblages with its relation to phytoplankton near Zhongshan Station, East Antarctica.

He, J.F., Chen, B., *Chinese journal of polar research,* Sep. 1997, 9(3), p.182-191, In Chinese with English summary. Refs. p.190-191.

Algae, Biomass, Ecology, Sea ice, Antarctica—Zhongshan Station

Algal and phytoplankton assemblages were monitored from Apr. to Dec., 1992 near Zhongshan Station. The abundance of algae in the ice and water column (0-50 m) were highest in Apr. and mid Nov.-mid Dec. *Amphiprora kjellmanii, Berkeleyarutilans, Navicula glaciei, Nitzschia barkleyi, N. cylindrus, N. lecointei* and *Nitzschia* sp. were dominant in the ice. The comparison of algal composition and abundance between bottom layer of ice and surface layer of water showed differences, except in late Nov. when the spring bloom occurred. Both autumn and spring algal blooms occurred mainly by the *in situ* growth. (Auth. mod.)

52-3525

Recent progress in the study of Antarctic glaciology and global change.

Wen, J.H., Kang, J.C., Sun, B., *Chinese journal of polar research,* Sep. 1997, 9(3), p.232-237, In Chinese with English summary. 2 refs.

Research projects, Glaciology, Global change, Glacier mass balance, Ice composition, Snow composition, Atmospheric composition, Paleoecology, Paleoclimatology, Ice cores

The principal topics covered at the International Symposium on Antarctic and Global Change: Interactions and Impacts, are reviewed. Several research programs are discussed, including monitoring of the antarctic ice sheet mass balance, GPS, satellite techniques and digital modelling, atmospheric chemistry and climate records in antarctic ice and snow, and deep-ice core studies compared to other paleoenvironmental records.

52-3526

330km glaciological expedition from Zhongshan Station to inland of antarctic ice sheet.

Kang, J.C., Wang, D.L., *Chinese journal of polar research,* Sep. 1997, 9(3), p.238-242, In Chinese with English summary. 3 refs.

Research projects, Traverses, Glacier mass balance, Snow stratigraphy, Ice air interface, Paleoecology, Ice cores, Paleoclimatology, Antarctica—Zhongshan Station

The Chinese Antarctic Inland Glaciological Profile Expedition, carried out in summer of 1996-1997 and covering 330 km, is described. The traverse operation from Zhongshan Station to Dome A included studies of the ice sheet mass balance, environmental evolution during the last 200 yrs., and exchanging processes between air, ice and snow. The snow samples were collected from the surface and two 50-m deep cores.

52-3527

Ecological investigations on the fauna of the Arctic sea-ice. [Ökologische Untersuchungen zur Fauna des arktischen Meereises]

Friedrich, C., *Berichte zur Polarforschung,* 1997, No.246, 211p., In German with English summary. Refs. p.161-170.

Expeditions, Marine biology, Biomass, Animals, Sea ice, Sea water, Chemical composition, Barents Sea, Russia—Laptev Sea, Greenland Sea

52-3528

Comparative studies on the ecology and biodiversity of the Arctic and antarctic mega-epibenthos. [Vergleichende Untersuchungen zur Ökologie und Biodiversität des Mega-Epibenthos der Arktis und Antarktis]

Starmans, A., *Berichte zur Polarforschung,* 1997, No.250, 150p., In German with English summary. Refs. p.130-143.

Ocean bottom, Animals, Icebergs, Marine biology, Greenland Sea, Antarctica—Weddell Sea, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea

During the *Polarstern* cruises to the Greenland Sea, 1993, Weddell Sea, 1988, and Bellingshausen/Amundsen Seas, 1994, a remotely operated vehicle investigated the shelves at 54 stations. The video material provides quantitative, comparable data on the epibenthic megafauna. In the Arctic, 94 taxa comprising more than 100,000 individuals were identified. Echinoderms are the most populous faunal shelf elements off NE Greenland. A conspicuous zonation clearly distinguishes the shallow banks dwellers from those of the deeper troughs. Fauna in the troughs is poor with regard to numbers, but diverse. In Antarctica more than 115,000 individuals are identified in 168 taxa. Sponges, bryozoans, and other suspension feeders are prevalent on the shelf of the eastern Weddell Sea but are absent elsewhere in the named seas. Iceberg groundings, occurring once

every 230 years (Antarctica) and 53 years (Arctic), cause considerable damage to benthic communities. Sessile organisms are eradicated and pioneer species begin to grow abundantly.

52-3529
Elevation change of the southern Greenland Ice Sheet.
Davis, C.H., Kluever, C.A., Haines, B.J., *Science,* Mar. 27, 1998, 279(5359), p.2086-2088, 32 refs.
Ice sheets, Height finding, Measurement, Greenland

52-3530
Ice-sheet variability around the North Atlantic Ocean during the last glaciation.
McCabe, A.M., Clark, P.U., *Nature,* Mar. 26, 1998, 392(6674), p.373-377, 30 refs.
Ice sheets, Sediments, Icebergs, North Atlantic Ocean, Irish Sea

52-3531
Estimation of parameter uncertainty in the HBV model.
Seibert, J., *Nordic hydrology,* 1997, 28(4-5), Nordic Hydrological Conference, Akureyri, Iceland, Aug. 1996. Selected papers, p.247-262, 25 refs.
River basins, Flooding, Runoff forecasting, Snow accumulation, Snowmelt, Snow hydrology, Degree days, Models, Statistical analysis, Accuracy, Sweden

52-3532
Effect of climate change on river flow and snow cover in the NOPEX area simulated by a simple water balance model.
Xu, C.Y., Halldin, S., *Nordic hydrology,* 1997, 28(4-5), Nordic Hydrological Conference, Akureyri, Iceland, Aug. 1996. Selected papers, p.273-282, 15 refs.
River basins, Climatic changes, Precipitation (meteorology), Water balance, River flow, Snow hydrology, Snowmelt, Snow water equivalent, Runoff forecasting, Mathematical models, Seasonal variations, Sweden

52-3533
Neural networks in the ice-correction of discharge observations.
Huttunen, M., Vehviläinen, B., Ukkonen, E., *Nordic hydrology,* 1997, 28(4-5), Nordic Hydrological Conference, Akureyri, Iceland, Aug. 1996. Selected papers, p.283-296, 17 refs.
Hydrology, River flow, River ice, Ice cover thickness, Water level, Ice melting, Ice breakup, Snow cover effect, Forecasting, Mathematical models, Simulation, Accuracy, Finland—Tornionjoki Karunki

52-3534
Model for water exchange between the Baltic Sea and the Gulf of Riga.
Otsmann, M., Astok, V., Suursaar, U., *Nordic hydrology,* 1997, 28(4-5), Nordic Hydrological Conference, Akureyri, Iceland, Aug. 1996. Selected papers, p.351-364, 9 refs.
Hydrology, Water balance, Estuaries, Ocean currents, Water flow, Velocity measurement, Channels (waterways), Ice cover effect, Wind factors, Mathematical models, Baltic Sea, Riga, Gulf

52-3535
Chemotaxonomic analysis of phytoplankton distribution in the Indian sector of the southern ocean during late austral summer.
Cailliau, C., Claustre, H., Giannino, S., *Oceanologica acta,* Sep. 1997, 20(5), p.721-732, With French summary. Refs. p.730-732.
Marine biology, Biomass, Plankton, Chemical composition, Distribution, Chlorophylls, Sampling, Antarctica—Weddell Sea, —Scotia Sea
A chromatographic analysis of chlorophyll *a* and of taxon-specific pigments revealed the abundance, composition and fate of phytoplankton in the Indian sector of the southern ocean during the late austral summer of 1994 (ANTARES 2 cruise). In the study area (49-67°S, 62°E), four different sub-systems are presented from south to north: the Coastal and Continental Shelf Zone (CCSZ), the Seasonal Ice Zone, including the Antarctic Divergence (AD), the Permanent Open Ocean Zone and a frontal system, the Polar Frontal Zone (PFZ). The phytoplankton biomass was low everywhere. The highest biomass was found in the CCSZ, in the AD and in the PFZ. An analysis of physical and chemical factors indicated their influence on phytoplankton abundance, composition and fate. Thus, a high diatom biomass was found in areas where silicic acid was most abundant and where the euphotic zone was deeper than the wind-mixed layer. (Auth. mod.)

52-3536
Strain localisation and incremental deformation within ice masses, Framnes Mountains, East Antarctica.
Marmo, B.A., Wilson, C.J.L., *Journal of structural geology,* Feb.-Mar. 1998, 20(2-3), p.149-162, 21 refs.
Glaciology, Ice mechanics, Glacier flow, Ice deformation, Cracking (fracturing), Brittleness, Crevasses, Shear strain, Shear rate, Shear properties, Antarctica—Framnes Mountains
Mesoscale fracture analysis of brittle features has been used to identify zones of localized ductile deformation within an ice stream in the Framnes Mountains, East Antarctica. Ground-based survey of three strain grids has been integrated with the detailed structural analysis to develop a model of temporal and spatial variation in strain localization within large high strain zones. Modelled strain distributions are in good agreement with the occurrence and sense of movement across zones of high ductile strain which have been inferred from observed brittle features. Despite this constant annual strain rate the internal deformation was incremental, localized and temporal in nature resulting in the development of new zones of fracturing. (Auth. mod.)

52-3537
Wind turbine performance under icing conditions.
Jasinski, W.J., Noe, S.C., Selig, M.S., Bragg, M.B., *Journal of solar engineering,* Feb. 1998, 120(1), p.60-65, 24 refs.
Wind power generation, Propellers, Ice accretion, Glaze, Wind velocity, Performance, Ice air interface, Supercooled fog, Ice cover effect, Wind tunnels, Models

52-3538
Analysis of freezing in an eccentric annulus.
Zhang, Y.W., Faghri, A., *Journal of solar energy engineering,* Aug. 1997, 119(3), p.237-241, 11 refs.
Phase transformations, Pipes (tubes), Physical properties, Liquid solid interfaces, Heat transfer, Thermal conductivity, Freezing rate, Freezing front, Latent heat, Analysis (mathematics)

52-3539
New findings concerning the ice age (Last Glacial Maximum) glacier cover of the East-Pamir, of the Nanga Parbat up to the Central Himalaya and of Tibet, as well as the age of the Tibetan inland ice.
Kuhle, M., *GeoJournal,* July 1997, 42(2-3), p.87-257, 66 refs.
Pleistocene, Glaciation, Ice age theory, Geological surveys, Geomorphology, Mountain glaciers, Snow line, Glacier oscillation, Geochronology, Glacial deposits, Radioactive age determination, Himalaya Mountains, China—Tibet

52-3540
Historical to post glacial glaciation and their differentiation from the late glacial period on examples of the Tian Shan and the N.W. Karakorum.
Meiners, S., *GeoJournal,* July 1997, 42(2-3), p.259-302, 43 refs.
Pleistocene, Mountain glaciers, Glaciation, Glacier oscillation, Snow line, Glacier tongues, Geomorphology, Classifications, Moraines, Geochronology, Statistical analysis, Topographic features, China—Tian Shan, Pakistan—Karakoram Mountains

52-3541
Investigation into albedo-controlled energy loss during the last glaciation.
Bielefeld, B., *GeoJournal,* July 1997, 42(2-3), p.329-336, 24 refs.
Pleistocene, Paleoclimatology, Ice sheets, Insolation, Radiation balance, Ice cover effect, Albedo, Heat loss, Models, Climatic factors

52-3542
Modeled glacial North Atlantic ice-rafted debris pattern and its sensitivity to various boundary conditions.
Matsumoto, K., *Paleoceanography,* Apr. 1997, 12(2), p.271-280, 19 refs.
Pleistocene, Oceanography, Sedimentation, Ice sheets, Surface drainage, Ocean currents, Meltwater, Icebergs, Ice rafting, Ice age theory, Models, Atlantic Ocean

52-3543
Temporal-geographical meltwater influences on the North Atlantic Conveyor: implications for the Younger Dryas.
Fanning, A.F., Weaver, A.J., *Paleoceanography,* Apr. 1997, 12(2), p.307-320, Refs. p.318-320.
Pleistocene, Oceanography, Paleoclimatology, Cooling, Ice sheets, Glacier melting, Meltwater, Surface drainage, Ocean currents, Salinity, Air ice water interaction, Mathematical models, Atlantic Ocean

52-3544
Coupled ocean-atmosphere model response to freshwater input: comparison to Younger Dryas event.
Manabe, S., Stouffer, R.J., *Paleoceanography,* Apr. 1997, 12(2), p.321-336, 58 refs.
Pleistocene, Oceanography, Paleoclimatology, Surface temperature, Cooling, Ice sheets, Meltwater, Ocean currents, Salinity, Air water interactions, Ice age theory, Models, Atlantic Ocean

52-3545
Origin of the middle Pleistocene transition by ice sheet erosion of regolith.
Clark, P.U., Pollard, D., *Paleoceanography,* Feb. 1998, 13(1), p.1-9, 74 refs.
Pleistocene, Ice age theory, Ice sheets, Ice volume, Calving, Glacier beds, Regolith, Ice solid interface, Glacial erosion, Deformation, Mathematical models

52-3546
Holocene tree limit history in the northern French Alps stomata and pollen evidence.
David, F., *Review of palaeobotany and palynology,* Sep. 1997, 97(3-4), p.227-237, With French summary. 38 refs.
Paleoecology, Paleobotany, Alpine landscapes, Forest lines, Peat, Sediments, Litter, Quaternary deposits, Palynology, Radioactive age determination, Indexes (ratios), Geochronology, France—Alps

52-3547
Magnetic properties of modern soils and Quaternary loessic paleosols: paleoclimatic implications.
Maher, B.A., *Palaeogeography, palaeoclimatology and paleoecology,* Feb. 1998, 137(1-2), p.25-54, 71 refs.
Paleoclimatology, Soil science, Soil classification, Soil formation, Loess, Remanent magnetism, Quaternary deposits, Stratigraphy, Statistical analysis, Correlation, X ray diffraction

52-3548
Oligocene to Miocene agglutinated foraminifers in deltaic and deep-water facies of the Beaufort-Mackenzie Basin.
Schröder-Adams, C.J., McNeil, D.H., *Canada. Geological Survey. Bulletin,* 1994, No.477, 67p., With French summary. Refs. p.44-48.
Marine geology, Geological surveys, Paleoecology, Sedimentation, Deltas, Quaternary deposits, Classifications, Wells, Hydrocarbons, Beaufort Sea

52-3549
Style and timing of glaciation in the Lahul Himalaya, northern India: a framework for reconstructing late Quaternary palaeoclimatic change in the western Himalayas.
Owen, L.A., Bailey, R.M., Rhodes, E.J., Mitchell, W.A., Coxon, P., *Journal of Quaternary science,* Mar.-Apr. 1997, 12(2), p.83-109, 42 refs.
Pleistocene, Paleoclimatology, Glacial geology, Mountain glaciers, Glacier oscillation, Moraines, Quaternary deposits, Geomorphology, Luminescence, Geochronology, Topographic effects, India—Himalaya Mountains

52-3550
Preliminary history of Holocene colluvial (debris-flow) activity, Leirdalen, Jotunheimen, Norway.
Matthews, J.A., Dahl, S.O., Berrisford, M.S., Nesje, A., Dresser, P.Q., Dumayne-Peaty, L., *Journal of Quaternary science,* Mar.-Apr. 1997, 12(2), p.117-129, Refs. p.127-129.
Geomorphology, Paleoclimatology, Alpine landscapes, Mass flow, Sedimentation, Quaternary deposits, Mineralogy, Stratigraphy, Landscape development, Peat, Radioactive age determination, Geochronology, Norway—Jotunheimen

52-3551
Relocation of earthquakes in the Cook Inlet area, south central Alaska, using the Joint Hypocenter Determination method.
Ratchkovsky, N.A., Pujol, J., Biswas, N.N., *Seismological Society of America. Bulletin,* June 1997, 87(3), p.620-636, 43 refs.
Earth crust, Tectonics, Seismic surveys, Seismic velocity, Earthquakes, Distribution, Wave propagation, Statistical analysis, Correlation, United States—Alaska—Cook Inlet

52-3552
Greenland earthquake of 11 July 1987 and post-glacial fault reactivation along a passive margin.
Chung, W.Y., Gao, H., *Seismological Society of America. Bulletin,* Aug. 1997, 87(4), p.1058-1068, 47 refs.
Tectonics, Subpolar regions, Marine geology, Geological surveys, Seismic surveys, Earthquakes, Wave propagation, Isostasy, Ice cover effect, Greenland

52-3553
Sea ice fields and atmospheric phenomena in Eurasiatic arctic seas as seen from the NOAA-12 satellite.
Anselme, B., *International journal of remote sensing,* Jan. 20, 1998, 19(2), p.307-316, 25 refs.
Oceanographic surveys, Ice surveys, Spaceborne photography, Sea ice distribution, Polynyas, Ice floes, Drift, Gravity waves, Wind direction, Air ice water interaction, Image processing, Barents Sea, Russia—Kara Sea

52-3554
β-galactosidase transferase activity in ice and use of vinyl-β-D-galactoside as donor.
Chiffoleau-Giraud, V., Spangenberg, P., Rabiller, C., *Tetrahedron: asymmetry,* June 27, 1997, 8(12), p.2017-2023, 19 refs.
Ice physics, Ice spectroscopy, Solutions, Polymers, Hydrocarbons, Frozen liquids, Molecular structure, Chemical analysis, Temperature effects, Spectra

52-3555
Spatial distribution of loess and loess-like sediments in the mountain areas of central and high Asia.
Lehmkuhl, F., *Zeitschrift für Geomorphologie,* Oct. 1997, Vol.111(suppl.), Middle-European Conference on Geomorphology, 2nd, Stuttgart, Germany, Sep. 30-Oct. 6, 1996. Proceedings. Eolian dynamics: landforms and processes. Edited by W.D. Blümel, p.97-116, With German summary. 37 refs.
Pleistocene, Mountain soils, Eolian soils, Soil profiles, Quaternary deposits, Loess, Frost weathering, Sedimentation, Distribution, Sampling, Mongolia, China—Tibet

52-3556
Observations on distribution and age of loess-like sediments in the high-mountain ranges of central China.
Rost, K.T., *Zeitschrift für Geomorphologie,* Oct. 1997, Vol.111(suppl.), Middle-European Conference on Geomorphology, 2nd, Stuttgart, Germany, Sep. 30-Oct. 6, 1996. Proceedings. Eolian dynamics: landforms and processes. Edited by W.D. Blümel, p.117-129, With German summary. 23 refs.
Pleistocene, Quaternary deposits, Mountain soils, Sedimentation, Eolian soils, Loess, Weathering, Distribution, Age determination, Grain size, China—Qinling Shan, China—Wutai Shan

52-3557
Early Quaternary genesis of glacial and aeolian forms in semi-arid Patagonia (Argentina).
Wenzens, G., Wenzens, E., Schellmann, G., *Zeitschrift für Geomorphologie,* Oct. 1997, Vol.111(suppl.), Middle-European Conference on Geomorphology, 2nd, Stuttgart, Germany, Sep. 30-Oct. 6, 1996. Proceedings. Eolian dynamics: landforms and processes. Edited by W.D. Blümel, p.131-144, With German summary. 14 refs.
Pleistocene, Geomorphology, Landforms, Sedimentation, Glacial geology, Quaternary deposits, Moraines, Eolian soils, Landscape development, Geochronology, Argentina—Patagonia

52-3558
Stratification of soil ecological processes: a study of birch forest floor in the Alaskan taiga.
Wagener, S.M., Schimel, J.P., *Oikos,* Feb. 1998, Vol.81, p.63-74, 36 refs.
Forest ecosystems, Plant ecology, Taiga, Forest soils, Soil microbiology, Nutrient cycle, Litter, Decomposition, Biomass, Stratification, Sampling, Seasonal variations, United States—Alaska—Fairbanks

52-3559
Electrofreezing effect and nucleation of ice crystals in free growth experiments.
Braslavsky, I., Lipson, S.G., *Applied physics letters,* Jan. 12, 1998, 72(2), p.264-266, 19 refs.
Ice physics, Ice crystal growth, Supercooling, Water, Freezing, Electric charge, Electric fields, Homogeneous nucleation, Capillary ice

52-3560
Structure and evolution of a continental winter cyclone, part II: frontal forcing of an extreme snow event.
Martin, J.E., *Monthly weather review,* Feb. 1998, 126(2), p.329-348, 43 refs.
Synoptic meteorology, Precipitation (meteorology), Snowstorms, Fronts (meteorology), Turbulent boundary layer, Atmospheric disturbances, Atmospheric circulation, Convection, Wind direction, Static stability, Mathematical models, United States

52-3561
Detection of viable yeast in 3-million-year-old permafrost soils of Siberia.
Dmitriev, V.V., Gilichinskiĭ, D.A., Faĭzutdinova, R.N., Shershunov, I.N., Golubev, V.I., Duda, V.I., *Microbiology,* Sep.-Oct. 1997, 66(5), p.546-550, Translated from Mikrobiologiia. 19 refs.
Pleistocene, Permafrost structure, Soil microbiology, Fungi, Detection, Viability, Classifications, Sampling, Chemical composition, Russia—Siberia

52-3562
Distribution, morphology and structure of sea ice pressure ridges in the Baltic Sea.
Kankaanpää, P., *Fennia,* 1997, 175(2), p.139-240, Refs. p.226-230.
Sea ice, Ice surveys, Pressure ridges, Ice mechanics, Ice water interface, Physical properties, Ice cover thickness, Distribution, Topographic features, Profiles, Terminology, Classifications, Statistical analysis, Baltic Sea

52-3563
Ablation of volatile films by laser heating of substrates.
Ellegaard, O., Schou, J., *Journal of applied physics,* Jan. 15, 1998, 83(2), p.1078-1086, 37 refs.
Ice physics, Lasers, Heating, Radiation absorption, Ablation, Sublimation, Water films, Substrates, Surface temperature, Ice solid interface, Heat transfer, Light effects

52-3564
Balance between hydrolysis and methanogenesis during the anaerobic digestion of organic matter.
Vavilin, V.A., Rytov, S.V., Lokshina, L.IA., *Microbiology,* Nov.-Dec. 1997, 66(6), p.712-717, Translated from Mikrobiologiia. 11 refs.
Soil microbiology, Tundra soils, Wetlands, Organic soils, Biomass, Sewage disposal, Sludges, Natural gas, Decomposition, Mathematical models, Simulation

52-3565
Kimberlites in the Slave Craton, Northwest Territories, Canada: a preliminary review.
Pell, J.A., *Russian geology and geophysics,* 1997, 38(1), International Kimberlite Conference, 6th, Novosibirsk, Russia, July 30- Aug. 19, 1995. Proceedings, Vol.1. Edited by N.V. Sobolev and R.H. Mitchell. Kimberlites, related rocks and mantle xenoliths, p.5-16, Translated from Geologiia i geofizika. 17 refs.
Geological surveys, Geologic processes, Subarctic landscapes, Geochemistry, Minerals, Earth crust, Exploration, Sedimentation, Rock properties, Lithology, Sampling, Canada—Northwest Territories

52-3566
Detailed petrology and geochemistry of a rare corundum eclogite xenolith from Obnazhennaya, Yakutia.
Qi, Q., Taylor, L.A., Snyder, G.A., Clayton, R.N., Mayeda, T.K., Sobolev, N.V., *Russian geology and geophysics,* 1997, 38(1), International Kimberlite Conference, 6th, Novosibirsk, Russia, July 30- Aug. 19, 1995. Proceedings, Vol.1. Edited by N.V. Sobolev and R.H. Mitchell. Kimberlites, related rocks and mantle xenoliths, p.247-260, Translated from Geologiia i geofizika. 32 refs.
Geologic processes, Subpolar regions, Earth crust, Minerals, Migration, Diagenesis, Geochemistry, Isotope analysis, Chemical composition, Lithology, Origin, Russia—Yakutia

52-3567
Variability in the location of the Antarctic Polar Front (90°-20°W) from satellite sea surface temperature data.
Moore, J.K., Abbott, M.R., Richman, J.G., *Journal of geophysical research,* Dec. 15, 1997, 102(C13), p.27,825-27,833, 38 refs.
Oceanography, Ocean currents, Surface temperature, Boundary layer, Fluid dynamics, Spaceborne photography, Radiometry, Sensor mapping, Topographic effects, —Scotia Sea, —Drake Passage
The path of the Antarctic Polar Front (PF) is mapped using satellite sea surface temperature data from the NOAA/NASA Pathfinder program. The mean path and variability of the PF are strongly influenced by bathymetry. Meandering intensity is weaker where the bathymetry is steeply sloped and increases in areas where the bottom is relatively flat. There is an inverse relationship between meandering intensity and both the width of the front and the change in temperature across it. There is a persistent, large separation between the surface and subsurface expressions of the PF at Ewing Bank on the Falkland Plateau. (Auth.)

52-3568
Temperature evolution of the upper ocean in the Greenland Sea January to March 1989.
Sutton, P.J., Morawitz, W.M.L., Worcester, P.F., Cornuelle, B.D., *Journal of geophysical research,* Dec. 15, 1997, 102(C13), p.27,861-27,874, 21 refs.
Oceanographic surveys, Subpolar regions, Water temperature, Temperature variations, Acoustic measurement, Profiles, Sea ice distribution, Ice cover effect, Heat flux, Turbulent diffusion, Greenland Sea

52-3569
Thermobaric effect on buoyancy-driven convection in cold sea water.
Løyning, T.B., Weber, J.E., *Journal of geophysical research,* Dec. 15, 1997, 102(C13), p.27,875-27,885, 23 refs.
Oceanography, Sea water freezing, Polynyas, Fluid dynamics, Water temperature, Thermal expansion, Buoyancy, Salinity, Stratification, Convection, Mathematical models

52-3570
Ice thickness in the Arctic Ocean: the statistical reliability of experimental data.
Wadhams, P., *Journal of geophysical research,* Dec. 15, 1997, 102(C13), p.27,951-27,959, 21 refs.
Oceanographic surveys, Ice surveys, Sea ice distribution, Ice cover thickness, Seasonal variations, Sampling, Ice bottom surface, Acoustic measurement, Subglacial observations, Accuracy, Statistical analysis, Arctic Ocean

52-3571
List of protected areas in Antarctica.
British Antarctic Survey, Cambridge, 1997, 33p., 4 refs.
Environmental protection, International cooperation, Regional planning
This booklet provides a reference list of all the existing protected areas designated in Antarctica as of the 20th Antarctic Treaty Consultative Meeting in Utrecht, 1996. There are 20 Specially Protected Areas, 35 Sites of Special Scientific Interest, 72 Historic Sites and Monuments, 3 CCAS Seal Reserves, 2 CCAMLR Ecosystem Monitoring Programme sites, one Tomb (the site of the Nov. 1979 aircraft crash on Mount Erebus), one Antarctic Specially Managed Area, one Specially Reserved Area, and one Multiple-use Planning Area.

52-3572
Britain's role in Antarctica.
British Antarctic Survey, Cambridge, 1993, 14p., 8 refs.
Research projects, Organizations, Stations, International cooperation, Environmental protection
This booklet briefly describes the United Kingdom's stations in Antarctica, scientific research, and participation in the Antarctic Treaty system.

52-3573
RRS *James Clark Ross*.
British Antarctic Survey, Cambridge, 1992, 4p.
Oceanographic ships, Research projects
This brochure briefly describes the performance capabilities and research activities of the RRS *James Clark Ross*, an ice-strengthened research vessel that can also serve as a cargo and personnel carrier for the British Antarctic Survey. A sketch of the ship is also provided.

52-3574
Rothera air facility.
British Antarctic Survey, Cambridge, 1992, 4p.
Aircraft landing areas, Runways, Stations, Logistics, Research projects, Antarctica—Rothera Station
The Rothera air facility consists of a 900-m long, crushed rock airstrip with parking area, hangar, and fuel storage tanks. It was built to support the research activities of the British Antarctic Survey at Rothera Station. It can accommodate the DHC-6 Twin Otter and the four-engined DHC-7.

52-3575
Halley research station.
British Antarctic Survey, Cambridge, 1992, 4p.
Stations, Buildings, Cold weather construction, Logistics, Research projects, Antarctica—Halley Station
This brochure briefly describes the Accommodation Building which houses the living quarters, the Ice and Climate Building, and the Space Sciences Building at Halley Station, and some of the major research programs which are carried out there. The buildings sit 4 m above the snow on independent jackable steel platforms. A cutaway sketch of the Accommodation Building is included.

52-3576
Oxygen isotope distribution, palynology and hydrochemistry of wedge ice in the organomineral complex of the Duvannyy Yar type section.
Vasil'chuk, IU.K., Vaĭkmiae, R.A., Punning, IA.M.K., Leĭbman, M.O., *USSR Academy of Sciences. Transactions. Earth science sections,* June 1988, 292(1), p.69-72, Translated from Akademiia nauk SSSR. Doklady, Vol.292, No.5, 1987, p.1207-1211. 12 refs.
Ice wedges, Ground ice, Fossil ice, Ice composition, Ice dating, Permafrost dating, Isotope analysis, Palynology, Paleobotany, Paleoclimatology, Russia—Kolyma River

52-3577
Experience of functional testing of winter tyres for passenger cars and heavy vehicles by means of the VTI indoor flat bed test facility and a mobile tyre test vehicle.
Nordström, O., Gustavsson, L.E., *Swedish National Road and Transport Research Institute (Statens väg- och transportforskningsinstitut). VTI särtryck,* 1998, No.291, n.p., Reprinted from PIARC (Permanent International Association of Road Congresses) International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998, Technical report volume 3, p.977-987.
Road icing, Tires, Rubber ice friction, Rubber snow friction, Traction, Skid resistance, Motor vehicles, Cold weather tests, Environmental tests, Sweden

52-3578
Program and abstracts. Arctic science and resource management: exploring the issues.
Arctic Division Science Conference, 48th, Valdez, AK, Sep. 24-27, 1997, Cooney, R.T., ed, Fairbanks, American Association for the Advancement of Science, Arctic Division, 1997, 124p.
Research projects, Regional planning, Economic development, Environmental impact, Environmental protection, Air pollution, Water pollution, Health

52-3579
Use of calcium chloride in alleviating frost heave of Alaskan granular soils.
Mays, R.H., Fairbanks, University of Alaska, 1986, 169p., M.S. thesis. 60 refs.
Subgrade soils, Saline soils, Soil structure, Soil freezing, Frost heave, Frost protection, Soil stabilization, Subgrade maintenance, Road maintenance

52-3580
Destructive snow and ice storm.
Illick, J.S., *Forest leaves,* 1916, Vol.15, p.103-107.
Snowstorms, Ice storms, Snow loads, Ice loads, Damage, Forest strips, Trees (plants), United States—Pennsylvania

52-3581
Increase in flood risk due to bedload—examples from the Swiss Alps.
Schilling, M., *International journal of sediment research,* Dec. 1997, 12(3), p.160-169, 5 refs.
River flow, Sediment transport, Suspended sediments, Bottom sediment, Alluvium, Flood forecasting, Flow control, Flood control, Switzerland

52-3582
Aircraft icing. Packaged literature search 85-1, Washington, D.C., U.S. National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service, 1985, 88p., 254 citations.
Aircraft icing, Bibliographies

52-3583
Termination of drift station North Pole 4. [Okonchanie dreĭfa stantsii "Severnyĭ polius-4"]
Petrov, I.G., *Problemy arktiki,* 1958, No.2, p.108, In Russian.
Drift stations, Ice islands, Drift

52-3584
Natural hazards in Switzerland: their appearance as an indication of climate change. [Naturgefahren in der Schweiz: Entwicklung im Zeichen der Klimaänderung]
Vischer, D., *Schweizer Ingenieur und Architekt,* 1997, No.47, 5p., In German. 6 refs.
Avalanches, Floods, Accidents, Climatic changes, Global warming, Switzerland

52-3585
Natural hazards and climate change in Switzerland: no detectable increase in disasters due to a climate warming. [Naturgefahren und Klimaänderung in der Schweiz: Keine nachweisbaren Häufungen von Katastrophen infolge einer Klimaerwärmung]
Vischer, D.L., *Neue Zürcher Zeitung,* Nov. 12, 1997, No.263, p.71, In German.
Floods, Avalanches, Climatic changes, Global warming, Switzerland

52-3586
Influence of applied voltage on the surface conductivity of atmospheric ice deposited on insulating surfaces.
Farzaneh, M., Chen, X., Zhang, J., IEEE International Symposium on Electrical Insulation, Montréal, Québec, Canada, June 16-19, 1996. Conference record, Windsor, Institute of Electrical and Electronics Engineers, Inc., 1996, p.275-278, 15 refs.
DLC TK3401.I13a 1996
Power line icing, Ice accretion, Electrical resistivity, Electrical insulation, Ice electrical properties, Charge transfer, Ice cover effect, Ice solid interface, Electrical measurement

52-3587
Influence of air temperature on flashover along ice surfaces.
Zhang, J., Farzaneh, M., Chen, X., IEEE International Symposium on Electrical Insulation, Montréal, Québec, Canada, June 16-19, 1996. Conference record, Windsor, Institute of Electrical and Electronics Engineers, Inc., 1996, p.324-327, 16 refs.
DLC TK3401.I13a 1996
Power line icing, Electrical insulation, Electrical resistivity, Charge transfer, Ice accretion, Air temperature, Ice air interface, Ice solid interface, Temperature effects, Ice electrical properties, Electrical measurement

52-3588
System for near real time processing of NOAA-AVHRR satellite data: application to snow monitoring in Scotland.
Marçal, A.R.S., Slater, M.T., International Conference on Image Processing and its Applications, 6th, Dublin, Ireland, July 14-17, 1997. Proceedings, Vol.2 and IEE conference publication No.443, Bedfordshire, Institution of Electrical Engineers, 1997, p.546-549, 3 refs.
DLC TA1637.I553
Remote sensing, Spaceborne photography, Radiometry, Image processing, Snow surveys, Sensor mapping, Snow cover distribution, Data processing, Time factor, United Kingdom—Scotland

52-3589
Anisotropy in structural phase transitions at ice surfaces: a molecular dynamics study.
Nada, H., Furukawa, Y., *Applied surface science,* Nov. 1997, Vol.121-122, International Symposium on Surface Nano-Control of Environmental Catalysts and Related Materials, 6th, Tokyo, Japan, Nov. 25-27, 1996. Proceedings. Edited by Y. Murata et al, p.445-447, 12 refs.
Ice physics, Molecular structure, Ice surface, Ice melting, Ice water interface, Molecular energy levels, Anisotropy, Phase transformations, Simulation

52-3590
Spatial and temporal variation of sublimation on Antarctica: results of a high-resolution general circulation model.
Van den Broeke, M.R., *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.29,765-29,777, 50 refs.
Precipitation (meteorology), Polar atmospheres, Atmospheric circulation, Advection, Sublimation, Moisture transfer, Snow evaporation, Snow heat flux, Snow air interface, Models, Seasonal variations
This paper uses a high-resolution general circulation model to study the spatial and temporal variation of snow sublimation on Antarctica. The model results suggest that 10-15% of the annual precipitation over Antarctica is lost through sublimation and that sublimation plays an important role in the formation of blue ice areas. Dry air advection, and thus surface sublimation, is enhanced in areas where katabatic winds are strong and have a large downslope component and where the antarctic topography drops suddenly from the plateau to the coastal zone. (Auth. mod.)

52-3591
Interdependence of the tropical and extratropical QBO: relationship to the solar cycle versus a biennial oscillation in the stratosphere.
Salby, M., Callaghan, P., Shea, D., *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.29,789-29,798, 18 refs.
Climatology, Polar atmospheres, Stratosphere, Air temperature, Temperature variations, Atmospheric circulation, Gravity waves, Oscillations, Seasonal variations, Solar radiation, Correlation, Mathematical models

52-3592
Simulation and validation of arctic radiation and clouds in a regional climate model.
Rinke, A., Dethloff, K., Christensen, J.H., Botzet, M., Machenhauer, B., *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.29,833-29,847, 48 refs.
Climatology, Polar atmospheres, Insolation, Radiation balance, Cloud cover, Radiation absorption, Haze, Seasonal variations, Simulation, Models

52-3593

Near-field measurements on contrail properties from fuels with different sulfur content.

Petzold, A., et al, *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.29,867-29,880, 39 refs.

Climatology, Aerosols, Air pollution, Fuels, Chemical composition, Condensation nuclei, Condensation trails, Heterogeneous nucleation, Homogeneous nucleation, Ice formation, Sampling, Particle size distribution, Environmental tests

52-3594

Assessment of the record of the 1982 El Chichón eruption as preserved in Greenland snow.

Zielinski, G.A., et al, *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.30,031-30,045, Refs. p.30,043-30,045.

Climatology, Atmospheric composition, Stratosphere, Aerosols, Volcanic ash, Sedimentation, Snow air interface, Snow composition, Chemical analysis, Ice cores, Electron microscopy, Greenland

52-3595

Detailed assessment of snow accumulation in katabatic wind areas of the Ross Ice Shelf, Antarctica.

Braaten, D.A., *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.30,047-30,058, 15 refs.

Precipitation (meteorology), Snow accumulation, Snow depth, Wind erosion, Ultrasonic tests, Wind factors, Snow air interface, Sampling, Turbulent boundary layer, Coring, Glacier ablation, Antarctica—Ross Ice Shelf

An investigation of time dependent snow accumulation and erosion dynamics in a wind-swept environment was undertaken at two automatic weather station sites on the Ross Ice Shelf between Jan. 1994 and Nov. 1995 using a technique which automatically disperses glass microspheres onto the snow surface at fixed intervals throughout the year. The microspheres act as a time marker and tracer to allow the accumulation rate and wind erosion processes to be quantified with a high temporal resolution. The two sites chosen for this investigation have characteristically different mean wind speeds and therefore allow a comparative examination on the role of wind on ice sheet growth. Accumulation rates derived from an ultrasonic snow depth gauge operated at one of the sites are compared to the actual tracer-derived accumulation rates and show the limitations of only having a measure of snow surface height with no instantaneous measurements of the snowy density profile. Snow depth gauge derived accumulation rates were found to be greatly overestimated during high-accumulation periods and were greatly underestimated during low-accumulation periods. (Auth. mod.)

52-3596

Temporal and spatial variability of snow accumulation in central Greenland.

Kuhns, H., Davidson, C., Dibb, J., Stearns, C., Bergin, M., Jaffrezo, J.L., *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.30,059-30,068, 12 refs.

Climatology, Precipitation (meteorology), Snow accumulation, Snow depth, Seasonal variations, Ice cores, Sampling, Correlation, Statistical analysis, Accuracy, Greenland—Crete, Greenland—Summit

52-3597

Reconstructing recent atmospheric trace gas concentrations from polar firn and bubbly ice data by inverse methods.

Rommelaere, V., Arnaud, L., Barnola, J.M., *Journal of geophysical research,* Dec. 27, 1997, 102(D25), p.30,069-30,083, 25 refs.

Climatology, Atmospheric composition, Aerosols, Snow composition, Porosity, Firn, Bubbles, Snow air interface, Vapor diffusion, Ice cores, Chemical analysis, Mathematical models, Correlation, Antarctica—Vostok Station

The authors present a method to extract the atmospheric signal of trace gas mixing ratios from firn and bubbly ice measurements. This method, validated using data from antarctic sites (Vostok and DE08), includes a numerical model that simulates air transport in the firn, and inverse theory. This study also provides information on the effective diffusity-porosity relationship and quantifies the smoothing effect due to gas diffusion in firn and at pore closure, showing the typical time periods of events that are filtered by the firn and therefore not observed in the gas record of ice cores. (Auth. mod.)

52-3598

Analytical study of the effect of natural convection on cryogenic pipe freezing.

Keary, A.C., Bowen, R.J., *International journal of heat and mass transfer,* May 1998, 41(10), p.1129-1138, 11 refs.

Cryogenics, Pipeline freezing, Sealing, Ice formation, Freezing front, Convection, Ice water interface, Freezing points, Heat transfer coefficient, Mathematical models, Forecasting

52-3599

Transport of ^{137}Cs and $^{239,240}Pu$ with ice-rafted debris in the Arctic Ocean.

Landa, E.R., Reimnitz, E., Beals, D.M., Pochkowski, J.M., Winn, W.G., Rigor, I., *Arctic,* Mar. 1998, 51(1), p.27-39, With French summary. Refs. p.37-39.

Oceanographic surveys, Water pollution, Radioactive wastes, Radioactive isotopes, Sea ice, Ice rafting, Drift, Sediment transport, Ice composition, Sampling, Environmental tests, Isotope analysis, Arctic Ocean

52-3600

Observations of the terminus of Bunde Glacier, Axel Heiberg Island, Northwest Territories, Canada in 1955 and 1983.

McMillan, N.J., *Arctic,* Mar. 1998, 51(1), p.55-57, With French summary. 6 refs.

Glaciology, Glacier surveys, Glacier oscillation, Glacier tongues, Ice edge, Periodic variations, Canada—Northwest Territories—Axel Heiberg Island

52-3601

Diurnal variations of surface ozone on Kola peninsula: preliminary results.

Larin, V.F., Beloglazov, M.I., Vasil'ev, A.N., Rumiantsev, S.A., *Annales geophysicae,* Dec. 1997, 15(12), p.1615-1616, 10 refs.

Climatology, Polar atmospheres, Atmospheric boundary layer, Atmospheric composition, Ozone, Sampling, Luminescence, Diurnal variations, Photochemical reactions, Ultraviolet radiation, Russia—Kola Peninsula

52-3602

Vitrification properties of solutions of ethylene glycol in saline containing PVP, Ficoll, or dextran.

Shaw, J.M., Kuleshova, L.L., MacFarlane, D.R., Trounson, A.O., *Cryobiology,* Nov. 1997, 35(3), p.219-229, 39 refs.

Cryobiology, Low temperature research, Preserving, Vitreous ice, Solutions, Phase transformations, Melting points, Cracking (fracturing), Polymers, Chemical composition, Temperature measurement

52-3603

Tree-ring growth and structure of *Pinus uncinata* and *Pinus sylvestris* in the Central Spanish Pyrenees.

Camarero, J.J., Guerrero-Campo, J., Gutiérrez, E., *Arctic and alpine research,* Feb. 1998, 30(1), p.1-10, 39 refs.

Plant ecology, Trees (plants), Plant physiology, Plant tissues, Growth, Phenology, Alpine landscapes, Sampling, Seasonal variations, Temperature effects, Climatic factors, Spain—Pyrenees

52-3604

Influence of the dominant grass *Festuca varia* Haenke on the spatial pattern of alpine grasslands in the northwestern Caucasus, Russia.

Pokarzhevskaia, G.A., *Arctic and alpine research,* Feb. 1998, 30(1), p.11-18, 37 refs.

Plant ecology, Alpine landscapes, Ecosystems, Grasses, Distribution, Growth, Vegetation patterns, Physical properties, Sampling, Statistical analysis, Russia—Caucasus

52-3605

Seasonality of nutrient availability in soils of subarctic mountain birch woodlands, Swedish Lapland.

Weih, M., *Arctic and alpine research,* Feb. 1998, 30(1), p.19-25, 38 refs.

Forest soils, Soil chemistry, Soil tests, Forest ecosystems, Subarctic landscapes, Ion exchange, Nutrient cycle, Snowmelt, Seepage, Seasonal variations, Sweden—Lapland

52-3606

Nitrogen and carbon soil dynamics in response to climate change in a high-elevation ecosystem in the Rocky Mountains, U.S.A.

Williams, M.W., Brooks, P.D., Seastedt, T., *Arctic and alpine research,* Feb. 1998, 30(1), p.26-30, 22 refs.

Mountain soils, Alpine landscapes, Climatic changes, Global warming, Soil chemistry, Soil temperature, Snow fences, Snow depth, Snow cover effect, Vapor transfer, Simulation, United States—Colorado—Rocky Mountains

52-3607

Effects of established willows on primary succession on Lyman Glacier forefront, North Cascade Range, Washington, U.S.A.: evidence for simultaneous canopy inhibition and soil facilitation.

Jumpponen, A., Mattson, K., Trappe, J.M., Ohtonen, R., *Arctic and alpine research,* Feb. 1998, 30(1), p.31-39, 50 refs.

Forest ecosystems, Alpine landscapes, Forest canopy, Plant ecology, Growth, Vegetation patterns, Glacier tongues, Ice edge, Soil formation, Organic soils, United States—Washington—North Cascade Range

52-3608

Methodology and implications of maximum paleodischarge estimates for mountain channels, upper Animas River basin, Colorado, U.S.A.

Pruess, J., Wohl, E.E., Jarrett, R.D., *Arctic and alpine research,* Feb. 1998, 30(1), p.40-50, 50 refs.

Flood forecasting, Alpine landscapes, River basins, Precipitation (meteorology), Channels (waterways), Sediments, Lithology, Classifications, Altitude, Statistical analysis, Periodic variations, United States—Colorado—Animas River

52-3609

Spatial and temporal patterns of Late Holocene rockfall activity on a Norwegian talus slope: a lichenometric and simulation-modeling approach.

McCarroll, D., Shakesby, R.A., Matthews, J.A., *Arctic and alpine research,* Feb. 1998, 30(1), p.51-60, 36 refs.

Geomorphology, Slope processes, Alpine landscapes, Talus, Mass transfer, Sedimentation, Periglacial processes, Lichens, Age determination, Rock properties, Models, Norway—Visdalen

52-3610

Modern benthic foraminifera off Novaya Zemlya tidewater glaciers, Russian Arctic.

Korsun, S., Hald, M., *Arctic and alpine research,* Feb. 1998, 30(1), p.61-77, 56 refs.

Marine biology, Glacial hydrology, Meltwater, Biomass, Ecosystems, Plankton, Bottom sediment, Lithology, Paleoecology, Sampling, Classifications, Russia—Novaya Zemlya

52-3611

Host-specific insect herbivores as sensors of climate change in arctic and alpine environments.

Hodkinson, I.D., Bird, J., *Arctic and alpine research,* Feb. 1998, 30(1), p.78-83, 53 refs.

Ecosystems, Plant ecology, Biomass, Distribution, Altitude, Monitors, Alpine landscapes, Arctic landscapes, Climatic changes, Temperature effects, Sampling, Statistical analysis

52-3612
Projections of sea-level change in Hudson and James Bays, Canada, due to global warming.
Gough, W.A., *Arctic and alpine research,* Feb. 1998, 30(1), p.84-88, 20 refs.
Climatology, Global warming, Sea level, Isostasy, Thermal expansion, Land ice, Ice melting, Correlation, Models, Environmental impact, Environmental tests, Canada—Hudson Bay, Canada—Quebec—James Bay

52-3613
Three Holocene tephras identified in lacustrine sediment cores from the Wonder Lake area, Denali National Park and Preserve, Alaska, U.S.A.
Child, J.K., Begét, J.E., Werner, A., *Arctic and alpine research,* Feb. 1998, 30(1), p.89-95, 13 refs.
Geochronology, Subarctic landscapes, Volcanic ash, Lacustrine deposits, Quaternary deposits, Remanent magnetism, Drill core analysis, Radioactive age determination, Stratigraphy, United States—Alaska—Wonder Lake

52-3614
Winter CO_2 fluxes in a boreal forest.
Winston, G.C., Sundquist, E.T., Stephens, B.B., Trumbore, S.E., *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.28,795-28,804, 46 refs.
Forest ecosystems, Forest soils, Frozen ground chemistry, Decomposition, Soil temperature, Snow air interface, Carbon dioxide, Vapor transfer, Seasonal variations, Snow cover effect, Isotope analysis, Geochemical cycles, Canada—Manitoba—Thompson

52-3615
Albedo over the boreal forest.
Betts, A.K., Ball, J.H., *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.28,901-28,909, 20 refs.
Forest ecosystems, Forest land, Atmospheric boundary layer, Albedo, Snow cover effect, Snow cover distribution, Vegetation factors, Forest canopy, Statistical analysis, Radiometry, Seasonal variations, Canada—Manitoba, Canada—Saskatchewan

52-3616
Seasonal trends in energy, water, and carbon dioxide fluxes at a northern boreal wetland.
Lafleur, P.M., McCaughey, J.H., Joiner, D.W., Bartlett, P.A., Jelinski, D.E., *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,009-29,020, 31 refs.
Forest ecosystems, Wetlands, Phenology, Hydrologic cycle, Carbon dioxide, Albedo, Radiation balance, Surface energy, Snow cover effect, Snowmelt, Vapor transfer, Radiometry, Seasonal variations, Canada—Manitoba—Thompson

52-3617
Sensitivity of spruce/moss boreal forest net ecosystem productivity to seasonal anomalies in weather.
Frolking, S., *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,053-29,064, 46 refs.
Forest ecosystems, Biomass, Growth, Decomposition, Geochemical cycles, Precipitation (meteorology), Meteorological factors, Temperature effects, Snowmelt, Snow cover effect, Seasonal variations, Models, Simulation, Canada—Manitoba—Thompson

52-3618
Variation of snow cover ablation in the boreal forest: a sensitivity study on the effects of conifer canopy.
Davis, R.E., et al, MP 5115, *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,389-29,395, 30 refs.
Forest ecosystems, Forest canopy, Radiation balance, Solar radiation, Surface energy, Snow hydrology, Snowmelt, Snow air interface, Turbulent exchange, Snow cover effect, Models, Vegetation factors, Wind factors, Canada—Manitoba—Thompson
Characteristics of conifer canopies exert important control on the energy exchange at the forest floor, which in turn controls snow cover processes such as melting. This analysis investigated the role of the conifer tree characteristics, including height and canopy density. Canopy and snow models estimated radiation incoming to the snow surface, the net energy budget of the snow, and melting rates of snow cover under conifer forests with different canopy density and tree height. Measurements during winter and thaw in 1994 of incoming solar and longwave radiation, humidity, and wind speed above the forest canopy provided input to the models, along with air temperature measured in the canopy. Results showed the importance of canopy density and tree height as the first-order controls on cumulative incoming solar radiation at the forest floor. The combined canopy and snow models showed a large range of snow ablation within conifers, which showed the trade-offs between canopy density and tree height.

52-3619
Snow ablation modeling at the stand scale in a boreal jack pine forest.
Hardy, J.P., et al, MP 5116, *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,397-29,405, 34 refs.
Forest ecosystems, Forest canopy, Snow cover distribution, Snow hydrology, Snowmelt, Solar radiation, Water balance, Surface energy, Radiation balance, Snow water equivalent, Snow air interface, Vegetation factors, Models
The purpose of this study is to predict spatial distributions of snow properties important to the hydrology and the remote sensing signatures of the boreal ecosystem. This study is part of the Boreal Ecosystems Atmosphere Study of central Saskatchewan and northern Manitoba. Forested environments provide unique problems for snow cover process modeling due to the complex interactions among snow, energy transfer, and trees. These problems are approached by coupling a modified snow process model with a model of radiative interactions with forest canopies. Additionally, a tree well model describes the influence of individual trees on snow distribution on the ground. Field data consisted of measured meteorological parameters above and within the canopy, spatial variability of snow properties, and variations of incoming solar irradiance beneath the forest canopy. Results show that the area beneath tree canopies accumulated 60% of the snow accumulated in forest openings. Peak solar irradiance on the snow cover was less than one half that measured above the canopy. Model runs are compared between the open and the forested sites.

52-3620
Modeling soil temperature and snow dynamics in northern forests.
Levine, E.R., Knox, R.G., *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,407-29,416, 15 refs.
Forest soils, Forest ecosystems, Soil physics, Soil profiles, Soil temperature, Phase transformations, Frozen ground temperature, Permafrost origin, Snow depth, Snow cover distribution, Models, Simulation

52-3621
Snow parameters derived from microwave measurements during the BOREAS winter field campaign.
Chang, A.T.C., et al, *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,663-29,671, 46 refs.
Snow surveys, Aerial surveys, Radiometry, Forest land, Forest canopy, Snow cover distribution, Snow water equivalent, Lake ice, Ice cover thickness, Brightness, Vegetation factors, Air temperature, Canada—Manitoba—Thompson

52-3622
Winter and spring thaw as observed with imaging radar at BOREAS.
Way, J.B., Zimmermann, R., Rignot, E., McDonald, K., Oren, R., *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,673-29,684, 39 refs.
Forest ecosystems, Forest soils, Forest canopy, Plant physiology, Spaceborne photography, Radar echoes, Backscattering, Soil freezing, Seasonal freeze thaw, Photosynthesis, Geochemical cycles, Canada—Manitoba, Canada—Saskatchewan

52-3623
Ice storm damage to urban trees.
Hauer, R.J., Wang, W.S., Dawson, J.O., *Journal of arboriculture,* July 1993, 19(4), p.187-193, With French and German summaries. 27 refs.
Ice storms, Glaze, Ice loads, Trees (plants), Damage, Urban planning, Cost analysis, United States—Illinois

52-3624
New method for melting ice on overhead transmission lines.
Dmitriev, K.S., Gonik, IA.E., *Electrical technology,* 1997, No.1, p.17-28, Translated from Elektrichestvo, No.11, 1997, p.11-17. 7 refs.
Power line icing, Electric equipment, Electric heating, Ice melting, Artificial melting, Ice removal

52-3625
Study on ice adhesiveness to water-repellent coating.
Saito, H., Takai, K., Yamauchi, G., *Materials science research international,* 1997, 3(3), p.185-189, 25 refs.
Radio communication, Antennas, Ice adhesion, Ice prevention, Protective coatings, Wettability, Waterproofing

52-3626
Effect of studded tires on skid resistance and pavement wear.
New York State Department of Public Works. Bureau of Physical Research, Physical research report, RR 65-3, Albany, NY, 1965, 11p., 5 refs.
Road icing, Tires, Rubber snow friction, Rubber ice friction, Skid resistance, Traction, Pavements, Abrasion, United States—New York

52-3627
Nuclear power plant cold weather problems and protective measures.
Padovan, L.M., *U.S. Nuclear Regulatory Commission. Office for Analysis and Evaluation of Operational Data. Engineering evaluation report,* Dec. 1997, AEOD/E97-03, 33p., Refs. p.1,31-33.
Nuclear power, Cooling systems, Water intakes, Ice loads, Ice control, Accidents, Safety, Cold weather operation

52-3628
Erosional and depositional history of two delta lakes in arctic Alaska.
Roselle, D.L., Walker, H.J., *Heidelberger geographische Arbeiten,* 1996, No.104, p.413-426, With German summary. 11 refs.
Deltas, Frozen lakes, Thermokarst lakes, Permafrost beneath lakes, Permafrost hydrology, Water erosion, Soil erosion, Shore erosion, Alluvium, Lacustrine deposits, Drainage, United States—Alaska—Colville River Delta

52-3629
Marine aerosols index for biological productivity and significance to ice core study.
Cao, J.Z., Li, T.J., *Chinese journal of polar research,* Dec. 1997, 9(4), p.254-257, In Chinese with English summary. 14 refs.
Marine biology, Ice cores, Air water interactions, Atmospheric composition, Aerosols, Ice composition, Air pollution, Paleoclimatology, Antarctica—Vostok Station
Marine biological productivity determines the sea water sulfur emissions, which are a more significant contribution to atmospheric sulfur than anthropogenic emissions or long-range transportation. The concentrations of sulfur and chloride in the coarse part of marine aerosols are reviewed in this paper. The spatial distributions of non-seasalt S (nss-S) and Cl are closely correlated, which shows that they are of the same origin and that they are influenced by total aerosol flux of sea surface with the atmosphere. The ratio of nss-S to Cl agrees well with the spatial distribution of marine primary productivity, and can be used as an accurate index for marine biological activity. The ratio of nss-S to the total seasalt concentration in a Vostok ice core is calculated and shows a similar trend to that of the temperature. (Auth. mod.)

52-3630
Comparison of biological proxy recorded in Antarctic lake sediments and ice core in the recent 4000 years.
Cao, J.Z., Li, T.J., *Chinese journal of polar research,* Dec. 1997, 9(4), p.258-261, In Chinese with English summary. 6 refs.
Geochemistry, Limnology, Lacustrine deposits, Global change, Marine biology, Ice cores, Antarctica—Zhongshan Station
The sedimentation rate of Lake Nella near Zhongshan Station is deduced according to the ice sheet retreat rate and the temporal variations of sulfur concentrations in the sediments of the lake. The 4,000-yr variations of sulfur concentrations, index for biological activity in sediments of West Antarctica and East Antarctica is compared with that of $CH_3SO^-_3$, index for marine biological activity in the D10 ice core. The results show that the three curves are very similar indicating global change in the past 4,000 yrs. The highest biological activity was between 1850 BP and 1150 BP. (Auth. mod.)

52-3631
Grain size characteristics and environmental indication of the sediments around Great Wall Station, Antarctica.
Liu, G.N., Cui, Z.J., Xiong, H.G., *Chinese journal of polar science,* Dec. 1997, 8(2), p.111-120, 14 refs.
Glacial geology, Glacial deposits, Periglacial processes, Grain size, Sediments, Particle size distribution, Antarctica—Great Wall Station
The Great Wall Station sediments can be divided into glacial, periglacial, fluvial lacustrine and littoral deposits in origin. Analysis of the fine particles (below 3.52 mm) shows obvious differences among grain size composition, frequency curve, accumulative curve and scatter diagram. In the periglacial-glacial-fluvial-littoral deposits, sand increases, silt and clay decreases; skewness changes from very positive to symmetric. The scatter diagram of grain size parameters shows differences in the sediments. Variation among frequency curves reflects processing and forming conditions of the sediments. The fluvial and littoral deposits follow normal distribution. The glacial and periglacial deposits follow Rosin's distribution. (Auth. mod.)

52-3632
Atmospheric ice—a major gap in understanding the effects of clouds on climate.
Stephens, G.L., Jakob, C., Miller, M., *Global Energy and Water Cycle Experiment. GEWEX news,* Feb. 1998, 8(1), p.1,4-8,20, 19 refs.
Cloud cover, Cloud physics, Ice crystal size, Atmospheric composition, Water vapor, Humidity, Hydrologic cycle, Radiation balance

52-3633
Wintertime surface energy budget within the GCIP domain.
Meyers, T.P., Hollinger, S., *Global Energy and Water Cycle Experiment. GEWEX news,* Feb. 1998, 8(1), p.10-13, 3 refs. GCIP is an acronym for GEWEX Continental-Scale International Project.
Soil air interface, Heat flux, Heat balance, Evapotranspiration, Atmospheric circulation, Computerized simulation

52-3634
Mechanism of frost heave by film water migration under temperature gradient.
Xu, X.Z., et al, *Chinese science bulletin,* Aug. 1997, 42(15), p.1290-1294, 7 refs.
Soil freezing, Freezing front, Frost heave, Frozen ground thermodynamics, Temperature gradients, Water films, Soil water migration

52-3635
Trees in a glaze storm.
Rogers, W.E., *Tycos-Rochester,* Jan. 1924, 14(1), p.4-8.
Ice storms, Glaze, Ice loads, Trees (plants), Damage, United States—Great Lakes

52-3636
Influence of glaze storms upon hardwood forests in the southern Appalachians.
Abell, C.A., *Journal of forestry,* 1934, Vol.32, p.35-37.
Ice storms, Glaze, Ice loads, Trees (plants), Forest strips, Damage, United States—North Carolina

52-3637
Guts, technology bolster cold weather construction.
Bennett, F.L., *Roads & bridges,* Nov. 1989, 27(11), p.50,52,56.
Winter concreting, Cold weather construction, Road maintenance, Highway planning

52-3638
1996-97 snow season.
Kocin, P.J., Gartner, W.E., Graf, D.H., *Weatherwise,* Mar.-Apr. 1998, 51(2), p.47-54.
Climatology, Weather observations, Snowstorms, Snow accumulation, Seasonal variations, Statistical analysis, United States

52-3639
Temperature extremes.
Hickox, D.H., *Weatherwise,* Mar.-Apr. 1998, 51(2), p.56-60.
Climatology, Weather observations, Air temperature, Temperature variations, Records (extremes), Seasonal variations, Statistical analysis, United States

52-3640
Comparison of near-infrared diode laser techniques for airborne hygrometry.
Silver, J.A., Hovde, D.C., *Journal of atmospheric and oceanic technology,* Feb. 1998, 15(1)pt.1, p.29-35, 17 refs.
Meteorological instruments, Aerial surveys, Hygrometers, Sensors, Spectroscopy, Lasers, Freezing points, Performance

52-3641
Accuracy of NWS 8" standard nonrecording precipitation gauge: results and application of WMO intercomparison.
Yang, D.Q., et al, MP 5117, *Journal of atmospheric and oceanic technology,* Feb. 1998, 15(1)pt.1, p.54-68, 36 refs.
Precipitation (meteorology), Precipitation gages, Standards, Accuracy, Rain, Snow accumulation, Wind velocity, Performance, Correlation, Statistical analysis, United States—Alaska—Barrow
The standard 8" nonrecording precipitation gauge has been used by the National Weather Service as the official precipitation measurement instrument of the U.S. climate station network. From 1986 to 1992, the accuracy and performance of this gauge were evaluated during the WMO Solid Precipitation Measurement Intercomparison at 3 stations in the U.S. and Russia, representing a variety of climate, terrain, and exposure. The double-fence intercomparison reference was the reference standard used at all the intercomparison stations in the Intercomparison project. The Intercomparison data collected at different sites are compatible with respect to the catch ratio for the same gauges, when compared using wind speed at the height of gauge orifice during the observation period. The effects of environmental factors, such as wind speed and temperature, on the gauge catch were investigated. Wind speed was found to be the most important factor determining gauge catch when precipitation was classified into snow, mixed, and rain. The regression functions of the catch ratio versus wind speed at the gauge height on a daily time step were derived for various types of precipitation. Independent checks of the equations have been conducted at these intercomparison stations and good agreement was obtained. Application of the correction procedures for wind, wetting loss, and trace amounts was made daily at Barrow, AK, for 1982 and 1983, and, on average, the gauge-measured precipitation was increased by 20% for rain and 90% for snow.

52-3642
Airborne APT weather satellite imaging system.
Jordan, J.E., Marcotte, D.L., Moore, G.W.K., *Journal of atmospheric and oceanic technology,* Feb. 1998, 15(1)pt.1, p.80-88, 5 refs.
Weather forecasting, Spaceborne photography, Radiometry, Subpolar regions, Marine meteorology, Meteorological data, Computer programs, Data processing, Image processing, Antennas, Performance

52-3643
Comparisons of ice cloud parameters obtained by combined remote sensor retrievals and direct methods.
Matrosov, S.Y., et al, *Journal of atmospheric and oceanic technology,* Feb. 1998, 15(1)pt.1, p.184-196, 28 refs.
Climatology, Cloud cover, Cloud physics, Optical properties, Water content, Ice crystals, Particle size distribution, Remote sensing, Radiometry, Sampling, Accuracy, Correlation, Statistical analysis

52-3644
TRANSDRIFT III Expedition: Freezeup studies in the Laptev Sea.
Kassens, H., ed, Dmitrenko, I., ed, Timokhov, L., ed, Thiede, J., ed, *Berichte zur Polarforschung,* 1997, No.248, p.1-190, With Russian introduction p.1-3. 35 refs.
Sea ice, Sediments, Polynyas, Freezeup, Plankton, Water temperature, Russia—Laptev Sea

52-3645
Expedition to the Lena and Yana Rivers, June-September 1995.
Rachold, V., Hoops, E., Alabian, A.M., Korotaev, V.N., Zaitsev, A.A., *Berichte zur Polarforschung,* 1997, No.248, p.197-210, 12 refs.
River flow, Sediments, Hydrology, Water supply, Russia—Lena River, Russia—Yana River, Russia—Laptev Sea

52-3646
Late Quaternary glacial history and paleoceanographic reconstructions along the East Greenland continental margin: evidence from high resolution records of stable isotopes and ice rafted debris. [Spätquartäre Vereisungsgeschichte und paläozeanographische Rekonstruktionen am ostgrönländischen Kontinentalrand]
Nam, S.I., *Berichte zur Polarforschung,* 1997, No.241, 157p., With German summary. Refs. p.138-157.
Paleoclimatology, Ice sheets, Sea ice, Ice rafting, Ice cores, Sediments, Ocean currents, Sea water, Chemical composition, Greenland Sea, Norwegian Sea, Iceland Sea

52-3647
Factors influencing the retention of hydrogen peroxide and molecular oxygen in rime ice.
Snider, J.R., Huang, J., *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1405-1415, 34 refs.
Cloud physics, Supercooled clouds, Cloud droplets, Turbulent diffusion, Aerosols, Solubility, Phase transformations, Ice vapor interface, Hoarfrost, Mass transfer, Wind tunnels

52-3648
Ozone and meteorology during the 1994 Polar Sunrise Experiment.
Hopper, J.F., Barrie, L.A., Silis, A., Hart, W., Gallant, A.J., Dryfhout, H., *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1481-1492, 21 refs.
Climatology, Polar atmospheres, Marine atmospheres, Atmospheric composition, Atmospheric boundary layer, Ozone, Turbulent diffusion, Degradation, Profiles, Sounding, Snow air interface, Arctic Ocean

52-3649
High-latitude stratospheric NO_2 and HNO_3 over Fairbanks (65°N) 1992-1994.
Slusser, J., et al, *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1549-1554, 40 refs.
Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Ozone, Heterogeneous nucleation, Seasonal variations, Spectroscopy, Photochemical reactions, United States—Alaska—Fairbanks

52-3650
Sulfur chemistry in the Antarctic Troposphere Experiment: an overview of project SCATE.
Berresheim, H., Eisele, F.L., *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1619-1627, 49 refs.
Climatology, Polar atmospheres, Atmospheric composition, Chemical composition, Aerosols, Atmospheric boundary layer, Sampling, Research projects, Antarctica—Palmer Station
In Jan. and Feb. 1994 the Sulfur Chemistry in the Antarctic Troposphere Experiment (SCATE), a multi-institutional field research project, was conducted at Palmer Station. This paper describes the scientific background and major objectives of SCATE and presents an overview of the field measurement program, the study site, and meteorological conditions prevailing during the experiment. (Auth. mod.)

52-3651
Measurements of dimethyl sulfide, dimethyl sulfoxide, dimethyl sulfone, and aerosol ions at Palmer Station, Antarctica.
Berresheim, H., Huey, J.W., Thorn, R.P., Eisele, F.L., Tanner, D.J., Jefferson, A., *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1629-1637, 44 refs.
Climatology, Polar atmospheres, Marine atmospheres, Atmospheric composition, Air water interactions, Biomass, Aerosols, Turbulent diffusion, Photochemical reactions, Sampling, Antarctica—Palmer Station
In Jan. and Feb. 1994, measurements of dimethylsulfide (DMS) in air and seawater were conducted at Palmer Station during project SCATE (Sulfur Chemistry in the Antarctic Troposphere Experiment). Corresponding values ranged between 6 and 595 pptv and 0.7 and 3.7 n*M*, respectively. Atmospheric dimethylsulfoxide (DMSO) and dimethylsulfone ($DMSO_2$) mixing ratios varied mostly between <0.2 and 15 pptv. The DMSO photochemical lifetime with respect to the 24-hour average OH concentration is approximately 25 hours in the coastal antarctic troposphere in summer. A good correlation was

found between DMSO and $DMSO_2$. DMS was not correlated with any of its measured oxidation products, probably because of its long atmospheric residence time over Antarctica. (Auth. mod.)

52-3652

Sources and sinks of H_2SO_4 in the remote antarctic marine boundary layer.

Jefferson, A., Tanner, D.J., Eisele, F.L., Berresheim, H., *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1639-1645, 40 refs.

Climatology, Polar atmospheres, Atmospheric composition, Marine atmospheres, Atmospheric boundary layer, Aerosols, Origin, Sampling, Biomass, Antarctica—Palmer Station

A steady state analysis of H_2SO_4 sources and sinks in the antarctic marine boundary layer was performed using measurements from project SCATE (Sulfur Chemistry in the Antarctic Troposphere Experiment). The calculations show that the SO_2 levels needed to account for the observed gas phase H_2SO_4 ranged from about 17 to 300 pptv with an average SO_2 concentration of 100 pptv, far more than previous measurements of SO_2 in this region which range between 7 and 17 pptv. Boundary layer oxidation of DMS via an SO_2 intermediate was found to be an insufficient source of H_2SO_4 in this region. Likely alternative sources of H_2SO_4 include oxidation of boundary layer DMDS and vertical entrainment of air from higher altitudes. (Auth. mod.)

52-3653

OH photochemistry and methane sulfonic acid formation in the coastal antarctic boundary layer.

Jefferson, A., et al, *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1647-1656, 53 refs.

Climatology, Polar atmospheres, Marine atmospheres, Aerosols, Atmospheric composition, Photochemical reactions, Sampling, Models, Antarctica—Palmer Station

Studies of dimethylsulfide (DMS) oxidation chemistry were conducted at Palmer Station on Anvers I. during 1993-94. Part of the study involved gas phase measurements of OH, methane sulfonic acid (MSA), and H_2SO_4 using a chemical ionization mass spectrometer. Model calculations of OH compared well with observed levels. The modeling results suggest that the dominant source of OH is from the reaction of $O(^1D)$ with H_2O where $O(^1D)$ is the product of O_3 photolysis. The dominant OH sink was found to be reaction with CO and CH_4. Alternate mechanisms for generating MSA in the particle phase were speculated to involve either in-cloud oxidation of dimethylsulfoxide or OH oxidation of DMS in the atmospheric buffer layer above the boundary layer followed by condensation of gas phase MSA on aerosols and transport back to the boundary layer. (Auth. mod.)

52-3654

DMS oxidation in the antarctic marine boundary layer: comparison of model simulations and field observations of DMS, DMSO, $DMSO_2$, H_2SO_4(g), MSA(g), and MSA(p).

Davis, D., et al, *Journal of geophysical research,* Jan. 20, 1998, 103(D1), p.1657-1678, Refs. p.1676-1678.

Climatology, Polar atmospheres, Marine atmospheres, Atmospheric composition, Atmospheric boundary layer, Aerosols, Photochemical reactions, Sampling, Biomass, Models, Antarctica—Palmer Station

A sulfur field study (SCATE) at Palmer Station (Jan. 18 to Feb. 25) has revealed several major new findings concerning (dimethyl sulfide) DMS oxidation chemistry and the cycling of sulfur within the antarctic environment. Significant evidence was found supporting the notion that the OH/DMS addition reaction is a major source of dimethyl sulfoxide (DMSO). Evidence supporting the hypothesis that the OH/DMS addition reaction, as well as follow-on reactions involving OH/DMSO, are a major source of SO_2 was significant, but not conclusive. One of the major findings of SCATE was the recognition that a large fraction of the antarctic oxidative cycle for DMS (near Palmer Station) took place above the boundary layer. Although still speculative in places, the overall picture emerging from the SCATE field/modeling results is one involving major coupling between chemistry and dynamics in the Antarctic. The study suggests that previous chemical interpretations of antarctic field data may need to be altered. (Auth. mod.)

52-3655

Monte Carlo simulation of ice models.

Barkema, G.T., Newman, M.E.J., *Physical review E,* Jan. 1998, 57(1), p.1155-1166, 24 refs.

Ice physics, Ice models, Simulation, Molecular structure, Hydrogen bonds, Molecular energy levels, Defects, Statistical analysis, Analysis (mathematics)

52-3656

Snow avalanches.

Keylock, C., *Progress in physical geography,* Dec. 1997, 21(4), p.481-500, Refs. p.496-500.

Climatology, Geomorphology, Avalanche mechanics, Classifications, Snow cover stability, Avalanche tracks, Safety, Avalanche forecasting, Climatic factors

52-3657

Freezing-induced hydration forces between phosphatidylcholine bilayers—the effect of osmotic pressure.

Yoon, Y.H., Pope, J., Wolfe, J., *Colloids and surfaces A,* Nov. 30, 1997, Vol.129-130, p.425-434, 21 refs.

Colloids, Solutions, Frozen liquids, Hydrates, Solubility, Phase transformations, Ice water interface, Deuterium oxide ice, Unfrozen water content, Molecular energy levels, Nuclear magnetic resonance, Spectra

52-3658

Radiocarbon AMS dating of pollen concentrated from eolian sediments: implications for monsoon climate change since the Late Quaternary.

Zhou, W.J., Donahue, D., Jull, A.J.T., *Radiocarbon,* 1997, 39(1), p.19-26, 20 refs.

Paleoclimatology, Precipitation (meteorology), Loess, Eolian soils, Palynology, Quaternary deposits, Sedimentation, Profiles, Radioactive age determination, Geochronology, Laboratory techniques, China—Loess Plateau

52-3659

Light scattering experiments during freezing and melting.

Bilgram, J., *Crystal research and technology,* 1997, 32(8), p.1029-1039, 21 refs.

Liquid solid interfaces, Light scattering, Ice water interface, Ice crystal growth, Layers, Statistical analysis, Simulation

52-3660

Freeze dried samples of volcanic gases—a new method for the determination of trace elements by NAA.

Bichler, M., Sortino, F., *Radiochimica acta,* 1997, Vol.78, p.177-180, 17 refs.

Freeze drying, Magma, Gases, Chemical analysis, Neutron activation analysis, Sampling, Geochemistry

52-3661

On shear flow of a saturated ice-sediment mixture with thermodynamic equilibrium pressure and momentum exchange.

Wu, T., Hutter, K., Svendsen, B., *Royal Society of London. Proceedings A,* Jan. 8, 1998, 454(1968), p.71-88, 30 refs.

Glacier flow, Shear flow, Glacier beds, Ice composition, Glacial geology, Glacier mass balance, Ice solid interface, Sedimentation, Thermodynamics, Mathematical models, Stress concentration

52-3662

Increased polar stratospheric ozone losses and delayed eventual recovery owing to increasing greenhouse-gas concentrations.

Shindell, D.T., Rind, D., Lonergan, P., *Nature,* Apr. 9, 1998, 392(6676), p.589-592, 30 refs.

Ozone, Atmospheric composition, Climatic changes, Air temperature, Models, Greenhouse effect, Global change

Investigated here is the interplay between projected future emissions of greenhouse gases and levels of ozone-depleting halogen species using a global climate model that incorporates simplified ozone-depletion chemistry. Increased concentrations of greenhouse gases might be at least partly responsible for the very large arctic ozone losses observed in recent winters. Arctic losses reach a maximum in the decade 2010 to 2019 in the model, roughly a decade after the maximum in stratospheric chlorine abundance. The mean losses are about the same as those over the Antarctic during the early 1990s, with geographically localized losses of up to two-thirds of the arctic ozone column in the worst years. The severity and the duration of the antarctic ozone hole are also predicted to increase because of greenhouse-gas-induced stratospheric cooling over the coming decades.

52-3663

Exceptionally steep north-south gradients in lake temperatures during the last glaciation.

Levesque, A.J., Cwynar, L.C., Walker, I.R., *Nature,* Jan. 30, 1997, 385(6615), p.423-426, 35 refs.

Lake water, Water temperature, Canada—New Brunswick, United States—Maine

52-3664

Incorporation of physical optics effects and computation of the Legendre expansion for ray-tracing phase functions involving δ-function transmission.

Mishchenko, M.I., Macke, A., *Journal of geophysical research,* Jan. 27, 1998, 103(D2), p.1799-1805, 27 refs.

Cloud physics, Light scattering, Wave propagation, Radiation absorption, Ice crystal optics, Particles, Ice crystal size, Mathematical models, Statistical analysis, Theories

52-3665

Three months of continuous monitoring of atmospheric water vapor with a network of Global Positioning System receivers.

Emardson, T.R., Elgered, G., Johansson, J.M., *Journal of geophysical research,* Jan. 27, 1998, 103(D2), p.1807-1820, 45 refs.

Climatology, Weather forecasting, Subpolar regions, Radio echo soundings, Radiometry, Water vapor, Seasonal variations, Statistical analysis, Correlation, Sweden, Finland

52-3666

Retrieval of Pinatubo aerosol optical depth and surface bidirectional reflectance from six years of AVHRR global vegetation index data over boreal forests.

Molineaux, B., Royer, A., O'Neill, N., *Journal of geophysical research,* Jan. 27, 1998, 103(D2), p.1847-1856, 41 refs.

Climatology, Atmospheric composition, Aerosols, Optical properties, Reflectivity, Volcanic ash, Radiometry, Spaceborne photography, Forest land, Statistical analysis, Models, Climatic factors, United States—Alaska, Russia—Siberia, Finland

52-3667

Vertical distribution of the spectral aerosol optical depth in the Arctic from 1993 to 1996.

Nagel, D., Herber, A., Thomason, L.W., Leiterer, U., *Journal of geophysical research,* Jan. 27, 1998, 103(D2), p.1857-1870, 38 refs.

Climatology, Polar atmospheres, Atmospheric composition, Radiation balance, Photometry, Aerosols, Volcanic ash, Attenuation, Haze, Profiles, Seasonal variations, Spectra, Statistical analysis

52-3668

Possible laboratory evidence for multipole electric charge structures in thunderstorms.

Jayaratne, E.R., *Journal of geophysical research,* Jan. 27, 1998, 103(D2), p.1871-1878, 31 refs.

Precipitation (meteorology), Thunderstorms, Cloud physics, Ice crystal collision, Cloud droplets, Spectra, Cloud electrification, Polarization (charge separation), Charge transfer, Simulation, Temperature effects

52-3669

Relay protection of rectifier installations for ice-melting with a direct current.

Levchenko, I.I., Alliluev, A.A., Zasypkin, A.S., *Electrical technology,* Dec. 1997, No.3, p.135-141, Translated from Elektrichestvo. 2 refs.

Power line icing, Ice control, Ice melting, Electrical resistivity, Electrical grounding, Electronic equipment, Protection, Design

52-3670

Faceted ice crystals grown in water without air.

Shichiri, T., *Journal of crystal growth,* Apr. 1998, 187(1), p.133-137, 8 refs.

Ice physics, Ice crystal growth, Ice crystal structure, Vacuum freezing, Adsorption

52-3672
Totally frozen water triple point cells: a comparison between the INTI (Argentina) and the ICAITI (Guatemala).
Tischler, M., Prado, N.F., *Metrologia,* Sep. 1997, 34(4), p.371-374, 15 refs.
Standards, Freezing points, Water temperature, Electrical measurement, Measuring instruments, Temperature variations, Accuracy

52-3673
Freezing of supercooling water using magnetic fluid.
Inatomi, Y., Gao, L., Honda, T., Yamashita, H., *JSME international journal,* Aug. 1997, 40(3), p.454-460, 9 refs.
Ice makers, Heat sinks, Brines, Freezing, Supercooling, Colloids, Films, Ice solid interface, Electric fields, Interfacial tension, Electromagnetic properties

52-3674
Damping maximum of hardened cement past (hcp) in the region of -90°C: a mechanical relaxation test.
Xu, X.J., Setzer, M.J., *Advanced cement based materials,* Apr.-May 1997, 5(3-4), p.69-74, 24 refs.
Cement admixtures, Ice mechanics, Ice solid interface, Porous materials, Damping, Flexural strength, Oscillations, Relaxation (mechanics), Low temperature tests, Impact tests, Temperature effects

52-3675
Open-system pingos in Spitsbergen.
Liestøl, O., *Norsk geografisk tidsskrift,* 1996, Vol.50, p.81-84, 5 refs.
Geomorphology, Arctic landscapes, Permafrost structure, Permafrost hydrology, Subpermafrost ground water, Pingos, Profiles, Solifluction, Norway—Spitsbergen

52-3676
Estimate of the subglacier dielectric constant of an ice shelf using a ground-penetrating step-frequency radar.
Hamran, S.E., Erlingsson, B., Gjessing, Y., Mo, P., *IEEE transactions of geoscience and remote sensing,* Mar. 1998, 36(2), p.518-525, 14 refs.
Sea ice, Ice surveys, Remote sensing, Ice shelves, Ice water interface, Ice bottom surface, Classifications, Ice melting, Dielectric properties, Radar echoes, Sounding, Profiles, Antarctica—Riiser-Larsen Ice Shelf
The mass balance of the antarctic ice cap, its stability, and the role of the surrounding ice shelf in bottom-water mass formation is, to a large extent, dictated by processes associated with subsurface freezing and melting, where the submerged ice meets the surrounding ocean. It is demonstrated how multifrequency ground-penetrating radar data collected at the Riiser-Larsen Ice Shelf can be used to examine the physical conditions of the ice-shelf subsurface. It is demonstrated that the data can be used to distinguish between types of ice at the ice-ocean interface, such as for freezing marine ice, melting marine ice, melting meteoric ice from the ice cap, and melting firn/ice. The data analysis shows that the subsurface can be regarded as rough on length scales in the order of 1 m. (Auth. mod.)

52-3677
Infrared resonant desorption of H_2O from ice multilayers.
Krasnopoler, A., George, S.M., *Journal of physical chemistry B,* 1998, 102(5), p.788-794, 28 refs.
Ice physics, Vacuum freezing, Ice spectroscopy, Infrared spectroscopy, Lasers, Resonance, Hydrogen bonds, Vibration, Radiation absorption, Ablation, Water films

52-3678
Antarctic communities: species, structure and survival.
Battaglia, B., ed, Valencia, J., ed, Walton, D.W.H., ed, Cambridge, U.K., Cambridge University Press, 1997, 464p., Refs. passim. For individual papers see A-59104, B-59043 through B-59055, B-59057 through B-59089, B-59094 through B-59103, B-59105, E-59091, I-59090, I-59092, I-59093, J-59056 or 52-3679 through 52-3695.
Marine biology, Ecology, Cryobiology, Plankton, Microbiology, Acclimatization, Environmental impact, Ozone, Low temperature research, Polar regions
This volume is a collection of papers presented at the 6th biological symposium, sponsored by the Scientific Committee on Antarctic Research, held in Venice, Italy, May 30-June 3, 1994. The object of the symposium was to obtain a clear understanding of the antarctic community species composition, structural relationships and survival strategies. The 63 papers contained in this volume are grouped under the following areas of interest: biodiversity and evolution, community structure and function, survival mechanisms, adaptive mechanisms, and human impact and environmental change.

52-3679
Temporal dynamics of coastal Antarctic phytoplankton: environmental driving forces and impact of a 1991/92 summer diatom bloom on the nutrient regimes.
Moline, M.A., Prézelin, B.B., Schofield, O., Smith, R.C., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.67-72, 21 refs.
Plankton, Algae, Biomass, Photosynthesis, Ecology, Sea ice distribution, Meteorological factors, Seasonal variations, Nutrient cycle, Antarctica—Palmer Station
Within the Palmer Long Term Ecological Research Program, a suite of environmental data sets were collected at a nearshore station throughout the 1991-92 austral summer. Seasonal changes are presented in the context of phytoplankton community ecology. Subseasonal fluctuations in sea-ice coverage, freshwater inputs, as well as wind driven and advective processes disrupting stratified surface waters, appeared to be the major driving forces affecting the timing, duration and demise of local phytoplankton blooms. During a large diatom-dominated bloom, macronutrients were depleted to detection limits and significant shifts in nutrient ratios were observed. Phytoplankton populations were light limited below ca. 5 m during the bloom, resulting from self-shading. The depth of light limitation deepened after the bloom was physically disrupted and removed from the region by strong advective processes. (Auth.)

52-3680
Identification of dominant taxa in coastal Antarctic water and ice core samples using lipid signature.
Skerratt, J.H., Nichols, P.D., McMeekin, T.A., Burton, H.R., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.79-85, Refs. p.84-85.
Algae, Microbiology, Sea ice, Plant physiology, Antarctica—Davis Station
Diatoms (predominantly *Nitzschia*) and the prymnesiophyte *Phaeocystis* sp. form major algal blooms in antarctic waters. Lipid components and their ratios were used to differentiate between these two algal groups. Lipid profiles were compiled for water-column particulate and ice algal communities collected near Davis Station over 5 summer seasons (1988 to 1993). *Phaeocystis* sp. exhibited high levels of the fatty acid 14:0 and brassicasterol, low levels of polyunsaturated fatty acids (PUFAs) and a low 16:1ω7c to 16:0 ratio. Sea-ice diatom blooms in the same area reflected lower levels of PUFAs than observed in the water column and had high concentrations of the sterol 24-ethylcholesterol. Branched-chain fatty acids were used as indicators of bacterial biomass and increased in concentration after the summer algal blooms each year. *Phaeocystis* sp. can be difficult to identify and enumerate using conventional methods, hence, during a bloom in 1989, the lipid signatures facilitated an estimate of the abundance of this alga. (Auth. mod.)

52-3681
Distributions and dynamics of microbial communities in the pack ice of the western Weddell Sea, Antarctica.
Fritsen, C.H., Sullivan, C.W., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.101-106, Refs. p.105-106.
Algae, Pack ice, Microbiology, Ice composition, Marine biology, Ice water interface, Biomass, Antarctica—Weddell Sea
Antarctic pack ice contains diverse microbial communities in a variety of sea-ice habitats. The authors investigated the biological and physicochemical dynamics within first-year and second-year sea ice in the western Weddell Sea during the austral summer-to-winter transition, from Feb. to June. Both the multi-year ice and the first-year ice supported the net accumulation of both microalgae and bacteria. The microbes showed net growth near the surface of the second-year ice. In the first-year ice, net growth was concentrated near the ice/seawater interface. Therefore, the first time-series of antarctic pack-ice microbial communities revealed concurrent, yet spatially separated, autumnal blooms that were previously unaccounted for in conceptual models of seasonal cycles of pack-ice production. (Auth. mod.)

52-3682
Abundance and distribution of larval krill, *Euphausia superba*, associated with annual sea ice in winter.
Frazer, T.K., Quetin, L.B., Ross, R.M., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.107-111, 15 refs.
Algae, Ecology, Marine biology, Biomass, Sea ice, Antarctica—Antarctic Peninsula
Larval krill, *Euphausia superba,* associated with annual sea ice were censused visually using SCUBA during three winter cruises to a region west of the Antarctic Peninsula. Sampling during Sep. 1991 and June 1993 was restricted to a small number of stations off Adelaide I. A more extended, mesoscale survey was conducted in Sep. 1993. Larval krill were observed feeding on ice-associated biota at all sampling locations. A majority of larval krill censused during late winter occurred in large aggregations, which were not found in early winter. Eighty per cent of larvae were observed under a complex habitat provided by over-rafted and/or eroded ice floes, and were generally associated with upward facing ice surfaces. Larval krill were rarely observed on the downward facing surfaces of unilayer floes, though ice-algae were often visible in these areas. (Auth. mod.)

52-3683
Environment and microbial communities in a tidal lagoon at Bratina Island, McMurdo Ice Shelf, Antarctica.
Hawes, I., Howard-Williams, C., Schwarz, A.M.J., Downes, M.T., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.170-177, 21 refs.
Microbiology, Limnology, Ice shelves, Ecology, Geochemistry, Algae, Photosynthesis, Antarctica—McMurdo Ice Shelf, Antarctica—Bratina Island
The McMurdo Ice Shelf, with its 1500 km^2 of fresh and saline ponds is the largest concentration of non-marine biota in the Ross Sea area. At rare intervals around the landward margins of this ice shelf, the semi-permanent ponds are replaced by areas which are inundated by the single daily tide. At Bratina I., one such lagoon was investigated during the 1992-93 summer. Low tide revealed a network of ponds, streams and mudflats and the flora and fauna of these was in many ways quite distinct from the non-tidal ponds in the area. Pools greater than 30 cm deep (at low tide) were strongly stratified, with highly saline water underlying the brackish water which flushed the lagoon. The lower, saline layers were super-saturated with oxygen and contained very little dissolved inorganic carbon. Dense populations of benthic diatoms colonized the isolated saline layer of water though their photosynthetic rates were low. (Auth. mod.)

52-3684
Role of antifreeze proteins in survival of Antarctic fishes in freezing environments.
Devries, A.L., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.202-208, Refs. p.207-208.
Marine biology, Antifreezes, Acclimatization, Sea ice, Ice crystals
Freezing avoidance in antarctic fishes is associated with the presence of high levels of blood borne antifreeze proteins (AFs). Synthesized in the liver, they are secreted into the blood and distributed into most body fluids. They prevent freezing by adsorbing to, and inhibiting the growth of small ice crystals which have entered from the sea water. The notothenioid fish AFs are composed of repeats of Ala-Ala-Thr- with a disaccharide, attached to each Thr and range in size from 2.6 to 33 KDa. The zoarcid fish peptides with molecular weights of 7 and 14 KDa show no biased amino acid composition, show no repeats in sequence and are globular. Adsorption to ice involves a structural match between the Af molecules and the ice lattice, with both type of AFs binding to the prism planes. Shallow-water fishes have ice associated with their integument, intestinal fluid and spleen. The AF-free ocular fluid and urine remain supercooled throughout the life of the fish, and are protected from inoculation because the surrounding tissues contain AFs. (Auth. mod.)

52-3685
Freezing resistance in antarctic fish.
Wöhrmann, A.P.A., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.209-216, Refs. p.215-216.
Marine biology, Antifreezes, Acclimatization, Sea ice, Antarctica—Weddell Sea
Antifreeze glycopeptides and peptides have been isolated from 37 species of antarctic fish representing the families Nototheniidae, Artedidraconidae, Bathydraconidae, Channichthyidae, Muraenolepididae, Liparididae, Zoarcidae and Myctophidae. Amino acid and carbohydrate analysis as well as antifreeze activity indicate that all investigated notothenioids contain antifreeze glycopeptides (AFGP). *Pleuragramma antarcticum, Lepidonotothen kempi,*

Bathydraco marri and *Dolloidraco longedorsalis* synthesize additional antifreeze molecules. The non-notothenioid species possess antifreeze peptides, *Muraenolepis marmoratus* possesses an antifreeze glycopeptide like the AFGP. A novel glycopeptide comprised of the carbohydrate residue N-acetylglucosamine and the amino acids asparagine, glutamine, glycine, alanine, and traces of arginine, valine and threonine were isolated and characterized from *P. antarcticum*.

52-3686

Ecophysiological strategies of terrestrial arthropods in the maritime Antarctic.

Block, W., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.316-320, 19 refs.

Microbiology, Low temperature research, Soil temperature, Snow cover, Acclimatization, Antarctica—Signy Island

The environmental constraints acting on terrestrial microarthropods in maritime antarctic habitats are listed. Six ecophysiological features have been identified as the basis of the ecophysiological strategies of two common species: *Alaskozetes antarcticus* (Acari, Cryptostigmata) and *Cryptopygus antarcticus* (Collembola, Isotomidae). The latter species is considered to be pre-adapted for responding to polar warming. (Auth.)

52-3687

Climatic change and the recent climatic record.

Karlén, W., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.343-348, Refs. p.347-348.

Paleoclimatology, Climatic changes, Ice cores, Glacier oscillation, Air temperature, Forest lines

Information about climatic change available from studies of ice cores from Greenland and Antarctica, fluctuations of alpine glaciers, changes in the treeline altitude and variations in tree-ring width are reviewed. Large-amplitude, high-frequency temperature fluctuations in Greenland during the last ice age have been recognized in both ice cores from Greenland and peat deposits in central Europe. Variations in tree-ring width indicate that temperature fluctuations of about 1.5°C have occurred during periods as short as a few decades during the last 1000 years. The paleoclimatic record shows that changes in temperature during the last 100 years are not unique and are well within the limits of natural variability. Changes in the climate lasting several hundred years appear to be recognized over most of the globe, while fluctuations lasting decades may be local. (Auth. mod.)

52-3688

Ecological variability in Antarctic coastal environments: past and present.

Berkman, P.A., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.349-357, Refs. p.355-357.

Paleoclimatology, Fossils, Geochemistry, Geomorphology, Geochronology, Glacier oscillation, Marine biology, Meltwater, Antarctica—Victoria Land

Holocene macrofossils in emerged beaches can be used to interpret environmental variability in the coastal zone around Antarctica which has been directly impacted by ice-sheet advance and retreat during the last 10,000 years. Radiocarbon dating was used to determine fossil ages based on reservoir corrections derived from the average pre-bomb ^{14}C-ages of different antarctic species: seals (1424±200 years), penguins (1130±134 years) and molluscs (1300±100 years). In the modern marine environment, the oxygen isotope composition of mollusc shells varies seasonally and across nearshore depth gradients associated with glacial meltwater input. In the fossil record, scallop shells in emerged beaches along the Victoria Land coast have oxygen isotope ratios that reflect a relatively long warm period around 6000 BP and a brief cold period 500 y BP which may be associated with the Little Ice Age. The persistence of scallop and Adélie penguin populations along the Victoria Land coast since the middle Holocene, as well as their localized migrations during this period, can be attributed unambiguously to natural phenomena in the absence of human activities. (Auth. mod.)

52-3689

Climate change in Kerguelen Islands and colonization of recently deglaciated areas by *Poa kerguelensis* and *P. annua*.

Frenot, Y., Gloaguen, J.C., Tréhen, P., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.358-366, Refs. p.365-366.

Weather observations, Climatic changes, Air temperature, Plant ecology, Glacier melting, Soil stabilization, —Kerguelen Islands

The changes in temperature, precipitation, sunshine and atmospheric humidity on Kerguelen Is. are analyzed by year and month between 1951 and 1993: the range of annual mean temperature is high over the whole period but the trend of increase is low. The current temperature remains at a high level. Precipitation drastically decreased in the early 1960s and its current level is lower than in the 1950s by about 500 mm. These climatic changes have accelerated the retreat of most of the glacier snouts since 1970. *Poa kerguelensis* and *P. annua* are used as an example of changes in the primary succession on the recently deglaciated areas. Seed arrival and germination occur even in the most recent glacier forelands. Results suggest that the colonization dynamics and the interaction processes between the two *Poa* species on the Ampère Glacier forelands are essentially governed by the soil development, in terms of stabilization, cryoturbation, and nutrient and water accessibility. (Auth. mod.)

52-3690

Impacts of ozone depletion on Antarctic organisms.

Marchant, H.J., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.367-374, Refs. p.373-374.

Ozone, Atmospheric composition, Ultraviolet radiation, Plant physiology, Marine biology, Microbiology

Springtime stratospheric ozone depletion over Antarctica leads to a period in Oct. and Nov. when incident solar UV-B radiation (280-320 nm) is at least as high as at the summer solstice. The terrestrial plants of Greater Antarctica that have been examined posses UV absorbing compounds and differ in their responses to UV exposure. Some antarctic marine phytoplankton synthesize UV-B photoprotective compounds and most, if not all, have repair mechanisms. Interspecific differences in productivity and growth in response to enhanced UV-B exposure lead to changes in phytoplankton species composition. Antarctic marine bacteria may also be stressed by present levels of UV-B exposure, as their viability and extracellular enzymic activity are markedly impaired by UV-B exposure. Antarctic birds and mammals are unlikely to be directly effected by UV-B. (Auth. mod.)

52-3691

Effects of solar ultraviolet radiation on primary production in Antarctic waters.

Holm-Hansen, O., Villafañe, V.E., Helbling, E.W., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.375-380, 9 refs.

Biomass, Marine biology, Photosynthesis, Ultraviolet radiation, Ozone, Antarctica—Palmer Station

The effects of solar ultraviolet radiation on inhibition of rates of photosynthesis in antarctic phytoplankton were studied at Palmer Station from early Oct. to the end of Dec. 1993. A well developed ozone hole was present in Oct. and Nov. Experiments with natural phytoplankton assemblages from Arthur Harbor showed that UV-A radiation was responsible for approximately twice as much inhibition of photosynthesis as the resulting from UV-B radiation, even on days with low column ozone concentrations. Results from *in situ* incubations also demonstrated that UV-A radiation was responsible for much more inhibition of photosynthesis than UV-B radiation, and that no inhibition by either UV-B or UV-A radiation could be detected below 10-12 m in a water column where the euphotic zone extended to approximately 50 m. These data suggest that the impact of enhanced UV-B radiation resulting from ozone depletion will not seriously lessen the rate of primary production in antarctic waters. (Auth. mod.)

52-3692

Preliminary sediment core evidence against short-term UV-B induced changes in Antarctic coastal diatom communities.

McMinn, A., Heijnis, H., Hodgson, D., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.381-387, Refs. p.386-387.

Algae, Sea ice, Ice cover effect, Photosynthesis, Biomass, Ultraviolet radiation, Ozone, Antarctica—Vestfold Hills

In coastal areas the sea ice, which attenuates most of the UV-B before it reaches the water column, remains until Dec./Jan., by which time UV-B levels have returned to long-term seasonal averages. Phytoplankton from these areas are unlikely to show long-term changes resulting from the hole in the ozone layer. Fjords of the Vestfold Hills have anoxic basins which contain high-resolution, unbioturbated sedimentary sequences. Diatom assemblages from these sequences reflect the diatom component of the phytoplankton and sea-ice algal assemblages at the time of deposition. Twenty-year records from these sequences show that recent changes in diatom abundances generally fall within the limits of natural variability and there is little evidence of recent changes that might be associated with UV-B-induced change. (Auth. mod.)

52-3693

Microbial niches in the polar environment and the escape from UV radiation in non-marine habitats.

Vincent, W.F., Quesada, A., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.388-395, Refs. p.394-395.

Microbiology, Algae, Ecology, Ultraviolet radiation, Bacteria, Polar regions

The non-marine environments of Antarctica contain a physically and chemically diverse variety of habitats for microbial colonization and growth. Three potential niche strategies are evaluated: specialized genotypes that occupy narrow niches in which they outperform other colonizing species: generalist genotypes that grow suboptimally, but survive because of their tolerance to environmental extremes; and generalists that experience broad, variable conditions including périods (or patches) of optimal and suboptimal growth. Ecological success may ultimately depend on flexibility, and the speed of response to changing conditions. No single strategy appears to be characteristic of the polar zones, and it is likely that all three often operate in the same species in different niche dimensions. This combination of traits may influence the response of microbiota to the changing UV-B radiation flux over the polar zones. (Auth. mod.)

52-3694

Human impact on an oligotrophic lake in the Larsemann Hills.

Ellis-Evans, J.C., Laybourn-Parry, J., Bayliss, P.R., Perriss, S.T., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.396-404, 19 refs.

Limnology, Water pollution, Human factors, Microbiology, Algae, Sewage disposal, Antarctica—Zhongshan Station

No Worry Lake (unofficial name) is immediately downslope of the Zhongshan Station, which was established in 1989. Studies pre-1989 indicated a slightly brackish, clear, shallow lake with a gravel catchment and virtually no terrestrial vegetation, comparable to other lakes in the area. Sampling during summer 1993 indicated that the lake, now surrounded by buildings and vehicles, had planktonic microbial communities markedly different from any other lakes in the Larsemann Hills. The lake water column was turbid from the high particulate content, much of it organic. Very large numbers of ciliate protozoa were feeding on the abundant microbial flora indicative of very rapid nutrient cycling. Human activities in the catchment are causing changes in meltwater and sediment input patterns. Recycling of lake water to facilitate cooling of the station generators has resulted in bottom-water warming, which appears to promote heterotrophic microbial activity even under winter ice cover. (Auth. mod.)

52-3695

***Bahia Paraiso*: a case study in environmental impact, remediation and monitoring.**

Penhale, P.A., Coosen, J., Marschoff, E.R., Antarctic communities: species, structure and survival. Edited by B. Battaglia, J. Valencia and D.W.H. Walton, Cambridge, U.K., Cambridge University Press, 1997, p.437-444, 20 refs.

Oil spills, Oil recovery, Environmental impact, Environmental protection, Research projects, Monitors, International cooperation, Antarctica—Palmer Station

The sinking of the ship, *Bahia Paraiso*, in the vicinity of Palmer Station in Jan. 1989 resulted in a diesel fuel spill of about 600,000 l. After an initial international effort directed toward rescue of personnel and damage containment, the U.S. National Science Foundation organized a quick-response team of scientists from the United States, Argentina and Chile to assess the environmental impacts. Initial results showed an immediate negative impact to the rocky intertidal community and to certain seabird species. United States scientists have continued a long-term monitoring effort which has shown recovery by certain species and long-term negative effects on others. Continuing fuel leakage from the *Bahia Paraiso* resulted in a joint fuel recovery effort conducted by The Netherlands and Argentina between Dec. 2, 1992 and Jan. 2, 1993. The application of modern hot tap salvage techniques for the penetration of the submerged tanks and for fuel pumping proved environmentally sound; no disturbance of wildlife was observed. (Auth. mod.)

52-3696

New perspective on the dynamical link between the stratosphere and troposphere.

Hartley, D.E., Villarin, J.T., Black, R.X., Davis, C.A., *Nature*, Jan. 29, 1998, 391(6666), p.471-474, 23 refs.

Stratosphere, Polar atmospheres, Climate, Models

52-3697

Lewis Cliff 86360: an antarctic L-chondrite with a terrestrial age of 2.35 million years.

Welten, K.C., Alderliesten, C., Van der Borg, K., Lindner, L., Loeken, T., Schultz, L., *Meteoritics & planetary science,* Nov. 1997, 32(6), p.775-780, 37 refs.

Geochemistry, Mineralogy, Ice sheets, Antarctica—East Antarctica, Antarctica—Lewis Cliff

Concentrations of the cosmogenic radionuclides ^{10}Be, ^{26}Al, and ^{36}Cl were measured in Lewis Cliff (LEW) 86360, an L-chondrite from the Lewis Cliff stranding area. In addition, the concentrations and isotopic compositions of He, Ne and Ar were measured. The combined results yield a terrestrial age of 2.35. Only one other stony meteorite with a similar terrestrial age (ca. 2 Ma) is known from the Allan Hills stranding area (ALH 88019), whereas all previously dated stony meteorites from Antarctica are younger than 1 Ma. It is argued that LEW 86360 spent most of its terrestrial residence time deep inside the ice, near the base of the glacier, where ice flow rates are much lower than at the surface. The terrestrial ages of LEW 86360 and ALH 88019 are consistent with existing hypotheses concerning the stability and persistence of the East Antarctic ice sheet. (Auth. mod.)

52-3698

Climatic characteristics of the tropopause over the Arctic Basin.

Nagurnyĭ, A.P., *Annales geophysicae,* Jan. 1998, 16(1), p.110-115, 14 refs.

Climatology, Polar atmospheres, Atmospheric physics, Meteorology, Air temperature, Temperature gradients

52-3699

Papers.

International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996, Walsh, J.E., ed, *Annals of Glaciology,* 1997, Vol.25, 462p., Refs. passim. For individual papers see 52-3700 through 52-3776 or F-59114, F-59115, F-59117, F-59119 through F-59126, F-59129, F-59131 through F-59133, I-59116, I-59118, I-59128, I-59130 and J-59127.

Ice sheets, Glacier mass balance, Glacier oscillation, Glacial meteorology, Snow cover distribution, Snow air interface, Sea ice distribution, Ice heat flux, Air ice water interaction, Ice models, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Global change, Paleoclimatology, Computerized simulation

This collection of 77 papers, of which 20 are explicitly pertinent to the Antarctic, deals mainly with the role of ice sheets, sea ice, and to a lesser extent, snow, in climate models, especially, general circulation models. Some of the papers, including those pertinent to the Antarctic, do describe observed data on local conditions, but even those are mainly to provide data for validation of proposed models.

52-3700

Physical characteristics of the antarctic sea-ice zone derived from modelling and observations.

Budd, W.F., Wu, X.R., Reid, P.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.1-7, 20 refs.

Sea ice distribution, Ice conditions, Ice cover thickness, Drift, Ice heat flux, Ice cover effect, Air ice water interaction, Atmospheric circulation, Ice models, Computerized simulation

Antarctic sea ice plays a key role in the present climate system, providing a regulating balance between the atmosphere and ocean heat fluxes, as well as influencing the salt fluxes and deep water formation over the continental shelves. The severe winter environmental conditions of the antarctic sea-ice zone make it difficult to observe many of the physical characteristics in a comprehensive way. The interrelations between the variables mean that much can be learned from the observations of some features along with detailed numerical modelling of the whole system and the interactions between the variables. This study therefore aims to use numerical modelling of the atmosphere, sea ice and surface mixed-layer ocean in the sea-ice zone, together with observations to simulate a comprehensive range of parameters and their variability through the annual cycle to provide a basis for further observations and model validation for the present climate. (Auth. mod.)

52-3701

First results of the Sea-Ice Model Intercomparison Project (SIMIP).

Kreyscher, M., Harder, M., Lemke, P., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.8-11, 17 refs.

Sea ice distribution, Ice cover thickness, Ice friction, Ice plasticity, Ice deformation, Ice volume, Drift, Ice heat flux, Air ice water interaction, Atmospheric circulation, Ice models, Computerized simulation

52-3702

Effect of sea-ice parameterizations on the simulation of the arctic ice pack.

Vavrus, S.J., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.12-16, 37 refs.

Pack ice, Sea ice distribution, Ice cover thickness, Ice heat flux, Air ice water interaction, Ice models, Polar atmospheres, Atmospheric circulation, Global warming, Computerized simulation

52-3703

Arctic ocean-ice system studied by contamination modelling.

Nazarenko, L., Sou, T., Eby, M., Holloway, G., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.17-21, 27 refs.

Sea ice distribution, Ice cover effect, Drift, Ice water interface, Water pollution, Ocean currents, Water transport, Computerized simulation

52-3704

Possible effects of including ridge-related roughness in air-ice drag parameterization: a sensitivity study.

Tremblay, L.B., Mysak, L.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.22-25, 12 refs.

Sea ice distribution, Ice cover thickness, Ice friction, Ice deformation, Pressure ridges, Drift, Air ice water interaction, Ice models, Computerized simulation

52-3705

On modeling sea-ice fracture and flow in numerical investigations of climate.

Hibler, W.D., III, Schulson, E.M., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.26-32, 12 refs.

Sea ice distribution, Ice cover thickness, Ice deformation, Ice friction, Ice cracks, Ice openings, Pressure ridges, Drift, Air ice water interaction, Ice models, Mathematical models

52-3706

Development and evaluation of surface shortwave flux parameterizations for use in sea-ice models.

Key, J.R., Liu, Y., Stone, R.S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.33-37, 18 refs.

Sea ice, Ice heat flux, Ice air interface, Polar atmospheres, Cloud cover, Radiation balance, Ice models, Mathematical models, Statistical analysis

52-3707

Parameterization of fluxes over heterogeneous snow cover for GCMs.

Essery, R., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.38-41, 7 refs.

Snow heat flux, Snow air interface, Atmospheric circulation, Computerized simulation

52-3708

Snow-cover simulations in mountainous regions based on general circulation model outputs.

Martin, E., Brun, E., Durand, Y., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.42-45, 7 refs.

Snow line, Snowfall, Snow cover distribution, Snow water equivalent, Snow air interface, Atmospheric circulation, Computerized simulation

52-3709

Sensitivity tests of the Canadian Land Surface Scheme (CLASS) for arctic tundra.

Tilley, J.S., Chapman, W.L., Wu, W.L., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.46-50, 4 refs.

Tundra soils, Soil temperature, Soil composition, Soil water, Permafrost distribution, Permafrost heat balance, Snow cover effect, Soil air interface, Tundra climate, Atmospheric circulation, Computerized simulation, United States—Alaska—North Slope

52-3710

Changing albedo of the Greenland ice sheet: implications for climate modeling.

Nolin, A.W., Stroeve, J., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.51-57, 19 refs.

Ice sheets, Snow ice interface, Snow cover structure, Snow optics, Snow heat flux, Snow air interface, Snow cover effect, Grain size, Albedo, Global change, Computerized simulation, Greenland

52-3711

High-resolution model of the 100 ka ice-age cycle.

Tarasov, L., Peltier, W.R., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.58-65, 26 refs.

Ice sheets, Glacial meteorology, Glacier heat balance, Glacier oscillation, Glaciation, Ice age theory, Global change, Paleoclimatology, Isostasy, Computerized simulation

52-3712

Coupling a multi-layered snow model with a GCM.

Brun, E., Martin, E., Spiridonov, V., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.66-72, 27 refs.

Snow cover distribution, Snow cover structure, Snow stratigraphy, Snow cover effect, Snow air interface, Snow heat flux, Global change, Computerized simulation

52-3713

Antarctic surface mass balance in a stretched grid general circulation model.

Krinner, G., Genthon, C., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.73-78, 22 refs.

Ice sheets, Glacial meteorology, Glacier mass balance, Glacier alimentation, Snow ice interface, Snow air interface, Snowfall, Precipitation (meteorology), Computerized simulation, Antarctica

The Laboratoire de Météorologie Dynamique variable-grid atmospheric general circulation model was used in this study for a 5-year high-resolution simulation of the antarctic climate. The horizontal resolution is about 100 km over a large part of the ice sheet. This study focuses on the simulated surface mass balance and on the spatial and temporal variability of snowfall in Antarctica. The simulated annual mean surface mass balance for the whole continent is close to the observed value, and the model simulates well the spatial distribution of the surface mass balance. The annual cycle of snowfall exhibits a clear minimum in summer over the high interior plateau as well as for Antarctica as a whole. In the interior of the continent, the model produces a permanent light background snowfall that accounts for about 5% of the total annual precipitation. The bulk of the snowfall is produced irregularly during periods that generally last only two or three days that are caused by cyclones off the coast. (Auth.)

52-3714

Climate of Antarctica in the UGAMP GCM: sensitivity to topography.

Marsiat, I., Bamber, J.L., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.79-84, 4 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric boundary layer, Air temperature, Surface temperature, Topographic maps, Topographic effects, Computerized simulation, Antarctica

Most spectral general circulation models (GCMs) use an envelope topography to set on land surface elevations. The UK Universities Global Atmospheric Modelling Programme General Circulation Model (UGAMP GCM) uses such a formulation for Antarctica. The authors use a new high-resolution, high-accuracy digital elevation model to improve the representation of Antarctica in the UGAMP GCM. The effect of changing the land-sea mask and the topography on the surface temperature, precipitation and wind field is investigated for both summer and winter runs. Changing the land-sea mask had a dramatic effect on temperature, producing a reduction of 13.3°C for the sector west of the Ross Ice Shelf. Using the new mean topography also introduces substantial differences in temperature, wind speed and precipitation for summer and winter. (Auth. mod.)

52-3715

Use of ice-sheet normal modes for initialization and modelling small changes.

Hindmarsh, R.C.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.85-95, 34 refs.

Ice sheets, Glacier oscillation, Glacier mass balance, Glacier thickness, Glacier flow, Ice volume, Ice age theory, Ice models, Mathematical models, Computerized simulation, Antarctica

Linearizations about two horizontal-dimensional ice sheets are proposed as methods of generating normal mode initializations for ice-sheet models and for computing the short-term response. Linearized models can be generated directly from balance-flux calculations without the need for tuning the rate factor. A linearized model is compared with the Eismint Benchmark, and the normal modes for two coarse antarctic digital elevation models are computed and compared. Volumetric relaxation spectra are presented. The slowest mode has a time constant comparable to that computed from scale theory. (Auth.)

52-3716

Sensitivity of an atmospheric general circulation model to the parameterization of leads in sea ice.

Flato, G.M., Ramsden, D., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.96-101, 16 refs.

Sea ice distribution, Ice openings, Ice heat flux, Ice cover effect, Air ice water interaction, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Global warming, Ice models, Computerized simulation

52-3717

On the role of sea-ice transport in modifying arctic responses to global climate change.

Maslanik, J.A., Dunn, J., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.102-106, 16 refs.

Sea ice distribution, Ice cover thickness, Ice volume, Ice conditions, Ice cover effect, Ice heat flux, Air ice water interaction, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Global warming, Ice models, Computerized simulation

52-3718

Simulation of sea ice in the NCAR Climate System Model.

Weatherly, J.W., Bettge, T.W., Briegleb, B.P., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.107-110, 12 refs.

Sea ice distribution, Ice conditions, Ice cover thickness, Drift, Ice cover effect, Ice heat flux, Air ice water interaction, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ice models, Computerized simulation

The Climate System Model (CSM) developed at the National Center for Atmospheric Research consists of atmosphere, land and ocean models, as well as a dynamic-thermodynamic sea-ice model. The results of sea-ice simulation using the first coupled climate simulation with the CSM is presented. It was found that the simulated total-ice areas in both hemispheres compared well with observations for winter, but were too large for summer. The numerical solution of the cavitating fluid dynamics was found to allow excessive ridging of ice, and an ad hoc correction was implemented. The ice velocities were realistic for the Antarctic, but for the Arctic were turned toward Alaska and Siberia by modeled winds and currents. This ice-drift pattern was reflected by ice thickness, which lacks the observed ridging near Greenland. The results illustrate the sensitivity of sea ice to the simulation of polar climate and the challenge of modeling the entire climate system. (Auth.)

52-3719

On the impact of sea ice in a global ocean circulation model.

Stössel, A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.111-115, 29 refs.

Sea ice, Ice cover thickness, Ice cover effect, Ice water interface, Air ice water interaction, Ice heat flux, Ocean currents, Convection, Atmospheric circulation, Ice models, Global change, Computerized simulation

This paper investigates the long-term impact of sea ice on global climate using a global sea-ice-ocean general circulation model. Depending on the physical description of sea ice, significant changes are detected in the convective activity, in the hydrographic properties and in the thermohaline circulation of the ocean model. Most of these changes originate in the southern ocean, emphasizing the crucial role of sea ice in this marginally stably stratified region of the world's oceans. Specifically, if the effect of brine release is neglected, the deep layers of the southern ocean warm up considerably. Introducing explicit new-ice thickness growth in partially ice-covered gridcells leads to a substantial increase in convective activity, especially in the southern ocean, with a concomitant significant cooling and salinification of the deep ocean. (Auth. mod.)

52-3720

Ocean—sea-ice coupling in a global ocean general circulation model.

Legutke, S., Maier-Reimer, E., Stössel, A., Hellbach, A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.116-120, 15 refs.

Sea ice distribution, Ice cover effect, Ice water interface, Air ice water interaction, Ice heat flux, Ocean currents, Atmospheric circulation, Global change, Ice models, Computerized simulation

A global ocean general circulation model has been coupled with a dynamic-thermodynamic sea-ice model. This model has been spun-up in a 1000 year integration using daily atmosphere model data. Main water masses and currents are reproduced as well as the seasonal characteristics of the ice cover of the Northern and Southern hemispheres. Model results for the southern ocean, however, show the ice cover as too thin, and there are large permanent polynyas in the Weddell and Ross seas. These polynyas are due to a large upward oceanic heat flux caused by haline rejection during the freezing of sea ice. Sensitivity studies were performed to test several ways of treating the sea-surface salinity and the rejected brine. The impact on the ice cover, water-mass characteristics, and ocean circulation are described. (Auth.)

52-3721

Investigating the interactions among river flow, salinity and sea ice using a global coupled atmosphere-ocean-ice model.

Miller, J.R., Russell, G.L., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.121-126, 22 refs.

Sea ice distribution, Ice cover effect, Drift, Ice heat flux, Air ice water interaction, River flow, Hydrologic cycle, Ocean currents, Sea water, Salinity, Atmospheric circulation, Global change, Ice models, Computerized simulation

52-3722

Multivariate comparison of two land-surface models integrated into an Arctic Regional Climate System model.

Lynch, A.H., McGinnis, D.L., Chapman, W.L., Tilley, J.S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.127-131, 13 refs.

Tundra climate, Vegetation patterns, Soil air interface, Heat flux, Radiation balance, Hydrologic cycle, Polar atmospheres, Atmospheric circulation, Global warming, Computerized simulation

52-3723

Sensible heat flux and local advection over a heterogeneous landscape at an arctic tundra site during snowmelt.

Marsh, P., Pomeroy, J.W., Neumann, N., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.132-136, 11 refs.

Snow cover distribution, Snow melting, Snow cover effect, Snow heat flux, Snow air interface, Soil air interface, Polar atmospheres, Tundra climate, Albedo, Radiation balance, Canada—Northwest Territories—Inuvik

52-3724
Impact of transient increases in atmospheric CO_2 on the accumulation and mass balance of the antarctic ice sheet.
O'Farrell, S.P., McGregor, J.L., Rotstayn, L.D., Budd, W.F., Zweck, C., Warner, R., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.137-144, 33 refs.
Ice sheets, Glacial meteorology, Glacier mass balance, Glacier oscillation, Ice air interface, Snow ice interface, Snowfall, Glacier alimentation, Polar atmospheres, Atmospheric composition, Sea level, Global warming, Ice models, Computerized simulation, Antarctica
The response of the antarctic ice sheet to climatic change over the next 500 years is calculated using the output of a transient-coupled ocean-atmosphere simulation assuming the atmospheric CO_2 value increases up to three times present levels. The main effects on the ice sheet on this time-scale include increasing rates of accumulation, minimal surface melting, and basal melting of ice shelves. The response of the antarctic ice sheet to the warming is increased accumulation inland, offset by loss from basal melting from the floating ice, and increased ice flow near the grounding line. Results of this study show that the change to the ice-sheet balance for the transient-coupled model forcing amounted to a minimal sea-level contribution in the next century, but a net positive sea-level rise of 0.21 m by 500 years. This new result supercedes earlier results that showed the antarctic ice sheet made a net negative contribution to sea-level rise over the next century. (Auth. mod.)

52-3725
Ice-sheet mass balance during the Last Glacial Maximum.
Ramstein, G., Fabre, A., Pinot, S., Ritz, C., Joussaume, S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.145-152, 36 refs.
Ice sheets, Glaciation, Glacial meteorology, Glacier mass balance, Glacier oscillation, Ice age theory, Global change, Paleoclimatology, Computerized simulation

52-3726
Areal distribution of the oxygen-isotope ratio in Antarctica: an assessment based on multivariate models.
Giovinetto, M.B., Zwally, H.J., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.153-158, 32 refs.
Ice sheets, Ice shelves, Glacial meteorology, Glacier ice, Ice air interface, Ice composition, Oxygen isotopes, Isotope analysis, Polar atmospheres, Marine atmospheres, Atmospheric composition, Atmospheric circulation, Ice models, Paleoclimatology, Statistical analysis, Antarctica
Mean oxygen-isotope ratio values relative to standard mean ocean water reported for 406 sites in Antarctica are compiled together with data on mean annual surface temperature, latitude, surface elevation, and mean annual shortest distance to open ocean denoted by the 20% sea-ice concentration boundary. Contoured distributions of $\delta^{18}O$ may be used to assess the effects of atmospheric advection, as well as derive ice-flow adjustments for $\delta^{18}O$ series obtained from deep-core or ablation-zone samples. (Auth. mod.)

52-3727
Asynchronously coupling the cryosphere and atmosphere in an energy-balance climate model.
Steen, R.S., Ledley, T.S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.159-164, 16 refs.
Ice sheets, Glaciation, Glacial meteorology, Glacier mass balance, Glacier heat balance, Glacier oscillation, Air ice water interaction, Ice age theory, Global change, Paleoclimatology, Ice models, Computerized simulation
A major component of the climate system on the 10,000-100,000 year time-scales is continental ice sheets, yet many of the mechanisms involved in the land-sea-ice processes that affect the ice sheets are poorly understood. In order to examine these processes in more detail, the authors have developed a coupled energy balance climate-thermodynamic sea-ice—continental-ice-sheet model. This model includes a hydrologic cycle, a detailed surface energy and mass balance, a thermodynamic sea-ice model, and a zonally averaged dynamic ice-flow model with bedrock depression. (Auth. mod.)

52-3728
Local and global stand-alone tests of the Météo-France snow parameterization.
Douville, H., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.165-169, 6 refs.
Snow cover distribution, Snow depth, Snow air interface, Snow heat flux, Snow surface temperature, Snow water equivalent, Snow cover effect, Albedo, Atmospheric circulation, Computerized simulation

52-3729
Numerical modeling of snow cover over polar ice sheets.
Dang, H., Genthon, C., Martin, E., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.170-176, 12 refs.
Polar atmospheres, Meteorological factors, Snow air interface, Snow heat flux, Snow temperature, Snow cover distribution, Snow cover structure, Snow density, Snow depth, Snow stratigraphy, Metamorphism (snow), Computerized simulation, Antarctica—Amundsen-Scott Station
Crocus, a one-dimensional model of snow-cover stratigraphy and evolution, was originally developed by the Centre d'Etudes de la Neige for temperate Alpine conditions. This is a study of Crocus's ability to reproduce the characteristics of polar snow at the surface of ice sheets. Crocus simulates the evolution of the thermal and structural features of snow cover as a function of meteorological parameters at the snow-atmosphere interface. Only models can provide the necessary meteorological information with full ice-sheet spatial coverage, and with the temporal resolution needed by Crocus. Meteorological data have been extracted from the European Centre for Medium-Range Weather Forecasts archives over the entire surface of Antarctica and in particular from the South Pole. (Auth. mod.)

52-3730
Towards improving the physical basis for ice-dynamics models.
Richter-Menge, J.A., MP 5118, *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.177-182, 16 refs.
Ice floes, Pack ice, Ice cover strength, Ice friction, Ice pressure, Ice creep, Drift, Ice deformation, Ice temperature, Thermal stresses, Ice models, Computerized simulation, United States—Alaska, Beaufort Sea
In situ measurements of ice stress were made on a multi-year floe in the Alaskan Beaufort Sea over a 6 month period, beginning in Oct. 1993. The data suggest that, in this region of the Arctic during this experiment, there were two main sources of stress: a thermally induced stress caused by changes in air temperature, and a stress generated by ice motion. Due to the natural damping of the snow and ice above the sensor, the thermally-induced stresses are low frequency (order of days). Stresses associated with periods of ice motion have both a high-frequency (order of hours), and low-frequency, content. The relative significance of these sources of stress is seasonal, reflecting the changes in the strength and continuity of the pack.

52-3731
On the improvement of sea-ice models for climate simulations: the Sea Ice Model Intercomparison Project.
Lemke, P., Hibler, W.D., III, Flato, G.M., Harder, M., Kreyscher, M., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.183-187, 14 refs.
Sea ice distribution, Ice conditions, Ice cover thickness, Ice cover strength, Ice deformation, Drift, Ice models, Air ice water interaction, Atmospheric circulation, Ocean currents, Global change, Computerized simulation

52-3732
Calculation of solar-energy inputs into melt ponds.
Podgornyĭ, I.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.188-192, 15 refs.
Sea ice, Ice water interface, Ice surface, Ice heat flux, Ice melting, Ponds, Albedo, Solar radiation, Radiation balance, Mathematical models

52-3733
Response of sea-ice models to perturbations in surface heat flux.
Arbetter, T.E., Curry, J.A., Holland, M.M., Maslanik, J.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.193-197, 34 refs.
Polar atmospheres, Marine atmospheres, Atmospheric circulation, Sea ice distribution, Ice cover thickness, Ice heat flux, Air ice water interaction, Global change, Ice models, Computerized simulation

52-3734
Existence of an ice cap during the mid-Cretaceous period (120-90 Ma): an AGCM investigation.
Ramstein, G., Fluteau, F., Masson, V., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.198-202, 21 refs.
Ice sheets, Glaciation, Glacial meteorology, Glacier oscillation, Atmospheric circulation, Ocean currents, Ice age theory, Global change, Paleoclimatology, Ice models, Computerized simulation

52-3735
Impact of ocean circulation on regional polar climate simulations using the Arctic Region Climate System Model.
Bailey, D.A., Lynch, A.H., Hedström, K.S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.203-207, 22 refs.
Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Sea ice distribution, Ice cover effect, Air ice water interaction, Global change, Ice models, Computerized simulation

52-3736
Areal distribution of the oxygen-isotope ratio in Greenland.
Zwally, H.J., Giovinetto, M.B., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.208-213, 25 refs.
Ice sheets, Glacial meteorology, Glacier ice, Ice air interface, Ice composition, Oxygen isotopes, Isotope analysis, Polar atmospheres, Marine atmospheres, Atmospheric composition, Atmospheric circulation, Ice models, Paleoclimatology, Statistical analysis, Greenland

52-3737
Assessment of the regional distribution of the oxygen-isotope ratio in northeastern Canada.
Giovinetto, M.B., Holdsworth, G., Fisher, D.A., Waters, N.M., Zwally, H.J., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.214-219, 26 refs.
Glacial meteorology, Glacier ice, Ice air interface, Ice composition, Oxygen isotopes, Isotope analysis, Polar atmospheres, Marine atmospheres, Atmospheric composition, Atmospheric circulation, Ice models, Statistical analysis, Canada—Northwest Territories—Axel Heiberg Island, Canada—Northwest Territories—Ellesmere Island, Canada—Northwest Territories—Devon Island

52-3738
Characteristics of the water balance of the Moshiri experimental watershed, Japan.
Ishikawa, N., Takeuchi, Y., Ishii, Y., Kodama, Y., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.220-225, 12 refs.
Watersheds, Snow hydrology, Snow heat flux, Snowmelt, Precipitation (meteorology), Evaporation, Runoff, Water balance, Japan—Hokkaido

52-3739
Application of a conceptual precipitation-runoff model (HYCYMODEL) in a debris-covered glacierized basin in the Langtang Valley, Nepal Himalaya.
Rana, B., Nakawo, M., Fukushima, Y., Ageta, Y., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.226-231, 21 refs.
Mountain glaciers, Glacial meteorology, Glacial hydrology, Glacier heat balance, Glacier ablation, Glacier surfaces, Glacier melting, Subglacial drainage, Meltwater, Runoff forecasting, Computerized simulation, Nepal

52-3740
Response of areal snow cover to climate change in a snowmelt-runoff model.
Rango, A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.232-236, 26 refs.
Snow cover distribution, Snow cover effect, Snow air interface, Snow heat flux, Snow hydrology, Snowmelt, Global warming, Runoff forecasting, Computerized simulation

52-3741
Roughness, age and drift trajectories of sea ice in large-scale simulations and their use in model verifications.
Harder, M., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.237-240, 21 refs.
Sea ice distribution, Ice conditions, Ice cover thickness, Ice surface, Surface roughness, Ice cover effect, Drift, Ice deformation, Pressure ridges, Air ice water interaction, Ice models, Computerized simulation

52-3742
Hemispheric snow cover and surface albedo for model validation.
Robinson, D.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.241-245, 17 refs.
Snow cover distribution, Snow depth, Snow surface, Snow air interface, Albedo, Snow surveys, Spaceborne photography, Radiometry, Global change

52-3743
Sensitivity of a two-layer model atmosphere to changes in ice-sheet topography.
Jackson, C.S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.246-249, 5 refs.
Ice sheets, Glaciation, Glacial meteorology, Glacier oscillation, Glacier thickness, Glacier surfaces, Topographic effects, Atmospheric circulation, Ice age theory, Paleoclimatology, Global change, Ice models, Computerized simulation

52-3744
Ice-sheet mass balance at the Last Glacial Maximum from the GENESIS version 2 global climate model.
Thompson, S.L., Pollard, D., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.250-258, 44 refs.
Ice sheets, Glaciation, Glacial meteorology, Glacier mass balance, Glacier oscillation, Ice age theory, Paleoclimatology, Global change, Ice models, Computerized simulation

52-3745
Modeling the antarctic ice sheet.
Verbitskiĭ, M.IA., Saltzman, B., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.259-268, 31 refs.
Ice sheets, Glacial meteorology, Glacier mass balance, Glacier heat balance, Glacier flow, Glacier oscillation, Ice age theory, Paleoclimatology, Global change, Ice models, Mathematical models, Computerized simulation, Antarctica
A three-dimensional (3-D), high-resolution, non-linearly viscous, non-isothermal ice-sheet model is employed to calculate the "present-day" equilibrium regime of the antarctic ice sheet and its evolution during the last glacial cycle. Steady-state solutions for both the shape and extent of the areas of basal melting (or freezing) are shown to be in good agreement with those obtained from the solution of the full 3-D thermodynamic equation. The solution for the basal temperature field of the West Antarctic Siple Coast is reminiscent of Ice Streams A-E. This configuration appears to be robust, preserving its features in spite of climatic changes during the last glacial cycle. Ice Stream C seems to be more vulnerable to stagnation, switching to a passive mode at least once during the penultimate interglacial. (Auth. mod.)

52-3746
Year-round pack ice in the Weddell Sea, Antarctica: response and sensitivity to atmospheric and oceanic forcing.
Geiger, C.A., Ackley, S.F., Hibler, W.D., III, MP 5119, *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.269-275, 21 refs.
Pack ice, Sea ice distribution, Ice cover thickness, Ice edge, Ice heat flux, Air ice water interaction, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Air temperature, Humidity, Ocean currents, Ice models, Mathematical models, Computerized simulation, Antarctica—Weddell Sea
Using a dynamic-thermodynamic numerical sea-ice model, external oceanic and atmospheric forcings on sea ice in the Weddell Sea are examined to identify physical processes associated with the seasonal cycle of pack ice, and to identify further the parameters that coupled models need to consider in predicting the response of the pack ice to climate and ocean-circulation changes. The primary influence on the winter ice-edge maximum extent is air temperature. Ocean heat flux has more impact on the minimum ice-edge extent and in reducing pack-ice thickness. Low relative humidity enhances ice growth in thin ice and open-water regions. The modeled extent of the Weddell summer pack is equally sensitive to ocean heat flux and atmospheric relative humidity variations with the more dynamic responses being from the atmosphere. Ocean heat-transport variability is shown to lead to overall ice thinning in the model response and is a known feature of the actual system. (Auth. mod.)

52-3747
Impact of sea-ice formation on the properties of Antarctic Bottom Water.
Goosse, H., Campin, J.M., Fichefet, T., Deleersnijder, E., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.276-281, 23 refs.
Sea water freezing, Ice formation, Ice melting, Ice water interface, Ice cover effect, Salinity, Water temperature, Ocean currents, Water transport, Computerized simulation, Antarctica
It is generally accepted that fresh-water fluxes due to ice accretion or melting profoundly influence the formation of Antarctic Bottom Water (AABW). This is investigated by means of a global, three-dimensional ice-ocean model. At high southern latitudes, the model exhibits positive (towards the ocean) fresh-water fluxes over the deep ocean, and large negative fluxes over the antarctic continental shelf, because of the intense ice-production taking place in this region. The salinity of shelf water can increase in such a way that deep-water formation is facilitated. The fresh-water flux over the shelf induces a transport of salt to bottom waters. If the AABW-formation rate decreases, the influence of North Atlantic deep water (NADW) increases. As NADW is warmer and saltier than AABW, the bottom-water salinity and temperature become higher. (Auth. mod.)

52-3748
Evaluating moist physics for antarctic mesoscale simulations.
Hines, K.M., Bromwich, D.H., Cullather, R.I., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.282-286, 15 refs.
Polar atmospheres, Cloud cover, Cloud physics, Air temperature, Humidity, Water vapor, Condensation nuclei, Ice crystal size, Precipitation (meteorology), Computerized simulation, Antarctica
The performance of an explicit cloud physics parameterization is examined with simulations of high southern latitude winter climate using a version of the Pennsylvania State University/National Center for Atmospheric Research Mesoscale Model, version 4. The results reveal that there are three moist physics regimes in the vertical over the elevated interior of Antarctica: the very cold upper troposphere, the relatively warm middle troposphere and the cold boundary layer. A reduction in the excessive cloud ice in the upper troposphere significantly improves the simulation of upper-tropospheric temperature. (Auth. mod.)

52-3749
Effects of snowfall on a snow—ice-thickness distribution.
Schramm, J.L., Holland, M.M., Curry, J.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.287-291, 15 refs.
Sea ice distribution, Ice cover thickness, Ice growth, Snow ice interface, Snowfall, Snow depth, Snow cover effect, Albedo, Ice models, Computerized simulation

52-3750
Arctic modeling data resources: the data archives at the ARCSS Data Coordination Center and the National Snow and Ice Data Center, U.S.A.
McGinnis, D.L., Cross, M.D., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.292-295, 2 refs.
Research projects, Organizations, Data processing, Polar atmospheres, Marine atmospheres, Global change, Air ice water interaction, Ice models, Computerized simulation

52-3751

Driving a high-resolution dynamic ice-sheet model with GCM climate: ice-sheet initiation at 116 000 BP.

Pollard, D., Thompson, S.L., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.296-304, 39 refs.

Ice sheets, Glaciation, Glacial meteorology, Glacier oscillation, Glacier mass balance, Glacier formation, Ice age theory, Global change, Paleoclimatology, Ice models, Computerized simulation

52-3752

Estimation of large-scale sea-ice motion from SSM/I 85.5 GHz imagery.

Agnew, T.A., Le, H., Hirose, T., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.305-311, 11 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Drift, Radar tracking, Radiometry, Spaceborne photography, Data processing

52-3753

Modelling the snow cover in a complex Alpine topography.

Fierz, C., Plüss, C., Martin, E., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.312-316, 10 refs.

Snow cover distribution, Snowfall, Snow depth, Snow heat flux, Snow temperature, Snow air interface, Radiation balance, Computerized simulation, Switzerland

52-3754

Modeling polar glaciation.

Oglesby, R.J., Marshall, S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.317-321, 13 refs.

Ice sheets, Glaciation, Glacial meteorology, Glacier formation, Glacier mass balance, Glacier oscillation, Ice age theory, Global change, Paleoclimatology, Ice models, Computerized simulation

A key measure of the understanding of polar glaciation is the ability to model the initiation, maintenance, and elimination of glaciation over Antarctica and high-latitude land masses in the Northern Hemisphere. Studies that address questions of Cenozoic antarctic glaciation, as well as studies that address questions of Pleistocene glaciation in the Northern Hemisphere, are described in some detail. The intention is to emphasize and discuss issues that are important in modeling these types of glacial events as much as to present specific results. (Auth.)

52-3755

Modelling inter-annual sea-ice variability off eastern Canada.

Marko, J.R., Fissel, D.B., Haller, D., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.322-326, 13 refs.

Sea ice distribution, Ice cover thickness, Ice growth, Ice conditions, Ice volume, Ice edge, Ice heat flux, Air ice water interaction, Drift, Ice models, Computerized simulation, Baffin Bay, Davis Strait, Labrador Sea

52-3756

Thermodynamic feedback processes in a single-column sea-ice—ocean model.

Holland, M.M., Schramm, J.L., Curry, J.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.327-332, 22 refs.

Sea ice distribution, Ice cover thickness, Ice cover effect, Ice heat flux, Air ice water interaction, Ice water interface, Albedo, Radiation balance, Polar atmospheres, Marine atmospheres, Global change, Ice models, Computerized simulation

52-3757

Three-dimensional climate—ice-sheet model applied to the Last Glacial Maximum.

Huybrechts, P., T'siobbel, S., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.333-339, 26 refs.

Ice sheets, Glaciation, Glacial meteorology, Glacier oscillation, Glacier mass balance, Ice age theory, Paleoclimatology, Global change, Ice models, Computerized simulation

52-3758

Historical variability in Northern Hemisphere spring snow-covered area.

Brown, R.D., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.340-346, 27 refs.

Snow cover distribution, Snowfall, Weather stations, Meteorological data, Climatic changes, Statistical analysis

52-3759

Relationship between snow cover and atmospheric circulation, central North America, winter 1988.

Derksen, C., Misurak, K., LeDrew, E., Piwowar, J., Goodison, B., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.347-352, 22 refs.

Plains, Snow cover distribution, Snow water equivalent, Snow heat flux, Snow cover effect, Snow air interface, Atmospheric circulation, Atmospheric pressure, Statistical analysis

52-3760

Preliminary analysis of snow microwave-radiometry using the SSM/I passive-microwave data: the case of La Grande River watershed (Quebec).

De Sève, D., Bernier, M., Fortin, J.P., Walker, A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.353-361, 19 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow temperature, Snow water equivalent, Radiometry, Terrain identification, Spaceborne photography, Image processing, Canada—Quebec

52-3761

Seasonal snow cover and climate change in the Hadley Centre GCM.

Essery, R., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.362-366, 17 refs.

Snow cover distribution, Snowfall, Snow depth, Snow cover effect, Snow heat flux, Snow air interface, Global warming, Computerized simulation

52-3762

Rapid changes in snow cover at low elevations in the Sierra Nevada, California, U.S.A.

Kattelmann, R., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.367-370, 26 refs.

Snow cover distribution, Snowfall, Snowstorms, Snow hydrology, Snow water equivalent, Snowmelt, Runoff forecasting, Flood forecasting, United States—California—Sierra Nevada

52-3763

Cryospheric data for model validations: requirements and status.

Barry, R.G., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.371-375, 54 refs.

Research projects, Data processing, Global warming, Computerized simulation, Air ice water interaction, Snow air interface, Snow water equivalent, Snow cover effect, Ice cover effect, Atmospheric circulation

52-3764

Perennial ice cover of the Beaufort Sea from active- and passive-microwave observations.

Kwok, R., Comiso, J.C., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.376-381, 21 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Radiometry, Synthetic aperture radar, Spaceborne photography, Image processing, Beaufort Sea

52-3765

Determination of a melt-onset date for arctic sea-ice regions using passive-microwave data.

Anderson, M.R., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.382-387, 8 refs.

Ice surveys, Sea ice, Ice detection, Ice forecasting, Ice heat flux, Ice temperature, Snow ice interface, Snow melting, Ice melting, Ice breakup, Radiometry, Spaceborne photography, Image processing

52-3766

AVHRR-based Polar Pathfinder products for modeling applications.

Maslanik, J.A., Fowler, C., Key, J.R., Scambos, T., Hutchinson, T., Emery, W., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.388-392, 17 refs.

Polar atmospheres, Marine atmospheres, Air ice water interaction, Ice surveys, Sea ice distribution, Ice conditions, Ice heat flux, Drift, Global change, Ice models, Radiometry, Spaceborne photography, Data processing

A suite of arctic and antarctic products is being prepared from Advanced Very High Resolution Radiometer and ancillary data as part of NASA's Polar Pathfinder effort. These products consist of twice-daily gridded fields of clear-sky—surface temperature, surface albedo and cloud fraction, as well as daily ice velocities, for 1983-96. The products and their production methodology are summarized, with examples demonstrating applications of the Pathfinder products for process studies and modeling. (Auth.)

52-3767
Surface turbulent fluxes over pack ice inferred from TOVS observations.
Lindsay, R.W., Francis, J.A., Persson, P.O.G., Rothrock, D.A., Schweiger, A.J., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.393-399, 13 refs.
Polar atmospheres, Marine atmospheres, Atmospheric boundary layer, Turbulent exchange, Sea ice distribution, Pack ice, Ice heat flux, Air ice water interaction, Radiometry, Spaceborne photography, Ice models, Computerized simulation

52-3768
On the potential use of glacier and permafrost observations for verification of climate models.
Beniston, M., Haeberli, W., Hoelzle, M., Taylor, A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.400-406, 37 refs.
Permafrost surveys, Permafrost heat balance, Soil air interface, Glacier surveys, Glacial meteorology, Glacier heat balance, Glacier mass balance, Global warming, Computerized simulation

52-3769
Geometry response of glaciers to changes in spatial pattern of mass balance.
Boudreaux, A., Raymond, C., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.407-411, 6 refs.
Glacier mass balance, Glacier oscillation, Glacier thickness, Glacier flow, Glacial meteorology, Ice models, Mathematical models, Computerized simulation

52-3770
Snow-accumulation distribution in the interior of the Lambert Glacier basin, Antarctica.
Higham, M., Craven, M., Ruddell, A., Allison, I., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.412-417, 18 refs.
Glacier surveys, Ice sheets, Glacier mass balance, Glacier oscillation, Glacier surfaces, Glacier alimentation, Snow accumulation, Snow ice interface, Glacial meteorology, Antarctica—Lambert Glacier
A prime input variable to uncoupled ice-sheet models, or for estimating the mass budget of present-day ice sheets, is the distribution of net surface mass balance. In most cases this is extrapolated from relatively few direct measurements over a limited time period, and parameterized in terms of continentality, surface elevation and other broad-scale indicators. Between 1989 and 1995 a series of oversnow traverses around the interior of the Lambert Glacier basin gathered a comprehensive set of data on snow accumulation and surface properties, surface climatology, ice-sheet velocities, elevations and thicknesses. Above the 2000 m level accumulation averages were found to be 76 kg/m^2/a. (Auth. mod.)

52-3771
How well can we parameterize past accumulation rates in polar ice sheets.
Steig, E.J., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.418-422, 53 refs.
Ice sheets, Glacier alimentation, Glacier mass balance, Glacier oscillation, Glacial meteorology, Snow accumulation, Paleoclimatology, Global change, Ice models, Mathematical models, Computerized simulation
An important component of models of the cryosphere is the calculation of accumulation rates over polar ice sheets. As a first-order approximation, many models rely on the assumption that temperature is the main controlling factor for precipitation. Compilation of available ice-core data, including a new core from Taylor Dome, East Antarctica, suggests that precipitation is significantly decoupled from temperature for a large proportion of both the Greenland and antarctic ice sheets. While the estimated glacial-to-interglacial change in temperature does not differ greatly among ice cores from each ice sheet, the estimated change in accumulation rate varies by more than a factor of 2. A simple vapor-pressure parameterization gives reasonable estimates of accumulation in the ice-sheet interior, but this is not necessarily the case close to the ice-sheet margin, where synoptic weather systems are important. (Auth.)

52-3772
Evaluation of the representation of arctic sea ice in the U.K. Hadley Centre GCM.
Smith, D.M., Cooper, C., Wingham, D.J., Laxon, S.W., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.423-428, 24 refs.
Polar atmospheres, Marine atmospheres, Sea ice distribution, Ice conditions, Ice heat flux, Air ice water interaction, Global change, Ice models, Computerized simulation

52-3773
Arctic precipitation as represented in the NCEP/NCAR reanalysis.
Serreze, M.C., Maslanik, J.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.429-433, 24 refs.
Polar atmospheres, Marine atmospheres, Precipitation (meteorology), Hydrologic cycle, Meteorological data, Data processing, Air ice water interaction, Ice models, Computerized simulation

52-3774
Determination of areal surface-feature coverage in the Beaufort Sea using aircraft video data.
Tschudi, M.A., Curry, J.A., Maslanik, J.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.434-438, 10 refs.
Polar atmospheres, Marine atmospheres, Ice surveys, Sea ice distribution, Ice surface, Ice heat flux, Ice melting, Air ice water interaction, Terrain identification, Albedo, Aerial surveys, Statistical analysis, Ice models, Computerized simulation

52-3775
Improved elevation dataset for climate and ice-sheet modelling: validation with satellite imagery.
Bamber, J.L., Bindschadler, R.A., *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.439-444, 14 refs.
Glacier surveys, Ice sheets, Ice shelves, Glacier thickness, Glacier surfaces, Glacier flow, Glacier beds, Ice models, Topographic surveys, Spaceborne photography, Data processing, Antarctica—West Antarctica, Antarctica—Ross Ice Shelf
The authors present a new, high-resolution (5 km) digital elevation model for the antarctic ice sheet, derived from radar-altimeter data obtained from the geodetic phase of the satellite, ERS-1. These data have been combined with a revised ice-thickness grid to produce a bed- and surface-elevation dataset for use in regional and global climate and paleo-climate modelling applications. The surface topography in the region of the Ross Ice Shelf has been used to illustrate the level of detail in both the vertical and horizontal resolution of the surface dataset. Landsat data has also been used to examine features in the surface-elevation data. In particular, the location of the grounding zone, for Ice Streams D and E, derived from the two data sources shows good agreement. The results of this validation underscore the utility of the new datasets for high-resolution modelling. (Auth. mod.)

52-3776
Arctic sea-ice conditions and the distribution of solar radiation during summer.
Perovich, D.K., Tucker, W.B., MP 5120, *Annals of Glaciology,* 1997, Vol.25, International Symposium on Representation of the Cryosphere in Climate and Hydrological Models, Victoria, British Columbia, Aug. 12-15, 1996. Papers. Edited by J.E. Walsh, et al, p.445-450, 23 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice surface, Ice melting, Ice heat flux, Ice openings, Ponds, Air ice water interaction, Radiation balance, Aerial surveys
Understanding the interaction of solar radiation with the ice cover is critical in determining the heat and mass balance of the arctic ice pack, and in assessing potential impacts due to climate change. Because of the importance of the ice-albedo feedback mechanism, information on the surface state of the ice cover is needed. Observations of the surface state of sea ice were obtained from helicopter photography missions made during the 1994 Arctic Ocean Section cruise. Photographs from one flight, taken during the height of the melt season (July 31, 1994) at 76°N, 172°W, were analyzed in detail. Bare ice covered 82% of the total area, melt ponds 12%, and open water 6%. While leads make up only a small portion of the total area, they are the source of virtually all of the solar energy input to the ocean.

52-3777
RADARSAT-I system commissioning and beyond.
Parashar, S., Langham, E., Ahmed, S., Canadian Conference on Electrical and Computer Engineering, Calgary, May 26-29, 1996. Proceedings. Vol.I: Glimpse into the 21st Century, edited by T.J. Malkinson, Calgary, Canada, University of Calgary, 1996, p.5-12, 3 refs.
DLC TK7801.C36a Vol.1 1996
Radar, Spaceborne photography, Mapping, Imaging, Electronic equipment, Radio communication, Data processing
Canada's first Earth observation satellite, RADARSAT-I was launched in a polar, sun-synchronous, dawn-dusk orbit by a Delta II rocket on Nov. 4, 1995. The system has been commissioned through months of on-orbit testing of the satellite along with operational demonstrations. The operation phase began on Apr. 1, 1996, and should last for 5 years, the designed lifetime of the satellite. During this phase, RADARSAT data will be supplied to users around the world for a variety of applications and the satellite will be turned from right looking to left looking orientation twice to map Antarctica. An overview of the RADARSAT-I system and operation is presented along with examples of the imagery. (Auth. mod.)

52-3778
Palaeomagnetism of three dyke swarms in Nansen Land, north Greenland (83°N).
Abrahamsen, N., Bengaard, H.J., Frederichsen, J.D., Van der Voo, R., *Geologie en mijnbouw,* 1997, 76(1-2), p.83-95, 33 refs.
Pleistocene, Subpolar regions, Earth crust, Geomagnetism, Tectonics, Hydrothermal processes, Magma, Remanent magnetism, Statistical analysis, Age determination, Greenland

52-3779
Southern flux of sea ice in the Tatarskiy Strait, Japan Sea and the generation of the Liman Current.
Martin, S., Kawase, M., *Journal of marine research,* Jan. 1998, 56(1), p.141-155, 19 refs.
Oceanography, Ocean currents, Sea ice distribution, Ice volume, Advection, Ice edge, Ice melting, Ice water interface, Mass balance, Spaceborne photography, Mathematical models, Japan, Sea

52-3780
Under-ice observations of water column temperature, salinity and spring phytoplankton dynamics: eastern Bering Sea shelf.
Stabeno, P.J., Schumacher, J.D., Davis, R.F., Napp, J.M., *Journal of marine research,* Jan. 1998, 56(1), p.239-255, 20 refs.
Marine biology, Sea ice distribution, Biomass, Plankton, Subglacial observations, Water temperature, Ice heat flux, Air ice water interaction, Ice cover effect, Chlorophylls, Moorings, Bering Sea

52-3781
High-pressure freezing of plant cells cultured in cellulose microcapillaries.
Tiedemann, J., Hohenberg, H., Kollmann, R., *Journal of microscopy,* Feb. 1998, 189(pt.2), p.163-171, 29 refs.
Cryogenics, Plant tissues, Preserving, Freezing, High pressure tests, Laboratory techniques, Thin sections, Electron microscopy, Microstructure

52-3782
One-dimensional model for frost formation on a cold flat surface.
Lee, K.S., Kim, W.S., Lee, T.H., *International journal of heat and mass transfer,* Nov.-Dec. 1997, 40(18), p.4359-4365, 10 refs.
Ice physics, Ice air interface, Ice solid interface, Air flow, Frost, Ice formation, Ice cover thickness, Ice sublimation, Vapor diffusion, Heat transfer, Mathematical models, Heat pumps, Mathematical models

52-3783
Melting heat transfer characteristics of a horizontal ice cylinder immersed in quiescent saline water.
Yamada, M., Fukusako, S., Kawanami, T., Watanabe, C., *International journal of heat and mass transfer,* Nov.-Dec. 1997, 40(18), p.4425-4435, 24 refs.
Ice physics, Ice water interface, Phase transformations, Ice melting, Ice surface, Salinity, Convection, Heat transfer coefficient, Profiles, Simulation

52-3784
Microbial activity under the ice cover of the shallow Neusiedler See (Austria, central Europe).
Reitner, B., Herzig, A., Herndl, G.J., *Hydrobiologia,* Dec. 19, 1997, Vol.357, p.173-184, 35 refs.
Limnology, Microbiology, Ecosystems, Plankton, Bacteria, Biomass, Lake ice, Nutrient cycle, Suspended sediments, Ice cover effect, Sampling, Seasonal variations, Austria—Neusliedler See

52-3785
Behavior of ice-water transition in dimyristoylphosphatidylethanolamine-water system.
Takahashi, H., Aoki, H., Inoue, H., Kodama, M., Hatta, I., *Thermochimica acta,* Jan. 5, 1998, Vol.308(1-2), IUPAC Conference on Chemical Thermodynamics, 14th, Osaka, Japan, Aug. 15-30, 1996. Collected papers. Interaction with water. Edited by S. Kidokoro et al, p.85-91, 29 refs.
Colloids, Hydrates, Hydrocarbons, Ice water interface, Hygroscopic water, Ice melting, Temperature measurement, X ray diffraction, Phase transformations, Enthalpy

52-3786
Facet of recent ice sciences.
Suga, H., *Thermochimica acta,* Oct. 15, 1997, 300(1-2), p.117-126, 53 refs.
Ice physics, Ice structure, Molecular structure, Molecular energy levels, Phase transformations, Doped ice, Impurities, Protons, Defects, Thermodynamic properties, Theories

52-3787
Sediment and organic carbon budget for the Canadian Beaufort Shelf.
Macdonald, R.W., Solomon, S.M., Cranston, R.E., Welch, H.E., Yunker, M.B., Gobeil, C., *Marine geology,* Jan. 1998, 144(4), p.255-273, Refs. p.269-273.
Oceanography, Subpolar regions, Sedimentation, Sediment transport, Estuaries, Deltas, Carbon dioxide, Geochemical cycles, Biomass, Mass transfer, Statistical analysis, Models, Arctic Ocean, Beaufort Sea

52-3788
Reaction of clean Li surfaces with small molecules in ultrahigh vacuum.
Zhuang, G.R., Ross, P.N., Jr., Kong, F.P., McLarnon, F., *Electrochemical Society. Journal,* Jan. 1998, 145(1), p.159-164, 26 refs.
Ice physics, Ice sublimation, Ice spectroscopy, Ice solid interface, Adsorption, Water films, Metals, Batteries

52-3789
Surface cooled convection simulations with application to ice-covered seas.
Piacsek, S., Allard, R., Warn-Varnas, A., *Dynamics of atmospheres and oceans,* Jan. 1998, 27(1-4), p.601-617, 18 refs.
Oceanography, Ocean currents, Convection, Sea ice, Ice water interface, Ice growth, Surface temperature, Cooling rate, Salinity, Turbulent diffusion, Heat transfer, Buoyancy, Mathematical models

52-3790
Transitivity properties of surface temperature and ice cover in the CCM1.
Saltzman, B., Hu, H.J., Oglesby, R.J., *Dynamics of atmospheres and oceans,* Jan. 1998, 27(1-4), p.619-629, 24 refs.
Paleoclimatology, Climatic changes, Ice age theory, Carbon dioxide, Surface temperature, Periodic variations, Heat balance, Albedo, Sea ice, Ice cover effect, Snow cover effect, Mathematical models

52-3791
Snow: metamorphism of deposited snow.
Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Laboratory. Contributions. Review articles,* [1968], No.1, 4p., 6 refs. Reprinted from Encyclopedia of geomorphology, edited by R.W. Fairbridge, New York, Reinhold Publishing Corp., 1968, p.1025-1028.
Metamorphism (snow), Snow compression

52-3792
Physics of natural precipitation processes.
Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Laboratory. Contributions. Review articles,* [1968], No.1, 12p., 2 refs. Reprinted from Weather modification: science and public policy, edited by R.G. Fleagle, Seattle, University of Washington, 1968, p.18-29.
Cloud physics, Clouds (meteorology), Precipitation (meteorology), Condensation nuclei, Ice nuclei, Coalescence

52-3793
Scientific basis, techniques, and results of cloud modification.
Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Laboratory. Contributions. Review articles,* [1968], No.1, 13p., 2 refs. Reprinted from Weather modification: science and public policy, edited by R.G. Fleagle, Seattle, University of Washington, 1968, p.30-42.
Cloud physics, Clouds (meteorology), Precipitation (meteorology), Condensation nuclei, Ice nuclei, Cloud seeding, Artificial precipitation

52-3794
Optical techniques for counting ice particles in mixed-phase clouds.
Turner, F.M., Radke, L.F., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 7p., 6 refs. Reprinted from Atmospheric technology, No.8, Spring 1976, p.25-31.
Cloud physics, Clouds (meteorology), Ice crystal size, Ice crystal optics, Meteorological instruments

52-3795
Concentrations of ice particles in orographic clouds and cyclonic storms over the Cascade Mountains.
Hobbs, P.V., Atkinson, D.G., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 13p., 46 refs. Reprinted from Journal of the atmospheric sciences, Vol.33, No.7, July 1976, p.1362-1374.
Cloud physics, Clouds (meteorology), Ice nuclei, Ice crystal size, Ice crystal collision, Ice storms, Snow pellets, Snowstorms, Statistical analysis, United States—Washington—Cascade Mountains

52-3796
Observation of natural cloud seeding with accompanying release of precipitation.
Radke, L.F., Herzegh, P.H., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 6p., 7 refs. Reprinted from Preprint volume of the International Conference on Cloud Physics, Boulder, CO, July 26-30, 1976, p.458-463.
Cloud physics, Clouds (meteorology), Ice nuclei, Cloud seeding, Precipitation (meteorology)

52-3797
Theoretical study of the evolution of mixed phase cumulus clouds.
Scott, B.C., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 5p., 4 refs. Reprinted from Preprint volume of the International Conference on Cloud Physics, Boulder, CO, July 26-30, 1976, p.543-547.
Cloud physics, Clouds (meteorology), Condensation nuclei, Cloud droplets, Ice nuclei, Ice crystal growth, Ice crystal size, Snow pellets

52-3798
Field measurements obtained with two optical ice particle counters in cumulus clouds over Florida.
Turner, F.M., Ramachandra Murty, A.S., Sax, R.I., Radke, L.F., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 6p., 5 refs. Reprinted from Preprint volume of the International Conference on Cloud Physics, Boulder, CO, July 26-30, 1976, p.581-586.
Cloud physics, Clouds (meteorology), Ice crystal size, Ice crystal optics, Ice detection, Meteorological instruments, United States—Florida

52-3799
Theoretical study of some effects of artificial seeding on mixed phase cumulus clouds.
Scott, B.S., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 6p., 6 refs. Reprinted from Proceedings of the 2nd WMO Scientific Conference on Weather Modification, Boulder, CO, Aug. 2-6, 1976, p.117-122.
Cloud physics, Clouds (meteorology), Ice crystal growth, Ice nuclei, Cloud seeding, Artificial nucleation, Snow pellets, Artificial precipitation

52-3800
Dynamics and microphysics of a stratiform cloud system.
Herzegh, P.H., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 6p., 12 refs. Reprinted from Preprint volume of the 17th Conference on Radar Meteorology, Seattle, WA, Oct. 26-29, 1976, p.200-205.
Cloud physics, Clouds (meteorology), Ice nuclei, Ice crystal growth, Ice crystal size, Precipitation (meteorology)

52-3801
Preliminary explorations of a technique for deducing ice particle types from Doppler radar measurements.
Weiss, R.R., Sr., Locatelli, J.D., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 2p., 4 refs. Reprinted from Preprint volume of the 17th Conference on Radar Meteorology, Seattle, WA, Oct. 26-29, 1976, p.226-227.
Cloud physics, Clouds (meteorology), Ice crystal size, Radar echoes

52-3802
Wave-like precipitation bands, precipitation cores and generating cells associated with a warm front.
Hobbs, P.V., Locatelli, J.D., Weiss, R.R., Sr., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 8p., 13 refs. Reprinted from Preprint volume of the 17th Conference on Radar Meteorology, Seattle, WA, Oct. 26-29, 1976, p.249-256.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Storms

52-3803
Internal structure of mesoscale precipitation features in extratropical cyclonic storms.
Matejka, T.J., Houze, R.A., Jr., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1977], No.19, 6p., 9 refs. Reprinted from Preprint volume of the 17th Conference on Radar Meteorology, Seattle, WA, Oct. 26-29, 1976, p.264-269.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Storms

52-3804
Use of a vertically pointing pulsed Doppler radar in cloud physics and weather modification studies.
Weiss, R.R., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1976], No.17, 10p., 8 refs. Reprinted from Journal of applied meteorology, Vol.14, No.2, Mar. 1975, p,222-231.
Cloud physics, Clouds (meteorology), Cloud seeding, Ice nuclei, Ice crystal growth, Ice crystal size, Precipitation (meteorology), Artificial precipitation, Radar echoes

52-3805
Computer simulation of snowflake size distributions and radar Doppler-velocities.
Harrison, H., Simon, B., Weiss, R.R., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1976], No.17, 4p., 1 ref. Reprinted from Preprint volume of the 16th Radar Meteorology Conference, Houston, TX, Apr. 22-24, 1975, p.447-450.
Snowfall, Falling snow, Snowflakes, Ice crystal size, Particle size distribution, Radar echoes, Computerized simulation

52-3806
Dynamical and microphysical structure of an occluded frontal system and its modification by orography.
Hobbs, P.V., Houze, R.A., Jr., Matejka, T.J., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1976], No.17, 21p., 31 refs. Reprinted from Journal of the atmospheric sciences, Vol.32, No.8, Aug. 1975, p.1542-1562.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Ice nuclei, Ice crystal growth, Ice crystal size, Weather forecasting, United States—Washington—Cascade Mountains

52-3807
Nature of winter clouds and precipitation in the Cascade Mountains and their modification by artificial seeding. Part I: natural conditions.
Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1976], No.17, 22p., 23 refs. Reprinted from Journal of applied meteorology, Vol.14, No.5, Aug. 1975, p.783-804.
Cloud physics, Clouds (meteorology), Cloud seeding, Fronts (meteorology), Ice nuclei, Ice crystal growth, Ice crystal size, Snow pellets, Snowfall, Precipitation (meteorology), United States—Washington—Cascade Mountains

52-3808
Nature of winter clouds and precipitation in the Cascade Mountains and their modification by artificial seeding. Part II: techniques for the physical evaluation of seeding.
Hobbs, P.V., Radke, L.F., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1976], No.17, 14p., 28 refs. Reprinted from Journal of applied meteorology, Vol.14, No.5, Aug. 1975, p.805-818.
Cloud physics, Clouds (meteorology), Cloud seeding, Artificial nucleation, Ice nuclei, Ice crystal growth, Ice crystal size, Snowfall, Artificial precipitation, Artificial snow, United States—Washington—Cascade Mountains

52-3809
Nature of winter clouds and precipitation in the Cascade Mountains and their modification by artificial seeding. Part III: case studies of the effects of seeding.
Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1976], No.17, 40p., 11 refs. Reprinted from Journal of applied meteorology, Vol.14, No.5, Aug. 1975, p.819-858.
Cloud physics, Clouds (meteorology), Cloud seeding, Artificial nucleation, Ice nuclei, Ice crystal growth, Ice crystal size, Snow pellets, Snowfall, Artificial precipitation, Artificial snow, United States—Washington—Cascade Mountains

52-3810
Precipitation scavenging of aerosol particles.
Radke, L.F., Eltgroth, M.W., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 5p., 17 refs. Reprinted from Preprint volume of the Conference on Cloud Physics and Atmospheric Electricity, Issaquah, WA, July 31-Aug. 4, 1978, p.44-48.
Cloud physics, Clouds (meteorology), Precipitation (meteorology), Aerosols, Scavenging

52-3811
Airborne measurements of the size distributions of precipitation particles in frontal clouds.
Houze, R.A., Jr., Hobbs, P.V., Herzegh, P.H., Parsons, D.B., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 5p., 18 refs. Reprinted from Preprint volume of the Conference on Cloud Physics and Atmospheric Electricity, Issaquah, WA, July 31-Aug. 4, 1978, p.168-172.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Ice crystal size, Coalescence, Particle size distribution, Statistical analysis

52-3812
University of Washington's CYCLES Project: an overview.
Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 6p., 35 refs. Reprinted from Preprint volume of the Conference on Cloud Physics and Atmospheric Electricity, Issaquah, WA, July 31-Aug. 4, 1978, p.271-276.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Storms, Weather forecasting

52-3813
Air motions, mesoscale structure and cloud microphysics associated with a cold front.
Hobbs, P.V., Locatelli, J.D., Matejka, T.J., Houze, R.A., Jr., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 7p., 7 refs. Reprinted from Preprint volume of the Conference on Cloud Physics and Atmospheric Electricity, Issaquah, WA, July 31-Aug. 4, 1978, p.277-283.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Ice nuclei, Ice crystal size, Storms, Radar tracking, United States—Washington

52-3814
Generating cells and precipitation growth in mesoscale rainbands.
Harzegh, P.H., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 8p., 18 refs. Reprinted from Preprint volume of the Conference on Cloud Physics and Atmospheric Electricity, Issaquah, WA, July 31-Aug. 4, 1978, p.284-291.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Ice nuclei, Snow pellets, Coalescence, Storms, United States—Washington

52-3815
Microphysical and dynamical structure of mesoscale cloud features in extratropical cyclones.
Matejka, T.J., Houze, R.A., Jr., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 8p., 30 refs. Reprinted from Preprint volume of the Conference on Cloud Physics and Atmospheric Electricity, Issaquah, WA, July 31-Aug. 4, 1978, p.292-299.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Ice nuclei, Ice crystal size, Coalescence, Storms

52-3816
Organization and structure of clouds and precipitation on the mesoscale and microscale in cyclonic storms.
Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 15p., 35 refs. Reviews of geophysics and space physics, Vol.16, No.4, Nov. 1978, p.741-755.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Ice nuclei, Ice crystal size, Coalescence, Storms

52-3817
Size distributions of precipitation particles in frontal clouds.
Houze, R.A., Jr., Hobbs, P.V., Herzegh, P.H., Parsons, D.B., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1979], No.22, 7p., 21 refs. Journal of the atmospheric sciences, Vol.36, No.1, Jan. 1979, p.156-162.
Cloud physics, Clouds (meteorology), Fronts (meteorology), Precipitation (meteorology), Ice nuclei, Ice crystal size, Particle size distribution, Statistical analysis

52-3818
Ice winter of 1996/97 on the German coasts between Ems and Oder, with a survey of the entire Baltic area.
Strübing, K., *Deutsche Hydrographische Zeitschrift,* 1996, 48(2), p.185-195, 8 refs.
Oceanographic surveys, Ice surveys, Ice conditions, Shores, Sea ice distribution, Ice volume, Seasonal variations, Baltic Sea, North Sea

52-3819
Ice conditions in Zalew Szczecinski (Stettiner Haff) and in Zatoka Pomorska (Pomeranian Bight) during the winter of 1996/97.
Schmelzer, N., Sztobryn, M., Stanisławczyk, I., *Deutsche Hydrographische Zeitschrift,* 1996, 48(2), p.197-202, With German summary. 2 refs.
Sea ice distribution, Ice conditions, Air temperature, Water temperature, Ice cover thickness, Seasonal variations, Baltic Sea

52-3820
Influence of the geomorphologic heritage on present slope dynamics. The Gredos Cirque, Spain.
Muñoz, J., Palacios, D., De Marcos, J., *Pirineos,* 1995, Vol.145/146, p.35-63, With Spanish summary. Refs. p.61-63.
Geomorphology, Landscape development, Mountain soils, Cirques, Glacial geology, Slope processes, Snow erosion, Nivation, Solifluction, Periglacial processes, Snow cover effect, Spain—Sierra de Gredos

52-3821
Surface movement of the Argualas rock glacier. [Movimiento superficial del glaciar rocoso de las Argualas]
Serrano, E., Sanjosé, J.J., Silio, F., Agudo, C., *Pirineos,* 1995, Vol.145/146, p.103-110, In Spanish with English summary. 5 refs.
Geomorphology, Rock glaciers, Slope processes, Sediment transport, Periglacial processes, Velocity measurement, Geological surveys, Spain—Pyrenees

52-3822

Development of a chemistry module for GCMs: first results of a multiannual integration.

Steil, B., et al, *Annales geophysicae,* Feb. 1998, 16(2), p.205-228, 71 refs.

Climatology, Polar atmospheres, Polar stratospheric clouds, Atmospheric composition, Degradation, Aerosols, Ozone, Profiles, Models, Photochemical reactions

The comprehensive chemistry module CHEM has been developed for application in general circulation models (GCMs) describing tropospheric and stratospheric chemistry, including photochemical reactions and heterogeneous reactions on sulphate aerosols and polar stratospheric clouds. It has been coupled to the spectral atmospheric GCM ECHAM3. First results of a 15-year model integration indicate that the model ECHAM3/CHEM runs are numerically efficient and stable, i.e. that no model drift can be detected in dynamic and chemical parameters. The model reproduces the main features regarding ozone, in particular intra- and interannual variability. ECHAM3/CHEM well describes the chemical processes leading to ozone reduction. The model results show an activation of chlorine inside the polar vortex which is stronger in the southern than in the northern winter hemisphere, yielding an ozone hole over the Antarctic; this hole, however, is also caused to a substantial degree by the dynamics. (Auth. mod.)

52-3823

Measurement errors in cirrus cloud microphysical optical properties.

Larsen, H., Gayet, J.F., Febvre, G., Chepfer, H., Brogniez, G., *Annales geophysicae,* Feb. 1998, 16(2), p.266-276, 54 refs.

Climatology, Cloud physics, Optical properties, Light scattering, Sensors, Probes, Particle size distribution, Water content, Ice crystal optics, Ice crystal structure, Accuracy

52-3824

CUTLASS HF radar observations of the Odden ice tongue.

Shand, B.A., et al, *Annales geophysicae,* Feb. 1998, 16(2), p.280-282, 6 refs.

Sea ice distribution, Ice surveys, Ice growth, Ice detection, Radar echoes, Spaceborne photography, Backscattering, Sea clutter, Sensor mapping, Correlation, Greenland Sea

52-3825

Calculation of melt pond albedos on arctic sea ice.

Makshtas, A.P., Podgornyĭ, I.A., *Polar research,* June 1996, 15(1), p.43-52, 26 refs.

Sea ice, Albedo, Ice surface, Ponds, Meltwater, Optical properties, Radiance, Radiation absorption, Ice optics, Mathematical models, Spectra, Radiometry, Barents Sea

52-3826

Thermal structure of Hansbreen, a tidewater glacier in southern Spitsbergen, Svalbard.

Jania, J., Mochnacki, D., Gądek, B., *Polar research,* June 1996, 15(1), p.53-66, 27 refs.

Glacial hydrology, Grounded ice, Shores, Ice edge, Boreholes, Ice temperature, Thermal analysis, Profiles, Stratification, Hydrothermal processes, Norway—Spitsbergen

52-3827

Newtontoppen granitoid rocks, their geology, chemistry and Rb-Sr age.

Teben'kov, A.M., Ohta, Y., Balashov, IU.A., Sirotkin, A.N., *Polar research,* June 1996, 15(1), p.67-80, 36 refs.

Pleistocene, Geologic structures, Geologic processes, Earth crust, Subpolar regions, Lithology, Classifications, Geochemistry, Geochronology, Isotope analysis, Norway—Spitsbergen

52-3828

Two major unconformities beneath the Neoproterozoic Murchisonfjorden Supergroup on the Caledonides of central Nordaustlandet, Svalbard.

Gee, D.G., Teben'kov, A.M., *Polar research,* June 1996, 15(1), p.81-91, 23 refs.

Pleistocene, Bedrock, Geologic processes, Subpolar regions, Earth crust, Sedimentation, Stratigraphy, Magma, Lithology, Mapping, Norway—Svalbard

52-3829

Trends of ozone in the troposphere.

Oltmans, S.J., et al, *Geophysical research letters,* Jan. 15, 1998, 25(2), p.139-142, 15 refs.

Climatology, Polar atmospheres, Atmospheric composition, Ozone, Profiles, Statistical analysis, Seasonal variations, Antarctica—South Pole, United States—Alaska—Barrow

Using a set of selected surface ozone (nine stations) and ozone vertical profile measurements (from six stations), changes in tropospheric ozone at a number of locations are documented. From two stations at high Northern Hemisphere (NH) latitudes there has been a significant decline in ozone amounts throughout the troposphere since the early 1980s. In Antarctica large declines in the ozone concentration are noted in the South Pole data, and like those at high latitudes of the NH, seem to parallel the large decreases in the stratosphere. (Auth. mod.)

52-3830

Interhemispheric differences in stratospheric water vapour during late winter, in version 4 MLS.

Morrey, M.W., Harwood, R.S., *Geophysical research letters,* Jan. 15, 1998, 25(2), p.147-150, 17 refs.

Climatology, Radiometry, Polar atmospheres, Stratosphere, Atmospheric composition, Water vapor, Distribution, Turbulent diffusion, Atmospheric circulation, Seasonal variations

Observations of stratospheric water vapor, made by the Microwave Limb Sounder during the 1992 and 1993 arctic and 1992 antarctic late winters have now been produced using version 4 of the retrieval software. These improved measurements are analyzed as equivalent latitude zonal means. Major interhemispheric differences are revealed in the water vapor content of the vortex in the lower stratosphere. This technique emphasizes mixing ratio gradients at the edges of both polar vortices, and a local maximum at the edge of the antarctic vortex. A mixing ratio gradient across the interior of the antarctic vortex at 530K indicates it is not isentropically mixed. (Auth. mod.)

52-3831

Using the sunspot cycle to date ice cores.

Steig, E.J., Morse, D.L., Waddington, E.D., Polissar, P.J., *Geophysical research letters,* Jan. 15, 1998, 25(2), p.163-166, 31 refs.

Paleoclimatology, Ice sheets, Ice cores, Ice dating, Solar radiation, Gamma irradiation, Isotope analysis, Correlation, Antarctica—Taylor Dome

For selected Holocene sections of the Taylor Dome core, East Antarctica, high-resolution ^{10}Be measurements are used to establish a nominal 11-year thickness, taking advantage of the solar cycle in cosmogenic isotope production. The authors compare measured thicknesses with the layer thickness profile predicted by a finite element ice flow model. The results are in good agreement, supporting the assumption that the length of the solar cycle has remained essentially constant throughout the Holocene. (Auth. mod.)

52-3832

Upper ocean velocities in the Beaufort Gyre.

Plueddemann, A.J., Krishfield, R., Takizawa, T., Hatakeyama, K., Honjo, S., *Geophysical research letters,* Jan. 15, 1998, 25(2), p.183-186, 15 refs.

Oceanographic surveys, Ocean currents, Tidal currents, Subpolar regions, Drift stations, Underwater acoustics, Profiles, Spectra, Velocity measurement, Topographic effects, Diurnal variations, Arctic Ocean

52-3833

Production of monthly mean climatological archives for the Nordic Seas.

Engedahl, H., Ådlandsvik, B., Martinsen, E.A., *Journal of marine systems,* Jan. 1998, 14(1-2), p.1-26, 36 refs.

Oceanography, Climatology, Ocean currents, Marine atmospheres, Polar atmospheres, Hydrography, Air water interactions, Mathematical models, Statistical analysis, Seasonal variations, North Sea, Norwegian Sea, Greenland Sea, Barents Sea, Russia—Kara Sea

52-3834

Wind forced oceanic responses near ice edges revisited.

Fennel, W., Johannessen, O.M., *Journal of marine systems,* Jan. 1998, 14(1-2), p.57-79, 20 refs.

Oceanography, Atmospheric boundary layer, Sea ice, Ice edge, Air ice water interaction, Wind factors, Stresses, Profiles, Upwelling, Mathematical models, Theories, Ice cover effect

52-3835

Postglacial trends in palynological richness in the northern Fennoscandian tree-line area and their ecological interpretation.

Seppä, H., *Holocene,* Jan. 1998, 8(1), p.43-53, Refs. p.52-53.

Paleoecology, Forest lines, Subarctic landscapes, Tundra vegetation, Quaternary deposits, Lacustrine deposits, Stratigraphy, Palynology, Vegetation patterns, Geochronology, Statistical analysis, Finland, Norway

52-3836

Holocene history of *Betula* at Lake Iilompolo, Inari Lapland, northeastern Finland.

Mäkelä, E., *Holocene,* Jan. 1998, 8(1), p.55-67, 39 refs.

Trees (plants), Paleoecology, Quaternary deposits, Subpolar regions, Forest lines, Vegetation patterns, Lacustrine deposits, Radioactive age determination, Palynology, Sampling, Statistical analysis, Finland—Lapland

52-3837

Recent paludification of kettle holes on the central islands of Lake Bienville, northern Québec, Canada.

Filion, L., Bégin, Y., *Holocene,* Jan. 1998, 8(1), p.91-96, 32 refs.

Subarctic landscapes, Tundra soils, Paludification, Soil formation, Forest fires, Podsol, Snowmelt, Snow cover distribution, Vegetation patterns, Quaternary deposits, Radioactive age determination, Canada—Quebec—Bienville, Lake

52-3838

Assessment of the wave-iceberg load combination factor.

Foschi, R., Isaacson, M., Allyn, N., Saudy, I., *International journal of offshore and polar engineering,* Mar. 1998, 8(1), p.1-8, 25 refs. For another source see 51-5714.

Offshore structures, Ice solid interface, Icebergs, Ocean waves, Ice water interface, Dynamic loads, Impact, Ice loads, Analysis (mathematics), Mechanical properties, Standards, Design criteria

52-3839

Ice conditions in an anisotropic sea ice dynamics model.

Pritchard, R.S., *International journal of offshore and polar engineering,* Mar. 1998, 8(1), p.9-15, 12 refs. For another version see 51-5726.

Sea ice distribution, Ice openings, Ice formation, Ice cover thickness, Ice cover strength, Surface structure, Classifications, Orientation, Pressure ridges, Anisotropy, Ice plasticity, Ice models, Mathematical models

52-3840

Limit-force ice loads and their significance to offshore structures in the Beaufort Sea.

Comfort, G., Singh, S., Dinovitzer, A., *International journal of offshore and polar engineering,* Mar. 1998, 8(1), p.16-21, 21 refs. For another version see 51-5749.

Offshore structures, Sea ice, Pack ice, Ice loads, Ice cover thickness, Ice solid interface, Ice mechanics, Stress concentration, Statistical analysis, Analysis (mathematics), Forecasting, Beaufort Sea

52-3841

Gas hydrates in the Messoyakha gas field of the West Siberian Basin—a re-examination of the geologic evidence.

Collett, T.S., Ginsburg, G.D., *International journal of offshore and polar engineering,* Mar. 1998, 8(1), p.22-29, 25 refs. For another source see 51-5687.

Hydrocarbons, Natural gas, Reservoirs, Hydrates, Sediments, Permafrost bases, Geochemistry, Well logging, Geological surveys, Russia—Messoyakha

52-3842
Velocity distribution in snow avalanches.
Nishimura, K., Ito, Y., *Journal of geophysical research,* Dec. 10, 1997, 102(B12), p.27,297-27,303, 15 refs.
Avalanche mechanics, Velocity measurement, Flow measurement, Impact tests, Snow air interface, Turbulent flow, Turbulent boundary layer, Atmospheric pressure, Air entrainment, Sensors, Simulation

52-3843
Uplift of the Transantarctic Mountains and the bedrock beneath the East Antarctic ice sheet.
Ten Brink, U.S., Hackney, R.I., Bannister, S., Stern, T.A., Makovsky, Y., *Journal of geophysical research,* Dec. 10, 1997, 102(B12), p.27,603-27,621, 75 refs.
Glacial geology, Ice sheets, Bedrock, Tectonics, Earth crust, Isostasy, Gravity anomalies, Seismic surveys, Seismic velocity, Antarctica—Transantarctic Mountains
In recent years the Transantarctic Mountains (TAM) have become the focus of modelers who explained their uplift by a variety of isostatic and thermal mechanisms. A problem with these models is a lack of available data to compare with model predictions. The authors report the results of a 312-km long geophysical traverse conducted in 1993-94 in the hinterland of the TAM. Detailed subglacial topography and gravity measurements confirm the origin of the TAM as a flexural uplift of the edge of East Antarctica; argue that the uplift is coincident with a relatively minor tectonic event of transtensional motion between East and West Antarctica during the Eocene rather than the Late Cretaceous rifting event that created the Ross Embayment; and suggest that this transtensional motion caused the continuous plate to break, which created an escarpment that significantly increased the rates of erosion and exhumation. (Auth. mod.)

52-3844
Changes in rotation induced by Pleistocene ice masses with stratified analytical Earth models.
Vermeersen, L.L.A., Fournier, A., Sabadini, R., *Journal of geophysical research,* Dec. 10, 1997, 102(B12), p.27,689-27,702, 48 refs.
Pleistocene, Ice sheets, Glacier oscillation, Isostasy, Relaxation (mechanics), Geologic processes, Viscosity, Stratification, Mathematical models, Theories

52-3845
Polar stratospheric clouds due to vapor enhancement: HALOE observations of the antarctic vortex in 1993.
Hervig, M.E., et al, *Journal of geophysical research,* Dec. 20, 1997, 102(D23), p.28,185-28,193, 35 refs.
Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Water vapor, Heterogeneous nucleation, Ice formation, Photometry
Aerosol measurements from the Halogen Occultation Experiment during the antarctic spring of 1993 are compared with calculations of the volume of different types of polar stratospheric clouds (PSCs) at equilibrium. Comparing the observed volumes with model calculations assuming constant nitric acids suggests that the PSCs were composed of liquid ternary aerosols rather than solid nitric acid trihydrate. These comparisons highlight the importance of the vapor distributions for modeling PSC growth and suggest that vapor resupply is important for late spring PSC growth. (Auth. mod.)

52-3846
Polar stratospheric cloud threshold temperatures in the 1995-1996 arctic vortex.
Rosen, J.M., et al, *Journal of geophysical research,* Dec. 20, 1997, 102(D23), p.28,195-28,202, 37 refs.
Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Classifications, Optical properties, Air temperature, Aerosols, Radio echo soundings, Backscattering, Detection, Thermodynamics, Greenland—Thule, Norway—Spitsbergen, Finland—Sodankylä

52-3847
Comment on "On the magnitude of transport out of the antarctic polar vortex" by Wiel M. F. Wauben et al.
Tuck, A.F., Proffitt, M.H., Wauben, W.M.F., Van Velthoven, P.F.J., Kelder, H., Bintanja, R., *Journal of geophysical research,* Dec. 20, 1997, 102(D23), p.28,215-28,221, Includes reply. 29 refs. For pertinent paper see 51-2901 or 25I-56985.
Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Mass transfer, Atmospheric circulation, Models, Accuracy
Wauben et al. [1997] report numerical studies of the release of tracers in a model using European Centre for Medium-Range Weather Forecasts (ECMWF) analyzed fields. They compute the transport of a tracer released at (75°S, 70°W) on Aug. 1 out to Oct. 31 and assume that 51°S can be used to calculate the isentropic transport out of the vortex and that the base of the vortex is at the tropopause, assumed to be at 300 hPa. By so doing, they arrive at a figure of 65% loss of tracer from the vortex and use this result to conclude that the vortex is a containment vessel rather than a flow reactor. Both this conclusion and the techniques they use to reach it call for comment. It is concluded that Wauben et al.'s [1997] support of the containment vessel idea for the antarctic vortex is invalid and that even their own estimates show the mass transport to be proceeding at about the same rate as the chemically induced ozone loss in the Aug.-Oct. period. Such a condition is characteristic of a flow reactor. (Auth. mod.)

52-3848
Seasonal and interannual variations of atmospheric CO_2 and climate.
Dettinger, M.D., Ghil, M., *Tellus,* Feb. 1998, 50B(1), p.1-24, 65 refs.
Climatology, Climatic changes, Polar atmospheres, Atmospheric boundary layer, Atmospheric composition, Carbon dioxide, Sampling, Statistical analysis, Seasonal variations, Antarctica—South Pole
Interannual variations of atmospheric CO_2 concentrations at the South Pole are small and are almost lost in the trend and interannual variations. Singular-spectrum analysis (SSA) is used here to isolate and reconstruct interannual signals and to visualize recent decadal changes in the amplitude and phase of the seasonal cycle. Variations of the seasonal CO_2 cycle at the South Pole differ from those at Mauna Loa: it is phase changes of the seasonal cycle at the South Pole, rather than amplitude changes, that parallel hemispheric and global temperature trends. The seasonal CO_2 cycles exhibit earlier occurrences of the seasons by 7 days at Mauna Loa and 18 days at the South Pole. Interannual CO_2 variations are shared at the two locations, appear to respond to tropical processes, and can be decomposed mostly into two periodicities. (Auth. mod.)

52-3849
Tropospheric ozone depletion in polar regions—a comparison of observations in the Arctic and Antarctic.
Wessel, S., et al, *Tellus,* Feb. 1998, 50B(1), p.34-50, 29 refs.
Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Ozone, Stratification, Degradation, Advection, Profiles, Seasonal variations, Norway—Spitsbergen, Antarctica—Neumayer Station
The dynamics of tropospheric ozone variations in the Arctic (Ny-Ålesund, Spitsbergen), and in Antarctica (Neumayer Station) were investigated for the period Jan. 1993 to June 1994. Continuous surface ozone measurements, vertical profiles of tropospheric ozone by ECC-sondes, meteorological parameters, trajectories as well as ice charts were available for analysis. Four surface ozone minima were detected in Aug. and Sep. 1993 at Neumayer Station with absolute ozone mixing ratios between 8 ppbv and 14 ppbv throughout the minima. At both measuring stations, the ozone minima were detected during polar spring. It was found that in both polar regions, the ozone depletion events were confined to the planetary boundary layer with a capping temperature inversion at the upper limit of the ozone poor air mass. Back-trajectory analyses revealed that the ozone-depleted air masses were transported across the marine, ice-covered regions of the central Arctic and the South Atlantic Ocean. These comparable observations in both polar regions suggest a similar ozone destruction mechanism which is responsible for an efficient ozone decay. In the Antarctic, elevated ozone-depleted air masses due to the influence of katabatic surface winds were observed. (Auth. mod.)

52-3850
Note on the C/N and C/P ratio of the biological production of the Nordic seas.
Broström, G., *Tellus,* Feb. 1998, 50B(1), p.93-109, 55 refs.
Oceanography, Geochemical cycles, Carbon dioxide, Subpolar regions, Biomass, Plankton, Carbon dioxide, Suspended sediments, Organic nuclei, Sampling, Models, Turbulent exchange, Norwegian Sea, Greenland Sea

52-3851
Particle-image velocimetry for whole-field measurement of ice velocities.
Ettema, R., Fujita, I., Muste, M., Kruger, A., *Cold regions science and technology,* Oct. 1997, 26(2), p.97-112, 8 refs.
River ice, Ice floes, Fluid flow, Velocity measurement, Distribution, Imaging, Statistical analysis, Image processing, Ice models, Simulation, Hydraulics

52-3852
Modelling the dynamics and thermodynamics of icebergs.
Bigg, G.R., Wadley, M.R., Stevens, D.P., Johnson, J.A., *Cold regions science and technology,* Oct. 1997, 26(2), p.113-135, 49 refs.
Sea ice, Icebergs, Drift, Sea ice distribution, Air ice water interaction, Ice water interface, Calving, Spectra, Ocean currents, Ice melting, Advection, Mathematical models, Thermodynamics, Arctic Ocean

52-3853
Statistical effects on the evolution of compliance and compressive fracture stress of ice.
Kim, J.K., Shyam Sunder, S., *Cold regions science and technology,* Oct. 1997, 26(2), p.137-152, 15 refs.
Ice mechanics, Ice strength, Cracking (fracturing), Crack propagation, Orientation, Compressive properties, Stress concentration, Ice microstructure, Grain size, Mathematical models, Statistical analysis

52-3854
Fatigue of freshwater ice.
Weber, L.J., Nixon, W.A., *Cold regions science and technology,* Oct. 1997, 26(2), p.153-164, 23 refs.
Ice mechanics, Ice strength, Fatigue (materials), Ice microstructure, Cracking (fracturing), Ice solid interface, Crack propagation, Dynamic loads, Mechanical tests, Lasers

52-3855
Snowmelt resulting from advection.
Shook, K., Gray, D.M., *Hydrological processes,* Oct. 30, 1997, 11(13), Canadian Geophysical Union, Hydrology Section. Annual Meeting. Banff, Alberta, Canada, 1996. Selected papers, p.1725-1736, 22 refs.
Snow hydrology, Snow air interface, Advection, Phase transformations, Snowmelt, Snow evaporation, Heat balance, Surface energy, Snow heat flux, Thermodynamics, Mathematical models

52-3856
Stability of quasi-steady flow in an englacial conduit.
Szilder, K., Lozowski, E.P., *Hydrological processes,* Oct. 30, 1997, 11(13), Canadian Geophysical Union, Hydrology Section. Annual Meeting. Banff, Alberta, Canada, 1996. Selected papers, p.1737-1746, 8 refs.
Glacial hydrology, Glacial lakes, Lake bursts, Subglacial drainage, Ice water interface, Water flow, Unsteady flow, Channels (waterways), Stability, Ice pressure, Water pressure, Mathematical models

52-3857
Organic and inorganic nitrogen pools in talus fields and subtalus water, Green Lakes Valley, Colorado Front Range.
Williams, M.W., Davinroy, T., Brooks, P.D., *Hydrological processes,* Oct. 30, 1997, 11(13), Canadian Geophysical Union, Hydrology Section. Annual Meeting. Banff, Alberta, Canada, 1996. Selected papers, p.1747-1760, 23 refs.
Hydrogeochemistry, Snow hydrology, Snowmelt, Snow composition, Alpine landscapes, Nutrient cycle, Organic soils, Talus, Ground water, Biomass, Ion density (concentration), Sampling, United States—Colorado—Front Range

52-3858
Parametric expression for estimating infiltration into frozen soils.
Zhao, L.T., Gray, D.M., *Hydrological processes,* Oct. 30, 1997, 11(13), Canadian Geophysical Union, Hydrology Section. Annual Meeting. Banff, Alberta, Canada, 1996. Selected papers, p.1761-1775, 25 refs.
Frozen ground mechanics, Frozen ground physics, Clay soils, Snow hydrology, Snowmelt, Snow water equivalent, Seepage, Permeability, Saturation, Forecasting, Mathematical models

52-3859

Cryoelectron microscopy studies of low-density lipoprotein in vitreous ice.

Spin, J.M., Boston, MA, Boston University, 1997, 374p., University Microfilms order No.DA9713151, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.57(11-B), p.6809.

Ice physics, Polymers, Ice spectroscopy, Electron microscopy, Vitreous ice, Low temperature research

52-3860

Climate change and postglacial environmental history of permafrost peatlands in the Mackenzie Delta area, N.W.T.

Vardy, S.R., Waterloo, University of Waterloo, 1997, 157p., University Microfilms order No.DANQ21394, Ph.D. thesis. For abstract see Dissertation abstracts international, 1998, Vol.58(9-B), p.4689.

Climatology, Climatic changes, Subarctic landscapes, Peat, Swamps, Permafrost transformation, Canada—Northwest Territories—Mackenzie Delta

52-3861

Towards a snow cover fingerprint for climate change.

Frei, A.H., New Brunswick, NJ, Rutgers University, 1997, 245p., University Microfilms order No.DA9800251, Ph.D. thesis. For abstract see Dissertation abstracts international, 1998, Vol.58(7-B), p.3530.

Climatology, Climatic changes, Snow surveys, Snow cover distribution, Detection

52-3862

Sorption and desorption of radionuclides on natural materials.

Fuhrmann, M., Stony Brook, NY, State University of New York, 1997, 276p., University Microfilms order No.DA9736495, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(6-B), p.2912.

Oceanography, Water pollution, Radioactive wastes, Bottom sediment, Radioactive isotopes, Absorption, Ground water, Isotope analysis, Russia—Kara Sea

52-3863

Design and development of a coherent radar depth sounder for measurement of Greenland ice sheet thickness.

Chuah, T.S., Lawrence, KS, University of Kansas, 1997, 273p., University Microfilms order No.AAD98-11286, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5544.

Ice sheets, Glacier mass balance, Ice cover thickness, Ice surveys, Remote sensing, Radio echo soundings, Sensors, Electronic equipment, Data processing, Design, Performance, Computer applications

52-3864

Climate sensitivity and water management in the upper Amu Darya basin.

Bedford, D.P., Boulder, CO, University of Colorado, 1997, 312p., University Microfilms order No.AAD98-12851, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-A), p.4024.

Climatology, Global warming, River basins, Runoff forecasting, Glacial hydrology, Glacier melting, Hydrography, International cooperation, Mathematical models, Uzbekistan, Turkmenistan, Tajikistan, Afghanistan

52-3865

Analytical and experimental investigation of thermal cracking in asphalt pavements.

Shalaby, A., Ottawa, Carleton University, 1997, 269p., University Microfilms order No.AADNQ-22177, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5535.

Concrete pavements, Bituminous concretes, Cold weather performance, Cracking (fracturing), Crack propagation, Thermal stresses, Forecasting, Tensile properties, Mathematical models

52-3866

Climate change and the arctic treeline.

Landhausser, S.M., Edmonton, University of Alberta, 1994, 104p., University Microfilms order No.AADNQ-22154, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5213.

Forest ecosystems, Climatic changes, Global warming, Forest lines, Tundra soils, Organic soils, Degradation, Forest fires, Tundra vegetation, Growth, Revegetation, Sampling, Forest fires, Canada—Northwest Territories—Inuvik

52-3867

Isotope paleohydrology at the northern boreal treeline, Canada and Russia.

Wolfe, B.B., Waterloo, University of Waterloo, 1997, 205p., University Microfilms order No.AADNQ-22249, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5304.

Paleoclimatology, Global warming, Temperature variations, Paleoecology, Hydrologic cycle, Forest ecosystems, Forest lines, Lacustrine deposits, Isotope analysis, Geochronology, Geochemical cycles, Canada, Russia

52-3868

Spatial and temporal variations in snow stability and snowpack conditions throughout the Bridger Mountains, Montana.

Birkeland, K.W., Tempe, AZ, Arizona State University, 1997, 206p., University Microfilms order No.AAD98-11244, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5308.

Mountains, Snow cover stability, Snow cover structure, Snow surveys, Avalanche forecasting, Sampling, Topographic effects, Slope orientation, Statistical analysis, United States—Montana—Bridger Mountains

52-3869

River ice dynamic simulation with smoothed particle hydrodynamics.

Su, J.S., Potsdam, NY, Clarkson University, 1997, 178p., University Microfilms order No.AAD98-12516, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5536.

River ice, River flow, Water level, Ice water interface, Floating ice, Seepage, Grounded ice, Mathematical models, Hydrodynamics

52-3870

Simulations of hydrologically-significant winter storms over a mountainous watershed.

Wang, D.H., Moscow, ID, University of Idaho, 1997, 176p., University Microfilms order No.AAD98-11997, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5445.

Precipitation (meteorology), Watersheds, Flooding, Snow hydrology, Snowmelt, Snow cover distribution, Wind factors, Simulation, Mathematical models

52-3871

Investigation of ice production mechanisms using a three-dimensional cloud model with explicit microphysics.

Ovtchinnikov, M., Norman, OK, University of Oklahoma, 1997, 128p., University Microfilms order No.AAD98-12254, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5444.

Cloud physics, Clouds (meteorology), Ice formation, Ice crystal growth, Homogeneous nucleation, Ice water interface, Water content, Mathematical models

52-3872

Development and application of varved sediment records for geochronological and paleoclimatic research.

Hughen, K.A., Boulder, CO, University of Colorado, 1997, 184p., University Microfilms order No.AAD98-12885, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5307.

Paleoclimatology, Climatic changes, Global change, Lacustrine deposits, Sedimentation, Layers, Geochronology, Canada—Baffin Island

52-3873

Record of climate and Late Quaternary paleoclimate from stable isotopes in lakes and lake sediments, eastern Canadian Arctic.

Sauer, P.E., Boulder, CO, University of Colorado, 1997, 223p., University Microfilms order No.AAD98-12922, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5303.

Paleoclimatology, Paleoecology, Climatic changes, Quaternary deposits, Lacustrine deposits, Arctic landscapes, Oxygen isotopes, Isotope analysis, Canada—Labrador

52-3874

Numerical and experimental studies of electromagnetic scattering from sea ice.

Nassar, E.M., Columbus, OH, Ohio State University, 1997, 243p., University Microfilms order No.AAD98-13323, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5560.

Sea ice, Remote sensing, Wave propagation, Dielectric properties, Backscattering, Antennas, Simulation, Mathematical models

52-3875

Spatially distributed model of methane emissions from arctic tundra calculated from remotely sensed images and field data.

Shippert, M.M., Boulder, CO, University of Colorado, 1997, 154p., University Microfilms order No.AAD98-12925, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58(10-B), p.5297.

Climatology, Arctic landscapes, Spaceborne photography, Atmospheric composition, Natural gas, Tundra soils, Soil air interface, Vapor transfer, Mathematical models, Image processing, United States—Alaska—North Slope

52-3876

Svartfjella, Eidembukta, and Daudmannsodden lineament: Tertiary orogen-parallel motion in the crystalline hinterland of Spitsbergen's fold-thrust belt.

Maher, H.D., Jr., Bergh, S., Braathen, A., Ohta, Y., *Tectonics,* Feb. 1997, 16(1), p.88-106, 54 refs.

Pleistocene, Tectonics, Subpolar regions, Geologic structures, Deformation, Orientation, Geological maps, Norway—Spitsbergen

52-3877

Activity of substrates in the catalyzed nucleation of undercooled melts and aqueous aerosols.

Gutzow, K., Todorova, S., Vassilev, Ts., Dobreva, A., *Crystal research and technology,* 1997, 32(7), p.893-916, 39 refs.

Climatology, Cloud physics, Heterogeneous nucleation, Ice water interface, Ice vapor interface, Aerosols, Nucleating agents, Substrates, Adhesion, Simulation, Chemical analysis, Mathematical models, Thermodynamics

52-3878

Effect of ice-nucleating bacteria (*Pseudomonas syringae* Van Hall) on insect susceptibility to subzero temperatures.

Mignon, J., Haubruge, E., Gaspar, C., *Journal of stored products,* Jan. 1998, 34(1), p.81-86, 22 refs.

Cold storage, Biomass, Bacteria, Microbiology, Ice formation, Nucleating agents, Heterogeneous nucleation, Low temperature tests

52-3879

Precipitation scavenging at high alpine sites.

Kasper, A., Puxbaum, H., EUROTRAC Symposium '96, Transport and Transformation of Pollutants in the Troposphere, Garmisch-Partenkirchen, Germany, Mar. 25-29, 1996. Proceedings, Vol.1. Clouds, aerosols, modelling and photo-oxidants. Edited by P.M. Borrell et al, Southampton, Computational Mechanics Publications, 1997, p.61-65, 21 refs.

DLC TD883.7.E83 E93 1997

Cloud physics, Precipitation (meteorology), Alpine landscapes, Scavenging, Indexes (ratios), Snow air interface, Ice water interface, Ion density (concentration), Aerosols, Heterogeneous nucleation, Sampling, Switzerland—Rigi, Mount, Austria—Sonnblick

52-3880

Chemical mass balances in precipitating cold clouds at Jungfraujoch.

Schwikowski, M., Baltensperger, U., Gäggeler, H.W., EUROTRAC Symposium '96, Transport and Transformation of Pollutants in the Troposphere, Garmisch-Partenkirchen, Germany, Mar. 25-29, 1996. Proceedings, Vol.1. Clouds, aerosols, modelling and photo-oxidants. Edited by P.M. Borrell et al, Southampton, Computational Mechanics Publications, 1997, p.85-88, 6 refs.

DLC TD883.7.E83 E93 1997

Precipitation (meteorology), Cloud physics, Snowfall, Snow composition, Aerosols, Mass balance, Heterogeneous nucleation, Scavenging, Chemical properties, Sampling, Switzerland—Jungfraujoch

52-3881

Long-term measurements of the atmospheric aerosol composition at Ny Ålesund, Spitsbergen.

Maenhaut, W., Beyaert, K., Ducastel, G., Havránek, V., Solomonovic, R., Hanssen, J.E., EUROTRAC Symposium '96, Transport and Transformation of Pollutants in the Troposphere, Garmisch-Partenkirchen, Germany, Mar. 25-29, 1996. Proceedings, Vol.1. Clouds, aerosols, modelling and photo-oxidants. Edited by P.M. Borrell et al, Southampton, Computational Mechanics Publications, 1997, p.273-276, 5 refs.

DLC TD883.7.E83 E93 1997

Climatology, Subpolar regions, Atmospheric composition, Air pollution, Aerosols, Sampling, Seasonal variations, Particle size distribution, Environmental tests, Statistical analysis, Norway—Spitsbergen

52-3882

Heterogeneous kinetics of HONO on H_2SO_4 solutions and on ice: activation of HCl.

Fenter, F.F., Rossi, M.J., EUROTRAC Symposium '96, Transport and Transformation of Pollutants in the Troposphere, Garmisch-Partenkirchen, Germany, Mar. 25-29, 1996. Proceedings, Vol.1. Clouds, aerosols, modelling and photo-oxidants. Edited by P.M. Borrell et al, Southampton, Computational Mechanics Publications, 1997, p.309-315, 7 refs.

DLC TD883.7.E83 E93 1997

Cloud physics, Climatology, Air pollution, Aerosols, Solutions, Supercooled clouds, Ice vapor interface, Adsorption, Phase transformations, Simulation

52-3883

Vertical 0_3 stratification, surface NO and H_2O_2 in the marine arctic atmosphere in summer.

Weller, R., Schrems, O., EUROTRAC Symposium '96, Transport and Transformation of Pollutants in the Troposphere, Garmisch-Partenkirchen, Germany, Mar. 25-29, 1996. Proceedings, Vol.1. Clouds, aerosols, modelling and photo-oxidants. Edited by P.M. Borrell et al, Southampton, Computational Mechanics Publications, 1997, p.973-977, 6 refs.

DLC TD883.7.E83 E93 1997

Climatology, Air pollution, Polar atmospheres, Atmospheric boundary layer, Ozone, Advection, Atmospheric composition, Photochemical reactions, Stratification, Sampling, Arctic Ocean

52-3884

History of European pollution recorded in alpine ice cores.

Wagenbach, D., Preunkert, S., EUROTRAC Symposium '96, Transport and Transformation of Pollutants in the Troposphere, Garmisch-Partenkirchen, Germany, Mar. 25-29, 1996. Proceedings, Vol.2. Emissions, deposition, laboratory work and instrumentation. Edited by P.M. Borrell et al, Southampton, Computational Mechanics Publications, 1997, p.273-281, 18 refs.

DLC TD883.7.E83 E93 1997

Climatology, Precipitation (meteorology), Snowfall, Air pollution, Aerosols, Alpine landscapes, Glacier ice, Ice cores, Ion density (concentration), Impurities, Chemical analysis, Environmental tests, Alps

52-3885

New methods for studying the kinetics of heterogeneous reactions of atmospheric interest: some results.

Rossi, M.J., EUROTRAC Symposium '96, Transport and Transformation of Pollutants in the Troposphere, Garmisch-Partenkirchen, Germany, Mar. 25-29, 1996. Proceedings, Vol.2. Emissions, deposition, laboratory work and instrumentation. Edited by P.M. Borrell et al, Southampton, Computational Mechanics Publications, 1997, p.437-451, 21 refs.

DLC TD883.7.E83 E93 1997

Climatology, Cloud physics, Stratosphere, Air pollution, Aerosols, Ice vapor interface, Adsorption, Ice sublimation, Simulation

52-3886

Structure and potential surface of liquid methanol in low temperature: comparison of the hydrogen bond network in methanol with water.

Kabeya, T., Tamai, Y., Tanaka, H., *Journal of physical chemistry B,* Jan. 29, 1998, 102(5), p.899-905, 34 refs.

Supercooling, Liquid cooling, Hydrocarbons, Solutions, Molecular energy levels, Molecular structure, Density (mass/volume), Hydrogen bonds, Thermodynamics, Low temperature tests, Simulation

52-3887

Effect of hydrostatic confining pressure on the failure mode and compressive strength of polycrystalline ice.

Mizuno, Y., *Journal of physical chemistry B,* Jan. 8, 1998, 102(2), p.376-381, 13 refs.

Ice physics, Ice mechanics, Ice deformation, Strain tests, Ice solid interface, Ice strength, Fracture zones, Compressive properties, Ice microstructure, X ray analysis, Thin sections

52-3888

CO adsorption isotherms on ice by Fourier Transform infrared spectroscopy and new insights on the ice surface from quantum ab initio investigations.

Allouche, A., Verlaque, P., Pourcin, J., *Journal of physical chemistry B,* Jan. 1, 1998, 102(1), p.89-98, 45 refs.

Ice physics, Molecular structure, Ice spectroscopy, Infrared spectroscopy, Ice vapor interface, Adsorption, Enthalpy, Isotherms, Molecular energy levels, Thermodynamic properties, Substrates, Models

52-3889

Anthropogenic mercury deposition to arctic lake sediments.

Hermanson, M.H., *Water, air, and soil pollution,* Jan. 1998, 101(1-4), p.309-321, 39 refs.

Limnology, Arctic landscapes, Lacustrine deposits, Sedimentation, Air pollution, Aerosols, Metals, Drill core analysis, Environmental tests, Sampling, Origin, Canada—Hudson Bay

52-3890

Airborne pollution in five drainage basins in eastern Finnmark, Norway: an evaluation of overbank sediments as sampling medium for environmental studies and geochemical mapping.

Langedal, M., Ottesen, R.T., *Water, air, and soil pollution,* Jan. 1998, 101(1-4), p.377-398, Refs. p.396-398.

Air pollution, Soil pollution, Metals, Aerosols, Subpolar regions, River basins, Floodplains, Sediments, Sampling, Environmental tests, Mining, Norway—Finnmark

52-3891

Mechanical properties and frost resistance of silica fume concrete.

Sabir, B.B., *Cement & concrete composites,* Aug. 1997, 19(4), p.285-294, 30 refs.

Cement admixtures, Concrete durability, Frost resistance, Freeze thaw cycles, Freeze thaw tests, Elastic properties, Compressive properties, Flexural strength, Porosity

52-3892

Characteristics of snow cover duration across the northeast United States of America.

Leathers, D.J., Luff, B.L., *International journal of climatology,* Nov. 30, 1997, 17(14), p.1535-1547, 24 refs.

Climatology, Snow surveys, Snow cover distribution, Seasonal variations, Surface temperature, Snow depth, Air temperature, Statistical analysis, Correlation, Snow cover effect, United States

52-3893

Energy balance and synoptic climatology of a melting snowpack in the Southern Alps, New Zealand.

Neale, S.M., Fitzharris, B.B., *International journal of climatology,* Nov. 30, 1997, 17(14), p.1595-1609, 37 refs.

Snow hydrology, Alpine landscapes, Snowmelt, Synoptic meteorology, Snow air interface, Snow heat flux, Heat balance, Atmospheric boundary layer, Radiometry, Wind factors, New Zealand—Southern Alps

52-3894

Element concentrations in Scots pine needles on radial transects across a subarctic area.

Rautio, P., Huttunen, S., Lamppu, J., *Water, air, and soil pollution,* Mar. 1998, 102(3-4), p.389-405, Refs. p.403-405.

Plant ecology, Trees (plants), Subarctic landscapes, Plant tissues, Damage, Metals, Air pollution, X ray analysis, Environmental tests, Environmental impact, Sampling, Russia—Kola Peninsula, Norway, Sweden

52-3895

Granitoid pluton formation by spreading of continental crust: the Wiley Glacier complex, northwest Palmer Land, Antarctica.

Vaughan, A.P.M., Wareham, C.D., Miller, I.M., *Tectonophysics,* Dec. 30, 1997, 283(1-4), p.35-60, 60 refs.

Glacial geology, Geochemistry, Continental drift, Earth crust, Antarctica—Antarctic Peninsula, Antarctica—Palmer Land, Antarctica—Willey Glacier

The emplacement mechanism, geometry, and isotope geochemistry of plutons of the Willey Glacier complex suggest that new continental crust grew by multiple injection of tonalitic dykes during dextral transtension in the Antarctic Peninsula magmatic arc in Early Cretaceous times. The suggested mechanism is analogous to basalt dyke injection during sea-floor spreading. Addition of new crustal material by mafic underplating at the base of the crust and by redistribution of granitic s.l. and mafic, modified, underplated magma to mid-crustal levels along extensional shear zones as the arc 'spread' were the primary mechanisms of crustal growth. (Auth. mod.)

52-3896

Automated ground-based star-pointing UV-visible spectrometer for stratospheric measurements.

Roscoe, H.K., et al, *Applied optics,* Aug. 20, 1997, 36(24), p.6069-6075, 7 refs.

Design, Meteorological instruments, Cold weather operation, Solar radiation, Waterproofing, Spectra, Ozone

A novel automated ground-based star-pointing spectrometer system has been constructed for long-term deployment in Antarctica. Similar to an earlier stellar system, a two-dimensional detector array measures the spectra of the star and the adjacent sky, so that auroral emission from the sky can be subtracted from the stellar signal. Some new features are an altitude-azimuth pointing mirror, so that the spectrometer does not move; slip rings to provide its power thereby avoiding flexing of cables and restriction of all-around viewing; and a glazed enclosure around the mirror to ensure protection from rain and snow, made from flat plates to avoid changing the focal length of the telescope. The optical system can also view sunlight scattered from the zenith sky. The system automatically points and tracks selected stars and switches to other views on command. The system is now installed at Halley Station and some preliminary measurements of ozone from Antarctica are shown. (Auth.)

52-3897

Population dynamics of microalgae in the upper land-fast sea ice at a snow-free location.

Stoecker, D.K., Gustafson, D.E., Black, M.M.D., Baier, C.T., *Journal of phycology,* Feb. 1998, 34(1), p.60-69, 42 refs.

Plankton, Algae, Marine biology, Microbiology, Sea ice, Antarctica—McMurdo Sound

The population dynamics of interior ice microalgae were investigated at a snow-free site on annual land-fast sea ice in McMurdo Sound during the austral spring and summer of 1995-96. During late Nov. and early Dec. cryo- and halotolerant dinoflagellates and chrysophytes bloomed in brine channels within the upper ice. In Nov. and

Dec., dinoflagellates, chrysophytes, and praisinophytes contributed an average of 66%, 44%, and <1% of the phytoflagellate biomass, respectively. Both the dinoflagellates and the chrysophytes encysted in Dec., with cyst formation most intense just prior to surface melt and flushing of the ice. In Jan., when ice temperatures were similar to those in the water column, pennate diatoms replaced flagellates as the photosynthetic dominants in the upper sea ice. The upper land-fast sea ice undergoes dramatic seasonal changes in light availability, temperature, brine salinity, and inorganic nutrient availability. Ephemeral blooms of cyst-forming phytoflagellates exploit this habit in the austral spring, when both inorganic nutrients and light are available but temperatures <-2°C and brine salinities elevated. (Auth. mod.)

52-3898

Temperature dependence of UV radiation effects on antarctic cyanobacteria.

Roos, J.C., Vincent, W.F., *Journal of phycology,* Feb. 1998, 34(1), p.118-125, 29 refs.

Algae, Microbiology, Sea ice, Solar radiation, Ultraviolet radiation, Bacteria, Photosynthesis, Antarctica—McMurdo Ice Shelf

The mat-forming cyanobacterium *Phormidium murrayi* West and West isolated from a meltwater pond on the McMurdo Ice Shelf was grown in unialgal batch cultures to evaluate the temperature dependence of ultraviolet radiation (UVR) effects on pigment composition, growth rate, and photosynthetic characteristics. Chlorophyll *a* concentrations per unit biomass were generally reduced in cells grown under UVR. *In vivo* absorbance spectra showed that the carotenoid/chlorophyll *a* ratio increased as a function of photosynthetically available radiation and UVR exposure and varied inversely with temperature. Ultraviolet inhibition of growth increased linearly with decreasing temperature, consistent with the hypothesis that net inhibition represents the balance between temperature-independent photochemical damage and temperature-dependent biosynthetic repair. There was no significant effect of UVR on photosynthesis over the first hour of exposure, but significant UV inhibition was observed after 5 days. These results imply that assays of UVR effects on photosynthesis are not an accurate guide to growth responses and that low ambient temperatures can have a major influence on the UV sensitivity of polar organisms.

52-3899

Report on environmental engineering in Greenland and northern Scandinavia.

Heinke, G.W., Ottawa, Department of Indian Affairs and Northern Development, Northern Science Research Group, 1973, 222p., 16 refs.

Regional planning, Urban planning, Economic development, Utilities, Sanitary engineering, Water supply, Sewage disposal, Cost analysis, Greenland, Sweden, Finland, Norway

52-3900

Evaluation of wet skid resistance using four deicing salts.

Wambold, J.C., *Pennsylvania State University. Pennsylvania Transportation Institute. Report,* July 1983, PTI 8316, 14p. + append.

Pavements, Salting, Chemical ice prevention, Skid resistance, Road maintenance, Cold weather tests, Environmental tests

52-3901

Upper Cretaceous foraminifera from Ocean Point, northern Alaska.

Macbeth, J.I., Schmidt, R.A.M., *Journal of paleontology,* Nov. 1973, 47(6), p.1047-1061, 48 refs.

Marine biology, Marine deposits, Marine geology, Fossils, Paleoecology, Stratigraphy, United States—Alaska—North Slope

52-3902

Bog flats and physiographic processes in the upper Kuskokwim River region, Alaska.

Drury, W.H., Jr., *Harvard University. Gray Herbarium. Contributions,* 1956, No.178, 130p., Refs. p.121-127.

Swamps, Muskeg, Paludification, Floodplains, Alluvium, Periglacial processes, Peat, Vegetation patterns, Revegetation, Plant ecology, Paleobotany, United States—Alaska—Kuskokwim River

52-3903

Reconnaissance for radioactive deposits in the Darby Mountains, Seward Peninsula, Alaska, 1948.

West, W.S., *U.S. Geological Survey. Circular,* 1953, No.300, 7p. + fold. map, 3 refs.

Geological surveys, Exploration, Minerals, Geochemistry, Natural resources, United States—Alaska—Seward Peninsula

52-3904

Reconnaissance for radioactive deposits in the lower Yukon-Kuskokwim highlands region, Alaska, 1947.

White, M.G., Killeen, P.L., *U.S. Geological Survey. Circular,* 1953, No.255, 18p., 11 refs.

Geological surveys, Exploration, Minerals, Geochemistry, Natural resources, United States—Alaska

52-3905

Preliminary summary of reconnaissance for uranium in Alaska, 1951.

White, M.G., West, W.S., Tolbert, G.E., Nelson, A.E., Houston, J.R., *U.S. Geological Survey. Circular,* 1952, No.196, 17p., 1 ref.

Geological surveys, Exploration, Minerals, Geochemistry, Natural resources, United States—Alaska

52-3906

Temperatures of northern North America.

Hogue, D.W., *U.S. Army Quartermaster Research and Engineering Center, Natick, MA. Environmental Protection Research Division. Regional Environments Research Branch. Research study report,* June 1956 (Revised Oct. 1957), RER-9, 62p., Refs. p.4-8.

Air temperature, Weather stations, Meteorological data, United States—Alaska, Canada, Greenland, Iceland

52-3907

Goals and opportunities for arctic research.

U.S. Arctic Research Commission, Arlington, VA, 1997, 21p., 13 refs.

Organizations, Research projects, Regional planning, Legislation, Cost analysis

52-3908

Late Quaternary vegetational and climatic history of the Snag-Klutlan area, southwestern Yukon Territory, Canada.

Rampton, V.N., *Geological Society of America. Bulletin,* Apr. 1971, 82(4), p.959-978, 52 refs.

Plant ecology, Vegetation patterns, Forest lines, Paleobotany, Palynology, Lacustrine deposits, Quaternary deposits, Paleoclimatology, Canada—Yukon Territory

52-3909

Distribution and ecology of the marine invertebrates of Point Barrow, Alaska.

MacGinitie, G.E., *Smithsonian miscellaneous collections,* Nov. 30, 1955, 128(9), 201p., Refs. p.194-201.

Marine biology, Cryobiology, Ecology, Ecosystems, Nutrient cycle, Biogeography, Sea ice, United States—Alaska—Barrow

52-3910

Glacial boulders on the arctic coast of Alaska.

MacCarthy, G.R., *Arctic,* [1958], 11(2), p.71-85, 6 refs.

Glaciation, Glacial geology, Glacial deposits, Quaternary deposits, Ice rafting, Moraines, Glacial till, Rocks, Lithology, Striations, Pleistocene, United States—Alaska—Barrow

52-3911

Journey to the Northwest Territories, June 1979, June 1980.

Pedersen, G.L., Rosendahl, G.P., Ølgaard, H., Copenhagen, Greenland Technical Organization, 1982, 67p.

Regional planning, Urban planning, Economic development, Cold weather construction, Buildings, Logistics, Utilities, Canada—Northwest Territories

52-3912

Seventh Yellowstone Field Research Expedition, January 10-February 7, 1967. Final report.

Schaefer, V.J., ed, *New York. State University, Albany. Atmospheric Sciences Research Center. Publication,* May 1967, No.45, 143p., Refs. passim.

Research projects, Snowfall, Cloud physics, Ice nuclei, Weather observations, Meteorological data, United States—Wyoming—Yellowstone National Park

52-3913

Proceedings of the second Circumpolar Arctic Vegetation Mapping Workshop, Arendal, Norway, 19-24 May 1996 and the CAVM-North America Workshop, Anchorage, Alaska, US, 14-16 January 1997.

Walker, D.A., ed, Lillie, A.C., ed, *Colorado. University. Institute of Arctic and Alpine Research. Occasional paper,* 1997, No.52, 62p., Refs. passim.

Tundra vegetation, Vegetation patterns, Plant ecology, Ecosystems, Mapping, Data processing, Meetings

52-3914

Ny-Ålesund, international research at 79°N.

Norwegian Polar Institute (Norsk Polarinstitutt), Oslo, 1996, 19p., 9 refs.

Stations, Organizations, Research projects, International cooperation, Norway—Spitsbergen

52-3915

Snow survey bulletin & water supply forecast, March 1, 1998, Yukon Territory.

Canada. Indian and Northern Affairs. Water Resources Division, Whitehorse, 1998, 27p.

Snow surveys, Runoff forecasting, Snow depth, Snow water equivalent, Stream flow, Canada—Yukon Territory

52-3916

Hydrodynamic analysis of circulation and orientation of lakes in northern Alaska.

Rex, R.W., Geology of the Arctic, Toronto, University of Toronto Press, 1961, p.1021-1043, 30 refs.

Lakes, Shoreline modification, Shore erosion, Water waves, Wind direction, Wind factors, Climatic changes, Paleoclimatology, United States—Alaska—North Slope

52-3917

Alaska's mineral industry 1997: a summary.

Swainbank, R.C., Clautice, K.H., *Alaska Department of Natural Resources. Division of Geological and Geophysical Surveys. Information circular,* Mar. 1998, No.43, 12p.

Geological surveys, Exploration, Minerals, Geochemistry, Natural resources, Mining, Economic development, Cost analysis, United States—Alaska

52-3918

Hot water de-icing trials for the 1994-1995 winter.

Dawson, P., D'Avirro, J., *Transport Canada. Dryden Commission Implementation Project. Publication,* Dec. 1995, TP 12653E, 47p. + appends., With French summary.

Aircraft icing, Artificial melting, Ice removal, Hydraulic jets, Cold weather tests, Environmental tests

52-3919

Improvement plans and development of the Saimaa Channel and the proposed Kymi-Channel.

Rytkönen, J., Nyman, T., Riipi, T., *Maritime research news,* 1997, 11(2), p.4-5.

Channels (waterways), Channel stabilization, River ice, Ice navigation, Ice control, Finland

52-3920

Model tests of a multipurpose icebreaker.

Wilhelmson, M., Kukkanen, T., *Maritime research news,* 1997, 11(2), p.10-11.

Icebreakers, Ice navigation, Environmental tests

52-3921

Arctic Sea ice biota: design and evaluation of a mesocosm experiment.

Weissenberger, J., *Polar biology,* Mar. 1998, 19(3), p.151-159, 52 refs.

Marine biology, Microbiology, Ecosystems, Sea ice, Ice composition, Biomass, Seasonal variations, Simulation, Experimentation, Sampling, Classifications, Finland—Rovaniemi

52-3922
Semi-quantitative study of macrobenthic fauna in the region of the South Shetland Islands and the Antarctic Peninsula.
Arnaud, P.M., López, C.M., Olaso, I., Ramil, F., Ramos-Esplá, A.A., Ramos, A., *Polar Biology,* Mar. 1998, 19(3), p.160-166, Refs. p.165-166.
Marine biology, Biomass, Ocean bottom, Ecosystems, Sampling, Classifications, Antarctica—South Shetland Islands, Antarctica—Antarctic Peninsula
During the BENTART 95 Expedition, 24 Agassiz trawls for macrozoobenthos sampling were carried out at depths of 40-850 m, from north of Livingston I. to the Antarctic Peninsula. A total of 74,624 specimens, belonging to 38 taxonomic groups, were collected. The most abundant group was Polychaeta Sedentaria, with 36% of the total, whereas the highest relative masses were from Ascidiacea (23%), Echinoidea Regularia (18%) and Ophiuroidea (16%). The maximum number of specimens recorded was 15,600 ind./50 l. Cluster analysis separated stations located in Foster Bay, characterized by low taxonomic richness and high relative mass. A zonation of ascidians, regular sea urchins and ophiuroids was observed at Deception I. The remaining stations were separated into two groups. The first comprised the shallowest stations (40-130 m), dominated by sessile active filter-feeders, belonging to Ascidiacea, Demospongia and Bryozoa, and probably related to high primary production zones. The second group comprised deeper stations and was dominated by classes exhibiting a diversity of trophic strategies: ophiuroidea and Asteroidea, to 400 m and Polychaeta Sedentaria at greater depths. (Auth. mod.)

52-3923
Comparative studies in biochemical composition of benthic invertebrates (bivalves, ophiuroids) from Northeast Water (NEW) Polynya.
Gallagher, M.L., Ambrose, W.G., Jr., Renaud, P.E., *Polar biology,* Mar. 1998, 19(3), p.167-171, 25 refs.
Marine biology, Polynyas, Biomass, Ocean bottom, Subpolar regions, Chemical composition, Chemical analysis, Sampling, Nutrient cycle, Advection, Greenland—Northeast Water Polynya

52-3924
RAPD profiling of genetic diversity in two populations of the moss *Ceratodon purpureus* in Victoria Land, Antarctica.
Skotnicki, M.L., Selkirk, P.M., Beard, C., *Polar Biology,* Mar. 1998, 19(3), p.172-176, 22 refs.
Plant ecology, Plant physiology, Plant tissues, Chemical composition, Mosses, Chemical analysis, Classifications, Origin, Antarctica—Granite Harbor, Antarctica—Edmonson Point
Isolates of the moss *Ceratodon purpureus* were collected down a channel formed by a meltstream waterfall at Granite Harbor in southern Victoria Land. The RAPD technique was used to analyze the extent of genetic variation within clumps, between clumps, and between this population and specimens of the same species from two other areas, one a few hundred meters away, and the other at Edmonson Point, 300 km further north. Genetic variation was detected within and among clumps, with some spatial structure to the population within the channel. Isolates from the nearby location were quite closely related, whereas those from Edmonson Point formed an outgroup on a phylogenetic tree of relatedness. (Auth. mod.)

52-3925
Origin of arctic terrestrial and freshwater tardigrades.
Pugh, P.J.A., McInnes, S.J., *Polar biology,* Mar. 1998, 19(3), p.177-182, 66 refs.
Marine biology, Biomass, Arctic landscapes, Biogeography, Sampling, Statistical analysis, Classifications, Origin, Arctic Ocean

52-3926
Diatom communities in small water bodies at H. Arctowski Polish Antarctic Station (King George Island, South Shetland Islands, Antarctica).
Kawecka, B., Olech, M., Nowogrodzka-Zagórska, M., Wojtún, B., *Polar Biology,* Mar. 1998, 19(3), p.183-192, Refs. p.191-192.
Limnology, Plant ecology, Ecosystems, Algae, Biomass, Ponds, Streams, Sampling, Statistical analysis, Scanning electron microscopy, Antarctica—Arctowski Station
An investigation of ponds, puddles and slow-flowing waters situated in the area of the Polish antarctic station distinguished two groups of diatom communities. The first group characterized waters poor in nutrients and brackish. The number of taxa, abundance of species and diatom biomass index were all low. *Nitzschia homburgiensis, Achnanthes laevis* var. *quadratarea* and *A. delicatula* prevailed. The second group characterized water richer in nutrients and brackish. The number of species was also low, but the diatom biomass index was higher. *Nitzschia gracilis, Navicula gregaria* and *Navicula wiesneri* formed large populations. (Auth.)

52-3927
Ice CO-cktails in molecular cloud cores.
Teixeira, T.C., Emerson, J.P., Palumbo, M.E., *Astronomy and astrophysics,* Feb. 10, 1998, 330(2), p.711-725, 82 refs.
Extraterrestrial ice, Cosmic dust, Ice detection, Ice composition, Chemical composition, Infrared spectroscopy, Ice spectroscopy, Spectra, Statistical analysis, Optical properties

52-3928
Sticking probability and mobility of a hydrogen atom on icy mantle of dust grains.
Masuda, K., Takahashi, J., Mukai, T., *Astronomy and astrophysics,* Feb. 10, 1998, 330(2), p.773-781, 17 refs.
Extraterrestrial ice, Cosmic dust, Ice physics, Amorphous ice, Hydrogen, Molecular structure, Molecular energy levels, Ice temperature, Adhesion, Thermal diffusion, Simulation, Temperature effects

52-3929
Transmission of solar radiation in boreal conifer forests: measurements and models.
Ni, W.G., Li, X.W., Woodcock, C.E., Roujean, J.L., Davis, R.E., MP 5121, *Journal of geophysical research,* Dec. 26, 1997, 102(D24), p.29,555-29,566, 35 refs.
Climatology, Atmospheric boundary layer, Forest ecosystems, Forest canopy, Solar radiation, Radiation balance, Radiance, Light scattering, Vegetation patterns, Vegetation factors, Mathematical models
A combined geometric-optical and radiative transfer model allows incorporation of multiple scales of clustering in conifer canopies on the estimation of radiation transmission. Consideration of clustering of branches into whorls is the latest addition to this model. Whorl orientation distributions are derived from multidirectional measurements using a geometric optical mutual shadowing model. For BOREAS test stands, model estimates and vertical measurements of photosynthetically active radiation transmittance within the canopy show (1) general decreases in transmission as solar zenith angles increase in the range of solar zenith angles dominated by beam irradiance, (2) increases in PAR transmission at very high solar zenith angles where diffuse skylight is dominant, and (3) maximum scattering and absorption occur in the middle of the canopy.

52-3930
Crustal-scale seismic study of the Byrd Subglacial Basin, Antarctica.
Clarke, T.S., Madison, University of Wisconsin, 1996, 138p., University Microfilm order No. 96-34171, Ph.D. thesis. Refs. p.121-138.
Seismic refraction, Seismic reflection, Subglacial observations, Bottom topography, Seismic velocity, Ice sheets, Velocity measurement, Antarctica—Byrd Subglacial Basin
A crustal-scale seismic refraction/wide-angle-reflection experiment was undertaken near the southern edge of the Byrd Subglacial Basin during the 1994-95 austral summer. The program comprised a series of wave tests to ascertain optimum shooting and recording parameters on an ice sheet, followed by the completion of a reversed 235-km long profile. The wave tests showed that the effectiveness of converting explosive energy to seismic energy increased one-hundred-fold between 25 and 75 m depth, with most of the increase occurring across the firn-ice transition; the 200-Hz frequencies commonly generated by near-offset shots required a digitizing rate of 500 Hz; and the seismographs could be separated by up to 200 m without aliasing the 10-20 Hz the crustal refractions and wide-angle reflections. The profile showed the bottom third of the crust to be highly reflective. The crustal thickness and reflective lower crust strongly suggest extension, but wave speeds in the mantle suggest that extension is not currently active in the area of the profile. (Auth. mod.)

52-3931
Algal investigations at varying temporal scales in an extreme environment: McMurdo dry valley lakes, Antarctica.
Spaulding, S.A., Fort Collins, Colorado State University, 1996, 129p., University Microfilm order No. 96-38712, Ph.D. thesis. Refs. passim.
Limnology, Algae, Biomass, Sediments, Lake ice, Microbiology, Antarctica—McMurdo Dry Valleys, Antarctica—Hoare, Lake
In a series of 3 studies, algal assemblages were investigated in 2 perennially ice-covered lakes in the McMurdo Dry Valleys. In the first study, phytoplankton were collected over 5 summers (1987-88 through 1991-92) to examine seasonal and annual fluctuations in species composition and biovolume in Lake Fryxell. The phytoplankton consisted primarily of cryptophyte and chlorophyte flagellates and filamentous cyanobacteria. The stratification of the phytoplankton reflects the gradients of nutrients and light, and the stability of the water column. In the second study, diatom assemblages in surficial sediments, sediment cores, sediment traps, and inflowing streams of perennially ice-covered Lake Hoare were examined to ascertain if diatom species composition has changed over the past one thousand years. Analysis of a shallow water, 30 cm core from the sediment of Lake Hoare revealed 2 abrupt changes in diatom assemblages. The core postdates the desiccation of Lake Hoare, postulated to have occurred approximately 1000 y.a. The third study, a taxonomic investigation of the genus Muelleria Frenguelli (Bacillariophyta), concerned a little known but distinct group of diatoms. (Auth. mod.)

52-3932
Satellite radar altimetry over East Antarctica.
Yi, D.H., Madison, University of Wisconsin, 1996, 131p., University Microfilm order No. 96-33520, Ph.D. thesis. Refs. p.124-131.
Topographic surveys, Remote sensing, Glaciology, Height finding, Seasonal variations, Ice surface, Spaceborne photography, Ice sheets, Antarctica—East Antarctica
Both surface scattering and volume scattering contribute energy to satellite-radar-altimeter return waveforms over a continental ice sheet. A retracking algorithm that includes surface scattering and volume scattering is presented and, for the first time, also includes the surface topography, the satellite pointing angle and the curvature of the earth in both the surface-scattering and volume-scattering models. This algorithm can yield surface elevation values for individual waveforms. At the same time, quantitative estimates of the surface roughness and signal penetration and their regional and seasonal variations can be obtained. The algorithm has been applied to Geosat data over a section of East Antarctica. The results have been compared with those of previous retracking systems. Retracked elevations have been used to study surface elevation change over the studied region. Thirty-five months of Geosat Exact Repeat Mission data from Nov. 1986, to Sep. 1989, have been used in this study. Using the elevation data from the first three months as a reference elevation, the elevation data for each month thereafter were compared to the first three months through a crossover method. (Auth. mod.)

52-3933
U.S. antarctic activities, 1994-1995. *Antarctic journal of the United States,* 1995, 30(5), p.xi-xx.
Research projects, Low temperature research, Ice cores, Glaciology, Ozone, Waste disposal, Atmospheric physics, Geophysical surveys, Instruments, Antarctica—Amundsen-Scott Station, Antarctica—Vostok Station, Antarctica—Taylor Dome
The National Science Foundation funds and manages the U.S. Antarctic Program (USAP) in support of the U.S. science presence, maintaining three year-round stations, two research vessels, and a number of field camps. During the 1994-95 austral summer, Oct. through Feb., USAP supported 122 science projects involving 671 scientists and technicians. The projects described here are highlights of the 1994-95 antarctic field season, and they include aerogeophysical and astrophysical research, ice coring, the disintegration of the Larsen Ice Shelf, the ANFLUX program, the Weddell Sea bloom recording, the rescue of the *Polar Duke*, waste management and ozone depletion.

52-3934
Pliocene-Pleistocene diatoms in Devonian to Cretaceous sedimentary and igneous rocks from Antarctica: a paradigm reclaimed.
Burckle, L.H., *Antarctic journal of the United States,* 1995, 30(5), p.2-3, 4 refs.
Glacial geology, Algae, Ice sheets, Pleistocene, Antarctica—Transantarctic Mountains
This article is one of a series that gives the results of a test of the eolian hypothesis for introduction of diatoms into Sirius Group sediments, which crop out along the slopes of the Transantarctic Mountains. Some facts are examined which would rule out the use of diatoms in the Sirius as evidence that the east antarctic ice sheet had collapsed or even been highly dynamic in its behavior as late as the Pliocene.

52-3935
240-Kilometer seismic and gravity profile in central West Antarctica.
Bentley, C.R., et al, *Antarctic journal of the United States,* 1995, 30(5), p.18-20.
Geophysical surveys, Seismic surveys, Ice cores, Ice sheets, Subglacial observations, Gravity, Seismic reflection, Antarctica—Byrd Subglacial Basin
A large-scale seismic refraction and wide-angle reflection program was executed in central West Antarctica by parties from the Universities of Wisconsin and Wyoming during the 1994-95 field season. The program comprised first a series of tests to ascertain the optimum parameters for shooting and recording and then the completion of a mostly reversed, 240 km profile over the southern portion of the Byrd Subglacial Basin. Gravity data were also collected along the seismic profile line. Incidental to the seismic program were the collection and preservation of some of the ice cores that were produced in the course of the shot-hole drilling. A summary of preliminary results is presented.

52-3936
Antalith-seismic reflection profile in West Antarctica.
Anandakrishnan, S., et al, *Antarctic journal of the United States,* 1995, 30(5), p.20-21, 8 refs.
Seismic reflection, Seismic refraction, Ice sheets, Seismic surveys, Antarctica—West Antarctica
The goal of the 1994-95 lithospheric seismic reflection profile was to image the shallow to midcrustal layers of the interior Ross embayment. The authors conducted an integrated seismic and magnetotelluric survey along a line that extended from the interior west antarctic ice sheet stagnant ice stream that was fully active as recently as 130 years ago. The cause of shutdown is hypothesized as glaciologic and hydrologic. The investigations into tectonic variables relating to ice streaming are likely to be broadly applicable to all the ice streams. A secondary goal of this field season was to test and develop the technology for a longer seismic traverse in the future. The authors profiled 63 km from the interior west antarctic ice sheet onto the upper, marginally active limb of ice stream C.

52-3937
Late Quaternary glacial history of Ross Sea, Antarctica—Preliminary results of seismic analysis from the *Nathaniel B. Palmer* 1995-01 cruise.
Anderson, J.B., Shipp, S., Domack, E.W., *Antarctic journal of the United States,* 1995, 30(5), p.30-33, 16 refs.
Glacial geology, Glaciation, Marine geology, Seismic surveys, Glacier oscillation, Paleoclimatology, Antarctica—Ross Sea
Because a significant portion of the west antarctic ice sheet drains into Ross Sea, an understanding of the recent deglacial history of the Ross Sea region is critical to predicting the future activity of the west antarctic ice sheet. The objective of the R/V *Nathaniel B. Palmer* 1995-01 cruise was to collect marine geophysical and geological data to reconstruct the history of Ross Sea subsequent to the last glacial maximum. Specific inquiry focused on assessing extent of the most recent glaciation, timing of the onset of deglaciation, mechanisms of ice sheet retreat, and configuration of the ice sheet during retreat. High-resolution seismic instrumentation was selected specifically to allow detailed mapping and correlation of the upper sedimentary strata and to attempt to tie seismic data to the core database. Correlation between the databases permits proper interpretation of key seismic facies and features and the development of more complex and geologically sound models of deglaciation history.

52-3938
Permian and Triassic paleosols and paleoenvironments of southern Victoria Land, Antarctica.
Retallack, G.J., Krull, E.S., Robinson, S.E., *Antarctic journal of the United States,* 1995, 30(5), p.33-36, 24 refs.
Fossils, Paleobotany, Paleoecology, Glacial geology, Soil dating, Antarctica—Victoria Land
The studies of paleosols as guides to Permian and Triassic paleoenvironments in southern Victoria Land were stimulated by earlier reports of fossil soils in rocks of the Beacon Supergroup. The authors measured stratigraphic sections spanning the Permian-Triassic boundary in the central Allan Hills and on the southeast ridge of Mount Crean. Each paleosol type or pedotype was characterized in detail. The authors found 94 paleosols of 11 different pedotypes in a 292 m thickness of rock in the Allan Hills and 16 paleosols of 4 pedotypes in 145 m at Mount Crean; they are more abundant than fossil plant localities known from only 4 stratigraphic levels in the section measured at Mount Crean and 8 levels in the Allan Hills.

52-3939
Use of cosmogenic radionuclides to measure ice-flow velocities in the "Crescent Moraine", Brimstone Peak-Griffin Nunatak, southern Victoria Land.
Faure, G., Mensing, T.M., Nishiizumi, K., *Antarctic journal of the United States,* 1995, 30(5), p.46-47, 6 refs.
Rheology, Glacier flow, Velocity measurement, Geochronology, Radioactive age determination, Antarctica—Victoria Land
Annexstad and Schultz (1989) reported velocities ranging from about 100 cm per year to near 0 on the ice sheet west of the Allan Hills based on a triangulation network. The authors propose here a new method of measuring ice-flow velocities based on the exposure of quartz-bearing boulders to cosmic rays. They have measured exposure ages of two quartz-sandstone boulders in the Cresent Moraine located on the ice between Brimstone Peak and Griffin Nunatak. Calculated ice-flow velocities between 23 and 300 cm per year are reported.

52-3940
Late Quaternary lake levels in the dry valleys, Antarctica.
Hall, B.L., Denton, G.H., *Antarctic journal of the United States,* 1995, 30(5), p.52-53, 4 refs.
Limnology, Glacial geology, Glacial lakes, Geochronology, Geochemistry, Antarctica—McMurdo Dry Valleys
Shorelines and perched deltas in the dry valleys are the primary evidence for the former extent and elevation of glacial lakes. Additional data come from lake-bottom or lake-ice conveyor sediments draped across valley floors and lower valley walls. Layers of fossilized lacustrine algae and (rarely) carbonates within some of these deposits allowed the authors to construct a chronology of lake-level changes from accelerator-mass-spectrometry radiocarbon dates of numerous small samples. A figure presents a preliminary reconstruction for Glacial Lake Washburn in Taylor Valley based solely on radiocarbon-dated deltas. Another figure shows a similar diagram for Wright Valley. Radiocarbon samples now being processed will add considerable chronologic detail to these diagrams.

52-3941
Aerobic biodegradation of biphenyl and polychlorinated biphenyls by arctic soil microorganisms.
Mohn, W.W., Westerberg, K., Cullen, W.R., Reimer, K.J., *Applied and environmental microbiology,* Sep. 1997, 63(9), p.3378-3384, 29 refs.
Soil microbiology, Soil pollution, Arctic landscapes, Soil chemistry, Soil conservation, Degradation, Biomass, Mineralogy, Environmental tests, Soil tests, Canada—Northwest Territories—Resolution Island

52-3942
Photochemical formation of volatile mercury in high arctic lakes.
Amyot, M., Lean, D., Mierle, G., *Environmental toxicology and chemistry,* Oct. 1997, 16(10), p.2054-2063, 42 refs.
Water pollution, Limnology, Lake water, Air water interactions, Wetlands, Metals, Solubility, Ultraviolet radiation, Photochemical reactions, Environmental tests, Sampling, Canada—Northwest Territories—Amituk Lake, Canada—Northwest Territories—Merretta Lake

52-3943
Monitoring regional sea ice of China's Bohai Sea by SSM/I scattering indexes.
Jin, Y.Q., *IEEE journal of oceanic engineering,* Apr. 1998, 23(2), p.141-144, 6 refs.
Remote sensing, Ice surveys, Sea ice distribution, Ice detection, Ice conditions, Radiometry, Brightness, Scattering, Indexes (ratios), Ice water interface, Mathematical models, China—Bohai Sea

52-3944
95-GHz scattering by terrain at near-grazing incidence.
Ulaby, F.T., et al, *IEEE transactions on antennas and propagation,* Jan. 1998, 46(1), p.3-13, 19 refs.
Remote sensing, Radar echoes, Backscattering, Image processing, Snow optics, Snow cover effect, Statistical analysis, Terrain identification

52-3945
Formation of locust bean gum hydrogel by freezing-thawing.
Tanaka, R., Hatakeyama, T., Hatakeyama, H., *Polymer international,* Jan. 1998, 45(1), p.118-126, 17 refs.
Polymers, Solutions, Solidification, Frozen liquids, Freeze thaw cycles, Molecular structure, Ice crystal growth, Temperature measurement, Cooling rate, Hydrogen bonds

52-3946
Structure and phonons of the ice surface.
Braun, J., Glebov, A., Graham, A.P., Menzel, A., Toennies, J.P., *Physical review letters,* Mar. 23, 1998, 80(12), p.2638-2641, 24 refs.
Ice physics, Ice surface, Molecular structure, Surface structure, Ice solid interface, Adsorption, Ice spectroscopy, Scattering, Spectra, Vibration, Polarization (charge separation)

52-3947
Freezing of confined water: a bilayer ice phase in hydrophobic nanopores.
Koga, K., Zeng, X.C., Tanaka, H., *Physical review letters,* Dec. 29, 1997, 79(26), p.5262-5265, 20 refs.
Ice physics, Water films, Phase transformations, Ice water interface, Freezing, Ice crystal structure, Hydrogen bonds, Molecular energy levels, Simulation, Thermodynamics, Temperature effects

52-3948
Modelling probability of snow and wind damage in Scots pine stands using tree characteristics.
Valinger, E., Fridman, J., *Forest ecology and management,* Oct. 9, 1997, 97(3), p.215-222, 36 refs.
Forestry, Plant ecology, Trees (plants), Physical properties, Damage, Wind factors, Snow loads, Snow cover effect, Mathematical models, Statistical analysis, Forecasting

52-3949
Latitudinal cline of requirement for far-red light for the photoperiodic control of budset and extension growth in *Picea abies* (Norway spruce).
Clapham, D.H., Dormling, I., Ekberg, I., Eriksson, G., Qamaruddin, M., Vince-Prue, D., *Physiologia plantarum,* Jan. 1998, 102(1), p.71-78, 29 refs.
Plant physiology, Plant ecology, Trees (plants), Growth, Light effects, Radiance, Diurnal variations, Simulation

52-3950
Ground freezing goes for the gold in Canada. *Civil engineering,* Dec. 1997, 67(12), p.18-19.
Mining, Gold, Geocryology, Engineering geology, Soil freezing, Pipeline freezing, Artificial freezing, Walls, Refrigeration, Canada—Ontario—Timmins

52-3951
Heterogeneous reactions of chlorine peroxide with halide ions.
De Haan, D.O., Birks, J.W., *Journal of physical chemistry A,* Oct. 23, 1997, 101(43), p.8026-8034, 56 refs.
Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Ice vapor interface, Heterogeneous nucleation, Doped ice, Ozone, Solid phases, Ice spectroscopy, Ions, Simulation

52-3952
Hydrates represent gas source, drilling hazard.
Bagirov, E., Lerche, I., *Oil & gas journal,* Dec. 1, 1997, 95(48), p.99-101,104, 8 refs.
Hydrates, Natural gas, Clathrates, Ocean bottom, Ice composition, Molecular structure, Phase transformations, Stability, Offshore drilling, Safety

52-3953
Is tissue culture a viable system with which to examine environmental and hormonal regulation of cold acclimation in woody plants.
Baldwin, B.D., Bandara, M.S., Tanino, K.K., *Physiologia plantarum,* Feb. 1998, 102(2), p.201-209, 27 refs.
Plant physiology, Plant tissues, Acclimatization, Cold tolerance, Simulation, Laboratory techniques, Temperature effects, Light effects, Accuracy

52-3954
Deep weathering profiles (saprolites) in north east Scotland.
Wright, J.S., *Scottish geographical magazine,* Nov. 1997, 113(3), p.189-194, 16 refs.
Pleistocene, Glacial geology, Regolith, Clay minerals, Landforms, Weathering, Profiles, Clays, Rock properties, Glacial erosion, Topographic effects, Geochemistry, United Kingdom—Scotland

52-3955
Time domain reflectometry as a field method for measuring water content and soil water electrical conductivity at a continuous permafrost site.
Boike, J., Roth, K., *Permafrost and periglacial processes,* Oct.-Dec. 1997, 8(4), p.359-370, With French summary. 20 refs.
Soil tests, Permafrost hydrology, Continuous permafrost, Active layer, Electrical resistivity, Probes, Electrical measurement, Water content, Chemical composition, Models, Russia—Siberia

52-3956
Multivariate analysis of clast displacement rates on stone-banked sheets Cordillera Real, Bolivia.
Francou, B., Bertran, P., *Permafrost and periglacial processes,* Oct.-Dec. 1997, 8(4), p.371-382, With French summary. 17 refs.
Periglacial processes, Geocryology, Slope processes, Sediment transport, Rock streams, Soil creep, Solifluction, Ice lenses, Stratification, Velocity measurement, Bolivia—Cordillera Real

52-3957
Active layer thermal regime at three rock glaciers in Greenland.
Humlum, O., *Permafrost and periglacial processes,* Oct.-Dec. 1997, 8(4), p.383-408, With French summary. 65 refs.
Frozen ground mechanics, Rock glaciers, Talus, Periglacial processes, Continuous permafrost, Active layer, Surface structure, Thermal regime, Ventilation, Seasonal variations, Wind factors, Degree days, Greenland

52-3958
Analysing the creep of mountain permafrost using high precision aerial photogrammetry: 25 years of monitoring Gruben rock glacier, Swiss Alps.
Kääb, A., Haeberli, W., Gudmundsson, G.H., *Permafrost and periglacial processes,* Oct.-Dec. 1997, 8(4), p.409-426, With French summary. 31 refs.
Geomorphology, Rock glaciers, Periglacial processes, Glacier tongues, Glacier mass balance, Aerial surveys, Photogrammetric surveys, Permafrost mass transfer, Permafrost physics, Soil creep, Profiles, Switzerland—Alps

52-3959
Permafrost changes in the northern Tien Shan during the Holocene.
Marchenko, S.S., Gorbunov, A.P., *Permafrost and periglacial processes,* Oct.-Dec. 1997, 8(4), p.427-435, With French summary. 14 refs.
Permafrost surveys, Cryogenic soils, Soil temperature, Thermal regime, Permafrost transformation, Permafrost heat balance, Boreholes, Temperature measurement, Temperature variations, Profiles, Kazakhstan—Zailiysky Alatau Range

52-3960
Thermal regime for a thufa apex and its adjoining depression, Mashai Valley, Lesotho.
Grab, S., *Permafrost and periglacial processes,* Oct.-Dec. 1997, 8(4), p.437-445, With French summary. 13 refs.
Periglacial processes, Cryogenic soils, Alpine landscapes, Landforms, Soil temperature, Thermal regime, Temperature measurement, Seasonal variations, Air temperature, Pit and mound topography, Topographic effects, South Africa—Lesotho

52-3961
Observations on sorted circle development, Abisko, northern Sweden.
Kling, J., *Permafrost and periglacial processes,* Oct.-Dec. 1997, 8(4), p.447-453, With French summary. 8 refs.
Periglacial processes, Geocryology, Patterned ground, Sorting, Rock mechanics, Frost heave, Solifluction, Settlement (structural), Mechanical tests, Sweden—Abisko

52-3962
Using the anchoring device of a comet lander to determine surface mechanical properties.
Kömle, N.I., et al, *Planetary and space science,* Dec. 1997, 45(12), p.1515-1538, 48 refs.
Extraterrestrial ice, Spacecraft, Geological surveys, Anchors, Projectile penetration, Penetration tests, Ice mechanics, Ice sublimation, Ice solid interface, Simulation, Design

52-3963
Composition of cometary dust from polarization spectra.
Kolokolova, L., Jockers, K., *Planetary and space science,* Dec. 1997, 45(12), p.1543-1550, 38 refs.
Extraterrestrial ice, Ice optics, Cosmic dust, Chemical composition, Ice spectroscopy, Spectra, Refractivity, Indexes (ratios), Polarization (waves), Simulation

52-3964
Low-frequency Raman scattering in normal and deuterated ice I_h.
Amoruso, A., Benassi, P., Crescentini, L., Mazzacurati, V., *Physical review B,* Apr. 1, 1998, 57(13), p.7415-7418, 12 refs.
Ice physics, Molecular structure, Deuterium oxide ice, Ice spectroscopy, Ice crystal optics, Light scattering, Spectra, Temperature effects, Vibration, Low frequencies

52-3965
Determination of dominant solid precipitation particle growth processes with a vertically pointing Doppler radar.
Weiss, R.R., Hobbs, P.V., *Washington. University, Seattle. Department of Atmospheric Sciences. Cloud Physics Group. Contributions. Collection of reprints,* [1976], No.17, 5p., 6 refs. Reprinted from Preprint volume of the 16th Radar Meteorology Conference, Houston, TX, Apr. 22-24, 1975, p.410-414.
Cloud physics, Clouds (meteorology), Precipitation (meteorology), Ice crystal growth, Ice crystal size, Falling snow, Radar echoes

52-3966
Laboratory study of volatile organic compound partitioning: vapor/aqueous/soil.
Hewitt, A.D., SR 98-03, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Feb. 1998, 16p., ADA-337 494, 23 refs.
Soil pollution, Soil composition, Soil chemistry, Soil tests, Chemical analysis
A laboratory experiment measured the concentrations of volatile organic compounds (VOCs) existing in a vapor, water, and bulk soil media after several weeks of exposure to a contaminant source. The experimental design included quiescent conditions, hydrated mineral surfaces, and a constant temperature of 11°C. The findings show that similar to Henry's law, fairly constant ratios are likely to exist between soil vapor and bulk soil VOC concentrations. These results are encouraging for those attempting to use active soil gas measurements to predict bulk VOC concentrations in the vadose zone.

52-3967
Soil moisture determinations using capacitance probe methodology.
Atkins, R.T., Pangburn, T., Bates, R.E., Brockett, B.E., SR 98-02, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Jan. 1998, 42p., ADA-337 497, 3 refs.
Soil water, Water content, Moisture detection, Moisture meters, Electromagnetic prospecting, Soil temperature, Soil tests, Freeze thaw cycles, Statistical analysis
Determining soil moisture content by measuring the dielectric constant of the soil is not a new concept. However, determining the dielectric constant by measuring capacitance directly rather than through the use of time domain reflectometry (TDR) systems is a relatively new approach to soil moisture measurements. A unique probe assembly and a readout device that measures voltage drop and phase shift were developed and used for direct capacitance measurements. The capacitance measurement was calibrated using known capacitors and resistors. Soil moisture measurements were calibrated by adding known amounts of distilled water to dry soil enclosed in a known volume. Soil moisture measurements through an entire winter's freeze-thaw cycle demonstrated the feasibility of using this capacitance measurement system. The conclusions drawn from these tests are that this measurement technique could and should be developed as an easier, more economical, and more easily automated and calibrated system for soil moisture measurement.

52-3968
Quantification of shape, angularity, and surface texture of base course materials.
Janoo, V.C., SR 98-01, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Jan. 1998, 22p., ADA-335 673, 29 refs.
Pavements, Pavement bases, Subgrade soils, Aggregates, Earth fills, Gravel, Particle size distribution, Soil texture, Soil strength, Soil creep, Subgrade maintenance, Road maintenance
A state-of-the-art review was conducted to determine existing test methods for characterizing the shape, angularity, and surface texture of coarse aggregates. The review found direct methods used by geologists to determine these characteristics. These methods involve physical measurements of individual aggregates and are very laborious and time consuming. Engineers have developed index tests (indirect methods) to quantify the combined effect of the shape, angularity, and surface texture of coarse aggregates in terms of changes in the voids in the aggregate bulk. A description of both the direct and indirect methods is provided in the report. Also, the effect of shape, angularity, and surface texture of coarse aggregates on the base course performance was reviewed. It was found that there is some contradiction in the published data on resilient modulus. Shape, angularity, and surface texture of coarse aggregates clearly influence the angle of internal friction.

52-3969
Factors influencing ice conveyance at river confluences.
Ettema, R., Muste, M., Kruger, A., Zufelt, J.E., SR 97-34, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Dec. 1997, 30p., ADA-335 571, 8 refs. For another version see 52-701.
River ice, Ice jams, Ice water interface, Ice cover effect, River flow, Hydraulics, Environmental tests, Mathematical models
This report documents preliminary findings concerning ice jam conditions in river confluences, using two laboratory approaches. First is categorizing the different conditions of ice discharge into a confluence based on two general classifications: free drift of ice and movement of contiguous ice accumulations. The two most common causes of jams seem to be sluggish water velocities in the outflow channel and local bathymetric features. The second approach examines how confluence geometry and flow processes affect ice discharge—for example, the influence on ice discharge of bathymetric features. The approach uses a large hydraulic model of a two-channel confluence, which is adaptable to a variety of channels, and particle image velocimetry (PIV) for determining and mapping whole fields of water and ice velocities in a confluence. PIV, which is becoming extensively used, lends itself very well here. This study is the first demonstration of the PIV method for ice movement through a two-river confluence.

52-3970
Results of stabilized waste material testing for the Raymark Superfund site.
Janoo, V.C., Barna, L.A., Orchino, S.A., SR 97-33, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Dec. 1997, 25p., ADA-336 129, 6 refs.
Soil pollution, Waste disposal, Land reclamation, Subgrade soils, Soil stabilization, Pavements, Soil cement, Earth fills, Freeze thaw tests, Frost penetration, Frost resistance, Frozen ground strength, United States—Connecticut
This project was conducted to assist in predicting the effects of freeze-thaw cycling on stabilized hazardous waste material during the 1996-97 freezing season. The Raymark Superfund site in Stratford, CT, is under remediation with the intent of using the area for commercial development. The site was classified as a Superfund site in 1995. The onsite soil contains asbestos, lead, PCBs, volatile organic compounds (VOCs), semi-Vocs, and solvents. These contaminants are by-products of the manufacturing process for heat-resistant automotive parts. The stabilized waste material is being used as the subgrade material in the pavement structure. Field testing was conducted to determine the unconfined compressive strength of the stabilized material before and after the freezing season. Testing was completed using the Clegg impact soil tester and dynamic cone penetrometer. Additionally, thermocouples were installed to estimate the depth of frost penetration that could be expected, and to ensure that the overlying layers in the pavement structure would be adequate to prevent frost penetration into the stabilized layer.

52-3971
Detecting metallic primary explosives with a portable X-ray fluorescence spectrometer.
Hewitt, A.D., SR 97-08, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Apr. 1997, 9p., ADA-325 530, 7 refs.
Soil pollution, Soil chemistry, Explosives, Chemical analysis, X ray analysis
X-ray fluorescence spectrometry (XRF) analysis is a practical means of performing *in-situ* screening to establish the presence of high concentrations (>0.1% or 1000 ppm) of lead (Pb) and/or mercury (Hg). These two metals are of special military interest because they are constituents in three primary explosives: lead azide [$Pb(N_3)_2$], lead styphnate ($C_6HO_6N_3Pb$), and mercury fulminate [$Hg(CNO)_2$]. The success of *in-situ* XRF analysis to perform this task depends on instrumental sensitivity, selectivity, effective sample volume, transportability, and user friendliness. Laboratory experiments established that the MAP-3 XRF spectrum analyzer (SCITEC Corporation) is well-suited for this application. This instrument is self-contained, portable, and equipped with a Co-57 source that allows for a simultaneous analysis of both the K and L energy lines of Pb and Hg, among other metals. Laboratory experiments established that high concentrations of Pb and Hg could be detected in an active sample area of cylindrical shape, approximately 1.0 cm in diameter and 1.5 cm in depth.

52-3972
Analysis of linear and monoclinal river wave solutions.
Ferrick, M.G., Goodman, N.J., CR 98-01, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Jan. 1998, 24p., ADA-336 342, 22 refs.
River flow, Unsteady flow, Flow rate, Water waves, Wave propagation, Flood forecasting, Mathematical models
Linear dynamic wave and diffusion wave analytical solutions are obtained for a small, abrupt flow increase from an initial to a higher steady flow. Equations for the celerities of points along the wave profiles are developed from the solutions and related to the kinematic wave and dynamic wave celerities. The linear solutions are compared systematically in a series of case studies to evaluate the differences caused by inertia. These comparisons use the celerities of selected profile points, the paths of these points on the x-t plane, and complete profiles at selected times, indicating general agreement between the solutions. Initial diffusion wave inaccuracies persist over relatively short time and distance scales that increase with both the wave diffusion coefficient and Froude number. The nonlinear monoclinal wave solution parallels that of the linear dynamic wave but is applicable to arbitrarily large flow increases. As wave amplitude increases the monoclinal rating curve diverges from that for a linear wave, and the maximum Froude number and energy gradient along the profile increase and move toward the leading edge.

52-3973
Review of sintering in seasonal snow.
Colbeck, S.C., CR 97-10, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* Dec. 1997, 11p., ADA-335 556, 34 refs.
Snow cover structure, Snow stratigraphy, Metamorphism (snow), Snow compression, Snow strength, Ice sintering, Ice crystal adhesion
Strength and electrical pathways develop in snow as bonds grow among grains. Strong ice-to-ice bonds form in wet snow at low liquid contents but not in highly saturated wet snow. In freely draining wet snow, grain clusters form, and these require a certain configuration among the three phases of water. This depends somewhat on the number of grains in the cluster, but always leads to bonding. In dry snow, bonds form more slowly, but considerable strength can develop as long as rounded grains develop. The rate of bond growth is probably controlled by the temperature gradient, because both grains and bonds are observed to grow very slowly in dry snow in the absence of a temperature gradient. The basic shape of the bonds is dictated by the geometrical requirements of grain-boundary grooves and is not a simple concave neck. In dry snow, this shape, and possibly the processes, have been misunderstood.

52-3974
Removing sludge from wastewater lagoon with a sludge sled.
Hardy, S.E., Martel, C.J., MP 5123, *U.S. Army Center for Public Works, Alexandria, VA. Facilities Engineering Applications Program. User guide,* Feb. 1998, FEAP-UG-CRREL-98/01, 6p.
Sewage treatment, Water treatment, Waste disposal, Sludges, Ponds, Dredging, Military facilities, Cost analysis

52-3975
Test and Evaluation Project No.28: anti-icing technology, field evaluation report.
Ketcham, S.A., Minsk, L.D., Danyluk, L.S., MP 5122, *U.S. Federal Highway Administration. Office of Engineering Research and Development. Report,* Mar. 1998, FHWA-RD-97-132, 284p., 19 refs.
Road icing, Chemical ice prevention, Salting, Sanding, Ice storms, Snowstorms, Weather forecasting, Road maintenance, Safety, Highway planning, Cold weather tests, Cost analysis
Highway anti-icing is the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. Its operations consist of chemical applications and coordinated plowing. The prefix "anti" signifies the preventive nature of anti-icing and distinguishes it from deicing, which is the traditional practice of mechanically or chemically removing compacted snow or ice that is already bonded to pavement. Anti-icing practices have been in use for many years. The term has evolved to mean a modern and efficient snow and ice control practice that makes use of technologies such as road weather information systems, site-specific weather and pavement forecasts, portable pavement temperature sensors, and sophisticated spreader equipment. Anti-icing can provide two major benefits: efficient use of labor and materials, and increased traffic safety.

52-3976
Origin of penitents. [De l'origine des pénitents]
Villecrose, J., *Neige et avalanches,* Mar. 1998, No.81, p.2-3,32, In French with English summary. 1 ref.
Snow surface, Snow melting, Snow air interface, Snow evaporation, Ablation, Insolation

52-3977
Avalanche prevention: the system NivoLog. [Prévention des avalanches: le système NivoLog]
Bolognesi, R., *Neige et avalanches,* Mar. 1998, No.81, p.4-7,32, In French with English summary.
Avalanche forecasting, Avalanche modeling, Computerized simulation, Data processing, Data transmission

52-3978
Probing for avalanche victims: new prospects? [Sondages pour la recherche de victimes d'avalanche: nouvelles perspectives?]
Sivardière, F., *Neige et avalanches,* Mar. 1998, No.81, p.8-12,32, In French with English summary. 2 refs.
Avalanches, Accidents, Rescue operations

52-3979
FlowCapt: a new sensor to automatically measure snowdrift. [FlowCapt: un capteur dans le vent]
Chritin, V., *Neige et avalanches,* Mar. 1998, No.81, p.13-15,32, In French with English summary. 6 refs.
Snowdrifts, Blowing snow, Anemometers, Meteorological instruments, Snow cover stability, Avalanche forecasting

52-3980
Better understanding of slab avalanches. [Mieux comprendre les avalanches de plaque]
Schillinger, L., *Neige et avalanches,* Mar. 1998, No.81, p.16-21,32, In French with English summary.
Snow cover stability, Avalanche mechanics, Avalanche modeling, Avalanche forecasting

52-3981
Avalanche safety: result obligation? [Sécurité avalanche: obligation de résultat?]
Meffre, J.F., *Neige et avalanches,* Mar. 1998, No.81, p.22-26,32, In French with English summary.
Avalanches, Avalanche forecasting, Safety, Accidents, Legislation, France

52-3982
Sun Valley Avalanche Center, 1998: through the looking glass.
Kellam, J., *Avalanche review,* Apr. 1998, 16(5), p.1,3.
Organizations, Avalanche forecasting, Weather forecasting, Safety, Education, United States—Idaho—Sun Valley

52-3983
Avalanche notes from the National Avalanche Center. *Avalanche review,* Apr. 1998, 16(5), p.4-5.
Avalanche forecasting, Organizations, Data processing, Avalanches, Accidents

52-3984
Rapid Deployment: avalanche rescue in Summit County, Colorado.
Henceroth, A., Toepfer, S., *Avalanche review,* Apr. 1998, 16(5), p.6-7.
Avalanches, Accidents, Rescue operations, Helicopters, Cost analysis, United States—Colorado

52-3985
Where have all the avalanches gone.
Conger, S., *Avalanche review,* Apr. 1998, 16(5), p.8.
Avalanches, Accidents, United States—Idaho

52-3986
FINNARP Symposium, Helsinki, Finland, 5 October 1993. *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1994, No.4, 48p., Refs. passim. For selected papers see B-59199, B-59200, E-59195 through E-59197, I-59202, J-59201, L-59198 or 52-3987 through 52-3989.
DLC G877.F55
Research projects, Geology, Marine biology, Gravity, Sea ice, Air ice water interaction, Weather stations, Meteorological data
This is a collection of papers presented in a symposium on Finnish antarctic studies carried out during 1989-93. The topics of the symposium ranged from geophysics to marine microbiology. The main forum of publication is and will be refereed journals of separate disciplines. Therefore, the report presents summaries of the work done so far, with references to already published papers.

52-3987
Properties of till fines in the Vestfold Hills and Vestfjella areas, Antarctica.
Hirvas, H., Lintinen, P., Nenonen, K., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1994, No.4, FINNARP Symposium, Helsinki, Finland, 5 Oct. 1993, p.20-27, Refs. p.26-27.
DLC G877.F55
Glacial geology, Glacial till, Geochemistry, Meltwater, Antarctica—Vestfold Hills, Antarctica—Kraul Mountains
The properties are compared of till samples collected from two areas in Antarctica: in East Antarctica in the 1988-1989 field season, and at the Aboa Station in the 1989-1990 field season. The location of the study areas is shown in a figure. The resulting data are presented in tables and charts, including the mean concentrations of selected soluble ions and the pH values of samples from the antarctic and reference areas.

52-3988
Ice drift and surface heat exchange in the Weddell Sea.
Launiainen, J., Uotila, J., Rantanen, K., Vihma, T., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1994, No.4, FINNARP Symposium, Helsinki, Finland, 5 Oct. 1993, p.39-43, 4 refs.
DLC G877.F55
Research projects, Oceanographic surveys, Marine meteorology, Weather stations, Ice surveys, Drift, Meteorological data, Air ice water interaction, Antarctica—Weddell Sea
Data from 5 automatic marine meteorological buoys are used to study the sea ice drift and air-sea and air-ice heat exchange. Three of the buoys were deployed during the FINNARP-89 expedition, and 2 during FINNARP-91. The 5 buoys have functioned for 87 months and were located by the Argos satellite survey. The data suggest mostly wind-induced sea-ice dynamics with spatial differences in the Weddell Sea as well as differences in the dominant drift forcing between various time scales. The turbulent heat flux is typically downwards over ice and snow covered localities, whereas over the open water the turbulent fluxes of sensible and latent heat are upwards and may reach extreme magnitude. (Auth. mod.)

52-3989
Springtime ozone depletion at Marambio, Antarctica, and observations at Sodankylä during a comparable time of the year.
Rummukainen, M., Kyrö, E., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1994, No.4, FINNARP Symposium, Helsinki, Finland, 5 Oct. 1993, p.44-48, 4 refs.
DLC G877.F55
Ozone, Atmospheric composition, Atmospheric circulation, Meteorological data, Antarctica—Marambio Station
A study of the behavior and changes of the ozone layer in polar regions is reported. On the premise that the development and strength of a polar vortex regulates the extent and magnitude of the seasonal ozone depletion, a diagnostic for a polar vortex, the Ertel's Potential Vorticity, was used in the study and is described. Results are illustrated in various figures, including ozone profiles at Marambio Station and in Finland based on measurements carried out inside and outside the vortex at different dates.

52-3990
FINNARP air-sea-ice interaction experiment in the Weddell Sea in 1996-1997.
Vihma, T., Launiainen, J., Uotila, J., Kotro, A., *Finland. Ministry of Trade and Industry. Antarctic reports of Finland. Report,* 1997, No.7, var. p., 15 refs.
Research projects, Oceanographic surveys, Marine meteorology, Weather stations, Sea ice distribution, Ice surveys, Meteorological data, Air ice water interaction, Antarctica—Weddell Sea
A technical report, including data, of an air-sea-ice interaction project of the Finnish Antarctic Research Program (FINNARP) is presented. The report is the third meteorological Argos buoy data report from FINNARP. The report contains meteorological and ice drift observations from 7 buoys deployed on sea-ice floes in the Weddell Sea in Jan.-Feb. 1996. All the buoys functioned until Oct. 1996, and three were still functioning in May 1997. The buoys provide year-round meteorological and sea-ice motion data from an area with sparse observations available. In addition, the report presents meteorological sounding data from the FINNARP-95/96 expedition, and the properties of temperature inversions and low-level jets are introduced. (Auth.)

52-3991
Field observations and model calculations of dielectric properties of arctic sea ice in the microwave C-band.
Shokr, M.E., *IEEE transactions on geoscience and remote sensing,* Mar. 1998, 36(2), p.463-478, 34 refs.
Sea ice, Frazil ice, Ice cores, Salinity, Dielectric properties, Bubbles, Brines, Probes, Electrical measurement, Thin sections, Temperature effects, Analysis (mathematics), Canada—Northwest Territories—Resolute Passage

52-3992
Estimate of the subglacier dielectric constant of an ice shelf using a ground-penetrating step-frequency radar.
Hamran, S.E., Erlingsson, B., Gjessing, Y., Mo, P., *IEEE transactions on geoscience and remote sensing,* Mar. 1998, 36(2), p.518-525, 14 refs.
Ice shelves, Geophysical surveys, Glacier mass balance, Ice water interface, Ice conditions, Classifications, Radio echo soundings, Profiles, Subglacial observations, Dielectric properties, Antarctica—Riiser-Larsen Ice Shelf
The mass balance of the antarctic ice cap, its stability, and the role of the surrounding ice shelf in bottom-water mass formation is, to a large extent, dictated by processes associated with subsurface freezing and melting, where the submerged ice meets the surrounding ocean. It is demonstrated how multifrequency ground-penetrating radar data collected at the Riiser-Larsenisen can be used to distinguish between types of ice at the ice-ocean interface. The data analysis shows that the subsurface can be regarded as rough on length scales in the order of 1 m. (Auth. mod.)

52-3993
Analyzing lead information from SAR images.
Van Dyne, M.M., Tsatsoulis, C., Fetterer, F., *IEEE transactions on geoscience and remote sensing,* Mar. 1998, 36(2), p.647-660, 21 refs.
Oceanographic surveys, Ice surveys, Spaceborne photography, Synthetic aperture radar, Image processing, Ice openings, Classifications, Distribution, Statistical analysis, Beaufort Sea

52-3994
Land-surface process/radiobrightness model with coupled heat and moisture transport for freezing soils.
Liou, Y.A., England, A.W., *IEEE transactions on geoscience and remote sensing,* Mar. 1998, 36(2), p.669-672, 32 refs.
Frozen ground mechanics, Soil freezing, Hydrologic cycle, Water transport, Ice water interface, Phase transformations, Freeze thaw cycles, Diurnal variations, Radiometry, Brightness, Mathematical models

52-3995
Loss-factor behavior of freshwater ice at 13.5 and 37.5 GHz.
Bordonskiĭ, G.S., Krylov, S.D., *IEEE transactions on geoscience and remote sensing,* Mar. 1998, 36(2), p.678-681, 7 refs.
Lake ice, Ice dielectrics, Dielectric properties, Radiometry, Brightness, Impurities, Attenuation, Simulation

52-3996
Temporal variability of the energy balance of thick arctic pack ice.
Lindsay, R.W., *Journal of climate,* Mar. 1998, 11(3), p.313-333, 29 refs.
Climatology, Marine atmospheres, Surface energy, Pack ice, Ice heat flux, Heat balance, Albedo, Ice water interface, Seasonal variations, Seasonal freeze thaw, Drift stations, Mathematical models, Thermodynamics, Arctic Ocean

52-3997
Spatial and temporal variability of antarctic precipitation from atmospheric methods.
Cullather, R.I., Bromwich, D.H., Van Woert, M.L., *Journal of climate,* Mar. 1998, 11(3), p.334-367, Refs. p.364-367.
Climatology, Polar atmospheres, Precipitation (meteorology), Snow accumulation, Snow evaporation, Moisture transfer, Atmospheric boundary layer, Glacier mass balance, Seasonal variations, Weather forecasting, Models
The spatial and temporal variability of net precipitation (precipitation minus evaporation/sublimation) for Antarctica derived from the European Centre for Medium-Range Weather Forecasts operational analyses via the atmospheric moisture budget is assessed in comparison to a variety of glaciological and meteorological observations and datasets. For the 11-yr period 1985-95, the average continental value is 151 mm/yr water equivalent. Interannual variability in the southern ocean storm tracks is found to be an important mechanism for enhanced precipitation minus evaporation in both east and west Antarctica. Despite large regional discrepancies, the general agreement on the main features of antarctic precipitation between studies suggests that a threshold has been reached, where the assessment of the smaller terms including evaporation/sublimation and drift snow loss is required to explain the differences. (Auth. mod.)

52-3998
Impact of antarctic cloud radiative properties on a GCM climate simulation.
Lubin, D., Chen, B., Bromwich, D.H., Somerville, R.C.J., Lee, W.H., Hines, K.M., *Journal of climate,* Mar. 1998, 11(3), p.447-462, 36 refs.
Climatology, Polar atmospheres, Cloud cover, Optical properties, Radiation balance, Surface temperature, Ice crystal optics, Atmospheric circulation, Simulation, Models, Climatic factors
A sensitivity study to evaluate the impact upon regional and hemispheric climate caused by changing the optical properties of clouds over the antarctic continent is conducted with the NCAR Community Model version 2 (CCM2). Sensitivity runs are performed in which radiation interacts with ice clouds with particle sizes of 10 and 40 μm rather than with the standard 10 μm water clouds. The effects of these cloud changes on the antarctic radiation budget are examined by considering cloud forcing at the top of the atmosphere and net radiation at the surface. Changes of the cloud radiative properties to those of 10 μm ice clouds over Antarctica have significant impact on regional climate: temperature increases throughout the antarctic troposphere by 1-2°C and total cloud fraction over Antarctica is smaller than that of the control at low levels but is larger than that of the control in the mid- to upper troposphere. The simulated impacts of the antarctic cloud radiative alteration are not confined to the Southern Hemisphere. The simulation with radiative properties of 40 μm ice clouds produces colder surface temperatures over Antarctica by up to 3°C compared to the control. (Auth. mod.)

52-3999
Large-eddy simulation of contrails.
Chlond, A., *Journal of the atmospheric sciences,* Mar. 1, 1998, 55(5), p.796-819, 63 refs.
Climatology, Air pollution, Aerosols, Cloud physics, Condensation trails, Heterogeneous nucleation, Ice crystal growth, Supersaturation, Particle size distribution, Turbulent exchange, Mathematical models

52-4000
Sublimation of ice crystals.
Nelson, J., *Journal of the atmospheric sciences,* Mar. 1, 1998, 55(5), p.910-919, 45 refs.
Climatology, Cloud physics, Ice physics, Ice crystal growth, Ice crystal structure, Ice sublimation, Mass transfer, Vapor diffusion, Ice vapor interface, Simulation

52-4001
Numerical analysis of the stratification properties of chilled water storage tanks charged at the freezing point temperature.
Spall, R.E., *Journal of heat transfer,* Feb. 1998, 120(1), p.271-274, 14 refs.
Water storage, Storage tanks, Water temperature, Temperature control, Heat transfer, Density (mass/volume), Stratification, Freezing points, Thermal diffusion, Turbulent diffusion, Buoyancy, Analysis (mathematics)

52-4002
Molecular bending mode frequencies of the surface and interior of crystalline ice.
Hernandez, J., Uras, N., Devlin, J.P., *Journal of chemical physics,* Mar. 15, 1998, 108(11), p.4525-4529, 15 refs.
Ice physics, Deuterium oxide ice, Molecular structure, Surface structure, Ice crystal structure, Hydrogen bonds, Oscillations, Adsorption, Ice spectroscopy, Infrared spectroscopy, Spectra

52-4003
Impulsive stimulated scattering in ice VI and ice VII.
Baer, B.J., Brown, J.M., Zaug, J.M., Schiferl, D., Chronister, E.L., *Journal of chemical physics,* Mar. 15, 1998, 108(11), p.4540-4544, 36 refs.
Ice physics, Ice acoustics, Acoustic measurement, Velocity measurement, High pressure ice, Lasers, Ice spectroscopy, Ice elasticity, Spectra

52-4004
Shallow ice approximation for anisotropic ice: formulation and limits.
Mangeney, A., Califano, F., *Journal of geophysical research,* Jan. 10, 1998, 103(B1), p.691-705, 56 refs.
Ice sheets, Ice structure, Ice mechanics, Glacier flow, Ice solid interface, Shear stress, Profiles, Bedrock, Anisotropy, Topographic effects, Mathematical models

52-4005
Arctic paleoecology and soil processes: developing new perspectives for understanding global change.
Eisner, W.R., Symposium on Carbon Sequestration in Soils, Columbus, OH, July, 1996. Soil processes and the carbon cycle. Collected papers. Edited by R. Lal et al and Advances in soil science, Boca Raton, CRC Press LLC, 1998, p.127-141, 29 refs.
DLC S592.6.C35 S65 1997
Pleistocene, Paleoecology, Pollen, Peat, Tundra soils, Organic soils, Soil chemistry, Sedimentation, Geochemical cycles, Global change, Sampling, Soil dating

52-4006
Soil carbon distribution in nonacidic and acidic tundra of arctic Alaska.
Bockheim, J.G., Walker, D.A., Everett, L.R., Symposium on Carbon Sequestration in Soils, Columbus, OH, July, 1996. Soil processes and the carbon cycle. Collected papers. Edited by R. Lal et al and Advances in soil science, Boca Raton, CRC Press LLC, 1998, p.143-155, 24 refs.
DLC S592.6.C35 S65 1997
Soil chemistry, Soil formation, Organic soils, Tundra soils, Active layer, Chemical properties, Soil classification, Carbon dioxide, Cryoturbation, Sampling, United States—Alaska—Kuparuk River

52-4007
Characteristics of soil organic matter in arctic ecosystems of Alaska.
Ping, C.L., Michaelson, G.J., Loya, W.M., Chandler, R.J., Malcolm, R.L., Symposium on Carbon Sequestration in Soils, Columbus, OH, July, 1996. Soil processes and the carbon cycle. Collected papers. Edited by R. Lal et al and Advances in soil science, Boca Raton, CRC Press LLC, 1998, p.157-167, 39 refs.
DLC S592.6.C35 S65 1997
Tundra soils, Ecosystems, Soil air interface, Organic soils, Active layer, Carbon dioxide, Chemical properties, Decomposition, Litter, Sampling, United States—Alaska

52-4008
Crystal orientations in floating ice sheets.
Weeks, W.F., Wettlaufer, J.S., Johannes Weertman Symposium, Anaheim, CA, Feb. 4-8, 1996. Proceedings. Edited by R.J. Arsenault et al, Warrendale, Minerals, Metals & Materials Society, 1996, p.337-350, 81 refs.
DLC TA417.6.J64 1996
Floating ice, Lake ice, Sea ice, Ice crystal growth, Ice crystal structure, Orientation, Anisotropy, Ice water interface, Sea water freezing

52-4009
Scale effects on the fracture of ice.
Dempsey, J.P., Johannes Weertman Symposium, Anaheim, CA, Feb. 4-8, 1996. Proceedings. Edited by R.J. Arsenault et al, Warrendale, Minerals, Metals & Materials Society, 1996, p.351-361, 69 refs.
DLC TA417.6.J64 1996
Sea ice, Rheology, Ice mechanics, Indexes (ratios), Ice deformation, Ice solid interface, Cracking (fracturing), Crack propagation, Dynamic loads, Classifications, Simulation

52-4010

Failure of ice under compression.

Schulson, E.M., Johannes Weertman Symposium, Anaheim, CA, Feb. 4-8, 1996. Proceedings. Edited by R.J. Arsenault et al, Warrendale, Minerals, Metals & Materials Society, 1996, p.363-374, 60 refs.

DLC TA417.6.J64 1996

Sea ice, Lake ice, Ice mechanics, Ice microstructure, Ice strength, Ice deformation, Strains, Compressive properties, Cracking (fracturing), Dynamic loads, Ice solid interface

52-4011

Structure of a Pleistocene glaciation cycle.

Hughes, T., Johannes Weertman Symposium, Anaheim, CA, Feb. 4-8, 1996. Proceedings. Edited by R.J. Arsenault et al, Warrendale, Minerals, Metals & Materials Society, 1996, p.375-399, 54 refs.

DLC TA417.6.J64 1996

Pleistocene, Ice age theory, Ice sheets, Glacial geology, Glaciation, Glacier oscillation, Sea level, Isostasy, Glacial erosion, Deformation, Ice cover effect, Mathematical models

52-4012

Creep of a composite and flow of dirty ice in glacier.

Mori, T., Wakashima, K., Johannes Weertman Symposium, Anaheim, CA, Feb. 4-8, 1996. Proceedings. Edited by R.J. Arsenault et al, Warrendale, Minerals, Metals & Materials Society, 1996, p.401-407, 18 refs.

DLC TA417.6.J64 1996

Ice mechanics, Glacier ice, Glacier flow, Sliding, Ice creep, Composite materials, Plastic deformation, Stresses, Ice solid interface, Mathematical models

52-4013

Proceedings.

International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996, Myrvang, A.M., ed, Vik, J., ed, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, 247p., Refs. passim. For individual papers see 52-4014 through 52-4045.

Mining, Mine shafts, Placer mining, Rock excavation, Frozen rock strength, Frozen ground strength, Permafrost control, Permafrost preservation, Soil stabilization, Engineering geology, Environmental protection, Exploration, Minerals, Coal, Gold, Economic development

52-4014

Diamond mining in the Canadian Arctic: a federal government perspective.

Lazarovich, J., Barnett, M., Lauer, R., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.3-9, 1 ref.

Exploration, Mining, Minerals, Natural resources, Economic development, Labor factors, Regional planning, Legislation, Cost analysis, Canada—Northwest Territories

52-4015

Reclamation of placer mines in the Circle mining district, Alaska.

McCaa, C., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.11-16, 11 refs.

Placer mining, Gold, Soil erosion, Soil pollution, Water pollution, Permafrost preservation, Land reclamation, Revegetation, Channel stabilization, Soil conservation, Soil stabilization, Environmental protection, United States—Alaska

52-4016

Tailings disposal at Polaris Mine.

Keen, A.J., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.17-24, 5 refs.

Mining, Tailings, Waste disposal, Salt lakes, Frozen lakes, Water pollution, Permafrost beneath lakes, Permafrost preservation, Environmental impact, Environmental protection, Canada—Northwest Territories—Little Cornwallis Island

52-4017

New ecologically safe technologies for kimberlite tubes mining in permafrost rocks and in conditions of the influx of corrosive brines.

Androsov, A.D., Savvinov, K.N., Ivanov, IU.N., Tarasov, I.I., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.25-27.

Mining, Pits (excavations), Frozen rocks, Rock excavation, Permafrost preservation, Slope protection, Soil stabilization, Waterproofing, Environmental protection, Russia—Yakutia

52-4018

Impacts of mining and smelting in the centre of the Barents region.

Halleraker, J.H., Reimann, C., Niskavaara, H., Pavlov, V.A., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.29-35, 2 refs.

Mining, Air pollution, Soil pollution, Polar atmospheres, Atmospheric circulation, Geochemical cycles, Nutrient cycle, Environmental impact, Mapping, Russia—Kola Peninsula, Norway, Finland

52-4019

Mining in Spitzbergen/Svalbard. Health and safety aspects.

Furuseth, K., Myran, T., Fjerdingsoy, E., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.37-41.

Mining, Coal, Economic development, Safety, Health, Labor factors, Norway—Svalbard

52-4020

Chemical and biological destruction of cyanide: comparative costs in a cold climate.

Nelson, M.G., Kroeger, E.B., Arps, P.J., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.43-50, 13 refs.

Gold, Mining, Tailings, Soil pollution, Waste treatment, Waste disposal, Leaching, Water treatment, Microbiology, Bacteria, Land reclamation, Cost analysis

52-4021

Introduction to the mining regulation on Svalbard.

Vik, J., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.53-56.

Exploration, Coal, Petroleum industry, Economic development, Legislation, Environmental protection, Safety, Norway—Svalbard

52-4022

Mineral exploration on Spitsbergen.

Nøttvedt, A., Flood, B., Pedersen, F., Sandstad, J.S., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.57-63, 2 refs.

Geological surveys, Exploration, Minerals, Coal, Gold, Natural resources, Economic development, Environmental impact, Norway—Spitsbergen

52-4023

Problems and prospects of the development of mining in the Urals.

IAkovlev, V.L., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.65-69.

Exploration, Minerals, Mining, Natural resources, Economic development, Air pollution, Environmental impact, Environmental protection, Safety, Russia—Ural Mountains

52-4024

Investigation of the gold distribution in placers by magnetic prospecting methods.

Akhmetshin, A.A., Kalinin, V.M., IAkupov, V.S., Bogach, S.V., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.71-76, 9 refs.

Gold, Placer mining, Geological surveys, Magnetic surveys, Exploration, Minerals, Geochemistry, Russia—Aldan Plateau

52-4025

Importance of geological investigations for mining—two case histories.

Ekberg, M., Storhaug, L., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.77-83, 8 refs.

Geological surveys, Exploration, Gold, Minerals, Mining, Economic development, Geochemistry, Norway

52-4026

Diamond core drilling of rock strata through overlaying glaciers.

Utsi, J., Hagen, S., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.85-90.

Geological surveys, Exploration, Coal, Mining, Ice drills, Rotary drilling, Rock drilling, Frozen rocks, Permafrost thickness, Permafrost control, Norway—Svalbard

52-4027

Predicting creep settlements for foundations in permafrost based on the results of in situ tests at Svea, Svalbard.

Ladanyi, B., Lunne, T., Vergobbi, P., Lhuillier, B., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.91-100, 16 refs.

Permafrost surveys, Permafrost beneath structures, Frozen ground strength, Frozen ground settling, Soil creep, Soil tests, Footings, Foundations, Settlement (structural), Norway—Svalbard

52-4028
Guidelines for the design of stable slopes for placer mines operating in permafrost.
Vongpaisal, S., Udd, J., Herget, G., Gorski, B., Prasad, N., Mougeot, C., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.103-109, 7 refs.
Gold, Placer mining, Pits (excavations), Slope stability, Frozen ground strength, Permafrost control, Safety, Canada—Yukon Territory

52-4029
Temperature regime of diamond openpit's permafrost slope under thermoinsulation.
Izakson, V.IU., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.111-115.
Mining, Pits (excavations), Slope stability, Slope protection, Permafrost preservation, Soil stabilization, Geotextiles, Thermal insulation, Russia—Yakutia

52-4030
Use of a thermoisolating snow-rock layer in combined ore deposit mining in the arctic conditions.
Demidov, IU.V., Aminov, V.N., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.117-120.
Mining, Pits (excavations), Frozen rock strength, Rock excavation, Snow (construction material), Snow strength, Snow thermal properties, Thermal insulation

52-4031
Practical blasting in permafrost.
Renshaw, A.E., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.121-127, 2 refs.
Mining, Pits (excavations), Frozen rock strength, Frozen ground strength, Permafrost control, Rock excavation, Rock drilling, Blasting

52-4032
Surface mining technology's schemes by large size blocks.
Zarovniaev, B.N., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.129-133, 2 refs.
Mining, Rock excavation, Permafrost control

52-4033
Roof span stability in an underground placer mine in the Arctic.
Bandopadhyay, S., Wang, X.K., Nelson, M.G., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.137-145, 8 refs.
Placer mining, Mine shafts, Roofs, Frozen ground strength, Permafrost control, Soil creep, Soil stabilization, Computerized simulation

52-4034
Stability of permafrost gravels in an Alaskan underground placer mine.
Seymour, J.B., Tesarik, D.R., McKibbin, R.W., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.147-156, 4 refs.
Placer mining, Mine shafts, Frozen ground strength, Gravel, Permafrost preservation, Permafrost control, Soil creep, Soil stabilization, United States—Alaska—Fairbanks

52-4035
Performance of rock bolts in the Svea Coal Mine, Svalbard.
Stjern, G., Ruistuen, H., Myrvang, A., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.157-168, 8 refs.
Coal, Mining, Mine shafts, Roofs, Joints (junctions), Frozen rock strength, Soil stabilization, Engineering geology, Norway—Spitsbergen

52-4036
Rock pressure control during mining of Urals ore deposits subjected to high tectonic stresses.
Vlokh, N.P., Lipin, IA.I., Zubkov, A.V., Shupletsov, IU.P., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.169-174, 7 refs.
Mining, Mine shafts, Frozen rock strength, Stress strain diagrams, Engineering geology, Russia—Ural Mountains

52-4037
Ice for support of mine walls.
Fangel, H., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.175-181, 8 refs.
Mine shafts, Walls, Ice (construction material), Artificial ice, Ice strength, Ice plasticity, Soil stabilization, Cost analysis

52-4038
Rock behaviour at low temperature conditions and its relevance to mining in cold region.
Dhar, B.B., Dube, A.K., Soni, A.K., Dutta, P.K., MP 5124, International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.183-191, 13 refs.
Frozen rock strength, Frozen ground compression, Permafrost thermal properties, Engineering geology, Mining, Mine shafts, Low temperature research, Environmental tests, Strain tests
Compressive and tensile strength properties of granite, limestone and sandstone at low temperature are analyzed. The properties of antarctic rocks are examined during Indian research efforts directed towards revealing the behavior of rocks of the region. The paper also highlights the design and development aspects of "environmental chamber" developed at Central Mining Research Institute (CMRI) for cryogenic studies. Also highlighted are the joint R&D programs involving CMRI-CRREL collaboration. (Auth. mod.)

52-4039
Search for precursors of intensive seismic events in mining areas of north-east Baltic Shield.
Mel'nikov, N.N., Kozyrev, A.A., Panin, V.I., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.193-199, 14 refs.
Mining, Frozen ground strength, Engineering geology, Shock waves, Detonation waves, Earthquakes, Seismology, Tectonics, Russia—Kola Peninsula

52-4040
Formation of centers of technogeneous catastrophes in the areas of intense mineral mining.
Sashurin, A.D., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.201-205, 5 refs.
Mining, Rock excavation, Blasting, Shock waves, Detonation waves, Seismology, Earthquakes, Accidents

52-4041
Longwall mining equipment for Svea mine.
Flook, S., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.207-214.
Coal, Mining, Mine shafts, Shaft sinking, Rock excavation, Construction equipment, Economic development, Norway—Spitsbergen

52-4042
Optimizing air management and energy costs in northern mines.
Udd, J., Clarke, R.W.D., Hardcastle, S., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.215-223, 12 refs.
Mining, Mine shafts, Ventilation, Electric power, Cost analysis, Canada

52-4043
Specific character of mining in Spitsbergen and environment.
Trifonenkov, V.D., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.225-231.
Coal, Mining, Economic development, Water supply, Avalanche engineering, Environmental protection, Norway—Spitsbergen

52-4044
Nepheline syenite production at Stjernøy, Norway.
Fagerli, S., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.233-238, 2 refs.
Minerals, Mining, Economic development, Labor factors, Norway

52-4045
Coal pilar extraction in Mine #7, Svalbard. Practical aspects.
Morken, P.O., Addison, T.B., International Symposium on Mining in the Arctic, 4th, Longyearbyen, Svalbard, July 27-30, 1996. Proceedings. Edited by A.M. Myrvang and J. Vik, Trondheim, Norway, SINTEF Rock and Mineral Engineering, 1996, p.239-247, 4 refs.
Coal, Mining, Mine shafts, Frozen rock strength, Permafrost control, Engineering geology, Economic development, Norway—Spitsbergen

52-4046
Antarctic sea ice: biological processes, interactions and variability.
Lizotte, M.P., ed, Arrigo, K.R., ed, *American Geophysical Union. Antarctic research series,* 1998, Vol.73, 198p., Refs. passim. For individual papers see B-59210 through B-59221 or 52-4047 through 52-4058.
DLC QH95.58.A58 1998
Marine biology, Ecology, Algae, Biomass, Microbiology, Sea ice, Pack ice
The 4-20 million sq km of sea ice that surrounds the antarctic continent represents one of the largest and most dynamic ecosystems on Earth. The purpose of this volume is to present new information about this ecosystem so that its role within the antarctic food-web (and as a sink for carbon dioxide) and its susceptibility to environmental changes can be better understood. Here are brought together articles covering a wide array of topics relating to sea ice biology and ecology. Four chapters present new information on algal biomass in sea ice. New physiological data is presented, including a chapter on nitrogen metabolism, as well as some topical aspects of sea ice microalgal physiology and their production of dimethylsulfoniopropionate. Two highly interdisciplinary chapters present results of numerical ecosystem modeling studies, one being at a small scale but highly mechanistic and the other being of a much larger scale but more highly parameterized. The eventual fate of sea ice algae is well documented in two chapters on zooplankton grazing and one on sedimentation and the use of sea ice diatoms as paleoenvironmental indicators.

52-4047

Flood-freeze cycles and microalgal dynamics in antarctic pack ice.

Fritsen, C.H., Ackley, S.F., Kremer, J.N., Sullivan, C.W., MP 5125, *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.1-21, Refs. p.19-21.

DLC QH95.58.A58 1998

Microbiology, Algae, Marine biology, Ice models, Ice growth, Ice composition, Pack ice, Air temperature, Sea ice, Freeze thaw cycles

Dynamics of surface and bottom-ice microalgal communities were investigated using a numerical model of ice growth, ice hydrostatics, radiative transfer processes, nutrient exchange processes, and microalgal growth. Annual simulations showed a general succession of ice properties and microalgal dynamics related to flood-freeze cycles. Specifically, microalgal blooms were predicted to accumulate on the bottom of first-year ice during the austral autumn when ice was actively thickening yet thin enough to allow sufficient light penetration for algal growth. During the austral spring, simulations showed flooding of seawater onto the surface of the ice due to snow loading, which resulted in algal blooms in the flooded snow. In ice that survived a summer melting season, the model predicted an additional growth of surface algae during the autumnal period when the flooded snow froze. During subsequent spring-summer periods, little or no growth or accumulation of algae was predicted at the bottom of the ice due to frequent ice ablation and a predominantly low-light environment. (Auth. mod.)

52-4048

Primary productivity of near surface communities within antarctic pack ice.

Arrigo, K., Worthen, D.L., Dixon, P., Lizotte, M.P., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.23-43, Refs. p.42-43.

DLC QH95.58.A58 1998

Biomass, Marine biology, Ice models, Pack ice, Ice volume, Ice cover effect, Snow cover effect, Antarctica—Weddell Sea, Antarctica—Ross Sea

A numerical model of the antarctic pack ice ecosystem has been developed for the purpose of investigating the spatial and temporal patterns of primary production. The sea ice habitat was described using a simplification of an existing one-dimensional fast-ice ecosystem model. Model results show that of the 35.7 Tg C produced annually in the antarctic ice pack, 75% was associated with first-year ice and nearly 50% occurred in the Weddell Sea. Although the productivity per unit ice surface was greatest in Jan., total production peaked in Nov. due to the more extensive sea ice cover. Rates of production in the Weddell Sea were more than twice as high as in the Ross Sea, despite reduced light from a thicker snow cover, because of more extensive surface flooding which provides additional nutrients to surface communities. Model results demonstrate that the thickness of the snow cover in combination with the proportion of first-year ice in a given region are fundamental in controlling primary production within sea ice over large scales. (Auth.)

52-4049

***Icecolors '93*: spectral UV radiation effects on antarctic frazil ice algae.**

Prézelin, B.B., Moline, M.A., Matlick, H.A., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.45-83, Refs. p.79-83.

DLC QH95.58.A58 1998

Biomass, Algae, Damage, Photosynthesis, Frazil ice, Sea ice, Ultraviolet radiation, Ozone, Antarctica—Palmer Station

The authors assessed and monitored the polychromatic effects of solar ultraviolet B (UVB), ultraviolet A (UVA) and photosynthetically available radiation on frazil ice algal communities that flowed into the vicinity of Palmer Station between Aug. and Nov., 1993. Pack ice provided incomplete protection to frazil ice algae from the damaging effects of incoming UV radiation. *In vivo* DNA damage, solely attributable to recent exposure to UVB radiation within the ice community was routinely evident. DNA damage occurred in spite of elevated levels of the mycosporine-like amino acid porphyra-344 within the algal community. Action spectra for UV inhibition of primary production indicated that carbon fixation was very sensitive to UVB radiation and that the relative UVB sensitivity became more pronounced at low light levels. The effects of UVB and UVA inhibition of carbon fixation varied over time and appeared dependent upon the photophysiological state of the community, the length of exposure, and pattern of light field fluctuations over the day. (Auth. mod.)

52-4050

Compilation data on sea ice algal standing crop from the Bellingshausen, Amundsen and Weddell seas from 1983 to 1994.

Dieckmann, G.S., et al, *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.85-92, Refs. p.91-92.

DLC QH95.58.A58 1998

Algae, Biomass, Ecology, Ice composition, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea, Antarctica—Weddell Sea

Algal standing stock as chlorophyll *a* in sea ice was compiled from 448 cores collected during 13 U.S. and German research cruises to Antarctica between 1983 and 1994. The data have a high variability and show no clear relationships with other parameters such as core length. However, seasonal variations in standing stock are discernable. The authors recommend that due to the high variability in the data and inconsistency of sampling methods, the data be used with caution, since they do not represent all sea ice habitats. They provide the data due to the current need for such information for the parameterization of models. (Auth.)

52-4051

Algal pigment signatures in antarctic sea ice.

Lizotte, M.P., Robinson, D.H., Sullivan, C.W., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.93-105, Refs. p.103-105.

DLC QH95.58.A58 1998

Algae, Microbiology, Marine biology, Sea ice, Ice composition, Sea water, Antarctica—Weddell Sea, Antarctica—Antarctic Peninsula

Algal pigments associated with particulate matter from antarctic sea ice and surface waters provide information about taxonomic composition, physiological state, and decomposition of sea ice microalgae. Samples of ice and seawater were collected in the Weddell Sea and west of the Antarctic Peninsula. Algal biomass as chlorophyll-*a* (Chl-*a*) within pack ice ranged from 0.07 to 1,300 µg/L compared with 0.01 to 0.26 µg/L in underlying waters. Using diagnostic accessory pigments to estimate taxonomic contributions to Chl-*a* biomass, it was found that sea ice algal communities were, on average, 65% diatoms, 19% chlorophytes, 11% prymnesiophytes, and 5% dinoflagellates; results were similar for nearby phytoplankton. Diatom dominance was greater in sea ice typical of later ice-formation stages. Fucoxanthin:Chl-*a* ratios in vertical profiles of floes typically increased with depth, implying that these diatom communities acclimated to lower light intensities. Fucoxanthin:Chl-*a* ratios were higher than reported for temperate or arctic diatom communities, supporting previous hypotheses that southern ocean algae have unique optical properties. (Auth. mod.)

52-4052

Composition and succession of sea ice diatom assemblages in the eastern and southern Weddell Sea, Antarctica.

Gleitz, M., Bartsch, A., Dieckmann, G.S., Eicken, H., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.107-120, Refs. p.119-120.

DLC QH95.58.A58 1998

Algae, Sea ice, Biomass, Ice formation, Antarctica—Weddell Sea

During July-Dec. 1986, in the eastern Weddell Sea development of a diatom bloom in the upper half of the ice characterized the seasonal progression from winter to spring in first-year pack ice. Species compositions of early season and bloom assemblages differed significantly, suggesting that several species did not grow during bloom development. Generally, species diversity decreased with increasing diatom biomass and age of ice, showing that the seasonal succession of sea ice assemblages progressively leads to monospecific diatom compositions. Different modes of ice formation were responsible for establishment of two distinct assemblages in the coastal region of the southern Weddell Sea. It is concluded that the physiological capacity to maintain high growth rates under conditions pertinent to the spring/summer season in combination with life history cycles tuned to the advance and retreat of the ice cover may be prominent causes for the exceptional success of only a small number of diatom species in antarctic sea ice. (Auth. mod.)

52-4053

Fate of antarctic "sea ice diatoms" and their use as paleoenvironmental indicators.

Leventer, A., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.121-137, Refs. p.132-137.

DLC QH95.58.A58 1998

Algae, Biomass, Ecology, Sea ice, Sea water, Marine biology

Although ecological constraints on the living assemblages are complex and numerous processes alter the settling assemblage, the information presented support use of diatom data from sediments to track sea ice. The most common species in congelation ice are large pennates that, due to dissolution and dilution, rarely are found in sediments in abundances high enough to serve as sea ice proxies. However, the success of *Fragilariopsis curta* and *F. cylindrus* in exploiting both the sea ice and ice edge ecosystems results in a discrete record at the sea floor. In contrast, *Thalassiosira antarctica* and *F. kerguelensis* dominate regions of open water primary production in the southern ocean. Combined with data on the previous two species, sea ice distribution on the antarctic continental shelf can be evaluated. More subtle details of sea ice distribution probably can be reconstructed once researchers develop a more complete database on several fronts. Differences in the distribution of *F. curta* and *F. cylindrus* in both the water column and in sediments have been noted and should be explored. (Auth. mod.)

52-4054

Dimethylsulfoniopropionate in sea ice algae from the Ross Sea polynya.

DiTullio, G.R., Garrison, D.L., Mathot, S., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.139-146, Refs. p.145-146.

DLC QH95.58.A58 1998

Algae, Chemical composition, Marine biology, Ecology, Sea ice, Ice composition, Polynyas, Antarctica—Ross Sea

Ice algal communities were sampled from the southern Ross Sea during austral spring 1994. Ratios of dimethylsulfoniopropionate (DMSP) to chlorophyll *a* (chl-*a*) in sea ice algae were highly variable, presumably due to changes in both algal species composition and the physiological state of the populations. DMSP:chl *a* ratios were relatively low for sea ice samples and were not significantly correlated with the concentrations of the algal pigments fucoxanthin or 19'-hexanoyloxyfucoxanthin. Ice samples that were dominated by diatoms had DMSP:chl-*a* ratios similar to those dominated by *Phaeocystis antarctica* indicating the potential importance of diatom populations with respect to particulate DMSP production. This study provides preliminary evidence that in the Antarctic, sea ice diatoms may, at times, be as important in DMSP production as *P. antarctica.* (Auth.)

52-4055

Nitrogen metabolism in antarctic fast-ice microalgal assemblages.

Priscu, J.C., Sullivan, C.W., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.147-160, Refs. p.158-160.

DLC QH95.58.A58 1998

Algae, Ecology, Chemical composition, Sea ice, Fast ice, Antarctica—McMurdo Sound

Nitrate reductase (NR) activity and inorganic nitrogen uptake were examined in surface and congelation ice algal assemblages in the fast ice from McMurdo Sound. NR activity was not inducible or synthesized *de novo* in cells exposed for 24 h to experimentally-elevated nitrate concentrations indicating that *in situ* nitrate levels were adequate to maintain an active NR system. Addition of <1 µM ammonium suppressed NR activity and nitrate uptake. Ammonium suppression was generally relieved by the addition of MSX, an inhibitor of glutamine synthetase (GS) activity, indicating that the amino acid glutamine is the allosteric product responsible for this effect. Inhibitor experiments also suggested that GS is the primary pathway for ammonium assimilation in the congelation assemblage tested. The results, together with other published reports, indicate that protein synthesis in fast-ice microalgae from McMurdo Sound is regulated by intracellular nutrient concentration rather than external supply. (Auth. mod.)

52-4056

Biological soup within decaying summer sea ice in the Amundsen Sea, Antarctica.

Thomas, D.N., et al, *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.161-171, Refs. p.169-171.

DLC QH95.58.A58 1998

Marine biology, Algae, Ice composition, Pack ice, Decomposition, Ecology, Nutrient cycle, Antarctica—Amundsen Sea

In late Feb. 1994, during the ANT XI/3 expedition of R/V *Polarstern*, ice cores from perennial sea ice were sampled in the Amundsen Sea in areas of dense pack ice. The ice was largely rotten, and a conspicuous feature was the occurrence of thick gaps and voids, often filled with a dark brown slush comprised of loose ice chunks and crystals. These interior ice assemblages were at depths between 1.0 and 1.5 m in 3 to 4 m thick ice floes, and had remarkably rich interior ice algal assemblages which were in turn a food source for unusually large numbers of foraminifers, the calanoid copepod *Stephos longipes* and harpacticoid copepods. Analysis of inorganic nutrients (nitrate, phosphate, ammonium, nitrite, and silicate) and dissolved organic carbon showed that these were sites of high nutrient supply coupled with high rates of nutrient regeneration. (Auth.)

52-4057

Copepods in antarctic sea ice.

Schnack-Schiel, S.B., Thomas, D., Dahms, H.U., Haas, C., Mizdalski, E., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.173-182, Refs. p.181-182.

DLC QH95.58.A58 1998

Algae, Marine biology, Sea ice, Ecology, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea

Intensive sea-ice biology investigations in the Bellingshausen and Amundsen seas were undertaken between Jan. and Mar., 1994. A large portion of the ice was thick second or multiyear ice, and a conspicuous feature was high standing stocks of sea ice algae. On several occasions these, in turn, were associated with large numbers of copepods, an indication that sea ice persisting through the summer may be a preferred shelter for some copepod species. In general, two species dominated the copepod populations found in the ice, the benthic harpacticoid *Drescheriella glacialis* and the pelagic calanoid *Stephos longipes*. Both *D. glacialis* and *S. longipes* had maximum concentrations in the upper or/and middle of ice floes, which coincided with higher salinities attributed to secondary flooding with sea water. This, in conjunction with optimal light conditions, promoted algal growth, an obviously major food source of the copepods. All developmental instars of *D. glacialis* were found in the ice, suggesting that this species reproduces and breeds within the ice matrix. In contrast, mainly young developmental stages of *S. longipes* occurred in the ice. (Auth. mod.)

52-4058

Physioecology of juvenile antarctic krill (*Euphausia superba*) during spring in ice-covered seas.

Daly, K.L., *American Geophysical Union. Antarctic research series,* 1998, Vol.73, Antarctic sea ice: biological processes, interactions and variability. Edited by M.P. Lizotte and K.R. Arrigo, p.183-198, Refs. p.195-198.

DLC QH95.58.A58 1998

Marine biology, Algae, Sea ice, Sea water, Chemical analysis, Antarctica—Antarctic Peninsula

In ice-covered waters west of the Antarctic Peninsula, during austral spring 1992, zooplankton biomass was dominated by juvenile krill, 27 mm in length, whose distribution and feeding activity were strongly related to the seasonal pack ice. Respiration and growth rates were comparable to those reported for juveniles in summer. Krill molted about every 33 days with an average 6.4% increase in body length. Gut fluorescence in krill collected from ice floes was 23-fold higher than that in individuals collected in the water column, with commensurate fecal pellet production rates. HPLC analyses measured relatively high ratios of accessory pigments to chlorophyll *a* in ice algae and significant amounts of chlorophyll *c* and phaeopigments in fecal pellets. These contained intact chlorophylls *a* and *c* and chlorophyll and fucoxanthin degradation products, most of which were derived from chlorophyll *c*. The combined results support the hypothesis that sea ice biota are the primary source of carbon and energy for juvenile krill during spring in this region. (Auth. mod.)

52-4059

Temperature requirements and biogeography of marine macroalgae—adaptation of marine macroalgae to low temperatures. [Temperaturbedarf und Biogeographie mariner Makroalgen—Anpassung mariner Makroalgen an tiefe Temperaturen]

Bischoff-Bäsmann, B., *Berichte zur Polarforschung,* 1997, No.245, 134p., In German and English. Refs. p.120-134.

Algae, Marine biology, Low temperature research, Cold tolerance, Biogeography, Antarctica—King George Island, Antarctica—Signy Island, Norway—Spitsbergen, Greenland—Disko Island

The report is an exploration of how well and for how long do marine macroalgae survive the low water temperatures in both polar regions, comparing the differences in tolerances among the red, green, and black algae. An introduction and a view point are presented and portions of five published papers are partially reproduced without text but with Author/Title and publication data, and tables, figures, and English abstracts. An extended discussion, in German, and fifteen pages of reference materials close the report.

52-4060

Biomass and CO_2 flux in wet sedge tundras: responses to nutrients, temperature, and light.

Shaver, G.R., et al, *Ecological monographs,* Feb. 1998, 68(1), p.75-97, 57 refs.

Ecosystems, Tundra vegetation, Tundra terrain, Floodplains, Biomass, Carbon dioxide, Photosynthesis, Nutrient cycle, Geochemical cycles, Statistical analysis, Simulation, Forecasting, United States—Alaska—Toolik Lake

52-4061

Alkalinity buildup during silicate weathering under a snow cover.

Berner, R.A., Rao, J.L., *Aquatic geochemistry,* 1996/1997, 2(4), p.301-312, 18 refs.

Hydrogeochemistry, Snow hydrology, Snowmelt, Runoff, Weathering, Ground water, Subsurface drainage, Chemical properties, Sampling, Vegetation factors, Geochemical cycles, Snow cover effect, United States—New Hampshire—Hubbard Brook

52-4062

Stream water geochemistry from selected catchments on the Kola Peninsula (NW Russia) and in neighbouring areas of Finland and Norway. 1. Element levels and sources.

De Caritat, P., Reimann, C., Äyräs, M., Niskavaara, H., Chekushin, V.A., Pavlov, V.A., *Aquatic geochemistry,* 1996, 2(2), p.149-168, 35 refs.

Limnology, Watersheds, Tundra terrain, Aerosols, Metals, Fallout, Streams, Geochemistry, Air pollution, Water pollution, Sampling, Environmental tests, Statistical analysis, Russia—Kola Peninsula, Finland, Norway

52-4063

Stream water geochemistry from selected catchments on the Kola Peninsula (NW Russia) and in neighbouring areas of Finland and Norway. 2. Time-series.

De Caritat, P., Reimann, C., Äyräs, M., Niskavaara, H., Chekushin, V.A., Pavlov, V.A., *Aquatic geochemistry,* 1996, 2(2), p.169-184, 20 refs.

Limnology, Arctic landscapes, Watersheds, Streams, Flooding, Snowmelt, Meltwater, Seepage, Snow impurities, Metals, Water pollution, Sampling, Geochemistry, Russia—Kola Peninsula, Finland, Norway

52-4064

Redox cycling of iron and manganese in sediments of the Kalix River estuary, northern Sweden.

Widerlund, A., Ingri, J., *Aquatic geochemistry,* 1996, 2(2), p.185-201, 48 refs.

Watersheds, Estuaries, Subpolar regions, Metals, Diffusion, Diagenesis, Geochemistry, Suspended sediments, Bottom sediment, Sampling, Spectroscopy, Sweden—Kalix River

52-4065

Alum residual floc interactions with an advancing ice/water interface.

Parker, P.J., Collins, A.G., Dempsey, J.P., *Journal of environmental engineering,* Mar. 1998, 124(3), p.249-253, 19 refs.

Water treatment, Waste treatment, Sludges, Freeze thaw cycles, Ice water interface, Freezing front, Hygroscopic water, Colloids, Migration, Aggregates, Freezing rate, Microstructure, Imaging

52-4066

Standard for the estimation of icing conditions. [Un criterio di valutazione delle condizioni di icing]

La Rocca, T., *Rivista di meteorologia aeronautica,* 1997, 57(1-2), p.48-56, In Italian. 2 refs.

Aircraft icing, Ice forecasting, Cloud physics, Ice formation, Glaze, Phase transformations, Water content, Ice water interface, Thermodynamics, Weather forecasting

52-4067

Lattice dynamics of ice in porous Vycor glass.

Li, J.C., Bennington, S.M., Benham, M.J., Ross, D.K., Conference on Neutron and X-ray Scattering: Complementary Techniques, Canterbury, UK, Mar. 29-31, 1989. Proceedings. Edited by M.C. Fairbanks et al. Conference series No.101, Bristol, Institute of Physics, 1990, p.109-118, 19 refs.

DLC QC793.5.M4628.C645 1989

Ice physics, Molecular structure, Porous materials, Ice spectroscopy, Neutron scattering, Hydrogen bonds, Ice water interface, Boundary layer, Spectra, Thermodynamic properties, Vibration, Molecular energy levels

52-4068

Quantitative assessment on the value of 1.38 micron imagery for the automated analysis of optically-thin cirrus in daytime imagery.

Hutchison, K.D., Choe, N., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.53-60, 16 refs.

DLC QC923.P37 1995

Climatology, Cloud cover, Classifications, Cloud physics, Optical properties, Ice crystals, Ice detection, Reflectivity, Radiometry, Infrared spectroscopy, Spaceborne photography, Image processing, Snow cover effect

52-4069

Subvisual cirrus: associations to the dynamic atmosphere and radiative effects.

Schmidt, E.O., Lynch, D.K., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.68-75, 12 refs.

DLC QC923.P37 1995

Cloud physics, Cloud cover, Remote sensing, Ice crystals, Optical properties, Radiation absorption, Light scattering, Radiance, Classifications

52-4070

Radiative properties of cirrus clouds observed during the EUropean Cloud Radiation EXperiment 94 in Brittany by active and passive remote sensing observations.

Brogniez, G., et al, *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.76-90, 9 refs.

DLC QC923.P37 1995

Cloud cover, Aerial surveys, Lidar, Radiometry, Optical properties, Backscattering, Ice detection, Ice crystal optics, Ice crystal structure, Polarization (waves), Models

52-4071

Correction of thin cirrus effects in the 0.4-1.0 region using the 1.375-μm cirrus detecting channel.

Gao, B.C., Kaufman, Y.J., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.101-109, 9 refs.

DLC QC923.P37 1995

Cloud cover, Cloud physics, Spaceborne photography, Infrared spectroscopy, Ice crystals, Ice detection, Radiance, Spectra, Image processing, Resolution

52-4072

Cirrus properties using ATSR and the potential of ATSR-2/AATSR.

Baran, A.J., Brown, S.J., Mitchell, D.L., Foot, J.S., Macke, A., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.110-121, 28 refs.

DLC QC923.P37 1995

Cloud cover, Cloud physics, Radiometry, Ice crystal optics, Ice crystal size, Ice detection, Radiance, Refractivity, Attenuation, Image processing, Particle size distribution

52-4073

Retrieval of a microphysical index for semitransparent cirrus clouds from AVHRR data: ICE'89 campaign study.

Giraud, V., Parol, F., Buriez, J.C., Fouquart, Y., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.122-132, 22 refs.

DLC QC923.P37 1995

Cloud cover, Cloud physics, Spaceborne photography, Radiometry, Ice crystal optics, Optical properties, Indexes (ratios), Radiation absorption, Image processing, Brightness, Transparence

52-4074

Studies of cloud ice water path and optical thickness during FIRE-II and ASTEX.

Matrosov, S.Y., Snider, J.B., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.133-137, 8 refs.

DLC QC923.P37 1995

Cloud cover, Optical properties, Cloud physics, Radiometry, Ice crystal optics, Water content, Infrared radiation, Radiation absorption, Scattering, Particle size distribution

52-4075

Observations of clouds in the polar stratosphere and polar mesosphere from POAM II.

Shettle, E.P., et al, *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.138-145, 25 refs.

DLC QC923.P37 1995

Climatology, Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Detection, Cloud physics, Aerosols, Ozone, Photometry, Attenuation

The Polar Ozone and Aerosol Measurement (POAM II) instrument has been measuring the vertical distribution of aerosols, polar stratospheric clouds (PSC), ozone, as well as several other atmospheric species since autumn 1993. The approach used to identify PSCs and polar mesospheric clouds (PMCs) from POAM II measurements will be described along a presentation of some of the early results of this high altitude cloud measurements. It is believed that the POAM II measurements of PMCs represent the first reported observations of PMCs directly by extinction; all previous observations utilized scattering. (Auth.)

52-4076

Specular scattering in cirrus clouds.

Shanks, J.G., Lynch, D.K., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.227-238, 24 refs.

DLC QC923.P37 1995

Cloud physics, Optical properties, Radiance, Specular reflection, Light scattering, Ice crystal optics, Ice crystal size, Orientation, Mathematical models, Imaging

52-4077

Discretized Mie-Formalism for plane wave scattering by dielectric objects with non-separable geometries.

Schmidt, K., Rother, T., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.262-272, 29 refs.

DLC QC923.P37 1995

Cloud physics, Remote sensing, Light scattering, Infrared radiation, Ice crystal optics, Ice crystal structure, Particles, Aerosols, Ice detection, Classifications, Mathematical models

52-4078

Retrieval of cloud optical depth and particle effective radius at high latitudes using visible and thermal satellite data.

Key, J.R., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.318-325, 10 refs.

DLC QC923.P37 1995

Cloud cover, Polar atmospheres, Spaceborne photography, Radiometry, Cloud physics, Ice crystal optics, Water content, Brightness, Particle size distribution, Beaufort Sea

52-4079

Determination of polar stratospheric cloud properties utilizing observations from SAGE III and ILAS.

Thomason, L.W., Pitts, M.C., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.326-333, 18 refs.

DLC QC923.P37 1995

Climatology, Polar atmospheres, Polar stratospheric clouds, Aerosols, Remote sensing, Infrared spectroscopy, Scattering, Attenuation, Particle size distribution

The SAGE III and ILAS instruments are scheduled to be launched in 1998 and 1996, respectively. These instruments will provide unique information regarding the composition and size distribution of polar stratospheric clouds. SAGE III will provide aerosol extinction measurements at 7 wavelengths in the visible and near-infrared from which the aerosol size distribution may be inferred. ILAS will provide continuous spectral coverage between 6 and 12 μm. Extinction by aerosol at these wavelengths is strongly dependent on the composition of the aerosol. The combination of measurements from these instruments should provide substantially improved understanding of the microphysical character of PSCs and, ultimately, into ozone depletion. (Auth. mod.)

52-4080

Specular reflection from atmospheric nonspherical particles.

Galileiskiĭ, V.P., Grishin, A.I., Morozov, A.M., Kolevatov, A.S., Oshlakov, V.K., Petrov, A.I., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.348-352, 5 refs.

DLC QC923.P37 1995

Remote sensing, Atmospheric composition, Optical properties, Particles, Sounding, Light scattering, Specular reflection, Ice detection, Ice crystal optics, Simulation

52-4081

Development of an automated classification scheme for detection of polar stratospheric clouds over Antarctica using AVHRR imagery.

Foschi, P.G., Pagan, K.L., Garcia, O., Smith, D.K., Gaines, S.E., Hipskind, R.S., *SPIE—The International Society for Optical Engineering. Proceedings. EUROPTO series,* 1995, Vol.2578, Passive infrared remote sensing of clouds and the atmosphere 3. Edited by D.K. Lynch and E.P. Shettle, p.375-383, 29 refs.

DLC QC923.P37 1995

Climatology, Polar stratospheric clouds, Aerosols, Detection, Spaceborne photography, Radiometry, Classifications, Image processing, Data processing

Although polar stratospheric clouds (PSCs) are a critical component in the ozone depletion process, their timing, duration, geographic extent, and annual variability are not well understood. The goal of this study is the development of an automated classification scheme for detecting PSCs using NOAA AVHRR data. Two types of automated techniques for detecting thin PSCs are investigated: namely, multispectral classification methods, including the use of texture and other image-derived features, and back-propagation neural networks, including the use of hyperspatial and hypertemporal data. UARS CLAES temperature and aerosol extinction coefficient data are being used as a verification dataset. If successful, this classification scheme will be used to process the entire record of AVHRR data in order to assemble a long-term PSC climatology. (Auth. mod.)

52-4082

***Clementine* bistatic radar experiment: evidence for ice on the Moon.**

Spudis, P.D., et al, *Solar system research,* Jan.-Feb. 1998, 32(1), p.17-22, 12 refs.

Moon, Extraterrestrial ice, Ground ice, Polar regions, Ice detection, Remote sensing, Spacecraft, Radar echoes, Backscattering

52-4083

Comparison of the styles of deformation associated with two recent push moraines, south Van Keulenfjorden, Svalbard.

Hart, J.K., Watts, R.J., *Earth surface processes and landforms,* Dec. 1997, 22(12), p.1089-1107, 40 refs.

Geomorphology, Glacial geology, Glacier surges, Ice solid interface, Moraines, Classifications, Deformation, Ice push, Outwash, Sedimentation, Lichens, Age determination, Norway—Svalbard

52-4084

Adjustment of daily precipitation data at 20 climate stations in Alaska: application of World Meteorological Organization intercomparison results.

Yang, D.Q., Goodison, B.E., Ishida, S., Benson, C.S., *Water resources research,* Feb. 1998, 34(2), p.241-256, 48 refs.

Precipitation (meteorology), Climatology, Subpolar regions, Precipitation gages, Snow accumulation, Seasonal variations, Meteorological data, Accuracy, Statistical analysis, Wind factors, United States—Alaska

52-4085

Katabatic wind profiles over the Greenland ice sheet: observations and modelling.

Meesters, A.G.C.A., Bink, N.J., Henneken, E.A.C., Vugts, H.F., Cannemeijer, F., *Boundary-layer meteorology,* Dec. 1997, 85(3), p.475-496, 22 refs.

Glacial meteorology, Atmospheric boundary layer, Turbulent boundary layer, Ice sheets, Ice air interface, Topographic effects, Turbulent diffusion, Wind direction, Wind velocity, Profiles, Mathematical models, Sodar, Greenland

52-4086

Climate change disequilibrium of boreal permafrost peatlands caused by local processes.

Camill, P., Clark, J.S., *American naturalist,* Mar. 1998, 151(3), p.207-222, 48 refs.

Climatic changes, Global warming, Landscape development, Peat, Permafrost transformation, Permafrost distribution, Ground thawing, Subsidence, Vegetation patterns, Vegetation factors, Mathematical models, Canada—Manitoba

52-4087
Remote controlled freeze corer for sampling unconsolidated surface sediments.
Lotter, A.F., Renberg, I., Hansson, H., Stöckli, R., Sturm, M., *Aquatic sciences,* 1997, 59(4), p.295-303, 26 refs.
Limnology, Bottom sediment, Lacustrine deposits, Sampling, Stratigraphy, Core samplers, Soil freezing, Artificial freezing, Design, Performance

52-4088
Defoliation and cold-hardiness of northern wheatgrass.
Kowalenko, B.L., Romo, J.T., *Journal of range management,* Jan. 1998, 51(1), p.63-68, 25 refs.
Plant ecology, Grasses, Damage, Agriculture, Biomass, Cold stress, Cold tolerance, Litter, Freezing, Cold weather survival, Temperature effects, Low temperature tests

52-4089
Effect of temperature and inorganic phosphorus supply on growth and acid phosphatase production in arctic and temperate strains of ectomycorrhizal *Hebeloma* spp. in axenic culture.
Tibbett, M., Sanders, F.E., Cairney, J.W.G., *Mycological research,* Feb. 1998, 102(pt.2), p.129-135, 53 refs.
Soil microbiology, Soil chemistry, Roots, Fungi, Growth, Biomass, Chemical properties, Nutrient cycle, Low temperature tests, Temperature effects

52-4090
Occurrence of *Gremmeniella abietina* var. *abietina* large- and small-tree types in separate Scots pine stands in northern Finland and in the Kola Peninsula, Russia.
Kaitera, J., Müller, M.M., Hantula, J., *Mycological research,* Feb. 1998, 102(pt.2), p.199-205, 27 refs.
Plant physiology, Trees (plants), Arctic landscapes, Plant tissues, Microbiology, Fungi, Damage, Distribution, Classifications, Chemical analysis, Sampling, Russia—Kola Peninsula, Finland

52-4091
Electrophysiological investigation of frost resistance in plants. 1. Nonfreezing electrode for measuring bioelectrical activity at temperatures below 0°C.
Martynenko, A.I., *Russian journal of plant physiology,* Jan.-Feb. 1998, 45(1), p.39-44, Translated from Fiziologiia rastenii. 10 refs.
Plant physiology, Plant tissues, Grasses, Electrical measurement, Probes, Electrical resistivity, Frost resistance, Light effects, Temperature effects, Low temperature tests

52-4092
Palaeoclimate sensitivity to CO_2 and insolation.
Berger, A., Loutre, M.F., *Ambio,* Feb. 1997, 26(1), p.32-37, 42 refs.
Paleoclimatology, Climatic changes, Atmospheric composition, Glacier oscillation, Ice volume, Insolation, Albedo, Radiation balance, Carbon dioxide, Ice cover effect, Oxygen isotopes, Models, Simulation

52-4093
Viability of mass algal cultures preserved by freezing and freeze-drying.
Cordero, B., Voltolina, D., *Aquacultural engineering,* Nov. 1997, 169(4), p.205-211, 18 refs.
Microbiology, Algae, Cryobiology, Preserving, Cold storage, Freeze drying, Solutions, Polymers, Viability

52-4094
Plant cold hardiness: molecular biology, biochemistry, and physiology.
International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996, Li, P.H., ed, Chen, T.H.H., ed, New York, Plenum Press, 1997, 368p., Refs. passim. For individual papers see 52-4095 through 52-4127.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Cold exposure, Physiological effects, Grasses, Trees (plants), Agriculture

52-4095
Molecular mechanism of plant cold acclimation and freezing tolerance.
Palva, E.T., Heino, P., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.3-14, Refs. p.10-14.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance

52-4096
Low temperature signal transduction during cold acclimation of alfalfa.
Dhindsa, R.S., Monroy, A.F., Sangwan, V., Kawczynski, W., Labbé, E., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.15-28, 38 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Acclimatization, Frost resistance, Cold tolerance

52-4097
Regulation of plant gene expression in response to low temperature.
Thomashow, M.F., Stockinger, E.J., Gilmour, S.J., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.29-34, 31 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Acclimatization, Frost resistance, Cold tolerance

52-4098
Constitutive freezing tolerant mutants in *Arabidopsis*: a genetic approach to signaling transduction in cold acclimation.
Xin, Z.G., Browse, J.A., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.35-44, 43 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance

52-4099
***Arabidopsis* mutants impaired in freezing tolerance after cold acclimation.**
Warren, G., McKown, R., Teutonico, R., Kuroki, G., Veale, E., Sagen, K., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.45-56, 27 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Acclimatization, Frost resistance, Cold tolerance

52-4100
Frost hardiness and cold acclimation in *Solanum* species.
Valverde, R., Chen, T.H.H., Li, P.H., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.57-66, 48 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4101
Understanding genetic control of freezing resistance using potato species as a model system.
Palta, J.P., Bamberg, J.B., Chen, Y.K., Vega, S.E., Weiss, L.S., Karlsson, B.H., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.67-75, 40 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4102
Dicktoo x Morex population: a model for dissecting components of winterhardiness in barley.
Hayes, P.M., et al, International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.77-87, 25 refs.
DLC QK756.P525 1997
Grasses, Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4103
Mapping of genes controlling cold hardiness on wheat 5A and its homologous chromosomes of cereals.
Galiba, G., Kerepesi, I., Snape, J.W., Sutka, J., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.89-98, 59 refs.
DLC QK756.P525 1997
Grasses, Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4104
Genetic control of cold hardiness in blueberry.
Arora, R., Rowland, L.J., Panta, G.R., Lim, C.C., Lehman, J.S., Vorsa, N., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.99-106, 18 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4105
Molecular chaperones: do they have a role in cold stress responses of plants.
Guy, C.L., Haskell, D.W., Li, Q.B., Zhang, C., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.109-129, Refs. p.125-129.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Molecular structure, Plant physiology, Cold exposure, Physiological effects, Frost resistance, Cold tolerance

52-4106
Characterization of antifreeze proteins from winter rye.
Griffith, M., et al, International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.131-141, 23 refs.
DLC QK756.P525 1997
Grasses, Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Antifreezes, Organic nuclei, Ice crystal growth, Ice crystal structure, Frost resistance, Cold tolerance

52-4107
Protection of thylakoid membranes from freeze-thaw damage by proteins.
Hincha, D.K., Sieg, F., Schmitt, J.M., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.143-152, 47 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance

52-4108
Investigating the role of lipid metabolism in chilling and freezing tolerance.
Tokuhisa, J., Wu, J.R., Miquel, M., Xin, Z.G., Browse, J.A., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.153-169, 55 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance

52-4109
Effect of cold acclimation on membrane lipid composition and freeze-induced membrane destabilization.
Uemura, M., Steponkus, P.L., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.171-179, 36 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Acclimatization, Cold exposure, Physiological effects, Frost resistance, Cold tolerance

52-4110
Regulation of cold acclimation: a complex interaction of low-temperature, light, and chloroplastic redox poise.
Gray, G.R., Chauvin, L.P., Sarhan, F., Huner, N.P.A., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.181-190, 58 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Photosynthesis, Cold exposure, Light effects, Physiological effects, Frost resistance, Cold tolerance

52-4111
Comparison of the cold hardiness potential of spring cereals and vernalized and non-vernalized winter cereals.
Wilen, R.W., Fu, P., Robertson, A.J., Gusta, L.V., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.191-201, 19 refs.
DLC QK756.P525 1997
Grasses, Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4112
Active oxygen and freezing tolerance in transgenic plants.
McKersie, B.D., Bowley, S.R., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.203-214, 50 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4113
Abscisic acid-induced chilling tolerance in maize.
Li, P.H., Chen, W.P., Jian, L.C., Xin, Z.G., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.215-223, 38 refs.
DLC QK756.P525 1997
Grasses, Plant ecology, Plant tissues, Plant physiology, Cold exposure, Physiological effects, Cold tolerance, Agriculture

52-4114
Molecular mechanisms of chilling-induced oxidative stress injury and tolerance in pre-emergent maize seedlings.
Prasad, T.K., Stewart, C.R., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.225-236, 38 refs.
DLC QK756.P525 1997
Grasses, Plant ecology, Plant tissues, Plant physiology, Acclimatization, Cold exposure, Physiological effects, Cold tolerance, Agriculture

52-4115
Characterization of vacuolar H^+-ATPases that are sensitive and tolerant to cold.
Hotsubo, K., Kawamura, Y., Takezawa, D., Arakawa, K., Yoshida, S., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.237-244, 10 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cold exposure, Physiological effects, Cold tolerance, Agriculture

52-4116
Phytochrome overexpression and cold hardiness in transgenic *Populus*.
Junttila, O., et al, International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.245-255, 42 refs.
DLC QK756.P525 1997
Trees (plants), Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Light effects, Physiological effects, Frost resistance, Cold tolerance, Forestry

52-4117
Responses of woody plant cells to freezing: investigations on the role of the plant cell wall.
Ashworth, E.N., Malone, S.R., Ristic, Z., Julian, J.W., Sarnighausen, E., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.257-269, 69 refs.
DLC QK756.P525 1997
Trees (plants), Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Supercooling, Ice formation, Cold exposure, Physiological effects, Frost resistance, Cold tolerance

52-4118
Cell tension and cavitation in plants during freezing: their role in injury.
Rajashekar, C.B., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.271-280, 38 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Ice formation, Supercooling, Physiological effects, Frost resistance

52-4119
Involvement of abscisic acid and proline in cold acclimation of winter wheat.
Dörffling, K., Abromeit, M., Bradersen, U., Dörffling, H., Melz, G., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.283-292, 13 refs.
DLC QK756.P525 1997
Grasses, Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4120
Differential accumulation of oligosaccharides and freezing tolerance of alfalfa.
Castonguay, Y., Nadeau, P., Michaud, R., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.293-299, 27 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4121
Oligosaccharides as endogenous cryoprotectants in woody plants.
Stushnoff, C., Seufferheld, M.J., Creegan, T., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.301-309, 32 refs.
DLC QK756.P525 1997
Trees (plants), Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture

52-4122
Use of infrared video thermography to study freezing in plants.
Wisniewski, M., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.311-316, 17 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Organic nuclei, Bacteria, Ice nuclei, Ice formation, Frost resistance, Cold tolerance, Infrared photography

52-4123
Breeding of cold hardy woody landscape plants.
Pellett, H., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.317-323, 14 refs.
DLC QK756.P525 1997
Introduced plants, Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Urban planning

52-4124
Cold hardiness factors that affect nursery production of woody plants in southeastern United States.
Lindstrom, O.M., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.325-330, 36 refs.
DLC QK756.P525 1997
Plant ecology, Plant tissues, Plant physiology, Cryobiology, Acclimatization, Cold exposure, Physiological effects, Introduced plants, Frost resistance, Cold tolerance, Agriculture, Cost analysis, United States—Georgia

52-4125

Winter survival of cereals parasitized by snow mold.

Gaudet, D.A., Laroche, A., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.331-342, Refs. p.339-342.

DLC QK756.P525 1997

Grasses, Plant ecology, Plant tissues, Plant physiology, Snow cover effect, Fungi, Physiological effects, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture, Canada

52-4126

Biological control of snow mold.

Matsumoto, N., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.343-350, 38 refs.

DLC QK756.P525 1997

Grasses, Plant ecology, Plant tissues, Plant physiology, Snow cover effect, Fungi, Physiological effects, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Agriculture, Japan

52-4127

Induction of chilling tolerance by brief abiotic shocks.

Saltveit, M.E., Mangrich, M., International Plant Cold Hardiness Seminar, 5th, Corvallis, OR, Aug. 5-8, 1996. Plant cold hardiness: molecular biology, biochemistry, and physiology. Edited by P.H. Li and T.H.H. Chen, New York, Plenum Press, 1997, p.351-356, 18 refs.

DLC QK756.P525 1997

Plant ecology, Plant tissues, Plant physiology, Acclimatization, Cold exposure, Physiological effects, Cold tolerance, Agriculture

52-4128

Design of steel for high strength line pipe requiring excellent notch toughness and corrosion properties for arctic applications.

DeCaux, G., Golini, F., Rayner, T.J., NACE Northern Area Western Conference & Exhibition, Victoria, British Columbia, Feb 15-18, 1998. Proceedings. Corrosion experiences and solutions, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1998], p.208-218, 13 refs.

Steels, Pipelines, Corrosion, Low temperature tests, Mechanical tests, Tensile properties, Specifications, Design criteria

52-4129

New inspection technology for detecting corrosion under insulation.

Galbraith, J.M., NACE Northern Area Western Conference & Exhibition, Victoria, British Columbia, Feb 15-18, 1998. Proceedings. Corrosion experiences and solutions, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1998], p.219-222, 2 refs.

Underground pipelines, Pipeline insulation, Steel structures, Corrosion, Electromagnetic prospecting

52-4130

Long living coating systems in the Arctic—a holy grail?

Prinsloo, H.F., NACE Northern Area Western Conference & Exhibition, Victoria, British Columbia, Feb 15-18, 1998. Proceedings. Corrosion experiences and solutions, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1998], p.223-236.

Oil storage, Storage tanks, Steel structures, Corrosion, Protective coatings, Weatherproofing, Cold weather tests, Specifications, Canada—Northwest Territories

52-4131

Novel chemical dispersant for removal of organic/inorganic "schmoo" scale in produced water injection systems.

Bohon, W.M, Blumer, D.J., Chan, A.F., Ly, K.T., NACE Northern Area Western Conference & Exhibition, Victoria, British Columbia, Feb 15-18, 1998. Proceedings. Corrosion experiences and solutions, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1998], p.237-254, 7 refs.

Wells, Gas production, Pipelines, Corrosion, Surfactants, United States—Alaska—Prudhoe Bay

52-4132

Evolution of a coating specification for arctic conditions.

Roosdahl, L., Prinsloo, H.F., NACE Canadian Region Western Conference, Calgary, Alberta, Feb. 7-10, 1994, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1994], p.111-120, 2 footnotes.

Oil storage, Storage tanks, Corrosion, Protective coatings, Weatherproofing, Building codes, Specifications, Canada—Northwest Territories

52-4133

Need for corrosion data and information acquisition and management in Alaska.

Perrigo, L.D., Perrigo, D.B., Talkington, J.P., NACE Canadian Region Western Conference, Calgary, Alberta, Feb. 7-10, 1994, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1994], p.174-192, 19 refs.

Corrosion, Weatherproofing, Bibliographies, Data processing, Cost analysis, Regional planning, Economic development, United States—Alaska

52-4134

Risk based assessment for pipeline river crossing inspections.

Wilson, K., NACE Canadian Region Western Conference, Calgary, Alberta, Feb. 7-10, 1994, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1994], p.326-339.

Pipelines, Site surveys, Muskeg, River crossings, Corrosion, Oil spills, Safety, Environmental protection, Canada

52-4135

Development of modelling criteria for predicting lifetimes of titanium nuclear waste containers.

Shoesmith, D.W., Ikeda, B.M., NACE Canadian Region Western Conference, Calgary, Alberta, Feb. 7-10, 1994, Houston, TX, National Association of Corrosion Engineers (NACE) International, [1994], p.389-396, 9 refs.

Radioactive wastes, Waste disposal, Storage tanks, Underground storage, Metals, Corrosion, Canada

52-4136

Small comets: naked-eye visibility.

Rizk, B., Dessler, A.J., *Geophysical research letters,* Dec. 15, 1997, 24(24), p.3121-3124, 9 refs.

Theories, Extraterrestrial ice, Cloud physics, Ice sublimation, Ice crystal optics, Radiometry, Ice detection, Brightness, Visibility

52-4137

Total ozone trends at sixteen NOAA/CMDL and cooperative Dobson spectrophotometer observatories during 1979-1996.

Komhyr, W.D., Reinsel, G.C., Evans, R.D., Quincy, D.M., Grass, R.D., Leonard, R.K., *Geophysical research letters,* Dec. 15, 1997, 24(24), p.3225-3228, 12 refs.

Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Ozone, Seasonal variations, Photometry, Statistical analysis, United States—Alaska—Barrow, United States—Alaska—Poker Flat, Antarctica—Amundsen-Scott Station

Ozone trends derived from 1979-1996 Dobson spectrophotometer total ozone data obtained at 16 international mid-latitude stations are analyzed. A linear trend approximation to ozone changes that occurred since 1978 during austral daylight times at Amundsen-Scott Station, yielded a value of -12%/decade. By combining 1979-1996 annual trend data for three U.S. mainland stations with trends for the sites derived from 1963-1978 data, it is estimated that the ozone decrease at U.S. mid-latitudes through 1996, relative to ozone present in the mid-1960s, was -6.7%. Similar analyses incorporating South Pole data obtained since 1963 yielded an ozone change at South Pole (daylight observations) through 1996 of approximately -25%. South Pole October total ozone values in 1996 were lower than mid-1960s October ozone values by a factor of two. (Auth. mod.)

52-4138

Possible ENSO signal in the Ross Sea.

Ledley, T.S., Huang, Z., *Geophysical research letters,* Dec. 15, 1997, 24(24), p.3253-3256, 19 refs.

Climatology, Atmospheric circulation, Marine atmospheres, Polar atmospheres, Water temperature, Surface temperature, Sea ice distribution, Air ice water interaction, Seasonal variations, Correlation, Antarctica—Ross Sea

An examination of the observational record in the Ross Sea over the period 1982-1994 indicates that there is a statistically significant relationship between the Ross Sea sea surface temperature (SST) and the ENSO (El Niño Southern Oscillation) signal in the tropical Pacific. During this period the Ross Sea SSTs lag the ENSO signal by 2-4 months with the highest correlation coefficient occurring with a lag of 3 months. Observations of the sea ice concentration during 1982-1994 also indicate a relation between the sea ice concentration in the Ross Sea and the ENSO cycle, with reduced sea ice concentrations in El Niño years. (Auth.)

52-4139

Influence of sea ice on the thermohaline circulation in the Arctic-North Atlantic Ocean.

Mauritzen, C., Häkkinen, S., *Geophysical research letters,* Dec. 15, 1997, 24(24), p.3257-3260, 17 refs.

Oceanography, Ocean currents, Salinity, Sea ice distribution, Drift, Heat flux, Ice water interface, Ice cover effect, Viscosity, Convection, Models, Atlantic Ocean, Arctic Ocean

52-4140

Ice-rafted debris in the North Pacific and correlation to North Atlantic climatic events.

Hewitt, A.T., McDonald, D., Bornhold, B.D., *Geophysical research letters,* Dec. 15, 1997, 24(24), p.3261-3264, 38 refs.

Paleoclimatology, Ice sheets, Ice volume, Ice rafting, Marine deposits, Drill core analysis, Radioactive age determination, Correlation, Ice cover effect, Models, Theories, Pacific Ocean

52-4141

Impact of light regimes on productivity patterns of benthic microbial mats in an antarctic lake: a modeling study.

Moorhead, D.L., Wolf, C.F., Wharton, R.A., Jr., *Limnology and oceanography,* Nov. 1997, 42(7), p.1561-1569, 37 refs.

Limnology, Ecosystems, Microbiology, Biomass, Lake ice, Ice cover effect, Snowmelt, Photosynthesis, Light effects, Seasonal variations, Models, Antarctica—Signy Island

Light availability to microbial mats is often below saturation intensity and is strongly influenced by modest changes in climatic factors. A model of net primary production for benthic mat communities of the subantarctic Sombre Lake, Signy I., was developed to evaluate depth-specific productivities of mat communities; to test the relative importance of model parameters to mat production; and to explore the potential impacts of climate change on mat production as manifested through changes in light regime. A detailed sensitivity analysis of model behavior revealed that variations in the time of ice and snow melt in spring accounted for 40-60% of the total variation in model behavior, emphasizing the importance of climatic factors to net primary production of mat communities and the sensitivity of mat production to climatic change. (Auth. mod.)

52-4142

Effect of salts and sugars on phase separation of polyvinylpyrrolidone-dextran solutions induced by freeze-concentration.

Izutsu, K., Heller, M.C., Randolph, T.W., Carpenter, J.F., *Chemical Society, London. Journal. Faraday transactions,* Feb. 7, 1998, 94(3), p.411-417, 36 refs.

Solutions, Polymers, Frozen liquids, Phase transformations, Chemical properties, Indexes (ratios), Thermal analysis, Profiles, Viscosity, Temperature measurement, Temperature effects, Low temperature research

52-4144
Optical properties of South Pole ice for neutrino astrophysics.
Price, P.B., et al, International Cosmic Ray Conference, 24th, Rome, Italy, Aug. 28-Sep. 8, 1995. Contributed papers, Vol.1, Urbino, International Union of Pure and Applied Physics, 1995, p.777-780, 7 refs.
DLC QC484.8.I57 1995
Glacier ice, Ice composition, Impurities, Bubbles, Hydrates, Optical properties, Light scattering, Gamma irradiation, Radiation absorption, Radiation measuring instruments, Antarctica—South Pole
The wavelength-dependent mean free path for light scattering, λ_{scat}, influences the design and limits the performance of detectors imbedded in ice. At depths d>1.4 km bubbles do not exist, and λ_{scat} is governed by dust, soluble impurities, crystal boundaries in ice, and air hydrate crystals. Quantitative estimates from antarctic ice samples are made. (Auth. mod.)

52-4145
Indirect evidence for long absorption lengths in antarctic ice.
Tilav, S., et al, International Cosmic Ray Conference, 24th, Rome, Italy, Aug. 28-Sep. 8, 1995. Contributed papers, Vol.1, Urbino, International Union of Pure and Applied Physics, 1995, p.1011-1014, 8 refs.
DLC QC484.8.I57 1995
Gamma irradiation, Detection, Glacier ice, Ice optics, Light transmission, Radiation absorption, Lasers, Simulation, Antarctica—South Pole
The absorption length of deep antarctic ice has been directly measured at visible wavelengths using the AMANDA laser calibration system. Cosmic ray muon data and SPASE/AMANDA coincidence data are used to confirm the long absorption lengths obtained by the direct calibration measurements. Comparison with data shows that the maximum absorption length of the South Pole ice at depths of 800-1000 m is ca. 310 m. (Auth. mod.)

52-4146
Using extra-clear antarctic ice as a supernova detector.
Halzen, F., Jacobsen, J.E., Zas, E., International Cosmic Ray Conference, 24th, Rome, Italy, Aug. 28-Sep. 8, 1995. Contributed papers, Vol.1, Urbino, International Union of Pure and Applied Physics, 1995, p.1027-1030, 12 refs.
DLC QC484.8.I57 1995
Gamma irradiation, Glacier ice, Detection, Measuring instruments, Ice optics, Radiation absorption, Antarctica—South Pole
The authors have simulated the response of a high energy neutrino telescope in deep antarctic ice to the stream of low energy neutrinos produced by a supernova. Recent experimental measurements of the absorption length of photons in deep ice are employed. The passage of a large flux of MeV-energy neutrinos during a period of seconds will be detected as an excess of single counting rates in all individual optical modules. The existing AMANDA detector can act as a galactic supernova watch. (Auth. mod.)

52-4147
Measurements of the absorption length of the ice at the South Pole in the wavelength interval 410 nm to 610 nm.
Erlandsson, B., et al, International Cosmic Ray Conference, 24th, Rome, Italy, Aug. 28-Sep. 8, 1995. Contributed papers, Vol.1, Urbino, International Union of Pure and Applied Physics, 1995, p.1039-1042, 1 ref.
DLC QC484.8.I57 1995
Glacier ice, Optical properties, Light scattering, Radiation absorption, Gamma irradiation, Lasers, Tests, Antarctica—South Pole
The AMANDA collaboration has measured the optical properties of the South Pole ice. This investigation is an extension of similar measurements made at a single wavelength in the 93-94 season. The experimental setup and the preliminary result of the analysis of the data are presented. (Auth. mod.)

52-4148
Solar protons from August 1972 flare and nitrate abundance in antarctic snow.
Gladisheva, O.G., Kocharov, G.E., International Cosmic Ray Conference, 24th, Rome, Italy, Aug. 28-Sep. 8, 1995. Contributed papers, Vol.4, Urbino, International Union of Pure and Applied Physics, 1995, p.1126-1128, 9 refs.
DLC QC484.8.I57 1995
Solar radiation, Polar atmospheres, Snow composition, Ionization, Aerosols, Protons
Thanks to long standing nitrate measuring at very high resolution in antarctic snow a unique possibility to detect individual solar flare protons in the past has been developed. In this paper the results of detailed calculations of precipitation of nitrates from heights up to 85 km have been presented. It is feasible to prolong the time scale of individual solar flare proton detection to several tens of thousands of years. (Auth. mod.)

52-4149
Solar signal in a 415-year nitrate record from a polar ice core.
Dreschhoff, G.A.M., Zeller, E.J., International Cosmic Ray Conference, 24th, Rome, Italy, Aug. 28-Sep. 8, 1995. Contributed papers, Vol.4, Urbino, International Union of Pure and Applied Physics, 1995, p.1196-1199, 26 refs.
DLC QC484.8.I57 1995
Solar radiation, Protons, Ice sheets, Ice cores, Aerosols, Ice composition, Ion density (concentration), Periodic variations, Correlation, Greenland

52-4150
Palaeoecology of pleniglacial sediments from the Venezuelan Andes. Palynological record of El Caball stadial, sedimentation rates and glacier retreat.
Rull, V., *Review of palaeobotany and palynology,* Jan. 1998, 99(2), International Palynological Conference, 9th, Houston, TX, June, 1996, p.95-114, 39 refs.
Pleistocene, Paleoecology, Glacial geology, Mountain glaciers, Glacier oscillation, Glacial deposits, Sedimentation, Altitude, Stratigraphy, Sampling, Geochronology, Venezuela—Andes

52-4151
Population strategies in severe environments: alpine plants in the northwestern Caucasus.
Onipchenko, V.G., Semenova, G.V., Van der Maarel, E., *Journal of vegetation science,* Feb. 1998, 9(1), p.27-40, 74 refs.
Plant ecology, Alpine landscapes, Ecosystems, Lichens, Biomass, Vegetation patterns, Classifications, Statistical analysis, Geobotanical interpretation, Russia—Caucasus Mountains

52-4152
Predicting the potential distribution of plant species in an alpine environment.
Guisan, A., Theurillat, J.P., Kienast, F., *Journal of vegetation science,* Feb. 1998, 9(1), p.65-74, 44 refs.
Plant ecology, Vegetation patterns, Distribution, Altitude, Alpine landscapes, Forecasting, Mapping, Sampling, Models, Statistical analysis, Switzerland—Valais

52-4153
Primary succession on glacier forelands in the subantarctic Kerguelen Islands.
Frenot, Y., Gloaguen, J.C., Cannavacciuolo, M., Billido, A., *Journal of vegetation science,* Feb. 1998, 9(1), p.75-84, 46 refs.
Plant ecology, Grasses, Vegetation patterns, Revegetation, Soil formation, Soil composition, Geocryology, Roots, Moraines, Statistical analysis, Age determination, —Kerguelen Islands
Primary succession was studied on recently deglaciated areas in front of the Ampère Glacier, Kerguelen Is. Vegetation, colonization processes and soil development were investigated on seven sites on the outwash plain over a distance of 5 km and representing a >200-yr old chronosequence. The plant succession pattern observed in this study appears to be related to soil development. Root architecture and fine particle dynamics in the soil may explain the behavior of the different species along the chronosequence. (Auth. mod.)

52-4154
Characteristics of antarctic surface air temperature and sea ice variations and their relationship.
Bian, L.G., Lu, L.H., Jia, P.Q., *Chinese journal of atmospheric sciences,* 1997, 21(3), p.265-274, 12 refs.
Climatology, Polar atmospheres, Surface temperature, Air temperature, Temperature variations, Seasonal variations, Sea ice distribution, Statistical analysis, Correlation
Temporal-spatial characteristics of antarctic surface air temperature and sea ice variations have been statistically analyzed. Results show that during the last 30 years there was an obvious warming trend in Antarctica, but there exists substantial difference in different sectors and periods. The most significant warming trend occurred in the Antarctic Peninsula. In the last 20 years the correlations between antarctic mean temperature and mean sea ice area are low. The different climate sectors defined by cluster analysis show a close relationship between two parameters on the inter-seasonal time scale. (Auth. mod.)

52-4155
Effects of snow pressure on growth form and life history of tree species in Japanese beech forest.
Homma, K., *Journal of vegetation science,* Dec. 1997, 8(6), p.781-788, 25 refs.
Plant ecology, Trees (plants), Snow mechanics, Creep, Pressure, Growth, Deformation, Damage, Snow cover effect, Vegetation patterns, Classifications, Japan—Echigo Mountains

52-4156
Experimental study on static solid-liquid phase equilibrium in the pores of a porous medium.
Miyata, Y., Akagawa, S., *Heat transfer—Japanese research,* 1997, 26(2), p.69-83, Translated from Japanese Society of Mechanical Engineers, Transactions, 1996, Vol.62. 15 refs.
Frozen ground mechanics, Frost heave, Porous materials, Phase transformations, Ice water interface, Freezing front, Water pressure, Unfrozen water content, Ice lenses, Mechanical tests, Simulation

52-4157
Concrete freeze/thaw as studied by magnetic resonance imaging.
Prado, P.J., Balcom, B.J., Beyea, S.D., Bremner, T.W., Armstrong, R.L., Grattan-Bellew, P.E., *Cement and concrete research,* Feb. 1998, 28(2), p.261-270, 51 refs.
Concrete strength, Frost action, Freeze thaw cycles, Freeze thaw tests, Porosity, Water content, Ice formation, Phase transformations, Imaging, Magnetic resonance, Thermodynamics, Temperature effects

52-4158
Mechanisms of acidification in natural water during spring flood (case study of the Kola subarctic).
Moĭseenko, T.I., *Water resources,* Jan.-Feb. 1998, 25(1), p.10-16, Translated from Vodnye resursy. 18 refs.
Limnology, Watersheds, Tundra terrain, Runoff, Snowmelt, Water pollution, Streams, Flooding, Sampling, Environmental tests, Ion density (concentration), Statistical analysis, Hydrogeochemistry, Russia—Kola Peninsula

52-4159
Current state and problems of field studies of snow cover.
Kaliuzhnyĭ, I.L., Shutov, V.A., *Water resources,* Jan.-Feb. 1998, 25(1), p.27-35, Translated from Vodyne resursy. 29 refs.
Snow surveys, Snow cover structure, Snow retention, Classifications, Snow hydrology, Water storage, Hydrologic cycle, Snow cover effect, Russia

52-4160
Chemical composition of snow near fuel and power projects.
Golovina, V.V., Eremina, A.O., Golovin, IU.G., Shchipko, M.L., *Water resources,* Jan.-Feb. 1998, 25(1), p.55-64, Translated from Vodyne resursy. 18 refs.
Air pollution, Environmental tests, Aerosols, Metals, Snow cover, Snow impurities, Snow composition, Solubility, Sampling, Wind factors, Sediment transport, Statistical analysis, Russia

52-4162
Lithostratigraphy, sedimentary evolution and sequence stratigraphy of the Upper Proterozoic Lyell Land Group, (Eleonore Bay Supergroup) of East and North-east Greenland.
Tirsgaard, H., Sønderholm, M., *Geology of Greenland survey bulletin,* 1997, No.178, 60p., Refs. p.57-60.
Pleistocene, Marine geology, Geological surveys, Subpolar regions, Geologic processes, Sedimentation, Sea level, Shoreline modification, Lithology, Stratigraphy, Classifications, Greenland

52-4163
Composition of glacial sediments in Canadian Shield terrane, southeastern Ontario and southwestern Quebec: applications to acid rain research and mineral exploration.
Kettles, I.M., Shilts, W.W., *Canada. Geological Survey. Bulletin,* 1994, No.463, 58p., With French summary. Refs. p.45-47.
Geological surveys, Glacial geology, Glacial deposits, Bedrock, Minerals, Weathering, Sediment transport, Geochemistry, Sampling, Exploration, Air pollution, Canada—Quebec, Canada—Ontario

52-4164
Climatic control of the thermal regime of permafrost, northwest Spitsbergen.
Putkonen, J.K., Seattle, University of Washington, 1997, 121p., University Microfilms order No.9807016, Ph.D. thesis. Refs. p.99-117.
Polar atmospheres, Atmospheric circulation, Soil air interface, Permafrost heat transfer, Permafrost heat balance, Frozen ground temperature, Soil temperature, Active layer, Snow air interface, Snow cover effect, Snow heat flux, Paleoclimatology, Global warming, Mathematical models, Norway—Spitsbergen

52-4165
Model study of natural variability in the arctic climate.
Bitz, C.M., Seattle, University of Washington, 1997, 199p., University Microfilms order No.9806958, Ph.D. thesis. Refs. p.191-199.
Polar atmospheres, Marine atmospheres, Atmospheric circulation, Sea ice distribution, Ice cover thickness, Ice volume, Ice cover effect, Ice heat flux, Air ice water interaction, Global warming, Ice models, Mathematical models, Computerized simulation

52-4166
Thermally enhanced bioventing of petroleum hydrocarbons in cold regions.
Filler, D.M., Fairbanks, University of Alaska, 1997, 194p., University Microfilms order No.9804922, Ph.D. thesis. Refs. p.140-146.
Oil spills, Soil pollution, Waste disposal, Land reclamation, Soil microbiology, Soil chemistry, Aeration, Electric heating, Thermal insulation, Artificial thawing, Cold weather operation, Cost analysis

52-4167
Mass balance and the flow of a polythermal glacier, McCall Glacier, Brooks Range, Alaska.
Rabus, B.T., Fairbanks, University of Alaska, 1997, 133p., University Microfilms order No.9804767, Ph.D. thesis. Refs. passim.
Mountain glaciers, Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier flow, Glacier oscillation, Glacial hydrology, Ice temperature, Basal sliding, Climatic changes, United States—Alaska—McCall Glacier

52-4168
New methodology for assessing the frost resistance of concrete aggregates.
Koubaa, A., Minneapolis, University of Minnesota, 1997, 186p., University Microfilms order No.9804735, Ph.D. thesis. 90 refs.
Concrete pavements, Concrete aggregates, Concrete freezing, Concrete strength, Concrete durability, Frost resistance, Freeze thaw tests, Lithology, Road maintenance

52-4169
Variability of air and snow chemical species concentrations in central Greenland.
Kuhns, H.D., Pittsburgh, PA, Carnegie Mellon University, 1997, 97p., University Microfilms order No.9802549, Ph.D. thesis. Refs. passim.
Polar atmospheres, Atmospheric composition, Air pollution, Aerosols, Scavenging, Snow composition, Snow accumulation, Ice cores, Ice composition, Impurities, Statistical analysis, Greenland

52-4170
Cloudy boundary layers of the Arctic: observations and modeling studies.
Pinto, J.O., Boulder, University of Colorado, 1997, 284p., University Microfilms order No.9800555, Ph.D. thesis. Refs. passim.
Polar atmospheres, Marine atmospheres, Atmospheric boundary layer, Cloud cover, Clouds (meteorology), Cloud physics, Atmospheric circulation, Ice openings, Air ice water interaction, Ice nuclei, Global warming

52-4171
Climate change and variability in a single column coupled sea ice/ocean mixed layer model.
Holland, M.M., Boulder, University of Colorado, 1997, 218p., University Microfilms order No.9800529, Ph.D. thesis. Refs. p.210-218.
Sea ice distribution, Ice cover thickness, Ice water interface, Air ice water interaction, Ice heat flux, Polar atmospheres, Marine atmospheres, Climatic changes, Global warming, Ice models, Mathematical models, Computerized simulation

52-4172
Impact of flood frequency, permafrost distribution, and climate variation on a northern treeline floodplain in Alaska.
Arians, A.E., Boulder, University of Colorado, 1997, 112p., University Microfilms order No.9800503, Ph.D. thesis. Refs. p.100-108.
Floodplains, Flooding, Permafrost distribution, Permafrost depth, Soil temperature, Trees (plants), Plant ecology, Vegetation patterns, Revegetation, Forest lines, Climatic changes, Global warming, United States—Alaska—Noatak River

52-4173
***In situ* and satellite observations of the visible and infrared albedo of sea ice during spring melt.**
De Abreu, R.A., Waterloo, Ontario, University, 1996, 326p., No.21339, Ph.D. thesis. Refs. p.315-326.
Sea ice, Ice surface, Ice optics, Ice heat flux, Ice melting, Ice cover effect, Snow ice interface, Snow cover effect, Air ice water interaction, Albedo, Radiometry, Spaceborne photography, Polar atmospheres, Global change, Canada—Northwest Territories—Barrow Strait, Canada—Northwest Territories—Lancaster Sound

52-4174
Freeze-and-thaw phenomena in concretes and aggregates.
Havens, J.H., *Kentucky Department of Highways. Division of Research. Research report. Part II,* Mar. 1970, 42p. + append., PB-192 980, 38 refs.
Concrete pavements, Concrete aggregates, Concrete freezing, Concrete durability, Frost action, Frost resistance, Freeze thaw tests, United States—Kentucky

52-4175
Protactinium-231 and Thorium-230 abundances and high scavenging rates in the western Arctic Ocean.
Edmonds, H.N., Moran, S.B., Hoff, J.A., Smith, J.N., Edwards, R.L., *Science,* Apr. 17, 1998, 280(5362), p.405-407, 28 refs.
Isotopes, Sea water, Chemical composition, Sea ice, Arctic Ocean

52-4176
Polar marine communities.
Dayton, P.K., Mordida, B.J., Bacon, F., *American zoologist,* 1994, 34(1), p.90-99, From the symposium Science as a Way of Knowing—Biodiversity presented at the Annual Meeting of the American Society of Zoologists, Dec. 27-30, 1992, Vancouver, Canada. 13 refs.
Biomass, Plankton, Algae, Sea ice
This paper is a review of the marine biology of polar seas. The Arctic has broad shallow continental shelves with seasonally fluctuating physical conditions and a massive fresh water impact in the northern coastal zones. However, it has a low seasonality of pack ice and little vertical mixing. The Antarctic has over twice the oceanic surface area, deep narrow shelves, and, except for ice cover, a relatively stable physical environment with very little terrestrial input. The Antarctic has great pack ice seasonality and much vertical mixing. Primary productivity in the polar areas tends to be strongly pulsed with the zooplankton lagging behind; however there are many exceptions to such generalizations. Most recent research has focused on specific patterns and processes resulting in biological hot spots such as predictable leads in the ice, polynyas, oceanographic fronts, areas of intense mixing, and the marginal ice zone. This review attempts to weave these recent oceanographic studies into the geological history of each habitat in an effort to develop a holistic understanding of the biological processes. (Auth. mod.)

52-4177
Paleological permafrost interpretation of oxygen isotope composition of a Late Pleistocene and Holocene wedge ice of Yakutia.
Vasil'chuk, IU.K., *USSR Academy of Sciences. Transactions. Earth science sections,* Jan.-Feb. 1988 (Pub. Apr. 89), 298(1-6), p.56-59, Translated from Doklady Akademii nauk SSSR. 10 refs.
Geocryology, Ground ice, Ice wedges, Permafrost origin, Ice composition, Oxygen isotopes, Isotope analysis, Radioactive age determination, Ice dating, Russia—Yakutia

52-4178
Rare-earth elements in Late Cenozoic volcanics of the western Bering Sea region as indicators of the type of lithosphere present there.
Bogdanov, N.A., Kepezhinskas, P.K., *USSR Academy of Sciences. Transactions. Earth science sections,* Jan.-Feb. 1988 (Pub. Apr. 89), 298(1-6), p.138-141, Translated from Doklady Akademii nauk SSSR. 9 refs.
Pleistocene, Geological surveys, Earth crust, Subpolar regions, Marine geology, Tectonics, Magma, Geochemistry, Chemical analysis, Origin, Bering Sea

52-4179
Continental margin of the Eurasian basin between Spitsbergen Archipelago and Franz Josef Land: structure and evolution.
Baturin, D.G., *USSR Academy of Sciences. Transactions. Earth science sections,* Mar.-Apr. 1988 (Pub. May 89), 299(1-6), p.101-105, Translated from Doklady Akademii nauk SSSR. 10 refs.
Marine geology, Subpolar regions, Pleistocene, Tectonics, Earth crust, Geologic processes, Seismic reflection, Profiles, Barents Sea

52-4180
Paleomagnetic reference intervals of the Late Pleistocene in the central area of the Russian plain.
Velichko, A.A., Svetlitskaia, T.V., *USSR Academy of Sciences. Transactions. Earth science sections,* May-June 1988, 300(1-6), p.194-197, Translated from Doklady Akademii nauk SSSR. 8 refs.
Pleistocene, Quaternary deposits, Plains, Loess, Geomagnetism, Remanent magnetism, Orientation, Geochronology, Correlation, Russia—Bryansk

52-4181
Antarctic sea ice: physical processes, interactions and variability.
Jeffries, M.O., ed, *American Geophysical Union. Antarctic research series,* 1998, Vol.74, 407p., Refs. passim. For individual papers see F-59255 through F-59273 or 52-4182 through 52-4200.
DLC GB2597.A48 1998
Snow cover, Sea ice, Pack ice, Spaceborne photography, Air ice water interaction, Oceanographic surveys, Fast ice
This volume, a companion to *Antarctic sea ice: biological processes, interactions and variability* (edited by M. Lizotte and K. Arrigo), contains 19 contributions grouped into the following 6 sections: Snow cover on sea ice; Ice formation, thickness and drift in the pack ice; Satellite microwave observations of pack ice characteristics and processes; Interactions between ice, ocean and atmosphere; Marginal ice zone characteristics and processes; and Landfast and marine ice characteristics.

52-4182
Winter snow cover of the west antarctic pack ice: its spatial and temporal variability.
Sturm, M., Morris, K., Massom, R., MP 5126, *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.1-18, Refs. p.17-18.
DLC GB2597.A48 1998
Snow cover effect, Snow cover structure, Snow ice interface, Snow temperature, Models, Pack ice, Ice cover thickness, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea, Antarctica—Ross Sea

The snow cover on the sea ice of the Bellingshausen, Amundsen and Ross seas was examined during one autumn and two winter cruises in 1994-95. The snow was extremely heterogeneous, being composed of depth hoar, soft slabs, icy layers, slush, and new snow, often all present at a single location. These dissimilar snow types resulted from cycling between cold, calm periods and warm, windy periods with rain-on-snow and melt events. Local snow heterogeneity also resulted from sea water flooding. At virtually every location, the bottom 9 cm of snow pack was saline and lay on snow-ice as thick as the snow. A diagenetic model of snow pack development is proposed in which snow-ice formation produces locally heterogeneous conditions in the snow pack, but at a regional scale tends to produce homogeneous conditions for the combined ice and snow system. The homogeneity is manifested in regional heat flux measurements from the ice surface. (Auth. mod.)

52-4183

Snow depth distribution over sea ice in the Southern Ocean from satellite passive microwave data.

Markus, T., Cavalieri, D.J., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.19-39, Refs. p.37-39.

DLC GB2597.A48 1998

Snow depth, Sea ice, Mathematical models, Spaceborne photography, Data processing, Antarctica—Weddell Sea, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea

In this paper, the authors present an algorithm to calculate snow depth on sea ice using DMSP SSM/I data. *In situ* snow depth measurements obtained from different expeditions to the Weddell, Bellingshausen, and Amundsen seas are regressed on SSM/I brightness temperatures. The relationship between snow depths and microwave data is consistent for all data sets. Multi-temporal information is included to identify wet snow or melt-refreeze events which result in large snow depth retrieval errors. Using this algorithm, the authors calculate monthly snow depths from 1988 through 1994. Areas of deep snow cover (about 40 cm) are found in the northwestern Weddell Sea and in the Bellingshausen and Amundsen seas. Shallower snow depths (less than 15 cm) occur in the East Antarctic region and seaward of the Ronne and Ross ice shelves. Average snow depths vary between 7 and 25 cm. The correlation coefficient between *in situ* snow depths and SSM/I-derived averages is 0.81. On average, the SSM/I snow depths are lower by 3.5 cm, which results primarily from the areal integration of the SSM/I retrieval. (Auth. mod.)

52-4184

East Antarctic sea ice: a review of its structure, properties and drift.

Worby, A.P., Massom, R.A., Allison, I., Lytle, V.I., Heil, P., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.41-67, Refs. p.64-67.

DLC GB2597.A48 1998

Pack ice, Polynyas, Ice structure, Ice physics, Ice composition, Sea ice distribution, Snow physics, Drift, Antarctica—East Antarctica

Data on the physical characteristics of east antarctic pack ice are presented for the period 1986-1995. The ice is confined to a narrow band that extends only 300 km from the continent at maximum extent in some locations, and retreats close to the coast in most places during summer. The ice is highly mobile and data from 32 drifting buoys show the mean drift speed to be 0.22 m/s, but highly variable on a daily basis. The net drift is divergent, but frequent periods of convergence cause floe deformation. Ice core textural analyses show this process to be a major contributor to the thickening of floes. The pack ice comprises, on average, 39% columnar ice, 47% frazil ice and 13% snow-ice, with other ice types comprising 1%. Ice salinity is shown to decrease with ice thickness, and mean core salinities are combined with monthly ice thickness distribution curves to estimate the total salt flux to the ocean over the growth season. The mean snow density is 360 kg/m^3 and the mean grain size is 1.6 mm. The constantly changing growth and deformation environment, coupled with high ice drift speeds, result in highly variable physical properties. (Auth. mod.)

52-4185

Late winter first-year ice floe thickness variability, seawater flooding and snow ice formation in the Amundsen and Ross seas.

Jeffries, M.O., Li, S., Jaña, R.A., Krouse, H.R., Hurst-Cushing, B., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.69-87, Refs. p.86-87.

DLC GB2597.A48 1998

Sea ice, Ice floes, Ice formation, Ice structure, Ice composition, Flooding, Ice cover thickness, Snow depth, Antarctica—Amundsen Sea, Antarctica—Ross Sea

In Sep. and Oct. 1994 in the western Amundsen and eastern Ross seas, snow depth, ice thickness, draft and freeboard data were collected by drilling along transects on ice floes, and ice core samples were obtained for analysis of ice structure/stratigraphy, stable isotopic composition and brine volume. Dynamic thickening by deformation had affected most of the ice cover. Three types of floe, X, Y and Z, were identified according to their coefficient of ice thickness variation and described as rafted, moderately ridged and strongly ridged, respectively. Types X, Y and Z had distinctive ice thickness probability density functions, and mean values of 0.68 m, 0.82 m and 1.17 m, respectively. Flooding was widespread throughout the study area. The total amount of snow ice, and the thickness of individual snow ice layers showed that, by late winter, snow ice formation had made a greater contribution than either congelation ice or frazil ice formation to the thermodynamic thickening of all the floes. (Auth. mod.)

52-4186

Deriving modes and rates of ice growth in the Weddell Sea from microstructural, salinity and stable-isotope data.

Eicken, H., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.89-122, Refs. p.119-122.

DLC GB2597.A48 1998

Sea ice, Ice models, Ice formation, Growth, Ice composition, Isotope analysis, Sea water, Ice structure, Grain size, Antarctica—Weddell Sea

The dependence of texture, salinity and $H_2{}^{18}O$ concentration of sea ice on the mode and rate of ice growth was studied based on ice, brine and seawater samples from the Weddell Sea. The near-constant isotopic composition of surface seawater in the study area allows for determination of effective fractionation coefficients from the bottom ice layers and the parent water mass, with a maximum value close to 2.70 per mill. A stagnant boundary-layer/seawater-entrainment fractionation model is derived to explain growth-rate dependent fractionation of $H_2{}^{18}O$ for sea ice. Through an exponential approximation, growth rates have been derived from the ice-core data, yielding a time-integrated growth rate of 0.22 mm/h. The data indicate significantly lower oceanic heat fluxes in the western as compared to the eastern and central Weddell Sea. Drawing on grain-size and salinity data and ice-growth simulations, temporal and spatial variability of ice accretion and the major modes of sea-ice growth are discussed. (Auth. mod.)

52-4187

Temporal and regional variation of sea ice draft and coverage in the Weddell Sea obtained from upward looking sonars.

Strass, V.H., Fahrbach, E., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.123-139, Refs. p.138-139.

DLC GB2597.A48 1998

Sea ice distribution, Ice bottom surface, Air ice water interaction, Ice deformation, Ice formation, Ice cover thickness, Antarctica—Weddell Sea

Up to two years-long time series of ice draft and coverage were obtained between 1990 and 1994, with moored Upward Looking Sonars, at 6 locations in the Weddell Sea. The measurements are analyzed for the temporal and regional variations, and used to estimate the relative contribution of thermodynamic growth and deformation to the ice draft distribution in the Weddell Sea. The mean ice draft varies between 0.8 m in the central Weddell Gyre, 2.2 m in the eastern inflow and 2.8 m in the western outflow. During circulation with the Weddell Gyre, mainly ice with a draft of less than 1 m is transformed into thicker ice; the major transformation occurs from drafts of 0.2 m to drafts of 1.2 m. It is concluded that deformation (rafting and ridging) contributes a minimum of 30% to the total amount of ice formed in the inner Weddell Sea and a minimum of 50% in the boundary regions. (Auth. mod.)

52-4188

Sea ice drift and deformation processes in the western Weddell Sea.

Geiger, C.A., Ackley, S.F., Hibler, W.D., III, MP 5127, *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.141-160, 19 refs.

DLC GB2597.A48 1998

Sea ice, Drift, Ice deformation, Bottom topography, Ocean currents, Wind factors, Data processing, Antarctica—Weddell Sea

Data from Ice Station Weddell during 1992 are used to examine sea ice drift and deformation activity to identify relevant external forces responsible for driving specific sea ice processes. Power spectra results from wind, sea ice, and ocean current measurements together with deformation analysis of sea ice reveal that the drift of sea ice in the western Weddell region is a low frequency dynamic process driven primarily by low frequency forcing in the form of moderate steady ocean currents and intermittent strong winds from high energy storm activity and that, higher frequencies, specifically diurnal and semi-diurnal tidal/inertial oscillation frequencies, are the main contributors to sea ice deformation in this region. Ice drift and deformation seem particularly sensitive to the forcing caused by topographic change as enhanced by ocean currents. (Auth. mod.)

52-4189

Oscillatory behavior in Antarctic sea ice concentrations.

Gloersen, P., Mernicky, A., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.161-171, 19 refs.

DLC GB2597.A48 1998

Sea ice distribution, Variations, Oscillations, Wind factors, Image processing, Polynyas, Antarctica—Weddell Sea, Antarctica—Amundsen Sea, Antarctica—Bellingshausen Sea

A frequency analysis methodology is used to explore the oscillations present in antarctic sea ice during the 9-year lifetime of the Scanning Multichannel Microwave Radiometer onboard the NASA Nimbus-7 spacecraft. The analysis includes determination of the spatial distribution of the trend in the sea ice concentrations. A positive trend in the Weddell Sea occurs approximately in the location of the Weddell Polynya. Spatial distribution of the amplitudes, phases, and confidence levels of the El Niño-Southern Oscillation (ENSO) components at periods of 2.4 and 4.2 years observed earlier in sector averages of ice areas and extents in the southern ocean is shown to be localized to only parts of the sectors in which the earlier composite observations were made. Finally, the phase diagrams of the 2.4- and 4.2-year ENSO components in the sea ice cover of the Amundsen-Bellingshausen seas reveal that the phases of the sea ice oscillations are about the same as those of the oscillations in scalar near-surface winds over the adjacent southern ocean, with the clear implication of a relationship between those winds and the sea ice. (Auth. mod.)

52-4190

Length of the sea ice season in the Southern Ocean, 1988-1994.

Parkinson, C.L., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.173-186, 8 refs.

DLC GB2597.A48 1998

Sea ice distribution, Seasonal variations, Mapping, Spaceborne photography, Image processing

The length of the sea ice season in the southern ocean has been determined, mapped, and analyzed for the first full seven years, 1988-1994, of the DMSP Special Sensor Microwave Imager data set. All years show ice season lengths decreasing northward around most of the continent, except in a portion of the Weddell Sea where the decrease is from southwest to northeast, under the influence of the Weddell Gyre, and in the Ross Sea where the near-coastal polynya produces shorter ice seasons in the southern portion of the sea than immediately to the north. Other aspects of the spatial patterns in ice season lengths, such as the existence and distribution of perennial ice along the coasts of the Bellingshausen, Amundsen, and eastern Ross seas, vary from year to year. Maps of the differences between the yearly ice season lengths and the seven-year average ice season lengths reveal a suggestion of eastward propagation of major anomaly patterns. (Auth. mod.)

52-4191

Active microwave remote sensing observations of Weddell Sea ice.

Drinkwater, M.R., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.187-212, Refs. p.210-212.

DLC GB2597.A48 1998

Sea ice distribution, Variations, Spaceborne photography, Imaging, Image processing, Climatic factors, Antarctica—Weddell Sea

Since July 1991, the European Space Agency's ERS-1 and ERS-2 satellites have acquired radar data of the Weddell Sea. C-band ERS-1 radar data are analyzed in conjunction with field data from two simultaneous field experiments in 1992. Satellite radar signature data are compared with shipborne radar data to extract a regional and seasonal signature database for recognition of ice types in the images. Performance of automated sea-ice tracking algorithms is tested on antarctic data to evaluate their success. Examples demonstrate that both winter and summer ice can be effectively tracked. The kinematics of the main ice zones within the Weddell Sea are illustrated, together with the complementary time-dependencies in their radar signatures. Time-series of satellite images are used to illustrate the development of the Weddell Sea ice cover from its austral summer minimum (Feb.) to its winter maximum (Sep.). (Auth. mod.)

52-4192
Sea ice characteristics and seasonal variability of ERS-1 SAR backscatter in the Bellingshausen Sea.
Morris, K., Jeffries, M.O., Li, S.S., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.213-242, Refs. p.239-242.
DLC GB2597.A48 1998
Sea ice distribution, Seasonal variations, Synthetic aperture radar, Ice physics, Snow physics, Backscattering, Antarctica—Bellingshausen Sea
Radiometrically-corrected synthetic aperture radar data acquired by the ERS-1 satellite have been used to document the backscatter variability of sea ice in the Bellingshausen Sea in winter (Aug. and Sep., 1993) and summer (Jan., Feb. and Mar., 1994). The greatest contrast in antarctic sea ice backscatter signatures is between new/young ice and the older, thicker ice types. At later stages of ice development such phenomena as seawater flooding and a perennial snow cover affect antarctic sea ice. The backscatter signals of many antarctic ice types do not vary greatly during the course of winter and summer; consequently, backscatter anomalies are very distinctive when they do occur. Two such anomalies occurred in summer; they were a consequence of the introduction of warm, marine air over the perennial pack ice by an intense cyclone which resulted in a uniform backscatter reduction of 5 dB. (Auth. mod.)

52-4193
Antarctic ocean-ice interaction: implications from ocean bulk property distributions in the Weddell Gyre.
Martinson, D.G., Iannuzzi, R.A., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.243-271, Refs. p.269-271.
DLC GB2597.A48 1998
Sea ice distribution, Ice formation, Air ice water interaction, Ocean currents, Climatic factors, Maps
The sea ice distribution in the antarctic polar oceans is intimately tied to the underlying ocean structure, which controls the oceans' vertical heat flux and stability. The former determines the rate at which ice grows for a given air-sea heat flux, while the latter limits the amount of sea ice that can grow locally before overturning the water column. These relationships have been described through a set of scalings, allowing the authors to estimate, through examination of the vertical distributions of ocean temperature and salinity: the maximum amount of *in situ* ice growth in any one location, the ratio of ice melt to ice growth, the amount of ice that has melted in any particular summer location, and the ocean winter-averaged heat flux. Climatological maps of these quantities are presented for the Weddell Gyre region and general results are described. (Auth. mod.)

52-4194
Ice formation in coastal polynyas in the Weddell Sea and their impact on oceanic salinity.
Markus, T., Kottmeier, C., Fahrbach, E., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.273-292, Refs. p.291-292.
DLC GB2597.A48 1998
Ice formation, Polynyas, Heat flux, Meteorological factors, Ice volume, Ocean currents, Salinity, Air ice water interaction, Antarctica—Weddell Sea
The coastal polynyas occupy only a relatively small area of the ice covered part of the Weddell Sea, about 0.2%, during the winter months when the ice production is highest. However, in spite of the small areal fraction of the polynyas, they produce between 2.5% and 5% of the total Weddell Sea ice volume. The fixed position of the polynyas at the coast, together with relatively slow mean currents on the shelves allow the accumulation of salt in coastal waters. To derive time series of the salinity increase in the coastal current due to brine release in the polynyas, the authors prescribe a clockwise circulation along the coastline. The mean drift of a water parcel along that trajectory is determined by adjusting the salt gain to the observed salinity, 34.06 psu, in the coastal belt in the eastern Weddell Sea and 34.49 psu off the northern tip of the Antarctic Peninsula. The results indicate an effective drift velocity of the coastal current of 2 to 5 km/d. (Auth. mod.)

52-4195
Interannual variability in summer sea ice minimum, coastal polynyas and bottom water formation in the Weddell Sea.
Comiso, J.C., Gordon, A.L., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.293-315, Refs. p.313-315.
DLC GB2597.A48 1998
Sea ice distribution, Ice volume, Oceanographic surveys, Salinity, Wind factors, Polynyas, Air ice water interaction, Antarctica—Weddell Sea
As sea ice formation plays a key role in driving Antarctic Bottom Water (AABW) production through brine rejection and the associated production of High Salinity freezing point Shelf Water, a possible link between interannual variability of the ice cover and changes in AABW production is expected. Analysis of satellite data indicates that the summer minimum extents (and area) in the Weddell Sea were highly variable from 1979 through 1995, but the correlations of summer ice characteristics to those of subsequent winter are generally weak. Wind effects appear to be an important factor in causing the large variability observed in the ice cover while the effects of air temperature variations are not apparent. Temporal variability of AABW in the western Weddell Sea from 1963 through 1993 also is observed, with the bottom water salinity being significantly lower in 1992 and 1993 than those in earlier decades. (Auth. mod.)

52-4196
Mesoscale ice features in the summer marginal ice zone off East Queen Maud Land observed in NOAA AVHRR imagery.
Fukamachi, Y., Ohshima, K.I., Ishikawa, T., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.317-323, 13 refs.
DLC GB2597.A48 1998
Sea ice distribution, Ice surface, Image processing, Spaceborne photography, Ocean currents, Wind factors, Polynyas, Bottom topography, Pack ice, Antarctica—Queen Maud Land
Mesoscale ice features off eastern Queen Maud Land are examined using NOAA advanced very high resolution radiometer imagery during summers 1987-1990. Characteristic mesoscale features are found at two locations. Ice tongues and eddies are identified in the marginal ice zone and wavelike patterns are identified on the offshore edge of a polynya located between regions of pack ice and landfast ice. The growth of these features is not correlated with the wind field. Patterns of the ice tongues and eddies are associated with those of cold water offshore. This suggests that ocean currents advect both ice and cold water to generate these patterns. The wavelike patterns at the polynya edge appear at various locations that are not correlated with bottom topography in the area. (Auth.)

52-4197
Wave dumping in compact pancake ice fields due to interactions between pancakes.
Shen, H.H., Squire, V.A., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.325-341, Refs. p.340-341.
DLC GB2597.A48 1998
Ice floes, Ice creep, Ice models, Ocean waves, Wave propagation, Ice water interface, Ice mechanics, Simulation, Antarctica—Weddell Sea
A new wave damping model is proposed that invokes ice floe collisions arising from the differential drift of individual floes to explain the attenuation of ocean waves as they pass through a field of pancake ice. The dissipated energy is found to be a function of the restitution coefficient of the pancakes and their impact velocities. For small dissipation, where the velocity of energy transport is unaffected by the damping, the spatial attenuation of the wave energy follows a power law rather than an exponential function. Although the value of the exponent is different, this is in agreement with the steady-state creep model of Wadhams [1973] to which it offers a physical basis. Results from the model are compared with a data set collected during the 1986 Winter Weddell Sea Project. (Auth.)

52-4198
Some features of the growth, structure and metamorphism of east antarctic landfast sea ice.
Fedotov, V.I., Cherepanov, N.V., Tyshko, K.P., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.343-354, Refs. p.353-354.
DLC GB2597.A48 1998
Fast ice, Ice formation, Ice structure, Ice physics, Ice mechanics, Sea ice distribution, Seasonal variations, Snow ice, Antarctica—East Antarctica
According to the results of many years of observations in East Antarctica, the width of landfast ice zones is controlled by underwater relief and continental shelf depth. The crystal structure of the fast ice during its growth is nearly always layered and may consist of combinations of congelation, frazil, shuga, infiltration and platelet ice. Infiltration ice (snow ice) increases multiyear ice thickness as a consequence of snow accumulation and ice formation on the upper ice surface. Characteristic layered structures appear in the landfast ice in spring; these are caused by metamorphism processes. On the basis of pronounced variations of ice crystal structure, and physical and mechanical properties in this period, the different and changing stages of the physical state of the ice can be distinguished. (Auth. mod.)

52-4199
Physical and structural properties of land-fast sea ice in McMurdo Sound, Antarctica.
Gow, A.J., Ackley, S.F., Govoni, J.W., Weeks, W.F., MP 5128, *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.355-374, Refs. p.373-374.
DLC GB2597.A48 1998
Fast ice, Ice physics, Ice structure, Ice cover thickness, Ice composition, Ocean currents, Ice water interface, Antarctica—McMurdo Sound
The physical properties of land-fast sea ice in McMurdo Sound were investigated in cores drilled to the bottom of the ice at 27 widely separated sites. Three major ice types were identified, including an upper transition layer, representing 15% of the total ice thickness, that consisted mainly of ice formed during the earliest stages of growth of congelation ice. Most of the underlying ice consisted of columnar congelation ice exhibiting aligned *c*-axes horizontal fabrics which transitioned into platelet ice forming the base of the ice sheet. These observations imply near-surface current circulation changes, possibly related to the onset of growth of the sub-ice platelet layer. Platelet ice appears to form by direct attachment to the bottom of the ice sheet and its morphological characteristics are consistent with formation from adiabatically supercooled water originating from beneath the Ross Ice Shelf. (Auth. mod.)

52-4200
Linking landfast sea ice variability to marine ice accretion at Hells Gate Ice Shelf, Ross Sea.
Tison, J.L., Lorrain, R.D., Bouzette, A., Dini, M., Bondesan, A., Stiévenard, M., *American Geophysical Union. Antarctic research series,* 1998, Vol.74, Antarctic sea ice: physical processes, interactions and variability. Edited by M.O. Jeffries, p.375-407, Refs. p.405-407.
DLC GB2597.A48 1998
Fast ice, Ice structure, Ice cores, Ice cover thickness, Ice composition, Ocean currents, Ice shelves, Ice accretion, Sea ice, Frazil ice, Ice salinity, Antarctica—Hells Gate, Antarctica—Terra Nova Bay
Eleven first-year sea ice cores collected in the vicinity of Hells Gate ice shelf are analyzed for their textures, ice fabrics, salinities, chemical composition and oxygen-18 values. These are compared to a new data set of four 10-45 m long marine ice cores drilled close to the ice shelf front. During most of the winter, granular frazil ice accretion prevails at the bottom of the landfast first-year sea ice cover in front of Hells Gate ice shelf. At the end of the winter, platelet ice is more commonly found. Bottom accretion at the base of the landfast first-year sea ice still occurs during the summer as a banded rectangular facies. It can form up to 54% of the ice core thickness. The seasonality of this banded facies accretion at the bottom of the landfast sea ice, the dominance of the banded marine ice facies closer to the ice shelf front and the chemical trends in the granular marine ice facies suggest that a link must exist between the banded facies' genesis and the tidal pumping of warm surface waters below the ice shelf during the summer. (Auth. mod.)

52-4201
Antarctic seas.
Priddle, J., Cambridge, British Antarctic Survey, 1993, 16p., Pamphlet.
Ocean currents, Ocean environments, Marine biology, Ecology, Ecosystems, Biomass, Nutrient cycle, Antarctica

52-4202
Penguins.
Williams, T.D., Cambridge, British Antarctic Survey, [1993], 11p., Pamphlet.
Marine biology, Animals, Ecology, Antarctica

52-4203
Antarctic whales & seals.
Priddle, J., Cambridge, British Antarctic Survey, 1992, 16p., Pamphlet.
Marine biology, Animals, Ecology, Antarctica

52-4204
Food & clothing.
British Antarctic Survey, Cambridge, [1991], 11p., Pamphlet.
Logistics, Human factors engineering, Health, Clothing, Cold weather survival, Cold weather operation, Antarctica

52-4205
Geology of Antarctica.
Leat, P., Cambridge, British Antarctic Survey, 1995, 15p., Pamphlet.
Geological surveys, Continental drift, Earth crust, Tectonics, Geologic structures, Geochronology, Antarctica

52-4206
Antarctic fact-file.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 4 refs.
History, Geography, Mapping, Antarctica

52-4207
British exploration of Antarctica.
British Antarctic Survey, Cambridge, 1991, 12p., Pamphlet.
History, Expeditions, Antarctica

52-4208
Ecosystems in climate response & regulation.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 3 refs.
Ecosystems, Ecology, Nutrient cycle, Paleoclimatology, Global change, Antarctica

52-4209
Living & working in Antarctica.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 3 refs.
Stations, Logistics, Clothing, Cold weather operation, Antarctica

52-4210
Continental drift: completing the jigsaw.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 1 ref.
Continental drift, Earth crust, Paleoclimatology, Antarctica

52-4211
Geospace: the Earth meets the Sun.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 5 refs.
Polar atmospheres, Atmospheric physics, Geomagnetism, Solar activity, Antarctica

52-4212
Conservation: managing marine resources.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 5 refs.
Marine biology, Natural resources, Ecosystems, Environmental protection, Antarctica

52-4213
Hole in the ozone layer.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 5 refs.
Polar atmospheres, Atmospheric composition, Air pollution, Ozone, Antarctica

52-4214
Climate change, ice & ice ages.
British Antarctic Survey, Cambridge, 1996, 4p., Pamphlet. 4 refs.
Glaciation, Ice shelves, Paleoclimatology, Global warming, Antarctica

52-4215
Antarctica.
United Kingdom Antarctic Heritage Trust (UK AHT), Guildford, England, 1993, 2p., Fold. leaflet.
Organizations, Environmental protection

52-4216
Moisture transport diagnosis of a wintertime precipitation event in the Mackenzie River Basin.
Lackmann, G.M., Gyakum, J.R., Benoit, R., *Monthly weather review,* Mar. 1998, 126(3), p.668-691, 33 refs.
Climatology, Subpolar regions, Synoptic meteorology, Fronts (meteorology), Precipitation (meteorology), Snowfall, Atmospheric circulation, Atmospheric pressure, Wind direction, Moisture transfer, Models, Canada—Northwest Territories—Mackenzie River

52-4217
Hailstorm damage observed from the *GOES-8* satellite: the 5-6 July 1996 Butte-Meade storm.
Klimowski, B.A., Hjelmfelt, M.R., Bunkers, M.J., Sedlacek, D., Johnson, L.R., *Monthly weather review,* Mar. 1998, 126(3), p.831-834, 8 refs.
Precipitation (meteorology), Hail, Ice storms, Plains, Vegetation, Grasses, Damage, Wind factors, Spaceborne photography, Weather observations, United States—South Dakota

52-4218
Anharmonic dynamics in crystalline, glassy, and supercooled-liquid glycerol: a case study on the onset of relaxational behavior.
Cuello, G.J., et al, *Physical review B,* Apr. 1, 1998, 57(14), p.8254-8263, 26 refs.
Supercooling, Liquid cooling, Polymers, Dielectric properties, Low temperature tests, Phase transformations, Temperature effects, Thermodynamic properties, Neutron scattering, Spectra, Vibration, Statistical analysis

52-4219
Scanning force microscope and vacuum chamber for the study of ice films: design and first results.
Bluhm, H., Pan, S.H., Xu, L., Inoue, T., Ogletree, D.F., Salmeron, M., *Review of scientific instruments,* Apr. 1998, 69(4), p.1781-1784, 14 refs.
Ice physics, Water films, Ice solid interface, Ice surface, Ice crystal structure, Ice friction, Measuring instruments, Electrical measurement, Topographic features, Imaging, Design, Performance

52-4220
Reconstruction of the mid-Holocene palaeoclimate of Siberia using a bioclimatic vegetation model.
Monserud, R.A., Tchebakova, N.M., Denissenko, O.V., *Palaeogeography, palaeoclimatology, palaeoecology,* May 1998, 139(1-2), p.15-36, Refs. p.33-36.
Paleoclimatology, Climatic changes, Temperature variations, Palynology, Paleoecology, Forest tundra, Vegetation patterns, Classifications, Degree days, Indexes (ratios), Models, Radioactive age determination, Statistical analysis, Russia—Siberia

52-4221
Phase changes associated with ice formation in large temperate-zone inland water bodies and possibilities for their microwave detection.
Melent'ev, V.V., Tikhomirov, A.I., Kondrat'ev, K.IA., Johannessen, O.M., Sandven, S., Pettersson, L.H., *Mapping sciences & remote sensing,* Jan.-Mar. 1998, 35(1), p.41-53, 13 refs.
Remote sensing, Ice surveys, Lake ice, Ice conditions, Ice formation, Phase transformations, Ice water interface, Water temperature, Synthetic aperture radar, Spaceborne photography, Russia—Ladoga, Lake

52-4222
Co-location of pixels in satellite remote sensing images with demonstrations using sea ice data.
Shokr, M.E., Moucha, R., *International journal of remote sensing,* Mar. 20, 1998, 19(5), p.855-869, 19 refs.
Sea ice distribution, Ice surveys, Spaceborne photography, Radiometry, Synthetic aperture radar, Sensor mapping, Image processing, Resolution, Correlation, Mathematical models

52-4223
Summary of SHRP research and economic benefits of snow and ice control.
Epps, J.A., Ardila-Coulson, M., *U.S. Federal Highway Administration. Special report,* Dec. 1997, FHWA-SA-98-015, 19p., 16 refs.
Road maintenance, Winter maintenance, Research projects, Snow removal, Ice control, Weather forecasting, Chemical ice prevention, Snow removal equipment, Cost analysis, Economic analysis

52-4224
Ice storm damage to a southern Wisconsin mesic forest.
Bruederle, L.P., Stearns, F.W., *Torrey Botanical Club. Bulletin,* Apr.-June 1985, 112(2), p.167-175, 33 refs.
Ice storms, Glaze, Ice loads, Trees (plants), Plant ecology, Forest ecosystems, Forest canopy, Vegetation patterns, Wood, Flexural strength, United States—Wisconsin

52-4225
Ice storms and forest succession in southwestern Virginia.
Whitney, H.E., Johnson, W.C., *Torrey Botanical Club. Bulletin,* Oct.-Dec. 1984, 111(4), p.429-437, 29 refs.
Ice storms, Glaze, Ice loads, Trees (plants), Plant ecology, Forest canopy, Forest ecosystems, Vegetation patterns, Revegetation, United States—Virginia

52-4226
Localized ice storm damage in an Appalachian plateau watershed.
Boerner, R.E.J., Runge, S.D., Cho, D.S., Kooser, J.G., *American midland naturalist,* 1988, 119(1), p.199-208, 19 refs.
Ice storms, Glaze, Trees (plants), Ice loads, Damage, United States—Ohio

52-4227
Resistance of trees to ice storm injury.
Rogers, W.E., *Torreya,* Nov.-Dec. 1923, 23(6), p.95-99, 4 refs.
Ice storms, Trees (plants), Ice loads, Damage

52-4228
Snow survey bulletin & water supply forecast, April 1, 1998, Yukon Territory.
Canada. Indian and Northern Affairs. Water Resources Division, Whitehorse, 1998, 27p.
Snow surveys, Runoff forecasting, Snow depth, Snow water equivalent, Stream flow, Canada—Yukon Territory

52-4229
Glaze storm of 1940.
Deuber, C.G., *American forests,* May 1940, Vol.46, p.210-211,235.
Ice storms, Glaze, Ice loads, Trees (plants), Damage, United States

52-4230
Spatial and temporal variability of nocturnal summer frost in elevated complex terrain.
Lindkvist, L., Lindqvist, S., *Agricultural and forest meteorology,* 1997, Vol.87, p.139-153, 32 refs.
Mountains, Frost forecasting, Air temperature, Diurnal variations, Degree days, Trees (plants), Plant ecology, Plant physiology, Frost resistance, Vegetation patterns, Revegetation, Sweden

52-4231
How snow, ice injury affects different trees.
Butler, J.D., Swanson, B.T., *Grounds maintenance,* Oct. 1974, Vol.9, p.29,30,40.
Trees (plants), Ice storms, Snowstorms, Snow loads, Ice loads, Damage

52-4232
Branch breakage under snow and ice loads.
Cannell, M.G.R., Morgan, J., *Tree physiology,* 1989, Vol.5, p.307-317, 12 refs.
Trees (plants), Snow loads, Ice loads, Wood, Flexural strength

52-4233
Transportation and economic potential in the Arctic.
Woods, K.B., Legget, R.F., *Traffic quarterly,* Oct. 1960, p.435-458, Refs. passim.
Transportation, Logistics, History, Highway planning, Airports, Channels (waterways), Railroads, Ice navigation, Economic development, Cost analysis, United States—Alaska, Canada

52-4234
Melting ice with space heaters.
Haehnel, R.B., Haynes, F.D., Clark, C.H., MP 5129, *U.S. Army Corps of Engineers. Waterways Experiment Station. Repair, Evaluation, Maintenance, and Rehabilitation Research Program. REMR bulletin,* Dec. 1997, 14(3), p.6-9.
Locks (waterways), Ice melting, Artificial melting, Ice control, Ice prevention, Ice removal, Radiant heating

52-4235

Measurements of O_3, CO_2 and H_2O fluxes over a Scots pine stand in eastern Finland by the micrometeorological eddy covariance method.

Aurela, M., Laurila, T., Tuovinen, J.P., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.97-108, 25 refs.

Forest ecosystems, Subarctic landscapes, Atmospheric boundary layer, Microclimatology, Soil air interface, Aerosols, Ozone, Turbulent exchange, Vapor transfer, Diurnal variations, Geochemical cycles, Statistical analysis, Carbon dioxide, Finland

52-4236

First-year results on the effects of elevated atmospheric CO_2 and O_3 concentrations on needle ultrastructure and gas exchange responses of Scots pine sapling.

Palomäki, V., Laitinen, K., Holopainen, T., Kellomäki, S., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.123-134, 28 refs.

Forest ecosystems, Subarctic landscapes, Plant ecology, Plant tissues, Microstructure, Ozone, Vapor diffusion, Climatic factors, Photosynthesis, Simulation, Environmental tests, Carbon dioxide, Trees (plants), Finland

52-4237

Combined effects of elevated winter temperatures and CO_2 on Norway spruce seedlings.

Skre, O., Nes, K., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.135-143, 33 refs.

Forest ecosystems, Plant ecology, Subarctic landscapes, Atmospheric composition, Global warming, Temperature effects, Carbon dioxide, Growth, Photosynthesis, Simulation, Trees (plants), Norway

52-4238

Testing of frost hardiness models for *Pinu sylvestris* in natural conditions and in elevated temperature.

Leinonen, I., Repo, T., Hänninen, H., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.159-168, 24 refs.

Plant ecology, Subarctic landscapes, Trees (plants), Frost resistance, Cold tolerance, Global warming, Temperature effects, Models, Forecasting, Simulation, Finland

52-4239

Change in Siberian phytomass predicted for global warming.

Monserud, R.A., Tchebakova, N.M., Kolchugina, T.P., Denissenko, O.V., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.185-200, 67 refs.

Climatic changes, Global warming, Plant ecology, Forest tundra, Forest ecosystems, Biomass, Geochemical cycles, Carbon dioxide, Forecasting, Vegetation patterns, Classifications, Models, Temperature effects, Russia—Siberia

52-4240

Forest zones of Siberia as determined by climatic zones and their possible transformation trends under global change.

Nazimova, D.I., Polikarpov, N.P., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.201-208, 30 refs.

Plant ecology, Forest ecosystems, Taiga, Vegetation patterns, Classifications, Growth, Distribution, Climatic changes, Global warming, Indexes (ratios), Temperature effects, Russia—Siberia

52-4241

Postfire recovery of forest litter in Scots pine forests in two different regions of boreal zone.

Gorshkov, V.V., Bakkal, I.J., Stavrova, N.I., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.209-219, 37 refs.

Plant ecology, Taiga, Forest ecosystems, Forest fires, Damage, Forest soils, Organic soils, Lichens, Litter, Revegetation, Global warming, Sampling, Statistical analysis, Russia—Kola Peninsula, Russia—Siberia

52-4242

Overwintering and productivity of Scots pine in a changing climate.

Hänninen, H., Leinonen, I., Repo, T., Kellomäki, S., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.229-237, 32 refs.

Forest ecosystems, Climatic changes, Global warming, Subarctic landscapes, Phenology, Biomass, Frost resistance, Cold tolerance, Damage, Seasonal variations, Models, Simulation, Trees (plants), Finland

52-4243

Regional predictions concerning the effects of climate change on forests in southern Finland.

Talkkari, A., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.247-257, 17 refs.

Forest ecosystems, Forestry, Vegetation patterns, Biomass, Growth, Climatic changes, Global warming, Subarctic landscapes, Classifications, Forecasting, Temperature effects, Simulation, Finland

52-4244

Species richness and structure variations of Scots pine forest communities during the period from 5 to 210 years after fire.

Gorshkov, V.V., Bakkal, I.J., *Silva fennica,* 1996, 30(2-3), International Boreal Forest Research Association Conference, Joensuu, Finland, July 30-Aug. 5, 1995. Selected papers. Climate change, biodiversity and boreal forest ecosystems, p.329-340, 46 refs.

Forest ecosystems, Arctic landscapes, Forest fires, Damage, Revegetation, Vegetation patterns, Mosses, Lichens, Sampling, Age determination, Statistical analysis, Russia—Kola Peninsula

52-4245

Decadal variability in coupled sea-ice—thermohaline circulation systems.

Yang, J.Y., Neelin, J.D., *Journal of climate,* Dec. 1997, 10(12), p.3059-3076, 35 refs.

Climatology, Oceanography, Climatic factors, Ocean currents, Water temperature, Ice water interface, Sea ice distribution, Ice cover effect, Heat flux, Oscillations, Salinity, Mathematical models, Thermodynamics

52-4246

Representation of antarctic katabatic winds in a high-resolution GCM and a note on their climate sensitivity.

Van den Broeke, M.R., Van de Wal, R.S.W., Wild, M., *Journal of climate,* Dec. 1997, 10(12), p.3111-3130, 56 refs.

Climatology, Atmospheric circulation, Wind direction, Wind direction, Turbulent boundary layer, Ice air interface, Topographic effects, Mathematical models, Simulation

A high-resolution GCM is found to simulate many characteristic features of the antarctic climate. The position and depth of the circumpolar storm belt, the semiannual cycle of the mid-latitude westerlies, and the temperature and wind field over the higher parts of the ice sheet are well simulated. In a climate run, the model was forced to a new equilibrium state under enhanced greenhouse conditions, which enables a preliminary look at the climate sensitivity of antarctic katabatic winds. The model predicts that the annual mean wind speed remains within 10% of its present value in a doubled CO_2 climate, but with an increased amplitude of the annual cycle. (Auth. mod.)

52-4247

Experimenting with ice-age cycles in a spreadsheet.

Berger, W.H., *Journal of geoscience education,* Nov. 1997, 45(5), p.428-439, 28 refs.

Education, Ice age theory, Paleoclimatology, Insolation, Ice sheets, Glacier oscillation, Computerized simulation, Quaternary deposits, Marine deposits, Isotope analysis

52-4248

Improved estimates of the areal extent of snow cover from AVHRR data.

Simpson, J.J., Stitt, J.R., Sienko, M., *Journal of hydrology,* Jan. 30, 1998, 204(1-4), p.1-23, 44 refs.

Geophysical surveys, Snow surveys, Cloud cover, Snow cover distribution, Detection, Sensor mapping, LANDSAT, Spaceborne photography, Radiometry, Statistical analysis, Classifications, Image processing, Resolution

52-4249

Angular momentum of Arctic Ocean tides.

Ray, R.D., Chao, B.F., Kowalik, Z., Proshutinskiĭ, A.IU., *Journal of geodesy,* May 1997, 71(6), p.344-350, 30 refs.

Oceanography, Tidal currents, Ocean currents, Sea level, Diurnal variations, Hydrodynamics, Mathematical models, Statistical analysis, Geodesy, Arctic Ocean

52-4250

Aircraft icing problems—after 50 years.

Perkins, P.J., Rieke, W.J., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1993, 9p., AIAA-93-0392, 9 refs. Presented at the AIAA 31st Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1993.

Aircraft icing, Ice accretion, Accidents, Safety

52-4251

EURICE: an European effort for the improvement of in-flight aircraft icing safety.

Amendola, A., Mingione, G., Cailhol, D., Hauf, T., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 11p., AIAA-98-0092, 9 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.

Aircraft icing, Ice forecasting, Ice detection, Weather forecasting, Safety, Data processing

52-4252

Investigation into the effectiveness of certification and operational icing procedures for turboprops.

Simpson, M.P., Render, P.M., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 8p., AIAA-98-0093, 6 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.

Aircraft icing, Ice forecasting, Ice detection, Weather forecasting, Safety, Data processing

52-4253

Workable, aircraft-specific icing severity scheme.

Jeck, R.K., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 4p. + figs., AIAA-98-0094, 9 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.

Aircraft icing, Airplanes, Ice accretion, Icing rate, Ice forecasting

52-4254

Interdisciplinary approach to inflight aircraft icing safety.

Bragg, M.B., et al, Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 15p., AIAA-98-0095, 41 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Weather forecasting, Accidents, Safety, Computerized simulation

52-4255

Investigation of the physical processes underlying the ice accretion phenomena.

Tezok, F., Brahimi, M.T., Paraschivoiu, I., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 8p., AIAA-98-0484, 12 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.

Aircraft icing, Ice accretion, Glaze, Ice loads, Ice forecasting, Supercooled clouds, Cloud droplets, Wind tunnels, Environmental tests, Computerized simulation

52-4256

Droplet size distribution and ice shapes.

Shah, A.D., Patnoe, M.W., Berg, E.L., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 20p., AIAA-98-0487, 18 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Supercooled clouds, Cloud droplets, Particle size distribution, Statistical analysis, Computerized simulation

52-4257

NASA/FAA/NCAR Supercooled Large Droplet Icing Flight research: summary of winter 96-97 flight operations.

Miller, D.R., Ratvasky, T.P., Bernstein, B.C., McDonough, F., Strapp, J.W., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 20p., AIAA-98-0577, 6 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998. Also published as U.S. National Aeronautics and Space Administration technical memorandum, NASA/TM-1998-206620.

Aircraft icing, Ice accretion, Ice forecasting, Weather forecasting, Supercooled clouds, Cloud droplets, Cold weather tests, Great Lakes

52-4258

Investigation into the effectiveness of certification and operational icing procedures for helicopters.

Simpson, M.P., Render, P.M., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1998, 9p., AIAA-98-0750, 5 refs. Presented at the AIAA 36th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 12-15, 1998.

Helicopters, Aircraft icing, Ice accretion, Ice forecasting, Weather forecasting, Safety

52-4259

Resistance of concrete to freezing and thawing.

Janssen, D.J., Snyder, M.B., *U.S. Strategic Highway Research Program. Report,* 1994, SHRP-C-391, 201p., PB94-198116, Refs. passim.

Concrete pavements, Concrete admixtures, Concrete aggregates, Concrete freezing, Concrete strength, Concrete durability, Frost action, Frost resistance, Frost protection, Freeze thaw tests

52-4260

Survey: Finland's turn to speak on northern and arctic cooperation and the northern dimension in the years 1987-1997. [Inventaario: Suomalaisia puheenvuoroja pohjoisesta ja arktisesta yhteistyöstä sekä pohjoisesta ulottuvuudesta vuosilta 1987-1997]

Heininen, L., *Arktisen keskuksen tiedotteita (University of Lapland. Rovaniemi, Finland. Arctic Centre. Reports),* 1998, No.25, 48p., In Finnish. Refs. p.39-48.

Regional planning, Economic development, International cooperation, History, Finland

52-4261

Detection and mapping of mine subsidence fractures in glacial drift using surface electrical methods.

Carpenter, P.J., Symposium on the Application of Geophysics to Engineering and Environmental Problems, Keystone, CO, Apr. 28-May 2, 1996. Proceedings, Wheat Ridge, CO, Environmental and Engineering Geophysical Society, 1996, p.1097-1106, 4 refs.

Coal, Mining, Mine shafts, Glacial till, Glacial deposits, Lacustrine deposits, Loess, Soil strength, Subsidence, Electromagnetic prospecting, Engineering geology, United States—Illinois

52-4262

Observations of heat transfer between atmosphere and sea ice at high latitudes.

Naito, G., Muraji, Y., Sasaki, Y., Symposium on the Air-Sea Interface: Radio and Acoustic Sensing, Turbulence and Wave Dynamics, Marseilles, France, June 24-30, 1993. Proceedings, Miami, FL, University, Rosenstiel School of Marine and Atmospheric Science, 1996, p.563-571, 4 refs.

Sea ice, Ice cover effect, Ice heat flux, Air ice water interaction, Snow air interface, Snow ice interface, Snow heat flux, Heat balance, Albedo, Japan—Hokkaido, Okhotsk Sea, Bering Sea

52-4263

Coupled ocean/atmosphere modeling study of an arctic lead.

Haack, T., Hodur, R.M., Symposium on the Air-Sea Interface: Radio and Acoustic Sensing, Turbulence and Wave Dynamics, Marseilles, France, June 24-30, 1993. Proceedings, Miami, FL, University, Rosenstiel School of Marine and Atmospheric Science, 1996, p.579-586, 13 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Sea ice, Ice openings, Ice water interface, Air water interactions, Heat flux, Computerized simulation

52-4264

ERS-1 SAR observation of swell travelling into ice.

Lehner, S., Symposium on the Air-Sea Interface: Radio and Acoustic Sensing, Turbulence and Wave Dynamics, Marseilles, France, June 24-30, 1993. Proceedings, Miami, FL, University, Rosenstiel School of Marine and Atmospheric Science, 1996, p.767-772, 8 refs.

Sea ice distribution, Ice cover thickness, Ice cover effect, Ice edge, Ice water interface, Sea states, Ocean waves, Wave propagation, Attenuation, Synthetic aperture radar, Spaceborne photography, Image processing

52-4265

Atmospheric considerations for uninhabited aerial vehicle (UAV) flight test planning.

Teets, E.H., Jr., Donohue, C.J., Underwood, K., Bauer, J.E., *U.S. Aeronautics and Space Administration. Technical memorandum,* Jan. 1998, NASA/TM-1998-206541, 12p., 7 refs. Presented as American Institute of Aeronautics and Astronautics paper AIAA-98-0748 at the AIAA 36th Aerospace Sciences Meeting & Exhibit, Reno, NV, Jan. 12-15, 1998.

Aircraft, Wind velocity, Wind direction, Turbulence, Weather forecasting, Statistical analysis, Cold weather tests, Environmental tests

52-4266

Review of the ice accretion phenomenon.

Perkins, P.J., Cleveland, OH, U.S. National Aeronautics and Space Administration, NASA Lewis Research Center, [1991], 15p. + figs., 9 refs. Presented at the FAA/NASA International Tailplane Icing Workshop, Nov. 4-5, 1991.

Aircraft icing, Ice accretion, Cloud physics, Supercooled clouds, Cloud droplets, Unfrozen water content, Ice forecasting, Weather forecasting, Statistical analysis, Safety, Standards

52-4267

Ølby-Ringsted concrete road. [Betonstrækningen Ølby-Ringsted]

Thøgersen, F., *Vejteknisk Institut (Road Institute), Roskilde, Denmark. Rapport,* 1997, No.81, 61p. + appends., In Danish with English summary. 8 refs.

Concrete pavements, Concrete durability, Skid resistance, Abrasion, Environmental tests, Road maintenance, Denmark

52-4268

Snow and ice blocking of tunnels.

Lia, L., Trondheim, Norwegian University of Science and Technology (Norges teknisk-naturvitenskapelige universitet, NTNU), 1998, 112p. + appends., Ph.D. thesis. Refs. p.107-112.

Dams, Hydraulic structures, Spillways, Tunnels, Water intakes, Naleds, Ice heat flux, Ice formation, Ice loads, Snowdrifts, Snow strength, Snow heat flux, Snow loads, Ice forecasting, Ice control, Mathematical models

52-4269

Reduced sensitivity of recent tree-growth to temperature at high northern latitudes.

Briffa, K.R., Schweingruber, F.H., Jones, P.D., Osborn, T.J., Shiiatov, S.G., Vaganov, V.A., *Nature,* Feb. 12, 1998, 391(6668), p.678-682, 30 refs.

Trees (plants), Air temperature, Temperature variations

52-4270

Ecological importance of the southern boundary of the Antarctic Circumpolar Current.

Tynan, C.T., *Nature,* Apr. 16, 1998, 392(6678), p.708-710, 19 refs.

Ocean currents, Sea water, Chemical composition, Ecology, Biomass

Shown here is the importance of the southernmost reaches of the Antarctic Circumpolar Current (ACC) to a complex and predictable food web of the southern ocean. The circumpolar distributions of blue, fin and humpback whales from spring to midsummer trace the non-uniform high-latitude penetration of shoaled, nutrient-rich upper circumpolar deep water, which is carried eastward by the ACC. The poleward extent of this water mass delineates the southern boundary of the ACC and corresponds not only to the circumpolar distributions of baleen whales, but also to distributions of krill and to regions of high, seasonally averaged, phytoplankton biomass. The association of primary production, krill, and whales with the southern boundary, suggests that it provides predictably productive foraging for many species, and is of critical importance to the function of the southern ocean ecosystem. (Auth. mod.)

52-4271

Accretion rate of cosmic spherules measured at the South Pole.

Taylor, S., Lever, J.H., Harvey, R.P., MP 5130, *Nature,* Apr. 30, 1998, 392(6679), p.899-903, 30 refs.

Cosmic dust, Spheres, Microstructure, Antarctica—Amundsen-Scott Station

Described here is the collection of thousands of well preserved and dated micrometeorites from the bottom of the South Pole water well, which supplies drinking water for Amundsen-Scott Station. Using this collection, precise estimates have been made of the flux and mass distribution for 50-700-μm cosmic spherules (melted micrometeorites). Allowing for the expected abundance of unmelted micrometeorites in the samples, the results indicate that about 90% of the incoming mass of submillimeter particles evaporates during atmospheric entry. The data indicate the loss of glass-rich and small stony spherules from deep-sea deposits, and they provide constraints for models describing the survival probability of micrometeoroids. (Auth. mod.)

52-4272
Cooperative learning exercise using glacial gravels.
Tucker, D.R., Tucker, M.R., Rieck, W.A., *Journal of geoscience education,* Jan. 1998, 46(1), p.41-44, 10 refs.
Education, Glacial geology, Glacial deposits, Glacial erosion, Lithology, Sediment transport, Classifications

52-4273
Evaporation from a central Siberian pine forest.
Kelliher, F.M., et al, *Journal of hydrology,* Mar. 1998, 205(3-4), p.279-296, 43 refs.
Plant ecology, Forest ecosystems, Subarctic landscapes, Precipitation (meteorology), Evaporation, Soil water, Turbulent exchange, Heat balance, Hydrologic cycle, Vapor diffusion, Wind factors, Russia—Siberia

52-4274
Electron crystallography of yeast RNA polymerase II preserved in vitreous ice.
Asturias, F.J., Chang, W.H., Li, Y., Kornberg, R.D., *Ultramicroscopy,* Jan. 1998, 70(3), p.133-143, 22 refs.
Ice physics, Vitreous ice, Polymers, Ice spectroscopy, Scanning electron microscopy, Imaging, Ice crystal structure, Molecular structure, Chemical composition, Two dimensional nucleation, Laboratory techniques, Statistical analysis

52-4275
Effects of the atmosphere on satellite-retrieved snowfield surface temperature.
Ren, P.B.C., *Journal of atmospheric and solar-terrestrial physics,* Jan. 1998, 60(1), p.5-15, 11 refs.
Remote sensing, LANDSAT, Radiometry, Glacier surveys, Snow surface temperature, Surface temperature, Brightness, Humidity, Temperature measurement, Profiles, Accuracy, Simulation

52-4276
Carbon isotopes of irradiated methane ices: implications for cometary $^{12}C/^{13}C$ ratio.
Lécluse, C., Robert, F., Kaiser, R.I., Roessler, K., Pillinger, C.T., Javoy, M., *Astronomy and astrophysics,* Feb. 1998, 330(3), 1175-1179, 33 refs.
Extraterrestrial ice, Ice composition, Isotope analysis, Hydrocarbons, Polymers, Carbon isotopes, Radiation absorption, Gamma irradiation, Ionization, Simulation, Indexes (ratios)

52-4277
Landscape-scale CO_2, H_2O vapour and energy flux of moist-wet coastal tundra ecosystems over two growing seasons.
Vourlitis, G.L., Oechel, W.C., *Journal of ecology,* Oct. 1997, 85(5), p.575-590, 58 refs.
Ecosystems, Tundra vegetation, Phenology, Wetlands, Soil air interface, Atmospheric boundary layer, Vapor diffusion, Evapotranspiration, Radiation balance, Sampling, Statistical analysis, Seasonal variations, United States—Alaska—North Slope

52-4278
Influence of subalpine snowbanks on vegetation pattern, production, and phenology.
Canady, B.B., Fonda, R.W., *Torrey Botanical Club. Bulletin,* Nov.-Dec. 1974, 101(6), p.340-350, 20 refs.
DLC QK1.T6 Vol.191
Plant ecology, Meadow soils, Soil temperature, Ecosystems, Vegetation patterns, Snow cover effect, Snowmelt, Phenology, Biomass, Hydrologic cycle, Statistical analysis, United States—Washington—Olympia National Park

52-4279
Development of acute frost drought in *Rhododendron ferrugineum* at the alpine timberline.
Larcher, W., Siegwolf, R., *Oecologia,* Sep. 1985, 67(2), p.298-300, 16 refs.
Plant physiology, Forest lines, Alpine landscapes, Plant tissues, Desiccation, Vapor pressure, Water balance, Photosynthesis, Cold stress, Snow cover effect, Simulation

52-4280
Snowy torrents—avalanche accidents in the United States, 1980-1986.
Logan, N., Atkins, D., *Colorado Geological Survey. Special publication,* 1996, No.39, 265p.
DLC QC929.A8 L64 1996
Avalanches, Accidents, Safety, Rescue operations, Statistical analysis, Seasonal variations

52-4281
Local orbital forcing of antarctic climate change during the last interglacial.
Kim, S.J., Crowley, T.J., Stössel, A., *Science,* May 1, 1998, 280(5364), p.728-730, 29 refs.
Glacier ice, Sea ice distribution, Paleoclimatology, Ice water interface, Ice models, Climatic changes
During the last interglacial, antarctic climate changed before that of the Northern Hemisphere. Large local changes in precession forcing could have produced this pattern if there were a rectified response in sea ice cover. Results from a coupled sea ice-ocean general circulation model supported this hypothesis when it was tested for three intervals around the last interglacial. Such a mechanism may play an important role in contributing to phase offsets between Northern and Southern Hemisphere climate change for other time intervals. (Auth.)

52-4282
Changes in temperature and tracer distributions within the Arctic Ocean: results from the 1994 Arctic Ocean section.
Carmack, E.C., et al, *Deep-sea research II,* Sep. 1997, 44(8), p.1487-1502, 47 refs.
Oceanography, Hydrography, Oceanographic surveys, Water temperature, Stratification, Ocean currents, Salinity, Hydrocarbons, Water pollution, Environmental tests, Sampling, Arctic Ocean

52-4283
Waters of the Makarov and Canada basins.
Swift, J.H., et al, *Deep-sea research II,* Sep. 1997, 44(8), p.1503-1529, 42 refs.
Oceanography, Hydrography, Oceanographic surveys, Ocean currents, Water transport, Water temperature, Temperature variations, Ventilation, Sampling, Profiles, Arctic Ocean

52-4284
Late Cenozoic Sr isotope evolution of the Arctic Ocean: constraints on water mass exchange with the lower latitude oceans.
Winter, B.L., Clark, D.L., Johnson, C.M., *Deep-sea research II,* Sep. 1997, 44(8), p.1531-1542, 43 refs.
Pleistocene, Oceanography, Ocean currents, Drill core analysis, Isotope analysis, Indexes (ratios), Plankton, Water transport, Stratigraphy, Radioactive age determination, Geochronology, Statistical analysis, Arctic Ocean

52-4285
Barium as a tracer of arctic halocline and river waters.
Guay, C.K., Falkner, K.K., *Deep-sea research II,* Sep. 1997, 44(8), p.1543-1569, 64 refs.
Oceanography, Oceanographic surveys, Hydrography, Ocean currents, Sedimentation, Estuaries, Runoff, Salinity, Profiles, Sampling, Arctic Ocean

52-4286
Nutrients, organic carbon and organic nitrogen in the upper water column of the Arctic Ocean: implications for the sources of dissolved organic carbon.
Wheeler, P.A., Watkins, J.M., Hansing, R.L., *Deep-sea research II,* Sep. 1997, 44(8), p.1571-1592, 39 refs.
Oceanography, Oceanographic surveys, Ocean currents, Sedimentation, Water chemistry, Organic nuclei, Distribution, Origin, Geochemical cycles, Indexes (ratios), Sampling, Statistical analysis, Arctic Ocean

52-4287
$^{234}Th/^{238}U$ disequilibrium in the central Arctic Ocean: implications for particulate organic carbon export.
Moran, S.B., Ellis, K.M., Smith, J.N., *Deep-sea research II,* Sep. 1997, 44(8), p.1593-1606, 25 refs.
Oceanography, Biomass, Sediment transport, Suspended sediments, Organic nuclei, Radioactive isotopes, Isotope analysis, Indexes (ratios), Scavenging, Subglacial observations, Ice cover effect, Sampling, Profiles, Arctic Ocean

52-4288
Microalgae on the Arctic Ocean Section, 1994: species abundance and biomass.
Booth, B.C., Horner, R.A., *Deep-sea research II,* Sep. 1997, 44(8), p.1607-1622, 40 refs.
Oceanography, Marine biology, Biomass, Ecosystems, Algae, Chlorophylls, Ice bottom surface, Ice water interface, Statistical analysis, Classifications, Drill core analysis, Arctic Ocean

52-4289
New measurements of phytoplankton and ice algal production in the Arctic Ocean.
Gosselin, M., Levasseur, M., Wheeler, P.A., Horner, R.A., Booth, B.C., *Deep-sea research II,* Sep. 1997, 44(8), p.1623-1644, 60 refs.
Oceanography, Marine biology, Biomass, Plankton, Algae, Distribution, Sedimentation, Solubility, Organic nuclei, Geochemical cycles, Sampling, Statistical analysis, Arctic Ocean

52-4290
High bacterial production, uptake and concentrations of dissolved organic matter in the central Arctic Ocean.
Rich, J., Gosselin, M., Sherr, E., Sherr, B., Kirchman, D.L., *Deep-sea research II,* Sep. 1997, 44(8), p.1645-1663, 46 refs.
Marine biology, Microbiology, Biomass, Water chemistry, Suspended sediments, Organic nuclei, Bacteria, Plankton, Sampling, Statistical analysis, Indexes (ratios), Arctic Ocean

52-4291
Heterotrophic protists in the central Arctic Ocean.
Sherr, E.B., Sherr, B.F., Fessenden, L., *Deep-sea research II,* Sep. 1997, 44(8), p.1665-1682, 60 refs.
Marine biology, Microbiology, Bacteria, Algae, Plankton, Biomass, Ecosystems, Classifications, Sampling, Distribution, Statistical analysis, Arctic Ocean

52-4292
Infaunal density, biomass and bioturbation in the sediments of the Arctic Ocean.
Clough, L.M., Ambrose, W.G., Jr., Cochran, J.K., Barnes, C., Renaud, P.E., Aller, R.C., *Deep-sea research II,* Sep. 1997, 44(8), p.1683-1704, 55 refs.
Oceanography, Marine biology, Ocean bottom, Bottom sediment, Suspended sediments, Organic nuclei, Turbulent diffusion, Biomass, Nutrient cycle, Sampling, Profiles, Classifications, Arctic Ocean

52-4293
Organic carbon burial rates across the Arctic Ocean from the 1994 Arctic Ocean Section expedition.
Cranston, R.E., *Deep-sea research II,* Sep. 1997, 44(8), p.1705-1723, 59 refs.
Oceanography, Sedimentation, Organic nuclei, Bottom sediment, Geochemistry, Geochemical cycles, Drill core analysis, Statistical analysis, Arctic Ocean

52-4294
Natural radionuclides and plutonium in the sediments from the western Arctic Ocean: sedimentation rates and pathways of radionuclides.
Huh, C.A., Pisias, N.G., Kelley, J.M., Maiti, T.C., Grantz, A., *Deep-sea research II,* Sep. 1997, 44(8), p.1725-1743, 41 refs.
Oceanography, Bottom sediment, Sedimentation, Sediment transport, Radioactivity, Radioactive isotopes, Isotope analysis, Fallout, Drill core analysis, Statistical analysis, Environmental tests, Arctic Ocean

52-4295

Radiocarbon chronology of depositional regimes in the western Arctic Ocean.

Darby, D.A., Bischof, J.F., Jones, G.A., *Deep-sea research II,* Sep. 1997, 44(8), p.1745-1757, 36 refs.

Oceanography, Pleistocene, Quaternary deposits, Paleoecology, Biomass, Sedimentation, Bottom sediment, Carbon isotopes, Drill core analysis, Radioactive age determination, Geochronology, Arctic Ocean

52-4296

In situ observations of floc settling velocities in Glacier Bay, Alaska.

Hill, P.S., Syvitski, J.P., Cowan, E.A., Powell, R.D., *Marine geology,* Feb. 1998, 145(1-2), p.85-94, 28 refs.

Marine geology, Deltas, Sedimentation, Suspended sediments, Particles, Aggregates, Density (mass/volume), Velocity measurement, Glacier melting, Meltwater, Sampling, Statistical analysis, United States—Alaska—Glacier Bay

52-4297

Dynamics of Atlantic water advection to the Norwegian-Greenland Sea—a time-slice record of carbonate distribution in the last 300 ky.

Henrich, R., *Marine geology,* Feb. 1998, 145(1-2), p.95-131, Refs. p.128-131.

Oceanography, Pleistocene, Ocean currents, Advection, Bottom sediment, Hydrocarbons, Paleoecology, Drill core analysis, Stratigraphy, Geochronology, Radioactive age determination, Statistical analysis, Atlantic Ocean, Greenland Sea, Norwegian Sea

52-4298

Holocene glacimarine sedimentation and macrofossil palaeoecology in the Canadian High Arctic.

Aitken, A.E., Bell, T.J., *Marine geology,* Mar. 1998, 145(3-4), p.151-171, 43 refs.

Marine geology, Glacial geology, Marine deposits, Glacial deposits, Deltas, Sedimentation, Meltwater, Paleoecology, Stratigraphy, Radioactive age determination, Geochronology, Canada—Northwest Territories—Axel Heiberg Island, Canada—Northwest Territories—Ellesmere Island

52-4299

Diatom flux and species composition in the Greenland Sea and the Norwegian Sea in 1991-1992.

Kohly, A., *Marine geology,* Mar. 1998, 145(3-4), p.293-312, 71 refs.

Marine biology, Microbiology, Ecology, Subpolar regions, Biomass, Plankton, Sedimentation, Suspended sediments, Moorings, Sampling, Classifications, Seasonal variations, Norwegian Sea, Greenland Sea

52-4300

Respiration and morphology of mitochondria in the crowns of winter wheat plants exposed to low temperatures and cartolin.

Abdrakhimova, I.R., Khokhlova, L.P., Abdrakhimov, F.A., *Russian journal of plant physiology,* Mar.-Apr. 1998, 45(2), p.213-220, Translated from Fiziologiia rastenii. 23 refs.

Plant physiology, Plant tissues, Grasses, Cold tolerance, Cold stress, Low temperature tests, Chemical analysis, Microstructure, Structural analysis

52-4301

Weathering of soils developed in eolian material overlying glacial deposits in eastern Nepal.

Guggenberger, G., Bäumler, R., Zech, W., *Soil science,* Apr. 1998, 163(4), p.325-337, 27 refs.

Alpine landscapes, Mountain soils, Quaternary deposits, Eolian soils, Soil formation, Geomorphology, Stratigraphy, Weathering, Sampling, Indexes (ratios), Radioactive age determination, Nepal

52-4303

Moisture performance of plywood wall structures. [Havuvanerirakenteiden kosteusteknisen toiminnan perusteet]

Ojanen, T., Kokko, E., Salonvaara, M., Viitanen, H., *Valtion teknillinen tutkimuskeskus. VTT tiedotteita (Technical Research Centre of Finland. VTT research notes),* Nov. 1997, No.1870, 90p. + appends., In Finnish with English summary. 12 refs.

Buildings, Walls, Wood, Thermal insulation, Vapor barriers, Ventilation, Weatherproofing, Cold weather construction

52-4304

Freezing precipitation.

Weber, E.M., *U.S. Air Force Weather Agency, Offutt AFB, NE. Technical note,* Mar. 31, 1998, AFWA/TN-98/001, Var. p.

Ice storms, Snowstorms, Precipitation (meteorology), Atmospheric pressure, Atmospheric circulation, Air temperature, Advection, Synoptic meteorology, Weather forecasting, United States

52-4305

Blowing snow and shrub barriers on the shortgrass prairie.

Peterson, T.C., Fort Collins, Colorado State University, 1982, 71p., M.S. thesis. Refs. p.46-51.

Blowing snow, Snowdrifts, Snow erosion, Wind erosion, Snow evaporation, Snow retention, Snow hedges, Protective vegetation, United States—Wyoming

52-4306

Role of snow in the thickening and mass budget of first-year floes in the eastern Pacific sector of the antarctic pack ice.

Jeffries, M.O., Hurst-Cushing, B., Krouse, H.R., Maksym, T., *Alaska. University. Geophysical Institute. Report,* Apr. 1998, UAG R-327, 34p., 52 refs.

Ice surveys, Ice floes, Sea ice distribution, Ice cover thickness, Ice volume, Ice formation, Ice growth, Snow depth, Snow ice interface, Snow ice, Flooding, Mass balance, Antarctica—Ross Sea, Antarctica—Amundsen Sea, Antarctica—Bellingshausen Sea

During winter cruises in 1993-95 aboard the R.V. *Nathaniel B. Palmer* the authors investigated snow depth and ice thickness variability, the occurrence of and factors contributing to seawater flooding at the snow/ice interface, and the contribution of snow to the thickening and mass budget of first-year ice floes in the Ross, Amundsen and Bellingshausen seas. Most of the snow cover was between 0.05, and 0.45 m deep. Most of the ice cover, the unridged portions of floes, was between 0.3 and 1.1 m thick. Snow ice contributed to 15% and 37% of the total ice volume in the inner and outer Ross Sea ice cover, respectively, in early winter, and 21-37% of the total ice volume in late winter throughout the study area. The amount of snow ice was typically exceeded by the amount of frazil ice and congelation ice, but the latter quantities owed their origin primarily to dynamic thickening. Snow ice and congelation ice were more important in the thermodynamic thickening of the ice cover than frazil ice formation, and on some occasions snow ice was more important than congelation ice. (Auth. mod.)

52-4307

Influence of microstructure on mechanical properties of snow.

Agrawal, K.C., Mittal, R.K., *Defence science journal,* Apr. 1995, 45(2), p.93-105, 12 refs. For another version see 49-894.

DLC U395.I5D4 Vol 45 1996

Snow cover structure, Microstructure, Snow strength, Snow deformation, Snow creep, Snow cover stability, Strain tests

52-4308

Measurement of microstructure of snow from surface sections.

Edens, M.Q., Brown, R.L., *Defence science journal,* Apr. 1995, 45(2), p.107-116, 11 refs. For another version see 49-893.

DLC U395.I5D4 Vol 45 1996

Snow cover structure, Microstructure, Snow surface, Snow strength, Snow deformation, Snow cover stability, Mathematical models

52-4309

Use of expert knowledge in avalanche forecasting.

McClung, D.M., *Defence science journal,* Apr. 1995, 45(2), p.117-123, 3 refs.

Avalanche forecasting, Analysis (mathematics), Computer programs

52-4310

Snow slab release, its mechanism and conclusion for the arrangements of supporting structures.

Salm, B., *Defence science journal,* Apr. 1995, 45(2), p.125-129, 10 refs.

DLC U395.I5D4 Vol 45 1996

Snow cover stability, Snow slides, Snow stabilization, Avalanche formation, Avalanche triggering, Avalanche modeling, Avalanche engineering, Mathematical models

52-4311

Avalanche hazard mapping with satellite data and a digital elevation model.

Gruber, U., Haefner, H., *Defence science journal,* Apr. 1995, 45(2), p.131-140, 7 refs. For other versions see 49-942 and 50-2345.

DLC U395.I5D4 Vol 45 1996

Snow surveys, Snow cover stability, Topographic surveys, Slope stability, Avalanche forecasting, Mapping, Terrain identification, Spaceborne photography, Image processing, Computerized simulation

52-4312

Field season report 1997.

Gundestrup, N., ed, Copenhagen, University, 1997, 116p.

Stations, Logistics, Cold weather operation, Ice coring drills, Coring, Drilling, Ice cores, Greenland

52-4313

Yukon Delta: a synthesis of information.

Thorsteinson, L.K., Becker, P.R., Hale, D.A., *U.S. Minerals Management Service. Alaska Outer Continental Shelf Region. OCS study,* 1989, MMS 89-0081, Outer Continental Shelf Environmental Assessment Program (OCSEAP), 89p., PB90-142746, Refs. p.83-89.

Deltas, Estuaries, Ecosystems, Ecology, Nutrient cycle, Suspended sediments, Alluvium, Environmental protection, United States—Alaska—Yukon Delta

52-4314

Community improvement feasibility report, Kivalina, Alaska.

U.S. Army Corps of Engineers. Alaska District, Smith, O.P., Hardy, D.L., Martel, C.J., Affleck, R.T., Tuthill, A.M., Chacho, E.F., Jr., MP 5131, Anchorage, AK, Apr. 1988, 55p. + appends., 22 refs.

Regional planning, Urban planning, Site surveys, Utilities, Sanitary engineering, Water supply, Sewage disposal, Waste disposal, Health, Human factors engineering, Cost analysis, United States—Alaska—Kivalina

52-4315

Proceedings.

Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997, Tsang, C.F., Mironenko, V.A., Pozdniakov, S., Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, 346p., Refs. passim. For selected papers see 52-4316 through 52-4330.

Radioactive wastes, Waste disposal, Soil pollution, Water pollution, Ground water, Environmental protection

52-4316

Environmental problems at the Mayak site.

Drozhko, E.G., Glagolenko, IU.V., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.4-14, With most captions in Russian.

Radioactive wastes, Waste disposal, Reservoirs, Lakes, Ground water, Water pollution, Soil pollution, Land reclamation, Russia—Chelyabinsk

52-4317
Mayak site characterization: interpretation of field tests for evaluation of hydraulic properties of fractured rocks.
Drozhko, E.G., Ivanov, I.A., Aleksakhin, A., Samsonova, L.M., Vasil'kova, N.I., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.15-33.
Radioactive wastes, Waste disposal, Reservoirs, Lakes, Wells, Ground water, Water pollution, Soil pollution, Russia—Chelyabinsk

52-4318
Geotechnical monitoring of underground water deep injection wells and basins of liquid radioactive waste sites of Siberian Chemical Combine.
Zubkov, A.A., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.34-45, With most captions in Russian.
Radioactive wastes, Waste disposal, Water pollution, Soil pollution, Ground water, Wells, Russia—Tomsk

52-4319
Study of radionuclides transport in deep-well injection of liquid radioactive wastes in Russia.
Rybal'chenko, A.I., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.46-58, 2 refs.
Radioactive wastes, Waste disposal, Wells, Ground water, Soil pollution, Water pollution, Environmental protection, Russia—Krasnoyarsk

52-4320
Preliminary assessment of radionuclide migration from HLW deep-borehole repository: PA "Mayak" site, south Urals, Russia.
Mal'kovskiĭ, V.I., Pek, A.A., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.59-69.
Radioactive wastes, Waste disposal, Boreholes, Underground storage, Soil pollution, Water pollution, Russia—Chelyabinsk

52-4321
Migration of liquid plume in sloping aquifer.
Mal'kovskiĭ, V.I., Pek, A.A., Tsang, C.F., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.70-89.
Radioactive wastes, Waste disposal, Underground storage, Ground water, Soil pollution, Water pollution, Mathematical models, Russia

52-4322
Salt-water convection in porous media on different scales.
Kuvaev, A.A., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.108-116.
Waste disposal, Salt water, Soil pollution, Water pollution, Saline soils, Permeability, Seepage, Soil water migration, Ground water, Russia

52-4323
Modeling of ground water contamination caused by organic pollutants.
Pashkovskiĭ, I.S., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.117-123, 3 refs.
Oil spills, Waste disposal, Soil pollution, Water pollution, Frost penetration, Frozen ground chemistry, Seepage, Soil water migration, Ground water, Mathematical models

52-4324
Non-equilibrium flows of fluids in natural rocks.
Barenblatt, G.I., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.124-161, Consists entirely of mathematical formulas.
Oil spills, Soil pollution, Ground water, Water pollution, Rock properties, Fluid flow, Seepage, Soil water migration, Mathematical models

52-4325
Isolation of radioactive wastes in permafrost rock.
Grant, S.A., Kazakov, A.N., Lobanov, N.F., Mironenko, M.V., Shapkin, A.I., MP 5132, Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.162-193, Extended abstract only.
Radioactive wastes, Waste disposal, Underground storage, Permafrost preservation, Frozen rock strength, Frozen ground strength, Environmental protection, International cooperation, Russia—Novaya Zemlya

52-4326
Potential remediation measures at Mayak site.
Parker, F.L., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.194-205, Consists of figures and outline only.
Radioactive wastes, Waste disposal, Soil pollution, Water pollution, Land reclamation, Environmental protection, Russia—Chelyabinsk

52-4327
Comments on presentation of F.L. Parker: "Potential remediation measures at the Mayak site".
Drozhko, E.G., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.206-209.
Radioactive wastes, Waste disposal, Soil pollution, Water pollution, Land reclamation, Environmental protection, Russia—Chelyabinsk

52-4328
Class I deep well injection: nature's subsurface treatment of injected waste.
Clark, J.E., Jr., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.210-216, Extended abstract only. 29 refs.
Waste disposal, Wells, Underground storage, Environmental protection

52-4329
Arsenic in ground water of Minnesota: hydrogeochemical modeling and regional trends.
Kanivetsky, R., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.217-230.
Soil pollution, Water pollution, Ground water, Hydrogeochemistry, Soil composition, Soil chemistry, Water chemistry, United States—Minnesota

52-4330
Modeling fate and transport of petroleum constituents in vadose and saturated zones using SESOIL and AT123D.
Prilepin, V.M., Joint Russian-American Hydrogeology Seminar, Berkeley, CA, July 8-9, 1997. Proceedings. Edited by C.F. Tsang, V.A. Mironenko, and S. Pozdniakov, Berkeley, University of California, Lawrence Berkeley National Laboratory, Russian-American Center for Contaminant Transport Studies, 1997, p.231-246, Consists of figures and outline only.
Oil spills, Soil pollution, Water pollution, Soil chemistry, Soil water migration, Leaching, Ground water, Computerized simulation

52-4331
Fundamental research of Earth cryosphere in arctic and sub-arctic (results and prospects); abstracts. [Fundamental'nye issledovaniia kriosfery zemli v arktike i subarktike (itogi i perspektivy); tezisy dokladov; Pushchino, 23-26 aprelia 1996]
International Conference on "Fundamental Research of Earth Cryosphere in Arctic and Sub-arctic (results and prospects)", Pushchino, Apr. 23-26, 1996, Pushchino, Consolidated Scientific Council on Earth Cryology, Russian Academy of Science, 1996, 234p., 102 abstracts in Russian and English.
Geocryology, Permafrost, Paleoclimatology, Maps, Data processing, Hydrates, Cryogenic soils, Periglacial processes, Arctic Ocean, Russia—Siberia

52-4332
Critical review of design and use of field tent shelters in polar regions.
Yan, X.Y.W., England, M.E., Kuivinen, K.C., Potter, J.J., Krug, N.S., *Polar record,* Apr. 1998, 34(189), p.113-122, Refs. p.122.
Portable shelters, Design, Design criteria, Safety, Cold weather performance
Polar research teams often spend extended periods of time away from base stations, living and working in remote field camps of portable tents. This article reports results of a survey study conducted in 1996 of polar researchers from the United States. The study was about the design and use of portable field tents being deployed in polar areas with regard to safety, health, and well-being from the user's perspective. Preliminary analysis indicates that there existed a number of areas in design and use of the shelters that contributed to concerns of safety, health, and well-being among a considerable number of tent users. The article concludes with suggestions for designing and manufacturing portable field tents. (Auth.)

52-4333
Tourism on Svalbard.
Viken, A., Jørgensen, F., *Polar record,* Apr. 1998, 34(189), p.123-128, 25 refs.
Environmental impact, Environmental protection, Norway—Svalbard

52-4334
SCAR bulletin No.129, April 1998.
Scientific Committee on Antarctic Research, *Polar record,* Apr. 1998, 34(189), p.169-190.
International cooperation, Legislation, Environmental protection, Environmental impact
The measures, decisions and resolutions adopted at the 21st Antarctic Treaty Consultative Meeting, held at Christchurch, New Zealand, May 19-30, 1997 are presented. Included are Measure 3— Antarctic Protected Areas System: revised descriptions and management plans for Sites of Special Scientific Interest— with 5 annexes covering the different protected areas; Decision 2 (Consultative status); and Resolutions 1-3, 1997.

52-4335
Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997).
Oerter, H., ed, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, 78p., Refs. passim. For selected papers see F-59295, F-59296, F-59301 through F-59306, J-59297, J-59298, J-59300 or 52-4336 through 52-4347.
Research projects, Ice mechanics, Ice cores, Ice composition, Ocean currents, Ice models, Sea ice, Air ice water interaction, Ice shelves, Antarctica—Filchner Ice Shelf, Antarctica—Ronne Ice Shelf
This report combines 12 extended summaries of 17 talks presented at the 12th International Workshop of the Filchner-Ronne Ice Shelf Programme (FRISP), held in London, U.K., on June 19-21, 1997. The papers collected in this volume present an overview of FRISP and the cooperation of the participating groups. The ice-shelf ocean interaction as well as the discussion of ice shelf stability are two of the major topics. The work on the Berkner I. ice cores continues; a new two dimensional model deals with the grounding line mobility and stability.

52-4336
Indentation testing on ice from the Filchner Ronne Ice Shelf area, Antarctica: preliminary results.
Gerland, S., Sammonds, P., Oerter, H., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.8-12, 13 refs.
Ice shelves, Ice cracks, Ice breaking, Ice strength, Hardness tests, Antarctica—Filchner Ice Shelf, Antarctica—Ronne Ice Shelf, Antarctica—Berkner Island
The dynamics of ice shelves, ice sheets, and glaciers are controlled by environmental conditions (e.g. temperature and accumulation) as well as ice properties. Results of mechanical testing, crucial for input data sets of mass balance studies and model calculations for ice sheets and glaciers, are presented. At University College London fracture toughness testing is performed by means of different experimental setups. One of these methods is indentation testing, which is described. It requires relatively small samples and therefore enables data acquisition at a high spatial resolution. Results of mechanical testing are shown from cores originating from drill locations on the Filchner Ronne Ice Shelf and from Berkner. I. (Auth.)

52-4337
Preliminary results from isotopic and chemical investigations on the 182 m ice core B25 from the southern dome of Berkner Island.
Graf, W., Minikin, A., Oerter, H., Mulvaney, R., Wagenbach, D., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.13-18, 6 refs.
Ice cores, Ice composition, Isotopes, Atmospheric composition, Air temperature, Climatic changes, Antarctica—Berkner Island
Environmental conditions in the Weddell Sea region in the last 1,000 years, using the isotopic and chemical information which is stored in the ice on Berkner I., were investigated. Berkner I., within the Filchner Ronne Ice Shelf, constitutes a small scale ice sheet grounded on the bedrock adjacent to the Weddell Sea. The 2H and ^{18}O contents and the chemistry of the ice reflect temperature variations and changes of the chemical composition of the past atmosphere. Special attention is focused on the causes of isotopic signals.

52-4338
Ocean circulation beneath ice shelves: first results from an isopycnic coordinate ocean general circulation model.
Jenkins, A., Holland, D.M., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.19-24, 7 refs.
Ice shelves, Freezing rate, Oceanographic surveys, Ocean currents, Ice water interface, Simulation, Subglacial caves, Antarctica—Filchner Ice Shelf, Antarctica—Ronne Ice Shelf
The cavities beneath the floating ice shelves of Antarctica are regions where the waters of the southern ocean come into direct contact with the ice sheet. Exchanges of mass and energy at the ice/ocean interface effect a transformation of water masses flowing into the cavity and contribute to the wastage side of Antarctica's mass balance equation. How sensitive the conditions in the sub-ice cavities are to external changes is a question of some importance, as the past and future evolution of both the ice sheet and the surrounding seas are at least partially linked to the answer. The understanding of the processes that drive sub-ice-shelf circulation owes much to the application of computer models of varying sophistication to the problem. Here the authors describe some of the preliminary results they have obtained applying an isopycnic coordinate ocean model to a similar domain.

52-4339
Oceanic environment of Ronne Entrance.
Johnson, M.R., Jenkins, A., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.25-29, 7 refs.
Ice shelves, Meltwater, Oceanographic surveys, Ocean currents, Ice water interface, Salinity, Antarctica—George VI Ice Shelf, Antarctica—Ronne Entrance, Antarctica—Bellingshausen Sea
George VI Ice Shelf lies between Alexander I. and the Antarctic Peninsula and is one of the larger ice shelves of the Bellingshausen Sea. An equilibrium mean melt rate of 2 m/yr was estimated from glaciological studies. Its southern ice front abuts Ronne Entrance, which forms one of the most southerly embayments of the Bellingshausen Sea coastline. In Feb.-Mar. 1996, on the naval ice patrol ship HMS Endurance, the authors made oceanographic measurements at 50 stations near this southern ice front. They use this data to identify the products of melting at the base of the ice shelf, infer the regional circulation, and investigate the impact of that melting on the temperature and salinity of the water masses.

52-4340
Berkner Island traverse—initial results.
Knight, B., Mulvaney, R., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.30-35, 4 refs.
Ice sheets, Ice composition, Ice cores, Air ice water interaction, Atmospheric composition, Climatic changes, Traverses, Antarctica—Berkner Island
Berkner I.'s proximity to the Weddell Sea means the record from this site can help establish the role of the sea in long term climate change over West Antarctica. The relatively high accumulation rates on the island allow the construction of high resolution records dating back from centuries to thousands of years before present. The successful 1994-95 Antarctic Field Season resulted in the acquisition of medium depth ice cores from two sites, and three shallow cores taken from a traverse between these sites. The initial results from the analysis of the traverse-cores are presented here for the first time and compared with data from the southern-most deeper core.

52-4341
Residual tidal currents along Filchner-Ronne Ice Front.
Makinson, K., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.36-41, 7 refs.
Ice shelves, Ocean currents, Tidal currents, Oceanographic surveys, Models, Ice edge, Ice water interface, Antarctica—Filchner Ice Shelf, Antarctica—Ronne Ice Shelf
Residual currents, generated by tidal oscillations over topographic features, are important for the long term transport of heat, salt and other tracers within the ocean. The Filchner-Ronne Ice Front presents a significant topographic feature causing a large reduction in the water column thickness. Tidal oscillations, over this step in the water column, will generate residual currents along the ice front and between the ice shelf cavity and open ocean. These residual currents strongly influence the local hydrography and may explain the permanent features observed in oceanographic sections that span the ice front. For this study a regularly spaced model grid size is used which is less than 3.5 km along the ice front, sufficient to prevent significant under representation of residual currents over much of its length. Currents and their residuals are a product of the model, with the residual currents being presented in this paper.

52-4342
Ice dynamics across the grounding line, a two dimensional flow model.
Mayer, C., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.42-46, 10 refs.
Ice shelves, Ice sheets, Flow measurement, Ice models, Electrical grounding, Stresses, Rheology
During the last few years some effort has been made to improve the understanding of the processes governing the ice flow within the transition zone between ice sheets and ice shelves. This grounding line area represents the sensible link across which most of the continental ice discharge towards the ocean takes place. The basic difference between the two flow regimes arises from the lack of basal shearing in the ice shelf. Therefore the flow characteristics change from shearing in horizontal planes in the ice sheet to longitudinal stretching in the ice shelf. In this paper the author presents a new two dimensional flow line model for investigations of the transition zone.

52-4343
SAR data exploitation for monitoring antarctic ice sheets and glaciers.
Müller, U., Sievers, J., Walter, H., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.48-50, 1 ref.
Ice shelves, Glaciology, Flow measurement, Synthetic aperture radar, Ice creep, Rheology, Antarctica—Ekström Ice Shelf
Change in volume of the antarctic ice sheet is a relevant control on global mean sea level, while ocean circulation patterns are influenced by cold bottom waters formed by interactions between the ice shelves and ocean and hence affecting the earth's climate. In this context the movement of the ice shelves is an important parameter for the estimation of the ice mass balance. Interferometrically processed ERS-1/2 SAR data from the Ice phases and Tandem Mission are used to derive velocity fields from the surface of the Ekström Ice Shelf. The influence of tidal movement on the detected over-all-velocities has especially been taken into account. (Auth.)

52-4344
Geophysical-glaciological studies in the grounding zone area of the Ekström Ice Shelf (EIS).
Nixdorf, U., Lambrecht, A., Steinhage, D., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.51-54.
Ice shelves, Seismic surveys, Glaciology, Electrical grounding, Velocity measurement, Bedrock, Flow measurement, Antarctica—Ekström Ice Shelf
During the austral summer 1997 a glaciological program with geophysical and geodetic measurements was carried out in the grounding zone area of the Ekström Ice Shelf. The structure and the seismic velocities of the bedrock in the grounding zone area were studied with reflection and refraction seismics. The condition of the ice bedrock interface has an important influence on the dynamics of the ice flow and thus on the expected reaction of the ice flow due to a supposed sea level rise.

52-4345
Stable isotope contents of near surface firn from Neumayer base towards Dronning Maud Land, Antarctica.
Oerter, H., Graf, W., Schlosser, E., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.56-64, 11 refs.
Ice dating, Firn, Snow accumulation, Snow temperature, Snow composition, Isotopes, Antarctica—Neumayer Station
Investigations on accumulation, isotopes, and chemical contents in near surface snow layers as well as in deeper ice cores are reported. A figure shows a compilation of accumulation stake readings at the wintering-over Neumayer Station for the years 1991-93. The stake readings illustrate the annual distribution of snow accumulation in this area. Data from shallow firn cores shows that since the late 1970s the accumulation rate has been decreasing continuously.

52-4346
Review of the British Antarctic Survey EPICA 96/97 radio echo survey season.
Walden, M.C., Corr, H.F.J., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.68-70, 1 ref.
Ice sheets, Radio echo soundings, Ice cover thickness, Airborne radar, Antarctica—Queen Maud Land
In Jan. 1997, the British Antarctic Survey employed an airborne radar system for measuring ice depth over Queen Maud Land as part of the collaborative European Project for Ice Coring in Antarctica. A total of twenty-eight hours were flown over seven flights. The flight lines are shown in a figure. The deep ice environment of Queen Maud Land allowed the radar system to be tested to its limits. It provided an ideal opportunity to determine the advantage offered by using a linear FM (chirp) waveform instead of the standard 250 ns constant carrier pulse over deep ice.

52-4347

Nordic EPICA Dronning Maud Land pre site survey 1996/97—preliminary results from shallow ice core analysis.

Winther, J.G., Van den Broeke, M.R., Karlöf, L., Filchner-Ronne Ice Shelf Programme (FRISP), Report No.11 (1997), compiled by H. Oerter, Bremerhaven, Alfred-Wegener-Institute for Polar and Marine Research, 1997, p.71-78, 3 refs.

Ice sheets, Ice cores, Firn, Snow accumulation, Snow temperature, Snow density, Ice composition, Traverses, Antarctica—Queen Maud Land

A reconnaissance phase, planned to produce data on accumulation rate, ice depth and dynamics, bedrock and surface topography, snow/ice chemistry and meteorology in Queen Maud Land is reported. This phase consists of several pre site surveys, including the Norwegian/Swedish/Dutch ground traverse during the last field season 1996-97. This report describes the activities during that traverse, as well as some preliminary scientific results.

52-4348

Recent fluctuations of Glaciar Pío XI, Patagonia: discussion of a glacial surge hypothesis.

Rivera, A., Aravena, J.C., Casassa, G., *Mountain research and development,* Nov. 1997, 17(4), p.309-322, With French and German summaries. 29 refs.

Glacier surveys, Geomorphology, Glacial hydrology, Glacier oscillation, Glacier surges, Sliding, Sedimentation, Hydrothermal processes, Climatic factors, Spaceborne photography, Theories, Chile—Glaciar Pío XI

52-4349

Geomorphic traces of Quaternary climates in the Cordillera Central, Dominican Republic.

Orvis, K.H., Clark, G.M., Horn, S.P., Kennedy, L.M., *Mountain research and development,* Nov. 1997, 17(4), p.323-331, With French and German summaries. 32 refs.

Geomorphology, Pleistocene, Paleoclimatology, Landscape development, Cryogenic structures, Cryogenic soils, Terrain identification, Solifluction, Cirques, Weathering, Snow line, Theories, Dominican Republic—Cordillera Central

52-4350

Deriving lapse rates of slope air temperature for meltwater runoff modeling in subtropical mountains: an example from the Punjab Himalaya, Pakistan.

De Scally, F.A., *Mountain research and development,* Nov. 1997, 17(4), p.353-362, With French and German summaries. 36 refs.

Snow hydrology, Mountains, Runoff forecasting, Snowmelt, Air temperature, Temperature measurement, Temperature distribution, Altitude, Statistical analysis, Correlation, Surface energy, Heat balance, Pakistan—Punjab Himalaya

52-4351

Possible thermal ice shifts and pressure in the Gulf of Ob.

Sukhorukov, K.K., *Russian meteorology and hydrology,* 1997, No.5, p.43-46, Translated from Meteorologiia i gidrologiia. 5 refs.

Sea ice, Ice conditions, Channels (waterways), Ice mechanics, Pressure ridges, Ice deformation, Stress concentration, Thermal expansion, Viscosity, Mathematical models, Cracking (fracturing), CIS—Ob', Gulf

52-4352

Influence of climate change on permafrost in the northern hemisphere.

Anisimov, O.A., Nelson, F.E., *Russian meteorology and hydrology,* 1997, No.5, p.47-53, Translated from Meteorologiia i gidrologiia. 23 refs.

Climatology, Global warming, Geocryology, Permafrost distribution, Ground thawing, Permafrost transformation, Forecasting, Models, Indexes (ratios)

52-4353

Mesoscale model of soil freezing dynamics.

Gusev, E.M., Busarova, O.E., IAsinskiĭ, S.V., *Russian meteorology and hydrology,* 1997, No.5, p.54-60, Translated from Meteorologiia i gidrologiia. 14 refs.

Geocryology, Soil freezing, Frost penetration, Frozen ground mechanics, Frozen ground thermodynamics, Ice water interface, Snow cover effect, Phase transformations, Mathematical models, Water balance

52-4354

Use of ERS-1/2 radar images for improving hydrometeorological support of navigation in the western part of the Northern Sea Route in 1993-96.

Melent'ev, V.V., et al, *Russian meteorology and hydrology,* 1997, No.5, p.61-67, Translated from Meteorologiia i gidrologiia. 5 refs.

Oceanography, Marine transportation, Sea ice distribution, Ice conditions, Ice navigation, Ice forecasting, Ice surveys, Route surveys, Spaceborne photography, Synthetic aperture radar, Image processing, Northern Sea Route

52-4355

Sedimentary response to mantle plumes: implications from Paleocene onshore successions, West and East Greenland.

Dam, G., Larsen, M., Sønderholm, M., *Geology,* Mar. 1998, 26(3), p.207-210, 31 refs.

Pleistocene, Geologic processes, Subpolar regions, Volcanoes, Magma, Upwelling, Stratigraphy, Sedimentation, Tectonics, Subsidence, Greenland

52-4356

Organochlorine pesticides and polychlorinated biphenyls (PCBs) in sediments and biota from four US arctic lakes.

Allen-Gil, S.M., et al, *Archives of environmental contamination and toxicology,* Nov. 1997, 33(4), p.378-387, 45 refs.

Limnology, Water pollution, Aerosols, Hydrocarbons, Bottom sediment, Lacustrine deposits, Biomass, Sampling, Chemical analysis, Environmental tests, Environmental impact, Origin, United States—Alaska

52-4357

Soil chemistry and plants in Fennoscandian boreal forest as exemplified by a local gradient.

Giesler, R., Högberg, M., Högberg, P., *Ecology,* Jan. 1998, 79(1), p.119-137, 60 refs.

Forest ecosystems, Plant ecology, Subarctic landscapes, Forest soils, Soil chemistry, Hydrogeochemistry, Ground water, Vegetation patterns, Nutrient cycle, Topographic effects, Sampling, Statistical analysis, Sweden

52-4358

Statistical analysis of the spatial-temporal structure of bottom communities of the Barents Sea and adjacent areas.

Kiĭko, O.A., Pogrebov, V.B., *Russian journal of marine biology,* Jan.-Feb. 1998, 24(1), p.1-6, Translated from Biologiia moria. 13 refs.

Marine biology, Subpolar regions, Ocean bottom, Ecosystems, Biomass, Classifications, Sampling, Mapping, Statistical analysis, Barents Sea, Greenland Sea, Norwegian Sea

52-4359

Holocene peat bogs in Prebaikalia as an object of paleoclimatic reconstructions.

Bezrukova, E.V., Mats, V.D., Letunova, P.P., Nakamura, T., Fuji, S., *Russian geology and geophysics,* 1996, 37(12), p.72-85, Translated from Geologiia i geofizika. 30 refs.

Pleistocene, Paleoecology, Paleoclimatology, Peat, Swamps, Lacustrine deposits, Stratigraphy, Palynology, Radioactive age determination, Vegetation patterns, Classifications, Russia—Baykal, Lake

52-4360

Interpretation of paleoclimatic reconstructions of Baikal bottom sediments.

Verkhozina, V.A., Kusner, IU.S., Lazo, F.I., Pastukhov, V.D., Popovskaia, G.I., Safarova, V.A., *Russian geology and geophysics,* 1996, 37(12), p.86-90, Translated from Geologiia i geofizika. 18 refs.

Paleoclimatology, Limnology, Quaternary deposits, Paleoecology, Lacustrine deposits, Bottom sediment, Diagenesis, Organic nuclei, Sampling, Correlation, Theories, Russia—Baykal, Lake

52-4361

Paleotemperature reconstructions for the Northern Urals according to borehole thermometry.

Khachaĭ, IU.V., Demezhko, D.IU., Ryvkin, D.G., Shchapov, V.A., *Russian geology and geophysics,* 1996, 37(12), p.100-105, Translated from Geologiia i geofizika. 19 refs.

Paleoclimatology, Climatic changes, Surface temperature, Boreholes, Soil temperature, Temperature measurement, Temperature distribution, Geothermometry, Mathematical models, Russia—Ural Mountains

52-4362

Cryosols in classification hierarchy.

Gilichinskiĭ, D., ed, Kimble, J.M., ed, Novosibirsk, Nauka, 1997, 36p., 60 refs. Papers were presented at the "Cryosol" session of the international conference "Fundamental'nye issledovaniia kriosfery zemli v arktike i subarktike; itogi i perspektivy" (Fundamental research of Earth cryosphere in the Arctic and Subarctic; results and prospects), Pushchino, Apr. 23-26, 1996. For individual papers from this session see 52-4363 through 52-4368.

Cryogenic soils, Soil classification, Geocryology, Permafrost

52-4363

Placement of cryosols in the World Reference Base for soil resources.

Sokolov, I.A., Naumov, E.M., Koniushkov, D.E., Cryosols in classification hierarchy. Edited by D. Gilichinskiĭ and J.M. Kimble, Novosibirsk, Nauka, 1997, p.4-10.

Cryogenic soils, Soil classification, Geocryology

52-4364

Gelisols: a newly proposed order in soil taxonomy.

Bokheim, J.G., Kimble, J.M., Tarnocai, C., Ping, C.L., Cryosols in classification hierarchy. Edited by D. Gilichinskiĭ and J.M. Kimble, Novosibirsk, Nauka, 1997, p.11-14.

Cryogenic soils, Soil classification, Geocryology, Cryoturbation, Permafrost

52-4365

Proposals on the cryosolic order definition in the WRB for soil resources (FAO).

Mazhitova, G.G., Zaboeva, I.V., Vturin, G.M., Cryosols in classification hierarchy. Edited by D. Gilichinskiĭ and J.M. Kimble, Novosibirsk, Nauka, 1997, p.15-16.

Cryogenic soils, Soil classification, Geocryology, Cryoturbation, Permafrost

52-4366

Pedon as a basic soil unit.

Tarnocai, C., Kimble, J.M., Bockheim, J.G., Ping, C.L., Cryosols in classification hierarchy. Edited by D. Gilichinskiĭ and J.M. Kimble, Novosibirsk, Nauka, 1997, p.17-22.

Cryogenic soils, Soil classification, Geocryology, Soil chemistry, Soil physics, Clay minerals

52-4367

Permafrost-affected soils: consideration in classification hierarchy.

Sletten, R.S., Cryosols in classification hierarchy. Edited by D. Gilichinskiĭ and J.M. Kimble, Novosibirsk, Nauka, 1997, p.23-29.

Cryogenic soils, Soil classification, Geocryology, Permafrost

52-4368
On classification of soils in permafrost regions.
Makeev, O.V., Cryosols in classification hierarchy. Edited by D. Gilichinskiĭ and J.M. Kimble, Novosibirsk, Nauka, 1997, p.30-33.
Cryogenic soils, Soil classification, Geocryology, Permafrost

52-4369
Snow survey bulletin & water supply forecast, April 1, 1997, Yukon Territory.
Canada. Indian and Northern Affairs. Water Resources Division, Whitehorse, 1997, 27p.
Snow surveys, Runoff forecasting, Snow depth, Snow water equivalent, Stream flow, Canada—Yukon Territory

52-4370
Ice control techniques for Corps projects.
Haynes, F.D., Haehnel, R., Clark, C., Zabilansky, L., MP 5133, *U.S. Army Corps of Engineers. Waterways Experiment Station, Vicksburg, MS. Repair, Evaluation, Maintenance, and Rehabilitation Research Program. Technical report,* Sep. 1997, REMR-HY-14, 18p. + figs., ADA-329 402, 9 refs.
Locks (waterways), Dams, Hydraulic structures, Ice control, Ice prevention, Bubbling, Electric heating, Radiant heating
This investigation was performed by the U.S. Army Cold Regions Research and Engineering Laboratory for Headquarters, U.S. Army Corps of Engineers. The overall objective of the study was to provide much more efficient methods for controlling and removing ice at locks and dams. Twelve serious ice problems at locks were identified, the most severe being ice accumulation in the miter gate recess. Fifteen ice problems around dams were identified, the most severe being ice accumulation upstream of a dam. The most common method of dealing with ice problems has previously been chipping the ice off, a labor-intensive, time-consuming, and hazardous practice. Other more efficient and more effective methods such as air bubbler systems and panel heaters were studied herein. The rationale has been to prevent ice from forming, or, if this is not possible, provide efficient, economical solutions. Future research should focus on optimizing panel heater size and power requirements in problem areas for ice buildup. Also, additional work should be done with bubblers and water cannons for moving ice.

52-4371
Spatial and seasonal variability of new production and export production in the Southern Ocean.
Dehairs, F., Semeneh, M., Elskens, M., Goeyens, L., Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Marine biogeochemistry and ecodynamics, Vol.1. Edited by S. Caschetto, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 83p., Refs. p.73-83.
Biomass, Plankton, Marine biology, Sea ice, Water chemistry, —South Atlantic Ocean, —Indian Ocean
This study focuses on the investigation of two intensely related fluxes in the southern ocean: the nutrient uptake regime, with main emphasis on the uptake of nitrogen sources, and the type and intensity of export production towards the deeper layers and the sediments. The nitrogen uptake by phytoplankton was also studied in relation to the biomass and structure of the community in the South Atlantic and Indian oceans. Two scenarios for the seasonal evolution of the uptake regime and the phytoplankton community structure are discussed. Export fluxes, as traced by mesopelagic stocks of particulate Ba-barite, were found to be strongly dependent on the type of production. (Auth. mod.)

52-4372
Ecological modelling of the planktonic microbial food-web.
Lancelot, C., Becquevort, S., Menon, P., Mathot, S., Dandois, J.M., Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Marine biogeochemistry and ecodynamics, Vol.1. Edited by S. Caschetto, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 78p., Refs. p.69-78.
Marine biology, Biomass, Models, Microbiology, Chemical analysis, Sea water, Nutrient cycle, Oceanographic surveys
Physical, chemical and biological conditions governing phytoplankton bloom development and food chain structure in the southern ocean were investigated, based on field observations and mathematical modelling. Particular attention was given to sea-ice dynamics and wind stress in triggering phytoplankton bloom induction, and iron and krill as vector of food chain structure and related surface carbon retention versus exportation. Within this framework, research focused on conditions determining the development of diatoms- versus nanoflagellates-dominated phytoplankton communities as well as on the dynamics of the microbial food web. Under events of favorable meteorological conditions for phytoplankton bloom initiation, the structure of the developing phytoplankton community is determined by iron availability with nanoflagellates outcompeting diatoms at iron subnanomolar concentration. It is concluded that the general high nutrient low chlorophyll conditions of the southern ocean result from the successful development of grazer-controlled nanophytoplanktonic communities in a low-iron environment. (Auth. mod.)

52-4373
Distribution and role of microprotozoa in the southern ocean. [Verteilung und Einfluß von herbivoren Protozoen auf Phytoplanktonbestände und Vertikalflüsse im Südpolarmeer]
Klaas, C., *Berichte zur Polarforschung,* 1997, No.253, 119p., With German summary. Refs. p.105-119.
Plankton, Marine biology, Biomass, Microbiology, Ice edge, Ice cover effect, Ocean currents, Antarctica—Weddell Sea
Distribution and composition of microprotistplankton (phytoplankton and protozoa between 20 and 200 µm) and mesoprotozooplankton (protozoa>200 µm) were studied during the Southern Ocean-Joint Global Ocean Flux Study cruise ANT X/6 of R/V *Polarstern,* during austral spring 1992. The growth and feeding response of an antarctic heterotrophic dinoflagellate *(Protoperidinium cf. pellucidum)* as a function of food concentration was also studied under controlled conditions. These experimental results combined with the field data on microphytoplankton and microprotozoan distributions were used to estimate microprotozoan grazing impact on primary producers, in particular the diatoms, in the field. The distribution of particles produced by micro- and mesoprotozooplankton (empty diatom frustules, faecal pellets, empty skeletons and loricas) and their contribution to carbon and silica vertical fluxes were also investigated. Materials and methods used are described, the study area is delineated, and details of the results are given.

52-4374
Regional and temporal variations of mineral assemblages in Arctic Ocean sediments as climatic indicator during glacial/interglacial changes. [Zeitliche und räumliche Verteilung von Mineralvergesellschaftungen in spätquartären Sedimenten des Arktischen Ozeans und ihre Nützlichkeit als Klimaindikatoren während der Glazial/Interglazial-Wechsel]
Vogt, C., *Berichte zur Polarforschung,* 1997, No.251, 309p., In German with English summary. Refs. p.283-305.
Polar regions, Minerals, Sediments, Climatic changes, Sea water, Subsurface investigations, Paleoclimatology, Ice cover effect, Arctic Ocean

52-4375
Subfossil chrysophyte cyst flora of some peat samples from Kerguelen Islands.
Van de Vijer, B., Beyens, L., *Archiv für Protistenkunde,* Dec. 1997, 148(4), p.491-503, 23 refs.
Paleoecology, Paleobotany, Peat, Glacier melting, —Kerguelen Islands
The fossil chrysophyte stomatocyst flora of six peat samples from Glacier Ampère, a retreating glacier on Grand Terre, in the subantarctic Kerguelen Archipelago, has been investigated by means of scanning electron microscopy. Thirty-two different stomatocysts were recorded, 27 of which appeared to be previously undescribed. This paper contains the descriptions and illustrations of the new morphotypes. This is the first systematic study of chrysophyte stomatocysts from this subantarctic archipelago following the guidelines of the International Statospore Working Group. (Auth.)

52-4376
Proceedings.
Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998, Göteborg, Sweden, University, Earth Sciences Centre, 1998, 286p., Refs. passim. For selected papers see 52-4377 through 52-4401.
Road maintenance, Road icing, Ice detection, Ice forecasting, Snowfall, Weather forecasting, Safety, Highway planning

52-4377
Danish Winter Index.
Kirk, J.S., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.1-9.
Road icing, Snowdrifts, Snowfall, Snow removal, Salting, Weather forecasting, Degree days, Road maintenance, Cost analysis, Denmark

52-4378
Development of a mobile winter road surface information collection system.
Masuda, Y., Sakakida, T., Godai, H., Takabe, H., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.10-23.
Road icing, Ice detection, Chemical ice prevention, Salting, Snowfall, Weather forecasting, Meteorological data, Data transmission, Road maintenance, Japan

52-4379
Critical review of thermal mapping techniques.
Gustavsson, T., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.25-31, 5 refs.
Road icing, Ice detection, Pavements, Surface temperature, Temperature measurement, Infrared mapping, Weather forecasting, Road maintenance, Sweden

52-4380
Experiences in applying the WELS road weather system over Austria.
Spreitzhofer, G., Steinacker, R., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.33-42, 15 refs.
Road maintenance, Highway planning, Frost forecasting, Snowfall, Weather forecasting, Meteorological data, Data processing, Data transmission, Computer applications, Austria

52-4381
Freezing forecast system.
Uchiyama, H., Yoshida, K., Shimomura, C., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.43-49.
Road icing, Ice forecasting, Frost forecasting, Snowfall, Weather forecasting, Road maintenance, Japan

52-4382
Verification studies on detailed area forecasts of road weather.
Raatz, W.E., Balzer, K., Jacobs, W., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.51-61, 2 refs.
Road icing, Ice forecasting, Weather forecasting, Road maintenance, Statistical analysis, Germany

52-4383
Verification of road weather forecasts and performance related road weather contracts.
Thornes, J.E., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.62-69, 4 refs.
Road icing, Ice forecasting, Frost forecasting, Snowfall, Weather forecasting, Road maintenance, Statistical analysis, Cost analysis, United Kingdom

52-4384
New development phases of the Finnish Road Weather Information System.
Toivonen, K., Kantonen, J., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.70-84.
Road maintenance, Highway planning, Weather forecasting, Data processing, Data transmission, Computer applications, Finland

52-4385
Integrated weather information systems: FHWA white paper findings.
Pisano, P.A., Nelson, G.G., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.92-104.
Road maintenance, Highway planning, Road icing, Ice forecasting, Weather forecasting, Accidents, Safety, Cost analysis, Data processing, Data transmission, Computer applications, United States

52-4386
Progress in road weather information acquisition on the Czech Republic territory.
Melcher, K., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.107-114.
Road maintenance, Highway planning, Weather forecasting, Safety, Data processing, Data transmission, Computer applications, Czech Republic

52-4387
Effects of luminance and color on drivers visibility during snowstorm in the daytime.
Hagiwara, T., Tokunaga, R.A., Kajiya, Y., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.115-128, 7 refs.
Snowstorms, Blowing snow, Falling snow, Snow optics, Visibility, Safety, Illuminating, Human factors engineering, Highway planning, Road maintenance

52-4388
Winter weather conditions and compact snow on carriageways in east Siberia.
Shaburov, S., Maevskiĭ, A., Mikhilov, A., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.129-138, 4 refs.
Snow roads, Snow compression, Snow compaction, Snow density, Snow strength, Rubber snow friction, Trafficability, Road maintenance, Russia—Irkutsk

52-4389
Effect of snow break trees on improving visibility.
Ishimoto, K., Fukuzawa, Y., Kajiya, Y., Kawakami, S., Takeuchi, M., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.150-163, 9 refs.
Blowing snow, Snow optics, Visibility, Snow hedges, Forest strips, Protective vegetation, Safety, Highway planning, Road maintenance, Japan—Hokkaido

52-4390
Relations between road weather, road maintenance and traffic accidents.
Norrman, J., Eriksson, M., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.164-173, 6 refs.
Road icing, Snowfall, Weather forecasting, Skid resistance, Safety, Accidents, Road maintenance, Sweden

52-4391
Climatology of road-surface temperatures for different site characteristics.
Jacobs, W., Raatz, W.E., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.174-185, 1 ref.
Air temperature, Weather forecasting, Road icing, Ice forecasting, Road maintenance, Germany

52-4392
Climate modelling for road planning using geographical information systems.
Eriksson, M., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.186-193, 8 refs.
Highway planning, Route surveys, Weather forecasting, Road maintenance, Data processing, Mapping, Sweden

52-4393
Influence of weather on the spatial differences in temperature close to the road surface.
Karlsson, M., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.194-202, 6 refs.
Road icing, Hoarfrost, Ice forecasting, Air temperature, Surface temperature, Weather forecasting, Road maintenance, Sweden

52-4394
Relation between winter road surface and weather conditions and road maintenance.
Matsuzawa, M., Kajiya, Y., Ishimoto, K., Kobayashi, T., Kaneda, Y., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.203-213, 1 ref.
Road icing, Skid resistance, Snowfall, Weather forecasting, Safety, Road maintenance, Japan—Hokkaido

52-4395
Temperature patterns during cloudy situations.
Postgård, U., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.214-222, 2 refs.
Road icing, Ice forecasting, Skid resistance, Cloud cover, Weather forecasting, Road maintenance, Sweden

52-4396
Reaction times of road-surface temperatures after cloud clearance and cold advection in the county of Devon, UK.
Wood, N.L.H., McLean, P.J., Clark, R.T., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.223-236, 7 refs.
Road icing, Ice forecasting, Cloud cover, Fronts (meteorology), Weather forecasting, Road maintenance, United Kingdom—England

52-4397
Study of service levels and sensors which scan cross-sections of snow on the road and provide information of the road surface characteristics.
Muramatsu, T., Wada, J., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.241-251.
Snowfall, Snow depth, Sensors, Weather forecasting, Road maintenance, Data transmission, Japan

52-4398
Video-detection of winter road state.
Kuehnle, A., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.252-259, 5 refs.
Road icing, Ice optics, Ice detection, Photographic techniques, Image processing, Road maintenance

52-4399
RWIS development in Sweden.
Sahlin, L., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.260-266.
Road icing, Ice optics, Ice detection, Sensors, Weather forecasting, Data processing, Data transmission, Road maintenance, Sweden

52-4400
Project "Erlkönig": the detection of fog along motorways.
Ruppert, P.W., Schlup, U., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.267-272.
Fog, Visibility, Meteorological instruments, Road maintenance, Switzerland

52-4401
Physical bases of freezing point measurement using active and passive probes.
Bornand, E., Standing International Road Weather Commission (SIRWEC) International Road Weather Conference, 9th, Luleå, Sweden, Mar. 15-17, 1998. Proceedings, Göteborg, Sweden, University, Earth Sciences Centre, 1998, p.273-286, 13 refs.
Road icing, Ice detection, Ice forecasting, Skid resistance, Sensors, Temperature measurement, Road maintenance

52-4402
Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Glaciology and Climatology, Vol.3.
Caschetto, S., ed, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 36p. + 65p. + 48p., Refs. passim. For individual papers see F-59321 through F-59323 or 52-4403 through 52-4405.
Research projects, Sea ice, Ice models, Air ice water interaction, Ice sheets, Glaciers, Ice shelves, Ice composition, Global change, Climatic factors, Paleoclimatology, Antarctica—Terra Nova Bay, Antarctica—Queen Maud Land
This volume presents the scientific results of research projects in the area of glaciology and climatology funded under the Third Phase of the Belgian Research Programme on the Antarctic (1992-1996). Achievements of research projects in the other areas of the Programme form the subject of two separate volumes (Volume I: Marine Biogeochemistry and Ecodynamics; Volume II: Part A-Hydrodynamics, Part B-Marine Geophysics). This research aimed to contribute to the development of the knowledge required for a science-based conservation and management of the antarctic environment and to assess the mechanisms through which the Antarctic and the global climate interact. Emphasis was given on a multi-disciplinary approach of the dynamics of the global functioning of antarctic main natural systems and of their evolution and interactions.

52-4403
Formation of the Terra Nova Bay polynya and climatic implications.
Gallée, H., Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Glaciology and Climatology, Vol.3. Edited by S. Caschetto, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 36p., 48 refs.
Polynyas, Models, Ice formation, Sea ice, Air ice water interaction, Wind factors, Climatic factors, Ocean currents, Atmospheric circulation, Antarctica—Terra Nova Bay
In this paper, a preliminary simulation is presented of the Terra Nova Bay polynya by a coupled atmosphere-polynya model. The atmospheric model is a hydrostatic primitive equations model that has been validated previously by a simulation of the strong katabatic winds observed in this area. The polynya observed in this region is well reproduced. It is found that heat losses from the polynya surface are stronger than previously estimated but are probably constrained by the idealized representation of frazil ice, which is assumed to be uniform in each grid box. This stresses the need for a better knowledge of frazil ice evolution in large polynyas. (Auth. mod.)

52-4404

Dynamics of the Antarctic ice sheet and environmental change.

Pattyn, F., Decleir, H., Willaert, D., Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Glaciology and Climatology, Vol.3. Edited by S. Caschetto, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 65p., Refs. p.57-62.

Ice models, Glacier flow, Ice cover thickness, Glacier oscillation, Glacier mass balance, Ice temperature, Ice dating, Glaciation, Paleoclimatology, Antarctica—Queen Maud Land, Antarctica—Enderby Land

In this study, the authors examined the stability of the ice sheet in East Queen Maud Land and Enderby Land where it is drained by a large fast-flowing continental ice stream (Shirase Glacier), and the regional behavior of the antarctic ice sheet in East Queen Maud Land as a function of environmental change over a period of the last 200,000 years. Both tasks were accomplished by numerical modeling of the ice sheet system and by satellite remote sensing. A method is presented to infer surface glacier velocities from sequential satellite imagery and successfully applied to the ice fall area of a glacier in the Sør Rondane Mountains. (Auth. mod.)

52-4405

Chemical and isotopic composition of ice from Antarctic ice shelves: implications for global change.

Souchez, R., Tison, J.L., Lorrain, R., Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Glaciology and Climatology, Vol.3. Edited by S. Caschetto, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 48p., Refs. p.43-48.

Ice composition, Isotopes, Ice formation, Sea ice, Air ice water interaction, Air temperature, Ice shelves, Water temperature, Sea level, Oceanographic surveys, Global change, Antarctica—Terra Nova Bay

In the context of global warming, the question of the stability of antarctic ice shelves is critical for predicting a sea level rise. Small ice shelves are likely to react more rapidly than large ones to a change in atmospheric and oceanic temperatures. Therefore, understanding their behavior is a priority in antarctic glaciological research. The behavior of ice shelves and floating ice tongues is dependent on their boundary conditions. At the ice-ocean interface, these boundary conditions can be appraised by studying the properties of marine ice forming accretions at the base. In this study, attention is drawn to two case studies, both in the Terra Nova Bay area. In the first case, it is found that marine ice is formed near the grounding line; in the second case, extensive frazil ice accumulation occurs under the ice shelf. Frazil ice types can be identified which have different crystallographic, isotopic and chemical characteristics. (Auth. mod.)

52-4406

Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Part A: Hydrodynamics—Part B: Marine geophysics, Vol.2.

Caschetto, S., ed, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 25p. + 69p., Refs. passim. For individual papers see E-59326, J-59325 or 52-4407 and 52-4408.

Research projects, Oceanographic surveys, Models, Ocean currents, Oil spills, Sea ice, Ice cover effect, Ice water interface, Geomorphology, Bottom topography, Seismic surveys, Glacial geology, Antarctica—Weddell Sea

This volume presents the scientific results of research projects in the areas of Hydrodynamics (Part A) and of Marine Geophysics (Part B) funded under the Third Phase of the Belgian Research Programme on the Antarctic (1992-1996). Achievements of research projects in the other areas of the Programme form the subject of two separate volumes (Volume I: Marine Biogeochemistry and Ecodynamics; Volume III: Glaciology and Climatology). This research aimed to contribute to the development of the knowledge required for a science-based conservation and management of the antarctic environment and to assess the mechanisms through which the antarctic and the global climate interact.

52-4407

Oil spill modelling in the Weddell Sea.

Petit, B., Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Part A: Hydrodynamics—Part B: Marine geophysics, Vol.2. Edited by S. Caschetto, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 25p., Refs. p.23-25.

Oil spills, Ice models, Ice composition, Sea water, Chemical analysis, Ice formation, Sea ice, Ice water interface, Ocean currents, Ice cover effect, Antarctica—Weddell Sea

This paper proposes a model of oil behavior in ice-infested waters. It describes the interactions between oil and ice coupled with a sea ice formation model. The main features of oil spreading and dynamics in an ice pack are taken into account in the model which is tested in three different situations: at short term in cold waters and in the presence of ice, and at long term. The results show that the presence of ice completely modifies the classic spreading of an oil slick by increasing or shrinking the contaminated area, and by incorporating some oil in its structures. The model is used for the simulation of a possible spill in the Weddell Sea. The mean drift of oil follows the Weddell Gyre, which takes the remaining contamination toward the circumpolar current. (Auth. mod.)

52-4408

BELANTOSTRAT—Belgian contribution to the "Antarctic Offshore Acoustic Stratigraphy Project (ANTOSTRAT)".

De Batist, M., Bart, P.J., Vanneste, K., Belgian research programme on the Antarctic. Scientific results of Phase III (1992-1996). Part A: Hydrodynamics—Part B: Marine geophysics, Vol.2. Edited by S. Caschetto, Brussels, Federal Office for Scientific, Technical and Cultural Affairs, 1997, 69p., Refs. p.64-69.

Marine geology, Glacial geology, Glacial deposits, Stratigraphy, Seismic surveys, Antarctica—West Antarctica, Antarctica—Weddell Sea

The scientific objective of ANTOSTRAT (Antarctic Offshore Acoustic Stratigraphy) Project is to extract Antarctica's Cenozoic glacial history from the sediments of its continental margins, principally by using seismic stratigraphy, where possible calibrated by coring or borehole evidence. The present report summarizes the Belgian research efforts and scientific contribution to ANTOSTRAT, with seismic-stratigraphic studies of various portions of the antarctic continental margin: the Trinity Peninsula and South Shetland Is. margins of central Bransfield Basin, along the Antarctic Peninsula; the West Antarctic continental margins of the Amundsen and Bellingshausen seas; and the continental margin of the northeastern Weddell Sea. (Auth. mod.)

52-4409

Late Cenozoic history of McQuesten map area, Yukon Territory, with applications to placer gold research.

Bond, J.D., Edmonton, University of Alberta, 1997, 161p., University Microfilms order No.AADMQ-21154, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.132.

Pleistocene, Glacial geology, Glaciation, Paleoclimatology, Sedimentation, Distribution, Gold, Placer mining, Exploration, Geological maps, Canada—Yukon Territory—McQuesten River

52-4410

Analysis of the post-regulation freezeup regime on the North Saskatchewan River.

Choles, J.E.S., Edmonton, University of Alberta, 1997, 145p., University Microfilms order No.AADMQ-21159, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.223.

Reservoirs, River flow, Flow control, Electric power, Freezeup, Ice jams, Ice growth, Ice cover effect, Flood forecasting, Ice forecasting, Canada—Saskatchewan—North Saskatchewan River

52-4411

Genesis of the North Battleford fluting field, west-central Saskatchewan.

Grant, N.M., Edmonton, University of Alberta, 1997, 202p., University Microfilms order No.AADMQ-21168, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.134.

Geomorphology, Pleistocene, Plains, Glacial hydrology, Glacier melting, Meltwater, Subglacial drainage, Water erosion, Landscape development, Canada—Saskatchewan—North Battleford

52-4412

Postglacial drainage in the Mohawk River Valley with emphasis on paleodischarge and paleochannel development.

Wall, G.R., Troy, NY, Rensselaer Polytechnic Institute, 1995, 352p., University Microfilms order No.AADAA-I9608471, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6001.

Pleistocene, Geomorphology, River basins, Glacial geology, Glacial lakes, Glacier melting, Meltwater, Surface drainage, Channels (waterways), Geochronology, United States—New York—Hudson River

52-4413

Evaluation of paper mill sludges for use as landfill covers.

Moo-Young, H.K., Jr., Troy, NY, Rensselaer Polytechnic Institute, 1995, 324p., University Microfilms order No.AADAA-I9608457, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6365.

Waste treatment, Environmental protection, Earth fills, Covering, Sludges, Frost protection, Frost penetration, Freeze thaw cycles, Permeability, Water content, Mechanical properties

52-4414

Light scattering by nonspherical ice crystals: theoretical study by finite-difference time domain technique and geometric optics methods.

Yang, P., Salt Lake City, University of Utah, 1995, 225p., University Microfilms order No.AADAA-I9608656, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6177.

Cloud physics, Ice crystal optics, Light scattering, Radiation absorption, Reflectivity, Wave propagation, Mathematical models, Simulation

52-4415

Fluvial and hillslope geomorphology of Hoseanna Creek watershed, central Alaska.

Wilbur, S.C., Fairbanks, University of Alaska Fairbanks, 1995, 287p., University Microfilms order No.AADAA-I9608769, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6177.

Geomorphology, Watersheds, Landslides, Geocryology, Subarctic landscapes, Discontinuous permafrost, Watersheds, Mass flow, Soil erosion, Hydrogeology, Statistical analysis, United States—Alaska—Hoseanna Creek

52-4416

Design of an image radiation monitor for ILS glide slope in the presence of snow.

Marcum, F.E., Athens, Ohio University, 1995, 78p., University Microfilms order No.AADAA-I9607683, Ph.D. thesis. For asbtract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6303.

Aircraft, Aircraft landing areas, Imaging, Sensors, Reflectivity, Ice detection, Snow cover effect, Safety, Electronic equipment, Analysis (mathematics)

52-4417

Field hydrology and water balance modeling of earthen final covers for waste containment.

Khire, M.V., Madison, University of Wisconsin, 1995, 177p., University Microfilms order No.AADAA-I9538010, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6272.

Earth fills, Waste treatment, Covering, Water balance, Evapotranspiration, Soil freezing, Snowmelt, Seepage, Capillarity, Computerized simulation, Soil air interface

52-4418

Development and validation of a new land surface model for regional and global climate modeling.

Lynch-Stieglitz, M., New York, Columbia University, 1995, 89p., University Microfilms order No.AADAA-I9606925, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6005.

Climatology, Hydrologic cycle, Hydrography, Watersheds, Global change, Soil water, Snowmelt, Snow hydrology, Water table, Seasonal variations, Models

52-4419
Factors controlling chemical weathering in soils; the provenance of ice-rafted debris in Heinrich layers.
Gwiazda, R.H., New York, Columbia University, 1995, 117p., University Microfilms order No.AADAA-I9606888, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.5996.
Soil chemistry, Geochemistry, Weathering, Carbon dioxide, Temperature effects, Models, Marine deposits, Ice rafting, Isotope analysis, Radioactive age determination

52-4420
Quaternary history of the Cypress Hills and adjacent areas in Alberta and Saskatchewan.
Kulig, J.J., Edmonton, University of Alberta, 1995, 319p., University Microfilms order No.AADAA-INN01712, Ph.D. thesis. For abstract See Dissertation abstracts international, 1996, Vol.56/11-B, p.6000.
Geomorphology, Glacial geology, Quaternary deposits, Glacial deposits, Glacial lakes, Meltwater, Subglacial drainage, Sediment transport, Lithology, Geochronology, Canada—Saskatchewan—Cypress Hills, Canada—Alberta

52-4421
Engineering properties of high strength concrete containing silica fume and lignite fly ash.
Ghosh, S., Saskatoon, University of Saskatchewan, 1994, 200p., University Microfilms order No.AADAA-INN00177, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6270.
Concrete strength, Concrete durability, Cold weather performance, Frost resistance, Air entrainment, Concrete admixtures, Aggregates, Mechanical properties, Indexes (ratios), Scanning electron microscopy, Microstructure

52-4422
Computer simulation of early-stage crystal growth and dissolution.
Baez, L.A., Ithaca, Cornell University, 1995, 251p., University Microfilms order No.AADAA-I9608225, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6255.
Crystal growth, Ice crystal growth, Ice water interface, Ice crystal size, Hydrates, Computerized simulation, Temperature effects, Thermodynamics

52-4423
Experimental study of transversely loaded continuous steel plates.
Ratzlaff, K.P., Edmonton, University of Alberta, 1995, 309p., University Microfilms order No.AADAA-INN01750, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6326.
Steels, Plates, Composite materials, Thickness, Mechanical tests, Icebreakers, Offshore structures, Ice solid interface, Loads (forces), Deformation, Flexural strength, Simulation

52-4424
High resolution structure of type III antifreeze protein and its implications for ice binding.
Deluca, C.I., Kingston, Queen's University at Kingston, 1997, 181p., University Microfilms order No.AADNQ-20556, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58/9-B, p.4611.
Antifreezes, Molecular structure, Ice physics, Ice crystal growth, Ice crystal structure, Ice solid interface, Adhesion, Molecular energy levels

52-4425
Controls on the chemistry of the Bow River, southern Alberta, Canada.
Grasby, S.E., Calgary, University of Calgary, 1997, 140p., University Microfilms order No.AADNQ-20738, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58/9-B, p.4673.
River flow, River basins, Hydrogeochemistry, Isotope analysis, Snowmelt, Seepage, Ground water, Canada—Alberta—Bow River

52-4426
Late Albian palynology and sequence stratigraphy, Central Sverdrup Basin, Axel Heiberg Island, Northwest Territories.
MacRae, R.A., Calgary, University of Calgary, 1997, 442p., University Microfilms order No.AADNQ-20750, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58/9-B, p.4690.
Pleistocene, Quaternary deposits, Arctic landscapes, Earth crust, Paleoecology, Palynology, Stratigraphy, Classifications, Geologic processes, Canada—Northwest Territories—Axel Heiberg Island

52-4427
Strength development of concrete prepared with an anti-freeze admixture and subject to cyclic freeze thaw during curing.
Mason, M.R., Anchorage, University of Alaska-Anchorage, 1997, 218p., University Microfilms order No.AAD13-86972, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.225.
Concrete strength, Concrete durability, Concrete curing, Cold weather performance, Cold weather tests, Freeze thaw cycles, Freeze thaw tests, Chemical composition, Antifreezes, Ice prevention

52-4428
Feasibility study of alum sludge dewatering by freezing it in layers on top of ice at Eklutna Water Treatment Facility.
Niziol, B., Anchorage, University of Alaska-Anchorage, 1997, 78p., University Microfilms order No.AAD13-86991, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.142.
Water treatment, Waste treatment, Sludges, Ponds, Ice cover, Ice solid interface, Sedimentation, Freezing, Moisture transfer, Cold weather tests, United States—Alaska—Anchorage

52-4429
Automatic instrumentation and telemetry system for the Fallen Leaf Lake watershed.
Cheng, E.W., Reno, University of Nevada, 1997, 73p., University Microfilms order No.AAD13-86808, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.230.
Watersheds, Limnology, Runoff forecasting, Snow hydrology, Snowmelt, Telemetering equipment, Sensors, Performance, Environmental protection, United States—California—Fallen Leaf Lake

52-4430
Understanding geological hazards; mercury and earthquakes: GIS applications.
Meldrum, D.G., Edmonton, University of Alberta, 1997, 220p., University Microfilms order No.AADMQ-21192, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.140.
Earthquakes, Mass flow, Glacial geology, Glacial deposits, Quaternary deposits, Glacier flow, Bedrock, Striations, Lithology, Dispersions, Safety, Forecasting, Canada—British Columbia—Chilliwack

52-4431
Geometric modification of laminated cylindrical shells with embedded nitinol.
Kim, B.H., Wichita, KS, Wichita State University, 1997, 91p., University Microfilms order No.AAD98-10304, Ph.D. thesis. For abstract see Dissertation abstracts international, 1998, Vol.58/9-B, p.4947.
Aircraft icing, Ice removal, Composite materials, Shells, Models, Simulation, Design, Mechanical properties, Strain tests

52-4432
Stratigraphic, microclimatic and thawing attributes associated with palsas located in the alpine tundra environment of the Macmillan Pass-Tsichu River region, Northwest Territories, Canada.
Skaret, K.D., Edmonton, University of Alberta, 1995, 177p., University Microfilms order No.AADAA-IMM01654, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.694.
Geomorphology, Alpine tundra, Geocryology, Permafrost mass transfer, Permafrost bases, Active layer, Frost mounds, Ice lenses, Ground thawing, Stratigraphy, Microclimatology, Canada—Northwest Territories—Tsichu River

52-4433
Magnetostratigraphic study of the Nikolai Greenstone, Wrangell Mountains, Alaska.
Chaky, D.A., Mississippi State, Mississippi State University, 1995, 73p., University Microfilms order No.AADAA-I1376090, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.684.
Geomorphology, Arctic landscapes, Earth crust, Magma, Mass flow, Stratigraphy, Geomagnetism, Volcanoes, Age determination, United States—Alaska—Wrangell Mountains

52-4434
High water content sludge dewatering via freeze-thaw.
Mao, S.Q., Edmonton, University of Alberta, 1997, 171p., University Microfilms order No.AADMQ-21188, M.S. thesis. For abstract see Masters abstracts, 1997, Vol.36/1, p.252.
Water treatment, Waste treatment, Sludges, Water content, Moisture transfer, Freeze thaw cycles, Freeze thaw tests, Cold weather tests, Temperature effects

52-4435
Sources of solutes in precipitation and surface runoff of mixed-conifer and alpine catchments in the Sierra Nevada, California.
Williams, M.R., Santa Barbara, University of California, 1997, 183p., University Microfilms order No.AAD98-09649, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58/9-B, p.4672.
Watersheds, Alpine landscapes, Aerosols, Hydrogeochemistry, Snowmelt, Runoff, Mass balance, Solubility, Origin, United States—California—Sierra Nevada

52-4436
Application of destructive and non-destructive testing techniques to qualitatively analyze the cracking structure produced by freeze-thaw cycles in compacted fine-grained soils.
Laplante, C.M.C., Troy, NY, Rensselaer Polytechnic Institute, 1997, 182p., University Microfilms order No.AAD98-09470, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.59/9-B., p.4985.
Soil tests, Clay soils, Soil structure, Microstructure, Cracking (fracturing), Freeze thaw cycles, Freeze thaw tests, X ray analysis, Imaging

52-4437
Nature and evolution of interstellar ices: studies of methanol and carbon monoxide.
Chiar, J.E., Troy, NY, Rensselaer Polytechnic Institute, 1997, 122p., University Microfilms order No.AAD98-07699, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58/9-B, p.4868.
Ice physics, Extraterrestrial ice, Cosmic dust, Geochemistry, Hydrocarbons, Molecular structure, Ice detection, Infrared spectroscopy, Simulation, Spectra

52-4438
Biogeochemistry and water balance of the Ottawa River basin.
Telmer, K.H., Ottawa, University of Ottawa, 1997, 279p., University Microfilms order No.AADNQ-21018, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.58/9-B, p.4672.
Watersheds, River basins, Water balance, Hydrogeochemistry, Geochemical cycles, Snowmelt, Ground water, Seepage, Isotope analysis, Weathering, Statistical analysis, Canada—Ontario—Ottawa

52-4439

Quaternary geology of the Fraser Valley area, Big Bar Creek to Pavilion, southcentral British Columbia.

Lian, O.B., London, University of Western Ontario, 1997, 489p., University Microfilms order No.AADNQ-21302, Ph.D. thesis. For abstracts see Dissertation abstracts international, 1997, Vol.58/9-B, p.4678.

Pleistocene, Glacial geology, Glacier flow, Quaternary deposits, Glacial deposits, Ice solid interface, Glacier beds, Sediment transport, Lithology, Age determination, Rheology, Canada—British Columbia—Fraser Valley

52-4440

VDOT district improves winter maintenance.

Salehi, M., *Better roads,* Apr. 1998, 68(4), p.23-26.

Road maintenance, Winter maintenance, Snow removal, Ice prevention, Logistics, Mapping, Cold weather operation, Standards, United States—Virginia

52-4441

Surface-subsurface transport cycle of chloride induced by wetland-focused groundwater recharge.

Hayashi, M., Waterloo, University of Waterloo, 1997, 140p., University Microfilms order No.AADNQ-21353, Ph.D. thesis. For abstract see Dissertation abstracts international, 1997, Vol.59/9-B, p.4687.

Snow hydrology, Wetlands, Snowmelt, Runoff, Ground water, Mathematical models, Leaching, Mass transfer, Subsurface drainage, Hydrogeochemistry, Mathematical models, Canada—Saskatchewan

52-4442

Detachment folds of the northeastern Brooks Range, Alaska: a basis for geometric and kinematic modes of detachment folds.

Homza, T.X., Fairbanks, University of Alaska-Fairbanks, 1995, 335p., University Microfilms order No.AADAA-I9608413, Ph.D. thesis. For abstract see Dissertation abstracts international, 1996, Vol.56/11-B, p.6000.

Tectonics, Earth crust, Subpolar regions, Geologic processes, Migration, Stratigraphy, Deformation, Models, United States—Alaska—Brooks Range

52-4443

Volumetric change of the Peyto Glacier, Alberta, Canada, 1896-1966.

Wallace, A.L., Waterloo, Wilfrid Laurier University, 1995, 153p., University Microfilms order No.AADAA-IMM01827, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.695.

Glaciology, Glacier surveys, Glacier oscillation, Glacier mass balance, Ice volume, Seasonal ablation, Photogrammetry, Canada—Alberta—Peyto Glacier

52-4444

Multiconverted reflections in marine environments with thin permafrost layers.

Chen, T.W., Calgary, University of Calgary, 1994, 125p., University Microfilms order No.AADAA-IMM99327, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.688.

Subsea permafrost, Oceanographic surveys, Seismic surveys, Seismic reflection, Wave propagation, Bottom sediment, Stratification, Mathematical models, Data processing, Imaging, Beaufort Sea

52-4445

Investigation of the performance of ground source heat pumps for residential heating in Nova Scotia.

Healy, P.F., Halifax, Technical University of Nova Scotia, 1995, 245p., University Microfilms order No.AADAA-IMM99753, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.856.

Heat pumps, Cooling systems, Cold weather performance, Residential buildings, Computerized simulation, Computer programs, Cost analysis, Design, Canada—Nova Scotia

52-4446

Hydrometeorological investigations on a small valley glacier in the Sawtooth Range, Ellesmere Island, Northwest Territories.

Wolfe, P.M., Waterloo, Wilfrid Laurier University, 1995, 225p., University Microfilms order No.AADAA-IMM01828, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.691.

Glacial hydrology, Glacier surveys, Arctic landscapes, Glacier mass balance, Snowmelt, Snow ice interface, Snow cover effect, Snow water equivalent, Regelation, Runoff, Statistical analysis, Canada—Northwest Territories—Ellesmere Island

52-4447

High energy geomorphic events in the Sawtooth Mountains, Ellesmere Island, arctic Canada.

Hartshorn, J., Toronto, University of Toronto, 1995, 157p., University Microfilms order No.AADAA-IMM02066, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.693.

Geomorphology, Arctic landscapes, Geocryology, Solifluction, Slope processes, Mass flow, Ablation, Drill core analysis, Radioactive age determination, Canada—Northwest Territories—Ellesmere Island

52-4448

Discharge and sediment transport in three high arctic basins, Ellesmere Island, Northwest Territories.

Taylor, H.R., Toronto, University of Toronto, 1994, 212p., University Microfilms order No.AADAA-IMM02174, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.694.

Geomorphology, Arctic landscapes, Mass transfer, Sediment transport, Lithology, Eolian soils, Snow hydrology, Snowmelt, Water erosion, Canada—Northwest Territories—Ellesmere Island

52-4449

Using remote sensing and a geographic information system to study glacier characteristics near the Columbia icefield, Alberta.

Mount, C.A., London, University of Western Ontario, 1995, 136p., University Microfilms order No.AADAA-IMM99238, M.S. thesis. For abstract see Masters abstracts, 1995, Vol.34/2, p.694.

Remote sensing, Geophysical surveys, Aerial surveys, Glacier surveys, Glacier mass balance, Photogrammetric surveys, Topographic features, Resolution, Seasonal variations, Canada—Alberta—Columbia Glacier

52-4450

Confederation Bridge: analysis of environmental impacts related to ice.

Brown, T.G., *Canadian journal of civil engineering,* Dec. 1997, 24(6), p.908-914, With French summary. 16 refs.

Bridges, Piers, Sea ice distribution, Drift, Ice jams, Ice breakup, Ice scoring, Ice solid interface, Environmental impact, Forecasting, Statistical analysis, Mathematical models, Canada—Northumberland Strait

52-4451

Dynamic effects of ice forces on the Confederation Bridge.

Langohr, P.H., Ghali, A., *Canadian journal of civil engineering,* Dec. 1997, 24(6), p.915-921, With French summary. 12 refs.

Offshore structures, Bridges, Piers, Protection, Shells, Floating ice, Ice solid interface, Ice breaking, Dynamic loads, Oscillations, Design, Models, Canada—Northumberland Strait

52-4452

Field monitoring and research on performance of the Confederation Bridge.

Cheung, M.S., Tadros, G.S., Brown, T., Dilger, W.H., Ghali, A., Lau, D.T., *Canadian journal of civil engineering,* Dec. 1997, 24(6), p.951-962, With French summary. 9 refs.

Bridges, Piers, Offshore structures, Performance, Mechanical properties, Monitors, Sensors, Ice floes, Ice loads, Ice pressure, Ice solid interface, Design criteria, Maintenance, Canada—Northumberland Strait

52-4453

Photosynthesis of black spruce, jack pine, and trembling aspen after artificially induced frost during the growing season.

Lamontagne, M., Margolis, H., Bigras, F., *Canadian journal of forest research,* Jan. 1998, 28(1), p.1-12, With French summary. 35 refs.

Plant physiology, Trees (plants), Forest canopy, Growth, Photosynthesis, Frost, Cooling rate, Damage, Simulation, Temperature effects, Cold weather tests, Seasonal variations

52-4454

Emissions of N_2O and NO and net nitrogen mineralization in a boreal forested peatland treated with different nitrogen compounds.

Regina, K., Nykänen, H., Maljanen, M., Silvola, J., Martikainen, P.J., *Canadian journal of forest research,* Jan. 1998, 28(1), p.132-140, With French summary. 55 refs.

Forest soils, Subarctic landscapes, Forest ecosystems, Organic soils, Soil air interface, Vapor transfer, Aerosols, Peat, Soil chemistry, Modification, Simulation, Finland

52-4455

Long-term tillage and crop residue management in the subarctic: fluxes of methane and nitrous oxide.

Cochran, V.L., Sparrow, E.B., Schlentner, S.F., Knight, C.W., *Canadian journal of soil science,* Nov. 1997, 77(4), p.565-570, With French summary. 27 refs.

Agriculture, Subarctic landscapes, Soil chemistry, Water content, Soil air interface, Snow cover effect, Vapor transfer, Litter, Decomposition, Natural gas, Soil tests, United States—Alaska—Delta Junction

52-4456

Geotechnical evidence of ice scour as a guide to pipeline burial depth.

Palmer, A., *Canadian geotechnical journal,* Dec. 1997, 34(6), p.1002-1003, With French summary. 7 refs.

Offshore structures, Underground pipelines, Trenching, Ice scoring, Ocean bottom, Stress concentration, Porosity, Deformation, Indexes (ratios), Countermeasures, Design criteria, Forecasting

52-4457

Winter oxygen conditions in ice-covered rivers: the impact of pulp mill and municipal effluents.

Chambers, P.A., Scrimgeour, G.J., Pietroniro, A., *Canadian journal of fisheries and aquatic sciences,* Dec. 1997, 54(12), p.2796-2806, With French summary. 38 refs.

Icebound rivers, Water transport, Water chemistry, Water pollution, Oxygen, Waste disposal, Sedimentation, Subglacial observations, Environmental tests, Sampling, Canada—Alberta—Athabasca River

52-4458

Changes in the active layer of a subarctic right-of-way as a result of a crude-oil spill.

Seburn, D.C., Kershaw, G.P., *Canadian journal of earth sciences,* Dec. 1997, 34(12), p.1539-1544, With French summary. 31 refs.

Soil pollution, Crude oil, Oil spills, Forest soils, Permafrost beneath roads, Degradation, Soil tests, Environmental tests, Environmental impact, Subarctic landscapes, Active layer, Thaw depth, Canada—Northwest Territories—Tulita

52-4459

Reconstruction of the Red Dog Zn-Pb-Ba orebody, Alaska: implications for the vent environment during the mineralizing event.

Edgerton, D., *Canadian journal of earth sciences,* Dec. 1997, 34(12), p.1581-1602, With French summary. 47 refs.

Pleistocene, Marine geology, Subpolar regions, Hydrothermal processes, Sediments, Minerals, Epigenesis, Fluid dynamics, Drill core analysis, Lithology, Stratigraphy, Models, United States—Alaska—Brooks Range

52-4460
Frost tolerance and hardening capacity during the germination and early developmental stages of four white spruce (*Picea glauca*) provenances.
Coursolle, C., Bigras, F.J., Margolis, H.A., *Canadian journal of botany,* Jan. 1998, 76(1), p.122-129, With French summary. 22 refs.
Plant physiology, Trees (plants), Plant tissues, Frost resistance, Growth, Low temperature tests, Temperature effects, Light effects

52-4461
Effect of ice clouds on millimeter-wave aeronautical and satellite communications.
Papatsoris, A.D., *Electronics letters,* Oct. 9, 1997, 33(21), p.1766-1768, 10 refs.
Radio communication, Telecommunication, Radio waves, Wave propagation, Polarization (waves), Cloud physics, Ice dielectrics, Ice crystal size, Ice crystal structure, Orientation, Particle size distribution, Attenuation, Analysis (mathematics)

52-4462
Effect of heat on photosynthesis, dark respiration and cellular ultrastructure of the arctic-alpine psychrophyte *Ranunculus glacialis*.
Larcher, W., Wagner, J., Lütz, C., *Photosynthetica,* 1997, 34(2), p.219-232, Refs. p.229-232.
Plant physiology, Plant ecology, Photosynthesis, Plant tissues, Microstructure, Thermal stresses, Global warming, Electron microscopy, Environmental tests, Simulation

52-4463
Current state of cold hardiness research on fruit crops.
Palonen, P., Buszard, D., *Canadian journal of plant science,* July 1997, 77(3), p.399-420, With French summary. Refs. p.416-420.
Plant physiology, Research projects, Agriculture, Trees (plants), Classifications, Cold tolerance, Cold stress, Plant tissues, Supercooling, Damage, Temperature effects

52-4464
Ice nucleation, freezing injury, and colonization of 'Totem' strawberry flowers with ice-nucleation-active (INA) bacteria.
Warmund, M.R., English, J.T., *American Society of Horticultural Science. Journal,* Mar. 1998, 123(2), p.234-238, 21 refs.
Plant physiology, Plant tissues, Microbiology, Ice crystal growth, Heterogeneous nucleation, Freezing points, Bacteria, Density (mass/volume), Damage, Cold weather tests, Temperature effects

52-4465
Trifluoroacetic acid levels in 1994-1996 fog, rain, snow and surface waters from California and Nevada.
Wujcik, C.E., Zehavi, D., Seiber, J.N., *Chemosphere,* Mar. 1998, 36(6), p.1233-1345, 22 refs.
Climatology, Air pollution, Precipitation (meteorology), Aerosols, Liquid phases, Snow impurities, Sampling, Ion density (concentration), Statistical analysis, Environmental tests, United States—California—Tahoe, Lake

52-4466
Biolog metabolic fingerprints for clustering marine oligotrophic bacteria from polar regions.
Tan, T.L., Microbial communities—functional versus structural approaches. Edited by H. Insam and A. Rangger, Heidelberg, Springer-Verlag, 1997, p.161-170, 15 refs.
DLC QR111.M379
Marine biology, Microbiology, Bacteria, Biomass, Ecosystems, Sampling, Laboratory techniques, Substrates, Statistical analysis, Classifications, Cold tolerance, Antarctica, Greenland Sea
Oligotrophic bacteria from the Western Greenland Sea have been isolated by enrichment culture techniques in dialysis chambers or by continuous-flow of seawater through nylon or glass-fiber filter in double Petri dishes. These bacteria were compared with 55 oligotrophic isolates from the Gunnerus and Astrid Ridge. From the five clusters found among the antarctic bacteria, two were the same as two clusters from the Arctic. These identical groups of bacteria from the north and south polar regions will be the subject of phylogenic investigations to study the strategies of cold adaptations in bacteria. (Auth. mod.)

52-4467
Complexity of the flux of natural substrates in soils: a freeze-thaw can increase the formation of ischemic or anaerobic microsites.
Zsolnay, A., Microbial communities—functional versus structural approaches. Edited by H. Insam and A. Rangger, Heidelberg, Springer-Verlag, 1997, p.236-241, 13 refs.
DLC QR111.M379
Soil chemistry, Frozen ground chemistry, Freeze thaw cycles, Organic soils, Sampling, Water content, Oxygen, Porosity, Soil tests, Substrates

52-4468
Debris flow disaster in Gamahara torrent. [Gamahara-zawa dosekiryu saigai ni tsuite]
Marui, H., Watanabe, N., Sato, O., Maekawa, T., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report,* 1997 (Pub. 1998), No.19, p.23-48, In Japanese with English summary. 7 refs.
Snowmelt, Rain, Streams, Gullies, Slope stability, Landslides, Mudflows, Alluvium, Water erosion, Hydrogeochemistry, Hydrogeology, Flood forecasting, Japan

52-4469
Study on adsorption of phosphate and ammonium ions on ice crystals. [Rinsan oyobi anmoniumu ion no hyokessho e no kyuchaku ni kansuru kenkyu]
Ando, T., Taguchi, Y., Aoyama, K., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report,* 1997 (Pub. 1998), No.19, p.97-102, In Japanese with English summary. 3 refs.
Marine atmospheres, Atmospheric composition, Air pollution, Scavenging, Snow composition, Snow impurities, Ice crystal structure, Ice composition, Adsorption, Ion density (concentration), Water pollution, Japan

52-4470
Report on International Congress of Acid Snow and Rain 1997. [Sanseisetsu, sanseiu ni kansuru kokusai kaigi '97 o kaisai shite]
Katoh, K., Taguchi, Y., Aoyama, K., Konno, T., Yamamoto, M., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report,* 1997 (Pub. 1998), No.19, p.103-118, In Japanese and English. 1 ref.
Meetings, Research projects, Air pollution, Scavenging, Snow composition, Snow impurities, Water pollution, Soil pollution

52-4471
Oceanographic data in the Greenland Sea and around Svalbard in 1991-1993.
Ushio, S., Ito, H., Ono, N., *Tokyo. National Institute of Polar Research. NIPR arctic data reports,* Mar. 1998, No.3, 46p.
Oceanographic surveys, Sea water, Water temperature, Salinity, Greenland Sea, Norway—Svalbard

52-4472
Seasonally freezing halic soils and their improvement-utilization in the Hexi Corridor, Gansu, China. [Gansu Hexi zoulang jijie dongjie yanzitu ji qi gailiang liyong]
Qiu, G.Q., et al, Lanzhou, University Press, 1996, 115p., In Chinese with abridged English version, p.81-115. 22 refs.
Soil surveys, Saline soils, Soil freezing, Frozen ground chemistry, Soil composition, Soil classification, Seasonal freeze thaw, Frost action, Frost penetration, Hydrogeology, Land reclamation, Soil conservation, Irrigation, Agriculture, Mathematical models, China—Hexi Corridor

52-4473
Overview of physical/chemical aspects of freezing.
Reid, D.S., Quality in frozen food. Edited by M.C. Erickson and Y.C. Hung, New York, Chapman & Hall, 1997, p.10-28, 37 refs.
DLC TP372.3.Q35 1997
Liquid solid interfaces, Freezing, Ice formation, Phase transformations, Ice water interface, Heterogeneous nucleation, Frozen liquids, Freeze thaw cycles, Thermodynamic properties, Heterogeneous nucleation, Temperature effects

52-4474
Measurement and interpretation of the glass transition in frozen foods.
Goff, H.D., Quality in frozen food. Edited by M.C. Erickson and Y.C. Hung, New York, Chapman & Hall, 1997, p.29-50, Refs. p.47-50.
DLC TP372.3.Q35 1997
Phase transformations, Liquid solid interfaces, Ice water interface, Frozen liquids, Solutions, Solid phases, Viscosity, Chemical properties, Thermodynamic properties, Temperature measurement

52-4475
Modeling of food freezing.
Heldman, D.R., Taylor, T.A., Quality in frozen food. Edited by M.C. Erickson and Y.C. Hung, New York, Chapman & Hall, 1997, p.51-64, 30 refs.
DLC TP372.3.Q35 1997
Freezing, Frozen liquids, Solutions, Liquid solid interfaces, Phase transformations, Freezing points, Thermal diffusion, Thermodynamics, Models

52-4476
Moisture migration and ice recrystallization in frozen foods.
Pham, Q.T., Mawson, R.F., Quality in frozen food. Edited by M.C. Erickson and Y.C. Hung, New York, Chapman & Hall, 1997, p.67-91, 48 refs.
DLC TP372.3.Q35 1997
Frozen liquids, Ice physics, Ice sublimation, Recrystallization, Ice air interface, Moisture transfer, Vapor transfer, Mathematical models, Temperature effects

52-4477
Freeze-cracking.
Hung, Y.C., Quality in frozen food. Edited by M.C. Erickson and Y.C. Hung, New York, Chapman & Hall, 1997, p.92-100, 21 refs.
DLC TP372.3.Q35 1997
Frozen liquids, Freezing, Damage, Frost action, Cracking (fracturing), Forecasting, Countermeasures

52-4478
Interference of *Vaccinium myrtillus* on establishment, growth, and nutrition of *Picea abies* seedlings in a northern boreal site.
Jäderlund, A., Zackrisson, O., Dahlberg, A., Nilsson, M.C., *Canadian journal of forest research,* Dec. 1997, 27(12), p.2017-2025, With French summary. 53 refs.
Plant ecology, Subarctic landscapes, Trees (plants), Forest ecosystems, Growth, Biomass, Roots, Viability, Vegetation factors, Revegetation, Sweden—Skavliden

52-4479
Indicator minerals from the CL-25 kimberlite pipe, Slave Craton, Northwest Territories, Canada.
Pokhilenko, N.P., McDonald, J.A., Mel'nik, U., McCorquodale, J., Reimers, L.F., Sobolev, N.V., *Russian geology and geophysics,* 1997, 38(2), International Kimberlite Conference, 6th. Proceedings, Vol.2. Diamonds: characterization, genesis and exploration, p.550-558, Translated from Geologiia i geofizika. 19 refs.
Minerals, Exploration, Subarctic landscapes, Geochemistry, Rock properties, Sampling, Chemical analysis, X ray analysis, Classifications, Canada—Northwest Territories—Slave Craton

52-4480
Landscapes and climate of West Siberia in the Paleogene and Neogene.
Kul'kova, K.A., Vol'kova, V.S., *Russian geology and geophysics,* 1997, 38(3), p.621-635, Translated from Geologiia i geofizika. 39 refs.
Paleoclimatology, Climatic changes, Tundra climate, Tundra vegetation, Quaternary deposits, Paleoecology, Palynology, Air temperature, Seasonal variations, Indexes (ratios), Correlation, Russia—Siberia

52-4481
Unidentified floating saucers.
Schlatter, T., *Weatherwise,* Dec. 1997, 50(6), p.36.
Weather observations, Lake ice, Floating ice, Surface structure, Slush, Supercooling, Ice water interface, Frazil ice, Water waves

52-4482

Shore ice.

Schlatter, T., *Weatherwise,* Dec. 1997, 50(6), p.36-37.

Weather observations, Lake ice, Shores, Surface structure, Freezeup, Grounded ice, Snow ice interface, Snow cover effect, Ice melting

52-4483

Classification scheme for surface textures of gold nuggets from Finnish Lapland.

Kinnunen, K.A., *Geological Society of Finland. Bulletin,* 1996, 68(pt.2), p.18-33, 50 refs.

Arctic landscapes, Exploration, Gold, Placer mining, Microanalysis, Surface properties, Classifications, Sampling, Laboratory techniques, Finland—Lapland

52-4484

Formation of raised beaches in southern Finland during the Ancylus and Litorina stages.

Jantunen, T., Donner, J., *Geological Society of Finland. Bulletin,* 1996, 68(pt.2), p.34-39, 18 refs.

Geomorphology, Pleistocene, Subarctic landscapes, Shores, Beaches, Shoreline modification, Sea level, Water level, Finland, Baltic Sea

52-4485

Spatial distribution of potholes in Uusimaa, southern Finland.

Jantunen, T., *Geological Society of Finland. Bulletin,* 1996, 68(pt.2), p.40-45, 11 refs.

Pleistocene, Geomorphology, Subarctic landscapes, Glacial geology, Glacial erosion, Meltwater, Water erosion, Bedrock, Crevasses, Finland—Uusimaa

52-4486

On the origin and glacial transport of erratics of Jotnian sandstone in southwestern Finland.

Donner, J., *Geological Society of Finland. Bulletin,* 1996, 68(pt.2), p.72-83, 23 refs.

Pleistocene, Glacial geology, Subarctic landscapes, Sediment transport, Dispersions, Lithology, Bedrock, Quaternary deposits, Finland

52-4487

Vegetation oasis in lower Mimerdalen, Billefjord, central Spitsbergen. [Eine Vegetationsoase im unteren Mimerdalen am Billefjord, Zentral-Spitzbergen]

Möller, I., Thannheiser, D., *Polarforschung,* 1995, 65(2), p.65-70, In German with English summary. 9 refs.

Plant ecology, Vegetation patterns, Deserts, Arctic landscapes, Biogeography, Sampling, Classifications, Norway—Spitsbergen

52-4488

Phytosociological survey of the *Oxyria digyna*- and *Chamaenerion latifolium*-vegetation in coastal southeast Greenland. [Eine pflanzensoziologische Übersicht der *Oxyria digyna*- und *Chamaenerion latifolium*-Vegetation im küstennahen Bereich Südost-Grönlands]

Lünterbusch, C., Bültmann, H., Daniëls, F.J.A., *Polarforschung,* 1995, 65(2), p.71-82, In German with English summary. 43 refs.

Plant ecology, Vegetation patterns, Ecosystems, Mosses, Lichens, Arctic landscapes, Shores, Sampling, Classifications, Greenland

52-4489

Impact of human activities on the terrestrial ecosystem of Antarctica: a review.

Chen, J., Blume, H.P., *Polarforschung,* 1995, 65(2), p.83-92, With German summary. Refs. p.91-92.

Environmental impact, Environmental protection, Ecology, International cooperation, Ecosystems

In this review, localized contamination of soils and vegetation, disturbance of wildlife, import of alien organisms as well as introduction of exogenous bacterial diseases as a result of human activities undertaken in Antarctica have been outlined and potential threats to the antarctic environment from the contaminants emanating from sources outside the Antarctic have been demonstrated. Efforts and progress within the Antarctic Treaty System towards protection of the antarctic environment and its terrestrial ecosystem are briefly summarized. (Auth. mod.)

52-4490

Characteristic of magnetic fabric of core NP93-2 from Prydz Bay, Antarctica, and its paleoclimatic significance.

Hou, H.M., Wang, B.G., Tang, X.Z., *Chinese journal of geophysics,* 1996, 39(4), p.505-511, 14 refs.

Paleoclimatology, Climatic changes, Marine deposits, Ocean currents, Remanent magnetism, Geomagnetism, Anisotropy, Drill core analysis, Antarctica—Prydz Bay

Systematic magnetic fabric analysis has been carried out on core NP93-2, collected from Prydz Bay. In order to trace paleoenvironmental information, several magnetic fabric parameters have been calculated. All samples have large anistropy of magnetic susceptibility, which indicates a sedimentary environment with strong water current in Prydz Bay. The directions of the paleocurrent determined by the maximum axis of magnetic susceptibility are mainly EW and NS. Combined with the regional oceanic background, they correspond to the Antarctic Circumpolar Current and Antarctic Bottom Water. According to variations of magnetic fabric parameters of the core and the direction of the paleocurrent, the authors divide the paleoclimate since 12700 B.P. into five paleoclimatic zones. (Auth. mod.)

52-4491

Summer and winter denitrification rates in western arctic shelf sediments.

Devol, A.H., Codispoti, L.A., Christensen, J.P., *Continental shelf research,* Aug. 1997, 17(9), p.1029-1050, 48 refs.

Oceanographic surveys, Water chemistry, Geochemical cycles, Organic nuclei, Bottom sediment, Biomass, Subglacial observations, Sampling, Mass balance, Chemical analysis, Seasonal variations, Arctic Ocean

52-4492

Oxygen utilization rates in the Nansen Basin, Arctic Ocean: implications for new production.

Zheng, Y., Schlosser, P., Swift, J.H., Jones, E.P., *Deep-sea research I,* Dec. 1997, 44(12), p.1923-1943, 38 refs.

Oceanography, Oceanographic surveys, Water chemistry, Hydrography, Meltwater, Oxygen, Biomass, Geochemical cycles, Indexes (ratios), Age determination, Forecasting, Arctic Ocean

52-4493

Effects of freezing rate, solids content, and curing time on freeze/thaw conditioning of water treatment residuals.

Parker, P.J., Collins, A.G., Dempsey, J.P., *Environmental science & technology,* Feb. 1, 1998, 32(3), p.383-387, 22 refs.

Water treatment, Waste disposal, Municipal engineering, Sludges, Aggregates, Layers, Freeze thaw cycles, Freeze thaw tests, Freezing rate, Design criteria

52-4494

Effect of water stress on frost resistance of oat leaves.

Maldonado, C.A., Zuñiga, G.E., Corcuera, L.J., Alberdi, M., *Environmental and experimental botany,* Nov. 1997, 38(2), p.99-107, 53 refs.

Plant physiology, Grasses, Plant tissues, Water balance, Desiccation, Permeability, Cold tolerance, Frost resistance, Acclimatization, Simulation, Chemical analysis

52-4495

Organic geochemical proxies of paleoceanographic, paleolimnologic, and paleoclimatic processes.

Meyers, P.A., *Organic geochemistry,* Oct.-Nov. 1997, 27(5-6), Organic Geochemical Division (Geochemical Society) Symposium, Denver, CO, Oct. 27, 1996. Selected papers. Edited by K. Kvenvolden and J. Curiale, p.213-250, Refs. p.244-250.

Paleoclimatology, Paleoecology, Biomass, Quaternary deposits, Marine deposits, Lacustrine deposits, Geochemical cycles, Organic nuclei, Hydrocarbons, Carbon isotopes, Isotope analysis, Indexes (ratios)

52-4496

Climate change during the last deglaciation in the Little Youerdusi Basin of the Tianshan Mountains, Xinjiang.

Ye, W., Mu, G.J., Xu, Y.Q., Zhao, X.Y., Wang, S.J., *Chinese journal of arid land research,* 1997, 10(3), p.183-190, 10 refs.

Paleoclimatology, Climatic changes, Paleoecology, Palynology, Vegetation patterns, Lacustrine deposits, Profiles, Grain size, Particle size distribution, Sampling, China—Tian Shan

52-4497

Assessment of carboxyl groups of some Canadian arctic fossil woods to evaluate their degradation.

Staccioli, G., Stasiuk, L.D., McMillan, N.J., *Organic geochemistry,* Nov.-Dec. 1997, 27(7-8), p.561-565, 10 refs.

Paleoecology, Subpolar regions, Sediments, Wood, Fossils, Degradation, Indexes (ratios), Geochemistry, Chemical analysis, Statistical analysis, Correlation, Standards, Canada—Northwest Territories—Axel Heiberg Island, Canada—Northwest Territories—Ellesmere Island

52-4498

Evaluation and application of conditional symmetric instability, equivalent potential vorticity, and frontogenetic forcing in an operational forecast environment.

Wiesmueller, J.L., Zubrick, S.M., *Weather and forecasting,* Mar. 1998, 13(1), p.84-101, 33 refs.

Synoptic meteorology, Precipitation (meteorology), Fronts (meteorology), Snowstorms, Snowfall, Turbulent boundary layer, Weather forecasting, Radio echo soundings, Reflectivity, Computer applications

52-4499

Improving nowcasts of road surface temperature by a backpropagation neural network.

Shao, J., *Weather and forecasting,* Mar. 1998, 13(1), p.164-171, 15 refs.

Road icing, Ice forecasting, Surface temperature, Mathematical models, Meteorological data, Statistical analysis, Accuracy

52-4500

Resistance and propulsion in ice using system identification techniques.

Dick, R.A., Prior, A.D., Peirce, T.H., Zahn, P., *Society of Naval Architects and Marine Engineers. Transactions,* 1995, Vol.103, p.237-254, Includes discussion. 18 refs.

Ships, Icebreakers, Physical properties, Ice breaking, Performance, Velocity measurement, Hydrodynamics, Ice solid interface, Ice cover effect, Simulation, Mathematical models, Ice mechanics, Forecasting

52-4502

Traction mechanism of automobile tires on snow: an investigation by means of the finite element method.

Liu, C.H., Vienna, Austria, Technical University, 1994, 182p., Ph.D. thesis. With German summary. 147 refs.

Motor vehicles, Tires, Rubber, Rubber snow friction, Snow surface, Snow strength, Snow plasticity, Snow deformation, Traction, Mathematical models

52-4503

Atmospheric change and biodiversity in the Arctic.

Hansell, R.I.C., Malcolm, J.R., Welch, H., Jefferies, R.L., Scott, P.A., *Environmental monitoring and assessment,* Feb. 1998, 49(2-3), Workshop on Atmospheric Change and Biodiversity: Formulating a Canadian Science Agenda, Toronto, Canada, Feb. 26-29, 1996. Proceedings. Edited by R.E. Munn, p.303-325, Refs. p.320-325.

Climatology, Global change, Global warming, Arctic landscapes, Ecosystems, Biomass, Forest lines, Sea ice distribution, Ice melting, Tundra vegetation, Temperature effects, Forecasting, Canada

52-4504

Where future Canadian gas supply will originate.

Meneley, R.A., *Oil & gas journal,* Dec. 15, 1997, 95(50), p.67-70.

Natural resources, Natural gas, Subpolar regions, Exploration, Canada—Northwest Territories

52-4505

Aqueous solutions of proline and NaCl studied by differential scanning calorimetry at subzero temperatures.

Rasmussen, P.H., Jørgensen, B., Nielsen, J., *Thermochimica acta,* Oct. 28, 1997, 303(1), p.23-30, 26 refs.

Cryobiology, Antifreezes, Hydrocarbons, Solutions, Salt water, Low temperature tests, Temperature measurement, Phase transformations, Freezing points, Ice melting, Enthalpy, Unfrozen water content, Thermal analysis

52-4506

Melville Island's salt-based fold belt, arctic Canada.

Harrison, J.C., *Canada. Geological Survey. Bulletin,* 1995, No.472, 331p., With French summary. Refs. p.276-288.

Pleistocene, Geological surveys, Geologic structures, Earth crust, Geologic processes, Subpolar regions, Tectonics, Bedrock, Sedimentation, Deformation, Seismic reflection, Profiles, Canada—Northwest Territories—Melville Island

52-4507

Application of the Snowmelt Runoff Model using multiple-parameter landscape zones on the Towanda Creek basin, Pennsylvania.

Mitchell, K.M., DeWalle, D.R., *American Water Resources Association. Journal,* Apr. 1998, 34(2), p.335-346, 26 refs.

Watersheds, Snow hydrology, Snowmelt, Stream flow, Hydrography, Spaceborne photography, Landscape types, Classifications, Simulation, Spaceborne photography, Runoff forecasting, United States—Pennsylvania

52-4508

Reaction and diffusion in heterogeneous atmospheric chemistry studied by attenuated total internal reflection IR spectroscopy.

Horn, A.B., Sully, J., *Chemical Society, London. Journal. Faraday transactions,* Aug. 21, 1997, 93(16), p.2741-2746, 49 refs.

Climatology, Atmospheric composition, Stratosphere, Ice vapor interface, Water films, Ice growth, Adsorption, Ion diffusion, Hydrates, Ice spectroscopy, Infrared spectroscopy, Spectra, Simulation

52-4509

Reflection-absorption IR spectroscopic investigation of the photolysis of thin films of dichlorine monoxide and chlorine dioxide.

Gane, M.P., Williams, N.A., Sodeau, J.R., *Chemical Society, London. Journal. Faraday transactions,* Aug. 21, 1997, 93(16), p.2747-2753, 54 refs.

Climatology, Atmospheric composition, Stratosphere, Photochemical reactions, Degradation, Solutions, Water films, Ice solid interface, Infrared spectroscopy, Ice spectroscopy, Spectra, Simulation, Vibration

52-4510

Dynamic and static secondary ion mass spectrometry studies of the solvation of HCl by ice.

Donsig, H.A., Vickerman, J.C., *Chemical Society, London. Journal. Faraday transactions,* Aug. 21, 1997, 93(16), p.2755-2761, 26 refs.

Climatology, Atmospheric composition, Cloud physics, Polar stratospheric clouds, Aerosols, Water films, Ice vapor interface, Absorption, Ion diffusion, Ice spectroscopy, Spectra, Simulation

52-4511

Influence of surface defects on the adsorption of HCl on ice.

Clary, D.C., Wang, L.C., *Chemical Society, London. Journal. Faraday transactions,* Aug. 21, 1997, 93(16), p.2763-2767, 31 refs.

Climatology, Atmospheric composition, Cloud physics, Polar stratospheric clouds, Ice vapor interface, Aerosols, Adsorption, Ice surface, Molecular structure, Defects, Molecular energy levels, Simulation

52-4512

Reactions of NO_2^+ in association with heterogeneous water clusters.

Angel, L., Stace, A.J., *Chemical Society, London. Journal. Faraday transactions,* Aug. 21, 1997, 93(16), p.2769-2773, 25 refs.

Climatology, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Aerosols, Ozone, Hydrocarbons, Aggregates, Degradation, Molecular energy levels, Ice vapor interface, Ionization, Simulation

52-4513

Hydrolysis of SO_3 and $ClONO_2$ in water clusters—a combined experimental and theoretical study.

Akhmatskaia, E.V., et al, *Chemical Society, London. Journal. Faraday transactions,* Aug. 21, 1997, 93(16), p.2775-2779, 30 refs.

Climatology, Atmospheric composition, Cloud physics, Polar stratospheric clouds, Aerosols, Adsorption, Chemical properties, Aggregates, Degradation, Water structure, Molecular energy levels, Simulation

52-4514

Multi-component carbon isotope evidence of early Holocene environmental change and carbon-flow pathways from a hard-water lake in northern Sweden.

Hammarlund, D., Aravena, R., Barnekow, L., Buchardt, B., Possnert, G., *Journal of paleolimnology,* Oct. 1997, 18(3), p.219-233, 54 refs.

Limnology, Subpolar regions, Quaternary deposits, Lacustrine deposits, Paleoecology, Organic soils, Carbon isotopes, Hydrogeochemistry, Geochemical cycles, Isotope analysis, Radioactive age determination, Sweden

52-4515

Colonization and evolution of lakes on the central Norwegian coast following deglaciation and land uplift 9500 to 7800 years B.P.

Solem, J.O., Solem, T., Aagaard, K., Hanssen, O., *Journal of paleolimnology,* Oct. 1997, 18(3), p.269-281, 37 refs.

Limnology, Subpolar regions, Geomorphology, Shoreline modification, Lacustrine deposits, Quaternary deposits, Paleoecology, Algae, Migration, Classifications, Radioactive age determination, Norway

52-4516

Hydrologic control on the oxygen-isotope relation between sediment cellulose and lake water, western Taimyr Peninsula, Russia: implications for the use of surface-sediment calibrations in paleolimnology.

Wolfe, B.B., Edwards, T.W.D., *Journal of paleolimnology,* Oct. 1997, 18(3), p.283-291, 40 refs.

Limnology, Hydrologic cycle, Tundra terrain, Paleoecology, Lacustrine deposits, Water chemistry, Mass balance, Oxygen isotopes, Snowmelt, Seasonal variations, Statistical analysis, Correlation, Russia—Taymyr Peninsula

52-4517

Petroleum hydrocarbon levels around the *Bahía Paraíso* in Arthur Harbor. [Niveles de hidrocarburos de petróleo en los alrededores del casco del buque "Bahía Paraíso", Puerto Arturo, Antártida]

Janiot, L., Molina, D., Vodopivez, C., *Buenos Aires. Instituto Antártico Argentino. Contribución,* 1997, No.474, 15p., In Spanish with English summary. 5 refs.

Crude oil, Hydrocarbons, Oil spills, Environmental impact, Marine biology, Antarctica—Arthur Harbor

The *Bahia Paraíso*, with a cargo of diesel fuel (DFA), jet fuel, gasoline and compressed gas cylinders, ran aground on Jan. 28, 1989 near Anvers I. A 10 m tear in the ship's hull began to discharge petroleum into the water. An estimated amount of 600,000 liters of DFA were spilled, and 100 km^2 of sea surface was covered by an oil slick. Water, organisms and sediments within a 5 km radius of the wreck were contaminated to various degrees for at least 2 years after the spill. During the summer season 1996-97, analysis of a variety of samples collected in the surroundings of the *Bahia Paraíso* wreck showed low levels of petroleum hydrocarbons in Arthur Harbor. (Auth. mod.)

52-4519

Foraminifers in the benthic fauna at the site of wreck of the nuclear submarine "Komsomolets".

Kuznetsov, A.P., Burmistrova, I.I., *Biology bulletin,* Jan.-Feb. 1998, 25(1), p.55-60, Translated from Rossiiskaia akademiia nauk. Izvestiia. Seriia biologicheskaia. 41 refs.

Marine biology, Subpolar regions, Ocean bottom, Ecosystems, Biomass, Nutrient cycle, Bottom sediment, Sampling, Classifications, Environmental tests, Norwegian Sea

52-4520

Rhythmic oscillation of metal content in the thallus of *Fucus distichus* (brown algae) under the polar day conditions.

Tropin, I.V., *Biology bulletin,* Jan.-Feb. 1998, 25(1), p.61-68, Translated from Rossiiskaia akademiia nauk. Izvestiia. Seriia biologischeskaia. 32 refs.

Plant ecology, Marine biology, Shores, Littoral zone, Algae, Chemical composition, Metals, Luminance, Tides, Diurnal variations, Sampling, Barents Sea

52-4521

Hydrobiological and ecological studies in the Arctic: sea biota of the Kara Sea southwestern coast (Baidaratskaia Bay).

Vozzhinskaia, V.B., et al, *Biology bulletin,* Nov.-Dec. 1997, 24(6), p.583-593, Translated from Rossiiskaia akademiia nauk. Izvestiia. Seriia biologicheskaia. 22 refs.

Marine biology, Subpolar regions, Ocean bottom, Shores, Ecosystems, Biomass, Tundra vegetation, Classifications, Pipelines, Environmental protection, Sampling, Russia—Kara Sea

52-4522

Tree-ring based reconstruction of summer temperatures at the Columbia Icefield, Alberta, Canada, AD 1073-1983.

Luckman, B.H., Briffa, K.R., Jones, P.D., Schweingruber, F.H., *Holocene,* Dec. 1997, 7(4), p.375-389, 64 refs.

Climatology, Climatic changes, Air temperature, Seasonal variations, Trees (plants), Forest lines, Age determination, Geochronology, Glacier oscillation, Sampling, Statistical analysis, Canada—Alberta—Athabasca Glacier

52-4523

5500-year proxy-climate and vegetation record from blanket mire at Talla Moss, Borders, Scotland.

Chambers, F.M., Barber, K.E., Maddy, D., Brew, J., *Holocene,* Dec. 1997, 7(4), p.391-399, 54 refs.

Paleoclimatology, Paleoecology, Quaternary deposits, Peat, Decomposition, Palynology, Vegetation patterns, Geochronology, Radioactive age determination, Statistical analysis, Correlation, United Kingdom—Scotland

52-4524

Humic- and fulvic-acid stratigraphy of the Holocene sediments from a small lake in Finnish Lapland.

Reinikainen, J., Hyvärinen, H., *Holocene,* Dec. 1997, 7(4), p.401-407, 32 refs.

Limnology, Arctic landscapes, Paleoclimatology, Paleoecology, Vegetation patterns, Quaternary deposits, Lacustrine deposits, Geochemistry, Chemical properties, Palynology, Stratigraphy, Radioactive age determination, Finland—Lapland

52-4525

Mid- and late-Holocene vegetation, surface weathering and glaciation, Fjallsjökull, southeast Iceland.

Rose, J., Whiteman, C.A., Lee, J., Branch, N.P., Harkness, D.D., Walden, J., *Holocene,* Dec. 1997, 7(4), p.457-471, 42 refs.

Glacial geology, Arctic landscapes, Geomorphology, Glacial erosion, Tectonics, Deformation, Paleoecology, Quaternary deposits, Weathering, Palynology, Stratigraphy, Radioactive age determination, Iceland—Fjallsjökull

52-4526

Holocene vegetation dynamics of the southeast Kola Peninsula, Russia.

Kremenetskiĭ, K.V., Patyk-Kara, N.G., *Holocene,* Dec. 1997, 7(4), p.473-479, 32 refs.

Pleistocene, Paleoclimatology, Climatic changes, Subarctic landscapes, Quaternary deposits, Lacustrine deposits, Paleoecology, Palynology, Forest tundra, Vegetation patterns, Migration, Russia—Kola Peninsula

52-4527

Age and nature of paraglacial debris cones along the margins of the San Rafael Glacier, Chilean Patagonia.

Harrison, S., Winchester, V., *Holocene,* Dec. 1997, 7(4), p.481-487, 34 refs.

Glacial geology, Glacial deposits, Landscape development, Sedimentation, Mass flow, Sediment transport, Slope processes, Lichens, Sampling, Age determination, Chile—Patagonia

52-4528

Toreva blocks in the central Transantarctic Mountains.

Elliot, D.H., *Antarctic journal of the United States,* 1995, 30(5), p.57-59, 5 refs.

Geomorphology, Paleoclimatology, Stratigraphy, Antarctica—Buttress Peak

More than a dozen examples of what may be interpreted as toreva blocks occur in the central Transantarctic Mountains. Toreva blocks are landslide deposits consisting of stratigraphically coherent blocks of sedimentary rock up to several hundred meters in strike length and scores of meters in stratigraphic thickness. An example of a toreva block that shows more significant separation from a bedrock source is that at Buttress Peak. The field relations at Buttress Peak suggest that a mesa-and-butte topography existed at the time of emplacement of that toreva block. The blocks indicate low rates of landscape modification for at least the last 2.5 million years, if not much longer.

52-4529

Chemical compositions of black magnetic spherules in till, Meteorite Moraine, Lewis Cliff ice tongue.

Wight, S.P., Faure, G., *Antarctic journal of the United States,* 1995, 30(5), p.59-60, 7 refs.

Mineralogy, Geochemistry, Cosmic dust, Glacier tongues, Antarctica—Lewis Cliff

Spherules ranging in diameter from about 500 to less than 50 micrometers and composed of black glass containing blocky crystals of olivine and dendrites of magnetite has been discovered in till along the edge of the Beardmore Glacier. An extraterrestrial origin of the spherules was indicated because of: their chemical compositions, which match those of carbonaceous chondrite meteorites; their high concentrations of iridium and gold; and the presence of the cosmogenic radionuclides beryllium-10 and aluminum-26. The authors report chemical compositions of 6 additional spherules extracted from a sample of till collected on the "Meteorite Moraine" at the Lewis Cliff ice tongue.

52-4530

Tectonic studies on Lower Paleozoic rocks from the Scott Glacier area, Antarctica.

Grunow, A., Encarnacion, J., *Antarctic journal of the United States,* 1995, 30(5), p.60-61, 4 refs.

Tectonics, Geochemistry, Geochronology, Antarctica—Scott Glacier

During the austral summer of 1994-95 the authors collected geologic samples from basement granitoids, sedimentary and volcanic rocks to improve understanding of the tectonic evolution of the Transantarctic Mountains. Collected were approximately 500 paleomagnetic and approximately 30 uranium-lead and argon-argon geochronologic specimens during the field season from the Ackerman and Wyatt formations, and several basement granitoids. The mapping indicates that the potassium-feldspar megacrystic granite found at Price Bluff and Mount Zanuck is the oldest of the large granitoids in the area.

52-4531

Middle Devonian paleosols and vegetation of the Lashly Mountains, Antarctica.

Retallack, G.J., Robinson, S.E., Krull, E.S., *Antarctic journal of the United States,* 1995, 30(5), p.62-65, 24 refs.

Soil analysis, Soil structure, Paleoecology, Paleobotany, Antarctica—Lashly Mountains

Paleosols of the Aztec Siltstone are considered to be especially impressive for their development of subsurface clayey horizons and large root traces of the kinds usually associated with woody vegetation. These paleosols may represent an early phase in the evolution of woody vegetation and its soils. The authors' detailed observations were confined to the central part of the Aztec Siltstone on a steep ridge southeast of Mount Crean. This part of the formation was measured and is described, with particular attention to paleosol development, color, and reaction with acid. These and other features of the paleosols were used for a field classification into 5 pedotypes (paleosol types), which are thought to reflect particular ancient environments.

52-4532

Diatoms in igneous and metamorphic rocks from Queen Maud Land, East Antarctica: improbable places, improbable surfaces.

Burckle, L.H., *Antarctic journal of the United States,* 1995, 30(5), p.67-68, 7 refs.

Paleobotany, Stratigraphy, Glacial geology, Pleistocene, Antarctica—Queen Maud Land

At an Apr. 1995 workshop on Pliocene antarctic glaciation, the author reported finding Pliocene-Pleistocene diatoms in Devonian to Cretaceous sedimentary and igneous rocks from the dry valleys and Marie Byrd Land. These data effectively ruled out the use of diatoms in antarctic sediments to document multiple collapse and renewal episodes of the east antarctic ice sheet during the Neogene. The major argument against the author's findings was that the samples had been contaminated. He responds to this objection by describing various tests against the argument.

52-4533

Meteorite searches in the Foggy Bottom region of the Walcott Névé Transantarctic Mountains, Antarctica, 1994-1995.

Harvey, R.P., Schutt, J.W., *Antarctic journal of the United States,* 1995, 30(5), p.70-73.

Cosmic dust, Nunataks, Geochemistry, Antarctica—Walcott Névé

The goal for the 1994-1995 season's research was to complete the systematic search for the meteorites in a set of unnamed nunataks at the southeast end of the Walcott Névé. In total, 611 meteorites were recovered during the season. The vast majority of these are ordinary chondrites, and are thought to represent a small number of shower falls rather than a large number of individual falls.

52-4534

Some terrestrial aspects of meteorite accumulations in the Queen Alexandra Range region, Victoria Land.

Benoit, P.H., Sears, D.W.G., *Antarctic journal of the United States,* 1995, 30(5), p.73-74, 5 refs.

Cosmic dust, Geochemistry, Ice sheets, Antarctica—Queen Alexandra Range

In this article, the authors review some of their work involving natural thermoluminescence measurements on ordinary chondrites (the most common group of meteorites) from blue icefields near the Queen Alexandra Range and they concentrate on the terrestrial implications of these data. Preliminary results suggest that even in the localized area of the icefields near the Queen Alexandra Range different processes are dominant in different icefields, and that certain icefields in the area became active accumulators of meteorites at different periods as a result of the interaction of the ice sheet with the local terrain.

52-4535

Synchrotron x-ray topographic studies of dislocations in polycrystalline ice.

Baker, I., Liu, F., Jia, K., Hu, X., Dudley, M., *Antarctic journal of the United States,* 1995, 30(5), p.75-76, 8 refs.

Land ice, X ray analysis, Ice crystal optics, Ice deformation, Ice mechanics, Ice surface

White-beam synchrotron x-ray topography method was used to study polycrystalline ice by the authors. The high brightness of the synchrotron x-ray source eliminates problems arising from long exposure times, and the broad spectral range of the area-filling beam means that several grains in large-grained polycrystals can be imaged simultaneously in a single, few-second exposure. This allows higher resolution images to be obtained without blurring from dislocation movement. It has been shown that grain boundaries dominate the deformation behavior of ice. The studies help to elucidate the fundamental mechanisms responsible for the mechanical behavior of ice.

52-4536

Geochemical composition and stratigraphy of tephra layers in antarctic blue ice: insights into glacial tephrochronology.

Dunbar, N.W., Kyle, P.R., McIntosh, W.C., Esser, R.P., *Antarctic journal of the United States,* 1995, 30(5), p.76-78, 6 refs.

Volcanic ash, Geochemistry, Geochronology, Glacial geology, Ice composition, Impurities, Antarctica—Transantarctic Mountains

The blue ice areas where meteorites are collected also contain "dust bands" exposed in stratigraphic section at the ice surface, many of which are volcanic ashes (tephra). Approximately 50 of these layers from a number of different blue ice areas along the Transantarctic Mountains were sampled during the 1994-95 field season and most are revealed to be tephra, although some layers contain terrestrial wind-blown(?) debris. Argon-40/argon-39 dating of large tephra samples offers a means of establishing a chronology that may extend back to 300,000 years ago or more. Dated layers found in blue ice areas may be geochemically correlated with tephra in deep ice cores, enabling a reliable chronology to be established.

52-4537

***In situ* cosmogenic carbon-14 in polar ice: chemical phases and concentrations.**

Lal, D., Jull, A.J.T., *Antarctic journal of the United States,* 1995, 30(5), p.79-80, 5 refs.

Ice composition, Radioactive age determination, Ice accretion

The authors have measured concentrations of cosmogenic carbon-14 in the two chemical phases, carbon monoxide and carbon dioxide, present in accumulating polar ice from several sites in Antarctica and in Greenland. The aims of this ongoing investigation are outlined. Several conclusions drawn from the studies are discussed. It is pointed out that the present studies lead to a certain self-consistent framework for interpreting the record of *in situ* carbon-14 in ice.

52-4538

Characterization of the glacimarine grounding-line environment of Mackay Glacier Tongue, Antarctica, using a submersible remotely operated vehicle.

McInnes, J.N., Powell, R.D., *Antarctic journal of the United States,* 1995, 30(5), p.80-82, 3 refs.

Marine geology, Glacial deposits, Glacial erosion, Glacier tongues, Antarctica—Mackay Glacier Tongue

The environment beneath a polar floating glacier tongue was observed using a submersible remotely operated vehicle (ROV) during the 1994-95 field season on the Mackay Glacier Tongue. A primary goal of the study was to determine processes by which polar glaciers transport debris from terrestrial to marine environments and to estimate the sediment volume contributed annually to the grounding line depositional system. The ROV was used to document physical processes involved in release of debris beneath the glacier and sediment dispersal and accumulation rates within the ice-proximal glacimarine environment. Sedimentation in this environment is thought to be an important factor influencing the behavior of marine-ending glaciers during periods of climatic change.

52-4539

Chronology of glacial marine lithofacies related to the recession of the west antarctic ice sheet in the Ross Sea.

Hilfinger, M., Franceschini, J., Domack, E.W., *Antarctic journal of the United States,* 1995, 30(5), p.82-84, 13 refs.

Marine geology, Geochemistry, Glacial geology, Geochronology, Glacier oscillation, Ice sheets, Antarctica—Ross Sea

Over the last 2 years the authors have been developing a detailed chronology based on accelerator mass spectrometer radiocarbon dating of glacial marine sediments from the Ross Sea. Their primary objective has been to place temporal constraints on the recession of the west antarctic ice sheet from the Ross Sea continental shelf.

52-4540

Siple Dome ice core—reconnaissance glaciochemistry.

Mayewski, P.A., Twickler, M.S., Whitlow, S., *Antarctic journal of the United States,* 1995, 30(5), p.85-87, 9 refs.

Ice cores, Ice composition, Climate, Antarctica—Siple Coast

Two highly resolved Northern Hemisphere climate records, obtained from ice cores including Summit, Greenland, contain a robust environmental history of climate events. Two sites have now been identified in West Antarctica from which Summit Greenland-like quality records may be recovered. In this article, the authors describe the initial results of a glaciochemical survey conducted at one of these sites (Siple Dome) during the 1994-95 field season. During the 1995-96 field season, similar work will be conducted at the "inland site."

52-4541
Satellite image and global positioning system study of the morphology of Siple Dome, Antarctica.
Scambos, T.A., Nereson, N.A., *Antarctic journal of the United States,* 1995, 30(5), p.87-89, 10 refs.
Topographic surveys, Spaceborne photography, Image processing, Ice surface, Ice cores, Antarctica—Siple Coast
A series of articles, of which this is one, discusses the results of image analysis and fieldwork conducted during the 1994-95 field season at Siple Dome with the objective of characterizing Siple Dome as a potential site for deep ice coring and investigating the history of ice dynamics in the area. Fieldwork consisted of surface-based ice-penetrating radar profiling, shallow core and snow pit observations, and global positioning system and optical surveying for ice motion, strain, and topography determinations.

52-4542
Radar observations of relict ice-stream margin traversing Siple Dome, Antarctica.
Jacobel, R.W., Gades, A.M., *Antarctic journal of the United States,* 1995, 30(5), p.89-91, 7 refs.
Ice surface, Ice cores, Radar, Spaceborne photography, Antarctica—Siple Coast
During the 1994-95 field season, the authors carried out radar observations on Siple Dome as a part of glaciological studies. The purpose was to characterize the summit region ice dynamics and history for a possible deep-core site and to use the radar to investigate a curvilinear scarlike feature traversing the northeast flank of the dome. The radar studies confirm that the scar feature is the margin of a former ice stream that shut down prior to 1,300 y.a.

52-4543
Geometry and stratigraphy of Siple Dome, Antarctica.
Raymond, C.F., Nereson, N.A., Gades, A.M., Conway, H., Jacobel, R.W., Scambos, T.A., *Antarctic journal of the United States,* 1995, 30(5), p.91-93, 3 refs.
Ice surface, Ice cores, Stratigraphy, Ice age theory, Antarctica—Siple Coast
Geophysical observations were carried out on Siple Dome during the 1994-1995 field season. The dome lies between ice streams C and D, and its geometry and internal stratigraphy should contain information about the history of these bounding ice streams. This article describes the broadscale geometry of the surface, bed, and internal layering with focus on the near summit area, which is a potential site for deep coring. The stratigraphy indicates that Siple Dome has been in existence at its present location for about 10,000 years.

52-4544
Electrical measurements on the Taylor Dome ice core.
Taylor, K., *Antarctic journal of the United States,* 1995, 30(5), p.94-95, 4 refs.
Ice cores, Electrical properties, Dielectric properties, Paleoclimatology, Antarctica—Taylor Dome
The Taylor Dome ice core, recovered in the 1993-94 field season, is an archive of ancient snow, particles, and atmospheric gases. The authors determined direct-current conductivity of the ice by using the electrical conductivity method, and the alternating-current conductivity of the ice by using dielectric properties (DEP) measurement. Variations in the ionic concentrations associated with changes in atmospheric transport and ocean process, the transition between the Holocene and Wisconsin time periods, and other marine isotope stages can be readily observed in the DEP record.

52-4545
Cosmogenic isotope concentrations at Taylor Dome, Antarctica.
Steig, E., Stuiver, M., Polissar, P., *Antarctic journal of the United States,* 1995, 30(5), p.95-97, 13 refs.
Snow composition, Isotopes, Snow accumulation, Ice cores, Cosmic dust, Antarctica—Taylor Dome
Analyses of cosmic-ray produced beryllium-10 (^{10}Be) and chlorine (^{36}Cl) in the Taylor Dome core can be used to study past solar and geomagnetic activity, atmospheric mixing patterns, and aerosol deposition processes. Over the past several field seasons at Taylor Dome, the authors have collected and measured ^{36}Cl and ^{10}Be concentrations in snow pits and shallow firn cores. They present a summary of the preliminary data and discuss the possible implications for ice-core analysis. A table summarizes the results of ^{10}Be measurements in surface snow at Taylor Dome, along with estimated accumulation rates from each location.

52-4546
Surface velocity of ice streams D and E, West Antarctica.
Bindschadler, R., Vornberger, P., Scambos, T.A., *Antarctic journal of the United States,* 1995, 30(5), p.98-99, 3 refs.
Stream flow, Velocity measurement, Ice sheets, Imaging, Mapping, Antarctica—West Antarctica
Sequential Landsat Thematic Mapper imagery has been used to derive a map of surface velocity for the active ice streams D and E in West Antarctica. The method applies a cross-correlation procedure to track unique features on eight pairs of time-separated images. Over 75,000 velocity measurements were made of ice streams D and E using this technique. Suitable features for both coregistration and velocity mapping were found within most of the gray-scaled region shown in a figure. The resultant velocity field displays clearly the overall along-flow acceleration of ice from the head of the ice stream to the ice shelf and intense shear at the lateral margins. The details of the velocity patterns on the two ice streams are distinctly different.

52-4547
Evidence for thicker ice in interior West Antarctica.
Borns, H.W., Jr., Dorion, C., Calkin, P.E., Wiles, G.C., Barclay, D., *Antarctic journal of the United States,* 1995, 30(5), p.100-101, 11 refs.
Ice cover thickness, Ice surface, Glacial deposits, Moraines, Glacial geology, Ice sheets, Antarctica—West Antarctica
During the 1994-95 field season, the authors found evidence for a once thicker ice sheet on the flanks of Mount Waesche. Mount Waesche is the southernmost nunatak of the volcanic Executive Committee Range, about 350 km inland from the coast of West Antarctica. Ice-cored moraines at the current ice-sheet elevation flank the southwest side of Mount Waesche. The observed lateral moraines clearly indicate an ice-sheet surface that was higher than present at Mount Waesche. This may indicate that the west antarctic ice sheet as a whole was thicker at interior sites in the past.

52-4548
Natural event monitoring of ice stream C, West Antarctica.
Anandakrishnan, S., *Antarctic journal of the United States,* 1995, 30(5), p.102-103, 4 refs.
Seismic surveys, Streams, Icequakes, Antarctica—West Antarctica
During the austral summer of 1994-95, arrays of seismometers were deployed in the catchment of ice stream C and on its upper limb. This is the first year of a 2-year deployment to map the number of basal microearthquake events along the length of ice stream C and to correlate that activity to the basal hydrologic potential; it has been hypothesized that basal microearthquakes are zones of high stress that are indicators of low water content at the bed. In addition to deploying high-frequency sensors to detect local events, two broadband sensors were also deployed as a test of regional and teleseismic recording on ice.

52-4549
Structural ice control: a review.
Tuthill, A.M., MP 5135, *Journal of cold regions engineering,* June 1998, 12(2), p.33-51, 45 refs.
River ice, Ice navigation, Ice jams, Countermeasures, Ice control, Hydraulic structures, Offshore structures, Ice booms, Artificial islands, Ice breakup, Ice solid interface, Classifications, Performance
This paper reviews the state of the art in structural ice control, addressing the ranges as well as the limitations of ice retention methods in use today. Structural techniques are grouped according to the main purposes of ice formation and breakup ice control. The objectives and performance of a range of existing ice retention structures are discussed, with special attention given to innovative methods. Typical hydraulic conditions of application for different types of structures are considered, and possible future directions in structural ice control research and development are discussed.

52-4550
Field-scale in-situ compliance of arctic first-year sea ice.
Adamson, R.M., Dempsey, J.P., *Journal of cold regions engineering,* June 1998, 12(2), p.52-63, 19 refs.
Sea ice, Ice mechanics, Ice cover strength, Ice creep, Ice deformation, Cracking (fracturing), Crack propagation, Dynamic loads, Viscoelasticity, Ice solid interface, Mechanical tests, Mathematical models, Correlation

52-4551
Predicting frost heave using FROST model with centrifuge models.
Yang, D., Goodings, D.J., *Journal of cold regions engineering,* June 1998, 12(2), p.64-83, 15 refs.
Frozen ground mechanics, Soil freezing, Clay soils, Frost heave, Frost penetration, Mathematical models, Mechanical tests, Correlation, Statistical analysis, Forecasting, Accuracy

52-4552
Site investigations of fuel spill migration into permafrost.
Biggar, K.W., Haidar, S., Nahir, M., Jarrett, P.M., *Journal of cold regions engineering,* June 1998, 12(2), p.84-104, 8 refs.
Soil pollution, Arctic landscapes, Frozen ground chemistry, Active layer, Permafrost hydrology, Oil spills, Seepage, Migration, Permeability, Profiles, Environmental tests, Drill core analysis, Chemical analysis, Canada—Northwest Territories—Ellesmere Island, Canada—Northwest Territories—Ellef Ringnes Island

52-4553
Koolen metamorphic complex, NE Russia: implications for the tectonic evolution of the Bering Strait region.
Bering Strait Geologic Field Party, *Tectonics,* Oct. 1997, 16(5), p.713-729, 70 refs.
Pleistocene, Tectonics, Geological surveys, Geological maps, Subpolar regions, Geologic processes, Deformation, Earth crust, Magma, Russia—Chukchi Peninsula

52-4554
Timberline fluctuations and late Quaternary paleoclimates in the southern Rocky Mountains, Colorado.
Fall, P.L., *Geological Society of America. Bulletin,* Oct. 1997, 109(10), p.1306-1320, 67 refs.
Paleoclimatology, Climatology, Paleoecology, Palynology, Classifications, Quaternary deposits, Forest lines, Vegetation patterns, Periodic variations, Sampling, Stratigraphy, Geochronology, United States—Colorado—Rocky Mountains

52-4555
Soil development on a Pleistocene terrace sequence, Boise Valley, Idaho.
Othberg, K.L., McDaniel, P.A., Fosberg, M.A., *Northwest science,* Nov. 1997, 71(4), p.318-329, 39 refs.
Pleistocene, Geomorphology, Landscape development, Soil formation, Soil chemistry, Clay soils, Terraces, Geochronology, United States—Idaho

52-4556
Detection of features in first-year pack ice by synthetic aperture radar (SAR).
Melling, H., *International journal of remote sensing,* Apr. 1998, 19(6), p.1223-1249, 38 refs.
Sea ice, Ice surveys, Pack ice, Pressure ridges, Detection, Ice bottom surface, Ice cover thickness, Backscattering, Spaceborne photography, Synthetic aperture radar, Underwater acoustics, Image processing, Correlation, Beaufort Sea

52-4557
New reflections on the structure and evolution of the Makkovikian—Ketilidian Orogen in Labrador and southern Greenland.
Kerr, A., Hall, J., Wardle, R.J., Gower, C.F., Ryan, B., *Tectonics,* Dec. 1997, 16(6), p.942-965, 70 refs.
Pleistocene, Tectonics, Geologic structures, Subpolar regions, Earth crust, Seismic surveys, Seismic reflection, Profiles, Gravity anomalies, Models, Greenland

52-4558
On the morphodynamics of ice/debris-transport systems in cold mountain areas.
Haeberli, W., *Norsk geografisk tidsskrift,* Mar. 1996, 50(1), p.3-9, 48 refs.
Geomorphology, Mountain soils, Landscape development, Geocryology, Periglacial processes, Glacial erosion, Glacier flow, Frost action, Sediment transport, Rock glaciers, Permafrost mass transfer, Theories

52-4559

Mapping and modelling of mountain permafrost distribution in the Alps.

Hoelzle, M., *Norsk geografisk tidsskrift,* Mar. 1996, 50(1), p.11-15, 17 refs.

Permafrost surveys, Alpine landscapes, Discontinuous permafrost, Permafrost distribution, Mapping, Snow cover distribution, Snow temperature, Permafrost indicators, Correlation, Insolation, Radiation balance, Models, Switzerland—Alps

52-4560

Geological control of slope processes in northwest Spitsbergen.

André, M.F., *Norsk geografisk tidsskrift,* Mar. 1996, 50(1), p.37-40, 8 refs.

Geomorphology, Arctic landscapes, Slope processes, Bedrock, Rock glaciers, Periglacial processes, Frost shattering, Rock mechanics, Norway—Spitsbergen

52-4561

Permafrost mapping and prospecting in southern Norway.

Ødegård, R.S., Hoelzle, M., Johansen, K.V., Sollid, J.L., *Norsk geografisk tidsskrift,* Mar. 1996, 50(1), p.41-53, 43 refs.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Snow cover distribution, Snow temperature, Profiles, Permafrost indicators, Sounding, Mapping, Correlation, Norway

52-4562

Long-term mass balance of selected polythermal glaciers on Spitsbergen, Svalbard.

Etzelmüller, B., Sollid, J.L., *Norsk geografisk tidsskrift,* Mar. 1996, 50(1), p.55-66, 22 refs.

Glacier surveys, Photogrammetric surveys, Sensor mapping, Glacier flow, Velocity measurement, Glacier oscillation, Glacier mass balance, Altitude, Subglacial drainage, Topographic features, Norway—Spitsbergen

52-4563

Meltwater routing in a high arctic glacier, Hannabreen, northern Spitsbergen.

Vatne, G., Etzelmüller, B., Ødegård, R.S., Sollid, J.L., *Norsk geografisk tidsskrift,* Mar. 1996, 50(1), p.67-74, 15 refs.

Glacial hydrology, Glacier mass balance, Glacier melting, Subglacial drainage, Runoff, Channels (waterways), Flow measurement, Sounding, Hydrography, Electrical resistivity, Seasonal variations, Norway—Spitsbergen

52-4564

Chronology of Pleistocene glacial advances in the central Rocky Mountains.

Chadwick, O.A., Hall, R.D., Phillips, F.M., *Geological Society of America. Bulletin,* Nov. 1997, 109(11), p.1443-1452, 48 refs.

Pleistocene, Geomorphology, Mountain glaciers, Glacial geology, Terraces, Moraines, Outwash, Glacier oscillation, Mapping, Geochronology, Radioactive age determination, United States—Wyoming—Rocky Mountains

52-4565

Cosmogenic ^{36}Cl and ^{10}Be ages of Quaternary glacial and fluvial deposits of the Wind River Range, Wyoming.

Phillips, F.M., et al, *Geological Society of America. Bulletin,* Nov. 1997, 109(11), p.1453-1463, 51 refs.

Pleistocene, Quaternary deposits, Sedimentation, Glacial geology, Glacier oscillation, Moraines, Sampling, Geochronology, Gamma irradiation, Radioactive age determination, Isotope analysis, Correlation, United States—Wyoming—Wind River Range

52-4566

Effect of sea ice compaction on high latitude atmospheric variability.

Kattsov, V.M., Meleshko, V.P., Alekseev, G.V., Matiugin, V.A., Shneerov, B.E., Gavrilina, V.M., *Russian meteorology and hydrology,* 1997, No.4, p.30-40, Translated from Meteorologiia i gidrologiia. 16 refs.

Climatology, Polar atmospheres, Synoptic meteorology, Sea ice distribution, Air ice water interaction, Polynyas, Heat flux, Mathematical models, Thermal regime, Statistical analysis, Climatic factors, Arctic Ocean

The atmosphere response to variations in sea ice compactness in both polar hemispheres in different seasons is studied with the MGO global spectral atmospheric general circulation model T30L14. The effect of polynyas and clearings on a thermal regime and the atmospheric circulation is most pronounced in the fall and winter. Statistically significant responses to variations in the geopotential height and precipitation are obtained both in synoptic (from 2.5 to 6 days) and low-frequency (from 10 days to a season) parts of the temporal spectrum. (Auth. mod.)

52-4567

Influence of spatial distribution of sea surface temperature on ice appearance dates on the rivers of the European CIS.

Ginzburg, B.M., Sil'nitskaia, M.I., *Russian meterology and hydrology,* 1997, No.4, p.58-63, Translated from Meteorologiia i gidrologiia. 23 refs.

Climatology, Atmospheric circulation, Air temperature, Marine atmospheres, Surface temperature, River ice, Freezeup, Seasonal variations, Statistical analysis, Correlation, Forecasting

52-4568

Magnetobiostratigraphic chronology of the Eocene-Oligocene transition in the CIROS-1 core, Victoria Land margin, Antarctica: implications for antarctic glacial history.

Wilson, G.S., Roberts, A.P., Verosub, K.L., Florindo, F., Sagnotti, L., *Geological Society of America. Bulletin,* Jan. 1998, 110(1), p.35-47, 72 refs.

Pleistocene, Marine geology, Bottom sediment, Glacial geology, Drill core analysis, Geomagnetism, Stratigraphy, Paleoclimatology, Continental drift, Geochronology, Antarctica—Victoria Land

Recently, the chronology of the CIROS-1 core had been questioned. The authors developed a magnetostratigraphy for the lower 400 m of the CIROS-1 core to clarify the chronology. From correlation with global oxygen isotope and sea-level records, they infer that the antarctic climate and surrounding oceans cooled after separation of Australia and Antarctica and development of deep-water circulation between them. This marked the onset of the Eocene-Oligocene transition at ca. 34.5 Ma. A major East Antarctic ice sheet did not develop until the early-Late Oligocene boundary, toward the end of the Eocene-Oligocene transition. Outlet glaciers did not breach the Transantarctic Mountains and ground across the Ross Sea Shelf until 0.5 m.y. later. (Auth. mod.)

52-4569

Rational use of perennial grasses on drained peat soils in eastern Russia.

Mustafin, A.M., Serikpaev, K.N., *Russian agricultural sciences,* 1996, No.3, p.30-33, Translated from Rossiĭskaia akademiia sel'skokhoziaĭstvennykh nauk. Doklady. 12 refs.

Agriculture, Grasses, Biomass, Peat, Permafrost hydrology, Subsurface drainage, Nutrient cycle, Soil chemistry, Modification, Russia—Buryatya

52-4570

Seismic studies around the Kola Superdeep Borehole, Russia.

Ganchin, Y.V., et al, *Tectonophysics,* Mar. 30, 1998, 288(1-4), International Symposium on Deep Seismic Profiling of the Continents, 7th, Asilomar, CA, Sep. 15-21, 1996. Selected papers, p.1-16, 29 refs.

Tectonics, Subpolar regions, Earth crust, Geologic structures, Boreholes, Seismic surveys, Seismic velocity, Profiles, Fracture zones, Correlation, Russia—Kola Peninsula

52-4571

Seismic lower crustal reflectivity and signal penetration in the Siljan Ring area, central Sweden.

Juhojuntti, N., Juhlin, C., *Tectonophysics,* Mar. 30, 1998, 288(1-4), International Symposium on Deep Seismic Profiling of the Continents, 7th, Asilomar, CA, Sep. 15-21, 1996. Selected papers, p.17-30, 32 refs.

Tectonics, Subpolar regions, Earth crust, Geologic structures, Seismic surveys, Seismic reflection, Profiles, Wave propagation, Data processing, Accuracy, Sweden

52-4572

Crustal structure at the SE Greenland margin from wide-angle and normal incidence seismic data.

Dahl-Jensen, T., Thybo, H., Hopper, J., Rosing, M., *Tectonophysics,* Mar. 30, 1998, 288(1-4), International Symposium on Deep Seismic Profiling of the Continents, 7th, Asilomar, CA, Sep. 15-21, 1996. Selected papers, p.191-198, 18 refs.

Pleistocene, Tectonics, Subpolar regions, Earth crust, Geologic structures, Seismic surveys, Seismic refraction, Continental drift, Greenland

52-4573

Late orogenic extensional origin for the infracrustal gneiss domes of the East Greenland Caledonides (72-74°N).

Andresen, A., Hartz, E.H., Vold, J., *Tectonophysics,* Feb. 28, 1998, 285(3-4), Symposium of the European Union of Geosciences, 8th, Strasbourg, France, Apr. 9-13, 1995. Selected papers, p.353-369, 45 refs.

Tectonics, Geological surveys, Earth crust, Subpolar regions, Geologic processes, Sedimentation, Shear strain, Stratigraphy, Isotope analysis, Greenland

52-4574

Potential for biodegradation of hydrocarbons in soil from the Ross Dependency, Antarctica.

Aislabie, J., McLeod, M., Fraser, R., *Applied microbiology and biotechnology,* Feb. 1998, 49(2), p.210-214, 18 refs.

Soil analysis, Oil spills, Geochemistry, Hydrocarbons, Soil microbiology, Soil pollution, Antarctica—Scott Base, Antarctica—Marble Point, Antarctica—Vanda, Lake

Oil spills occur in the Antarctic when fuel oils such as JP8 jet fuel are moved or stored. Hydrocarbons, both *n*-alkanes and aromatic compounds, have been detected in oil contaminated soils of the Ross Dependency. Soil samples from oil-impacted and control sites were analyzed for hydrocarbon-degrading microbes and for a range of parameters known to limit biodegradative activity. Soils were analyzed for water content, pH, concentrations of nutrients (N and P) and electrical conductivity. Numbers of culturable heterotrophic bacteria and hydrocarbon degraders were greater in some of the oil-contaminated samples. Mineralization studies with ^{14}C-radiolabelled hexadecane and naphthalene demonstrated that nitrogen amendments significantly enhanced hydrocarbon mineralization rates in an oil-impacted soil. (Auth. mod.)

52-4575

Physical processes determining the antarctic sea ice environment.

Allison, I., *Australian journal of physics,* 1997, 50(4), p.759-771, Refs. p.770-771.

Sea ice distribution, Seasonal variations, Air ice water interaction, Ice physics, Ice cover thickness, Air water interactions, Climatic changes

The antarctic sea ice zone undergoes one of the greatest seasonal surface changes on Earth, with an annual change in extent of around 15 x 10^6 km^2. This ice, and its associated snow cover, plays a number of important roles in the ocean-atmosphere climate system: the high albedo ice cover restricts surface absorption of solar radiation and acts as a barrier to the exchange of mass and energy between the ocean and atmosphere, and salt rejected by the growing ice cover affects the ocean structure and circulation. Additionally, a number of sea ice feedback processes have the potential to play an important role in climate change. Much of the antarctic sea ice only grows thermodynamically to about 0.5 m thick, with thickness increases beyond that resulting from the deformational processes of rafting and ridge-building. (Auth. mod.)

52-4576

Ice-Vu: an integrated data communications and image analysis system.

Asmus, K.W., Koonar, A., MacDonald, S., International Conference on Satellite Systems for Mobile Communications and Navigation, 5th, London, UK, May 13-15, 1996 and Conference publication No.424, London, Institution of Electrical Engineers, 1996, p.191-194, 1 ref.

DLC TK5104.I569 1996

Marine transportation, Icebreakers, Ice navigation, Ice reporting, Radar photography, Ice forecasting, Telecommunication, Data processing, Computer programs, Image processing

52-4577

Photobionts isolated from antarctic lichens.

Aoki, M., Nakano, T., Kanda, H., Deguchi, H., *Journal of marine biotechnology,* 1998, 6(1), p.39-43, 16 refs.

Ecology, Deserts, Lichens, Algae, Plant ecology, Structural analysis, Growth, Sampling, Classifications

Dodge (1973) reported 86 genera including 424 species of lichens from Antarctica and its adjacent islands. No systematic study, however, has been carried out on photobionts of the antarctic lichens until now. In this paper, three species of photobiont isolated from some antarctic lichens are reported, with comments on their systematic position and physiological adaptation to low temperatures; in particular, the optimum and upper limit temperatures of their growth under culture condition were almost the same as previously published results. (Auth. mod.)

52-4578

Explicit approach to microphysics in MC2.

Kong, F.Y., Yau, M.K., *Atmosphere-ocean,* Sep. 1997, 35(3), p.257-291, With French summary. 50 refs.

Climatology, Precipitation (meteorology), Fronts (meteorology), Cloud physics, Weather forecasting, Turbulent boundary layer, Ice water interface, Snow crystal growth, Ice sublimation, Sedimentation, Advection, Mathematical models

52-4579

Linking arctic sea-ice and atmospheric circulation anomalies on interannual and decadal timescales.

Slonosky, V.C., Mysak, L.A., Derome, J., *Atmosphere-ocean,* Sep. 1997, 35(3), p.333-366, With French summary. 24 refs.

Climatology, Oceanography, Atmospheric circulation, Atmospheric pressure, Marine atmospheres, Polar atmospheres, Air ice water interaction, Sea ice distribution, Ice cover effect, Statistical analysis, Correlation, Periodic variations, Arctic Ocean

52-4580

Sea-ice interaction and the stability of the thermohaline circulation.

Yang, J.Y., Neelin, J.D., *Atmosphere-ocean,* Dec. 1997, 35(4), p.433-469, With French summary. 56 refs.

Climatology, Oceanography, Ocean currents, Stability, Salinity, Air ice water interaction, Ice cover effect, Heat flux, Thermodynamics, Mathematical models

52-4581

Freezing without ice crystal damage: semithin and ultrathin frozen sections of ethanol-infiltrated tissue for microscopy, with applications to immunocytochemistry.

Christensen, A.K., Lowry, T.B., *Microscopy and microanalysis,* 1995, 1(3), p.217-230, 44 refs.

Cryogenics, Biomass, Microstructure, Electron microscopy, Microanalysis, Laboratory techniques, Microscope slides, Thin sections, Polymers, Saturation, Supercooling, Ice prevention, Low temperature tests

52-4582

Low temperature SEM of precipitated and metamorphosed snow crystals collected and transported from remote sites.

Wergin, W.P., Rango, A., Erbe, E.F., Murphy, C.A., *Microscopy and microanalysis,* 1996, 2(3), p.99-112, 31 refs.

Snow physics, Snowflakes, Sampling, Snow crystal structure, Metamorphism (snow), Algae, Scanning electron microscopy, Microanalysis, Imaging, Stereoscopy, Laboratory techniques, Cold storage, Laboratory techniques

52-4583

Methods for measuring changes in atmospheric O_2 concentration and their application in southern hemisphere air.

Keeling, R.F., Manning, A.C., McEvoy, E.M., Shertz, S.R., *Journal of geophysical research,* Feb. 20, 1998, 103(D3), p.3381-3397, 17 refs.

Climatology, Polar atmospheres, Atmospheric composition, Gases, Oxygen, Indexes (ratios), Meteorological instruments, Measuring instruments, Flow control, Sampling, Laboratory techniques, Standards, Accuracy

Methods are described for measuring changes in atmospheric O_2 concentration with emphasis on gas handling procedures. A 9-year survey of a suite of six reference gases showed no systematic long-term trends in relative O_2 concentrations to the level of 5 per meg. Results are presented from samples collected at Cape Grim, Macquarie I. and the Amundsen-Scott Station. From measurements spanning 1991-1995 it is found that the O_2 concentrations at the South Pole are on average 3.6±1.2 per meg higher than at Cape Grim. This result runs contrary to the expectation that the air at high southern latitudes should be depleted in O_2 as a result of O_2 uptake from the southern ocean and may require the existence of unknown O_2 sources near Antarctica or unexpected atmospheric transport patterns. (Auth. mod.)

52-4584

Air-snow exchange of HNO_3 and NO_y at Summit, Greenland.

Dibb, J.E., Talbot, R.W., Munger, J.W., Jacob, D.J., Fan, S.M., *Journal of geophysical research,* Feb. 20, 1998, 103(D3), p.3475-3486, 36 refs.

Climatology, Aerosols, Atmospheric composition, Sedimentation, Snow air interface, Atmospheric boundary layer, Snow surface, Snow composition, Sampling, Ion exchange, Indexes (ratios), Correlation, Greenland—Summit

52-4585

Comparison of modeled ozone distributions with sonde and satellite observations.

Wauben, W.M.F., Fortuin, J.P.F., Van Velthoven, P.F.J., Kelder, H.M., *Journal of geophysical research,* Feb. 20, 1998, 103(D3), p.3511-3530, 67 refs.

Climatology, Atmospheric composition, Ozone, Distribution, Profiles, Polar atmospheres, Radio echo soundings, Models, Statistical analysis, Correlation, Global change

The global distribution of ozone in the troposphere and lower stratosphere calculated with a three-dimensional chemistry transport model driven by European Centre for Medium-Range Weather Forecasts-analyzed meteorological fields has been compared with observed ozonesonde profiles. This comparison is presented in a new graphical format, which shows in a single panel the vertical and seasonal dependence. The modeled ozone profiles compare reasonably well with climatological ozonesonde data for various stations all over the world, especially if the variability of the ozone concentrations is taken into account. The latitudinal dependence and seasonal dependence of the observations are reproduced by the model calculations, except for the ozone concentrations at the surface. The ozone column density obtained by combining calculated ozone distributions up to 50 hPa with climatological zonal mean data for ozone above 50 hPa compares reasonably well with total ozone mapping spectrometer observations. The variability caused by synoptic features observable in modeled total ozone shows a high degree of correspondence to the observations. In this study a methane and carbon monoxide chemistry scheme has been employed without stratospheric chemistry. (Auth. mod.)

52-4586

Temperature-dependent nucleation rate constants and freezing behavior of submicron nitric acid dihydrate aerosol particles under stratospheric conditions.

Bertram, A.K., Sloan, J.J., *Journal of geophysical research,* Feb. 20, 1998, 103(D3), p.3553-3561, 34 refs.

Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Aerosols, Freezing points, Nucleation rate, Homogeneous nucleation, Spectroscopy, Spectra, Temperature effects, Simulation

52-4587

High-latitude, summertime NO_x activation and seasonal ozone decline in the lower stratosphere: model calculations based on observations by HALOE on UARS.

Brühl, C., Crutzen, P.J., Grooß, J.U., *Journal of geophysical research,* Feb. 20, 1998, 103(D3), p.3587-3597, 26 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Degradation, Photochemical reactions, Aerosols, Ozone, Radiometry, Models, Seasonal variations

52-4588

Predicting total ozone based on GTS data: applications for South American high-latitude populations.

Jones, A.E., Bowden, T., Turner, J., *Journal of applied meteorology,* May 1998, 37(5), p.477-485, 23 refs.

Climatology, Polar atmospheres, Atmospheric composition, Ozone, Migration, Solar radiation, Ultraviolet radiation, Forecasting, Environmental impact, Chile—Punta Arenas

A regular occurrence during the 1990s has been the excursion of the edge of the springtime antarctic ozone hole over the southernmost region of the South American continent. Given the essential role of atmospheric ozone in absorbing incoming solar ultraviolet radiation, the populations in this area are thus exposed to much higher ultraviolet-B irradiance than is normal for this time of year. The authors report here on a simple technique that might be used to forecast these low ozone episodes, based upon data readily available on the World Meteorological Organization Global Telecommunications System. Using this technique, total ozone during Oct. 1991 at Punta Arenas, Chile, is predicted. (Auth. mod.)

52-4589

Ice loads on a lattice tower estimated by weather station data.

Sundin, E., Makkonen, L., *Journal of applied meteorology,* May 1998, 37(5), p.523-529, 18 refs.

Telecommunication, Towers, Latticed structures, Ice loads, Ice accretion, Temperature measurement, Design criteria, Clouds (meteorology), Meteorological data, Seasonal variations, Statistical analysis, Forecasting

52-4590

Predictions of antarctic crustal motions driven by present-day ice sheet evolution and by isostatic memory of the Last Glacial Maximum.

James, T.S., Ivins, E.R., *Journal of geophysical research,* Mar. 10, 1998, 103(B3), p.4993-5017, Refs. p. 5014-5017.

Earth crust, Isostasy, Glacier mass balance, Viscoelasticity, Gravity, Bedrock, Ice solid interface, Mathematical models, Forecasting, Pleistocene

Detectable crustal motion and secular rate of change of solid-surface gravity may be produced by the Earth's response to present-day and past ice mass changes in Antarctica. Scenarios of present-day ice mass balance, previously utilized to explore the global geodetic signatures of the antarctic ice sheet, produce elastic crustal responses that are typically bounded by uplift rates ≤5 mm/yr, horizontal motion ≤1 mm/yr, and solid-surface gravity change rates ≤1 μGal/yr. A published revision to the CLIMAP model of the antarctic ice sheet at LGM, the D91 model, features a substantially altered West Antarctic ice sheet reconstruction. This revision predicts a spatial pattern of present-day crustal motion and surface gravity change that diverges strikingly from CLIMAP-based models. Tabulated crustal response predictions for selected antarctic bedrock sites indicate critical localities in the interior of West Antarctica where expected responses are large and D91 predictions differ from CLIMAP-based models by a factor of 2 or more. Observations of the postglacial rebound signal in Antarctica might help constrain antarctic mass balance and contribution to sea level rise over the past 20,000 years. (Auth. mod.)

52-4591

Dynamic recrystallization and texture development in ice as revealed by the study of deep ice cores in Antarctica and Greenland.

De La Chapelle, S., Castelnau, O., Lipenkov, V., Duval, P., *Journal of geophysical research,* Mar. 10, 1998, 103(B3), p.5091-5105, 57 refs.

Glaciology, Ice mechanics, Ice sheets, Ice deformation, Recrystallization, Thin sections, Ice crystal structure, Ice cores, Orientation, Dislocations (materials), Migration, Antarctica—Vostok Station, Greenland

The purpose of this work is to obtain a better understanding of recrystallization processes that occur in polar ice sheets and to clarify the relationship between dynamic recrystallization and textures. The study was based on two deep ice cores from Greenland and Antarctica, the GReenland Ice core Project (GRIP) and Vostok ice cores. The transition between recrystallization regimes was studied, estimating, for interglacial ice, the evolution with depth of the dislocation density. This calculation has shown the efficiency of grain boundary migration for the absorption of dislocations. The observed textures were compared with those predicted by the self-consistent approach. Recrystallization textures are interpreted by assuming that the less stressed grains, i.e., the best oriented for basal slip, are favored by the size advantage of subgrains. The recrystallization textures are compared with those of other materials. (Auth. mod.)

52-4592

Crustal accretion at the Reykjanes Ridge, 61°-62°N.

Smallwood, J.R., White, R.S., *Journal of geophysical research,* Mar. 10, 1998, 103(B3), p.5185-5201, 59 refs.

Marine geology, Subpolar regions, Oceanographic surveys, Seismic surveys, Seismic velocity, Earth crust, Ocean bottom, Magnetic anomalies, Hydrothermal processes, Upwelling, Models, Atlantic Ocean

52-4593

History of Antarctica.

Martin, S., Sydney, State Library of New South Wales Press, 1996, 272p., Refs. passim.

DLC G870.M37 1996

Expeditions, History, International cooperation

This history is based on a number of sources, including journal articles, discussions with antarctic workers, and the author's personal experience. The book consists of 8 chapters, as follows: people in Antarctica; early images and contacts; exploitation and exploration 1775-1893; first continental exploration 1895-1919; Antarctica claimed, exploited and occupied 1920-45; the evolution of the Antarctic Treaty 1940-60; after the treaty 1960-96; and conclusion: Antarctica. Each chapter ends with numerous notes providing a basic bibliography for further research.

52-4594

Near realtime use of RADARSAT SAR imagery combined with AVHRR images for ship navigation in Antarctica.

Danduran, P., Garello, R., Mouchot, M.C., Fleury, D., Thépaut, I., Oceans '97 MTS/IEEE Conference. Halifax, Nova Scotia, Canada, Oct. 6-9, 1997. Proceedings, Vol.1, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1997, p.8-11, 5 refs.

DLC GC2.O3 1997 Vol.1

Spaceborne photography, Sea ice distribution, Synthetic aperture radar, Radiometry, Ice reporting, Ice navigation, Image processing, Telecommunication, Antarctica—Dumont d'Urville Station

In polar regions satellite imagery—especially AVHRR and SAR data—has been providing information about ice types and ice concentration. In Antarctica, the availability of SAR images was not sufficient until now for this data to be used on a realtime approach. AVHRR imagery has thus been critical in directing ship navigation in this region. Due to its onboard recorder, the Canadian satellite RADARSAT can now acquire images over Antarctica on a regular basis. Its potential for ship routing in Antarctica and its complementarity with AVHRR were investigated in the experiment presented in this paper. (Auth. mod.)

52-4595

Detection of ice pressure in the Gulf of St. Lawrence using acoustics.

Maillet, A., Oceans '97 MTS/IEEE Conference. Halifax, Nova Scotia, Canada, Oct. 6-9, 1997. Proceedings, Vol.1, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1997, p.203-207, 2 refs.

DLC GC2.O3 1997 Vol.1

Oceanography, Ice navigation, Ice surveys, Ice acoustics, Underwater acoustics, Pack ice, Ice mechanics, Ice pressure, Detection, Spectra, Canada—St. Lawrence, Gulf

52-4596

Navigation system of an autonomous underwater vehicle for antarctic exploration.

Uliana, M., Andreucci, F., Papalia, B., Oceans '97 MTS/IEEE Conference. Halifax, Nova Scotia, Canada, Oct. 6-9, 1997. Proceedings, Vol.1, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1997, p.403-408, 8 refs.

DLC GC2.O3 1997 Vol.1

Oceanography, Exploration, Subsurface investigations, Subglacial observations, Vehicles, Performance, Navigation, Sensors, Filters, Radar echoes

In the context of the Italian Scientific Program for Antarctica an underwater vehicle is being developed that will be capable of operating autonomously for many hours under the antarctic shelf or in sea areas covered by floating ice blocks. The vehicle must carry a navigation system satisfying severe constraints on accuracy, size, and power consumption. During navigation the vehicle cannot use low-cost systems such as magnetic compasses (ineffective near the Earth poles), GPS (which cannot be used underwater), or acoustic transponders (because of the long range of the missions). To estimate its own heading and position, the vehicle can only exploit measurements of acceleration, rotation rate, and velocity. The optimal integration of inertial and velocity measurements is accomplished by using a Kalman filter for correcting the effect of the biases of the inertial sensors (which would cause relevant long-term position errors) by exploiting a velocity measurement. The navigation system is described and its performance analyzed, showing the effectiveness of the indexing technique in improving the Kalman filter performance both in convergence speed and in estimation accuracy. (Auth. mod.)

52-4597

Bird orientation effects in quantitative airborne electromagnetic interpretation of pack ice thickness sounding.

Holladay, J.S., Lo, B., Prinsenberg, S.J., Oceans '97 MTS/IEEE Conference. Halifax, Nova Scotia, Canada, Oct. 6-9, 1997. Proceedings, Vol.2, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1997, p.1114-1119, 2 refs.

DLC GC2.O3 1997 Vol.2

Oceanography, Sea ice, Aerial surveys, Ice cover thickness, Helicopters, Sensors, Radio echo soundings, Height finding, Accuracy, Orientation, Data processing

52-4598

Pack ice stress and convergence measurements by satellite-tracked ice beacons.

Prinsenberg, S.J., Van Der Baaren, A., Fowler, G.A., Peterson, I.K., Oceans '97 MTS/IEEE Conference. Halifax, Nova Scotia, Canada, Oct. 6-9, 1997. Proceedings, Vol.2, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1997, p.1283-1289, 11 refs.

DLC QC2.O3 1997 Vol.2

Oceanography, Sea ice distribution, Pack ice, Ice mechanics, Ice pressure, Thermal stresses, Radio beacons, Sensors, Spacecraft, Wind factors, Air ice water interaction, Statistical analysis

52-4599

Iceberg tracking using HF surface wave radar.

Chan, H.C., Davies, T.W., Hall, P., Oceans '97 MTS/IEEE Conference. Halifax, Nova Scotia, Canada, Oct. 6-9, 1997. Proceedings, Vol.2, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1997, p.1290-1296, 3 refs.

DLC QC2.O3 1997 Vol.2

Sea ice distribution, Ice surveys, Icebergs, Ice detection, Radar tracking, Sensors, Wave propagation, Resolution

52-4600

Prediction of sea ice movement using satellite data.

Rheem, C.K., Maeda, H., Oceans '97 MTS/IEEE Conference. Halifax, Nova Scotia, Canada, Oct. 6-9, 1997. Proceedings, Vol.2, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1997, p.1297-1302, 8 refs.

DLC QC2.O3 1997 Vol.2

Oceanography, Sea ice distribution, Ice surveys, Radiometry, Drift, Ice cover thickness, Ice conditions, Rheology, Forecasting, Mathematical models, Ice water interface, Okhotsk Sea

52-4601

Technical report.

PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, 1055p. (3 vols.), Refs. passim. For individual papers see 52-4602 through 52-4707. The congress program and exhibition catalog is published as a separate booklet in English and French.

Road maintenance, Highway planning, Road icing, Salting, Chemical ice prevention, Sanding, Snow removal, Weather forecasting, Skid resistance, Safety, Cold weather operation, Cost analysis

52-4602

Effects of the technology improvements in winter maintenance of Estonian roads.

Tsefels, K., Varik, H., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.1-6.

Road icing, Ice removal, Snow removal, Salting, Sanding, Road maintenance, Highway planning, Cold weather operation, Cost analysis, Estonia

52-4603

Latvian winter road maintenance.

Lapsins, A., Kronlaks, O., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.7-14.

Road icing, Salting, Sanding, Snow removal, Road maintenance, Highway planning, Economic development, Cold weather operation, Cost analysis, Latvia

52-4604

Performance of winter road operation duties on the national road network within a corporate operation framework—a comparison between the Hungarian and EU practices.

Dobosi, T., Timár, A., Tóth, S., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.15-21.

Road icing, Salting, Snow removal, Highway planning, Road maintenance, Safety, Economic development, Cold weather operation, Cost analysis, Hungary

52-4605

Road standards for winter services.

Jaquet, J., Prahl, K.B., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.23-34.

Highway planning, Road maintenance, Salting, Snow removal, Safety, Legislation, Standards, Cold weather operation, Cost analysis, Denmark

52-4606

Experience of some compartimenti in north Italy on the subject of winter services.

Postiglioni, G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.35-40.

Highway planning, Road maintenance, Salting, Snow removal, Cold weather operation, Cost analysis, Italy

52-4607
Route selection and salt management in Northern Ireland.
Fraser, G., Drew, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.41-52.
Highway planning, Road maintenance, Road icing, Salting, Route surveys, Accidents, Safety, Cold weather operation, Cost analysis, United Kingdom—Northern Ireland

52-4608
Way to optimise winter maintenance.
Danielson, U., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.53-58.
Highway planning, Road icing, Road maintenance, Salting, Snow removal, Cold weather operation, Sweden

52-4609
General political context of winter service in France.
Roussel, J.J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.59-67.
Road icing, Salting, Snow removal, Road maintenance, Highway planning, Cold weather operation, France

52-4610
Winter service level: method of calculation and testing.
Paquier, F., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.69-78.
Road icing, Chemical ice prevention, Salting, Road maintenance, Highway planning, Cold weather operation, Statistical analysis, France

52-4611
Maintenance research—a unique approach to innovation in winter maintenance.
Keranen, P.F., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.79-89, 4 refs.
Road icing, Salting, Sanding, Chemical ice prevention, Snow removal, Road maintenance, Cold weather tests, Research projects, United States—Minnesota

52-4612
Outline of winter road management measures in Japan.
Miyamoto, Y., Mizukami, T., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.91-100.
Road icing, Chemical ice prevention, Salting, Snow removal, Highway planning, Road maintenance, Cold weather operation, Japan

52-4613
From PIVH to DOVH.
Cat, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.101-110.
Highway planning, Road maintenance, Salting, Snow removal, Cold weather operation, France

52-4614
Winter management of a mountain highway.
Caniggia, F., Gillio, I., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.111-118.
Road icing, Chemical ice prevention, Salting, Snow removal, Highway planning, Road maintenance, Cold weather operation, Italy

52-4615
Methods of evaluating the costs of snow removal from roads.
Sakai, T., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.119-129.
Snow removal, Highway planning, Road maintenance, Cold weather operation, Cost analysis, Japan

52-4616
Effects of reduced use of salt in de-icing of roads to the contents of chloride in groundwater.
Vallius, P., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.131-136.
Road maintenance, Salting, Soil pollution, Ground water, Water pollution, Environmental protection, Finland

52-4617
Overview of winter maintenance. Organization and strategies in Spain.
Gutiérrez-Bolívar, O., Vilanova, V., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.137-147, 3 refs.
Highway planning, Road maintenance, Snow removal, Safety, Cold weather operation, Spain

52-4618
Moscow region road maintenance strategy development project.
Popkov, G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.149-164.
Road maintenance, Highway planning, Urban planning, Research projects, Russia—Moscow

52-4619
Flexible working hours during winter.
Dahl, T., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.165-169.
Road maintenance, Highway planning, Cold weather operation, Labor factors, Norway

52-4620
Managing winter maintenance through the eyes of the customer.
Pletan, R.A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.171-179.
Highway planning, Road maintenance, Snow removal, Cold weather operation, United States—Minnesota

52-4621
Greater efficiency by making road maintenance competitive in Sweden.
Nordlander, J.O., Eriksson, H., Brusk, P., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.181-186.
Highway planning, Road maintenance, Salting, Safety, Cold weather operation, Cost analysis, Sweden

52-4622
Danish experience of tendering winter services.
Carstensen, A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.187-197.
Highway planning, Road maintenance, Salting, Snow removal, Cold weather operation, Cost analysis, Denmark

52-4623
Friction based quality assurance measures for snow clearing operations.
Perchanok, M.S., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.199-208, 6 refs.
Road icing, Sanding, Snow removal, Rubber snow friction, Rubber ice friction, Skid resistance, Safety, Road maintenance, Statistical analysis

52-4624
Winter road maintenance—a Swedish typical case.
Bröchner, J., Johansson, A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.209-218, 6 refs.
Highway planning, Road maintenance, Safety, Cold weather operation, Sweden

52-4625
Organisation of winter service on national road network, "Winter Trafficability Plan".
Giloppé, D., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.219-226.
Highway planning, Road maintenance, Cold weather operation, France

52-4626
Independent Region Aosta Valley: problem areas of the extra-urban road maintenance in winter.
Freppa, E., Piazzano, F., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.227-236.
Highway planning, Road maintenance, Snow removal, Salting, Avalanche forecasting, Safety, Cold weather operation, Italy

52-4627
Development of multi-purposes carrier and attachment fleet for protection against skidding in Hungary.
Holnapy, L., Derzsi, M., Künnle, T., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.1, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.237-241.
Road icing, Snow removal, Salting, Skid resistance, Safety, Road maintenance, Hungary

52-4628

Training staff for winter service: the Salles Training Centre.

Pigeon, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.243-248.

Highway planning, Road maintenance, Cold weather operation, Education, France

52-4629

Partnering model for public-private partnerships: a concept maintenance vehicle.

Smithson, L.D., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.249-260, 3 refs.

Motor vehicles, Snow removal equipment, Salting, Chemical ice prevention, Sanding, Research projects, Road maintenance, Design criteria, Cost analysis, United States—Iowa, United States—Michigan, United States—Minnesota

52-4630

Federal Highway Administration involvement in anti-icing and other snow and ice technologies.

Chollar, B.H., Nassif, S.F., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.261-272.

Road icing, Snow removal, Chemical ice prevention, Salting, Road maintenance, Research projects, Cost analysis, United States

52-4631

Technological innovations supporting winter maintenance in Québec.

Deschênes, D., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.273-283.

Road icing, Snow removal, Salting, Chemical ice prevention, Road maintenance, Research projects, Cost analysis, Canada—Quebec

52-4632

Test and evaluation of alternative deicing methods and materials in Sweden.

Ihs, A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.285-296, 14 refs.

Road icing, Salting, Chemical ice prevention, Antifreezes, Ice removal, Artificial melting, Pavements, Skid resistance, Road maintenance, Sweden

52-4633

Effectivity and economy of de-icing agent spraying systems.

Moritz, K., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.297-306, 13 refs.

Road icing, Ice detection, Chemical ice prevention, Ice removal, Accidents, Safety, Road maintenance, Cost analysis, Germany

52-4634

Buthier Viaduct: a different approach to road network maintenance in winter.

Christillin, M., Ardemagni, C., Trombella, G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.307-315.

Bridges, Chemical ice prevention, Salting, Antifreezes, Road maintenance, Italy

52-4635

Equipment for removal of snow and slush.

Andersen, Ø., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.317-324, 2 refs.

Slush, Snow removal equipment, Chemical ice prevention, Salting, Road maintenance, Norway

52-4636

Approach to cost analysis and priorization of snow drift treatments on public highways.

Perchanok, M.S., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.325-335, 8 refs.

Snowdrifts, Snow fences, Snow hedges, Snow removal, Road maintenance, Cost analysis, Environment simulation, Computerized simulation, Canada—Ontario

52-4637

Permissible thickness of snow layer on roads and new snow fence constructions.

Vasil'ev, A.P., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.337-343, 3 refs.

Rubber snow friction, Snow strength, Trafficability, Skid resistance, Traction, Snow fences, Road maintenance

52-4638

Avalanche study and modeling: application to road protection.

Naaim, M., Cligniez, V., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.345-354, 14 refs.

Avalanche modeling, Avalanche forecasting, Road maintenance, Computerized simulation, France

52-4639

Assessing the risks of using de-icing salts on groundwater.

Brod, H.G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.355-364, 23 refs.

Road maintenance, Salting, Environmental impact, Soil pollution, Ground water, Water pollution

52-4640

Solar energy for ice control.

Schlup, U., Schatzmann, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.365-374, 3 refs.

Bridges, Solar radiation, Heat pipes, Heat recovery, Heating, Road icing, Ice prevention, Artificial melting, Road maintenance, Cost analysis, Switzerland

52-4641

Development of highway snow melting technology using natural energy.

Tanno, H., Tezuka, N., Kobayashi, N., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.375-388.

Heat sources, Heat recovery, Heat pumps, Heat pipes, Artificial melting, Snow melting, Snow removal, Road maintenance, Japan

52-4642

Qualification of salt spreaders for winter duty.

Valeux, J.C., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.389-396.

Motor vehicles, Snow removal equipment, Salting, Road maintenance, France

52-4643

Snow drifting acoustic detector.

Font, D., Naaim-Bouvet, F., Roussel, M., Jeymond, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.397-406, 9 refs.

Snowdrifts, Blowing snow, Snow acoustics, Warning systems, Data transmission, Road maintenance

52-4644

Living snow fences.

Naaim-Bouvet, F., Mullenbach, P., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.407-417, 7 refs.

Blowing snow, Snowdrifts, Snow fences, Snow hedges, Protective vegetation, Road maintenance, France

52-4645

To salt? Not to salt? That is the question.

Queyrel, G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.419-427.

Snow removal, Salting, Highway planning, Road maintenance, France

52-4646

Road practicability to the Great Saint Bernard Tunnel in winter.

Charbonnier, P., Réal, C., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.429-435.

Tunnels, Snowsheds, Avalanche engineering, Highway planning, Road maintenance, Italy

52-4647

Developing a system and equipment for efficient snow removal.

Okazaki, H., et al, PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.437-445.

Snow removal equipment, Motor vehicles, Road maintenance, Highway planning, Safety, Japan

52-4648
Implantation of a steady plant for automatically spraying chemical de-icer on the Lausanne Bypass.
Zambelli, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.447-458.
Road icing, Ice detection, Chemical ice prevention, Ice removal, Salting, Artificial melting, Highway planning, Road maintenance, Cost analysis, Switzerland

52-4649
Factors regulating the air-borne spreading of pollutants from roads.
Blomqvist, G., Johansson, E.L., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.459-468, 20 refs.
Road maintenance, Salting, Environmental impact, Air pollution, Soil pollution, Sweden

52-4650
New experiences with the use of abrasives in Germany.
Hanke, H., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.469-475, 11 refs.
Road icing, Salting, Road maintenance, Environmental impact, Health, Safety, Germany

52-4651
Field comparison of snow plow cutting edges.
Nixon, W.A., Wei, Y.C., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.477-486, 14 refs.
Road icing, Snow removal equipment, Ice cutting, Ice removal, Road maintenance

52-4652
Automated bridge deicers for increased safety and decreased salt use in Minnesota.
Keranen, P.F., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.487-497, 3 refs.
Bridges, Road icing, Chemical ice prevention, Salting, Ice removal, Road maintenance, Cost analysis, United States—Minnesota

52-4653
Impact of road de-icers on groundwaters located in the Walloon Region.
Frankart, L., Staquet, F., Defourny, C., Diericx, R., Vandevenne, L., Pirard, F., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.499-515, 21 refs.
Road icing, Chemical ice prevention, Salting, Road maintenance, Environmental impact, Soil pollution, Ground water, Water pollution, Belgium

52-4654
Melt volume and ice penetration study of magnesium chloride and calcium chloride deicers.
McElroy, A.D., Cooper, G., Gall, J.A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.517-528, 5 refs.
Road icing, Chemical ice prevention, Salting, Ice melting, Artificial melting, Road maintenance

52-4655
Effect of deicing chemicals on turfgrass.
Minner, D.D., Bingaman, B.R., Gall, J.A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.529-537.
Chemical ice prevention, Urea, Salting, Soil pollution, Environmental impact, Physiological effects, Grasses, Plant physiology, Revegetation

52-4656
Experimental structures to prevent icing.
Eerola, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.539-546, 2 refs.
Permafrost beneath roads, Road icing, Ice prevention, Culverts, Drains, Drainage, Water pipes, Waterproofing, Thermal insulation, Road maintenance, Finland

52-4657
Personnel training—winter activities.
Dahlen, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.547-552.
Road maintenance, Highway planning, Snow removal, Salting, Labor factors, Education, Cost analysis, Norway

52-4658
Preventing snow accumulation on road pavements.
Saarelainen, S., Kivikoski, H., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.553-561, 8 refs.
Embankments, Snow depth, Snow accumulation, Snow removal, Road maintenance, Finland

52-4659
Winter maintenance—new cutting edge for snowploughs and graders.
Ingulstad, A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.563-569.
Snow removal equipment, Ice cutting, Ice removal, Road maintenance, Cost analysis, Norway

52-4660
Developing an AI based expert system to control an underbody plow.
Nixon, W.A., Novotny, C., Kruger, A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.571-576, 4 refs.
Snow removal equipment, Ice cutting, Computer applications, Road maintenance

52-4661
Lead States program—leading the way with cutting-edge technology.
Shaffer, D., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.577-583, Includes phone, fax, and email of three contact persons.
Road icing, Salting, Sanding, Snow removal, Weather forecasting, Highway planning, Road maintenance, Cold weather operation, Cost analysis, United States

52-4662
Heating plant for the roadway of the Aosta east toll plaza.
Christillin, M., Arditi, R., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.585-594, 8 refs.
Road icing, Ice prevention, Snow melting, Artificial melting, Electric heating, Highway planning, Road maintenance, Italy

52-4663
Anti-icing filler for asphalt concrete mixes.
Grinevich, S.V., Lysenko, V.E., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.595-602.
Road icing, Chemical ice prevention, Concrete pavements, Bituminous concretes, Concrete admixtures, Antifreezes, Road maintenance

52-4664
Conception, design and fabrication of an all composite snowplough for highways.
Bélanger, G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.2, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.603-610.
Motor vehicles, Snow removal equipment, Composite materials, Road maintenance, Canada—Quebec

52-4665
Studded tyres and public health: "The Road Grip Project".
Krokeborg, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.611-620.
Road icing, Salting, Tires, Air pollution, Health, Environmental protection, Safety, Legislation, Highway planning, Road maintenance, Cost analysis, Norway

52-4666
Winter skidding accidents on road surfaces covered with snow and ice under studded-tire regulation.
Takagi, H., Tsutae, A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.621-633, 3 refs.
Road icing, Tires, Rubber ice friction, Skid resistance, Accidents, Safety, Air pollution, Environmental protection, Legislation, Highway planning, Road maintenance, Japan—Hokkaido

52-4667
Intensified snow removal.
Durth, W., Bernhard, M., Stöckert, R., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.635-646, 3 refs.
Snow removal equipment, Streets, Road icing, Skid resistance, Safety, Urban planning, Highway planning, Road maintenance, Germany

52-4668
Winter maintenance on urban roads.
Svedová, D., Kovac, P., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.647-654, 5 refs.
Road icing, Salting, Sanding, Chemical ice prevention, Snow removal, Visibility, Safety, Urban planning, Highway planning, Road maintenance, Slovakia

52-4669
Winter maintenance problems on the streets of Lithuanian cities.
Laurinavicius, A., Cygas, D., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.655-666, 2 refs.
Streets, Road icing, Chemical ice prevention, Salting, Sanding, Snow removal, Skid resistance, Accidents, Safety, Urban planning, Highway planning, Road maintenance, Lithuania

52-4670
Estimating the winter maintenance of a street on the basis of street properties.
Mattsson, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.667-675.
Streets, Road icing, Snow removal, Urban planning, Highway planning, Road maintenance, Cold weather operation, Labor factors, Cost analysis, Finland

52-4671
Single accidents among pedestrians and cyclists in Sweden.
Öberg, G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.677-685, 1 ref.
Road icing, Skid resistance, Accidents, Safety, Human factors engineering, Road maintenance, Sweden

52-4672
Use of brine to combat icy bicycle lane surfaces.
Mikkelsen, L., Prahl, K.B., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.687-697.
Road icing, Chemical ice prevention, Salting, Brines, Safety, Human factors engineering, Road maintenance, Cost analysis, Denmark

52-4673
How to reduce street dust in spring.
Valtonen, J., Mustonen, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.699-704.
Streets, Skid resistance, Sanding, Dust, Air pollution, Urban planning, Road maintenance, Finland

52-4674
Deicer spreading methods for road surfaces following the prohibition of spike tires.
Shimomura, C., Oshita, T., Ebiko, Y., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.705-714.
Road icing, Skid resistance, Salting, Chemical ice prevention, Tires, Air pollution, Health, Legislation, Safety, Road maintenance, Japan

52-4675
Direct and indirect methods for predicting slipperiness of road surfaces in winter using a neural network model.
Nakatsuji, T., Fujiwara, T., Hagiwara, T., Onodera, Y., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.715-728, 12 refs.
Road icing, Rubber ice friction, Skid resistance, Weather forecasting, Safety, Warning systems, Road maintenance, Computerized simulation

52-4676
Variable slip friction measurement techniques for snow and ice operations.
Fleege, E.J., Wambold, J.C., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.729-739, 3 refs.
Road icing, Rubber ice friction, Rubber snow friction, Skid resistance, Safety, Warning systems, Road maintenance

52-4677
Development and validation of BV14, a new twin track fixed slip friction tester for winter road maintenance monitoring in Sweden.
Nordström, O., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.741-753.
Road icing, Rubber ice friction, Rubber ice friction, Skid resistance, Safety, Monitors, Warning systems, Road maintenance, Sweden

52-4678
Improving winter road management under Euroregional project "VIKING".
Leviäkangas, P., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.755-765, 8 refs.
Road icing, Ice forecasting, Weather forecasting, International cooperation, Data processing, Highway planning, Road maintenance, Cold weather operation

52-4679
Assessment of road surface freezing point sensors for the UK.
Burtwell, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.767-778, 7 refs.
Road icing, Ice forecasting, Sensors, Temperature measurement, Weather forecasting, Salting, Safety, Road maintenance, United Kingdom

52-4680
Radiometric system for road surface condition monitoring.
Pani, B., Troïtskiĭ, A., Totaro, S., Khaĭkine, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.779-785.
Road icing, Ice detection, Ice forecasting, Monitors, Radiometry, Road maintenance

52-4681
Integrated system of meteorological roads protection in Poland based on intelligent road weather stations.
Maletka, G., Dzienis, T., Palys, M., Antosz, M., Supernak, S., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.787-795.
Weather stations, Meteorological instruments, Weather forecasting, Data processing, Data transmission, Computer applications, Highway planning, Road maintenance, Poland

52-4682
"Meteo Routes": the Walloon project of meteorological data control for a better service to the users.
Ledent, T., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.797-803.
Road icing, Ice forecasting, Weather forecasting, Data processing, Computer applications, Highway planning, Road maintenance, Belgium

52-4683
Danish winter management system.
Knudsen, F., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.805-816.
Road icing, Ice detection, Ice forecasting, Weather forecasting, Data processing, Warning systems, Cost analysis, Highway planning, Road maintenance, Denmark

52-4684
Winter road management support by pulsed Doppler avalanche radar.
Randeu, W.L., Schreiber, H., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.817-826, 4 refs.
Avalanche forecasting, Radar tracking, Warning systems, Safety, Road maintenance, Austria

52-4685
Winter and MATHEUS: the development and experiences in Finnish road and traffic management.
Muurinen, I., Kokkinen, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.827-834.
Road icing, Ice detection, Ice forecasting, Weather stations, Weather forecasting, Monitors, Data processing, Cost analysis, Urban planning, Highway planning, Road maintenance, Finland

52-4686
Prediction system for winter road maintenance and a study of service levels.
Kobayashi, N., Maruyama, T., Wada, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.835-842.
Weather forecasting, Snowfall, Snow removal, Highway planning, Road maintenance, Cold weather operation, Data processing, Cost analysis, Japan

52-4687
Black ice sensing system with optical fiber sensor.
Tokida, K., Imacho, N., Kato, H., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.843-853.
Road icing, Ice detection, Ice forecasting, Temperature measurement, Sensors, Warning systems, Safety, Road maintenance, Japan

52-4688
Solving the problems of support systems of the Czech Republic winter road maintenance.
Melcher, K., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.855-866.
Road icing, Ice forecasting, Weather forecasting, Snow removal, Chemical ice prevention, Salting, Sanding, Warning systems, Safety, Highway planning, Road maintenance, Cold weather operation, Czech Republic

52-4689
Automatic visibility measurement methods based on video cameras.
Kwon, T.M., Fleege, E., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.867-876, 7 refs.
Visibility, Night vision, Photographic techniques, Photographic reconnaissance, Light (visible radiation), Light scattering, Atmospheric attenuation, Road maintenance, Safety, Mathematical models

52-4690
Winter management system.
Dahl, T., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.877-881.
Highway planning, Road maintenance, Weather forecasting, Snow removal, Data transmission, Computer applications, Cold weather operation, Norway

52-4691
Implementing an integrated Road Weather Information System in Minnesota.
Wikelius, M., Rockvam, J., Fleege, E., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.883-897.
Weather forecasting, Safety, Data processing, Data transmission, Highway planning, Road maintenance, United States—Minnesota

52-4692
Expert system control of automated ice prevention equipment for bridges.
Ask, B., Ask, T., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.899-912, 6 refs.
Bridges, Road icing, Chemical ice prevention, Weather forecasting, Computer applications, Road maintenance

52-4693
WELS-weather prediction system.
Steinacker, R., Spreitzhofer, G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.913-919, 7 refs.
Snowfall, Weather forecasting, Road maintenance, Computer applications

52-4694
Road weather information systems—intelligent transportation system applications by the Nevada Department of Transportation.
Nelson, R.J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.921-925.
Highway planning, Road maintenance, Weather forecasting, Warning systems, Safety, Computer applications, United States—Nevada

52-4695
Driver behaviour on winter roads: a driving simulator study.
Wallman, C.G., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.927-938, 10 refs.
Road icing, Skid resistance, Human factors, Computerized simulation, Environment simulation, Safety, Highway planning, Road maintenance

52-4696
Expressway traffic operation in the winter season.
Suzuki, S., Asano, T., Taketani, E., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.939-946.
Road icing, Snow removal, Highway planning, Road maintenance, Safety, Cold weather operation, Japan

52-4697
Road user information service in Norway.
Leiren, K., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.947-956.
Road icing, Weather forecasting, Data transmission, Warning systems, Safety, Highway planning, Road maintenance, Cold weather operation, Norway

52-4698
Experimental assessment of the effect of snow build-up on the efficiency of a parapet.
Desmarchais, P., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.957-966, 4 refs.
Highway planning, Road maintenance, Snowdrifts, Accidents, Snow removal, Safety, Canada—Quebec

52-4699
Winter serviceability.
Cabanes, A., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.967-976.
Road icing, Tires, Rubber snow friction, Rubber ice friction, Skid resistance, Traction, Cold weather tests, Environmental tests, Road maintenance, France

52-4700
Experience of functional testing of winter tyres for passenger cars and heavy vehicles by means of the VTI indoor flat bed test facility and a mobile tyre test vehicle.
Nordström, O., Gustavsson, L.E., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.977-987, For another source see 52-3577.
Road icing, Motor vehicles, Tires, Rubber snow friction, Rubber ice friction, Traction, Skid resistance, Cold weather tests, Environmental tests, Road maintenance, Sweden

52-4701
ITS technology for winter road management—ITS/Win Research Program of the Hokkaido Development Bureau.
Kajiya, Y., Ishimoto, K., Matsuzawa, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.989-1002, 6 refs.
Highway planning, Road maintenance, Weather forecasting, Safety, Human factors, Data transmission, Computer applications, Cold weather operation, Japan—Hokkaido

52-4702
Laser ray visible system.
Sasaki, M., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.1003-1011.
Snowstorms, Blowing snow, Snow optics, Visibility, Lasers, Human factors engineering, Safety, Road maintenance, Highway planning, Japan

52-4703
Interaction between people, roads and vehicles in Denmark.
Schou, H., Antonsen, L., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.1013-1018.
Highway planning, Road maintenance, Weather forecasting, Safety, Data transmission, Denmark

52-4704
Effects of road and weather conditions on traffic flow on a three-lane rural highway in Finland.
Enberg, Å., Mannan, S., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.1019-1032, 5 refs.
Road icing, Snowfall, Highway planning, Road maintenance, Safety, Cold weather operation, Finland

52-4705
Secondary environmental impact due to winter road salting.
Gustavsson, E., Yakoub, J., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.1033-1042, 5 refs.
Road maintenance, Salting, Environmental impact, Sweden

52-4706

Analysis of accident statistics during three winter seasons.

Johansson, Ö., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.1043-1051, 2 refs.

Road icing, Skid resistance, Accidents, Safety, Road maintenance, Statistical analysis, Sweden

52-4707

Relationship between traffic accident rate and pavement surface conditions in different districts.

Amel'chenko, V., Smirnov, A., Khristoliubov, I., Shipitsin, V., Agalakov, IU., PIARC [Permanent International Association of Road Congresses] International Winter Road Congress, 10th, Luleå, Sweden, Mar. 16-19, 1998. Technical report. Vol.3, Linköping, Swedish National Road and Transport Research Institute (VTI), 1998, p.1053-1055.

Road icing, Skid resistance, Accidents, Safety, Highway planning, Road maintenance, Statistical analysis, Russia—Siberia

52-4708

Contribution of salps to carbon flux of marginal ice zone of the Lazarev Sea, southern ocean.

Perissinotto, R., Pakhomov, E.A., *Marine biology,* Apr. 1998, 131(1), p.25-32, Refs. p.31-32.

Marine biology, Ice edge, Plankton, Sea water, Antarctica—Weddell Sea

In order to estimate the *in situ* grazing rates of *Salpa thompsoni* and their implications for the development of phytoplankton blooms and for the sequestration of biogenic carbon in the Antarctic, a repeat-grid survey and drogue study were carried out in the eastern Weddell Sea during summer of 1994-95. Exceptionally high grazing rates were measured for *S. thompsoni* at the onset of a phytoplankton bloom in Dec. 1994. Dense salp swarms extended throughout the marginal ice zone, consuming up to 108% of daily phytoplankton production and 21% of the total chlorophyll *a* stock. Due to the much faster sinking rates and higher carbon content of salp faecal pellets, the efficiency of downward carbon flux through salps is much higher than through the other major grazers, krill and copepods. *S. thompsoni* can thus export large amounts of biogenic carbon from the euphotic zone to the deep ocean. (Auth. mod.)

52-4709

Belgian scientific research programme on the Antarctic. Phase IV, 1997-2000. Synopsis.

Belgium. Prime Minister's Services. Federal Office for Scientific, Technical and Cultural Affairs (OSTC), Brussels, OSTC, Jan. 1998, 32p.

Research projects, Ecology, Global change, Geochemistry, Sediments, Sea ice, Ice sheets, Air ice water interaction, Oceanographic surveys, Paleoclimatology

This is a synopsis of the 4th phase of the Belgian Scientific Research Programme on the Antarctic. It outlines nine projects covering seven research topics in three areas of interest: marine biota and global change; dynamics of the southern ocean; and paleoenvironmental records. The name of the principal investigator and the title, theme, objectives and task of each project are included.

52-4710

Snow and ice control manual for transportation facilities.

Minsk, L.D., MP 5136, New York, McGraw-Hill, 1998, 289p., Refs. p.263-268.

DLC TE220.5.M56 1998

Road icing, Chemical ice prevention, Salting, Snow removal, Snow removal equipment, Rubber ice friction, Rubber snow friction, Road maintenance, Manuals, Cost analysis

52-4711

Hot talk, cold science: global warming's unfinished debate.

Singer, S.F., Oakland, CA, Independent Institute, 1998, 110p., Refs. p.93-100.

Global warming, Atmospheric circulation, Atmospheric composition, Climatic changes, Long range forecasting, Climate control, Climatic factors, Human factors, Economic development

52-4712

Window on Antarctica: an introduction to the Corporate Plan of the Australian Antarctic Division.

Australian Antarctic Division. Department of the Arts, Sport, the Environment, Tourism and Territories, Hobart, Tasmania, 1991, 27p.

Organizations, Research projects, Expeditions, Stations

52-4713

Basics of snow and ice control. Kansas City, MO, American Public Works Association (APWA), 1998, 43p.

Snowstorms, Ice storms, Road icing, Chemical ice prevention, Salting, Snow removal, Ice detection, Ice forecasting, Weather forecasting, Highway planning, Urban planning, Cold weather operation, Cost analysis

52-4714

Glaciers and glaciation.

Benn, D.I., Evans, D.J.A., London, Arnold, 1998, 734p., Refs. p.631-716.

Glaciation, Glacial geology, Glacial deposits, Glacial erosion, Glacier flow, Glacier friction, Glacier oscillation, Glacier mass balance, Glacial meteorology, Glacial hydrology, Geomorphology, Paleoclimatology, Global change

52-4715

Concentration and separation of impurities in liquid by freezing with supersonic radiation.

Matsuda, A., Kawasaki, K., *Journal of chemical engineering of Japan,* Oct. 1997, 30(5), p.825-830, 5 refs.

Waste treatment, Sludges, Frozen liquids, Ice water interface, Solutions, Freezing, Sound waves, Vibration, Cavitation, Impurities, Solubility, Simulation

52-4716

In-situ testing of near-surface concrete—the foundation for service life prediction.

Long, A.E., Basheer, P.A.M., Rankin, G.I.B., *Insight,* July 1997, 39(7), p.482-487, 14 refs.

Concrete durability, Concrete strength, Surface properties, Permeability, Corrosion, Degradation, Mechanical tests, Freeze thaw tests, Frost resistance, Design criteria, Forecasting

52-4717

Limnological and climatological changes in the Lake Titicaca basin (Bolivia) during the last 30 millennia. [Changements limnologiques et climatologiques dans le bassin du lac Titicaca (Bolivie), depuis 30 000 ans]

Mourguiart, P., et al, *Académie des sciences, Paris. Comptes rendus. Série IIa. Science de la terre et des planètes,* July 1997, 325(2), p.139-146, In French with abridged English version. 32 refs.

Pleistocene, Paleoclimatology, Climatic changes, Limnology, Paleoecology, Lacustrine deposits, Quaternary deposits, Water level, Hydrologic cycle, Sampling, Geochronology, Correlation, Bolivia—Titicaca, Lake

52-4718

Archaean oceanic crust remnants from eastern Finland. [Reliques d'une croûte océanique archéenne en Finlande orientale]

Blais, S., Martin, H., Jégouzo, P., *Académie des sciences, Paris. Comptes rendus. Série IIa. Science de la terre et des planètes,* Sep. 1997, 325(6), p.397-402, In French with abridged English version. 20 refs.

Pleistocene, Subpolar regions, Marine geology, Earth crust, Tectonics, Magma, Stratigraphy, Geochemistry, Lithology, Chemical analysis, Finland

52-4719

Physicochemical features of water in capillaries and fog water droplets. [Caractéristiques physicochimiques de l'eau capillaire et des gouttelettes de brouillard]

Mercury, L., Tardy, Y., *Académie des sciences, Paris. Comptes rendus. Série IIa. Science de la terre et des planètes,* Dec. 1997, 325(12), p.947-954, In French with abridged English version. 21 refs.

Water structure, Thermodynamics, Ice physics, Water vapor, Drops (liquids), Fog, Chemical properties, Dielectric properties, High pressure ice, Freezing points, Capillarity, Models

52-4720

Antarctic Treaty. Final report of the twenty-first Antarctic Treaty Consultative Meeting.

New Zealand Ministry of Foreign Affairs and Trade. Antarctic Policy Unit, Wellington, 1997, 335p.

Legislation, International cooperation, Environmental protection, Education

The Meeting convened in Christchurch, New Zealand, on May 19-30, 1997, with participation of representatives of the Consultative Parties and Delegations from eight Contracting Parties to the Antarctic Treaty. A wide range of topics came under discussion: the operation of the Antarctic Treaty System; tourism and non-governmental activities in the Antarctic Treaty area; inspection, science and education issues; environmental monitoring and environmental protection measures. Discussions of many of these agenda items resulted in specific recommendations. Lists of documents presented at the Meeting are appended.

52-4721

Foam protection of plants against frost: a mathematical simulation and prediction of frost conditions.

Krasovitski, B., Kimmel, E., Amir, I., International Conference on Computers in Agriculture, 6th, Cancun, Mexico, June 1996. Proceedings. Edited by F.S. Zazueta et al, Gainesville, American Society of Agricultural Engineers, 1996, p.1038-1045, 6 refs.

DLC S494.5.D3 I58 1996

Agriculture, Plant physiology, Atmospheric boundary layer, Radiant cooling, Heat loss, Heat transfer, Protective coatings, Thermal insulation, Frost protection, Mathematical models, Frost forecasting

52-4722

Using suction and dielectric measurements as performance indicators for aggregate base materials.

Scullion, T., Saarenketo, T., *Transportation research record,* Aug. 1997, No.1577, p.37-44, 8 refs.

Concrete pavements, Pavement bases, Cold weather performance, Concrete aggregates, Freeze thaw cycles, Frost resistance, Mechanical tests, Hygroscopic water, Capillarity, Permeability, Dielectric properties, Electrical measurement

52-4723

Kansas experience with Strategic Highway Research Program Washington hydraulic fracture index test.

Zubery, M.H., Hossain, M., Clowers, K.C., *Transportation research record,* Aug. 1997, No.1577, p.45-52, 9 refs.

Concrete pavements, Concrete aggregates, Concrete durability, Forecasting, Cold weather performance, Mechanical tests, Cracking (fracturing), Freeze thaw tests, Standards, Classifications, Statistical analysis, Correlation

52-4724

Simple model of forward visibility for snowplow operators through snow and fog at night.

Bullough, J., Rea, M.S., *Transportation research record,* Aug. 1997, No.1585, p.19-24, 14 refs.

Road maintenance, Winter maintenance, Snow removal equipment, Visibility, Night vision, Illuminating, Orientation, Backscattering, Light effects, Blowing snow, Fog, Mathematical models, Safety

52-4725
Survey of snowplow operators about forward lighting and visibility during nighttime operations.
Eklund, N.H., Rea, M.S., Bullough, J., *Transportation research record,* Aug. 1997, No.1585, p.25-29, 6 refs.
Winter maintenance, Safety, Road maintenance, Snow removal equipment, Illuminating, Orientation, Night vision, Visibility, Fog, Blowing snow, Statistical analysis, Cold weather performance, Design

52-4726
Frictional characteristics of sand and sand-deicer mixtures on bare ice.
Hossain, M.M., Bajorski, P., Yang, W.S., *Transportation research record,* Aug. 1997, No.1585, p.30-38, 9 refs.
Pavements, Road maintenance, Winter maintenance, Skid resistance, Sliding, Ice solid interface, Ice temperature, Ice friction, Sanding, Brines, Admixtures, Simulation, Chemical composition, Performance

52-4727
Design of mixed Langmuir films exposing segregated hydroxyl domains for inducing ice nucleation.
Arbel-Haddad, M., Lahav, M., Leiserowitz, L., *Journal of physical chemistry B,* Feb. 26, 1998, 102(9), p.1543-1548, 29 refs.
Cloud physics, Cloud seeding, Ice nuclei, Hydrocarbons, Cloud droplets, Air water interactions, Monomolecular films, Molecular structure, Heterogeneous nucleation, Aggregates, Infrared spectroscopy, X ray diffraction, Spectra, Simulation

52-4728
Climate change as the primary cause for pH shifts in a high alpine lake.
Koinig, K.A., Schmidt, R., Sommaruga-Wögrath, S., Tessadri, R., Psenner, R., *Water, air, and soil pollution,* May 1998, 104(1-2), p.167-180, 48 refs.
Limnology, Alpine landscapes, Climatic changes, Air temperature, Temperature variations, Paleoecology, Lacustrine deposits, Lake water, Hydrogeochemistry, Drill core analysis, Spectroscopy, Statistical analysis, Temperature effects, Austria—Alps

52-4729
3600 years paleoclimatic change inferred from organic $\delta^{13}C$ and TOC/TN of the Gucheng Lake sediments, southeast China.
Shen, J., Matsumoto, R., Wang, S.M., *Chinese journal of oceanology and limnology,* 1997, 15(3), p.279-284, 18 refs.
Paleoclimatology, Climatic changes, Limnology, Paleoecology, Lacustrine deposits, Carbon isotopes, Isotope analysis, Drill core analysis, Organic nuclei, Indexes (ratios), China—Gucheng, Lake

52-4730
Growth of spruce, larch, arolla pine and mountain pine near the timberline of four french alpine sites. [Croissance de l'épicéa, du mélèze, du pin cembro et du pin à crochets en limite supérieure de la forêt dans quatre régions des Alpes françaises]
Petitcolas, V., Rolland, C., Michalet, R., *Annales des sciences forestières,* Dec. 1997, 54(8), p.731-745, In French with English summary. 28 refs.
Forest ecosystems, Forest canopy, Plant ecology, Alpine landscapes, Forest lines, Growth, Classifications, Age determination, France—Alps

52-4731
Strontium, neodymium, and lead isotope variations of authigenic and silicate sediment components from the Late Cenozoic Arctic Ocean: implications for sediment provenance and the source of trace metals in seawater.
Winter, B.L., Johnson, C.M., Clark, D.L., *Geochimica et cosmochimica acta,* Oct. 1997, 61(19), p.4181-4200, Refs. p.4196-4200.
Pleistocene, Marine geology, Bottom sediment, Sea water, Water chemistry, Isotope analysis, Sedimentation, Sediment transport, Sampling, Origin, Stratigraphy, Geochronology, Arctic Ocean

52-4732
Geochemistry and radiometric dating of a Middle Pleistocene peat.
Rowe, P.J., Richards, D.A., Atkinson, T.C., Bottrell, S.H., Cliff, R.A., *Geochimica et cosmochimica acta,* Oct. 1997, 61(19), p.4201-4211, 35 refs.
Pleistocene, Quaternary deposits, Peat, Diagenesis, Soil dating, Isotope analysis, Radioactive isotopes, Spectroscopy, Radioactive age determination, Geochronology, Statistical analysis, United Kingdom—Norfolk

52-4733
Physical forcing of phytoplankton dynamics in the southwestern Ross Sea.
Arrigo, K.R., Weiss, A.M., Smith, W.O., Jr., *Journal of geophysical research,* Jan. 15, 1998, 103(C1), p.1007-1021, 28 refs.
Marine biology, Plankton, Biomass, Polynyas, Air ice water interaction, Turbulent boundary layer, Hydrography, Wind factors, Ice cover effect, Sampling, Antarctica—Ross Sea
Coastal zone color scanner imagery of phytoplankton pigments and passive microwave imagery of sea ice distributions in the southwestern Ross Sea are presented for three different seasons and were analyzed in conjunction with meteorological data obtained from a series of automatic weather stations. Dynamics of the phytoplankton bloom in Terra Nova Bay differed from those in the Ross Sea owing to spatial differences in katabatic wind fields which determine when the surface waters stratify. Interannual variation in the timing of formation of the Ross Sea polynya appears to be controlled by winter temperatures, which determine sea ice thickness and integrity, rather than variability or intensity in wind stress. These data suggest that when the Ross Sea polynya forms early, stronger and more frequent katabatic winds result in increased advective losses of phytoplankton in surface waters and a delay in the phytoplankton bloom. The observation that diatoms dominate both the marginal ice zone and Terra Nova Bay, which are hydrographically similar, suggests that stratification plays an important role in determining species composition in the Ross Sea. (Auth. mod.)

52-4734
Synthesis of particulate and extracellular carbon by phytoplankton at the marginal ice zone in the Barents Sea.
Vernet, M., Matrai, P.A., Andreassen, I., *Journal of geophysical research,* Jan. 15, 1998, 103(C1), p.1023-1037, 86 refs.
Marine biology, Plankton, Biomass, Ecosystems, Nutrient cycle, Ice edge, Ice cover effect, Water chemistry, Chlorophylls, Organic nuclei, Seasonal variations, Sampling, Barents Sea

52-4735
Space-time variation of mixed-layer properties, heat and salt fluxes, and ice melt in the Newfoundland marginal ice zone.
Tang, C.L., DeTracey, B.M., *Journal of geophysical research,* Jan. 15, 1998, 103(C1), p.1177-1191, 33 refs.
Oceanography, Hydrography, Air ice water interaction, Ice melting, Water temperature, Salinity, Heat flux, Pack ice, Ice edge, Ice cover effect, Advection, Mathematical models, Atlantic Ocean

52-4736
Variability in arctic sea ice optical properties.
Perovich, D.K., Roesler, C.S., Pegau, W.S., MP 5137, *Journal of geophysical research,* Jan. 15, 1998, 103(C1), p.1193-1208, 40 refs.
Sea ice, Ice structure, Optical properties, Physical properties, Meltwater, Ice optics, Light transmission, Radiance, Albedo, Radiation absorption, Attenuation, Snow cover effect, Arctic Ocean
During a field experiment at Barrow, AK, the horizontal variability of spectral albedo and transmittance as well as the vertical variability of in-ice radiance were examined. Temporal changes were monitored under cold conditions in Apr. and during the onset of melt in June. Physical properties, including ice structure and concentrations of particulate and dissolved material, were measured to provide a context for understanding the observed temporal, horizontal, vertical, and spectral variability in optical properties. For snow-covered first-year ice in Apr., wavelength-integrated albedos were high and spatially uniform, but there was considerable variability in transmittance. At the onset of melt in June, the ice surface rapidly evolved into a variegated mixture of melting snow, bare ice, and melt ponds. Albedos were much lower and exhibited considerable spatial variability, ranging from 0.2 to 0.5 over distances of a few meters concomitant with the variation in surface characteristics. Transmission increased over the spring transition as surface characteristics evolved to decrease albedo and as in-ice structure was altered by heating to reduce attenuation within the ice. Variability in the in-ice spectral radiance values was observed between nearby sites in both first-year and multiyear ice. Not only was there a strong shift in the spectral nature of the radiance as a function of horizontal distance, but there also existed large changes vertically within the ice. The vertical variability in the radiance attenuation coefficient was spatially coherent with variations in both the physical structure of the ice, especially grain size, and the concentrations of particulate and dissolved materials entrapped in the ice.

52-4737
Paleosalinity and $\delta^{18}O$: a critical assessment.
Rohling, E.J., Bigg, G.R., *Journal of geophysical research,* Jan. 15, 1998, 103(C1), p.1307-1318, 70 refs.
Oceanography, Paleoclimatology, Bottom sediment, Sea water, Salinity, Sea ice distribution, Meltwater, Ice cover effect, Oxygen isotopes, Indexes (ratios), Statistical analysis, Accuracy

52-4738
Late Quaternary climatic and environmental history of Bunger Oasis, East Antarctica. [Die spätquartäre Klima- und Umweltgeschichte der Bunger-Oase, Ostantarktis]
Kulbe, T., *Berichte zur Polarforschung,* 1997, No.254, 129p., In German with English summary. Tabular data p.105-129. Refs. p.97-104.
Paleoclimatology, Geochemistry, Quaternary deposits, Sediments, Antarctica—Bunger Hills
A five months' expedition was carried out in the austral summer 1993-94 within the scope of a bilateral project of the Alfred Wegener Institute (Potsdam) and the Arctic and Antarctic Research Institute (St. Petersburg). The purpose was to obtain a detailed Late Quaternary environmental history by using the proxies of the sediments. More than 100 m of marine and lacustrine sediments were investigated by geochemical and isotopic methods and their physical properties. Absolute ages were obtained by using calibrated ^{14}C dates. For long sediment sequences accumulation rates were calculated. The results show that prior to the Last Glacial Maximum, probably during Middle Weichselian time, organic matter was produced in subaquatic, ice-free environments in the Bunger Oasis or its surroundings. During the Last Glacial Maximum the organic matter was incorporated into the advancing ice masses, and deposited with clastic debris in the oasis. ^{14}C dates made on organic carbon indicate ice-free areas which existed in the southwest portion of Bunger Oasis even at the Last Glacial Maximum. (Auth. mod.)

52-4739
Antarctic Treaty exchange of information in accordance with Articles III(1) & VII(5) and Recommendation VIII(6). Belgian antarctic activities planned for 1997-98.
Belgium. Prime Minister's Services. Federal Office for Scientific, Technical and Cultural Affairs (OSTC), Brussels, 1997, 11p.
Research projects, Sea ice, Ice cores
Activities for 1997-1998 are outlined, including 6 research projects of the summer party and one project of the winter party. Additional information regarding personnel details, scientific equipment, and activities of tour organizers is also provided.

52-4740
Aurora, June 1997, Vol.16, No.4.
ANARE Club, Melbourne, 1997, 36p., Special Edition for the ANARE Jubilee Science Symposium.
Research projects, Glaciology, Low temperature research, Sea ice, Ice sheets
The articles and news items in this issue deal with the following: changes in the 50 years since ANARE was established due to new technologies; physics and astronomy; ANARE medical research; antarctic operational meteorology; history of the antarctic continental shelf; geological and biological research; exploitation of resources; the ice sheets; glaciology; climate; ocean currents; conservation of Mawson's huts; and ANARE miscellaneous news items.

52-4741
Aurora, Sep. 1997, Vol.17, No.1.
ANARE Club, Melbourne, 1997, 36p.
Research projects, History, Expeditions, Snow vehicles, Antarctica—Mawson Station
The articles and news items in this issue deal with the following: an account of the experiences of an expedition member wintering at an ANARE station in 1956; information from the Australian Antarctic Division; highlights of the ANARE Jubilee Science Symposium; activities at the ANARE Club Queensland branch; the future of the old Mawson Station; a review of ANARE Club's annual general meeting; a list of 1997 ANARE wintering expeditioners, including name and position of participants and the station to which they were assigned; book reviews and ANARE miscellaneous news items.

52-4742
Aurora, Mar. 1998, Vol.17, No.3.
ANARE Club, Melbourne, 1998, 36p.
Research projects, Snow vehicles, History

The articles and news items in this issue include with the following: a Dec. 28, 1997 press release from the Australian Antarctic Division; recollections of a visitor to Antarctica on his second visit, thirty years later; the history of the ANARE stations; book reviews; news round-up; the Mawson huskies; and the continuation of an account of 50 years of Australian radio communications in the Antarctic.

52-4743

Results of TSP metals monitoring at McMurdo Station, Antarctica.

Lugar, R.M., *U.S. Department of Energy. Report,* Apr. 1994, EGG-CIET-11270, 19p., DE-94015264, 15 refs.

Atmospheric composition, Air pollution, Polar atmospheres, Antarctica—McMurdo Station

This report presents the results of ambient air monitoring of metals in total suspended particulate (TSP) matter performed during the 1992-93 summer at McMurdo Station. Seven samples of TSP were collected from 3 different locations and analyzed for arsenic, beryllium, cadmium, chromium, lead, nickel, and mercury. Critical-flow high-volume air samplers were used to collect the particulate matter on quartz fiber filters for subsequent laboratory analysis. Sampling site selection, sampling procedures, and quality assurance procedures used were consistent with US Environmental Protection Agency guidance for local ambient air quality networks. The data indicate that McMurdo operations have a measurable impact on the qualitative toxic metals composition of suspended particulate matter in the ambient air. The levels measured are well below the US National Ambient Air Quality Standards and American Conference of Governmental Industrial Hygienists worker exposure levels. (Auth. mod.)

52-4744

FY 1993 environmental sampling and analysis report for wastewater discharge at McMurdo Station, Antarctica.

Crockett, A.B., *U.S. Department of Energy. Progress report,* Apr. 1994, EGG-CIET-11127, 42p. + appends., DE-94015256, Refs. p.40-42.

Environmental impact, Marine biology, Waste disposal, Water pollution, Sea water, Antarctica—McMurdo Station

Wastewater impact assessment at McMurdo Station is being conducted by 4 organizations: Antarctic Support Associates, which conducts the effluent monitoring; Moss Landing Marine Laboratories, which conducts all of the benthic monitoring and most of the biological monitoring; Montana State University, which conducted water quality and water current measurements; and EG&G Idaho, which conducted water quality and sea ice monitoring. All 4 programs are interrelated and were needed to determine the impact of the wastewater discharge on the marine environment. This report summarizes the relevant monitoring work being conducted by Antarctic Support Associates, Moss Landing, and Montana State personnel, and specifically documents the results of EG&G Idaho's efforts. (Auth.)

52-4745

Sea ice on the Southern Ocean.

Jacobs, S.S., *U.S. National Aeronautics and Space Administration. Contract report,* Mar. 1998, NASA-CR-207495, 107p., N19980021232, Refs. passim.

Sea ice distribution, Ice cover thickness, Seasonal variations, Polynyas, Ocean currents, Atmospheric circulation, Air ice water interaction, Air temperature

Features indicative of oceanic and atmospheric interactions with antarctic sea ice were studied. In the Amundsen and Bellingshausen seas, sea ice extent was found to have decreased by approximately 20% from 1973 through the early 1990's. This change coincided with and probably contributed to recently warmer surface conditions on the west side of the Antarctic Peninsula where air temperatures have increased by approximately 0.5 C/decade since the mid-1940's. The sea ice decline included multiyear cycles of several years in length superimposed on high interannual variability. The retreat was strongest in summer, and would have lowered the regional mean ice thickness, with attendant impacts upon vertical heat flux and the formation of snow ice and brine. The cause of the regional warming and loss of sea ice is believed to be linked to large-scale circulation changes in the atmosphere and ocean. At the eastern end of the Weddell Gyre, the Cosmonaut Polynya revealed greater activity since 1986, a recurrence pattern during recent winters and two possible modes of formation. In the Ross Sea, ice extent fluctuates over periods of several years, with summer minima and winter maxima roughly in phase. (Auth. mod.)

52-4746

Black mats, spring-fed streams, and late-glacial-age recharge in the southern Great Basin.

Quade, J., Forester, R.M., Pratt, W.L., Carter, C., *Quaternary research,* Mar. 1998, 49(2), p.129-148, 41 refs.

Pleistocene, Quaternary deposits, Organic soils, Sedimentation, Ground water, Springs (water), Alluvium, Hydrology, Paleoecology, Stratigraphy, Carbon isotopes, Radioactive age determination, United States—Nevada, United States—California

52-4747

Wind-transverse corrugations in Pleistocene periglacial landscapes of central Pennsylvania.

Marsh, B., *Quaternary research,* Mar. 1998, 49(2), p.149-156, 16 refs.

Geomorphology, Pleistocene, Periglacial processes, Topographic features, Orientation, Thermokarst, Nivation, Wind direction, Landscape development, United States—Pennsylvania

52-4748

Glacioisostasy and lake-level change at Moosehead Lake, Maine.

Balco, G., Belknap, D.F., Kelley, J.T., *Quaternary research,* Mar. 1998, 49(2), p.157-170, 46 refs.

Pleistocene, Quaternary deposits, Isostasy, Sea level, Lake water, Water level, Shoreline modification, Glacial deposits, Lacustrine deposits, Stratigraphy, Paleoecology, Radioactive age determination, United States—Maine—Moosehead Lake

52-4749

North Atlantic ice sheet fluctuations 10,000-70,000 yr ago as inferred from deposits on the Reykjanes Ridge, southeast of Greenland.

Lackschewitz, K.S., et al, *Quaternary research,* Mar. 1998, 49(2), p.171-182, 47 refs.

Pleistocene, Paleoclimatology, Marine geology, Ice sheets, Glacier oscillation, Ice rafting, Advection, Paleoecology, Marine deposits, Quaternary deposits, Drill core analysis, Radioactive age determination, Atlantic Ocean

52-4750

Climatic reconstruction in Europe for 18,000 yr B.P. from pollen data.

Peyron, O., et al, *Quaternary research,* Mar. 1998, 49(2), p.183-196, 55 refs.

Paleoclimatology, Climatic changes, Quaternary deposits, Paleoecology, Palynology, Vegetation patterns, Classifications, Statistical analysis, Correlation, Biogeography, Europe

52-4751

Palynological evidence of climatic and oceanographic change in the North Sea during the last deglaciation.

Rochon, A., De Vernal, A., Sejrup, H.P., Haflidason, H., *Quaternary research,* Mar. 1998, 49(2), p.197-207, 48 refs.

Pleistocene, Paleoclimatology, Climatic changes, Oceanography, Marine deposits, Drill core analysis, Palynology, Hydrography, Radioactive age determination, Stratigraphy, Correlation, North Sea

52-4752

Paleobiology of the sand beneath the Valders diamicton at Valders, Wisconsin.

Maher, L.J., Jr., Miller, N.G., Baker, R.G., Curry, B.B., Mickelson, D.M., *Quaternary research,* Mar. 1998, 49(2), p.208-221, 54 refs.

Pleistocene, Quaternary deposits, Glacial geology, Lacustrine deposits, Glacial deposits, Palynology, Paleoecology, Fossils, Vegetation patterns, Sands, Sedimentation, Carbon isotopes, Radioactive age determination, United States—Wisconsin—Valders

52-4753

Palynological evidence for late- and postglacial environmental change in central Colorado.

Vierling, L.A., *Quaternary research,* Mar. 1998, 49(2), p.222-232, 46 refs.

Pleistocene, Paleoclimatology, Climatic changes, Alpine landscapes, Sediments, Stratigraphy, Palynology, Paleoecology, Vegetation patterns, Spectra, Statistical analysis, United States—Colorado

52-4754

Plan now for cold-weather operation of cooling towers.

Michell, F.L., Drew, D.H., *Power,* June 1996, 140(6), p.53-54,56-58.

Electric power, Towers, Concrete structures, Water treatment, Cooling systems, Latticed structures, Air flow, Ice control, Ice prevention, Valves, Design, Cold weather performance

52-4755

Role of deicing salt in pavement deterioration by frost action.

Doré, G., Konrad, J.M., Roy, M., *Transportation research record,* Sep. 1997, No.1596, p.70-75, 12 refs.

Pavements, Degradation, Cracking (fracturing), Frost action, Frost heave, Ice lenses, Freezing front, Pavement bases, Impurities, Salinity, Brines, Freezing points, Temperature gradients, Mechanical tests

52-4756

Measurements of the arctic turbopause.

Hall, C.M., Manson, A.H., Meek, C.E., *Annales geophysicae,* Mar. 1998, 16(3), p.342-345, 19 refs.

Climatology, Polar atmospheres, Atmospheric physics, Wind velocity, Altitude, Turbulent exchange, Turbulent diffusion, Radar echoes, Sounding, Profiles

52-4757

Non-sorted patterned ground in the high Drakensberg, southern Africa: some new data.

Grab, S., *Geographical journal,* Mar. 1998, 164(pt.1), p.19-31, 47 refs.

Geocryology, Landscape development, Soil surveys, Cryogenic soils, Hummocks, Periglacial processes, Frozen ground mechanics, Patterned ground, Frost heave, Pit and mound topography, Vegetation patterns, Slope processes, South Africa—Drakensberg Mountains

52-4758

European snow cover and its influence on spring and summer temperatures.

Chaoimh, U.N., *Geographical journal,* Mar. 1998, 164(pt.1), p.41-54, 19 refs.

Climatology, Snow surveys, Snow cover distribution, Snow cover effect, Surface temperature, Air temperature, Snow air interface, Seasonal variations, Statistical analysis, Correlation, Europe

52-4759

Scientific cruise report of the Arctic Expedition ARK-XIII/2 of RV *Polarstern* in 1997. [Wissenschaftlicher Fahrtbericht über die Arktis-Expedition ARK-XIII/2 von 1997 mit FS *Polarstern*]

Stein, R., ed, Fahl, K., ed, *Berichte zur Polarforschung,* 1997, No.255, 235p., Refs. p.150-154.

Meteorological data, Marine biology, Oceanographic surveys, Sea water, Chemical composition, Sediments, Geochemistry, Norway—Svalbard

52-4760

Investigations of the seasonality of atmospheric dimethyl sulfide in the Arctic and Antarctica. [Untersuchungen der Saisonalität von atmosphärischem Dimethylsulfid in der Arktis und Antarktis]

Kleefeld, C., *Berichte zur Polarforschung,* 1998, No.257, 166p., In German with English summary. Tabular data p.155-166; refs. p.143-154.

Atmospheric composition, Air pollution, Models, Polar atmospheres, Antarctica—Neumeyer Station, Norway—Spitsbergen

Measurements of atmospheric dimethylsulfide (DMS) were performed at Neumayer Station during the overwintering campaign 1992-93. The resulting DMS time series covers the period from June 22, 1992 to Feb. 1, 1993. Routinely derived concentrations of the particulate DMS oxidation products methanesulfonate and sulfate supplement the DMS record. The DMS data from Antarctica are compared with results of DMS measurements in the Arctic. The arctic DMS data series were obtained near Ny-Ålesund, Spitsbergen and cover the time periods Mar. 22-May 9, 1994 and Apr. 19-June 10, 1995. The antarctic DMS mixing ratios range from 0.2 to 75 pptv. The DMS time series indicates a seasonality with lowest concentrations during the period from Aug. to Nov. and an average mixing ratio of 0.8 pptv. In July the DMS concentrations dropped with an exponential decline rate of about 44% per week. In Dec. an exponential increase of 61% per week could be observed. In the Arctic the measured DMS mixing ratios varied between 0.1 and 90 pptv in 1994 and between 0.5 and 140 pptv in 1995. The DMS time series of 1994 indicates an onset of the marine DMS emission in mid-Apr. In comparison with the antarctic measuring site a significant DMS emission could be observed about two months earlier relative to midwinter in the Arctic.

52-4761

Radionuclide tritium in the ocean: measurement and distribution of tritium in the South Atlantic and the Weddell Sea. [Das Radionuklid Tritium im Ozean: Meßverfahren und Verteilung von Tritium im Südatlantik und im Weddellmeer]

Sültenfuß, J., *Berichte zur Polarforschung,* 1998, No.256, 200p., In German with English summary. Refs. p.185-199.

Water chemistry, Fallout, Ocean currents, Radioactive isotopes, Isotope analysis, Sea water, Tritium, — South Atlantic Ocean, Antarctica—Weddell Sea

The parameter of a system for routine measurements of oceanic tritium samples by the ^{3}He-ingrowth-method are described and the potential of the data for oceanographic purposes is systematically shown. An extensive dataset with more than 3000 samples from the South Atlantic and the Weddell Sea is presented and discussed. Tritium distribution and the comparison with the distribution of CFC F11 provide information on the ventilation of Central Water and Intermediate Water. The surface distribution shows strong meridional gradients with maximum concentrations in the center of the Subtropical Gyre. In the Agulhas Current region tritium is imported by surface water from the Indian Ocean. The tritium distribution in the Antarctic Circumpolar Current shows that the ACC does not contribute significant components of tritium to the South Atlantic via Drake Passage. The data show that Weddell Sea Deep Water is ventilated from the east and mixing with Weddell Sea Bottom Water is small. Replacement of bottom water in the Scotia Sea by ventilated water from the Weddell Sea is clearly pronounced. The source of this ventilated water is not the Filchner-Ronne ice shelf. (Auth. mod.)

52-4762

New Zealand Antarctic Research report to SCAR No.33, 1991: April 1, 1990-31 March 1991, record of activities; April 1, 1991-1992, planned activities.

Royal Society of New Zealand. National Committee for Antarctic Research, Christchurch, 1991, 35p., Bibliography p.23-32.

Research projects, Low temperature research, Antarctica—Scott Base

The report provides the following: information on, and a map of, New Zealand's permanently manned stations and summer only stations and refuges; observations carried out at Scott Base, covering seismology, geomagnetism, meteorology, and ionospheric physics; highlights of science activities for Apr.1, 1990-Mar. 31, 1991 in Earth, physical and life sciences; prospectus of planned activities for 1991-1992 in atmospheric sciences, biology, geology, glaciology, miscellaneous activities, observatory and monitoring, and oceanography; and a list of principal investigators and responsible authorities in both past and future activities.

52-4763

Practical aspects of establishing snow and ice runways at JARE stations: in the context of the East Antarctic Air Network.

Klokov, V., Shiraishi, K., *Tokyo. National Institute of Polar Research. Memoirs. Series F, Logistics,* Dec. 1997, No.5, 32p., 17 refs. For another version see G-58961 or 52-3459.

Ice runways, Aircraft landing areas, Cold weather construction, Logistics, Site surveys, Antarctica—Showa Station, Antarctica—Asuka Station, Antarctica—Queen Fabiola Mountains

A feasibility study has been undertaken to improve air support for the Japanese Antarctic Research Expedition (JARE) by establishing hard-surface runways near JARE stations and introducing an intercontinental air operation. Historical meteorological observations for JARE stations have been reviewed. Two major parameters, prevailing wind direction and maximum temperature, have been examined because they have a dominant influence on snow-ice runway construction. The glaciological conditions near Showa Station, Asuka Station and in the Queen Fabiola Mountains were considered to identify the favorable sites for hard-surface runway construction. The analysis shows that the Showa area is suitable for construction and operation of runways on both compacted snow and blue ice. Construction techniques and logistic facilities for snow-ice runway construction are outlined.

52-4764

Ozone depletion in and below the arctic vortex for 1997.

Knudsen, B.M., et al, *Geophysical research letters,* Mar. 1, 1998, 25(5), p.627-630, 16 refs.

Climatology, Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Degradation, Cooling rate, Ozone, Turbulent diffusion, Radio echo soundings

52-4765

Recent increase in the length of the melt season of perennial arctic sea ice.

Smith, D.M, *Geophysical research letters,* Mar. 1, 1998, 25(5), p.655-658, 22 refs.

Climatology, Global warming, Sea ice distribution, Ice melting, Seasonal freeze thaw, Ice edge, Radiometry, Brightness, Seasonal variations, Statistical analysis, Arctic Ocean

52-4766

Long-term climato-limnological oscillation during the past 2.5 million years printed in Lake Baikal sediments.

Kashiwaya, K., Ryugo, M., Sakai, H., Kawai, T., *Geophysical research letters,* Mar. 1, 1998, 25(5), p.659-662, 23 refs.

Pleistocene, Paleoclimatology, Climatic changes, Global change, Limnology, Lacustrine deposits, Sedimentation, Physical properties, Grain size, Water content, Drill core analysis, Russia—Baykal, Lake

52-4767

Mechanisms of loess-sized quartz silt production and their relative effectiveness: laboratory simulations.

Wright, J., Smith, B., Whalley, B., *Geomorphology,* May 1998, 23(1), p.15-34, 74 refs.

Geomorphology, Soil physics, Loess, Soil formation, Eolian soils, Glacial erosion, Weathering, Abrasion, Frost weathering, Simulation, Scanning electron microscopy

52-4768

Charging a thermal (ice) store: results of a theoretical and experimental study.

Eames, I.W., Adref, K., *Chartered Institution of Building Services Engineers. Proceedings A. Building services engineering research and technology,* 1996, 17(3), p.109-117, 8 refs.

Electric power, Air conditioning, Cold storage, Refrigeration, Heat sinks, Spheres, Ice water interface, Thermal diffusion, Heat transfer, Supercooling, Phase transformations, Mathematical models

52-4769

Benthic amphipods (Crustacea: Malacostraca) in Icelandic waters: diversity in relation to faunal patterns from shallow to intermediate deep Arctic and North Atlantic Oceans.

Weisshappel, J.B.F., Svavarsson, J., *Marine biology,* Apr. 1998, 131(1), p.133-143, 34 refs.

Marine biology, Ecosystems, Ecology, Ocean bottom, Biomass, Distribution, Sampling, Classifications, Statistical analysis, Arctic Ocean, Atlantic Ocean

52-4770

Windpolished boulders as indicators of a Late Weichselian wind regime in Denmark in relation to neighbouring areas.

Christiansen, H.H., Svensson, H., *Permafrost and periglacial processes,* Jan.-Mar. 1998, 9(1), p.1-21, With French summary. 56 refs.

Pleistocene, Paleoclimatology, Wind erosion, Wind direction, Wind factors, Ice cover effect, Rock properties, Surface properties, Abrasion, Lithology, Geochronology, Denmark

52-4771

Permafrost changes in rock walls and the retreat of alpine glaciers: a thermal modelling approach.

Wegmann, M., Gudmundsson, G.H., Haeberli, W., *Permafrost and periglacial processes,* Jan.-Mar. 1998, 9(1), p.23-33, With French summary. 32 refs.

Alpine glaciation, Mountain glaciers, Periglacial processes, Glacier oscillation, Permafrost bases, Permafrost distribution, Permafrost thermal properties, Bedrock, Surface temperature, Frost shattering, Heat transfer, Mathematical models, Switzerland—Alps

52-4772

Aeolian sediment transport during winter, Black Top Creek, Fosheim Peninsula, Ellesmere Island, Canadian Arctic.

Lewkowicz, A.G., *Permafrost and periglacial processes,* Jan.-Mar. 1998, 9(1), p.35-46, With French summary. 18 refs.

Geomorphology, Arctic landscapes, Sediment transport, Eolian soils, Active layer, Storms, Wind velocity, Wind erosion, Wind factors, Lithology, Canada—Northwest Territories—Ellesmere Island

52-4773

Rock temperatures and implications for cold region weathering. II: new data from Rothera, Adelaide Island, Antarctica.

Hall, K., *Permafrost and periglacial processes,* Jan.-Mar. 1998, 9(1), p.47-55, With French summary. 18 refs.

Geocryology, Periglacial processes, Frost weathering, Bedrock, Frozen rock temperature, Slope orientation, Temperature measurement, Temperature variations, Thermal regime, Thermal stresses, Antarctica—Adelaide Island

Rock temperature data collected at one-minute intervals from both the horizontal surface and the four cardinal directions of a rock outcrop on Adelaide I. show the influence of record interval and aspect on the thermal regime of bedrock as it applies to cryogenic weathering. The northern aspect exhibits the lowest temperatures despite its apparent preferential orientation. At the 2 cm depth, temperatures on the northern and horizontal surfaces sometimes stayed above those for the rock surface despite the daytime energy input from solar radiation. Short-term wind fluctuations are considered as a possible explanation. Because the rock temperatures are quite different from those of the air the latter can, in no way, be used as a surrogate for rock thermal conditions. The argument is made that one-minute record intervals are required for thermal data if use is to be made of this information to help explain and understand the weathering regime. (Auth. mod.)

52-4774

Morphology and surface structures of Maxwell Creek rock glaciers, St Elias Mountains, Yukon: rheological implications.

Johnson, P.G., *Permafrost and periglacial processes,* Jan.-Mar. 1998, 9(1), p.57-70, With French summary. 25 refs.

Geomorphology, Periglacial processes, Rock glaciers, Mass movements (geology), Flow rate, Surface structure, Rheology, Weathering, Lichens, Age determination, Canada—Yukon Territory—Maxwell Creek

52-4775

Thaw depth characteristics over five thaw seasons following installation of a simulated transport corridor, Tulita, NWT, Canada.

Nolte, S., Kershaw, G.P., Gallinger, B.J., *Permafrost and periglacial processes,* Jan.-Mar. 1998, 9(1), p.71-85, With French summary. 47 refs.

Forest soils, Permafrost transformation, Permafrost preservation, Thaw depth, Seasonal variations, Active layer, Soil temperature, Roads, Trenching, Excavation, Microclimatology, Environmental tests, Simulation, Canada—Northwest Territories—Tulita

52-4776

Comments on permafrost monitoring and detection of climate change by Smith and Riseborough [7(4): 301-309, 1996].

Osterkamp, T.E., Romanovsky, V.E., Smith, M.W., Riseborough, D.W., *Permafrost and periglacial processes,* Jan.-Mar. 1998, 9(1), p.87-92, Includes reply. 12 refs. For pertinent paper see 52-539.

Climatology, Global warming, Soil air interface, Frozen ground temperature, Permafrost transformation, Thermal regime, Ground thawing, Active layer, Thermal analysis, Analysis (mathematics)

52-4777

Factors influencing the variability of midwinter snow-depth decrease in the northern Great Plains of the United States.

Grundstein, A.J., Leathers, D.J., *Physical geography,* Sep.-Oct. 1997, 18(5), p.408-423, 21 refs.

Snow hydrology, Plains, Snowmelt, Snow depth, Seasonal ablation, Snow air interface, Heat flux, Radiation balance, Seasonal variations, Mathematical models, Statistical analysis, United States—Great Plains

52-4778
Wavelet-based inversion of seismo-acoustic waves in arctic ice.
Wang, G.Q., Cambridge, Massachusetts Institute of Technology, 1995, n.p., University Microfilms order No.DA0576991, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1355.
Sea ice, Ice mechanics, Ice acoustics, Ice water interface, Physical properties, Ice elasticity, Sound waves, Wave propagation, Velocity measurement, Models, Spectra

52-4779
Expression of fish antifreeze protein genes in transgenic tobacco for increased plant freeze resistance and as a model for molecular farming.
Kenward, K.D., Kingston, Queen's University, 1995, 188p., University Microfilms order No.DANN04824, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1053.
Plant physiology, Plant tissues, Frost resistance, Cold tolerance, Ice prevention, Chemical composition, Chemical analysis, Molecular structure, Models

52-4780
Imagery part of the refractive index of ice, ammonium sulfate, and sulfuric acid in the 1.4 to 7.8 μm range.
Gosse, S.F., Halifax, Dalhousie University, 1994, 92p., University Microfilms order No.MAMM98855, M.S. thesis. For abstract see Masters abstracts international, 1996, p.329.
Ice physics, Ice crystal optics, Refractivity, Indexes (ratios), Solutions, Spectra, Temperature effects

52-4781
FT-IR study of the H_2 crystalline ice surface.
Rowland, J.B., Oklahoma City, Oklahoma State University, 1995, 153p., University Microfilms order No.DA9618424, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1113.
Ice physics, Ice microstructure, Molecular structure, Surface structure, Molecular energy levels, Vibration, Ice water interface, Adsorption, Thermodynamics, Ice spectroscopy, Infrared spectroscopy, Spectra

52-4782
Isotopic and chemical tracing of macropore flow in laboratory soil columns under simulated snowmelt conditions.
Leigh, D.G., Peterborough, Trent University, 1995, 181p., University Microfilms order No.MAMM98794, M.S. thesis. For abstract see Masters abstracts international, 1996, p.260.
Soil physics, Soil tests, Soil water, Soil structure, Porosity, Snow hydrology, Snowmelt, Meltwater, Seepage, Isotope analysis, Simulation

52-4783
Sedimentological and glaciological study of basal debris entrainment and transport in polar glaciers of southwest Bylot Island, Northwest Territories.
Zoanowicz, C.M., Ottawa, Carleton University, 1994, 258p., University Microfilms order No.MAMM98639, M.S. thesis. For abstract see Masters abstracts international, 1996, p.258.
Glacial hydrology, Glacier flow, Glacial geology, Sediment transport, Subglacial observations, Sediments, Bedrock, X ray analysis, Ice solid interface, Thermal analysis, Models, Canada—Northwest Territories—Bylot Island

52-4784
Greenland ice core evidence for attenuation of the deuterium signal by climate cooling due to volcanic events.
White, D.E., Greeley, University of Northern Colorado, 1995, 76p., University Microfilms order No.MA1375773, M.S. thesis. For abstract see Masters abstracts international, 1996, p.260.
Climatology, Cooling, Ice sheets, Ice cores, Aerosols, Atmospheric composition, Optical properties, Volcanic ash, Ice dating, Isotope analysis, Greenland

52-4785
Modeling of orientational defects and proton transport in a hydrogen bonded chain.
Mittal, R.R., Arlington, University of Texas, 1995, 73p., University Microfilms order No.MA1376022, M.S. thesis. For abstract see Masters abstracts international, 1996, p.334.
Ice physics, Ice crystal structure, Molecular structure, Hydrogen bonds, Defects, Mathematical models, Ice models, Proton transport, Molecular energy levels, Thermodynamics

52-4786
Assessment of the effects of cloud inhomogeneity on ice cloud radiative properties.
Stackhouse, P.W., Jr., Fort Collins, Colorado State University, 1995, 286p., University Microfilms order No.DA9615634, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec, B, 1996, p.400.
Climatology, Cloud physics, Cloud cover, Classifications, Radiation balance, Optical properties, Radiance, Radiation absorption, Ice optics, Simulation

52-4787
Nitrogen dynamics in an alpine landscape.
Fisk, M.C., Boulder, University of Colorado, 1995, 114p., University Microfilms order No.DA9602355, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 1996, p.4695.
Plant ecology, Alpine landscapes, Alpine tundra, Tundra vegetation, Tundra soils, Organic soils, Soil microbiology, Biomass, Nutrient cycle, Geochemical cycles, Simulation, United States—Colorado—Niwot Ridge

52-4788
Microbial activity and nitrogen cycling under seasonal snowpacks, Niwot Ridge, Colorado.
Brooks, P.D., Boulder, University of Colorado, 1995, 138p., University Microfilms order No.DA9602336, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 1996, p.4783.
Soil microbiology, Alpine landscapes, Ecosystems, Snow hydrology, Biomass, Ground thawing, Snowmelt, Snow air interface, Aerosols, Vapor diffusion, Nutrient cycle, Snow cover effect, United States—Colorado—Niwot Ridge

52-4789
Supervised classification of natural targets using millimeter-wave multifrequency polarimetric radar measurements.
Lohmeier, S.P., Amherst, University of Massachusetts, 1996, 150p., University Microfilms order No.DA9619410, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1324.
Remote sensing, Radar echoes, Cloud cover, Ice crystals, Ice detection, Snow cover structure, Reflectivity, Classifications, Statistical analysis, Image processing

52-4790
Influence of zooplankton on biogeochemical fluxes and stoichiometry in an arctic marine system.
Daly, K.L., Knoxville, University of Tennessee, 1995, 183p., University Microfilms order No.DA9619606, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.928.
Marine biology, Microbiology, Water chemistry, Geochemical cycles, Polynyas, Plankton, Biomass, Sedimentation, Mass balance, Organic nuclei, Indexes (ratios), Sampling

52-4791
Infrared spectroscopy and physical chemistry of cryogenic aerosols.
Clapp, M.L., Chapel Hill, University of North Carolina, 1995, 279p., University Microfilms order No.DA9616160, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1102.
Atmospheric physics, Aerosols, Supercooling, Cryogenics, Extraterrestrial ice, Hydrates, Ice spectroscopy, Infrared spectroscopy, Simulation, Refractivity, Spectra, Indexes (ratios)

52-4792
Laboratory studies of sulfate aerosols at stratospheric temperatures.
Anthony, S.E., Boulder, University of Colorado, 1995, 113p., University Microfilms order No.DA9620604, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1100.
Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Aerosols, Heterogeneous nucleation, Ice vapor interface, Ice formation, Simulation, Temperature effects

52-4793
Adsorption and desorption processes of polar molecules at the ice/water vapor interface.
Tridico, A.C., Washington, D.C., Georgetown University, 1995, 174p., University Microfilms order No.DA9620305, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1115.
Climatology, Cloud physics, Stratosphere, Ice physics, Heterogeneous nucleation, Ice vapor interface, Water vapor, Ice surface, Molecular energy levels, Adsorption, Simulation, Lasers, Thermodynamic properties

52-4794
Late-glacial record of ice-sheet/ocean interactions, Hudson Strait and southern Baffin Island, eastern Canadian Arctic.
Manley, W.F., Boulder, University of Colorado, 1995, 252p., University Microfilms order No.DA9620637, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.953.
Pleistocene, Ice sheets, Glacial geology, Glacier oscillation, Ice scoring, Striations, Drill core analysis, Stratigraphy, Remanent magnetism, Geochronology, Models, Canada—Northwest Territories—Baffin Island

52-4795
Evolution of the passive microwave signature of thin sea ice.
Wensnahan, M.R., Seattle, University of Washington, 1995, 144p., University Microfilms order No.DA9616691, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1150.
Sea ice, Remote sensing, Young ice, Slush, Ice optics, Brightness, Surface properties, Radiometry, Statistical analysis, Meteorological factors, Ice cover thickness, Snow cover effect, Theories

52-4796
Effects of hydrophobic surface treatments on dropwise condensation and freezing of water.
Bryant, J.A., College Station, Texas A&M University, 1995, 168p., University Microfilms order No.DA9615775, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1379.
Ice solid interface, Plates, Metals, Surface temperature, Protective coatings, Laminar flow, Water films, Condensation, Heat transfer coefficient, Ice prevention, Temperature effects, Models

52-4797
Constitutive modeling and fracture analysis of ice.
Abdel-Tawab, K.I., Austin, University of Texas, 1995, 130p., University Microfilms order No.DA9617157, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1377.
Ice mechanics, Ice strength, Ice creep, Ice deformation, Cracking (fracturing), Crack propagation, Ice solid interface, Models, Theories, Elastic properties

52-4798

Characterization and deterioration detection of portland cement concrete using ultrasonic waves.

Al-Akhras, N.M., Blacksburg, Virginia Polytechnic Institute and State University, 1995, 187p., University Microfilms order No.DA9618947, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1272.

Concrete admixtures, Cement admixtures, Concrete durability, Concrete curing, Water cement ratio, Ultrasonic tests, Freeze thaw tests, Degradation, Detection, Chemical properties, Statistical analysis

52-4799

Electromagnetic wave propagation and scattering in dense, discrete random media with application to remote sensing of snow.

Zurk, L.M., Seattle, University of Washington, 1995, 166p., University Microfilms order No.DA9616693, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.1343.

Remote sensing, Light scattering, Wave propagation, Snow optics, Aggregates, Grain size, Radiation absorption, Attenuation, Simulation, Mathematical models, Dielectric properties

52-4800

Interspecific plant competition in alpine tundra.

Theodose, T.A., Boulder, University of Colorado, 1995, 160p., University Microfilms order No.DA9602417, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B., 1996, p.4700.

Plant ecology, Alpine tundra, Tundra vegetation, Ecosystems, Meadow soils, Vegetation patterns, Biomass, Growth, Nutrient cycle, Simulation

52-4801

Three-dimensional evolution of the temperature field in the Greenland Sea during 1988-1989, and its relationship to deep convection.

Morawitz, W.M.L., San Diego, University of California, 1995, 114p., University Microfilms order No.DA9544151, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 1996, p.4797.

Oceanography, Subpolar regions, Water temperature, Acoustic measurement, Underwater acoustics, Convection, Mathematical models, Statistical analysis, Temperature variations, Ice cover effect, Greenland Sea

52-4802

Reconstruction of late-Pleistocene equilibrium-line altitudes and paleoenvironments: Uinta Mountains, Utah and Wyoming.

Schlenker, G.C., College Station, Texas A&M University, 1995, 146p., University Microfilms order No.DA9615883, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 1996, p.211.

Pleistocene, Paleoclimatology, Climatic changes, Snow accumulation, Snow cover distribution, Snow line, Quaternary deposits, Atmospheric circulation, Air temperature, Isotope analysis, United States—Utah, United States—Wyoming

52-4803

Extent, timing, and climatic significance of latest Pleistocene and Holocene glaciation in the Sierra Nevada, California.

Clark, D.H., Seattle, University of Washington, 1995, 193p., University Microfilms order No.DA9616590, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Aug. 1996, p.952.

Pleistocene, Paleoclimatology, Glacial geology, Glacier oscillation, Glacier mass balance, Mountain glaciers, Geomorphology, Moraines, Geochronology, Radioactive age determination, United States—California—Sierra Nevada

52-4804

Simulation of the ablation of prairie snowcovers.

Shook, K.R., Saskatoon, University of Saskatchewan, 1995, 214p., University Microfilms order No.DANN09313, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 1996, p.3870.

Snow hydrology, Snowmelt, Seasonal ablation, Plains, Snow water equivalent, Snow depth, Fractals, Computerized simulation, Advection, Forecasting

52-4805

Effects of climatic variability on the active layer and permafrost.

Romanovsky, V.E., Fairbanks, University of Alaska, 1996, 231p., University Microfilms order No.DA9632229, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 1996, p.3621.

Paleoclimatology, Pleistocene, Permafrost distribution, Soil air interface, Thermal regime, Permafrost transformation, Active layer, Frozen ground temperature, Frozen ground thermodynamics, Mathematical models, Climatic factors

52-4806

Clast fabric in periglacial mass-movement deposits.

Millar, S.W.S., New Brunswick, Rutgers University, 1995, 158p., University Microfilms order No.DA9618888, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. A, Aug. 1996, p.808.

Slope processes, Geomorphology, Rock mechanics, Periglacial processes, Geocryology, Solifluction, Ice lenses, Mass movements (geology), Lithology, Orientation, Sampling, United States—Alaska

52-4807

Association of plant distribution patterns and microenvironments on patterned ground in a polar desert, Devon Island, N.W.T., Canada.

Anderson, D.G., Bliss, L.C., *Arctic and alpine research,* May 1998, 30(2), p.97-107, 55 refs.

Plant ecology, Arctic landscapes, Deserts, Desert soils, Vegetation patterns, Biomass, Patterned ground, Sorting, Cryoturbation, Microrelief, Geomorphology, Sampling, Canada—Northwest Territories—Devon Island

52-4808

Influence of cryptogamic crusts on the thermal environment and temperature relations of plants in a high arctic polar desert, Devon Island, N.W.T., Canada.

Gold, W.G., *Arctic and alpine research,* May 1998, 30(2), p.108-120, 56 refs.

Plant ecology, Plant physiology, Arctic landscapes, Deserts, Microclimatology, Plant tissues, Surface temperature, Growth, Soil temperature, Surface structure, Thermal insulation, Temperature effects, Sampling, Canada—Northwest Territories—Devon Island

52-4809

Nitrogen uptake during snowmelt by the snow buttercup, *Ranunculus adoneus*.

Mullen, R.B., Schmidt, S.K., Jaeger, C.H., III, *Arctic and alpine research,* May 1998, 30(2), p.121-125, 33 refs.

Plant ecology, Alpine tundra, Tundra vegetation, Growth, Nutrient cycle, Soil microbiology, Soil chemistry, Fungi, Snowmelt, Meltwater, Leaching, Seasonal variations, Sampling, United States—Colorado—Niwot Ridge

52-4810

Persistent suppression in dwarf birch after release from heavy summer browsing by caribou.

Crête, M., Doucet, G.J., *Arctic and alpine research,* May 1998, 30(2), p.126-132, 37 refs.

Plant ecology, Trees (plants), Subarctic landscapes, River basins, Biomass, Damage, Revegetation, Plant tissues, Wood, Indexes (ratios), Sampling, Animals, Environmental impact, Canada—Québec—Riviére George

52-4811

Distribution, community structure, and microhabitats of soil invertebrates along an elevational gradient in Taylor Valley, Antarctica.

Powers, L.E., Ho, M.C., Freckman, D.W., Virginia, R.A., *Arctic and alpine research,* May 1998, 30(2), p.133-141, 48 refs.

Ecosystems, Ecology, Soil chemistry, Chemical properties, Biomass, Distribution, Altitude, Topographic effects, Sampling, Statistical analysis, Antarctica—Taylor Valley

Soils in the Antarctic Dry Valleys have been significantly influenced by soil formation factors such as parent material, climate, and topography. This study examined the soil properties and soil invertebrate communities along an elevational gradient in Taylor Valley. Soil moisture, nitrogen, carbon, pH, and electrical conductivity, as well as the distribution and community structure of soil invertebrates were sampled. The authors found significant differences in soil properties with elevation along with associated differences in soil communities. Biodiversity was greatest at the lowest elevation, closest to the shore of Lake Hoare, where soil moisture, carbon, and nitrogen were highest, and salinity was lowest. (Auth. mod.)

52-4812

Re-evaluation of pre-late Wisconsin glacial deposits, lower Naknek River valley, southwestern Alaska, U.S.A.

Kaufman, D.S., Thompson, C.H., *Arctic and alpine research,* May 1998, 30(2), p.142-153, 39 refs.

Pleistocene, Subarctic landscapes, Geomorphology, Glacial geology, Glacial deposits, Moraines, Glacier oscillation, River basins, Stratigraphy, Sedimentation, Lithology, Geochronology, United States—Alaska—Naknek River

52-4813

Glacier regimes, periglacial landforms, and Holocene climate change in the Kigluaik Mountains, Seward Peninsula, Alaska, U.S.A.

Calkin, P.E., Kaufman, D.S., Przybyl, B.J., Whitford, W.B., Peck, B.J., *Arctic and alpine research,* May 1998, 30(2), p.154-165, 74 refs.

Cirque glaciers, Glacial geology, Glacier oscillation, Subarctic landscapes, Geomorphology, Paleoclimatology, Climatic changes, Periglacial processes, Talus, Rock glaciers, Lichens, Geochronology, United States—Alaska—Kigluaik Mountains

52-4814

Soils and cryoturbation in moist nonacidic and acidic tundra in the Kuparuk River basin, arctic Alaska, U.S.A.

Bockheim, J.G., Walker, D.A., Everett, L.R., Nelson, F.E., Shiklomanov, N.I., *Arctic and alpine research,* May 1998, 30(2), p.166-174, 36 refs.

Watersheds, Active layer, Tundra soils, Tundra vegetation, Plant ecology, Soil chemistry, Soil classification, Chemical properties, Cryoturbation, Sampling, United States—Alaska—Kuparuk River

52-4815

Frequency distributions of *Rhizocarpon geographicum* s.l., modeling, and climate variation in Tröllaskagi, northern Iceland.

Caseldine, C., Baker, A., *Arctic and alpine research,* May 1998, 30(2), p.175-183, 26 refs.

Plant ecology, Arctic landscapes, Lichens, Growth, Distribution, Biomass, Moraines, Distribution, Sampling, Statistical analysis, Age determination, Models, Iceland—Tröllaskagi

52-4816

Effects of rock surface temperature on exfoliation, rock varnish, and lichens on a boulder in the Hunza Valley, Karakoram Mountains, Pakistan.

Waragai, T., *Arctic and alpine research,* May 1998, 30(2), p.184-192, 36 refs.

Moraines, Alpine landscapes, Rock properties, Weathering, Insolation, Surface temperature, Temperature measurement, Diurnal variations, Lichens, Weathering, Frost shattering, Lichens, Microclimatology, Pakistan—Karakoram Mountains

52-4817

Terminology and predominant processes associated with the formation of weak layers of near-surface faceted crystals in the mountain snowpack.

Birkeland, K.W., *Arctic and alpine research,* May 1998, 30(2), p.193-199, 38 refs.

Snow physics, Snow cover structure, Snow strength, Metamorphism (snow), Snow recrystallization, Snow crystal structure, Layers, Snow surface temperature, Temperature gradients, Classifications, Terminology, Avalanche forecasting

52-4818

Near-surface faceted crystals formed by diurnal recrystallization: a case study of weak layer formation in the mountain snowpack and its contribution to snow avalanches.

Birkeland, K.W., Johnson, R.F., Schmidt, D.S., *Arctic and alpine research,* May 1998, 30(2), p.200-204, 15 refs.

Snow physics, Snow cover structure, Snow cover stability, Snow recrystallization, Snow crystal growth, Stratification, Metamorphism (snow), Snow surface temperature, Snow air interface, Diurnal variations, Avalanche forecasting

52-4819

Implications of optical properties of ocean, lake, and ice for ultrahigh-energy neutrino detection.

Price, P.B., *Applied optics,* Mar. 20, 1997, 36(9), p.1965-1975, 43 refs.

Ice physics, Ice optics, Ice sheets, Optical properties, Gamma irradiation, Luminescence, Radiation absorption, Light scattering, Detection, Antarctica—South Pole, Russia—Baykal, Lake

The collecting power and imaging ability of planned ultrahigh-energy neutrino observatories depend on wavelength-dependent absorption and scattering coefficients for the detector medium. Published data are compiled for deep ice at the South Pole, for deep fresh water at Lake Baykal, and for deep seawater. The effective volume per detector element as a function of energy is calculated for electromagnetic cascades produced by electron neutrinos interacting at the various sites. It is largest for deep bubble-free ice, smallest for shallow bubbly ice, and intermediate for lake and seawater. (Auth. mod.)

52-4820

Non-water-ice constituents in the surface material of the icy Galilean satellites from the Galileo near-infrared mapping spectrometer investigation.

McCord, T.B., et al, *Journal of geophysical research,* Apr. 25, 1998, 103(E4), p.8603-8626, 76 refs.

Ice physics, Extraterrestrial ice, Satellites (natural), Sensor mapping, Regolith, Ice spectroscopy, Ice composition, Ice detection, Regolith, Surface properties, Cosmic dust, Reflectivity, Spectra

52-4821

Inverse scattering problem for mixed-phase and ice clouds. I. Numerical simulation of particle sizing from phase-function measurements.

Oshchepkov, S., Isaka, H., *Applied optics,* Nov. 20, 1997, 36(33), p.8765-8774, 23 refs.

Cloud physics, Ice crystal optics, Ice crystal structure, Light scattering, Particle size distribution, Supercooled clouds, Cloud droplets, Simulation, Ice water interface, Mathematical models

52-4822

Variation trends of snow cover over the Tibetan Plateau and their relations to temperature and precipitation. [Qingzang gaoyuan jixue bianhua qushi ji qi yu qiwen he jiangshui de guanxi]

Ke, C.Q., Li, P.J., Wang, C.P., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.289-294, In Chinese with English summary. 5 refs.

Snow cover distribution, Snowfall, Air temperature, Precipitation (meteorology), Meteorological data, Climatic changes, Global warming, Statistical analysis, China—Qinghai-Xizang Plateau

52-4823

Characteristics of $\delta^{18}O$ in summer precipitation at Lhasa. [Lasa xiaji jiangshui zhong yang wending tongweisu bianhua tezheng]

Tian, L.D., Yao, T.D., Pu, J.C., Yang, Z.H., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.295-301, In Chinese with English summary. 15 refs.

Atmospheric composition, Air temperature, Precipitation (meteorology), Oxygen isotopes, Isotope analysis, China—Lhasa

52-4824

Estimation of average mass balance for glaciers in a water shed and its application. [Liuyu bingchuan pingjun wuzhiheng de jisuan fangfa ji qi yingyong]

Shen, Y.P., Xie, Z.C., Ding, L.F., Liu, J.S., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.302-307, In Chinese with English summary. 8 refs.

Mountain glaciers, Glacier mass balance, Glacier oscillation, Glacial hydrology, Meltwater, Runoff forecasting, China—Tian Shan, Pamirs

52-4825

Grey topology method for forecasting the runoff in the upper reaches of the Yellow River. [Huanghe shangyou jingliu yubao de huise tapu fangfa]

Lan, Y.C., Kang, E.S., Yang, W.H., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.308-311, In Chinese with English summary. 4 refs.

River flow, Reservoirs, Water reserves, Water supply, Runoff forecasting, Statistical analysis, China—Qinghai Province, China—Yellow River

52-4826

Simulated weathering experiment of small free granite blocks under freeze-thaw conditions. [Handong tiaojianxia huagangyan xiaokuaiti de fenghua moni shiyan ji qi fenxi]

Zhu, L.P., Whalley, W.B., Wang, J.C., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.312-320, In Chinese with English summary. 25 refs.

Frozen rock strength, Frozen rock temperature, Saline soils, Frozen ground chemistry, Frost weathering, Frost shattering, Freeze thaw tests

52-4827

Study on the relation between freezing point and load of wet soil. [Shouzaihe de shitu jiebing wendu bianhua guilu de yanjiu]

Cui, G.X., Yang, W.H., Li, Y., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.321-327, In Chinese with English summary. 3 refs.

Saline soils, Soil water, Water content, Soil freezing, Freezing points, Frozen ground temperature, Frozen ground compression, Frozen ground strength

52-4828

Effect of seasonal freezing on soil moisture and its significance for agriculture. [Jijiexing dongrong dui turang shuifen de zuoyong ji qi zai nongye shengchan zhong de yiyi]

Gong, J.D., Qi, X.S., Xie, Z.K., Wang, Y.J., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.328-333, In Chinese with English summary. 4 refs.

Soil water, Water content, Soil freezing, Seasonal freeze thaw, Water storage, Water retention, Irrigation, Agriculture

52-4829

Preliminary simulation experiment on regeneration mechanisms of gold placers in permafrost. [Dongtudai shajinkuang zaisheng jili de chubu moni shiyan yanjiu—han Au(III), Au(0) de NaCl rongye danxiang dongjie shiyan]

Zhang, B.L., Wang, C.H., Wang, J.C., Zhang, L.X., Tao, Z.X., Gu, T.X., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.334-339, In Chinese with English summary. 9 refs.

Gold, Placer mining, Permafrost control, Soil freezing, Artificial freezing, Frozen ground chemistry, Soil chemistry

52-4830

Experimental study on the effect of the sample size on fracture toughness K_{Ic} of frozen soils. [Dongtu duanlie rendu K_{Ic} chicun xiaoying shiyan yanjiu]

Li, H.S., Zhu, Y.L., Liu, Z.L., Liang, C.J., Zhang, B., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.340-345, In Chinese with English summary. 6 refs.

Frozen ground strength, Flexural strength, Fracturing, Soil creep, Soil tests, Strain tests, Statistical analysis

52-4831

Experimental researches on expansion behaviors of saline soil with NaCl and Na_2SO_4 solutions. [Han luyan he liusuanyan lei yanzitu pengzhang texing de yanjiu]

Gao, M.H., Li, B., Jin, Y.C., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.346-353, In Chinese with English summary. 4 refs.

Saline soils, Soil composition, Soil chemistry, Soil strength, Salinity, Temperature effects, Soil tests, Mathematical models

52-4832

Study on using short cone pile to improve frost heaving and thaw settlement of soil. [Zhuixing zhuang gailiang tuti dongzhangxing he rongchenxing yanjiu]

Xu, X.Y., Zhang, P.Z., An, Y., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.354-358, In Chinese with English summary. 1 ref.

Piles, Pile load tests, Foundations, Subgrade soils, Frost heave, Frozen ground settling, Settlement (structural), Frost protection, Soil stabilization

52-4833

Slide accelerated by water entrapment due to seasonal freezing. [Jijiexing dongjie zhishui cu hua xiaoying—huapo fayu de yizhong xin yinsu]

Wu, W.J., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.359-365, In Chinese with English summary. 4 refs.

Slope stability, Landslides, Seasonal freeze thaw, Frost action, Solifluction

52-4834

Study on the Quaternary glacial relics in the Gongwang Mountains in the northeast part of Yunnan Province. [Yunnan sheng dongbeibu Gongwangshan disiji bingchuan yiji yanjiu]

Kuang, M.S., Li, J.J., Zhao, Y., Chen, X.Q., Zhang, Y.P., Guo, T.X., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.366-372, In Chinese with English summary. 4 refs.

Alpine glaciation, Glacial geology, Glacial erosion, Glacial deposits, Quaternary deposits, Geomorphology, Paleoclimatology, China—Yunnan Province

52-4835

Insoluble microparticles in the cores and their climatic and environmental implications. [Bingxin zhong de burong weili ji qi qihou he huanjing yiyi]

Xie, S.C., Yao, T.D., *Journal of glaciology and geocryology,* Dec. 1997, 19(4), p.373-377, In Chinese with English summary. 11 refs.

Ice cores, Glacier ice, Ice composition, Impurities, Dust, Paleoclimatology

52-4836

Observation and discussion on the physical processes at ice-rock interface. [Guanyu shangu bingchuan bing-yan jiemian dimao guocheng yu bingchuan dongli ouhe moshi—yi zhong Tianshan bingchuan wei li]

Cui, Z.J., Xiong, H.G., Liu, G.N., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.193-201, In Chinese with English summary. 9 refs.

Mountain glaciers, Alpine glaciation, Glacial geology, Glacial erosion, Glacier friction, Glacier flow, Glacier beds, Striations, Geomorphology, China—Tian Shan

52-4837

Steady-state analysis of ice temperature in the Guliya Ice Cap, west Kunlun Mountains. [Xi Kunlunshan Guliya bingmao shen zuankong bingwen de wendingtai fenxi]

Huang, M.H., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.202-206, In Chinese with English summary. 12 refs.

Mountain glaciers, Glacier ice, Ice temperature, Glacier heat balance, Boreholes, Mathematical models, China—Kunlun Mountains

52-4838

Summer temperature rise quantified from the change of the Glacier No.1 at the source of Urumqi River in the 20th century. [Cong Tianshan Wulumuqi he yuan 1 hao bingchuan bianhua guji jin bai nian lai gai diqu xiaji shengwen]

Wang, N.L., Liu, S.Y., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.207-213, In Chinese with English summary. 7 refs.

Glacier surveys, Mountain glaciers, Glacier oscillation, Glacial meteorology, Air temperature, Climatic changes, Global warming, China—Tian Shan

52-4839

Features of hydrological processes in the Dongkemadi River basin, Tanggula Pass, Tibetan Plateau. [Qingzang gaoyuan Tanggulashan Dongkemadihe liuyu shuiwen guocheng tezheng fenxi]

Zhang, Y.S., et al, *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.214-222, In Chineses with English summary. 5 refs.

Glacial hydrology, Glacial rivers, River basins, Runoff, Precipitation (meteorology), Soil water, Soil air interface, Evaporation, Water balance, China—Qinghai-Xizang Plateau

52-4840

Preliminary study of the features of the spatial and temporal distribution of surface water resources and their variation in the northern Xinjiang. [Xinjiang Beijiang dibiao shui ziyuan shikong fenbu ji bianhua tezheng chutan]

Yuan, Y.J., Hu, L.Q., Li, J.F., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.223-230, In Chinese with English summary. 3 refs.

Surface waters, Water reserves, Climatic changes, Regional planning, Statistical analysis, China—Xinjiang

52-4841

Environmental change in patchy permafrost zone in the south section of the Qinghai-Tibet Highway. [Qingzang gonglu nanduan daozhuang dongtuqu nei dongtu huanjing bianhua]

Wang, S.L., Zhao, X.F., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.231-239, In Chinese with English summary. 3 refs.

Permafrost distribution, Discontinuous permafrost, Ground thawing, Climatic changes, Desiccation, Vegetation patterns, Global warming, China—Qinghai-Xizang Plateau

52-4842

Engineering geological conditions of permafrost and suggestions for route selection and construction of photocommunication lines embedded along the Qinghai-Xizang (Tibet) Highway. [Qingzang gonglu yanxian tongxin guanglan maishe diduan dongtu gongcheng dizhi tiaojian ji pingjie]

Wang, J.C., Wu, Z.W., Liu, Y.Z., Xu, X.Z., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.240-244, In Chinese with English summary. 4 refs.

Permafrost beneath roads, Permafrost distribution, Active layer, Frost penetration, Thaw depth, Frost heave, Underground cables, Transmission lines, Telecommunication, Route surveys, China—Qinghai-Xizang Plateau

52-4843

Effect of confining pressure on the dynamic features of frozen silt. [Weiya dui dongjie fentu dongli texing de yingxiang]

Shen, Z.Y., Zhang, J.Y., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.245-251, In Chinese with English summary. 10 refs.

Frozen ground strength, Frozen ground compression, Unfrozen water content, Soil tests, Strain tests, Stress strain diagrams, Mathematical models

52-4844

Salt heave of sulphate salty soil under different cooling rates. [Liusuan yanzitu zai butong jiangwen sulu xia de yanzhang guilu]

Peng, T.H., Li, B., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.252-257, In Chinese with English summary. 2 refs.

Subgrade soils, Saline soils, Soil chemistry, Soil strength, Cooling rate

52-4845

Measuring frozen soil displacement with speckle photography. [Dongtu weiyi de sanban zhaoxiang celiang]

Wu, J.J., He, L.H., Wang, T.D., Yu, Q.H., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.258-262, In Chinese with English summary. 3 refs.

Soil freezing, Frozen ground strength, Soil structure, Soil creep, Dislocations (materials), Photographic techniques

52-4846

Drilling and blasting method of artificially frozen soils. [Rengong dongtu zuanyan baopofa]

Ma, Q.Y., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.263-267, In Chinese with English summary. 7 refs.

Shaft sinking, Soil freezing, Artificial freezing, Soil stabilization, Frozen ground strength, Frozen rock strength, Rock excavation, Blasting

52-4847

Researches on preventing frost heaving of box-separated gate and their application. [Xianggeshi lanhezha de kangdongzhang yanjiu yu shijian]

Zhu, Y.J., Wang, T.G., Wang, S.R., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.268-271, In Chinese with English summary. 3 refs.

Hydraulic structures, Dams, Sluices (hydraulic engineering), Earth fills, Frost heave, Frost protection

52-4848

Clathrate methane and global change: a review. [Shuihe jiawan yu quanqiu bianhua]

Jin, H.J., Cheng, G.D., *Journal of glaciology and geocryology,* Sep. 1997, 19(3), p.272-279, In Chinese with English summary. 32 refs.

Clathrates, Hydrates, Atmospheric composition, Nutrient cycle, Geochemical cycles, Permafrost distribution, Soil air interface, Paleoclimatology, Climatic changes, Global warming

52-4849

Global warming and the stability of the West Antarctic Ice Sheet.

Oppenheimer, M., *Nature,* May 28, 1998, 393(6683), p.325-332, 122 refs.

Ice sheets, Air temperature, Ice melting, Stability, Global warming, Climatic changes, Antarctica—West Antarctica

Of today's great ice sheets, the West Antarctic Ice Sheet poses the most immediate threat of a large sea-level rise, owing to its potential instability. Complete release of its ice to the ocean would raise global mean sea level by 4-6 m, causing major coastal flooding worldwide. Human-induced climate change may play a significant role in controlling the long-term stability of the West Antarctic Ice Sheet and in determining its contribution to sea-level change in the near future. (Auth.)

52-4850

Correlation between Arabian Sea and Greenland climate oscillations of the past 110,000 years.

Schulz, H., Von Rad, U., Erlenkeuser, H., *Nature,* May 7, 1998, 393(6680), p.54-57, 30 refs.

Climatic changes, Paleoclimatology, Sediments, Air temperature, Greenland, Arabian Sea

52-4851

Possible triggering of Heinrich events by ice-load-induced earthquakes.

Hunt, A.G., Malin, P.E., *Nature,* May 14, 1998, 393(6681), p.155-158, 24 refs.

Sediments, Icebergs, Ice loads, Earthquakes, Climatic changes, Greenland, Canada

52-4852

Simulated response of the ocean carbon cycle to anthropogenic climate warming.

Sarmiento, J.L., Hughes, T.M.C., Stouffer, R.J., Manabe, S., *Nature,* May 21, 1998, 393(6682), p.245-249, 27 refs.

Climatic changes, Global warming, Carbon dioxide, Air water interactions

A 1995 report of the Intergovernmental Panel on Climate Change provides a set of illustrative anthropogenic CO_2 emission models leading to stabilization of atmospheric CO_2 concentrations ranging from 350 to 1,000 ppm. Ocean carbon-cycle models used in calculating these scenarios assume that oceanic circulation and biology remain unchanged through time. This assumption is examined by using a coupled atmosphere-ocean model of global warming for the period 1765 to 2065. A large potential modification to the ocean carbon sink in a vast region of the southern ocean is noted where increased rainfall leads to surface freshening and increased stratification. The increased stratification reduces the downward flux of carbon and the loss of heat to the atmosphere, both of which decrease the oceanic uptake of anthropogenic CO_2 relative to a constant-climate control scenario. Changes in the formation, transport and cycling of biological material may counteract the reduced uptake. The simulation suggests that such physical and biological changes might already be occurring, and that they could substantially affect the ocean carbon sink over the next few decades. (Auth. mod.)

52-4853

Dynamic responses of terrestrial ecosystem carbon cycling to global climate change.

Cao, M.K., Woodward, F.I., *Nature,* May 21, 1998, 393(6682), p.249-252, 30 refs.

Ecosystems, Climatic changes, Carbon dioxide, Periodic variations

52-4854

New ice outdoes related nets in smallest-ring size.

O'Keefe, M., *Nature,* Apr. 30, 1998, 392(6679), p.879, 7 refs. For the item being discussed, see 52-2878.

High pressure ice, Ice crystals, Water, Molecular structure

52-4855

Lead from Carthaginian and Roman Spanish mines isotopically identified in Greenland ice dated from 600 B.C. to 300 A.D.

Rosman, K.J.R., Chisholm, W., Hong, S.M., Candelone, J.P., Boutron, C.F., *Environmental science & technology,* Dec. 1997, 31(12), p.3413-3416, 26 refs.

Air pollution, Aerosols, Mining, Metals, Ice sheets, Ice cores, Ice dating, Isotope analysis, Origin, Correlation, Greenland, Spain

52-4856

Spatial and temporal variation of polycyclic aromatic hydrocarbons in the arctic atmosphere.

Halsall, C.J., et al, *Environmental science & technology,* Dec. 1997, 31(12), p.3593-3599, 32 refs.

Climatology, Air pollution, Polar atmospheres, Atmospheric circulation, Hydrocarbons, Organic nuclei, Haze, Aerosols, Sampling, Seasonal variations, Environmental tests, Canada—Northwest Territories—Ellesmere Island, Canada—Yukon Territory—Tagis, Russia—Siberia

52-4857

Comment on "Unidirectional freezing of waste-activated sludge: the presence of sodium chloride".

Parker, P.J., Collins, A.G., Chu, C.P., Feng, W.H., Tsai, Y.H., Lee, D.J., *Environmental science & technology,* Dec. 1997, 31(12), p.3740-3741, Includes reply. 13 refs. For pertinent paper see 52-1072.

Waste treatment, Sludges, Freeze thaw cycles, Freezing points, Freezing rate, Aggregates, Salinity, Ice water interface, Dendritic ice, Migration

52-4858
Ice-crystal absorption: a comparison between theory and implications for remote sensing.
Baran, A.J., Foot, J.S., Mitchell, D.L., *Applied optics,* Apr. 20, 1998, 37(12), p.2207-2215, 41 refs.
Cloud physics, Optical properties, Remote sensing, Sounding, Ice crystal optics, Ice crystal size, Radiation absorption, Infrared radiation, Radiometry, Analysis (mathematics), Theories

52-4859
Polarization anomaly of the microwave brightness temperature from ice.
Liu, Q.H., Augstein, E., Darovskikh, A., *Applied optics,* Apr. 20, 1998, 37(12), p.2228-2230, 4 refs.
Remote sensing, Microwaves, Brightness, Polarization (waves), Oscillations, Sea ice, Ice cover thickness, Reflectivity, Surface roughness, Ice air interface, Dielectric properties

52-4860
Modeling of the influence of snow reflectance on ultraviolet irradiance for cloudless sky.
Lenoble, J., *Applied optics,* Apr. 20, 1998, 37(12), p.2441-2447, 19 refs.
Climatology, Radiation balance, Atmospheric boundary layer, Radiance, Ozone, Backscattering, Snow optics, Snow cover effect, Ultraviolet radiation, Reflectivity, Transmissivity, Indexes (ratios), Mathematical models

52-4861
Can cirrus clouds produce glories?
Sassen, K., Arnott, W.P., Barnett, J.M., Aulenbach, S., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1427-1433, 24 refs.
Cloud physics, Optical phenomena, Light scattering, Backscattering, Wave propagation, Cloud droplets, Ice crystal optics, Ice crystal structure, Theories, Analysis (mathematics)

52-4862
Halo arcs from airborne, pyramidal ice crystals falling with their *c* axes in vertical orientation.
Pekkola, M., Riikonen, M., Moilanen, J., Ruoskanen, J., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1435-1440, 24 refs.
Cloud physics, Optical phenomena, Classifications, Sunlight, Light scattering, Ice crystal optics, Ice crystal structure, Orientation, Computerized simulation, Theories, Photography

52-4863
Comparison of Sun pillars with light pillars from nearby light sources.
Mallmann, A.J., Hock, J.L., Greenler, R.G., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1441-1449, 8 refs.
Cloud physics, Ice crystal optics, Ice crystal structure, Orientation, Optical phenomena, Sunlight, Light scattering, Reflectivity, Visibility, Simulation

52-4864
Identification of odd-radius halo arcs and of 44°/46° parhelia by their inner-edge polarization.
Können, G.P., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1450-1456, 17 refs.
Cloud physics, Light scattering, Classifications, Sunlight, Optical phenomena, Ice crystal optics, Wave propagation, Polarization (waves), Theories, Visibility

52-4865
Polarization structures in parhelic circles and in 120° parhelia.
Können, G.P., Tinbergen, J., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1457-1464, 11 refs.
Cloud physics, Optical phenomena, Sunlight, Ice crystal optics, Light scattering, Radiance, Polarization (waves), Wave propagation, Visibility, Theories

52-4866
Corona-producing ice clouds: a case study of a cold mid-latitude cirrus layer.
Sassen, K., Mace, G.G., Hallett, J., Poellot, M.R., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1477-1485, 16 refs.
Cloud physics, Cloud cover, Lidar, Radar echoes, Polarization (waves), Optical phenomena, Ice crystal optics, Particle size distribution, Homogeneous nucleation, Aerosols

52-4867
Scattering observations for tilted transparent fibers: evolution of Airy caustics with cylinder tile and the caustic merging transition.
Mount, C.M., Thiessen, D.B., Marston, P.L., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1534-1539, 13 refs.
Light scattering, Wave propagation, Sunlight, Icicles, Ice optics, Lasers, Simulation, Refractivity, Specular reflection

52-4868
Descartes glare points in scattering by icicles: color photographs and a tilted dielectric cylinder model of caustic and glare-point evolution.
Marston, P.L., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1551-1556, 17 refs.
Light scattering, Ice optics, Wave propagation, Icicles, Sunlight, Ice dielectrics, Imaging, Refractivity, Optical phenomena, Optical properties, Analysis (mathematics)

52-4869
Laboratory experiments in atmospheric optics.
Vollmer, M., Tammer, R., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1557-1568, 28 refs.
Atmospheric physics, Optical properties, Optical phenomena, Light scattering, Sunlight, Wave propagation, Ice crystal optics, Simulation, Refractivity

52-4870
Observations of glistening in the environment and its relationship to stereovision.
Bates, H.E., Warner, G., *Applied optics,* Mar. 20, 1998, 37(9), Topical Meeting on Light and Color in the Open Air, Santa Fe, NM, Feb. 9-12, 1997. Selected papers, p.1569-1572, 5 refs.
Snow optics, Brightness, Light scattering, Optical phenomena, Visibility, Simulation, Stereoscopy, Imaging, Theories

52-4871
Passive microwave signatures of simulated pancake ice and young pressure ridges.
Grenfell, T.C., Wensnahan, M.R., Winebrenner, D.P., *Remote sensing reviews,* 1994, 9(1-2), p.51-64, 14 refs. For another version see 47-673.
DLC G70.4 R466 Vol.9
Sea ice, Young ice, Remote sensing, Radiometry, Brightness, Spectra, Surface structure, Pressure ridges, Polarization (waves), Thin sections, Simulation, Statistical analysis

52-4872
Combination of algorithmic and heuristic methods for the classification of sea ice imagery.
Haverkamp, D., Tsatsoulis, C., Gogineni, S., *Remote sensing reviews,* 1994, 9(1-2), p.135-159, 21 refs.
DLC G70.4 R466 Vol.9
Sea ice, Surface properties, Classifications, Spaceborne photography, Radar photography, Synthetic aperture radar, Image processing, Models, Statistical analysis, Accuracy

52-4873
Theoretical developments on the optical properties of highly turbid waters and sea ice.
Maffione, R.A., *Limnology and oceanography,* Jan. 1998, 43(1), p.29-33, 20 refs.
Oceanography, Sea water, Optical properties, Sea ice, Ice optics, Turbidity, Ice water interface, Radiation balance, Radiance, Indexes (ratios), Wave propagation, Attenuation, Mathematical models, Theories

52-4874
Theory and measurements of the complete beam spread function of sea ice.
Maffione, R.A., Voss, J.M., Mobley, C.D., *Limnology and oceanography,* Jan. 1998, 43(1), p.34-43, 37 refs.
Sea ice, Optical properties, Ice optics, Electromagnetic properties, Light scattering, Wave propagation, Attenuation, Radiance, Ice water interface, Theories, Analysis (mathematics), Radiation measurement

52-4875
Photoadaptive response during the development of coastal antarctic diatom bloom and relationship to water column stability.
Moline, M.A., *Limnology and oceanography,* Jan. 1998, 43(1), p.146-153, 56 refs.
Marine biology, Plankton, Plant ecology, Biomass, Photosynthesis, Water chemistry, Chlorophylls, Turbulent diffusion, Light effects, Solar radiation, Radiance, Sampling, Correlation, Antarctica—Antarctic Peninsula
The ratio of the xanthophyll pigments diadinoxanthin and diatoxanthin to chlorophyll *a* was used as a photoadapative index during the development of a large antarctic diatom bloom. This index was found to track fluctuations in the incident solar irradiance and the *in situ* light field over a 3-order-magnitude change in the water column biomass. These time-series results illustrate the potential use of xanthophyll pigments in assessing phytoplankton light histories and the degree of water column stability. (Auth. mod.)

52-4876
Snow management and deep tillage for increasing crop yields on a rolling landscape.
McConkey, B.G., Ulrich, D.J., Dyck, F.B., *Canadian journal of soil science,* Aug. 1997, 77(3), p.479-486, With French summary. 40 refs.
Agriculture, Biomass, Soil water, Water supply, Water retention, Snow retention, Chernozem, Snowmelt, Meltwater, Seepage, Snow cover effect, Vegetation factors, Sampling

52-4877
Sedimentary processes at the base of a West Antarctic ice stream: constraints from textural and compositional properties of subglacial debris.
Tulaczyk, S., Kamb, B., Scherer, R.P., Engelhardt, H.F., *Journal of sedimentary research A,* May 1998, 68(3), p.487-496, Refs. p.494-496.
Glacial geology, Ice sheets, Ice solid interface, Sedimentation, Glacial deposits, Glacier beds, Bedrock, Lithology, Physical properties, Drill core analysis, Theories, Antarctica—Ross Ice Shelf
Samples of sediments from beneath Ice Stream B (at camp UpB), provide the first opportunity to study the relationship between sediment properties and physical conditions in a sub-ice-stream environment. Piston coring drilling yielded five undisturbed subglacial sediment cores, which the authors analyzed for granulometry, composition and particle morphology. Sedimentary particles in these cores bear no evidence of the recent crushing or abrasion that is common in other subglacial sedimentary environments. The presence of reworked diatoms and their state of preservation, as well as the relative spatial homogeneity of this diamicton, suggest that the UpB cores sampled a several-meter-thick till layer and not *in situ* glacimarine sediments. The authors propose that the lack of significant comminution in the UpB till is ultimately due to its setting over these easily erodible, clay-rich source sediments. The resulting fine-grained till matrix inhibits glacial comminution, because it facilitates buildup of high pore-water pressures and hinders interparticle stress concentrations. They hypothesize that extensive layers of weak till may develop preferentially where ice overrides preexisting, poorly indurated, fine-grained sediments. Since such weak till layers create a permissive condition for ice streaming, subglacial geology may have an indirect but strong control over the location, extent and basal mechanics of ice streams. (Auth. mod.)

52-4878

Low-temperature seal failure of systems and devices with rubber seals.

Pakholko, V.V., *Chemical and petroleum engineering,* May-June 1997 (Pub. Jan. 98), 33(3), p.259-261, Translated from Khimicheskoe i neftianoe mashinostroenie. 2 refs.

Rubber, Sealing, Degradation, Cryogenics, Thermal stresses, Temperature effects, Low temperature tests, Mechanical properties, Indexes (ratios)

52-4879

Effect of the chemical composition and concentration of salts on the shear strength of frozen sandy loam.

Roman, L.T., Svintitskaia, L.F., *Moscow University geology bulletin,* 1996, 51(5), p.44-50, Translated from Vestnik Moskovskogo universiteta. Geologiia. 11 refs.

Frozen ground chemistry, Frozen ground strength, Saline soils, Indexes (ratios), Shear strength, Organic soils, Coagulate soils, Mechanical properties, Chemical composition, Mechanical tests, Temperature effects

52-4880

Mineralogy and geochemistry of Devonian ultramafic minor intrusions of the southern Kola Peninsula, Russia: implications for the petrogenesis of kimberlites and melilitites.

Beard, A.D., Downes, H., Hegner, E., Sablukov, S.M., Vetrin, V.R., Balogh, K., *Contributions to mineralogy and petrology,* Feb. 1998, 130(3-4), p.288-303, 58 refs.

Pleistocene, Geological surveys, Subpolar regions, Magma, Rock properties, Classifications, Geologic processes, Mineralogy, Geochemistry, Sampling, Isotope analysis, Russia—Kola Peninsula

52-4881

Caledonian eclogite-facies metamorphism of Early Proterozoic protoliths from the North-East Greenland eclogite province.

Brueckner, H.K., Gilotti, J.A., Nutman, A.P., *Contributions to mineralogy and petrology,* Jan. 1998, 130(2), p.103-120, Refs. p.118-120.

Pleistocene, Tectonics, Subpolar regions, Earth crust, Geologic processes, Mineralogy, Lithology, Isotope analysis, Geochronology, Sampling, Greenland

52-4882

Comets and interstellar ices: a cosmic connection.

Brooke, T.Y., *Endeavour,* Sep. 1997, 21(3), p.101-104, 18 refs.

Extraterrestrial ice, Cosmic dust, Remote sensing, Infrared spectroscopy, Ice detection, Ice formation, Ice composition, Aggregates, Chemical analysis, Spectra

52-4883

Lost continent in a temperate Arctic.

Boulter, M.C., Manum, S.B., *Endeavour,* Sep. 1997, 21(3), p.105-108, 8 refs.

Marine geology, Pleistocene, Continental drift, Tectonics, Quaternary deposits, Marine deposits, Paleobotany, Paleoecology, Geomagnetism, Vegetation patterns, Drill core analysis, Arctic Ocean, Fram Strait

52-4884

Rockglaciers: indicators for the present and former geoecology in high mountain environments.

Barsch, D., Springer Series in Physical Environment. Vol.16, Berlin, Springer-Verlag, 1996, 331p., Refs. p.273-319.

DLC GB641.B37 1996

Alpine landscapes, Soil creep, Geomorphology, Landforms, Rock glaciers, Rock mechanics, Talus, Slope processes, Mass movements (geology), Periglacial processes, Permafrost indicators, Terminology, Classifications

52-4885

Measurements of precipitation and snow pack at Russian North Pole drifting stations.

Colony, R., Radionov, V., Tanis, F.J., *Polar record,* Jan. 1998, 34(188), p.3-14, 7 refs.

Precipitation (meteorology), Snowfall, Snow accumulation, Snow line, Measurement, Drift stations, Statistical analysis, Correlation, North Pole

52-4886

Short- and long-term impacts of human disturbances on snow-free surfaces in Antarctica.

Campbell, I.B., Claridge, G.G.C., Balks, M.R., *Polar record,* Jan. 1998, 34(188), p.15-24, 15 refs.

Environmental impact, Soil surveys, Soil strength, Desert soils, Antarctica—McMurdo Sound, Antarctica—McMurdo Dry Valleys

The speed with which tracks form as a result of trampling on exposed ground surfaces was investigated in the McMurdo Sound and Dry Valleys regions, by a simple treading experiment. Distinct tracks formed with fewer than 20 foot passes—as measured by stone cover, surface soil exposure, and track width—and they continued to develop with increasing traffic levels. Track development was rapid and most obvious on sandy gravel soils with a pebbly desert pavement, but slower and less distinct on soils with an extensive cover of surface boulders. The persistence of human impact from ground disturbances, which occurred up to 30 years previously, when pits were dug during field science investigations, was assessed using a range of previously defined criteria. Recently disturbed sites, where some action had been taken to restore the site immediately after disturbance, showed the least overall impact. (Auth. mod.)

52-4887

United Nations and Antarctica, 1996: maintaining consensus towards the millennium.

Beck, P.J., *Polar record,* Jan. 1998, 34(188), p.39-44, 15 refs.

Environmental protection, International cooperation, Meetings, Legislation

The thirteenth UN session on the 'Question of Antarctica,' held at the close of 1996, saw the reaffirmation of the consensus approach restored in 1994. One brief session of the First Committee, followed by the General Assembly's adoption of resolution A51/56 without a vote, signified the continued acceptance by UN members, including Antarctic Treaty Parties (ATPs), of the benefits of an agreed approach towards the 'Question of Antarctica.' Resolution A51/56, acknowledging the broader international community's interest in the continent, marked the ATPs' willingness to allow a limited UN role in Antarctica. UN members, identifying the merits of further research on environmental and scientific questions, pressed the case for a comprehensive report on the state of the antarctic environment. (Auth. mod.)

52-4888

New classification scheme for ice shelves based on mechanisms of mass gain and loss.

Vaughan, D.G., *Polar record,* Jan. 1998, 34(188), p.56-58, 13 refs.

Ice shelves, Classifications, Glacier mass balance, Antarctica—Ross Ice Shelf, Antarctica—Ronne Ice Shelf, Antarctica—Filchner Ice Shelf

The author proposes a classification that will serve as a reminder that all ice shelves cannot be considered as sharing the same origin or dynamic character. Models of ice sheets must take these differences into account if they are to attempt to assess the role of ice shelves in the past or future evolution of ice sheets. Among several examples in the new classification scheme, the author especially mentions the largest Antarctic ice shelves, Ross and Filchner-Ronne. (Auth. mod.)

52-4889

SCAR bulletin No.128, January 1998.

Scientific Committee on Antarctic Research, *Polar record,* Jan. 1998, 34(188), p.79-96.

Environmental protection, International cooperation, Legislation, Meetings

This is the first report on measures, decisions and resolutions adopted at the 21st Antarctic Treaty Consultative Meeting, held in Christchurch, New Zealand, May 19-30, 1997. Included are measures 1-5—Antarctic Protected Areas System—with 3 annexes covering the different protected areas; and Decision 1—revised rules of procedure (1997). For the second part of this report see A-59293 or 52-4334.

52-4890

Distribution of CO_2 species, estimates of net community production, and air-sea CO_2 exchange in the Ross Sea polynya.

Bates, N.R., Hansell, D.A., Carlson, C.A., Gordon, L.I., *Journal of geophysical research,* Feb. 15, 1998, 103(C2), p.2883-2896, 80 refs.

Oceanography, Polar atmospheres, Atmospheric boundary layer, Water chemistry, Biomass, Air water interactions, Vapor transfer, Carbon dioxide, Polynyas, Geochemical cycles, Sampling, Antarctica—Ross Sea

Measurements of surface total carbon dioxide (TCO_2), alkalinity, and calculated pCO_2, along with water column nutrients and hydrography, were made on two cruises to the Ross Sea polynya (Dec. 1994 to Jan. 1996). The polynya experiences an intense phytoplankton bloom during a short period of open water conditions from mid-Dec. to mid-Feb. each year. Biogeochemical observations were used to determine the temporal variability of CO_2, fluxes of carbon within the ocean, and rates of air-sea exchange of CO_2. Net community production (NCP) rates across the polynya ranged from 0.86 to 0.98 g $C/m^2/d$. Export of carbon from the surface to depth was at least 55-60% of NCP rates. (Auth. mod.)

52-4891

Water mass distribution and polar front structure in the western Barents Sea.

Harris, C.L., Plueddemann, A.J., Gawarkiewicz, G.G., *Journal of geophysical research,* Feb. 15, 1998, 103(C2), p.2905-2917, 26 refs.

Oceanography, Ocean currents, Boundary layer, Convection, Meltwater, Salinity, Buoyancy, Turbulent diffusion, Topographic effects, Seasonal variations, Statistical analysis, Barents Sea

52-4892

Biologically active insolation over antarctic waters: effect of a highly reflecting coastline.

Podgorny, I., Lubin, D., *Journal of geophysical research,* Feb. 15, 1998, 103(C2), p.2919-2928, 26 refs.

Climatology, Atmospheric boundary layer, Polar atmospheres, Shores, Cloud cover, Insolation, Radiation balance, Ultraviolet radiation, Albedo, Biomass, Snow cover effect, Radiometry, Mathematical models, Antarctica—Palmer Station

Near an antarctic coastline or sea ice edge, multiple reflection of photons between the high-albedo surface and a cloud will increase the downwelling surface insolation not only over the high-albedo surface itself but also out over the adjacent open water. This insolation enhancement is examined with a Monte Carlo radiative transfer model. This insolation enhancement is examined with a Monte Carlo radiative transfer model. The insolation enhancement extends to a typical distance of 4 km out to sea, with the most important effects being within 2 km of the coastline. The strength of the multiple reflection effect depends primarily on cloud base height and cloud optical depth and only slightly on cloud geometrical thickness. On the basis of the limited range of the multiple reflection effect the insolation enhancement due to the high-albedo coastline is unlikely to be a major influence on the primary productivity of all antarctic waters; however, it may influence phytoplankton blooms near the coast and photobiological experiments carried out at coastal research stations. Also, the insolation enhancement may have significance in sea ice leads and polynyas. (Auth. mod.)

52-4893

Nonhydrostatic haline convection under leads in sea ice.

Smith, D.C., IV, Morison, J.H., *Journal of geophysical research,* Feb. 15, 1998, 103(C2), p.3233-3247, 26 refs.

Oceanography, Ocean currents, Convection, Turbulent exchange, Fluid dynamics, Ice openings, Ice water interface, Boundary layer, Water pressure, Brines, Ice cover effect, Mathematical models

52-4894

Inertial-dissipation method for estimating turbulent flux in buoyancy-driven, convective boundary layers.

McPhee, M.G., *Journal of geophysical research,* Feb. 15, 1998, 103(C2), p.3249-3255, 12 refs.

Oceanography, Ice openings, Ice edge, Boundary layer, Ocean currents, Turbulent boundary layer, Turbulent diffusion, Air ice water interaction, Buoyancy, Salinity, Spectra, Convection, Analysis (mathematics), Arctic Ocean

52-4895
Lead convection measured with an autonomous underwater vehicle.
Morison, J.H., McPhee, M.G., *Journal of geophysical research,* Feb. 15, 1998, 103(C2), p.3257-3281, 22 refs.
Oceanography, Sea ice, Ice openings, Ice edge, Ocean currents, Convection, Buoyancy, Heat flux, Air ice water interaction, Salinity, Turbulent diffusion, Ice cover effect, Models, Arctic Ocean

52-4896
Thermodynamic stability and negative thermal expansion of hexagonal and cubic ices.
Tanaka, H., *Journal of chemical physics,* Mar. 22, 1998, 108(12), p.4887-4893, 22 refs.
Ice physics, Cubic ice, Molecular structure, Molecular energy levels, Defects, Hydrogen bonds, Thermal expansion, Thermodynamics, Stability, Temperature effects, Simulation

52-4897
Dissociative electron attachment in nanoscale ice films: thickness and charge trapping effects.
Simpson, W.C., Orlando, T.M., Parenteau, L., Nagesha, K., Sanche, L., *Journal of chemical physics,* Mar. 22, 1998, 108(12), p.5027-5034, 51 refs.
Ice physics, Deuterium oxide ice, Amorphous ice, Water films, Thickness, Ice dielectrics, Charge transfer, Ion diffusion, Resonance, Molecular energy levels, Ice spectroscopy

52-4898
Rates and mechanisms of heterogeneous ice nucleation on silver iodide and silver chloroiodide particulate substrates.
Finnegan, W.G., *Journal of colloid and interface science,* June 15, 1998, 202(2), p.518-526, 34 refs.
Cloud physics, Supercooled clouds, Heterogeneous nucleation, Ice crystal growth, Nucleation rate, Colloids, Substrates, Adsorption, Molecular structure, Silver iodide, Aerosols, Artificial nucleation, Cloud chambers

52-4899
Distribution of rock, metals, and ices in Callisto.
Anderson, J.D., Schubert, G., Jacobson, R.A., Lau, E.L., Moore, W.B., Sjogren, W.L., *Science,* June 5, 1998, 280(5369), p.1573-1576, 22 refs.
Extraterrestrial ice, Satellites (natural), Geophysical surveys, Remote sensing, Radar echoes, Gravity, Ground ice, Ice composition, Geologic processes, Ice solid interface, Stratification, Density (mass/volume), Structural analysis, Models

52-4900
Identification of water ice on the Centaur 1997 CU26.
Brown, R.H., Cruikshank, D.P., Pendleton, Y., Veeder, G.J., *Science,* May 29, 1998, 280(5368), p.1430-1432, 22 refs.
Planetary environments, Ice spectroscopy, Infrared spectroscopy, Hydrocarbons

52-4901
Dating of Sirius Group tillites in the Antarctic Dry Valleys with cosmogenic ^{3}He and ^{21}Ne.
Bruno, L.A., Baur, H., Graf, T., Schlüchter, C., Signer, P., Wieler, R., *Earth and planetary science letters,* Mar. 1997, 147(1-4), p.37-54, 47 refs.
Paleoclimatology, Geochronology, Geochemistry, Antarctica—Victoria Land, Antarctica—Fleming, Mount, Antarctica—Table Mountain
Cosmogenic ^{3}He and ^{21}Ne in boulder and bedrock surface samples were measured in and near Sirius Group tillites from two localities in southern Victoria Land. Pyroxene quantitatively retains cosmogenic ^{3}He for millions of years. The deposit at Mt. Fleming has a minimum exposure age of ca. 6.5 Ma, while ca. 6 Ma is a probable minimum age for the Table Mountain tillite. These lower limits are based on the samples with the highest concentrations of cosmogenic noble gases and currently accepted production rates. Since the plagioclase-bearing Mt. Fleming samples almost certainly lost part of their cosmogenic Ne, the minimum exposure age at this location is presumably even ≈50% higher than the stated value. The concentrations of cosmogenic Ne in the samples constrain uplift rates of the Transantarctic Mountains to <170 m/Ma. These data contradict the hypothesis of a collapse of the East Antarctic ice sheet in the Pliocene coupled with high uplift rates and support the model of a stable ice sheet since the middle Miocene. (Auth. mod.)

52-4902
Link between geomagnetic reversals and events and glaciations.
Worm, H.U., *Earth and planetary science letters,* Mar. 1997, 147(1-4), p.55-67, 54 refs.
Geomagnetism, Glaciation, Sediments, Oxygen isotopes, Arctic Ocean, Greenland Sea, Japan—Biwa, Lake, United States—California—Mono Lake

52-4903
Two dimensional simulation of temperature and moisture distribution in roads during a freeze-thaw cycle.
Klemets, B.W., Waterloo, Ontario, University, 1991, 122p., M.S. thesis. 27 refs.
Subgrade soils, Soil freezing, Freezing front, Frost penetration, Frost heave, Ground thawing, Thaw depth, Temperature distribution, Soil water migration, Road maintenance, Mathematical models, Computerized simulation

52-4904
Doing excavations using explosives in the wintertime.
Garstka, J., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* June 1993, FSTC-HT-436-92, 8p., ADB-174 910, Translated from Wojskowy przegląd techniczny, No.6, 1991, p.28-29.
Fortifications, Earthwork, Blasting, Excavation, Military operation, Cold weather operation

52-4905
Special features and method of camouflage in winter.
Rkman, I., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* July 1990, FSTC-HT-640-89, 8p., ADB-146 220, Translated from Vojni glasnik, no. 6, 1988, p.15-20.
Military operation, Cold weather operation, Snow optics, Snow cover effect

52-4906
Preparation of decontaminant solutions under winter conditions.
Dimitrov, V., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* May 1988, FSTC-HT-508-87, 5p., ADB-127 625, Translated from Armeyski pregled, No.1, 1986, p.100-103.
Military operation, Cold weather operation, Health, Safety, Human factors engineering, Countermeasures

52-4907
Operation of construction machines in winter.
Bardyshev, O.A., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* Nov. 1977, FSTC-HT-1076-77, 65p., ADB-028 234, For Russian original see 31-2057.
Railroads, Railroad equipment, Construction equipment, Motor vehicles, Engine starters, Fuels, Lubricants, Winter maintenance, Cold weather construction, Cold weather operation, Baykal Amur Railroad

52-4908
Winter battle and winter training of Soviet land forces.
Sobik, E., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* July 1973, FSTC-HT-23-1253-73, 8p., AD-922 147, Translated from Truppenpraxis, No. 11, 1972, p.848-852. 17 refs.
Cold weather operation, Cold weather survival, Military operation, Military research, Education

52-4909
Combat training in winter—winter bivouac.
Grüner, R., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* Sep. 1977, FSTC-613-77, 10p., ADB-026 047, Translated from Wehrausbildung, Jan. 1977, p.3-7. 9 refs.
Cold weather operation, Cold weather survival, Military operation, Military research, Education

52-4910
Tank platoon attacks in winter.
Kolev, M., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* Oct. 1980, FSTC-HT-592-80, 6p., ADB-053 938, Translated from Serzhant, No.12, 1979, p.7-9.
Cold weather operation, Cold weather survival, Military operation, Tanks (combat vehicles), Education

52-4911
Operation of motor vehicles under difficult conditions.
Hinic, M.S., *U.S. Army Foreign Science and Technology Center, Charlottesville, VA. Translation,* Apr. 1985, FSTC-HT-447-84, 396p., ADB-093 201, Translation of Eksploatacija automobila u teskim uslovima, Belgrade, Military School Publishing House, 1981. 89 refs.
Motor vehicles, Military equipment, Military operation, Military engineering, Cold weather operation, Winter maintenance, Trafficability, Route surveys, Serbia

52-4912
Safeguarding the operational capabilities of troops in winter.
Multanen, P., Saressalo, L., *U.S. Army Medical Intelligence and Information Agency, Washington, D.C. Translation,* Jan. 1978, USAMIIA-K-8665, 15p., ADB-024 279, Translation of Joukon toimintakyvyn säilyttäminen talvella, Helsinki, Finnish General Staff, Instruction Office, Oct. 1976.
Military operation, Cold weather operation, Cold weather survival, Cold exposure, Frostbite, Health, Safety, Finland

52-4913
Check Test of Launcher, Grenade, 40mm, M203, under arctic winter conditions.
Owen, B.P., U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, MD, TECOM Project No.8-WE-300203-019, Fort Greely, AK, U.S. Army Arctic Test Center, Apr. 1975, 27p. + appends., ADB-004 403, 14 refs.
Military equipment, Explosives, Cold weather tests, Military research

52-4914
Behavioral evaluation of a winter warfare training exercise, 1977.
McCarroll, J.E., Denniston, J.C., Pierce, D.R., Farese, L.J., *U.S. Army Research Institute of Environmental Medicine, Natick, MA. Report,* Oct. 1977, T-1/78, 52p., ADA-052 045, 36 refs.
Military operation, Cold weather operation, Cold weather survival, Cold exposure, Physiological effects, Frostbite, Health, Safety, Education

52-4915
Human fluid balance and dehydration during cold weather military operations.
Freund, B.J., Sawka, M.N., *U.S. Army Research Institute of Environmental Medicine, Natick, MA. Technical note,* Dec. 1994, T95-4, 34p., ADA-289 192, 49 refs.
Military operation, Cold weather operation, Cold weather survival, Cold exposure, Physiological effects, Health

52-4916
Medical aspects of cold weather operations: a handbook for medical officers.
Burr, R.E., *U.S. Army Research Institute of Environmental Medicine, Natick, MA. Technical note,* Mar. 1993, TN93-4, 58p., ADA-263 559, 40 refs.
Cold weather operation, Cold weather survival, Cold exposure, Physiological effects, Health, Military operation, Manuals

52-4917
Chosin Reservoir: defensive, retrograde, winter, 1st Marine Division, 27 November-11 December 1950.
Berger, F.M., Lenard, J.D., Wallace, W.S., Robichaud, R.S., Mize, D.M., Norton, W.R., Fort Leavenworth, KS, U.S. Army Command and General Staff College, Combat Studies Institute, 1983, 84p., ADA-149 352, 38 refs.
Military operation, History, Cold weather operation, Cold weather survival, Korea, North

52-4918
Effects of cold weather upon armored combat vehicles during the first winter campaign, eastern front, World War II.
Craddock, B.J., Fort Leavenworth, KS, U.S. Army Command and General Staff College, 1985, 203p., ADB-099 107, Master of Military Art and Science thesis. Refs. p. 196-203.
Military operation, Cold weather operation, History, Tanks (combat vehicles), Cold weather performance, Snow cover effect, Russia, Ukraine

52-4919
Deliquescence of sulfuric acid tetrahydrate following volcanic eruptions or denitrification.
Martin, S.T., Salcedo, D., Molina, L.T., Molina, M.J., *Geophysical research letters,* Jan. 1, 1998, 25(1), p.31-34, 19 refs.
Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Volcanic ash, Aerosols, Hydrates, Phase transformations, Ice formation, Models
A thermodynamic model is employed to investigate the effects of cooling sulfuric acid tetrahydrate (SAT) when the polar stratosphere is perturbed by denitrification or volcanic eruptions. Survey experiments relevant to both arctic and antarctic atmosphere are carried out to study the plausibility of the predictions of this model. In a denitrified atmosphere the liquid begins to form ca. 3 K colder, and SAT is not predicted to deliquesce completely above the ice frost point. Likewise, in an atmosphere with a high sulfate loading, solid/liquid aerosols are predicted to coexist over a large temperature range. For these two cases, SAT particles should thus deliquesce only partially upon cooling, and hence, should return to solid form upon warming. (Auth. mod.)

52-4920
Global hexachlorocyclohexane use trends and their impact on the arctic atmospheric environment.
Li, Y.F., Bidleman, T.F., Barrie, L.A., McConnell, L.L., *Geophysical research letters,* Jan. 1, 1998, 25(1), p.39-41, 35 refs.
Climatology, Air pollution, Polar atmospheres, Marine atmospheres, Hydrocarbons, Statistical analysis, Environmental impact, Air water interactions

52-4921
Effect of ice cloud on GCM climate simulations.
Ho, C.H., Chou, M.D., Suarez, M., Lau, K.M., *Geophysical research letters,* Jan. 1, 1998, 25(1), p.71-74, 9 refs.
Climatology, Cloud cover, Cloud physics, Particles, Ice crystals, Albedo, Light scattering, Solar radiation, Radiation absorption, Heating, Simulation

52-4922
Magnetostratigraphy and paleoclimatic interpretation of continuous 7.2Ma Late Cenozoic eolian sediments from the Chinese Loess Plateau.
Sun, D.H., Shaw, J., An, Z.S., Cheng, M.Y., Yue, L.P., *Geophysical research letters,* Jan. 1, 1998, 25(1), p.85-88, 23 refs.
Paleoclimatology, Climatic changes, Precipitation (meteorology), Quaternary deposits, Loess, Eolian soils, Sedimentation, Geomagnetism, Stratigraphy, China—Loess Plateau

52-4923
Production of high ice-crystal concentrations in stratiform clouds.
Mason, B.J., *Royal Meteorological Society. Quarterly journal A,* Jan. 1998, 124(545), p.353-356, 10 refs.
Cloud physics, Supercooled clouds, Ice crystal growth, Snow crystal growth, Hoarfrost, Dendritic ice, Ice vapor interface, Particles, Temperature effects, Mathematical models

52-4924
Relationship between the upper ocean and sea ice during the antarctic melting season.
Ohshima, K.I., Yoshida, K., Shimoda, H., Wakatsuchi, M., Endoh, T., Fukuchi, M., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.7601-7615, 18 refs.
Oceanography, Sea ice distribution, Ice cover thickness, Ice melting, Polynyas, Hydrography, Advection, Heat balance, Ice water interface, Models, Climatic factors, Oceanographic surveys
During the antarctic ice-melting season, high-resolution sea ice data were collected with the video monitoring system aboard the icebreaker *Shirase* along with the monitoring of temperature and salinity in the upper ocean. On the basis of these data, relationships among sea ice concentration, temperature, and salinity are investigated. From a heat budget analysis and ocean structure in the melting season, the authors propose a simple ice-upper ocean coupled model in which sea ice melts on the bottom and lateral faces with the heat source supplied to the open water area by solar radiation. The relations among ice concentration, temperature, and salinity derived from the model are consistent with the observed relations. The analytic solution for the no lateral melting case shows that the concentration-temperature relation converges to a certain asymptotic curve with time, which explains that the temperature-concentration plot shows a similar relation for any region. Dependence of the relations among ice concentration, temperature, and salinity on the spatial scale is also discussed. (Auth. mod.)

52-4925
Heat and salt changes on the continental shelf west of the Antarctic Peninsula between January 1993 and January 1994.
Klinck, J.M., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.7617-7636, 37 refs.
Oceanography, Ocean currents, Hydrography, Salinity, Seasonal variations, Water temperature, Thermal diffusion, Heat transfer, Oceanographic surveys, Sampling, Antarctica—Antarctic Peninsula
Hydrographic measurements from four cruises between Jan. 1993 and Jan. 1994 over the continental shelf west of the Antarctic Peninsula allow analysis of seasonal changes in heat and salt content of this region. Changes above the permanent pycnocline follow a seasonal pattern of cooling and increasing in salt from summer to winter and warming and freshening from winter to summer. Exchange of Upper Circumpolar Deep Water (UCDW), an oceanic water mass, and West Antarctic Peninsula modified Circumpolar Deep Water, a cooled version of UCDW on the shelf, is responsible for these changes. The annual change is due to a net flux of UCDW onto the shelf during 1993, with most of the exchange occurring in fall and winter. Meandering of the Antarctic Circumpolar Current along the shelf break in this area seems to cause these exchanges. Deep across-shelf cuts in the bottom topography may also play a role. (Auth. mod.)

52-4926
Hydrographic changes in the Canada Basin of the Arctic Ocean, 1979-1996.
Melling, H., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.7637-7645, 31 refs.
Oceanography, Ocean currents, Water temperature, Temperature variations, Seasonal variations, Isotherms, Salinity, Hydrography, Profiles, Arctic Ocean

52-4927
Circulation, dense water formation, and outflow on the northeast Chukchi shelf.
Weingartner, T.J., Cavalieri, D.J., Aagaard, K., Sasaki, Y., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.7647-7661, 51 refs.
Oceanography, Ocean currents, Hydrography, Moorings, Sounding, Sea ice distribution, Polynyas, Air ice water interaction, Spaceborne photography, Hydrodynamics, Chukchi Sea

52-4928
Gravity waves on ice-covered water.
Keller, J.B., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.7663-7669, 15 refs.
Oceanography, Ice water interface, Water waves, Gravity waves, Wave propagation, Attenuation, Viscosity, Mathematical models, Ice cover effect, Theories

52-4929
Regime shifts in mesoscale deformations of sea ice during the winter.
Korsnes, R., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.8167-8176, 22 refs.
Oceanography, Sea ice distribution, Ice deformation, Ice breakup, Drift, Fast ice, Spaceborne photography, Seasonal variations, Image processing, Theories, Phase transformations, Arctic Ocean

52-4930
Evolution of the passive and active microwave signatures of a large sea ice feature during its 2½-year drift through the Arctic Ocean.
Gohin, F., Cavanié, A., Ezraty, R., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.8177-8189, 30 refs.
Oceanography, Sea ice distribution, Ice surveys, Drift, Sensor mapping, Radiometry, Microwaves, Backscattering, Spaceborne photography, Seasonal variations, Arctic Ocean

52-4931
Sea ice motion from satellite passive microwave imagery assessed with ERS SAR and buoy motions.
Kwok, R., Schweiger, A., Rothrock, D.A., Pang, S., Kottmeier, C., *Journal of geophysical research,* Apr. 15, 1998, 103(C4), p.8191-8214, 13 refs.
Oceanography, Sea ice distribution, Drift, Ice surveys, Radiometry, Spaceborne photography, Synthetic aperture radar, Radar tracking, Sensor mapping, Arctic Ocean, Antarctica—Weddell Sea
To demonstrate the feasibility of creating a global multidecadal ice motion record from satellite passive microwave imagery and to quantitatively assess the errors in the estimated ice motions, the authors tracked ice every 3 days in the Arctic Ocean and daily in the Fram Strait and Baffin Bay during the 8 winter months from Oct. 1992 to May 1993 and daily in the Weddell Sea during the 8 winter months from Mar. to Oct. 1992. The method involves finding the spatial offset that maximizes the cross correlation of the brightness temperature fields over 100-km patches in two images separated in time by from 1 to 3 days. The resulting ice motions are compared with contemporaneous buoy- and SAR-derived ice motions. These passive microwave ice motions show a large increase in spatial detail over motion fields optimally interpolated from buoy and wind observations, especially where buoy data are virtually absent such as near coasts and in some passages between the Arctic Ocean and its peripheral seas. (Auth. mod.)

52-4932
Latitudinal temperature gradients and climate change.
Rind, D., *Journal of geophysical research,* Mar. 27, 1998, 103(D6), p.5943-5971, Refs. p.5969-5971.
Climatology, Paleoclimatology, Climatic changes, Air temperature, Surface temperature, Temperature gradients, Ice cores, Atmospheric circulation, Hydrologic cycle, Advection, Snow cover effect, Simulation, Theories

52-4933
Mesoscale model-based study of the dynamics of a wintertime polar low in the Weddell Sea region of the Antarctic during the Winter Weddell Sea Program field phase 1986.
Heinemann, G., *Journal of geophysical research,* Mar. 27, 1998, 103(D6), p.5983-6000, 28 refs.
Climatology, Polar atmospheres, Marine meteorology, Synoptic meteorology, Atmospheric pressure, Atmospheric disturbances, Turbulent boundary layer, Atmospheric boundary layer, Air ice water interaction, Simulation, Spaceborne photography, Antarctica—Weddell Sea
A wintertime mesocyclone (MC) event occurring during the Winter Weddell Sea Program field phase 1986 is studied by digital advanced very high-resolution radiometer data and numerical simulations using the mesoscale Norwegian Limited Area Model. The MC developed during July 30, 1986, near the sea ice front of the northern Weddell Sea. During its mature stage (the following 24 hours), a pronounced frontal system formed, and baroclinic instability can be regarded as the main process for its further development. The MC moved over the sea ice during its mature stage, so the forcing by surface energy fluxes was less important. The MC had a diameter of about 700 km and a lifetime of more than 48 hours and reached the intensity of a polar low. (Auth. mod.)

52-4934
Potential retrieval of dominating crystal habit and size using radiance data from a dual-view and multiwavelength instrument: a tropical cirrus anvil case.
Baran, A.J., Watts, P.D., Foot, J.S., *Journal of geophysical research,* Mar. 27, 1998, 103(D6), p.6075-6082, 30 refs.
Climatology, Clouds (meteorology), Cloud cover, Cloud physics, Ice crystal size, Ice crystal structure, Ice crystal optics, Light scattering, Radiance, Spacecraft, Radiometry, Meteorological instruments, Performance

52-4935

On light scattering in random media with large densely packed particles.

Kokhanovsky, A.A., *Journal of geophysical research,* Mar. 27, 1998, 103(D6), p.6089-6096, 59 refs.

Atmospheric physics, Atmospheric density, Optical properties, Light scattering, Snow optics, Particles, Radiation absorption, Radiation balance, Analysis (mathematics)

52-4936

Investigation of the effect of surface heterogeneity and topography on the radiation environment of Palmer Station, Antarctica, with a hybrid 3-D radiative transfer model.

Ricchiazzi, P., Gautier, C., *Journal of geophysical research,* Mar. 27, 1998, 103(D6), p.6161-6176, 28 refs.

Climatology, Polar atmospheres, Atmospheric boundary layer, Solar radiation, Radiation balance, Cloud cover, Albedo, Radiance, Sea ice distribution, Ice cover effect, Mathematical models, Topographic effects, Radiometry, Antarctica—Palmer Station

The authors have developed and used a Monte Carlo radiative transfer code to investigate how surface topography and heterogeneous snow/ice distributions affect the downwelling irradiance at Palmer Station. The radiative transfer calculations include the effects of molecular absorption, Rayleigh scattering, and clouds. Computed results for a range of cloud optical depth, solar zenith angle, and surface albedo are presented. Comparisons of the 3-D model calculations to plane-parallel model predictions show that the effective albedo which characterizes a given ice distribution is affected by regions surprisingly far from the point of interest. Since the radius of influence depends on atmospheric transmission and surface albedo, the effective albedo varies spectrally. (Auth. mod.)

52-4937

Winter convoy.

Young, N.D., MacLachlan, C.L., *Coast artillery journal,* Nov.-Dec. 1936, 79(6), p.437-439.

Military operation, Cold weather operation, Military transportation, Route surveys, Logistics, Motor vehicles

52-4938

Arctic airborne operations.

Zimmerman, J.S., *Military review,* Aug. 1952, Vol.32, p.23-30.

Military operation, Cold weather operation, Cold weather survival, Logistics, Aircraft, Military transportation

52-4939

Arctic winter.

O'Sullivan, H.B., *Military review,* Dec. 1950, Vol.30, p.73-75.

Military operation, Cold weather operation, Cold weather survival, Tanks (combat vehicles)

52-4940

Labrador Sea ice and RADARSAT.

Johnston, M.E., Sinha, N.K., Shokr, M.E., Workshop of the Canadian Ice Working Group, 6th, Ottawa, Nov. 19-21, 1996. RADARSAT for ice and oceans: early experience and data access, Rexdale, Ontario, Canadian Standards Association, 1996, 6p., 2 refs.

Sea ice, Ice surveys, Ice microstructure, Synthetic aperture radar, Backscattering, Spaceborne photography, Statistical analysis, Labrador Sea

52-4941

Creep cracking and acoustic emissions in polar shelf ice at high temperature of 0.96 T_m.

Sinha, N.K., World Conference on Non Destructive Testing, 14th, New Delhi, India, Dec. 8-13, 1996. Proceedings. Edited by C.G.K. Nair, B. Raj, C.R.L. Murthy and T. Jayakumar, New Delhi, Oxford & IBH Publishing Co. Pvt. Ltd., 1996, p.2475-2478, 5 refs.

Ice shelves, Ice strength, Ice loads, Ice creep, Ice deformation, Ice cracks, Ice acoustics

52-4942

Borehole *in situ* indentation tests in floating sea ice at high temperatures (> 0.97 T_m).

Sinha, N.K., International Conference on Fracture, 9th, Sydney, Australia, Apr. 1-5, 1997. Proceedings. Advances in fracture research. Vol.5. Edited by B.L. Karihaloo, Y.W. Mai, M.I. Ripley and R.O. Ritchie, Amsterdam, Pergamon, 1977, p.2595-2602, 13 refs.

DLC TA409.I44 1997

Sea ice, Ice structure, Ice microstructure, Ice cover strength, Ice creep, Ice deformation, Ice cracks, Ice breaking, Ice sampling, Hardness tests, Strain tests

52-4943

Crystallographic characterization of a core from the Ward Hunt ice shelf, Canada.

Barrette, P.D., Sinha, N.K., International Symposium on Snow and Related Manifestations, Manali, India, Sep. 26-28, 1994. Proceedings. Edited by K.C. Agrawal, Manali, India, Snow and Avalanche Study Establishment, 1996, p.114-124, 17 refs. For extended abstracts of this and other papers from the same conference see 49-890 through 49-965.

Ice shelves, Ice islands, Ice cores, Snow ice interface, Snow compression, Metamorphism (snow), Firn stratification, Glacier ice, Ice structure, Ice microstructure, Ice crystal size, Statistical analysis, Canada—Northwest Territories—Ellesmere Island

52-4944

Characteristics of acoustic emissions from different types of polycrystalline ice.

Sinha, N.K., International Symposium on Snow and Related Manifestations, Manali, India, Sep. 26-28, 1994. Proceedings. Edited by K.C. Agrawal, Manali, India, Snow and Avalanche Study Establishment, 1996, p.176-183, 13 refs. For extended abstracts of other papers from same conference see 49-890 through 49-965.

Ice acoustics, Icequakes, Ice structure, Ice microstructure, Ice creep, Ice deformation, Ice cracks, Ice elasticity

52-4945

Geologic investigations in support of Project Chariot in the vicinity of Cape Thompson, northwestern Alaska—preliminary report.

Kachadoorian, R., et al, *U.S. Geological Survey. Trace elements investigations report,* Jan. 1960, TEI-753, 94p., Refs. passim.

Geological surveys, Site surveys, Nuclear explosions, Blasting, Rock excavation, Engineering geology, Seismic velocity, Ground water, United States—Alaska—Thompson, Cape

52-4946

Fiber-reinforced polymer composite materials systems to enhance reinforced concrete structures.

Marshall, O.S., Jr., Dutta, P.K., MP 5138, *U.S. Army Construction Engineering Research Laboratories, Champaign, IL. Technical report,* Feb. 1998, USACERL TR 98/47, 70p. + appends., Refs. p.63-67.

Appendix E: Low-temperature evaluation of FRP composites bonded to concrete, 109p., describes studies at the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH.

Concrete structures, Reinforced concretes, Concrete strength, Concrete durability, Polymers, Composite materials, Low temperature tests, Cold weather tests, Freeze thaw tests, Strain tests, Structural analysis, Design criteria

The use of fiber-reinforced polymer (FRP) composites was investigated for purposes of enhancing, protecting, repairing, or upgrading reinforced concrete structures. Design methods and repair applications were addressed, as were durability issues and in-field test methods for performance verification. Investigations included shear rehabilitation techniques for concrete beams, in-field test methods to determine the bond strength of FRP composites, and low-temperature evaluation of FRP performance. Field demonstrations included evaluation of carbon fiber-reinforced polymer tendons for post-tensioning of double-tee beams and wall repair at a sewage treatment facility. Also, a feasibility study and laboratory tests were performed to evaluate glass fiber-reinforced polymer cables as tie-back tension members, and a test fixture was designed and fabricated to evaluate post-stressing tendon drape angle performance. Design examples were developed for shear upgrade of concrete beams, post-tensioning of double-tee beams, and tie-back rod arrangements. Finally, a model was developed to predict failure mechanisms for reinforced concrete beams with FRP sheets or plates bonded to the bottom tensile face.

52-4947

Draft environmental impact statement, October 1981. Proposed St. George Basin Oil and Gas Lease Sale 70.

U.S. Department of the Interior. Bureau of Land Management. Alaska Outer Continental Shelf Office, Anchorage, Oct. 1981, 322p. + appends., Bibliography 25p.

Exploration, Offshore drilling, Petroleum industry, Economic development, Oil spills, Environmental impact, Site surveys, Regional planning, United States—Alaska, Bering Sea

52-4948

Snow and ice in the hydrologic cycle. [Snö och is i vattnets kretslopp]

Bengtsson, L., Årsbok. Det evigt vandrande vattnet (Yearbook. Eternally wandering water), Stockholm, Naturvetenskapliga forskningsrådets (Swedish Natural Science Research Council), 1995, p.33-42,154, In Swedish. 8 refs.

DLC Q180.S8A32 1995

Snow hydrology, Snowmelt, Snow air interface, Snow ice interface, Snow cover effect, Ice cover effect, Hydrologic cycle, Flood forecasting, Sweden

52-4949

Ocean wave attenuation due to ice floe collisions.

Shen, H.H., Squire, V.A., Symposium on Mechanics of Deformation and Flow of Particulate Materials, Evanston, IL, June 29-July 2, 1997. Proceedings. Edited by C.S. Chang et al, New York, American Society of Civil Engineers, 1997, p.283-289, 8 refs.

DLC TA418.78.M4 1997

Oceanography, Ocean waves, Wave propagation, Attenuation, Pack ice, Ice floes, Impact, Ice water interface, Ice models, Mathematical models, Ice mechanics, Theories

52-4950

3D compression of circular ice floes: comparing experiments and simulations.

Hopkins, M., Tuhkuri, J., Hansen, E., MP 5139, Symposium on Mechanics of Deformation and Flow of Particulate Materials, Evanston, IL, June 29-July 2, 1997. Proceedings. Edited by C.S. Chang et al, New York, American Society of Civil Engineers, 1997, p.290-298, 12 refs.

DLC TA418.78.M4 1997

Sea ice, River ice, Ice mechanics, Ice floes, Ice deformation, Compressive properties, Ice solid interface, Ice override, Sliding, Ice friction, Pressure ridges, Computerized simulation, Mechanical tests

The compression of ice fields made up of thin floes is central to the processes of ice jam formation in northern rivers, pressure ridge formation in northern seas, and the dynamics of ice fields in antarctic marginal seas. Model experiments were performed in which a floating layer of thin, circular ice floes, confined in a rectangular domain, were uniaxially compressed. The forces exerted by the ice against the moving boundary were measured. Geometrically similar, three-dimensional computer simulations were performed and the calculated forces are compared with the forces measured in the model experiments.

52-4951

Morphological development of alpine valley heads in the Antarctic Peninsula.

Haynes, V.M., *Earth surface processes and landforms,* Jan. 1998, 23(1), p.53-67, Refs. p.65-67.

Pleistocene, Glacial geology, Alpine landscapes, Mountain glaciers, Glacial erosion, Geomorphology, Cirque glaciers, Landscape development, Landforms, Classifications, Statistical analysis, Antarctica—Antarctic Peninsula

Complex alpine valley heads up to 36 km wide are found in the Antarctic Peninsula. The largest of these may represent an advanced stage of alpine glaciation, having evolved from the earliest corries which could have developed around the early Oligocene. This study is based on a morphometric analysis of the planform of 1680 alpine valley heads. Skewed distributions of dimensional properties suggest that small corries are continually being added to the population, as older ones are enlarged and some eliminated by coalescence and ice sheet erosion. Very large features are found only in parts of Graham Land and Alexander I., where lack of high-level ice sheet erosion has allowed the forms of mountain glaciation to dominate the landscape. The attainment of an equilibrium planform shape is suggested by the persistence of an equidimensional form, the development of characteristic or limiting values of other morphometric properties, e.g. planform closure and basin order, and by the intercorrelation of morphometric properties. A combination of branching and coalescence is fundamental in the development of corries. (Auth. mod.)

52-4952
Shallow convection and buoyancy equilibration in an idealized coastal polynya.
Chapman, D.C., Gawarkiewicz, G., *Journal of physical oceanography,* Apr. 1997, 27(4), p.555-566, 15 refs.
Oceanography, Ocean currents, Shores, Turbulent exchange, Polynyas, Ice formation, Brines, Density (mass/volume), Buoyancy, Convection, Mathematical models, Theories

52-4953
Calculating Quaternary glacial erosion rates in northeast Scotland.
Glasser, N.F., Hall, A.M., *Geomorphology,* Sep. 1997, 20(1-2), p.29-48, 64 refs.
Pleistocene, Geomorphology, Landscape development, Glacial geology, Glacial erosion, Ice scoring, Mapping, Quaternary deposits, Weathering, Sedimentation, Marine deposits, Correlation, Models, United Kingdom—Scotland

52-4954
Morphology of the 1984 open-channel flow at Krafla volcano, northern Iceland.
Rossi, M.J., *Geomorphology,* Sep. 1997, 20(1-2), p.95-112, 33 refs.
Geomorphology, Volcanoes, Subpolar regions, Fluid flow, Magma, Topographic features, Erosion, Surface properties, Sediment transport, Mapping, Rheology, Iceland—Krafla

52-4955
Periglacial sediments in an Eemian-Weichselian succession at Emmerlev Klev, southwestern Jutland, Denmark.
Christiansen, H.H., *Palaeogeography, palaeoclimatology, palaeoecology,* Apr. 1998, 138(1-4), p.245-258, 37 refs.
Pleistocene, Paleoclimatology, Climatic changes, Geomorphology, Sedimentation, Quaternary deposits, Periglacial processes, Eolian soils, Nivation, Stratigraphy, Luminescence, Geochronology, Denmark

52-4956
Slope stability problems related to glacier shrinkage and permafrost degradation in the Alps.
Haeberli, W., Wegmann, M., Vonder Mühll, D., *Ecologae geologicae Helvetiae,* 1997, 90(3), p.407-414, With German summary. 40 refs.
Geomorphology, Alpine landscapes, Mountain glaciers, Glacier ablation, Glacier tongues, Ground thawing, Slope stability, Thaw weakening, Permafrost transformation, Degradation, Safety, Forecasting, Switzerland—Alps

52-4957
Magnitude-frequency aspects of alpine debris flows.
Zimmermann, M., Mani, P., Romang, H., *Ecologae geologicae Helvetiae,* 1997, 90(3), p.415-420, With German summary. 22 refs.
Mass flow, Alpine landscapes, Sediment transport, Safety, Statistical analysis, Periodic variations, Climatic factors, Switzerland—Alps

52-4958
Destructive snow avalanches and climate change in the Swiss Alps.
Schneebeli, M., Laternser, M., Ammann, W., *Ecologae geologicae Helvetiae,* 1997, 90(3), p.457-461, With German summary. 8 refs.
Avalanches, Alpine landscapes, Periodic variations, Avalanche protection, Damage, Distribution, Climatic changes, Meteorological factors, Statistical analysis, Switzerland—Alps

52-4959
Lattice rotation in a deformed ice crystal: a study by chemical etching and replication.
Barrette, P.D., Sinha, N.K., *Materials chemistry and physics,* 1996, 44(3), p.251-254, 18 refs.
Ice physics, Ice deformation, Plastic deformation, Ice sublimation, Strains, Ice crystal structure, Orientation, Replicas, Laboratory techniques

52-4960
Freezing tolerance, cold acclimation and oxidative stress in potato. Paraquat tolerance is related to acclimation but is a poor indicator of freezing tolerance.
Seppänen, M.M., Majaharju, M., Somersalo, S., Pehu, E., *Physiologia plantarum,* Mar. 1998, 102(3), p.454-460, 20 refs.
Plant physiology, Agriculture, Plant tissues, Damage, Chemical composition, Acclimatization, Cold tolerance, Frost resistance, Classifications, Chemical analysis, Simulation

52-4961
Photoperiodic induction of dormancy and freezing tolerance in *Betula pubescens*. Involvement of ABA and dehydrins.
Welling, A., Kaikuranta, P., Rinne, P., *Physiologia plantarum,* May 1997, 100(1), p.119-125, 23 refs.
Plant physiology, Trees (plants), Plant tissues, Frost resistance, Growth, Desiccation, Chemical properties, Light effects, Simulation

52-4962
Prediction of freezing and thawing durability of concrete paving blocks.
Ghafoori, N., Mathis, R., *Journal of materials in civil engineering,* Feb. 1998, 10(1), p.45-51, 14 refs.
Concrete pavements, Concrete durability, Concrete aggregates, Frost resistance, Bricks, Physical properties, Indexes (ratios), Tensile properties, Freeze thaw tests, Standards, Forecasting

52-4963
Quartz and feldspars in the surface layer of Kara Sea sediments.
Levitan, M.A., Bourtman, M.V., Gorbunova, Z.N., Gurvich, E.G., *Lithology and mineral resources,* Mar.-Apr. 1998, 33(2), p.99-108, Translated from Litologiia i poleznye iskopaemye. 24 refs.
Marine geology, Marine deposits, Bottom sediment, Sedimentation, Mineralogy, Lithology, Chemical composition, Sampling, Distribution, Russia—Kara Sea

52-4964
Ecological condition of the Kola shelf water area, Barents Sea.
Leonova, E.M., Kiiko, O.A., *Lithology and mineral resources,* Mar.-Apr. 1998, 33(2), p.109-115, Translated from Litologiia i poleznye iskopaemye. 24 refs.
Oceanography, Marine biology, Littoral zone, Ecosystems, Ocean bottom, Water pollution, Sedimentation, Bottom sediment, Sampling, Barents Sea

52-4965
Lithologic and mineralogical features of the Late Glacial-Holocene sediments in the Neva River valley.
Verzilin, N.N., Gontarev, E.A., Kalmykova, N.A., Oknova, N.S., *Lithology and mineral resources,* Mar.-Apr. 1998, 33(2), p.116-125, Translated from Litologiia i poleznye iskopaemye. 27 refs.
River basins, Quaternary deposits, Sediments, Stratigraphy, Lithology, Mineralogy, Geochronology, Correlation, Russia—Neva River

52-4966
Stabilization energies and rotational motions in clathrate hydrate of benzene studied by molecular dynamics simulations.
Fujii, K., Arata, Y., Tanaka, H., Nakahara, M., *Journal of physical chemistry A,* Apr. 16, 1998, 102(16), p.2635-2640, 25 refs.
Clathrates, Hydrates, Hydrocarbons, Low temperature tests, Molecular energy levels, Molecular structure, Anisotropy, Thermodynamics, Temperature effects, Simulation

52-4967
Recent discoveries of volcanic-associated massive sulphide deposits in the Yukon.
Hunt, J.A., *CIM bulletin,* Feb. 1998, 91(1017), p.56-65, 53 refs.
Geological surveys, Sediments, Minerals, Mining, Exploration, Stratigraphy, Canada—Yukon Territory

52-4968
Seismic signature of the Drybones Bay kimberlite pipe, N.W.T.
Power, M.A., *CIM bulletin,* Feb. 1998, 91(1017), p.66-69, 7 refs.
Geological surveys, Earth crust, Exploration, Seismic surveys, Seismic refraction, Minerals, Rock properties, Canada—Northwest Territories

52-4969
Stratigraphic subdivision of syngenetic permafrost by means of oxygen-isotope analysis.
Arkhangelov, A.A., Vaikmiae, R.A., Mikhalev, D.V., Punning, IA.M.K., Solomatin, V.I., *USSR Academy of Sciences. Transactions. Earth science sections,* 1986, 290(5), p.94-96, Translated from Akademiia nauk SSSR. Doklady, Vol.290, No.2, 1986, p.415-417. 5 refs.
Ice wedges, Ground ice, Fossil ice, Ice composition, Ice dating, Quaternary deposits, Permafrost dating, Isotope analysis, Stratigraphy, Paleoclimatology

52-4970
Interferometric measurement of the temperature field in the vicinity of ice crystals growing from supercooled water.
Braslavsky, I., Lipson, S.G., *Physica A,* 1998, Vol.249, p.190-195, 24 refs.
Ice physics, Deuterium oxide ice, Ice water interface, Ice crystal growth, Water temperature, Supercooling, Optical properties, Refractivity, Temperature measurement, Temperature effects

52-4971
Adsorption of acetone on thin films of amorphous and crystalline ice.
Schaff, J.E., Roberts, J.T., *Langmuir,* 1998, Vol.14, p.1478-1486, 42 refs.
Ice physics, Amorphous ice, Adsorption, Ice surface, Ice vapor interface, Ice spectroscopy, Infrared spectroscopy, Monomolecular films, Hydrocarbons, Gases, Spectra, Hydrogen bonds

52-4972
Structural studies of ices at high pressure.
Loveday, J.S., Nelmes, R.J., Marshall, W.G., Besson, J.M., Klotz, S., Hamel, G., *Physica B,* Dec. 1997, Vol.241-243, International Conference on Neutron Scattering, Toronto, Canada, Aug. 17-21, 1997. Proceedings. ICNS '97. Edited by J.D. Jorgensen, S.M. Shapiro and C.F. Majkrzak, p.240-246, 34 refs.
Ice physics, High pressure ice, Deuterium oxide ice, Ice microstructure, Molecular structure, Neutron diffraction, Hydrogen bonds, Molecular energy levels, Profiles

52-4973
Amorphous polymorphism in ice investigated by inelastic neutron scattering.
Schober, H., Koza, M., Tölle, A., Fujara, F., Angell, C.A., Böhmer, R., *Physica B,* Dec. 1997, Vol.241-243, International Conference on Neutron Scattering, Toronto, Canada, Aug. 17-21, 1997. Proceedings. ICNS '97. Edited by J.D. Jorgensen, S.M. Shapiro and C.F. Majkrzak, p.897-902, 15 refs.
Ice physics, Amorphous ice, Molecular structure, Phase transformations, Ice spectroscopy, Neutron scattering, Vibration, Spectra, Thermodynamics, Thermal analysis

52-4974
Use of composites in infrastructure.
Hui, D., Dutta, P.K., MP 5140, North Atlantic Treaty Organization. Advanced Science Institutes. ASI Series, Partnership Sub-Series 3: High technology, Vol.43. Advanced multilayered and fibre-reinforced composites. Edited by Y.M. Haddad, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.3-11, 25 refs. Presented at a NATO Advanced Research Workshop, Kiev, Ukraine, June 2-6, 1997. DLC TA418.9.C6A282 1998
Concrete structures, Reinforced concretes, Concrete durability, Concrete strength, Composite materials, Structural analysis
Construction engineering history may have reached a new stage with the advent and availability of the new, low-cost, high-performance structural composites. Not only the fiber-reinforced plastic (FRP) 'pultruded' sections can replace steel in many load bearing structures, but strengthening of concrete beams with internally or externally bonded FRPs has also been proved feasible to increase the load car-

rying capacity and stiffness of existing structures. Composites made with glass, aramid, or carbon fibers are being increasingly considered for pretensioning, post-tensioning, or reinforcing concrete. To replace the corroding steel rebars, FRP system may eventually be used in concrete bridge decks or other outdoor concrete flooring structures. However, quantitative guidelines for applications of composites in structures or reinforcement of concrete are not available. This paper reviews the current state of composite applications in infrastructure including concrete reinforcement and focuses on the R&D thrusts the lack of which appears to be hindering the development of the quantitative guidelines.

52-4975

Thermo-mechanical behavior of polymer composites.

Dutta, P.K., MP 5141, North Atlantic Treaty Organization. Advanced Science Institutes. ASI Series, Partnership Sub-Series 3: High technology, Vol.43. Advanced multilayered and fibre-reinforced composites. Edited by Y.M. Haddad, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.541-554, 6 refs. Presented at a NATO Advanced Research Workshop, Kiev, Ukraine, June 2-6, 1997.
DLC TA418.9.C6A282 1998

Polymers, Composite materials, Elastic properties, Tensile properties, Thermal stresses, Cold stress, Cracking (fracturing), Structural analysis, Low temperature tests, Freeze thaw tests

In polymer composites high elastic modulus fibers are incorporated into a lower elastic modulus matrix to achieve structural reinforcement. Most common fibers are E-glass, carbon or graphite, and aramids (kevlar). Typically the elastic modulus and strength of these fibers are of a magnitude higher than the polymer matrix in which these fibers are embedded. The essential quality of a good composite is that the bond between the fiber and the matrix is well established and is continuous both around the fiber and its length. Thus, a good composite's performance essentially depends on the interfacial bond quality. When a load is applied in the direction of the fiber orientation of the composite, the load is shared both by the fiber and the polymer matrix. The ratio of this load share depends on the relative elastic modulus of the fiber and the matrix. However, the elastic modulus of the polymer matrix is significantly influenced by the temperature. At lower temperature the modulus of elasticity increases considerably, and thus it is expected that load sharing between the fibers and the matrix would also change. The purpose of this paper is to briefly discuss the micromechanical aspects of the low temperature responses expected from the polymer composites.

52-4976

Sampling and analytical considerations for site characterization at military firing ranges.

Jenkins, T.F., et al, MP 5142, Biennial International Conference on Chemical Measurement and Monitoring of the Environment, 2nd, Ottawa, Ontario, May 11-14, 1998. Proceedings. EnviroAnalysis, Ottawa, Ontario, Carleton University, Chemistry Department, 1998, p.37-42, 8 refs.

Military facilities, Site surveys, Explosives, Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

Site characterization has been conducted at several explosives-contaminated military firing ranges in Canada and the United States. Unlike other areas, such as ammunition plants and explosive ordnance disposal areas, the contaminant present at highest concentration at firing ranges is often HMX (1,3,5,7-tetrahydro-1,3,5,7-tetranitrotetrazocine). The presence of HMX on these ranges is due to the firing of M72 Lightweight Anti-Armor Weapons (LAW), which have an abnormally high dud rate, and which sometimes break open on impact, spilling solid explosives on the site. The LAW rockets contain octol, a melt-cast explosive composed of a 70:30 mixture of HMX and TNT. The largest problem associated with characterization of these firing ranges is the enormous spatial heterogeneity in concentration distribution that is present at all distances. This problem is so extreme that single discrete samples are not representative of even small geographically defined areas. Composite sampling and use of commercially available, colorimetric-based, on-site methods for HMX and TNT have been shown to provide acceptably accurate and precise results for characterization of the soils at these firing ranges.

52-4977

Development of a continuously monitoring resistivity probe for free-phase petroleum hydrocarbons.

Shoop, S.A., Berini, C.M., Guyer, R., MP 5143, Symposium on the Application of Geophysics to Engineering and Environmental Problems, Keystone, CO, Apr. 28-May 2, 1996. Proceedings. Edited by R.S. Bell and M.H. Cramer, Wheat Ridge, CO, Environmental and Engineering Geophysical Society, [1996], p.11-18, 10 refs.

Oil spills, Soil pollution, Ground water, Wells, Water pollution, Soil chemistry, Soil analysis, Soil tests, Electromagnetic prospecting, Probes, Monitors

An *in-situ* electrical resistivity probe was evaluated for use in monitoring the vertical distribution of petroleum hydrocarbon in contaminated soil. By installing the probe to intersect the water table, it continuously monitors the presence of free-phase hydrocarbons by detecting electrical resistivity changes corresponding to the degree of oil saturation in the sediment pores. At a field site where diesel contamination occurs within a fine-grained sand, the results from the probe were compared to chemical analysis of total petroleum hydrocarbons of soil borings and measured free product (light non-aqueous phase liquid (LNAPL)) thickness and groundwater level in wells. The resistivity probe was also used to study LNAPL behavior under fluctuating water table conditions in a controlled laboratory environment. Results from the resistivity probe reflect the distribution of the contaminant within the sediment on a continuous basis and more accurately than contaminant thickness measurements in wells.

52-4978

Comparison of trichloroethylene concentrations in vapor and discrete soil samples.

Hewitt, A.D., MP 5144, Biennial International Conference on Chemical Measurement and Monitoring of the Environment, 2nd, Ottawa, Ontario, May 11-14, 1998. Proceedings. EnviroAnalysis, Ottawa, Ontario, Carleton University, Chemistry Department, 1998, p.7-11, 13 refs.

Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

A linear (slope=0.806) and strong correlation (r^2=0.950) was obtained for the comparison of soil vapor (µg TCE/L) to soil mass (µg TCE/kg) trichloroethylene concentrations. This strong relationship supports the concept that active soil vapor measurements could be used as an alternative to the collection and analysis of discrete soil samples for establishing both the presence and concentration of volatile organic compounds on a mass/mass basis.

52-4979

Rhizosphere-enhanced bioremediation.

Reynolds, C.M., Koenen, B.A., MP 5145, *Military engineer,* Aug.-Sep. 1997, 89(586), p.32-33.

Military facilities, Oil spills, Soil pollution, Soil microbiology, Waste disposal, Land reclamation, Plant ecology, Plant physiology, Roots, United States—Alaska

52-4980

New technology for disasters.

Bruzewicz, A.J., MP 5146, *Military engineer,* Aug.-Sep. 1997, 89(586), p.25-26.

Site surveys, Terrain identification, Environment simulation, Flood forecasting, Accidents, Rescue operations, Land reclamation, Image processing, Data processing, Data transmission

52-4981

Choosing a durable roofing system.

Tobiasson, W., MP 5147, *Interface,* June 1997, 15(6), p.6-8.

Buildings, Roofs, Weatherproofing, Waterproofing, Cold weather construction, Design criteria

Indoor and outdoor climates influence durability, as do conditions during construction. Cost is almost always a very important aspect of choosing a durable roofing system, and life-cycle costs are the most important costs to consider. The word "sustainable" connotes preservation of the environment. A host of other issues must be considered when the aspect of sustainability is included in the decision-making process. Governments have enacted environmental laws that limit choices, but governments have also contributed research and development funds that have helped advance the roofing industry. A vast array of information is available to assist in choosing durable roofing systems, some of it contradictory. Less risk is involved when proven roofing systems are chosen. Careful consideration of details also can significantly reduce risks. For most situations, a few systems are available that will provide excellent durability. The trick is to avoid the materials and systems that are unsuitable for each situation. Choosing a durable roofing system is a challenge.

52-4982

British Army's WW II experience casts doubt on Corps' ability to fight in the Arctic.

Bittner, D.F., *Marine Corps gazette,* July 1977, Vol.61, p.28-34.

Military operation, Military research, History, Cold weather operation, Cold weather survival

52-4983

"Can-do" won't do in Norway.

Leach, S., *Marine Corps gazette,* Sep. 1978, Vol.62, p.52-56.

Military operation, Military research, Cold weather operation, Cold weather survival

52-4984

War in the Arctic.

Bryan, P.H.H., *Army quarterly,* Apr. 1948, Vol.56, p.93-102 + map.

Military operation, Military research, Military transportation, Logistics, Cold weather operation, Cold weather survival

52-4985

Precipitation of sleet and the formation of glaze in the eastern United States, January 20 to 25, 1920, with remarks on forecasting.

Meisinger, C.L., *Monthly weather review,* Feb. 1920, Vol.48, p.73-80, Refs. passim. Charts are cited but do not appear in the text.

Ice storms, Glaze, Meteorological factors, Meteorological data, Weather forecasting

52-4986

Ice storm of 25-26 February 1961 at Montreal.

Mahaffy, F.J., *Weatherwise,* Dec. 1961, Vol.6, p.241-244.

Ice storms, Damage, Cost analysis, Canada—Quebec—Montreal

52-4987

Ice storm at Worcester, Mass., Nov. 26-29, 1921.

Howe, G.F., Brooks, C.F., *American Meteorological Society. Bulletin,* 1921, Vol.2, p.139-140.

Ice storms, Damage, United States—Massachusetts

52-4988

Ice storm in central New England, April 19, 1925.

Brooks, C.F., *American Meteorological Society. Bulletin,* May 1925, Vol.6, p.82-83.

Ice storms, Accidents, Damage, Cost analysis, United States—Massachusetts

52-4989

Ice storm at Buffalo, N.Y.

Spencer, J.H., *American Meteorological Society. Bulletin,* Feb. 1930, Vol.11, p.50-51.

Ice storms, Damage, Cost analysis, United States—New York—Buffalo

52-4990

Frequency of freeze-thaw cycles, bulk density and saturation effects on soil surface shear and aggregate stability in resisting water erosion.

Asare, S.N., Rudra, R.P., Dickinson, W.T., Wall, G.J., *Canadian agricultural engineering,* Oct./Nov./Dec. 1997, 39(4), p.273-279, With French summary. 28 refs.

Soil structure, Soil strength, Frost resistance, Freeze thaw cycles, Soil erosion, Water erosion

52-4991

Interaction between wear and polish on Swedish roads.

Höbeda, P., Jacobson, T., *Swedish National Road and Transport Research Institute (Statens väg- och transportforskningsinstitut). VTI särtryck,* 1998, No.284, 10p., 22 refs. Prepared for presentation at the 1st World Conference on Highway Surfacing, May 11-13, 1998, Budapest, Hungary.

Tires, Pavements, Abrasion, Skid resistance, Road maintenance, Sweden

52-4992

Wings over Antarctica.

Nordwall, B.D., *Aviation week & space technology,* May 25, 1998, p.58-79.

Stations, Logistics, Aircraft, Aircraft landing areas, Ice runways, Cold weather operation

This article is a personal account by the author, the Senior Avionics Editor of *Aviation week & space technology,* of his 10-day visit to Antarctica in late Jan. and early Feb. 1998. He discusses the challenges of normal flight operations, resupply efforts and maintenance, extreme weather conditions, and presents an overview of the scientific research being conducted at various stations. He describes the ski-equipped airplanes and helicopters used to supply the American stations, particularly McMurdo, Amundsen-Scott, Palmer, and Siple. He also explains the ski drag approach to landing on an unprepared snow or ice surface, that is, skimming the surface of the proposed landing area with the main skis to expose hidden crevasses before making a full stop landing. In Feb. 1998 the responsibility for main air support of the U.S. National Science Foundation's antarctic activities was transferred from the U.S. Navy to the U.S. Coast Guard.

52-4993
Strength and freeze-thaw characteristics of concrete incorporating granulated blast furnace slag.
Malhotra, V.M., Simposio Internacional sobre Tecnología del Concreto, 5th, San Nicolas de la Garza, Mexico, Universidad Autónoma de Nuevo León, Facultad de Ingeniería Civil, [1981], p.159-184, 21 refs.
Concrete strength, Concrete durability, Concrete admixtures, Frost resistance, Frost protection, Freeze thaw tests, Air entrainment, Water cement ratio

52-4994
Isotope studies of groundwater, ice cores, organic material, lake sediments and permafrost ice-veins of Holocene-Pleistocene time over the USSR continental area.
Ferronskiĭ, V.I., et al, Chapman Conference: Continental Isotopic Indicators of Climate, Jackson Hole, WY, June 10-14, 1991, Washington, D.C., American Geophysical Union, [1991], 2p., Extended abstract only.
Hydrogeology, Ground water, Ground ice, Fossil ice, Permafrost dating, Soil composition, Soil dating, Isotope analysis, Global change, Paleoclimatology, Russia

52-4995
Springtime peaks of trace metals in antarctic snow.
Ikegawa, M., Kimura, M., Honda, K., Makita, K., Fujii, Y., Itokawa, Y., *Environmental health perspectives,* June 1997, 105(6), p.654-659, 38 refs.
Snow composition, Chemical composition, Metals, Seasonal variations, Antarctica—Asuka Station
Drifting snow samples were collected at Asuka Station (having coordinates and elevation at or near those of the former Belgian Roi Baudouin Station) over a period from July to Dec. 1991. Thirty-six elements in snow were analyzed by inductively coupled plasma-mass spectrometry (ICP-MS) by direct sample introduction.

52-4996
Land surface temperature time series derived from weekly AVHRR GVI composite datasets: potential and constraints for northern latitudes.
Traoré, P.C.S., Royer, A., Goïta, K., *Canadian journal of remote sensing,* Dec. 1997, 23(4), p.390-400, With French summary. 33 refs.
Climatology, Forest land, Taiga, Forest tundra, Phenology, Air temperature, Surface temperature, Indexes (ratios), Radiometry, Spacecraft, Seasonal variations, Statistical analysis, Canada

52-4997
VVP technique applied to an Alberta storm.
Xin, L., Reuter, G.W., *Journal of atmospheric and oceanic technology,* Apr. 1998, 15(2), p.587-592, 11 refs.
Wind (meteorology), Precipitation (meteorology), Wind velocity, Turbulent boundary layer, Hail, Storms, Shear properties, Radar echoes, Mathematical models, Statistical analysis, Canada—Alberta

52-4998
Remote sensing of ice water characteristics in tropical clouds using aircraft microwave measurements.
Liu, G.S., Curry, J.A., *Journal of applied meteorology,* Apr. 1998, 37(4), p.337-355, 35 refs.
Climatology, Cloud cover, Precipitation (meteorology), Radiometry, Cloud physics, Supercooled clouds, Water content, Ice crystals, Ice detection, Particle size distribution, Profiles, Brightness

52-4999
Comparison of Late Pleistocene and modern glacier extents in central Nepal based on digital elevation data and satellite imagery.
Duncan, C.C., Klein, A.J., Masek, J.G., Isacks, B.L., *Quaternary research,* May 1998, 49(3), p.241-254, 74 refs.
Pleistocene, Glacial geology, Mountain glaciers, Glacier oscillation, Altitude, Snow line, Ice edge, Glacial hydrology, Geomorphology, Paleoclimatology, Spaceborne photography, LANDSAT, Nepal

52-5000
Late Pleistocene climatic variations at Achenheim, France, based on a magnetic susceptibility and TL chronology of loess.
Rousseau, D.D., Zöller, L., Valet, J.P., *Quaternary research,* May 1998, 49(3), p.255-263, 48 refs.
Pleistocene, Paleoclimatology, Storms, Quaternary deposits, Loess, Eolian soils, Sedimentation, Stratigraphy, Remanent magnetism, Luminescence, Geochronology, France—Achenheim

52-5001
Meltwater discharge to the Skagerrak-Kattegat from the Baltic Ice Lake during the Younger Dryas interval.
Jiang, H., Svensson, N.O., Björck, S., *Quaternary research,* May 1998, 49(3), p.264-270, 30 refs.
Pleistocene, Paleoecology, Oceanography, Ocean currents, Salinity, Glacial lakes, Meltwater, Surface drainage, Marine deposits, Lacustrine deposits, Quaternary deposits, Drill core analysis, Radioactive age determination, Baltic Sea, North Sea

52-5002
Sensitivity of glacial isostatic adjustment predictions to a low-viscosity layer at the base of the upper mantle.
Milne, G.A., Mitrovica, J.X., Forte, A.M., *Earth and planetary science letters,* Jan. 1998, 154(1-4), p.265-278, 46 refs.
Pleistocene, Sea level, Isostasy, Glacial geology, Geologic structures, Viscosity, Gravity, Profiles, Forecasting, Models

52-5003
Durability characteristics of concrete columns wrapped with FRP tow sheets.
Toutanji, H., Balaguru, P., *Journal of materials in civil engineering,* Feb. 1998, 10(1), p.52-57, 24 refs.
Polymers, Cellular plastics, Composite materials, Covering, Frost protection, Concrete structures, Concrete durability, Concrete strength, Frost resistance, Freeze thaw cycles, Freeze thaw tests, Tensile properties

52-5004
Crustal processes: major controls on Reykjanes Peninsula lava chemistry, SW Iceland.
Gee, M.A.M., Thirlwall, M.F., Taylor, R.N., Lowry, D., Murton, B.J., *Journal of petrology,* May 1998, 39(5), p.819-839, 53 refs.
Marine geology, Subpolar regions, Earth crust, Geologic processes, Hydrothermal processes, Magma, Geochemistry, Oxygen isotopes, Isotope analysis, Indexes (ratios), Iceland—Reykjanes Peninsula

52-5005
Gulf of Alaska atmosphere-ocean variability over recent centuries inferred from coastal tree-ring records.
Wiles, G.C., D'Arrigo, R.D., Jacoby, G.C., *Climatic change,* Mar. 1998, 38(3), p.289-306, 43 refs.
Climatology, Marine atmospheres, Air temperature, Surface temperature, Temperature variations, Periodic variations, Atmospheric circulation, Trees (plants), Age determination, Geochronology, Spectra, Statistical analysis, United States—Alaska—Alaska, Gulf

52-5006
Tidal variations of noctilucent clouds measured at 69°N latitude by groundbased lidar.
Von Zahn, U., Von Cossart, G., Fiedler, J., Rees, D., *Geophysical research letters,* May 1, 1998, 25(9), p.1289-1292, 20 refs.
Cloud cover, Polar atmospheres, Cloud physics, Ice crystals, Lidar, Backscattering, Ice detection, Altitude, Diurnal variations, Norway

52-5007
Arctic Oscillation signature in the wintertime geopotential height and temperature fields.
Thompson, D.W.J., Wallace, J.M., *Geophysical research letters,* May 1, 1998, 25(9), p.1297-1300, 31 refs.
Climatology, Atmospheric circulation, Atmospheric pressure, Polar atmospheres, Air temperature, Surface temperature, Temperature variations, Statistical analysis, Global warming

52-5008
Shape and size of contrails ice particles.
Goodman, J., et al, *Geophysical research letters,* May 1, 1998, 25(9), p.1327-1330, 16 refs.
Climatology, Cloud physics, Atmospheric composition, Condensation trails, Aerosols, Ice crystal size, Ice crystal structure, Heterogeneous nucleation, Particle size distribution, Scanning electron microscopy, Sampling, Environmental tests

52-5009
Shapes, sizes and light scattering properties of ice crystals in cirrus and a persistent contrail during SUCCESS.
Lawson, R.P., Heymsfield, A.J., Aulenbach, S.M., Jensen, T.L., *Geophysical research letters,* May 1, 1998, 25(9), p.1331-1334, 18 refs.
Cloud physics, Climatology, Aerosols, Condensation trails, Ice crystal optics, Ice crystal structure, Ice crystal size, Light scattering, Cloud chambers, Sampling, Correlation

52-5010
Growth of ice crystals in a precipitating contrail.
Heymsfield, A.J., Lawson, R.P., Sachse, G.W., *Geophysical research letters,* May 1, 1998, 25(9), p.1335-1338, 14 refs.
Climatology, Cloud physics, Atmospheric composition, Aerosols, Condensation trails, Precipitation (meteorology), Ice crystal size, Ice crystal growth, Heterogeneous nucleation, Ice vapor interface, Supersaturation, Sampling

52-5011
Airborne scanning lidar observations of aircraft contrails and cirrus clouds during SUCCESS.
Uthe, E.E., Nielsen, N.B., Osberg, T.E., *Geophysical research letters,* May 1, 1998, 25(9), p.1339-1342, 9 refs.
Climatology, Cloud physics, Atmospheric composition, Aerosols, Condensation trails, Lidar, Backscattering, Imaging, Ice crystals, Ice detection

52-5012
Upper-tropospheric relative humidity observations and implications for cirrus ice nucleation.
Heymsfield, A.J., Miloshevich, L.M., Twohy, C., Sachse, G., Oltmans, S., *Geophysical research letters,* May 1, 1998, 25(9), p.1343-1346, 7 refs.
Climatology, Cloud physics, Aerosols, Condensation trails, Ice crystal growth, Heterogeneous nucleation, Humidity, Supersaturation, Air temperature, Temperature effects, Temperature measurement

52-5013
Wavelet analysis of dynamical processes in cirrus.
Demoz, B.B., Starr, D.O., Chan, K.R., Bowen, S.W., *Geophysical research letters,* May 1, 1998, 25(9), p.1347-1350, 22 refs.
Cloud physics, Atmospheric physics, Dynamic properties, Structural analysis, Wind velocity, Turbulent boundary layer, Wave propagation, Aerial surveys, Sounding, Ice detection, Spectra

52-5014
Electron microscope analysis of residual particles from aircraft contrails.
Twohy, C.H., Gandrud, B.W., *Geophysical research letters,* May 1, 1998, 25(9), p.1359-1362, 20 refs.
Cloud physics, Condensation trails, Ice crystal structure, Aerosols, Particles, Sampling, Scanning electron microscopy, Chemical composition, Chemical analysis, Classifications

52-5015
Ice nucleation processes in upper tropospheric wave-clouds observed during SUCCESS.
Jensen, E.J., et al, *Geophysical research letters,* May 1, 1998, 25(9), p.1363-1366, 11 refs.
Cloud physics, Aerosols, Ice crystal growth, Homogeneous nucleation, Supersaturation, Ice nuclei, Humidity, Sounding, Simulation, Correlation

52-5016
Ice crystal nucleation and growth in contrails forming at low ambient temperatures.
Jensen, E.J., et al, *Geophysical research letters,* May 1, 1998, 25(9), p.1371-1374, 13 refs.
Climatology, Cloud physics, Atmospheric composition, Aerosols, Condensation trails, Ice crystal growth, Ice crystal size, Freezing nuclei, Heterogeneous nucleation, Particle size distribution, Models

52-5017
Role of ammoniated aerosols in cirrus cloud nucleation.
Tabazadeh, A., Toon, O.B., *Geophysical research letters,* May 1, 1998, 25(9), p.1379-1382, 17 refs.
Cloud physics, Aerosols, Phase transformations, Cloud droplets, Freezing nuclei, Ice crystal growth, Heterogeneous nucleation, Ions, Humidity, Ice vapor interface, Models

52-5018
Measurements of ice nucleating aerosols during SUCCESS.
Rogers, D.C., DeMott, P.J., Kreidenweis, S.M., Chen, Y.L., *Geophysical research letters,* May 1, 1998, 25(9), p.1383-1386, 12 refs.
Cloud physics, Aerosols, Condensation trails, Ice nuclei, Condensation nuclei, Heterogeneous nucleation, Density (mass/volume), Aerial surveys, Sampling

52-5019
Role of heterogeneous freezing nucleation in upper tropospheric clouds: inferences from SUCCESS.
DeMott, P.J., et al, *Geophysical research letters,* May 1, 1998, 25(9), p.1387-1390, 12 refs.
Cloud physics, Aerosols, Ice crystal growth, Heterogeneous nucleation, Ice nuclei, Freezing nuclei, Condensation nuclei, Sampling, Particle size distribution, Mathematical models, Correlation

52-5020
Single particle analyses of ice nucleating aerosols in the upper troposphere and lower stratosphere.
Chen, Y.L., Kreidenweis, S.M., McInnes, L.M., Rogers, D.C., DeMott, P.J., *Geophysical research letters,* May 1, 1998, 25(9), p.1391-1394, 15 refs.
Cloud physics, Stratosphere, Condensation trails, Atmospheric composition, Aerosols, Heterogeneous nucleation, Ice nuclei, Chemical composition, Particles, Classifications, Sampling

52-5021
Variability in deep exchange between the Eurasian and Greenland Basins: evidence from tritium and helium-3.
Top, Z., Moore, R.M., Clarke, W.B., *Geophysical research letters,* May 1, 1998, 25(9), p.1403-1406, 25 refs.
Oceanography, Ocean currents, Subpolar regions, Water chemistry, Radioactive isotopes, Turbulent exchange, Ventilation, Seasonal variations, Isotope analysis, Radioactive age determination, Statistical analysis, Models, Greenland Sea

52-5022
Mass fluxes and dynamics of Moreno Glacier, Southern Patagonia Icefield.
Rott, H., Stuefer, M., Siegel, A., Skvarca, P., Eckstaller, A., *Geophysical research letters,* May 1, 1998, 25(9), p.1407-1410, 10 refs.
Glacier surveys, Glacier oscillation, Calving, Glacier mass balance, Snow water equivalent, Ice edge, Seasonal variations, Spaceborne photography, Synthetic aperture radar, Topographic effects, Argentina—Patagonia

52-5023
On the effect of cloud inhomogeneity on area averaged radiative properties of contrails.
Schulz, J., *Geophysical research letters,* May 1, 1998, 25(9), p.1427-1430, 15 refs.
Cloud physics, Albedo, Condensation trails, Optical properties, Radiation balance, Attenuation, Aerosols, Ice nuclei, Turbulent diffusion, Simulation, Environmental tests

52-5024
Are polar cap gravity waves a heat source for the high-latitude thermosphere?
Innis, J.L., Greet, P.A., Dyson, P.L., *Geophysical research letters,* May 1, 1998, 25(9), p.1487-1490, 24 refs.
Climatology, Polar atmospheres, Air temperature, Gravity waves, Heating, Spectroscopy, Antarctica—Mawson Station
Ground based measurements of thermospheric temperatures from Mawson Station often show a marked spatial gradient, with data taken poleward of the discrete auroral oval up to 200 K or more warmer than measurements taken in or equatorward of the oval. This region of increased temperature is identified as the polar cap. The authors suggest a possible contribution to polar cap heating from thermospheric gravity waves. (Auth.)

52-5025
Orographic clouds in north Victoria Land from AVHRR images.
Zibordi, G., Frezzotti, M., *Polar record,* Oct. 1996, 32(183), p.317-324, 15 refs.
Clouds (meteorology), Spaceborne photography, Imaging, Meteorological data, Antarctica—Victoria Land
Orographic clouds over north Victoria Land have been observed in Advanced Very High Resolution Radiometer (AVHRR) satellite imagery. These occasional clouds are discussed through analysis of their spectral features in AVHRR data. Temporal occurrence, spatial extension, and direction of the clouds are also discussed in relation to meteorological data for two periods characterized by katabatic winds, in Dec. 1992 and Jan. 1993. (Auth.)

52-5026
Frobisher's 1578 voyage: early eyewitness accounts of English ships in arctic seas.
McDermott, J., *Polar record,* Oct. 1996, 32(183), p.325-334, 22 refs.
History, Expeditions, Ice navigation

52-5027
Identifying national interests in Antarctica: the case of Canada.
Beck, P.J., *Polar record,* Oct. 1996, 32(183), p.335-346, Refs. p.344-346.
International cooperation, Legislation, Research projects
During the past decade, most publications on antarctic politics and law have concentrated upon broader developments at the Antarctic Treaty System (ATS) level. Canada offers a useful case study illuminating the broad range of interests influencing the policy of individual governments toward Antarctica, and particularly the reasons why states lacking clear national interests therein participate in the ATS. By the late 1980s, accession to the Antarctic Treaty was deemed desirable on policy grounds, even if Canada assumed only a low key role in the ATS, at least until 1994-1995, when the appointment of an Ambassador for Circumpolar Affairs was apparently followed by a more active bi-polar strategy. (Auth. mod.)

52-5028
Pingo growth ages in the delta area, Adventdalen, Spitsbergen.
Yoshikawa, K., Nakamura, T., *Polar record,* Oct. 1996, 32(183), p.347-352, 14 refs.
Pingos, Ice cover thickness, Sea level, Subpermafrost ground water, Norway—Spitsbergen

52-5029
The Northern Sea Route, 1995.
Brigham, L.W., Armstrong, T., *Polar record,* Oct. 1996, 32(183), p.353-355, 2 refs.
Marine transportation, International cooperation, Ice navigation, Northern Sea Route

52-5030
Non-government aircraft in the Antarctic 1995/96.
Swithinbank, C., *Polar record,* Oct. 1996, 32(183), p.355-356.
Aircraft, Expeditions, Antarctica

52-5031
SCAR bulletin No.123, October 1996.
Scientific Committee on Antarctic Research, *Polar record,* Oct. 1996, 32(183), p.379-386.
Research projects, International cooperation
This bulletin consists of the following: lists and maps of stations of SCAR nations operating in the Antarctic in winter 1996; Address list of SCAR Executive Committee, honorary members, National Committee, delegates and chief officers; and future meeting dates.

52-5032
Southern ocean sinking and upwelling.
Gordon, A.L., *Antarctic journal of the United States,* 1995, 30(5), p.105-106, 9 refs.
Ocean currents, Sea water
Ekman-induced upwelling is often considered the cause of the deep water upwelling around Antarctica, but the direct effects of the Ekman upwelling reach only to a few 100 m and account for near-surface upwelling. Although this effect is important, the preconditioning for deep water upwelling may be the existence of the Antarctic Circumpolar Current (ACC). Although Ekman-induced upwelling may be responsible for the final transfer of deep water to the sea surface, another possibility may be the processes along the Antarctic Divergence (AD), the zone near 65°S marking the separation between the eastward flowing ACC and the westward flowing coastal current. At the AD, undiluted deep-water characteristics attain their shallowest depth.

52-5033
Laboratory-produced pancake ice cover in a two-dimensional wave field.
Shen, H.H., Ackley, S.F., MP 5148, *Antarctic journal of the United States,* 1995, 30(5), p.106-108, 2 refs.
Ice formation, Ice cover thickness, Experimentation
The formation of a pancake ice cover in a wave field was investigated in an outdoor pond 18.3 m long, 7.62 m wide, and 2.44 m deep. Video recording continuously monitored the ice cover. This study lasted for 12 hours. In the first hour, a layer of frazil ice quickly formed. The whole surface had the consistency of a slushy soup. This initial uniform frazil ice cover grew in thickness for several hours without apparent change of surface character. Then, as the whole surface became about 3 cm thick, pancake ice suddenly appeared. This study gave a complete picture of the formation of an ice cover through the pancake ice growth. It is believed that in a wave field, ice cover may form only through pancake growth. The rate of pancake growth and the effect of this growth on the wave field conceivably can change under different environmental conditions such as the air temperature, the wave amplitude, and wave length.

52-5034
Pilot study of stress waves in a land-fast sea-ice sheet at Ross Island, Antarctica.
Frankenstein, S., Shen, H.H., *Antarctic journal of the United States,* 1995, 30(5), p.112-114, 5 refs.
Land ice, Fast ice, Runways, Stresses, Ice strength, Measuring instruments, Ocean waves, Antarctica—Ross Island
During Nov. 11-15, 1994, six stress sensors and one accelerometer were deployed next to the sea-ice runway built on the first-year, land-fast sea ice just offshore of McMurdo Station. One of the purposes of this study was to test the feasibility of using the stress sensors and the accelerometer to measure stress propagation at the ice edge caused by impinging ocean waves. Both the sensitivity of these instruments and the logistics involved in deployment need to be considered. From this study, it was determined that the stress sensors can detect strains as low as 5×10^{-6} and that the accelerometers can detect accelerations as small as 20 microgravities.

52-5035
Late winter under the South Pacific sea ice.
Hellmer, H.H., Jacobs, S.S., Rock, S.W., Belem, A.L., *Antarctic journal of the United States,* 1995, 30(5), p.114-115, 8 refs.
Sea ice distribution, Seasonal variations, Ice water interface, Antarctica—Amundsen Sea, Antarctica—Ross Sea
Cruise 94-5 of the icebreaker *Nathaniel B. Palmer,* a study of sea-ice properties in the Pacific sector of the southern ocean, provided an opportunity to observe the late winter/early spring transition in the upper water column of the Amundsen Sea and northern Ross Sea. This work complemented late summer/early fall observations made to the south of this region 6 months earlier, revealing seasonal extremes in the upper ocean related to the growth and decay of sea ice.

52-5036
Antarctic Zone Flux Experiment.
McPhee, M.G., *Antarctic journal of the United States,* 1995, 30(5), p.117-119, 3 refs.
Ocean currents, Sea water, Climate, Drift, Antarctica—Weddell Sea
During July and Aug. 1994, a group of 8 principal investigators worked from the research icebreaker *Nathaniel B. Palmer* to execute the Antarctic Zone Flux Experiment in the Weddell Sea. The main thrust of the experiment was to measure fluxes of momentum, heat, salt, and other properties in the upper ocean in at least two locations in the cyclonic gyre that dominates the circulation of the central Weddell Sea during the winter. Understanding what maintains the present winter flux regime in the Weddell Sea is thought to be an important link in tracing how the abyssal ocean interacts with the rest of the climate system and is one of the major objectives of the international Antarctic Zone program.

52-5037
Upper layer current measurements in the eastern Weddell Sea during winter.
Muench, R.D., *Antarctic journal of the United States,* 1995, 30(5), p.119-120, 4 refs.
Ocean currents, Ice water interface, Sea ice, Antarctica—Weddell Sea
Time series observations were obtained of vertical profiles of upper ocean currents in the eastern Weddell Sea, near Maud Rise. These observations were obtained during July and Aug., 1994, from the research icebreaker *Nathaniel B. Palmer* as part of the Antarctic Zone Flux experiment. The internal gravity waves were found to vary with changing hydrographic conditions, such as those associated with a warm-core eddy and with ice-water relative speeds. The measured shear can be used in conjunction with the vertical density distribution and with detailed flux estimates.

52-5038
Surface heat fluxes in the eastern Weddell Sea during winter.
Guest, P., *Antarctic journal of the United States,* 1995, 30(5), p.121-122, 3 refs.
Wind factors, Meteorological data, Sea ice distribution, Air ice water interaction, Pack ice, Heat flux, Antarctica—Weddell Sea
As part of an experimental program, the wind vector, air temperature, humidity, pressure, and downward longwave (infrared) and shortwave (solar) radiation were continuously monitored with equipment onboard the R/V *Nathaniel B. Palmer.* The variations and the mean value of the total surface heat flux were primarily determined by the long-wave radiation balance which, in turn, was mostly controlled by the amount and elevation of clouds. Despite the intense storm activity, cloud conditions, not surface wind speed or air temperature, dominated the direct thermodynamic forcing of the atmosphere on the ocean.

52-5039
Ocean flux measurement during ANZFLUX Experiment.
McPhee, M.G., *Antarctic journal of the United States,* 1995, 30(5), p.122-124, 5 refs.
Sea water, Salinity, Ocean currents, Water temperature, Heat flux, Antarctica—Weddell Sea
Determining the vertical fluxes of heat, salt, and momentum in the upper ocean during winter was the central objective of the Antarctic Zone Flux Experiment. The investigators fielded a program to measure fluxes by direct covariance techniques using turbulence instruments clusters comprising mechanical current meters directed along three orthogonal axes near fast-response temperature and conductivity sensors. The clusters were mounted at several levels on two rigid masts, which could be lowered to any level in the upper 200 m of the ocean. The strategy was to deploy one mast near the surface and one relatively deeper in the mixed layer. In general, results demonstrated both the feasibility and importance of measuring oceanic fluxes directly during high-energy mixing events in the Weddell Sea during winter.

52-5040
Mixed-layer structure and turbulent fluxes in the eastern Weddell Sea during the ANZFLUX Experiment.
Stanton, T.P., *Antarctic journal of the United States,* 1995, 30(5), p.124-125, 2 refs.
Ocean currents, Wind factors, Oceanographic surveys, Measuring instruments, Ice cover thickness, Turbulence, Air ice water interaction, Antarctica—Weddell Sea
During the author's participation in the Antarctic Zone Flux Experiment, the vertical structure and turbulent fluxes within the oceanic mixed layer were measured using three instrument systems deployed from ice camps in the eastern Weddell Sea. The objectives of the measurements were to identify and model physical processes in the upper ocean that maintain anomalously thin winter ice cover over the eastern Weddell Sea. An example of the response of the mixed layer to the passage of a severe wind storm typical for the region is shown in a figure.

52-5041
Microwave backscatter measurements from first-year pack ice in the eastern Weddell Sea.
Lytle, V.I., Golden, K.M., *Antarctic journal of the United States,* 1995, 30(5), p.125-127, 5 refs.
Turbulence, Pack ice, Ice physics, Ice temperature, Snow temperature, Air ice water interaction, Antarctica—Weddell Sea
Measurements of C band microwave backscatter from first-year sea ice were collected in the eastern Weddell Sea during July and Aug. 1994. The objective was to understand how the physical properties of the ice pack determine measured backscatter coefficients and, in particular, to study in detail how backscatter changes in response to the dynamic variations in atmospheric and oceanic influences, particularly during the powerful winter storms and large vertical heat fluxes. Preliminary analysis of the results shows a rather complex relationship between backscatter and temperature profile.

52-5042
Pycnocline structure and fluxes in the eastern Weddell Sea in winter.
Padman, L., Robertson, R.A., Levine, M.D., *Antarctic journal of the United States,* 1995, 30(5), p.127-129, 6 refs.
Turbulence, Air temperature, Sea ice, Oceanographic surveys, Air ice water interaction, Antarctica—Weddell Sea
This project is one component of the Antarctic Zone Flux Experiment (ANZFLUX) physical oceanographic program conducted in the eastern Weddell Sea in winter 1994. ANZFLUX was a multi-investigator program designed to measure heat fluxes during winter from the Warm Deep Water, through the pycnocline, mixed layer, sea ice (and leads), and ultimately into the atmosphere. The measurements described here were obtained at two ice camps that were deployed from the icebreaker R/V *Nathaniel B. Palmer* in July and Aug. 1994.

52-5043
Thermohaline structure and tracer studies during ANZFLUX.
Huber, B.A., Schlosser, P., Martinson, D.G., *Antarctic journal of the United States,* 1995, 30(5), p.129-131, 7 refs.
Ocean currents, Sea water, Salinity, Water temperature, Antarctica—Weddell Sea
The conductivity-temperature-depth/tracer component of the Antarctic Zone Flux (ANZFLUX) experiment was designed to contribute to the overall ANZFLUX objectives by making measurements of the thermohaline and tracer fields along the cruise tracks, near the drift stations, and during the drift stations. These measurements were designed to establish regional property distributions, map the mesoscale property distributions, provide estimates of vertical and horizontal property gradients, and provide time series measurements during the drift stations for model initialization and diagnostics.

52-5044
Autonomous vehicle and hydrographic buoy measurements during ANZFLUX.
Morison, J.H., *Antarctic journal of the United States,* 1995, 30(5), p.131-133, 6 refs.
Oceanographic surveys, Ice cover effect, Sea ice, Water temperature, Salinity, Measuring instruments, Antarctica—Weddell Sea
During the Antarctic Zone Flux Experiment, two programs designed to extend the measurements to space and time scales not otherwise covered from the drifting ice stations were carried out. The first program was to use an autonomous conductivity temperature vehicle to measure the horizontal variations in salinity and temperature under the ice. The second was to deploy a polar ocean profile buoy to measure temperature and salinity over an extended time after the manned stations were abandoned. The objective of the operation was to determine the role of coherent boundary layer structures and lead convection in maintaining the deep mixed layer and high heat flux in the Weddell Sea.

52-5045
Sea-ice measurements during ANZFLUX.
Ackley, S.F., Lytle, V.I., Kuehn, G.A., Golden, K.M., Darling, M.N., MP 5149, *Antarctic journal of the United States,* 1995, 30(5), p.133-135, 6 refs.
Sea ice, Ice formation, Ice melting, Ice deformation, Ice water interface
The objective of the study was to understand the sea-ice growth, melt, and deformation processes in a high-ocean heat flux environment. To achieve this objective, the authors made estimates of the large-scale ice concentration and ice characteristics along the R/V *Nathaniel B. Palmer* cruise track during July and Aug. 1994 by making visual ice observations and establishing short-term ice sampling stations contemporaneously with the conductivity-temperature-depth casts. Results show that the ocean heat flux does not slow the freezing of the surface slush because that heat is being dissipated by the bottom ice ablation. Thus, during the winter period, the ice cover may act as a vertical conveyor belt: ice is added on the top by slush freezing, and at a similar rate, it is melted from below by the high ocean heat flux.

52-5046
Protein and humic substance fluorescence of dissolved organic matter in antarctic sea water.
Mopper, K., Sarpal, R.S., Kieber, D.J., *Antarctic journal of the United States,* 1995, 30(5), p.137-139, 5 refs.
Sea water, Marine biology, Chemical composition
The authors' studies to date indicate that fluorescence and absorbance properties can yield important insights into chemical/photochemical, biological, and physical processes in antarctic waters. They found that humic-like and protein-like fluorescences are decoupled as a function of depth. Humic-like fluorescence is subject to photobleaching, whereas protein-like fluorescence is not, except possibly during low ozone column events. Chemical evidence suggests that the protein-like fluorescence is caused by peptides and proteins. The ratio of humic fluorescence to absorbance is a sensitive indicator of photobleaching in surface waters.

52-5047
Absorbance properties of dissolved organic matter in antarctic sea water.
Sarpal, R.S., Mopper, K., Kieber, D.J., *Antarctic journal of the United States,* 1995, 30(5), p.139-140, 4 refs.
Marine biology, Sea water, Chemical composition, Antarctica—Bellingshausen Sea, Antarctica—Antarctic Peninsula
The major chromophores (or light-absorbing species) within dissolved organic matter (DOM) in antarctic waters are likely to be significantly different from those in coastal waters of tropical and temperate regions. The latter are affected by humic substances from soil run-off and river discharge, whereas productive antarctic waters contain chromophores mainly of recent algal origin. The authors present absorbance results that indicate that DOM in antarctic waters represents a nearly pure marine end member. The measurements were made on waters sampled from open oceanic and coastal sites in the Bellingshausen Sea and Antarctic Peninsula (R/V *Polar Duke* Dec. 1994).

52-5048
Photochemical production of the OH radical and formaldehyde in antarctic waters.
Qian, J.G., Mopper, K., Kieber, D.J., *Antarctic journal of the United States,* 1995, 30(5), p.141-143, 5 refs.
Sea water, Chemical composition, Ozone, Solar radiation, Marine biology, Antarctica—Weddell Sea, —Scotia Sea
From mid-Oct. to mid-Nov. 1993 and Dec. 1994, the authors measured the photoproduction of the OH radical (OH) and formaldehyde in surface waters and in the water column at several stations in the confluence of the Scotia and Weddell seas and in the Antarctic Peninsula region. The results suggest that the main precursors of formaldehyde in antarctic waters are recently released, UV-absorbing biomolecules, as opposed to geochemically formed humic substances, which appear to be the major precursors in low-latitude waters. Based on absorbance data, the concentration of humic substances appears to be negligible in antarctic waters. It is concluded that the photoproduction of OH results mainly from the photolysis of nitrate (and nitrite) in antarctic open oceanic water.

52-5049
On the radiative characteristics in the southern seas.
Wendler, G., Adolphs, U., Moore, B., *Antarctic journal of the United States,* 1995, 30(5), p.144-145, 2 refs.
Solar radiation, Sea ice, Sea water, Albedo, Cloud cover, Ice cover effect, Snow cover effect, Antarctica—McMurdo Sound
On Dec. 21, 1994, the USCGC *Polar Star* left from Hobart, Tasmania, for a trip to McMurdo Station to open up the sound for tanker and other support ship traffic. Although a wide variety of environmental data was gathered during this cruise, this article only focuses on radiative processes: due to the high surface albedo, most of the short-wave radiation is reflected back to space, and the long-wave radiation becomes the dominant parameter for the net radiation. These results show the importance of clouds on the surface energy budget. Not only should their presence or absence be known, but also the reflectivity of the underlying surface, because it might change the net radiation in opposite ways.

52-5050
Wavelength dependence of hydrogen peroxide photochemical production in antarctic waters.
Yocis, B.H., Kieber, D.J., Mopper, K., *Antarctic journal of the United States,* 1995, 30(5), p.146-147, 4 refs.
Sea water, Chemical composition, Solar radiation, Marine biology, Antarctica—Weddell Sea, —Scotia Sea
Sea water used for wavelength dependence studies was collected in the Weddell-Scotia confluence during Oct. and Nov. 1993 and at Paradise Harbor and Crystal Sound during Nov. and Dec. 1994. Results indicate that the photochemical production of hydrogen peroxide is primarily in the ultraviolet portion of the solar spectrum in antarctic waters. Based on this wavelength dependence and the relatively high transparency of these waters to UV greater than 320 nm, it is expected that hydrogen peroxide production will generally occur down to 20-30 m in the water column, except under bloom conditions or at locations strongly affected by ice cover.

52-5051
Dissolved flavins in the Weddell-Scotia Confluence during the 1993 austral spring.
Brown, B.M., Kieber, D.J., Mopper, K., *Antarctic journal of the United States,* 1995, 30(5), p.148-149, 1 ref.
Sea water, Chemical composition, Photosynthesis, Marine biology, Solar radiation, Antarctica—Weddell Sea, —Scotia Sea

Flavins were studied aboard the R/V *Nathaniel B. Palmer* in Oct. and Nov. 1993 in the Weddell-Scotia Confluence. Results show that dissolved flavins are ubiquitous in antarctic surface waters with total concentrations in the 0.05-0.3 nM range. At these concentrations, flavins are likely to be important photosensitizers resulting in the degradation of dissolved organic matter that does not absorb solar radiation. The authors do not expect variations in UV-B fluxes to affect rates of flavin photolyses directly, although enhanced UV-B may indirectly affect flavin cycles by changing inputs of the biologically produced flavins by the plankton.

52-5052

Photochemistry of antarctic waters during the 1994 austral summer.

Kieber, D.J., Mopper, K., *Antarctic journal of the United States,* 1995, 30(5), p.150-151, 5 refs.

Sea water, Marine biology, Chemical composition, Photochemical reactions, Antarctica—Antarctic Peninsula

A study to examine basic aspects of antarctic photochemistry, with the long-term objective of assessing the role of photochemistry on planktonic processes is reported. The authors present an overview of results from the 1994 R/V *Polar Duke* cruise, which was conducted near the Antarctic Peninsula during Dec. Ultrafiltration experiments were conducted as well as deck-board and *in situ* experiments to study the photochemical production of the OH radical, hydrogen peroxide, α-keto acids, flavins, and carbonyl compounds. Dark loss rates for hydrogen peroxide and flavins were also determined.

52-5053

Observations made by remotely operated vehicle of epifauna near the Mackey Glacier Tongue.

Dawber, M., Powell, R.D., *Antarctic journal of the United States,* 1995, 30(5), p.152-153, 6 refs.

Marine biology, Glacier tongues, Sediments, Subglacial observations, Antarctica—Mackay Glacier Tongue

Remotely operated (submarine) vehicle (ROV) investigations of the grounding line environment of the Mackay Glacier Tongue were carried out in 1994. The primary aims of the study are to determine the physical processes by which terrigenous clastic sediments move from antarctic glaciers into marine environments and to estimate the volume contributed annually at the grounding line. A complement to this goal is an evaluation of benthic communities. From dives made at 13 locations around the tongue, the authors have accumulated a large videotape record of the epifauna living beneath and close to the Mackay Glacier Tongue. Some interesting and distinctive patterns, which appear to be related to changes in the configuration of the glacier in the recent past observed within the community are discussed.

52-5054

RACER: Dissolved inorganic carbon, alkalinity and pH.

Carrillo, C.J., Karl, D.M., *Antarctic journal of the United States,* 1995, 30(5), p.153-155, 4 refs.

Marine biology, Biomass, Sea water, Chemical composition, Water pollution, Air pollution, Atmospheric composition, Antarctica—Antarctic Peninsula

Research on Antarctic Coastal Ecosystem Rates (RACER) was a research program designed to study the interactions between biological and physical processes in coastal regions of the Antarctic Peninsula. RACER 4 was conducted during the 1992 austral winter. Analyses of approximately 385 dissolved inorganic carbon and alkalinity samples, completed for RACER 3 and RACER 4, are shown in a table.

52-5055

Chemical feeding deterrant properties of the benthic algae *Phyllophora antarctica* and *Iridea cordata* from McMurdo Sound, Antarctica.

McClintock, J.B., Baker, B.J., *Antarctic journal of the United States,* 1995, 30(5), p.155-157, 8 refs.

Algae, Marine biology, Ocean bottom, Antarctica—Evans, Cape

The red algae *Phyllophora antarctica* and *Iridea cordata* are among the most abundant benthic macroalgae south of 77°S. Their distribution is coincident with a number of potential grazers including the common regular sea urchin *Sterechinus neumayeri.* During Sep. 1993, collections of both algae and sea urchins were made at Cape Evans to evaluate the phagostimulatory responses of *S. neumayeri* to both fresh algae and algae that had been extracted to remove secondary metabolites. Results suggest that *P. antarctica* contains secondary metabolites that inhibit phagostimulation in the antarctic sea urchin *S. neumayeri,* because algal disks extracted in chloroform became significantly more attractive to sea urchins.

52-5056

Distribution of algal cysts in the upper sea ice of McMurdo Sound, early austral spring 1994.

Stoecker, D., Gustafson, D., Merrell, J., *Antarctic journal of the United States,* 1995, 30(5), p.157-159, 3 refs.

Algae, Marine biology, Sea ice, Biomass, Ecology, Antarctica—McMurdo Sound

During 1994, the authors investigated the distribution and abundance of algae in the upper sea ice of McMurdo Sound during late Sep. to mid Nov. The vertical distribution of cysts in the sea ice was variable between types of cysts and among sampling locations. At the experimental site, the dinoflagellate cysts were consistently concentrated at 30-50 cm from the surface, whereas the coccoid cysts were concentrated in the top 20 cm of the sea-ice. In the multiyear ice, multiple bands of cysts were observed. Weekly data show that algal excystment and/or growth did not occur in 1994 on or before Nov. 14, the last sampling date at the experimental site.

52-5057

Temperature dependency of fluorescence decay parameters in an antarctic isolate of the diatom *Thalassiosira* sp.

Kroon, B.M.A., Prézelin, B.B., *Antarctic journal of the United States,* 1995, 30(5), p.159-160, 6 refs.

Algae, Ecology, Acclimatization, Sea ice, Photosynthesis, Ice water interface

As part of the *Icecolors '93* expedition, the authors used a fluorescence technique to identify the ultraviolet sensitivity of photosystem II (PSII) in ice algae and the consequences for primary production rates. The authors report the assessed temperature sensitivity of PSII in an antarctic diatom. The data indicate that the integrity of PSII in cold acclimated antarctic isolate of *Thalassiosira* sp. is not deteriorated by a gradual, short-term increase in temperature. The increase in the maximum rate of electron transfer with temperature may be accounted for by changes in the viscosity of the thylakoid membrane and, as such, influence *in situ* quantum yields.

52-5058

Agglutinated test morphogenesis in *Astrammina rara,* a giant, foraminiferan protist from Explorers Cove, McMurdo sound.

Bowser, S.S., Kinoshita, R.K., Bernhard, J.M., Hayden, J.H., *Antarctic journal of the United States,* 1995, 30(5), p.161-162, 8 refs.

Marine biology, Microbiology, Ocean bottom, Antarctica—Explorers Cove

Current studies which focus on agglutinated test morphogenesis in *Astrammina rara,* one of the most conspicuous members of the Explorers Cove foraminiferal assemblage, are discussed. This species is highly selective for more than 500-mm sand grains and binds these grains together with a fibrous adhesive to form a spherical test. The goals are to determine how *Astrammina's* adhesive matrix is secreted and to characterize the mechanical properties of the matrix by performing finite element analysis of the intact shell.

52-5059

Marine meteorological radiosoundings in the northern Baltic Sea from R/V *Aranda* in 1994-95.

Uotila, J., Vihma, T., Launiainen, J., *Finnish Institute of Marine Research (Merentutkimuslaitos). Report series. Meri (the sea),* 1997, No.30, 57p., 9 refs.

Marine meteorology, Atmospheric boundary layer, Atmospheric pressure, Wind velocity, Wind direction, Air temperature, Temperature inversions, Humidity, Heat flux, Air water interactions, Ice air interface, Weather forecasting, Finland, Gulf, Bothnia, Gulf

52-5060

Geology, geochemistry and mineralogy: general principles and marine geological applications especially in the Baltic Sea region—a literature review. [Geologia, geokemia ja mineralogia: yleiset perusteet ja merigeologiset sovellutukset (erityisesti itämeren alueella)—kirjallisuusselvitys]

Mälkki, M., *Finnish Institute of Marine Research (Merentutkimuslaitos). Report series. Meri (the sea),* 1998, No.34, 26p., In Finnish with English summary. 65 refs.

Marine geology, Marine deposits, Bottom sediment, Suspended sediments, Geochemistry, Mineralogy, Baltic Sea

52-5061

Weather and climate extremes.

Krause, P.F., Flood, K.L., *U.S. Army Corps of Engineers. Topographic Engineering Center. Report,* Sep. 1997, TEC-0099, 89p., PB98-100522, Refs. p.73-89. The National Technical Information Service (NTIS) cites the title as World weather extremes.

Meteorological data, Air temperature, Precipitation (meteorology), Snowfall, Snowstorms, Hail, Wind velocity, Records (extremes)

52-5062

Toward prediction of the arctic system: predicting future states of the arctic system on seasonal-to-century time scales by integrating observations, process research, modeling, and assessment.

Arctic Research Consortium of the United States (ARCUS), Fairbanks, AK, Mar. 1998, 54p., Refs. p.44-48.

Research projects, Organizations, International cooperation, Polar atmospheres, Global warming, Long range forecasting

52-5063

Proceedings of the NASA-LeRC/CRREL/FAA Inflight Remote Sensing Icing Avoidance Workshop, April 1-2 1997. Summaries and presentations.

Bond, T.H., ed, Reehorst, A.L., ed, Ryerson, C.C., ed, MP 5150, Cleveland, Ohio Aerospace Institute, [1997], n.p.

Aircraft icing, Ice detection, Ice forecasting, Weather forecasting, Supercooled clouds, Cloud droplets, Cloud physics, Meteorological instruments, Radar tracking, Warning systems, Safety

52-5064

Sustaining health and performance in the cold: environmental medicine guidance for cold-weather operations.

Young, A.J., Roberts, D.E., Scott, D.P., Cook, J.E., Mays, M.Z., Askew, E.W., *U.S. Army Research Institute of Environmental Medicine, Natick, MA. Technical note,* July 1992, TN-92-2, 67p., ADA-254 328.

Military operation, Cold weather operation, Cold weather survival, Health, Cold exposure, Frostbite, Physiological effects, Manuals

52-5065

Nutritional guidance for military field operations in temperate and extreme environment.

Thomas, C.D., et al, *U.S. Army Research Institute of Environmental Medicine, Natick, MA. Technical note,* June 1993, TN-93-8, 42p., Also available in microfiche from the National Technical Information Service (NTIS), ADA-269 950 or ADA-269 969.

Military operation, Cold weather operation, Cold weather survival, Health, Physiological effects, Manuals

52-5066

Sierra siege on pace for a record winter.

Johnson, R., Murphy, G., *Avalanche review,* Dec. 1995, 14(2), p.1,4,5.

Snowstorms, Snowfall, Snow depth, Snow water equivalent, Records (extremes), Snow slides, Avalanches, United States—California—Sierra Nevada

52-5067

IKAR/CIS, Norway, September 20-24, 1995.

Atkins, D., *Avalanche review,* Dec. 1995, 14(2), p.2-3.

Avalanches, Accidents, Rescue operations, Organizations, Meetings

52-5068

Skier compaction: a false sense of stability?

Andrews, J., *Avalanche review,* Feb. 1996, 14(4), p.3.

Skis, Snow compaction, Snow cover stability, Avalanche forecasting, Safety

52-5069

Snowslides in Alta area. Part 2.

Shank, H.M., *Avalanche review,* Feb. 1996, 14(4), p.4-5, Reprint of a memo to the Regional Forester, Ogden, UT, Feb. 21, 1945.

Avalanche forecasting, Snow slides, Meteorological data, Meteorological factors, Atmospheric pressure, Wind velocity, Precipitation (meteorology), Air temperature, United States—Utah

52-5070

Chena River Lakes Project, Alaska, Moose Creek Dam foundation/embankment criteria and performance report.

U.S. Army Corps of Engineers. Alaska District, Anchorage, Nov. 1983, 37p. + appends.

Earth dams, Earth fills, Rock fills, Embankments, Site surveys, Engineering geology, Hydraulic structures, Soil stabilization, Permafrost control, Flow control, Flood control, United States—Alaska—Fairbanks

52-5071

New instrument for automatic measurement of cloud liquid water content and droplet size.

Cormack, R.H., Lawson, R.P., MP 5151, Boulder, CO, Stratton Park Engineering Company, Inc. (SPECinc), 1993, 34p., 58 refs. Submitted to the U.S. Army Cold Regions Research and Engineering Laboratory under SBIR (Small Business Innovative Research) Contract No.DACA33-93-C-0006.

Aircraft icing, Ice accretion, Icing rate, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Unfrozen water content, Meteorological instruments, Particle size distribution

Reliable automated measurements of liquid water content (LWC) and drop size in icing conditions have been notoriously difficult to make. Such measurements are needed to predict icing rates and loading on structures, power lines, off-shore oil rigs, forests and airplanes. In Phase I, the objective was to design, build and test a laboratory breadboard model of an instrument that demonstrated promise for making good automatic measurements of LWC and drop size. A laboratory prototype of a new optical instrument that measures with high angular resolution the forward scattered light from an ensemble of cloud drops was built in Phase I. The new instrument measured accurately the (known) size distribution of 3-30 μm polystyrene spheres in aqueous solution. Comparisons of LWC measurements in an icing wind tunnel were also very good. The instrument has the unique ability to automatically correct for optical misalignment and contamination in software. It is anticipated that a fully-automated, computer-controlled version of the instrument capable of operation in harsh environmental conditions can be built in Phase II.

52-5072

COZOIL (Coastal Zone Oil Spill Model), Version 1.1.

Howlett, E., *U.S. Minerals Management Service. Alaska Outer Continental Shelf Region, Anchorage. OCS study,* Feb. 1998, MMS 98-0014, Var. p., Consists of three separate items: COZOIL for Windows. Technical manual (with 41 refs.); COZOIL improvement of model and linkage to graphical user interface. User's manual (ASA #96-127); and a CD-ROM (COZOIL 1.1, MMS OCS #98-0014).

Oil spills, Water pollution, Beaches, Soil pollution, Environmental impact, Environment simulation, Computer programs, United States—Alaska

52-5073

Vegetation of the Glacier Lakes Ecosystem Experiments Site.

Regan, C.M., Musselman, R.C., Haines, J.D., *U.S. Forest Service. Rocky Mountain Research Station, Fort Collins, CO. Research paper,* Feb. 1998, RMRS-RP-1, 36p., 72 refs.

Vegetation patterns, Plant ecology, Biogeography, Snow cover effect, Alpine tundra, Forest tundra, Tundra vegetation, Forest ecosystems, Forest soils, Meadow soils, Mountain soils, United States—Wyoming

52-5074

Snow survey bulletin & water supply forecast, May 1, 1998, Yukon Territory.

Canada. Indian and Northern Affairs. Water Resources Division, Whitehorse, 1998, 27p.

Snow surveys, Runoff forecasting, Snow depth, Snow water equivalent, Stream flow, Canada—Yukon Territory

52-5075

Report to Congress on advisability and capability of the Army Corps of Engineers to implement sanitation projects for rural and native villages in Alaska.

Hardy, D.L., ed, MP 5152, Anchorage, U.S. Army Corps of Engineers, Alaska District, Cold Regions Center of Expertise (CRCX), Mar. 1998, 91p. + appends., 7 refs. The U.S. Army Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH, is a partner in the Cold Regions Center of Expertise (CRCX), a joint venture of staff and resources of both CRREL and the Corps' Alaska District.

Sanitary engineering, Water supply, Water treatment, Sewage disposal, Waste disposal, Utilities, Health, Regional planning, Legislation, Cost analysis, United States—Alaska

52-5076

Engineering and design. Ice engineering.

U.S. Army Corps of Engineers, *Engineer manual,* Dec. 31 1996, EM 1110-2-1612, Var. p., Refs. passim.

Lake ice, River ice, Ice jams, Ice loads, Ice cover strength, Ice breaking, Ice navigation, Ice control, Hydraulic structures, Flood control, Manuals

52-5077

Global influence of the AD1600 eruption of Huaynaputina, Peru.

De Silva, S.L., Zielinski, G.A., *Nature,* June 4, 1998, 393(6684), p.455-458, 32 refs.

Seismology, Ice cores, Stratosphere, Volcanoes, Global change

The 1600 eruption of Huaynaputina, in southern Peru, has been speculated to be one of the largest eruptions of the past 500 years; acidity spikes from Greenland and antarctic ice, tree-ring chronologies, along with records of atmospheric perturbations in early 17th-century Europe and China, implicate an eruption of similar or greater magnitude than that of Krakatau in 1883. Tephra deposits are used to estimate the volume of the 1600 Huaynaputina eruption, revealing that it was indeed one of the largest eruptions in historic times. The chemical characteristics of the glass from juvenile tephra allow a firm cause-effect link to be established with glass from the antarctic ice, and thus improve on estimates of the stratospheric loading of the eruption. (Auth. mod.)

52-5078

Perennial antarctic lake ice: an oasis for life in a polar desert.

Priscu, J.C., et al, *Science,* June 26, 1998, 280(5372), p.2095-2098, 23 refs.

Lake ice, Cryobiology, Microbiology, Sediments, Antarctica—McMurdo Dry Valleys

The permanent ice covers of antarctic lakes in the McMurdo Dry Valleys develop liquid water inclusions in response to solar heating of internal aeolian-derived sediments. The ice sediment particles serve as nutrient (inorganic and organic)-enriched microzones for the establishment of a physiologically and ecologically complex microbial consortium capable of contemporaneous photosynthesis, nitrogen fixation, and decomposition. The consortium is capable of physically and chemically establishing and modifying a relatively nutrient- and organic matter-enriched microbial "oasis" embedded in the lake ice cover. (Auth.)

52-5079

Cretaceous depositional systems in the Norwegian Sea: heavy mineral constraints.

Morton, A.C., Grant, S., *AAPG bulletin,* Feb. 1998, 82(2), p.274-290, 26 refs.

Pleistocene, Marine geology, Subpolar regions, Geological surveys, Marine deposits, Quaternary deposits, Sedimentation, Stratigraphy, Mineralogy, Lithology, Classifications, Origin, Norwegian Sea

52-5080

Global warming and active-layer thickness: results from transient general circulation models.

Anisimov, O.A., Shiklomanov, N.I., Nelson, F.E., *Global and planetary change,* Oct. 1997, 15(3-4), p.61-77, 52 refs.

Climatology, Global warming, Permafrost distribution, Ground thawing, Active layer, Thermal regime, Thaw depth, Seasonal ablation, Soil air interface, Mathematical models, Forecasting

52-5081

Potential causes of differences between ground and surface air temperature warming across different ecozones in Alberta, Canada.

Majorowicz, J.A., Skinner, W.R., *Global and planetary change,* Oct. 1997, 15(3-4), p.79-91, 19 refs.

Climatology, Global warming, Taiga, Land development, Albedo, Radiation absorption, Air temperature, Surface temperature, Boreholes, Well logging, Temperature measurement, Temperature variations, Canada—Alberta

52-5082

Kentbrooksite from the Kangerdlugssuaq intrusion, East Greenland, a new Mn-REE-Nb-F end-member in a series within the eudialyte group: description and crystal structure.

Johnsen, O., Grice, J.D., Gault, R.A., *European journal of mineralogy,* Mar.-Apr. 1998, 10(2), p.207-219, 18 refs.

Mineralogy, Earth crust, Subpolar regions, Geochemistry, Lithology, Molecular structure, Chemical analysis, X ray diffraction, Greenland

52-5083

Early Pleistocene Glacial Lake Lesley, West Branch Susquehanna River valley, central Pennsylvania.

Ramage, J.M., Gardner, T.W., Sasowsky, I.D., *Geomorphology,* Feb. 1998, 22(1), p.19-37, 21 refs.

Pleistocene, Geomorphology, River basins, Surface drainage, Glacial geology, Glacial lakes, Glacial deposits, Lacustrine deposits, Stratigraphy, Geomagnetism, Geochronology, United States—Pennsylvania

52-5084

HALO™system—applying the "Safe Wing" concept to airline operations in ground icing operations.

Peterson, M.T., Nguyen, L., Edleman, D.V., Coffel, J.F., Digital Avionics Systems Conference, 14th, Cambridge, MA, Nov. 5-9, 1995, Piscataway, Institute of Electrical and Electronic Engineers, 1995, p.152-157, 3 refs.

DLC TL693.D55 1995

Aircraft icing, Ground ice, Sensors, Surface roughness, Ice detection, Ice conditions, Classifications, Impurities, Ultrasonic tests, Environmental protection, Safety

52-5085

Role of planetary waves in the formation of polar stratospheric clouds.

Teitelbaum, H., Sadourny, R., *Tellus,* May 1998, 50A(3), p.302-312, 25 refs.

Climatology, Polar atmospheres, Cloud physics, Air temperature, Cooling, Polar stratospheric clouds, Detection, Air masses, Gravity waves, Upwelling, Sounding

Several recent works attribute the formation of polar stratospheric clouds (PSCs) to the occurrence of localized orographic waves. Using European Center of Medium Weather Forecast analyses, the authors investigate the large scale stratospheric flow conditions in cases where PSCs have been detected, both in the Arctic and the Antarctic. PSCs appear within strong planetary scale uplifts of isentropic surfaces. The adiabatic cooling of air parcels travelling within such planetary scale uplifts seems to be the main mechanism for PSC formation. The PSC distribution would then follow a planetary structure, even though local orographic waves could still play an additional role when planetary scale conditions are met. (Auth. mod.)

52-5086

Western Baltic sea ice season in terms of a mass-related severity index 1879-1992 (II). Spectral characteristics and associations with the NAO, QBO, and solar cycle.

Loewe, P., Koslowski, G., *Tellus,* Mar. 1998, 50A(2), p.219-241, 61 refs.

Sea ice distribution, Ice volume, Seasonal variations, Indexes (ratios), Spectra, Air temperature, Atmospheric circulation, Solar radiation, Correlation, Statistical analysis, Classifications, Baltic Sea

52-5087
Recovery conditions for AC arc on ice surfaces.
Chen, X., Farzaneh, M., Zhang, J., IEEE Conference on Electrical Insulation and Dielectric Phenomena, 64th, Virginia Beach, VA, Oct. 22-25, 1995. Annual report, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1995, p.396-399, 14 refs.
DLC TK3421.A1 C65 1995
Ice physics, Ice dielectrics, Ice surface, Impurities, Electrical resistivity, Charge transfer, Electrical insulation, Ice solid interface, Ice cover effect, Electrical measurement, Simulation

52-5088
Variation of ice surface conductivity during flashover.
Zhang, J., Farzaneh, M., Chen, X., IEEE Conference on Electrical Insulation and Dielectric Phenomena, 64th, Virginia Beach, VA, Oct. 22-25, 1995. Annual report, Piscataway, Institute of Electrical and Electronics Engineers, Inc., 1995, p.479-483, 16 refs.
DLC TK3421.A1 C65 1995
Ice physics, Ice dielectrics, Electrical insulation, Electrical resistivity, Charge transfer, Ice melting, Meltwater, Ice solid interface, Ice cover effect, Ice surface, Simulation

52-5089
Volcanic and seismic swarm events on the Reykjanes Ridge and their similarities to events on Iceland: results of a rapid response mission.
Crane, K., et al, *Marine geophysical researches,* Aug. 1997, 19(4), p.319-338, 36 refs.
Marine geology, Tectonics, Geophysical surveys, Subpolar regions, Ocean bottom, Earthquakes, Detection, Seismic surveys, Backscattering, Magma, Iceland, Atlantic Ocean

52-5090
Marine gravity from satellite altimetry over ocean and sea ice.
Sandwell, D.T., Yale, M.M., McAdoo, D.C., Smith, W.H.F., Symposium on Global Gravity Field and Its Temporal Variations, No.116, Boulder, CO, July 12, 1995. International Association of Geodesy. Edited by R.H. Rapp et al, Berlin, Springer-Verlag, 1996, p.12-19, 14 refs.
DLC QB275.G59 1996
Geophysical surveys, Gravity anomalies, Sea ice, Spacecraft, Radar echoes, Height finding, Profiles, Resolution, Ice cover effect

52-5091
Breaking ice with finesse: oil and gas exploration in the Canadian Arctic.
Clark, K., Hetherington, C., O'Neil, C., Zavitz, J., Calgary, University, Arctic Institute of North America, 1997, 248p., Refs. p.229-236.
Petroleum industry, Economic development, Exploration, Offshore drilling, Offshore structures, Icebreakers, Ice breaking, Ice control, Logistics, Environmental protection, Canada, Beaufort Sea

52-5092
Cold-adapted microtubules: characterization of tubulin posttranslational modifications in the antarctic ciliate *Euplotes focardii*.
Pucciarelli, S., Ballarini, P., Miceli, C., *Cell motility and the cytoskeleton,* 1997, 38(4), p.329-340, 49 refs.
Marine biology, Cold tolerance
To fully understand their cold adaptation, a study was made of the tubulins of *Euplotes focardii,* an antarctic ciliated protozoan adapted to temperatures ranging from -2 to +4°C. The authors report that the amino acid sequence of the carboxy-terminal domain predicted from the β-T3 gene contains five substitutions and one insertion of conserved residues, unique with respect to all the other known β-tubulin sequences. These modifications can change the structural conformation of the carboxy-terminal domain. In the variable terminal end of that domain, a consensus sequence for a phosphorylation site is present, and the residue Glu-438, the most frequent site for polyglutamylation in β-tubulin, is substituted by Asp. It is shown that in *E. focardii* only α-tubulin is polyglutamylated, while β-tubulin undergoes phosphorylation. Polyglutamylated microtubules appear to colocalize with cilia and microtubular bundles, all structures in which microtubules undergo a sliding process. This supports the idea that α-tubulin polyglutamylation is involved in the interaction between tubulin and motor microtubule-associated proteins. Phosphorylation, which is found extensively distributed in the β-tubulin of this cold-adapted organism, may play a determinant role in the dynamic of polymerization and depolymerization at low temperatures. (Auth. mod.)

52-5093
Background levels of metals in soils, McMurdo Station, Antarctica.
Crockett, A.B., *Environmental monitoring and assessment,* May 1998, 50(3), p.289-296, 19 refs.
Metals, Soil pollution, Mineralogy, Soil science, Antarctica—McMurdo Station
McMurdo Station is the largest research station in Antarctica, with a population that ranges each year from 250 to 1200 people. Because of its size and 40-year history of use, a number of locations around the station have become contaminated with wastes. Soils and sediments in these areas have been shown to contain elevated levels of petroleum-related products, PCBs, other organics and metals. While some remedial investigations have been conducted, background levels of metals in soils have not been determined. This paper reports on background levels of metals in a natural basalt-derived soil ('gray soil') and scoria (soft porous rock used as fill, 'red soil') near McMurdo Station using two fundamentally different analytical procedures, concentrated acid extraction/analysis and total metals. These data facilitate determining the extent and levels of metal contamination near McMurdo Station and provide reference levels of metals for comparison with existing and future remediation data. There were statistically significant differences between metals concentrations in both gray and red soils, and no correlations between the level of extracted versus total metal. Generally, only a small fraction of a metal was extractable. (Auth.)

52-5094
Small ice crystals in cirrus clouds: a model study and comparison with in situ observations.
Lin, H., Noone, K.J., Ström, J., Heymsfield, A.J., *Journal of the atmospheric sciences,* June 1, 1998, 55(11), p.1928-1939, 27 refs.
Climatology, Cloud physics, Ice crystal growth, Ice crystal size, Particle size distribution, Homogeneous nucleation, Aerosols, Scavenging, Temperature effects, Wind factors, Simulation

52-5095
Dynamical influences on cirrus cloud formation process.
Lin, H., Noone, K.J., Ström, J., Heymsfield, A.J., *Journal of the atmospheric sciences,* June 1, 1998, 55(11), p.1940-1949, 16 refs.
Climatology, Cloud physics, Ice crystal growth, Ice crystal size, Spectra, Aerosols, Scavenging, Water content, Homogeneous nucleation, Particle size distribution, Wind factors, Gravity waves, Ice air interface, Models

52-5096
Optical properties of equatorial cirrus from observations in the ARM Pilot Radiation Observation Experiment.
Platt, C.M.R., Young, S.A., Manson, P.J., Patterson, G.R., Marsden, S.C., Austin, R.T., *Journal of the atmospheric sciences,* June 1, 1998, 55(11), p.1977-1996, 49 refs.
Climatology, Cloud cover, Cloud physics, Optical properties, Classifications, Radiometry, Lidar, Ice detection, Ice crystal optics, Backscattering, Attenuation, Temperature effects

52-5097
Autumnal mixed-phase cloudy boundary layers in the Arctic.
Pinto, J.O., *Journal of the atmospheric sciences,* June 1, 1998, 55(11), p.2016-2038, 34 refs.
Climatology, Atmospheric boundary layer, Polar atmospheres, Advection, Cloud cover, Cloud physics, Ice crystal growth, Ice nuclei, Colloids, Radiant cooling, Turbulent exchange, Static stability, Profiles, Aerial surveys, Ice cover effect, Arctic Ocean

52-5098
Definition and significance of an effective radius for ice clouds.
McFarquhar, G.M., Heymsfield, A.J., *Journal of the atmospheric sciences,* June 1, 1998, 55(11), p.2039-2052, 33 refs.
Climatology, Cloud physics, Ice crystal optics, Light scattering, Radiation balance, Ice crystal size, Ice crystal structure, Profiles, Albedo, Indexes (ratios), Classifications, Analysis (mathematics)

52-5099
ASTER polar cloud mask.
Feind, R.E., Welch, R.M., Berendes, T.A., *SPIE—The International Society for Optical Engineering. Proceedings,* 1996, Vol.2817, Infrared spaceborne remote sensing IV. Edited by M.S. Scholl and B.F. Andersen, p.120-131, 14 refs.
DLC G70.39.I53 1996
Climatology, Spaceborne photography, Radiometry, Cloud cover, Detection, Classifications, Sea ice, Slush, Ice cover effect, Snow cover effect, Image processing, Resolution
An algorithm is currently under development that will provide a classification mask for ASTER imagery obtained poleward of 60N and 60S, in both arctic and antarctic atmospheres. The classification mask is called the ASTER Polar Cloud Mask. Ten classes are currently in the mask and include six clear classes (water, slush/wet ice, ice/snow, land, shadow on land, and shadow on ice/snow) and four cloud classes (thin cloud over ice/snow, water, or land, and thick cloud). Over 3700 samples have been extracted and labeled to date representing over one million pixels from 82 Landsat TM circumpolar scenes. Tests of the algorithm on the labeled samples indicate that the clear/cloud classification accuracy is greater than 90% and subjective evaluation of the classification masks supports that result. (Auth. mod.)

52-5100
Weak bands within Ice Stream B, West Antarctica.
Hulbe, C.L., Whillans, I.M., *Journal of glaciology,* 1997, 43(145), p.377-386, 29 refs.
Glaciology, Glacier flow, Ice mechanics, Ice deformation, Ice crystal structure, Orientation, Velocity measurement, Topographic features, Migration, Shear properties, Strains, Antarctica—West Antarctica
Kilometer-scale variations in ice velocity and surface topography are used to investigate the style of glacier deformation in the main body of Ice Stream B. For Ice Stream B, most of the observed deformation occurs within two narrow bands, in which there is large across-flow compression and slow lateral shearing. The bands underlie valleys in the ice-surface topography. Measured upward displacement of ice adjacent to the rapidly compressing bands appears to be linked to the creation of the ice stream's topography. The most likely cause for the observed pattern of strain rates and surface topography, and their changes over time, is deformation guided by longitudinal bands of ice with an aligned crystal fabric. (Auth. mod.)

52-5101
Bubbly-ice densification in ice sheets: I. Theory.
Salamatin, A.N., Lipenkov, V.IA., Duval, P., *Journal of glaciology,* 1997, 43(145), p.387-396, 22 refs.
Glacier ice, Ice sheets, Ice mechanics, Ice deformation, Vapor pressure, Porosity, Ice density, Bubbles, Phase transformations, Ice air interface, Rheology, Mathematical models, Theories

52-5102
Bubbly-ice densification in ice sheets: II. Applications.
Lipenkov, V.IA., Salamatin, A.N., Duval, P., *Journal of glaciology,* 1997, 43(145), p.397-407, 36 refs.
Glaciology, Ice sheets, Ice cores, Ice density, Vapor pressure, Bubbles, Porosity, Ice air interface, Rheology, Mathematical models, Profiles, Mechanical tests, Antarctica—Vostok Station
A mathematical model for simulating the densification of bubbly glacier ice is used to interpret the following experimental data from the Vostok Station ice core: two ice-porosity profiles obtained by independent methods and a bubble-pressure profile obtained by direct measurements of air pressure within individual bubbles. The rheological properties of pure polycrystalline ice are deduced from the solution of the inverse problem. The model and the inferred ice-flow law are then validated, using porosity profiles from seven other ice cores drilled in Antarctica and Greenland. The corresponding flow law is in good agreement with results of both mechanical tests and independent estimations based on the analysis of different natural phenomena associated with glacier-ice deformation. The influence of the climatic change on the ice-porosity profile is discussed. (Auth. mod.)

52-5103
On the strain-rate sensitivity of columnar ice.
Manley, M.E., Schulson, E.M., *Journal of glaciology,* 1997, 43(145), p.408-410, 11 refs.
Ice mechanics, Strain tests, Stress concentration, Ice solid interface, Ice deformation, Sliding, Phase transformations, Dynamic loads, Mechanical tests

52-5104

Across-column cracks and axial splits in S2 saline ice under compression.

Schulson, E.M., Qi, S., Melton, J.S., Gratz, E.T., *Journal of glaciology,* 1997, 43(145), p.411-414, 19 refs.

Ice mechanics, Salt ice, Ice deformation, Dynamic loads, Shear stress, Ice microstructure, Ice solid interface, Cracking (fracturing), Crack propagation, Sliding, Mechanical tests, Shear properties

52-5105

Marginal shear stress of Ice Stream B, West Antarctica.

Jackson, M., Kamb, B., *Journal of glaciology,* 1997, 43(145), p.415-426, 40 refs.

Glaciology, Glacier flow, Velocity measurement, Shear stress, Ice creep, Ice deformation, Ice cores, Mechanical tests, Static loads, Thin sections, Ice microstructure, Rheology, Antarctica—West Antarctica

To ascertain whether the velocity of Ice Stream B may be controlled by the stresses in its marginal shear zones, a determination of the marginal shear stress in the Dragon shear zone near Camp Up B by using ice itself as a stress meter was undertaken. The observed marginal shear strain rate is used to calculate the marginal shear stress from the flow law of ice determined by creep tests on ice cores from a depth of 300 m in the Dragon, obtained by using a hot-water ice-coring drill. The test applies horizontal shear across vertical planes parallel to the margin. The marginal shear-stress value is twice that given by the ice-stream model of Echelmeyer and others, and the corresponding strain-rate enhancement factors differ greatly. This large discrepancy could be explained by recrystallization of the ice during or shortly after coring. However, the observed two-maximum fabric type is not what is expected for annealing recrystallization from the sharp single-maximum fabric that would be expected *in situ* at the high shear strains involved. (Auth. mod.)

52-5106

Surge of Bering Glacier and Bagley Ice Field, Alaska: an up-date to August 1995 and an interpretation of brittle-deformation patterns.

Herzfeld, U.C., Mayer, H., *Journal of glaciology,* 1997, 43(145), p.427-434, 24 refs.

Glaciology, Aerial surveys, Glacier flow, Glacier surges, Surface roughness, Ice mechanics, Ice deformation, Brittleness, Crevasses, Dynamic properties, Classifications, Models, Geologic processes, United States—Alaska—Bering Glacier, United States—Alaska—Bagley Ice Field

52-5107

Distribution and fall-out of ^{137}Cs and other radionuclides over Antarctica.

Pourchet, M., et al, *Journal of glaciology,* 1997, 43(145), p.435-445, 50 refs.

Climatology, Polar atmospheres, Air pollution, Fallout, Radioactive isotopes, Ice cores, Snow composition, Snow impurities, Isotope analysis, Distribution, Environmental tests

This article aims to give a comprehensive view of the distribution patterns for natural and artificial radionuclides over Antarctica by focusing on ^{137}Cs, ^{210}Pb and tritium. Various statistical methods show that the deposition of radionuclides reveals a structured distribution. The deposition of ^{137}Cs over Antarctica represents 0.09% of the total deposition of this radionuclide in the world and the correlation between ^{137}Cs fluxes and accumulation shows two sub-populations. For the stations with a mean annual temperature above -21°C, a strong correlation is found, whereas the correlation is lower for locations with temperatures below -21°C. The same mechanism governs the deposition of artificial and natural tritium but it clearly differs from that of other radionuclides associated with particulate material. Despite its isolated location, the radioactive fall-out of artificial long-lived radionuclides over Antarctica has been ten times greater than for natural radionuclides. (Auth. mod.)

52-5108

Pore-water controlled grain fracturing as an indicator for subglacial shearing in tills.

Hiemstra, J.F., Van der Meer, J.J.M., *Journal of glaciology,* 1997, 43(145), p.446-454, 44 refs.

Glacial geology, Glacial deposits, Glacier beds, Deformation, Ice solid interface, Shear strain, Microstructure, Cracking (fracturing), Abrasion, Thin sections, Rheology, Classifications

52-5109

Glacier recession on Kilimanjaro, East Africa, 1912-89.

Hastenrath, S., Greischar, L., *Journal of glaciology,* 1997, 43(145), p.455-459, 17 refs.

Glacier oscillation, Mountain glaciers, Glacier surveys, Ice deterioration, Glacier mass balance, Ice cover, Mapping, Spaceborne photography, Photogrammetric surveys, Periodic variations, Cloud cover, Insolation, Models, Tanzania—Kilimanjaro, Mount

52-5110

Clast collision frequency as an indicator of glacier sliding rate.

Fischer, U.H., Clarke, G.K.C., *Journal of glaciology,* 1997, 43(145), p.460-466, 20 refs.

Glacial geology, Glacier flow, Glacier beds, Sediments, Lithology, Ice solid interface, Loads (forces), Basal sliding, Velocity, Viscosity, Mechanical tests, Simulation, Rheology

52-5111

Climatic effects and bedrock control on rapid fluctuations of Chhota Shigri glacier, northwest Himalaya, India.

Kumar, S., Dobhal, D.P., *Journal of glaciology,* 1997, 43(145), p.467-472, 10 refs.

Glacial geology, Glacier oscillation, Mountain glaciers, Geomorphology, Ice solid interface, Bedrock, Moraines, Glacier flow, Velocity, Glacier ablation, Basal sliding, Wind factors, India—Himalaya Mountains

52-5112

Subglacial comminution in till—evidence from microfabric studies and grain-size distributions.

Yi, C.L., *Journal of glaciology,* 1997, 43(145), p.473-479, 14 refs.

Glacial geology, Glacial deposits, Lithology, Mineralogy, Glacial erosion, Abrasion, Grain size, Particle size distribution, Thin sections, Soil analysis, China—Altay Mountains

52-5113

Seasonal climatic forcing of alpine glaciers revealed with orbital synthetic aperture radar.

Smith, L.C., Forster, R.R., Isacks, B.L., Hall, D.K., *Journal of glaciology,* 1997, 43(145), p.480-488, 42 refs.

Glacial hydrology, Glacier oscillation, Glacier ablation, Mountain glaciers, Runoff, Wet snow, Snow cover distribution, Spaceborne photography, Synthetic aperture radar, Backscattering, Image processing, Snow cover effect, Seasonal variations, Canada—British Columbia

52-5114

Surge-type glaciers in the Russian High Arctic identified from digital satellite imagery.

Dowdeswell, J.A., Williams, M., *Journal of glaciology,* 1997, 43(145), p.489-494, 33 refs.

Glacier flow, Glacier surges, Detection, Arctic landscapes, Glacier surveys, Spaceborne photography, LANDSAT, Moraines, Russia—Novaya Zemlya, Russia—Severnaya Zemlya

52-5115

Response of sediment to ice-sheet loading in northwestern Germany: effective stresses and glacier-bed stability.

Piotrowski, J.A., Kraus, A.M., *Journal of glaciology,* 1997, 43(145), p.495-502, 53 refs.

Pleistocene, Glacial geology, Glacier beds, Ice override, Ice solid interface, Sediments, Deformation, Compaction, Stress concentration, Shear stress, Water films, Water pressure, Germany

52-5116

Glacial regime of the highest Tien Shan mountain, Pobeda-Khan Tengry massif.

Aĭzen, V.B., Aĭzen, E.M., Dozier, J., Melack, J.M., Sexton, D.D., Nesterov, V.N., *Journal of glaciology,* 1997, 43(145), p.503-512, 25 refs.

Glacier surveys, Mountain glaciers, Glacier mass balance, Glacier ablation, Glacial meteorology, Snowmelt, Heat balance, Radiation balance, Surface energy, Diurnal variations, Stratigraphy, Analysis (mathematics), Russia—Tien Shan

52-5117

Snow accumulation and ice flow at Dôme du Goûter (4300 m), Mont Blanc, French Alps.

Vincent, C., Vallon, M., Pinglot, J.F., Funk, M., Reynaud, L., *Journal of glaciology,* 1997, 43(145), p.513-521, 22 refs.

Glacier surveys, Mountain glaciers, Alpine glaciation, Glacier flow, Velocity measurement, Snow accumulation, Firn, Glacier thickness, Glacier mass balance, Ice cores, Snow composition, Radioactive isotopes, Age determination, Correlation, France—Mont Blanc

52-5118

Flow of a polythermal glacier: McCall Glacier, Alaska, U.S.A.

Rabus, B.T., Echelmeyer, K.A., *Journal of glaciology,* 1997, 43(145), p.522-536, 34 refs.

Mountain glaciers, Glacier flow, Glacial hydrology, Glacier ablation, Strains, Basal sliding, Seasonal ablation, Melting points, Velocity measurement, Glacier thickness, Profiles, Mathematical models, United States—Alaska—McCall Glacier

52-5119

Ice deformation at the confluence of two glaciers investigated with conceptual map-plane and flow-line models.

Gudmundsson, G.H., *Journal of glaciology,* 1997, 43(145), p.537-547, 17 refs.

Glacier flow, Velocity, Mountain glaciers, Ice mechanics, Basal sliding, Glacier beds, Ice solid interface, Ice deformation, Strains, Stress concentration, Mathematical models

52-5120

Measurements of ice deformation at the confluence area of Unteraargletscher, Bernese Alps, Switzerland.

Gudmundsson, G.H., Iken, A., Funk, M., *Journal of glaciology,* 1997, 43(145), p.548-556, 43 refs.

Mountain glaciers, Alpine glaciation, Glacier flow, Ice mechanics, Glacier thickness, Ice deformation, Basal sliding, Velocity measurement, Ice solid interface, Strains, Migration, Boreholes, Mechanical tests, Switzerland—Alps

52-5121

Width and length scaling of glaciers.

Bahr, D.B., *Journal of glaciology,* 1997, 43(145), p.557-562, 17 refs.

Glaciology, Mountain glaciers, Valleys, Surface properties, Physical properties, Ice volume, Glacier thickness, Indexes (ratios), Glacier surveys, Statistical analysis

52-5122

Evaluating the impact of climate on snow- and ice-melt dynamics in the Taillon basin, French Pyrénées.

Hannah, D.M., McGregor, G.R., *Journal of glaciology,* 1997, 43(145), p.563-568, 22 refs.

Climatology, Synoptic meteorology, Glacial meteorology, Mountain glaciers, Glacier ablation, Glacial hydrology, Snowmelt, Snow air interface, Heat balance, Meteorological factors, Wind factors, Glacier melting, Classifications, France—Pyrénées

52-5123

In situ thermal profiles and laboratory impact experiments on iceberg ice.

Gagnon, R.E., Gammon, P.H., *Journal of glaciology,* 1997, 43(145), p.569-582, 19 refs.

Sea ice, Ice physics, Ice mechanics, Icebergs, Ice strength, Impact tests, Penetration tests, Loads (forces), Ice deterioration, Thermal drills, Ice solid interface, Ice temperature, Temperature measurement, Temperature effects, Canada—Labrador—Ikak Bay

52-5124

Changes in glaciers in Hidden Valley, Mukut Himal, Nepal Himalayas, from 1974 to 1994.

Fujita, K., Nakawo, M., Fujii, Y., Paudyal, P., *Journal of glaciology,* 1997, 43(145), p.583-588, 18 refs.

Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier ablation, Glacier mass balance, Altitude, Seasonal variations, Statistical analysis, Nepal—Himalaya Mountains

52-5125

Mertz and Ninnis Glacier tongues mapped from satellite radar altimeter radar.

Herzfeld, U.C., Matassa, M.S., *Journal of glaciology,* 1997, 43(145), p.589-591, 9 refs.

Glacier surveys, Glacier oscillation, Glacier tongues, Spacecraft, Radar echoes, Geodetic surveys, Topographic maps, Sensor mapping, Height finding, Antarctica—Mertz Glacier, Antarctica—Ninnis Glacier

Mertz and Ninnis Glaciers are two glaciers in East Antarctica with long tongues extending into the southernmost Indian Ocean. A contribution in a 1996 issue of the *Journal of Glaciology* is concerned with advance and retreat of these tongues and with the description of their surface features based on satellite synthetic aperture radar. The authors note that accurate surface elevation and extent of these East Antarctic ice tongues are now available from an evaluation of Geosat Geodetic Mission radar altimeter (RA) data. A topographic map of the Ninnis and Mertz Glacier area is provided, in addition to enlarged versions of Mertz Glacier and Ninnis Glacier. In general, RA and SAR data can be combined to study changes in position, surface morphology and elevation of antarctic ice streams and glaciers. The advantage of RA data over SAR data is their longer record in time, more frequent repeat, and lesser data volume, which facilitates frequent collection and rapid evaluation for large areas. (Auth. mod.)

52-5126

Bellingshausen Sea and Amundsen Sea: development of a sedimentation model. [Bellingshausen- und Amundsenmeer: Entwicklung eines Sedimentationsmodells]

Nitsche, F.O., *Berichte zur Polarforschung,* 1998, No.258, 144p., In German with English summary. Refs. p.114-126.

Sea ice, Seismic surveys, Sediments, Models, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea

The shelf has a water depth between 400 and 600 m which is typical for polar regions. The inner shelf is deeper (up to 1000 m) than the shelf edge. Prograding and aggrading sequences are found in the outer shelf area, indicating that the west antarctic ice shield was grounded up to the shelf edge at least 7 times at previous glacial maxima. During interglacial times almost no sediment reached the outer shelf because the inner shelf area is much deeper than the shelf edge. In contrast, there has been much sediment deposited on the upper continental slope during glacial times when the ice was grounded at the shelf edge. On the continental slope and rise several major sediment structures are found which provide information about resedimentation processes. The slope shows evidence of small slumps and debris flows. On the rise turbidity currents and a westward flowing bottom current control the deposition. In the Bellingshausen Sea the amount of material delivered to the shelf edge varies. Glacial troughs on the shelf lead to the conclusion that ice streams were flowing through the troughs transporting more sediment. At locations where these ice streams reached the shelf edge the progradation of the shelf is much more pronounced. Differences in geometry of the sediment bodies on the rise indicate that the influence of the bottom current is also changing in the investigated area. (Auth. mod.)

52-5127

Geopolitics in Antarctica: views from the southern ocean rim.

Dodds, K., Chichester, UK, John Wiley & Sons, in association with Scott Polar Research Institute, University of Cambridge, 1997, 252p., Refs. p.225-245. DLC G877.D63 1997

Legislation, Environmental protection, International cooperation

The author provides an overview of the changing outlooks and attitudes of the Southern Ocean Rim States towards Antarctica and towards the non-SORS which also have interests in Antarctica. The Antarctic Treaty and its various protocols have apparently served primarily as devices to gain entry to the continent so as to advance the more practical/traditional interests in natural resources, real or imagined, and to establish a strategic presence for use at some near or far future date. The concept of Antarctica as a zone of peace and science, so prevalent in the 1960s, has given way to the resource potential and, more recently, environmental issues.

52-5128

Antarctic science: the role of SCAR.

Rocha Campos, A.C., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.5-12, With Spanish summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al.

Environmental protection, International cooperation, Research projects

This article, after briefly discussing the structure and functioning of the Scientific Committee on Antarctic Research (SCAR), examines the elements of SCAR strategy to perform its role as a non-governmental organization charged with the initiation, promotion and coordination of scientific activity in the Antarctic. An element in the development of SCAR's science strategy consists of the promotion of multi-disciplinary research programs that focus on major antarctic scientific questions of global significance. (Auth. mod.)

52-5129

Marine biological research in the Antarctic: present situation, international projects, and perspectives. [Investigación antártica en biología marina: situación actual, proyectos internacionales y perspectivas]

Arntz, W.E., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.13-44, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. Refs. p.38-44.

Marine biology, Biomass, Ice cover effect, Sea ice distribution, Environmental protection, Research projects

The author reviews the development, present state and future prospects of marine biology in the Antarctic, referring to the subsystems of sea ice, water column (pelagial) and seafloor (benthal). A great part of the investigations at present are related to basic scientific goals, climate impact studies and conservation of the antarctic environment. (Auth. mod.)

52-5130

Photosynthetic performance of the cyanobacterial lichen *Leptogium puberulum* Hue (Collemataceae) in the maritime Antarctica.

Schlensog, M., Schroeter, B., Sancho, L.G., Pintado, A., Kappen, L., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.105-111, With Spanish summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 14 refs.

Lichens, Meltwater, Photosynthesis, Marine biology, Antarctica—South Bay

The cyanobacterial lichen *Leptogium puberulum* occurs in the maritime Antarctic, predominantly in meltwater habitats, during spring. Its photosynthetic performance was measured in two different ecological situations: thalli growing between moss cushions, and thalli growing in a meltwater flurry. The diel carbon balance of *L. puberulum* differed significantly between the two different sites: the carbon balance of the epibryc thalli was low, or even negative on overcast days. That of the lichen growing with a sustained water supply was always positive, even when irradiance was low. (Auth. mod.)

52-5131

Photosynthesis of maritime cosmopolitan lichens. [Comportamiento fotosintético de líquenes cosmopolitas en la Antártida marítima]

Sancho, L.G., Valladares, F., Pintado, A., Schlensog, M., Schroeter, B., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.113-118, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 12 refs.

Lichens, Photosynthesis, Marine biology, Snow cover effect, Antarctica—Livingston Island

The ecophysiology of some cosmopolitan macrolichens was studied under natural summer conditions at Livingston I. Four species with different growth forms were selected; their gas exchange was measured during 15 days of metabolic activity, in Jan., Feb. and Dec. 1995. The carbon balance during this period was negative for all investigated species, except for one of two populations growing in sheltered areas. (Auth. mod.)

52-5132

Differences in the photosynthetic utilization of high irradiance by co-occurring lichens and vascular plants in maritime Antarctica. [Diferencias en la utilización fotosintética de radiaciones lumínicas elevadas por líquenes y plantas vasculares en la Antártida marítima]

Valladares, F., Sancho, L.G., Chico, J.M., Manrique, E., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.119-125, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 21 refs.

Lichens, Photosynthesis, Tundra vegetation, Antarctica—Livingston Island

The authors studied light utilization and photoprotection in some of the most representative species of the antarctic tundra, comparing poikilohydric with homeohydric organisms (lichens vs. vascular plants). All the species studied exhibited a remarkable tolerance to high irradiance combined with low temperatures. However, photochemical efficiency of vascular plants recovered faster from a photoinhibitory treatment than that of the lichens studied. In general, lichens harvested less light on a dry weight basis and were less efficient than vascular plants in using high light for carbon fixation, but were similarly resistant to high irradiance at low temperatures. (Auth. mod.)

52-5133

Circumpolar current in the Arc of Scotia; an altimetric study with satellites ERS-1 and Topex-Poseidon data. [La corriente circumpolar en el Arco de Scotia. Estudio altimétrico con los satélites ERS-1 y Topex-Poseidon]

Villares, P., Tejedor, B., Rojas, J.L., Catalán-Morollón, M., Pérez-Urquiola, M.C., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.127-135, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 20 refs.

Ocean currents, Sea level, Bottom topography, Spacecraft, Atmospheric disturbances, —Scotia Sea

The effects of seasonal meteorology and the Scotia Arc bottom interactions with the circumpolar current were studied. Data on semiannual sea surface elevations and depressions, in the area extending from the Falkland Is. to Brazil and from the South Sandwich Is. to the mid-Atlantic, were obtained from satellite observations. Analysis of results shows an extensive flow of eddies along the south border of the Scotia Arc, north of the Weddell Sea, and the development of seasonal variations of the sea surface. (Auth. mod.)

52-5134

Distribution of hydrographic variables on two long transects across the Weddell-Scotia Confluence. [Distribución de variables hidrográficas en dos transectos largos a través de la confluencia Weddell-Scotia]

López, O., Rojas, P., García, M.A., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.137-147, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 5 refs.

Ocean currents, Sea water, Water chemistry, Salinity, Optical properties, Antarctica—Weddell Sea, —Scotia Sea

A hydrographic survey, carried out on board the R/V *Hespérides* in the area of Elephant and King George islands, the tip of the Antarctic Peninsula and the northwestern boundary of the Weddell Sea, is reported. Vertical distributions of oceanographic variables have been obtained through spatial interpolation at 8 stations, showing a clear latitudinal zonation from the Weddell Sea to the Scotia Sea, across the Weddell-Scotia Confluence. The most relevant physical variables seem to influence the distribution of fluorescence, which exhibits relative maximum values at both extremes of each transect. The temperature and the salinity distributions display strong horizontal gradients at the surface, defining the Weddell and the Scotia fronts. (Auth. mod.)

52-5135

Structure of the Antarctic Circumpolar Current across the Scotia Sea: a Spanish contribution to WOCE. [Estructura de la Corriente Antártica Circumpolar en el Mar de Scotia: una contribución española al experimento internacional WOCE]

García, M.A., López, O., Sospedra, J., Rojas, P., S.-Arcilla, A., Gomis, D., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.149-160, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 9 refs.

Ocean currents, Sea water, Water temperature, Water chemistry, Salinity, Optical properties, —Scotia Sea

In Feb. 1995 and Feb. 1996, hydrographic surveys were carried out in the Scotia Sea by the World Ocean Circulation Experiment program. Twenty-one stations were sampled and continuous profiles of temperature, salinity, dissolved oxygen concentration, fluorescence and light transmission, were obtained. Results show that the water-mass distribution is characteristic of the Antarctic Circumpolar Current (ACC) and the zonation defined by the ACC hydrographic fronts: the Subantarctic Front, the Polar Front, the Southern ACC Front and the Continental Water Boundary. The comparison of the 1995 and the 1996 results reveals changes in the structure of the ACC which can be explained by the interannual variability of the ACC regime. (Auth. mod.)

52-5136

Distribution of nutrients and oxygen across the Scotia Sea—Austral summer of 1996.

García, H.E., Cruzado, A., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.161-171, With Spanish summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 19 refs.

Ocean currents, Sea water, Water chemistry, Salinity, —Scotia Sea

Results are summarized of an investigation of the Antarctic Circumpolar Water structure across the Scotia Sea. Chemical and physical measurements were obtained from Feb. 14 to Mar. 3, 1996, between the Falkland Plateau and Elephant I. The rich, large-scale water mass structure includes a vertical array of layers with markedly different sources and characteristics, which are described. (Auth. mod.)

52-5137

Approximation of thermic field analysis of the Spanish antarctic station Juan Carlos I, Livingston Island, South Shetland Islands. [Aproximación al análisis del campo térmico estival de la base antártica española Juan Carlos I, Isla Livingston, Islas Shetland del Sur, Antártida]

Aguilar Anfrons, E., Brunet India, M., *Real Sociedad Española de Historia Natural. Boletín. Sección Biológica,* 1997, 93(1-4), p.173-179, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 18 refs.

Air temperature, Subpolar regions, Antarctica—Juan Carlos I Station

Based on data obtained from an automatic weather station during the 1988 to 1991 and 1993-1994 summer seasons, the authors describe the thermic pattern at the Juan Carlos I Station for that period. The summer patterns, characterized by a high interannual and diurnal variability with daily means above 0°C, show an ascending line until the second half of Jan. The daily patterns show clearly a sinusoidal line but a low amplitude, without hourly means below 0°C. There is a difference of 0.5°C between the daily mean of the first half of Jan. and the first half of Feb. (Auth. mod.)

52-5138

Arctic and alpine environments, past and present. Program with abstracts.

International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, 168p., Refs. passim. For selected extended abstracts see 52-5139 through 52-5165.

Paleoclimatology, Glaciation, Glacial geology, Glacial deposits, Glacier oscillation, Marine geology, Marine deposits, Bottom sediment, Soil dating, Geochronology, Plant ecology, Global change

52-5139

Mid-Wisconsin interstadial vegetation in Alaska and Yukon Territory based on the fossil record: how extensive was boreal forest vegetation.

Ager, T.A., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.1-2, 2 refs.

Paleobotany, Plant ecology, Tundra vegetation, Vegetation patterns, Fossils, Forest lines, Paleoclimatology, United States—Alaska, Canada—Yukon Territory

52-5140

Permafrost zone of Daldyn-Alakit region. The problems of evolution and development.

Alekseev, S.V., Alekseeva, L.P., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.4-6.

Permafrost distribution, Permafrost depth, Permafrost thickness, Ground ice, Subpermafrost ground water, Hydrogeochemistry, Frozen ground chemistry, Paleoclimatology, Soil pollution, Soil erosion, Russia—Yakutia

52-5141

Holocene paleohydrology of Tangled Up Lake, central Brooks Range, Alaska.

Anderson, L., Abbott, M.B., Finney, B.P., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.8-10, 8 refs.

Lacustrine deposits, Bottom sediment, Soil dating, Isotope analysis, Forest lines, Water balance, Paleoclimatology, United States—Alaska—Brooks Range

52-5142

Sedimentology of late Holocene coastal eolian deposits interbedded with medieval Norse habitation sites in Shetland, U.K.

Anderson, L.R., Bigelow, G., Retelle, M.J., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.11-13, 9 refs.

Beaches, Marine geology, Eolian soils, Soil profiles, Soil dating, Climatic changes, Global change, United Kingdom—Shetland Islands

52-5143

Late Quaternary stratigraphic and morphologic investigations in the Poolepynten area, Prins Karls Forland, western Svalbard.

Andersson, T., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.14-15.

Marine geology, Marine deposits, Beaches, Glacial geology, Glacial deposits, Glacial till, Quaternary deposits, Soil dating, Stratigraphy, Paleoclimatology, Norway—Svalbard

52-5144

6400 years paleoenvironmental records from the Yana River lowland Russia.

Andreev, A.A., Klimanov, V.A., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.16-18, 5 refs.

Forest lines, Forest tundra, Tundra vegetation, Vegetation patterns, Plant ecology, Paleobotany, Soil dating, Stratigraphy, Paleoclimatology, Russia—Yana River

52-5145

Glacial Lake Ojibway and the cold event 8,200 calendar years ago: revised ^{14}C ages for the lake drainage event.

Barber, D.C., Jennings, A.E., Andrews, J.T., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.23-25, 18 refs.

Glacial lakes, Lake bursts, Floods, Drainage, Lacustrine deposits, Marine deposits, Soil dating, Ocean currents, Marine atmospheres, Global change, Paleoclimatology, Geochronology, Canada—Hudson Bay, Canada—Hudson Strait, Labrador Sea

52-5146

36Cl-based chronology for Wisconsin glacier fluctuations in the western Ahklun Mountains, southwestern Alaska.

Briner, J.P., Swanson, T.W., Kaufman, D.S., Caffee, M., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.28-30, 6 refs.

Alpine glaciation, Mountain glaciers, Glacier oscillation, Glacial geology, Glacial deposits, Moraines, Soil dating, Geochronology, Paleoclimatology, United States—Alaska—Ahklun Mountains

52-5147

Mercury in arctic charr (*Salvelinus alpinus*) from Kasegalik Lake, Belcher Islands, NWT, Canada.

Brozowski, J., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.32.

Air pollution, Water pollution, Lake water, Water chemistry, Physiological effects, Animals, Canada—Northwest Territories—Belcher Islands

52-5148

Assessment of ground ice volume near Eureka, Ellesmere Island, N.W.T.

Couture, N.J., Pollard, W.H., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.34-36, 7 refs.

Permafrost distribution, Permafrost thickness, Ground ice, Ice lenses, Ice wedges, Ice volume, Active layer, Ground thawing, Thermokarst, Canada—Northwest Territories—Ellesmere Island

52-5149

Summer bias in arctic warming reports: are winter temperatures irrelevant.

Doner, L.A., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.42-43, 6 refs.

Polar atmospheres, Marine atmospheres, Air temperature, Atmospheric circulation, Ocean currents, Paleoclimatology, Global warming

52-5150

Inferring past climatic and environmental changes in Alaska using diatom-based paleolimnology.

Gregory-Eaves, I., Smol, J.P., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.65-66, 6 refs.

Lacustrine deposits, Bottom sediment, Paleobotany, Forest lines, Nutrient cycle, Limnology, Water level, Paleoclimatology, United States—Alaska

52-5151

Canal Errazuriz: site of a significant Younger Dryas ice margin readvance in the central Chilean fjords.

Hibben, K.L., Malburg, J.A., Stravers, J.A., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.75-77.

Glaciation, Glacial geology, Glacial deposits, Glacier oscillation, Moraines, Marine geology, Coastal topographic features, Soil dating, Geochronology, Global change, Paleoclimatology, Chile

52-5152

Utility of NCEP/NCAR reanalysis for arctic precipitation studies.

Hurst, C.M., Serreze, M.C., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.78-79, 9 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Hydrologic cycle, Evaporation, Precipitation (meteorology), Weather forecasting, Long range forecasting, Computerized simulation

52-5153

Evidence for glacial ice extent and deglaciation history in Kangerlussuaq Trough, East Greenland shelf.

Jennings, A.E., Smith, L.M., Andrews, J.T., Syvitski, J.P., Hald, M., Weiner, N.J., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.82-83, 5 refs.

Glaciation, Glacier oscillation, Marine geology, Marine deposits, Bottom sediment, Glacial deposits, Icebergs, Ice rafting, Drill core analysis, Soil dating, Geochronology, Paleoclimatology, Greenland, Denmark Strait

52-5154

Late Quaternary glacial dynamics in the outer Cumberland Sound area, southeastern Baffin Island, eastern Canadian Arctic.

Kaplan, M.R., Steig, E.J., Pfeffer, W.T., Miller, G.H., Caffee, M.W., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.86-88, 4 refs.

Glaciation, Glacier oscillation, Glacial geology, Glacial erosion, Glacial deposits, Glacial till, Quaternary deposits, Marine geology, Soil dating, Geochronology, Paleoclimatology, Canada—Northwest Territories—Baffin Island

52-5155

Hot springs and tundra ecosystems in the northeast of Russia: is there any effect of elevated temperature on carbon balance.

Karelin, D.V., Zamolodchikov, D.G., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.89-90.

Hot springs, Tundra climate, Tundra vegetation, Plant ecology, Plant physiology, Biomass, Nutrient cycle, Global warming, Russia—Chukotskiy Peninsula

52-5156

Surface sediment diatom assemblages from Bathurst Island, NWT, Canadian High Arctic—a calibration project.

Lim, D.S.S., Douglas, M.S.V., Smol, J.P., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.95-97, 16 refs.

Polar atmospheres, Air pollution, Ponds, Lake water, Water pollution, Water chemistry, Limnology, Algae, Suspended sediments, Bottom sediment, Plant ecology, Global warming, Canada—Northwest Territories—Bathurst Island

52-5157

Holocene climate change in the Franz Josef Land region, arctic Russia, 80°N.

Lubinski, D.J., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.100-102, 11 refs.

Glaciation, Glacier oscillation, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Soil dating, Geochronology, Global change, Paleoclimatology, Russia—Franz Josef Land

52-5158

Quaternary sediments and bedrock in Ungava Bay, N.W.T., Canada.

MacLean, B., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.103-105, 12 refs.

Glaciation, Glacier oscillation, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Drill core analysis, Soil dating, Geochronology, Paleoclimatology, Canada—Northwest Territories—Ungava Bay

52-5159

GIS determination of modern and late Wisconsin equilibrium line altitudes in the Ahklun Mountains of southwestern Alaska.

Manley, W.F., Kaufman, D.S., Briner, J.P., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.107-108, 5 refs.

Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier mass balance, Paleoclimatology, Topographic surveys, Image processing, United States—Alaska—Ahklun Mountains

52-5160

Revised glacial chronology of the Pangnirtung Fjord region, Cumberland Peninsula, Baffin Island, based on ^{10}Be and ^{26}Al exposure age dating.

Marsella, K.A., Bierman, P.R., Davis, P.T., Caffee, M.W., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.111-113, 6 refs.

Glaciation, Glacial geology, Glacier oscillation, Glacial deposits, Marine geology, Moraines, Soil dating, Radioactive age determination, Geochronology, Paleoclimatology, Canada—Northwest Territories—Baffin Island

52-5161

Geochemical investigation of perennial spring activity, Axel Heiberg Island, N.W.T.

Omelon, C.R., Pollard, W.H., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.121-122, 10 refs.

Springs (water), Floodplains, Frost mounds, Hydrogeochemistry, Canada—Northwest Territories—Axel Heiberg Island

52-5162

Deglacial and Holocene stable-isotope and foraminiferal records from the northern Barents and Kara Seas.

Polyak, L., Lubinski, D.J., Forman, S.L., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.129-131, 8 refs.

Glaciation, Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Isotope analysis, Water transport, Ocean currents, Paleoclimatology, Barents Sea, Russia—Kara Sea

52-5163

Pollen-based Holocene July mean temperature reconstructions from Tsuolbmajavri, northern Finland.

Seppä, H., Birks, H.J.B., Peglar, S.M., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.140-141, 6 refs.

Lacustrine deposits, Bottom sediment, Palynology, Paleobotany, Forest lines, Paleoclimatology, Finland

52-5164

Water and sediment discharge dynamics of Russian arctic rivers.

Syvitski, J.P.M., Meade, R.H., Bobrovitskaia, N.N., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.145-148, 12 refs.

River flow, Water erosion, Suspended sediments, Sediment transport, Alluvium, Deltas, Estuaries, Russia

52-5165

Model of thick syngenetic ice-wedge formation.

Vasil'chuk, IU.K., Vasil'chuk, A.C., International Arctic Workshop, 28th, Boulder, CO, Mar. 12-14, 1998. Arctic and alpine environments, past and present. Program with abstracts, Boulder, University of Colorado, Institute of Arctic and Alpine Research, 1998, p.157-159, 4 refs.

Ice wedges, Permafrost hydrology, Permafrost indicators, Periglacial processes, Floodplains, Alluvium

52-5166

Increase of carbon dioxide in the bottom water of the Weddell Sea, Antarctica.

Hoppema, M., Fahrbach, E., Stoll, M.H.C., De Baar, H.J.W., *Marine chemistry,* Jan. 1998, 59(3-4), p.201-210, 38 refs.

Oceanography, Water chemistry, Carbon dioxide, Air water interactions, Atmospheric composition, Air pollution, Aerosols, Vapor transfer, Climatic factors, Sampling, Antarctica—Weddell Sea

High precision total CO_2 (TCO_2) data are presented from the NW Weddell Sea obtained during two cruises. A TCO_2 increase from 1993 to 1996 was observed in the newly formed bottom water, whereas no TCO_2 increase was found in the surrounding water masses. Bottom water with variable characteristics is produced along the margins of the Weddell Sea. Examination of possible causes leads to the conclusion that the bottom water variability is largely due to varying amounts of Warm Deep Water intruding onto the shelves of the Weddell Sea, thus changing the shelf water end-member of bottom water formation. Analysis of the data suggested that some part of the TCO_2 increase of the bottom water is due to the increased level of anthropogenic CO_2. (Auth. mod.)

52-5167

Dissolved organic matter and nutrients in the Lena River, Siberian Arctic: characteristics and distribution.

Lara, R.J., et al, *Marine chemistry,* Jan. 1998, 59(3-4), p.301-309, 29 refs.

River basins, Rivers, Water chemistry, Sediment transport, Suspended sediments, Bottom sediment, Organic nuclei, Solubility, Nutrient cycle, Sampling, Isotope analysis, Russia—Lena River

52-5168

Windstorms along the western side of the Washington Cascade Mountains. Part I: a high-resolution observational and modeling study of the 12 February 1995 event.

Colle, B.A., Mass, C.F., *Monthly weather review,* Jan. 1998, 126(1), p.28-52, 37 refs.

Synoptic meteorology, Storms, Precipitation (meteorology), Snowstorms, Mountains, Turbulent boundary layer, Wind velocity, Wind direction, Topographic effects, Radar echoes, Sounding, Profiles, Simulation, United States—Washington—Cascade Mountains

52-5169

Dual-Doppler radar study of longitudinal-mode snowbands. Part I: a three-dimensional kinematic structure of meso-γ-scale convective cloud systems within a longitudinal-mode snowband.

Fujiyoshi, Y., Yoshimoto, N., Takeda, T., *Monthly weather review,* Jan. 1998, 126(1), p.72-91, 39 refs.

Synoptic meteorology, Clouds (meteorology), Precipitation (meteorology), Turbulent boundary layer, Snowstorms, Cloud physics, Snow evaporation, Wind direction, Wind velocity, Sounding, Radar echoes, Reflectivity, Japan—Hokkaido

52-5170
Case study of antarctic katabatic wind interaction with large-scale forcing.
Parish, T.R., Bromwich, D.H., *Monthly weather review,* Jan. 1998, 126(1), p.199-209, 29 refs.
Climatology, Synoptic meteorology, Polar atmospheres, Wind (meteorology), Turbulent boundary layer, Atmospheric circulation, Atmospheric pressure, Air masses, Ice air interface, Topographic effects, Ice cover effect
Surface pressure decreases of up to 20 hPa occurred over much of the antarctic continent during a 4-day midwinter period of 1988. The widespread change in the pressure field accompanied intense cyclonic activity to the north of the ice sheet. The equatorward mass transport across the antarctic coastline resulted in a redistribution of atmospheric pressure that extended to the subtropics of the Southern Hemisphere. Most of the mass flux from Antarctica was the result of the low-level processes and appears tied to the katabatic wind circulation. Zonally averaged circulations over Antarctica were examined using output from the European Centre for Medium-Range Weather Forecasts model. Results suggest that only a poorly defined return branch of the meridional circulation exists in the middle and upper troposphere. This southward-directed flow does not compensate for the northward mass transport provided by the katabatic wind outflow in the lower atmosphere. Isallobaric contours over the antarctic ice sheet roughly match the area of the large-scale drainage catchment associated with katabatic wind transport through the Ross Sea sector. (Auth. mod.)

52-5171
Static SIMS studies of reactions on mimics of polar stratospheric clouds. II: Low-temperature, low-pressure interactions of Cl_2 and Cl_2O with solid ice films.
Donsig, H.A., Herridge, D., Vickerman, J.C., *Journal of physical chemistry A,* Mar. 26, 1998, 102(13), p.2302-2308, 15 refs.
Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Water films, Ice vapor interface, Condensation, Simulation, Temperature effects, Ice spectroscopy, Spectra
To simulate the formation of polar stratospheric clouds in both polar atmospheres, the interactions of molecular chlorine, dichlorine monoxide, and hypochlorous acid with solid ice films have been examined. At 90-100 K, chlorine can be made to condense as a molecular solid, forming a discrete layer on top of an existing film of solid H_2O. At temperatures above approximately 130 K, the Cl_2 and water react to produce a mixed film of water, hypochlorous acid, and solvated HCl. There was evidence of a hydrogen-bond-like interaction between the Cl_2O and H_2O molecules. Upon warming to 120 K or higher, the two reacted to produce a mixed film of hypochlorous acid and water. The reactions that occurred at the higher temperatures are of interest because of the well-documented influence of polar stratospheric clouds, which consist of solid water or water/nitric acid particles, on the release of active chlorine species into the stratosphere. (Auth. mod.)

52-5174
Magnetic properties of light and dark sediment layers from the Japan Sea: diagenetic and paleoclimatic implications.
Vigliotti, L., *Quaternary science reviews,* Dec. 1997, 16(10), p.1093-1114, 55 refs.
Paleoclimatology, Climatic changes, Oceanography, Sea level, Quaternary deposits, Bottom sediment, Rock magnetism, Remanent magnetism, Diagenesis, Grain size, Oxygen isotopes, Isotope analysis, Sampling, Japan Sea

52-5175
Surface water changes in the Norwegian Sea during last deglacial and Holocene times.
Bauch, H.A., Weinelt, M.S., *Quaternary science reviews,* Dec. 1997, 16(10), p.1115-1124, 55 refs.
Paleoclimatology, Climatic changes, Oceanography, Meltwater, Water chemistry, Bottom sediment, Paleoecology, Drill core analysis, Isotope analysis, Radioactive age determination, Stratigraphy, Correlation, Norwegian Sea

52-5176
Glacial and climatic events in Iceland reflecting regional North Atlantic climatic shifts during the Pleistocene-Holocene transition.
Ingólfsson, O., Björck, S., Haflidason, H., Rundgren, M., *Quaternary science reviews,* Dec. 1997, 16(10), p.1135-1144, 61 refs.
Pleistocene, Paleoclimatology, Climatic changes, Glacier oscillation, Volcanic ash, Quaternary deposits, Stratigraphy, Palynology, Geochronology, Ice cores, Bottom sediment, Correlation, Iceland

52-5177
Initiation of the last glaciation in northern Europe.
Forsström, L., Punkari, M., *Quaternary science reviews,* Dec. 1997, 16(10), p.1197-1215, Refs. p.1212-1215.
Pleistocene, Glacial geology, Quaternary deposits, Glacier oscillation, Glaciation, Ice edge, Paleoecology, Palynology, Drill core analysis, Stratigraphy, Geochronology, Correlation, Europe

52-5178
Relevance of laboratory impacts into ice and ice-silicate targets for the study of comets.
Koschny, D., *Advances in space research,* Oct. 1997, 20(8), B0.5 Symposium of COSPAR Scientific Commission B, Birmingham, UK, July 14-21, 1996. Proceedings. Laboratory planetology. Edited by D. Möhlmann and J. Klinger, p.1569-1576, 29 refs.
Extraterrestrial ice, Porous materials, Solutions, Ice solid interface, Ice mechanics, Surface properties, Topographic features, Impact tests, Mechanical tests, Simulation

52-5179
Hypervelocity impact cratering of CO_2 ice and implications for planetary sciences.
Leliwa-Kopystyński, J., Brooke-Thomas, W., Burchell, M.J., Zarnecki, J.C., *Advances in space research,* Oct. 1997, 20(8), B0.5 Symposium of COSPAR Scientific Commission B, Birmingham, UK, July 14-21, 1996. Proceedings. Laboratory planetology. Edited by D. Möhlmann and J. Klinger, p.1577-1580, 11 refs.
Extraterrestrial ice, Porous materials, Carbon dioxide, Ice mechanics, Ice solid interface, Impact tests, Projectile penetration, Pit and mound topography, Simulation

52-5180
Spectral absorption of solid CO_2 from the ultraviolet to the far-infrared.
Hansen, G.B., *Advances in space research,* Oct. 1997, 20(8), B0.5 Symposium of COSPAR Scientific Commission B, Birmingham, UK, July 14-21, 1996. Proceedings. Laboratory planetology. Edited by D. Möhlmann and J. Klinger, p.1613-1616, 13 refs.
Extraterrestrial ice, Mars (planet), Regolith, Ground ice, Carbon dioxide, Ice spectroscopy, Radiation absorption, Simulation, Spectra

52-5181
Thermal chemistry of ice mixtures of astrophysical relevance.
Schutte, W.A., *Advances in space research,* Oct. 1997, 20(8), B0.5 Symposium of COSPAR Scientific Commission B, Birmingham, UK, July 14-21, 1996. Proceedings. Laboratory planetology. Edited by D. Möhlmann and J. Klinger, p.1629-1635, 23 refs.
Extraterrestrial ice, Ice physics, Ice composition, Cryogenics, Infrared radiation, Photochemical reactions, Polymers, Geochemistry, Thermal analysis, Simulation

52-5182
Production of CO and CO_2 after ion irradiation of ices.
Palumbo, M.E., *Advances in space research,* Oct. 1997, 20(8), B0.5 Symposium of COSPAR Scientific Commission B, Birmingham, UK, July 14-21, 1996. Proceedings. Laboratory planetology. Edited by D. Möhlmann and J. Klinger, p.1637-1645, 32 refs.
Extraterrestrial ice, Cosmic dust, Ice physics, Simulation, Carbon dioxide, Infrared spectroscopy, Ice spectroscopy, Ionization, Photochemical reactions, Spectra, Profiles

52-5183
Alpine subglacial hydrology.
Hubbard, B., Nienow, P., *Quaternary science reviews,* Nov. 1997, 16(9), p.939-955, Refs. p.952-955.
Alpine glaciation, Glacial hydrology, Subglacial drainage, Meltwater, Hydraulics, Channels (waterways), Classifications, Ice water interface, Boreholes, Water level, Mathematical models, Theories, Switzerland—Haut Glacier d'Arolla

52-5184
Glacier hydrology in Svalbard, Norwegian High Arctic.
Hodgkins, R., *Quaternary science reviews,* Nov. 1997, 16(9), p.957-973, Refs. p.971-973.
Glacial hydrology, Thermal regime, Glacier melting, Subglacial drainage, Surface drainage, Sediment transport, Meltwater, Ice temperature, Ice water interface, Channels (waterways), Norway—Svalbard

52-5185
Basal ice layer of glaciers and ice sheets.
Knight, P.G., *Quaternary science reviews,* Nov. 1997, 16(9), p.975-993, Refs. p.991-993.
Glaciology, Ice physics, Glacier ice, Bottom ice, Ice composition, Ice structure, Ice formation, Ice solid interface, Glacier beds, Sedimentation, Classifications, Isotope analysis, Rheology

52-5186
Assessing the paradigm shift: deformable glacier beds.
Murray, T., *Quaternary science reviews,* Nov. 1997, 16(9), p.995-1016, Refs. 1013-1016.
Glacial geology, Glacial hydrology, Glacier beds, Ice solid interface, Deformation, Substrates, Sediments, Hydraulics, Viscosity, Rheology, Models, Accuracy, Theories

52-5187
How glaciers entrain and transport basal sediment: physical constraints.
Alley, R.B., Cuffey, K.M., Evenson, E.B., Strasser, J.C., Lawson, D.E., Larson, G.J., MP 5153, *Quaternary science reviews,* Nov. 1997, 16(9), p.1017-1038, Refs. p.1034-1038.
Glacial geology, Glacial hydrology, Glacier flow, Subglacial drainage, Sediment transport, Sedimentation, Glacier beds, Ice solid interface, Deformation, Regelation, Classifications, Theories, Analysis (mathematics)
Simple insights from the physics of ice, water and sediment place constraints on the possible sediment-transport behavior of glaciers and ice sheets. Because glaciers concentrate runoff, streams generated by glaciers transport much sediment and may erode bedrock rapidly. Deforming glacier beds also can transport much sediment, particularly in marginal regions. Rapid sediment entrainment producing thick debris-rich basal zones may occur by regelation into subglacial materials, and by freeze-on from rising supercooled waters. Numerous other mechanisms may be important but primarily near ice margins, especially those of advancing or fluctuating glaciers. Several sediment-entrainment mechanisms may be active beneath a single glacier, but one process is likely to be dominant at any place and time.

52-5188
Deforming beds: viscous and plastic scales of deformation.
Hindmarsh, R., *Quaternary science reviews,* Nov. 1997, 16(9), p.1039-1056, 65 refs.
Glacial geology, Glacial hydrology, Ice mechanics, Glacier beds, Sediment transport, Subglacial drainage, Plastic deformation, Viscosity, Ice solid interface, Fluid dynamics, Theories, Models, Statistical analysis

52-5189
Ring-shear device for the study of till deformation: tests on tills with contrasting clay contents.
Iverson, N.R., Baker, R.W., Hooyer, T.S., *Quaternary science reviews,* Nov. 1997, 16(9), p.1057-1066, 55 refs.
Glacial geology, Glacial deposits, Sediments, Glacier beds, Deformation, Clay soils, Rheology, Mechanical properties, Mechanical tests, Shear strain, Shear strength, Simulation, Laboratory techniques

52-5190
Reconstructing the evolutionary dynamics of former ice sheet using multi-temporal evidence, remote sensing and GIS.
Clark, C.D., *Quaternary science reviews,* Nov. 1997, 16(9), p.1067-1092, Refs. p.1090-1092.
Pleistocene, Ice sheets, Glacier oscillation, Glacier flow, Glacial geology, Geomorphology, Sensor mapping, Geophysical surveys, Spaceborne photography, Topographic surveys, Models

52-5191

Distribution of Atlantic and Pacific waters in the upper Arctic Ocean: implications for circulation.

Jones, E.P., Anderson, L.G., Swift, J.H., *Geophysical research letters,* Mar. 15, 1998, 25(6), p.765-768, 22 refs.

Oceanography, Ocean currents, Surface waters, Water balance, Water chemistry, Nutrient cycle, Water transport, Origin, Distribution, Sampling, Arctic Ocean

52-5192

Methyl halides from antarctic macroalgae.

Laturnus, F., Adams, F.C., Wiencke, C., *Geophysical research letters,* Mar. 15, 1998, 25(6), p.773-776, 35 refs.

Marine biology, Oceanography, Algae, Water chemistry, Air water interactions, Plant physiology, Vapor diffusion, Atmospheric composition, Chemical composition, Simulation, Environmental impact

Various species of antarctic macroalgae have been found to produce and release methyl halides into the seawater. Compared to temperate macroalgae, antarctic macroalgae showed an approximately 10 to 50-fold lower release of these compounds. Due to the lower release and the restriction to the antarctic region, antarctic macroalgae may play a minor role in the global production of methyl halide but have to be considered as biogenic contributors for methyl halides to the halocarbon budget in the antarctic environment. Additional, dimethylsulfoniopropionate (DMSP) concentrations detected in antarctic macroalgae showed no correlation with methyl halides release rates, suggesting that a formation different from proposed enzymic pathways from DMSP reacting with halides can be assumed. (Auth. mod.)

52-5193

In-situ mass spectrometric observation of impact vaporization of water-ice at low temperatures.

Sugi, N., Arakawa, M., Kouchi, A., Maeno, N., *Geophysical research letters,* Mar. 15, 1998, 25(6), p.837-840, 13 refs.

Ice physics, Deuterium oxide ice, Impact tests, Ice solid interface, Ice sublimation, Water vapor, Ice spectroscopy, Low temperature tests, Extraterrestrial ice, Simulation, Mechanical tests

52-5194

Evidence for increasing ultraviolet irradiance at Point Barrow, Alaska.

Gurney, K.R., *Geophysical research letters,* Mar. 15, 1998, 25(6), p.903-906, 23 refs.

Climatology, Polar atmospheres, Atmospheric density, Solar radiation, Ultraviolet radiation, Radiance, Photometry, Radiation absorption, Spectra, Seasonal variations, United States—Alaska—Point Barrow

52-5195

Simulating late Pliocene Northern Hemisphere climate with the LLN 2-D model.

Li, X.S., Berger, A., Loutre, M.F., Maslin, M.A., Haug, G.H., Tiedemann, R., *Geophysical research letters,* Mar. 15, 1998, 25(6), p.915-918, 21 refs.

Paleoclimatology, Pleistocene, Carbon dioxide, Insolation, Marine geology, Marine deposits, Ice sheets, Glacier oscillation, Ice volume, Simulation

52-5196

Diffusion of HNO_3 in ice.

Sommerfeld, R.A., Knight, C.A., Laird, S.K., *Geophysical research letters,* Mar. 15, 1998, 25(6), p.935-938, 12 refs.

Climatology, Ice physics, Cloud physics, Ice vapor interface, Vapor diffusion, Self diffusion, Ozone, Solubility, Simulation, Accuracy, Theories

52-5197

Loess chronology of the Middle and Upper Pleistocene in Tadjikistan.

Frechen, M., Dodonov, A.E., *Geologische Rundschau,* May 1998, 87(1), p.2-20, 55 refs.

Pleistocene, Paleoclimatology, Quaternary deposits, Loess, Eolian soils, Soil dating, Sedimentation, Stratigraphy, Luminescence, Geochronology, Tajikistan

52-5198

Structural and kinematic evolution of the Yukon-Tanana upland tectonites, east-central Alaska: a record of late Paleozoic to Mesozoic crustal assembly.

Hansen, V.L., Dusel-Bacon, C., *Geological Society of America. Bulletin,* Feb. 1998, 110(2), p.211-230, Refs. p.228-230.

Pleistocene, Tectonics, Earth crust, Geologic processes, Geologic structures, Rock properties, Origin, Deformation, Models, United States—Alaska

52-5200

Paleomagnetism of Paleozoic strata of the Alexander terrane, southeastern Alaska.

Butler, R.F., Gehrels, G.E., Bazard, D.R., *Geological Society of America. Bulletin,* Oct. 1997, 109(10), p.1372-1388, Refs. p.1387-1388.

Pleistocene, Geomagnetism, Earth crust, Continental drift, Geological surveys, Rock magnetism, Remanent magnetism, Tectonics, Stratigraphy, Mineralogy, Geochronology, United States—Alaska—Prince of Wales Island

52-5201

Probabilistic study of ice shedding in relation with flashover between overhead line conductors.

Savadjiev, K., Farzaneh, M., *IEEE transactions on power delivery,* Apr. 1998, 13(2), p.579-586, 11 refs. Includes discussion.

Power line icing, Electrical resistivity, Mechanical properties, Charge transfer, Ice solid interface, Icefalls, Ice loads, Ice cover effect, Forecasting, Mathematical models, Design criteria

52-5202

Recent trends in atmospheric deposition of trace elements in Norway as evident from the 1995 moss survey.

Berg, T., Steinnes, E., *Science of the total environment,* Dec. 22, 1997, 208(3), p.197-206, 22 refs.

Climatology, Subpolar regions, Air pollution, Soil pollution, Aerosols, Metals, Mining, Plant ecology, Mosses, Plant tissues, Sampling, Microelement content, Environmental tests, Statistical analysis, Norway

52-5203

Trace metals in field samples of zooplankton from the Fram Strait and the Greenland Sea.

Ritterhoff, J., Zauke, G.P., *Science of the total environment,* July 1, 1997, 199(3), p.255-270, Refs. p.268-270.

Oceanography, Water chemistry, Metals, Marine biology, Ecosystems, Subpolar regions, Plankton, Metals, Sampling, Chemical analysis, Environmental tests, Greenland Sea, Arctic Ocean

52-5204

Statistical self-similarity of spatial snow accumulation variations and its application to snowmelt runoff models.

Kuchment, L.S., Gel'fan, A.N., *Russian meteorology and hydrology,* 1997, No.7, p.53-60, Translated from Meteorologiia i gidrologiia. 20 refs.

Snow hydrology, Watersheds, Snow cover distribution, Snow accumulation, Snow depth, Snowmelt, Runoff forecasting, Hydrography, Statistical analysis, Fractals, Theories, Russia—Sosna River

52-5205

Upper Jurassic-Lower Cretaceous Byers Group, South Shetland Islands, Antarctica: revised stratigraphy and regional correlations.

Hathway, B., Lomas, S.A., *Cretaceous research,* Feb. 1998, 19(1), p.43-67, Refs. p.64-67.

Sediments, Volcanoes, Stratigraphy, Geochronology, Correlation, Glacial geology, Antarctica—South Shetland Islands

The Byers Group, exposed in the western South Shetland Is., is a thick succession recording Late Jurassic-Early Cretaceous sedimentation and volcanism on the Pacific flank of the Antarctic Peninsula magmatic arc. At least 1.3 km of marine clastic rocks are overlain by 1.4 km of non-marine strata. Penecontemporaneous, mainly intrusive, igneous rocks are present in much of the succession. At the base of the Byers Group, radiolarian-rich, hemipelagic mudstones of the Kimmeridgian-Tithonian Anchorage Formation are succeeded by terrigenous, slope-apron mudstones and sandstones of the Berriasian President Beaches Formation. These deep-marine strata are overlain by shallower-marine conglomerates and mudstones of the Berriasian-Valanginian Chester Cone Formation. The upper part of the marine succession also includes the volcanic breccias of the Start Hill Formation, interpreted as part of a debris-apron flanking a substantial volcanic edifice. (Auth. mod.)

52-5206

Design of an optical remote sensing system for measuring refractive turbulence in the antarctic boundary layer.

Gimmestad, G.G., White, J.R., Belen'kii, M.S., *SPIE—The International Society for Optical Engineering. Proceedings,* 1996, Vol.2828, Image propagation through the atmosphere. Edited by J.C. Dainty and L.R. Bissonnette, p.221-231, 11 refs.

DLC QC882.46.I63 1996

Measuring instruments, Turbulent boundary layer, Remote sensing, Antarctica—Amundsen-Scott Station

The authors investigated the feasibility of building an innovative optical remote sensing instrument to monitor the vertical profile of the refractive index structure characteristic C^2_n. There is currently no active optical remote sensing instrument which is capable of doing this. Calculations have been performed for a system designed specifically to resolve a site survey question at the South Pole, where recent balloon soundings suggest that excellent astronomical seeing conditions could be obtained by mounting telescopes above a thin layer of atmospheric refractive turbulence near the surface. The new sensor considered here is essentially an imaging lidar which measures range-dependent laser beam wander, from which the vertical profile of C^2_n can be derived. Calculations based on atmospheric characteristics and preliminary design parameters have been carried out for a practical system based on commercially available components. Design parameters include the choice of operating wavelength, elevation angle, transmitter and receiver diameters, and image scale. The calculations indicate that it is feasible to develop an optical remote sensor for monitoring vertical profiles of C^2_n at the South Pole. (Auth.)

52-5207

CASP annual report—1 February 1997-31 January 1998.

Cambridge Arctic Shelf Programme, Cambridge, England, 1998, 16p. + append., List of publications p.12-16.

Organizations, Research projects, International cooperation, Petroleum industry, Exploration, Geological surveys

52-5208

Development of a synergetic sea ice retrieval method for the ERS-1 AMI wind scatterometer and SSM/I radiometer.

Grandell, J., Johannessen, J.A., Hallikainen, M., *Helsinki University of Technology. Laboratory of Space Technology. Report,* Apr. 1998, No.31, 29p., 20 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Ice detection, Ice temperature, Radiometry, Backscattering, Spaceborne photography, Image processing

Sea ice retrievals from the standard passive microwave NASA Team algorithm for the SSM/I are compared to retrievals from a new ERS-1 AMI Wind Scatterometer sea ice retrieval algorithm. The main objective of the comparison is to develop a synergetic algorithm, with the combined advantages of both of the individual algorithms. The NASA Team weather correction for SSM/I sea ice retrievals works well over ice-free ocean surfaces, although it cannot be applied over mixed pixels or ice. The scatterometer algorithm presented, however, does not appear to need a weather correction. Therefore, especially mixed pixel estimates, e.g. around ice edges or polynyas, could be enhanced by the use of both active (ERS-1 AMI Wind Scatterometer) and passive (SSM/I) microwaves. Examples are provided from both the Antarctic and Arctic. (Auth. mod.)

52-5209

Comparison of ERS-1 AMI wind scatterometer and SSM/I sea ice extent retrievals in the Greenland and East Siberian Seas from 1992 to 1996.

Grandell, J., Johannessen, J.A., Hallikainen, M., *Helsinki University of Technology. Laboratory of Space Technology. Report,* Apr. 1998, No.32, 22p., 18 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Ice detection, Radiometry, Backscattering, Spaceborne photography, Image processing, Greenland Sea, Russia—East Siberian Sea

52-5210
Changes in the Greenland Sea and East Siberian Sea ice covers affecting the annual cycle of vertical salt fluxes.
Grandell, J., Johannessen, J.A., Hallikainen, M., *Helsinki University of Technology. Laboratory of Space Technology. Report,* Apr. 1998, No.33, 8p., 6 refs.
Sea ice distribution, Ice conditions, Sea water freezing, Ice growth, Ice melting, Ice cover effect, Ice water interface, Salinity, Ocean currents, Air ice water interaction, Global warming, Greenland Sea, Russia—East Siberian Sea

52-5211
Measurements of curvilinear ridges in the Bay of Bothnia during the ZIP-97 experiment.
Lensu, M., Tuhkuri, J., Hopkins, M., *Helsinki University of Technology. Ship Laboratory. Arctic Offshore Research Centre. Report,* 1998, M-231, 64p., 53 refs.
Pressure ridges, Ice cover thickness, Drift, Ice friction, Ice pressure, Ice deformation, Ice override, Ice pileup, Bothnia, Gulf

52-5212
Laser profilometer measurements in the Bay of Bothnia during the ZIP-97 experiment.
Lensu, M., *Helsinki University of Technology. Ship Laboratory. Arctic Offshore Research Centre. Report,* 1998, M-232, 148p., 6 refs.
Ice surveys, Pressure ridges, Ice cover thickness, Ice surface, Aerial surveys, Lidar, Height finding, Statistical analysis, Bothnia, Gulf

52-5213
Van Sickle's modern airmanship. Chapter 3. The atmosphere and its weather: icing. Chapter 15. Northern wilderness flying.
Welch, J.F., ed, New York, TAB Books, 1995, 1026p. (Pertinent p.365-376,909-966), 7th edition.
DLC TL545.V3 1995
Aircraft icing, Ice accretion, Ice forecasting, Safety, Cold weather operation, Cold weather survival, Winter maintenance, Aircraft landing areas

52-5214
Expedition ARKTIS-XIII/3 of RV *Polarstern* in 1997.
Krause, G., ed, *Berichte zur Polarforschung,* 1998, No.262, 93p., 10 refs.
Sediments, Sea ice, Oceanographic surveys, Sounding, Marine geology, Expeditions, Greenland Sea, Arctic Ocean

52-5215
Crustal structure and sedimentary cover of the Eurasian Basin, Arctic Ocean: results from seismic and gravity measurements. [Die Krustenstruktur und Sedimentdecke des Eurasischen Beckens, Arktischer Ozean: Resultate aus seismischen und gravimetrischen Untersuchungen]
Weigelt, E., *Berichte zur Polarforschung,* 1998, No.261, 127p., In German with English summary. Refs. p.75-79.
Earth crust, Sediments, Gravimetric prospecting, Seismic surveys, Arctic Ocean

52-5216
Investigations on mass balance and dynamics of the Ronne Ice Shelf, Antarctica. [Untersuchungen zu Massenhaushalt und Dynamik des Ronne Ice Shelfs, Antarktis]
Lambrecht, A., *Berichte zur Polarforschung,* 1998, No.265, 142p., In German with English summary. Refs. p.119-128.
Ice shelves, Mass balance, Ice melting, Ablation, Antarctica—Ronne Ice Shelf
The Filchner-Ronne Ice Shelf is the second largest in the world by area and the largest by volume. The ice shelf controls the drainage of the ice sheet and therefore influences its stability. In addition it plays an important role in the formation of Antarctic Bottom Water, an important water mass for the ventilation of the world's oceans. Mass balance calculations and models of the melting processes beneath the ice shelves need as input a good knowledge of the conditions in the transition area between ice sheet and ice shelf. Some of the topics examined include: the grounding line; mass inputs and losses of the Shelf; radio-echo soundings; Foundation, Möller, and Institute Ice Streams; and accumulation, ice thickness, surface topography, ice flow, and deformation. (Auth. mod.)

52-5217
Measurements of the stratospheric trace gases ClO, HCl, O_3, N_2O, H_2O, and OH using airborne submm-wave radiometry at 650 and 2500 GHz. [Messungen der stratosphärischen Spurengase ClO, HCl, O_3, N_2O, H_2O, und OH mittels flugzeuggetragener Submillimeterwellen-Radiometrie bei 650 und 2500GHz]
Urban, J., *Berichte zur Polarforschung,* 1998, No.264, 221p., In German with English summary. Refs. p.199-213.
Atmospheric composition, Chemical composition, Ozone, Stratosphere, Polar atmospheres, Radiation measuring instruments

52-5218
Pleistocene collapse of the West Antarctic Ice Sheet.
Scherer, R.P., Aldahan, A., Tulaczyk, S., Possnert, G., Engelhardt, H., Kamb, B., *Science,* July 3, 1998, 281(5373), p.82-85, Refs. p.84-85.
Ice sheets, Ice deterioration, Ice breakup, Glacial geology, Algae, Pleistocene, Quaternary deposits, Antarctica—West Antarctica
Some glacial sediment samples recovered from beneath the West Antarctic ice sheet at ice stream B contain Quaternary diatoms and up to 10^8 atoms of beryllium-10 per g. Other samples contain no Quaternary diatoms and only background levels of beryllium-10 (less than 10^6 atoms per g). The occurrence of young diatoms and high concentrations of beryllium-10 beneath grounded ice indicates that the Ross Embayment was an open marine environment after a Late Pleistocene collapse of the marine ice sheet. (Auth.)

52-5219
Physical, chemical and microbial community characteristics of lakes of the Larsemann Hills, Continental Antarctica.
Ellis-Evans, J.C., Laybourn-Parry, J., Bayliss, P.R., Perriss, S.J., *Archiv für Hydrobiologie,* Jan. 1998, 141(2), p.209-230, Refs. p.227-230.
Photosynthesis, Microbiology, Limnology, Hydrology, Antarctica—Larsemann Hills, Antarctica—Prydz Bay, Antarctica—Heart Lake
Numerous freshwater lakes have developed on the three small ice-free peninsulas that constitute the Larsemann Hills. All the lakes are ultra-oligotrophic and ice covered for 9-11 months each year, resulting in a photosynthetically distinctive seasonal environment with uniformly low water temperatures. The benthic communities are dominated by thick cyanobacterial mats in the deeper parts of all but the few shallow brackish lakes. In these brackish lakes, the photosynthetically active mats are located in the lake margins as the deeper parts of these lakes are strongly anoxic under winter ice cover. In the more freshwater lakes, a depth-related zonation of mat type was observed, which showed pigment modifications to a substantial depth consistent with measured penetration of PAR and UV radiation, even under the extensive ice cover. The thick organic deposits and intact mat structure at depth suggest slow decomposition rates within the mats. The plankton are almost entirely microbial, with two forms of planktonic rotifer and the cladoceran, *Daphniopsis studeri* present in very low numbers. A desmid, *Cosmarium,* occurred in relatively large numbers in Heart Lake, a coastal system. The desmid group is very rare in continental Antarctica. Abundances of bacteria, heterotrophic and phototrophic nanoflagellates, and ciliates were consistently low. (Auth. mod.)

52-5220
Paleocean circulation during the last deglaciation: a bipolar seesaw?
Broecker, W.S., *Paleoceanography,* Apr. 1998, 13(2), p.119-121, 14 refs.
Paleoclimatology, Climatic changes, Heat flux, Ocean currents, Air water interactions, Atmospheric composition, Carbon dioxide, Ice cores, Radioactive age determination, Theories, Greenland, Antarctica
Hughen et al. [1998] have documented that during the first 200 years of Younger Dryas time the ^{14}C content of atmospheric CO_2 increased by ca. 50 per mill and that during the remainder of this 1200-year-duration cold event it steadily declined. The initial increase in $^{14}C/C$ was likely the result of a reduction in the Atlantic's conveyor circulation. Modeling exercises show that if the conveyor is terminated, the transfer of radiocarbon into the deep sea shifts to the southern ocean, thereby stabilizing the atmospheric $^{14}C/C$ ratio. Paleoclimatic evidence from the antarctic continent suggests that this model-based scenario might have been played out in the real world. The point of this paper is that the steep rise in ^{18}O rise in antarctic ice which commenced close to the onset of the Younger Dryas might have been caused by heat released to the atmosphere in response to an increase in deep-sea ventilation in the southern ocean. (Auth. mod.)

52-5221
Temperatures at the last interglacial simulated by a coupled ocean-atmosphere climate model.
Montoya, M., Crowley, T.J., Von Storch, H., *Paleoceanography,* Apr. 1998, 13(2), p.170-177, 53 refs.
Paleoclimatology, Pleistocene, Climatic changes, Surface temperature, Global warming, Insolation, Seasonal variations, Heat flux, Simulation

52-5222
Central Arctic surface ocean environment during the past 80,000 years.
Nørgaard-Pedersen, N., Spielhagen, R.F., Thiede, J., Kassens, H., *Paleoceanography,* Apr. 1998, 13(2), p.193-204, 71 refs.
Paleoclimatology, Climatic changes, Pleistocene, Oceanography, Sedimentation, Ice rafting, Paleoecology, Oxygen isotopes, Isotope analysis, Drill core analysis, Radioactive age determination, Arctic Ocean

52-5223
Latest Pleistocene ice-rafting events on the Scotian Margin (eastern Canada) and their relationship to Heinrich events.
Piper, D.J.W., Skene, K.I., *Paleoceanography,* Apr. 1998, 13(2), p.205-214, 33 refs.
Pleistocene, Oceanography, Sea level, Marine deposits, Ice rafting, Advection, Drill core analysis, Grain size, Clays, Radioactive age determination, Stratigraphy, Geochronology, Atlantic Ocean

52-5224
Assessing the frost susceptibility of coarse-fragment soils with a silty-clayey filler.
Sokolova, O.V., Gorkovenko, N.B., *Soil mechanics and foundation engineering,* Mar.-Apr. 1997(Pub. Sep. 97), 34(2), p.46-51, Translated from Osnovaniia, fundamenty i mekhanika gruntov. 4 refs.
Cold weather construction, Foundations, Modification, Soil aggregates, Clay soils, Frost heave, Frozen ground mechanics, Deformation, Soil tests, Mechanical tests, Design criteria

52-5227
Cenozoic development of Baikal according to results of deep-water and seismostratigraphic studies.
Bukharov, A.A., *Russian geology and geophysics,* 1996, 37(12), p.91-99, Translated from Geologiia i geofizika. 21 refs.
Pleistocene, Limnology, Geomorphology, Glacial geology, Glacial erosion, Lacustrine deposits, Bottom topography, Stratigraphy, Seismic surveys, Seismic reflection, Profiles, Russia—Baykal, Lake

52-5229
Monitoring ice sheet behavior from space.
Bindschadler, R., *Reviews of geophysics,* Feb. 1998, 36(1), p.79-104, 87 refs.
Remote sensing, Ice sheets, Spaceborne photography, Synthetic aperture radar, Glacier surveys, Glacier thickness, Glacier oscillation, Glacier surfaces, Topographic surveys, Sensor mapping, Height finding
Satellite remote sensing has revolutionized ice sheet research. A variety of instruments sensitive to different parts of the electromagnetic spectrum take what the human eye detects as a flat, white desert and provide data sets rich in scientific information. Image-based maps of ice sheets are becoming commonplace and have become an integral component of field work. Visible imagery shows features that offer clues to the history and current behavior of the ice sheet. Radar and microwave imagery provide information from beneath the surface and have been used to estimate snow accumulation rates. Interferometry principles have recently been applied to measure surface topography and ice motion with unparalleled precision in Antarctica. Nonimaging instruments also keep a watchful eye, monitoring the ice sheet for indications of growth or shrinkage. (Auth. mod.)

52-5230
Explanatory notes to accompany the Geocryological Map of the USSR, scale 1:2,500,000. [Ob"iasnitel'naia zapiska k geokriologicheskoĭ karte SSSR masshtaba 1:2,500,000], Moscow, Moskovskiĭ gosudarstvennyĭ universitet; Ministerstvo geologii SSSR, PGO "GIDROSPETsGEOLOGIIA", 1991, 127p., In Russian.
Maps, Geocryology, Mapping, Taliks, Frozen rock temperature, Permafrost distribution, CIS—Central Asia, Russia—Siberia, Russia—Severnaya Zemlya, Russia—Franz Josef Land

52-5231

Snow stability trends at Wolf Creek Pass, Colorado.

Mueller, M., *Avalanche review,* June 1998, 16(6), p.1,4-7, 8 refs.

Snow cover stability, Avalanche triggering, Avalanche forecasting, Snowstorms, Snowfall, Snow density, Meteorological data, Road maintenance, United States—Colorado—San Juan Mountains

52-5232

Man survives, cabin doesn't.

Bachman, D., *Avalanche review,* June 1998, 16(6), p.8.

Avalanches, Accidents, Rescue operations, United States—Colorado—San Juan Mountains

52-5233

Eastern Sierra Avalanche Forecast Center.

Moynier, J., *Avalanche review,* June 1998, 16(6), p.9.

Organizations, Avalanche forecasting, Weather stations, Weather forecasting, Safety, Data transmission, United States—California—Sierra Nevada

52-5234

Digital avalanche rescue transceivers: are we ready for the transition.

Seaton, N., *Avalanche review,* June 1998, 16(6), p.10-12.

Avalanches, Accidents, Rescue operations, Rescue equipment, Radio beacons, Cold weather survival

52-5235

Proceedings.

International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995, Heikinheimo, P., ed, Academy of Finland. Publications 6/95., Helsinki, Painatuskeskus, 1995, 490p., Refs. passim. Hosted by the Finnish Research Programme on Climate Change (Suomalainen ilmakehänmuutosten tutkimusohjelma, SILMU). For selected papers see 52-5236 through 52-5266.

DLC QC980.I568 1995

Climatic changes, Global change, Global warming, Paleoclimatology, Atmospheric composition, Air temperature, Meteorological data, Paleobotany, Phenology

52-5236

Historical climatology in Europe: recent findings and developments.

Pfister, C., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.31-34, 19 refs.

DLC QC980.I568 1995

Climatic changes, Global change, Atmospheric circulation, Air temperature, Meteorological data, History

52-5237

Paleoclimates and chronology interpreted from the loess-paleosol sequence, north central China.

Rutter, N., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.35-41, 9 refs.

DLC QC980.I568 1995

Loess, Eolian soils, Soil formation, Soil structure, Soil profiles, Soil dating, Quaternary deposits, Stratigraphy, Geochronology, Atmospheric circulation, Global change, Climatic changes, Paleoclimatology, China—Loess Plateau

52-5238

Neoproterozoic glacial record and the Passo da Areia Sequence in the Lavras do Sul region, southern Brazil.

Eerola, T.T., Reis, M.R., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.52-55, 13 refs.

DLC QC980.I568 1995

Glaciation, Glacial geology, Glacial deposits, Continental drift, Paleoclimatology, Global warming, Brazil

52-5239

Stable isotope content of segregated ice: a new terrestrial paleothermometer.

Nikolaev, V.I., Mikhalev, D.V., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.60-63, 6 refs.

DLC QC980.I568 1995

Permafrost hydrology, Snowmelt, Ground ice, Ice lenses, Ice veins, Fossil ice, Ice composition, Isotope analysis, Air temperature, Paleoclimatology, Statistical analysis

52-5240

30,000 climatic record from Dome B ice core (East Antarctica).

Vaikmäe, R., Jouzel, J., Petit, J.R., Stievenard, M., Toots, M., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.64-66, 11 refs.

Ice cores, Ice dating, Global change, Paleoclimatology, Antarctica—East Antarctica

52-5241

Climate variations last late Pleistocene cryochron 40-10 kyr B.P. in northern Eurasia.

Vasil'chuk, IU.K., Vasil'chuk, A.C., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.67-70, 1 ref.

DLC QC980.I568 1995

Ice wedges, Fossil ice, Ice composition, Isotope analysis, Ice dating, Permafrost dating, Permafrost indicators, Paleoclimatology

52-5242

Carbonate nodules in Chinese loess as isotopic indicators of the Quaternary palaeoclimate.

Zhang, H.P., Paepe, R., Zhang, Z.H., Keppens, E., Haesaerts, P., Hus, J., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.71-74, 10 refs.

DLC QC980.I568 1995

Loess, Eolian soils, Quaternary deposits, Soil profiles, Stratigraphy, Soil composition, Isotope analysis, Soil dating, Global change, Paleoclimatology, China—Loess Plateau

52-5243

Length of the ice-cover period inferred from varved boreal lake sediments, Finland.

Itkonen, A., Salonen, V.P., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.77-80, 18 refs.

DLC QC980.I568 1995

Frozen lakes, Lake ice, Ice conditions, Freezeup, Ice breakup, Lacustrine deposits, Bottom sediment, Climatic changes, Global warming, Finland

52-5244

Deglaciation chronology and climate change in the Norra Storfjället area, northern Sweden.

Kalm, V., Mahaney, W.C., Earl-Goulet, J., Julig, P., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.81-84, 11 refs.

DLC QC980.I568 1995

Alpine glaciation, Glacial geology, Glacial deposits, Forest lines, Paleobotany, Paleoclimatology, Climatic changes, Global warming, Sweden

52-5245

Deglaciation and late Pleistocene-Holocene environmental change on Franz Josef Land, Russia: timing of Barents ice sheet disintegration.

Kuylenstierna, J.L., Näslund, J.O., Stroeven, A.P., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.89-93, 13 refs.

DLC QC980.I568 1995

Glaciation, Marine geology, Glacier melting, Glacial lakes, Frozen lakes, Lacustrine deposits, Bottom sediment, Salinity, Drill core analysis, Soil dating, Geochronology, Paleoclimatology, Russia—Franz Josef Land

52-5246

2,305 year tree-ring reconstruction of mean June-July temperature deviations in the Yamal Peninsula.

Hantemirov, R.M., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.124-127, 6 refs.

DLC QC980.I568 1995

Plant ecology, Trees (plants), Phenology, Paleobotany, Air temperature, Climatic changes, Global change, Russia—Yamal Peninsula

52-5247

Climatic evidence from stable carbon isotope data of tree rings of Scots pine from northern Finland.

Jungner, H., Sonninen, E., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.128-130, 10 refs.

DLC QC980.I568 1995

Plant ecology, Trees (plants), Phenology, Paleobotany, Climatic changes, Paleoclimatology, Finland

52-5248

Reconstruction of spatial variations in summer temperatures for the last 300 years in the north of West-Siberian plain.

Mazepa, V.S., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.136-139, 4 refs.

DLC QC980.I568 1995

Weather stations, Meteorological data, Air temperature, Paleobotany, Trees (plants), Phenology, Climatic changes, Russia—West Siberian Plain

52-5249

Reconstruction of climate and the upper timberline dynamics since AD 745 by tree-ring data in the polar Ural Mountains.

Shiiatov, S.G., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.144-147, 3 refs.

DLC QC980.I568 1995

Forest lines, Plant ecology, Trees (plants), Paleobotany, Phenology, Climatic changes, Russia—Ural Mountains

52-5250

7500-year pine tree-ring record from Finnish Lapland and its applications to palaeoclimatic studies.

Zetterberg, P., Eronen, M., Briffa, K.R., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.151-154, 9 refs.

DLC QC980.I568 1995

Plant ecology, Trees (plants), Phenology, Paleobotany, Forest lines, Paleoclimatology, Climatic changes, Finland

52-5251

Climatic fluctuation in the last two thousand years.

Brázdil, R., Kotyza, O., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.157-160, 12 refs.

DLC QC980.I568 1995

Climatic changes, Paleoclimatology, Global change, Meteorological data, History, Czech Republic

52-5252

"Cold-wet" famines of the years 1695-1697 in Finland and manifestations of the Little Ice Age in central Europe.

Munzar, J., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.167-170, 10 refs.

DLC QC980.I568 1995

Frost, Air temperature, Records (extremes), Climatic changes, Global change, History, Finland, Czech Republic

52-5253

"Country's ancient enemy": sea-ice variations in Iceland in historical times and their social impact.

Ogilvie, A.E.J., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.176-178, 8 refs.

DLC QC980.I568 1995

Sea ice distribution, Ice conditions, Ice cover effect, Climatic changes, History, Iceland

52-5254

Early temperature records from Tornio, northern Finland, 1737-1749.

Vesajoki, H., Narinen, M., Holopainen, J., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.183-186, 5 refs.

DLC QC980.I568 1995

Air temperature, Meteorological data, Climatic changes, History, Finland

52-5255

Detecting and attributing an anthropogenic influence on climate.

Santer, B.D., Jones, P.D., Taylor, K.E., Wigley, T.M.L., Penner, J.E., Cubasch, U., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.198-202, 19 refs.

DLC QC980.I568 1995

Air pollution, Atmospheric composition, Human factors, Global warming, Computerized simulation, Statistical analysis

52-5256

Enhanced greenhouse signal versus natural variations in observed climate time series: a statistical approach.

Schönwiese, C.D., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.203-207, 11 refs.

DLC QC980.I568 1995

Air pollution, Atmospheric composition, Atmospheric circulation, Human factors, Global warming, Computerized simulation, Statistical analysis

52-5257

Trends of maximum and minimum daily temperatures in central Europe.

Brázdil, R., et al, Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.222-225, 3 refs.

DLC QC980.I568 1995

Air temperature, Meteorological data, Climatic changes, Global warming, Statistical analysis

52-5258

Snow conditions in Finland during the last century.

Drebs, A., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.226-227, 1 ref.

Snow cover distribution, Snowfall, Snow depth, Meteorological data, Climatic changes, Finland

52-5259

Long-term climatic trends in Estonia during the period of instrumental observations.

Jaagus, J., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.240-243.

DLC QC980.I568 1995

Meteorological data, Air temperature, Precipitation (meteorology), Snowfall, Climatic changes, Statistical analysis, Estonia

52-5260

Long-term variability in the precipitation fluctuations over the Russian plain and its relationship with global climatic changes.

Popova, V.V., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.253-257, 6 refs.

DLC QC980.I568 1995

Precipitation (meteorology), Climatic changes, Global warming, Statistical analysis, Russia

52-5261

Warmest decade in Finland—the 1930s.

Tuomenvirta, H., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.258-261, 9 refs.

DLC QC980.I568 1995

Meteorological data, Air temperature, Records (extremes), Climatic changes, Statistical analysis, Finland

52-5262

Scenarios of arctic air temperature and precipitation in a warmer world based on instrumental data.

Przybylak, R., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.298-301, 13 refs.

DLC QC980.I568 1995

Polar atmospheres, Air temperature, Precipitation (meteorology), Global warming, Long range forecasting

52-5263

Melting, drainage patterns and frozen lakes on the land ice mass at Jutulgryta in Dronning Maud Land, Antarctica.

Winther, J.G., Sand, K., Bøggild, C.E., Elvehøy, H., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.316-318, 8 refs.

Limnology, Glacial hydrology, Glacier melting, Subglacial drainage, Glacier mass balance, Meltwater, Glacial lakes, Frozen lakes, Antarctica—Queen Maud Land

Even in the cold environments of Antarctica, surface melting of ice and snow can take place locally during summertime. The meltwater drainage channels flow into meltwater accumulation basins which form frozen lakes. The authors suggest that changes in the areal distribution of drainage channels and frozen lakes may serve as indicators of glacier mass balance and climatic change.

52-5264

Atmospheric CO_2, trace gas and CN concentrations in Värriö.

Ahonen, T., et al, Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.321-324, 2 refs.

DLC QC980.I568 1995

Polar atmospheres, Atmospheric composition, Air pollution, Finland

52-5265

Eight years of stratospheric ozone observations at Marambio, Antarctica.

Damski, J., Taalas, P., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.325-328, 5 refs.

DLC QC980.I568 1995

Polar atmospheres, Atmospheric composition, Ozone, Ultraviolet radiation, Physiological effects, Health, Antarctica—Marambio Station

The authors studied the behavior of stratospheric ozone using total ozone and ozone sounding measurements at Marambio Station, 1987-94. The levels of UV-B radiation were studied from the point of the erythemal UV-B doses on the horizontal human epidermis. (Auth. mod.)

52-5266
Exposure to solar UV in Finland.
Jokela, K., Leszczynski, K., Visuri, R., Ylianttila, L., Finnish Research Programme on Climate Change (SILMU). International Conference on Past, Present and Future Climate, Helsinki, Finland, Aug. 22-25, 1995. Academy of Finland. Publications 6/95. Edited by P. Heikinheimo, Helsinki, Painatuskeskus, 1995, p.393-396, 4 refs.
DLC QC980.I568 1995
Atmospheric composition, Ozone, Ultraviolet radiation, Physiological effects, Health, Finland

52-5267
Cold weather concreting.
Krylov, B.A., Boca Raton, FL, CRC Press, 1998, 227p., Refs. p.211-213.
DLC TA682.43 K79 1998
Winter concreting, Concrete heating, Concrete admixtures, Concrete freezing, Concrete curing, Precast concretes, Joints (junctions), Electric heating, Reinforced concretes, Cold weather performance

52-5268
Control on sediment and organic carbon delivery to the Arctic Ocean revealed with space-borne synthetic aperture radar: Ob' River, Siberia.
Smith, L.C., Alsdorf, D.E., *Geology,* May 1998, 26(5), p.395-398, 32 refs.
Hydrologic cycle, Geochemical cycles, Floodplains, Watersheds, Estuaries, Channels (waterways), Sediment transport, Sedimentation, Organic soils, Spaceborne photography, Synthetic aperture radar, Seasonal variations, Russia—Siberia, Arctic Ocean, Russia—Ob' River

52-5269
Helium isotopes in early Tertiary basalts, northeast Greenland: evidence for 58 Ma plume activity in the North Atlantic-Iceland volcanic province.
Marty, B., Upton, B.G.J., Ellam, R.M., *Geology,* May 1998, 26(5), p.407-410, 26 refs.
Pleistocene, Marine geology, Subpolar regions, Geologic processes, Magma, Volcanoes, Isotope analysis, Indexes (ratios), Atlantic Ocean, Greenland

52-5270
Late Holocene ~1500 yr climatic periodicities and their implications.
Campbell, I.D., Campbell, C., Apps, M.J., Rutter, N.W., Bush, A.B.G., *Geology,* May 1998, 26(5), p.471-473, 23 refs.
Paleoclimatology, Climatic changes, Oscillations, Periodic variations, Lacustrine deposits, Drill core analysis, Grain size, Radioactive age determination, Statistical analysis, Canada—Alberta—Pine Lake

52-5271
Long-term-mean aspect sensitivity of PMSE determined from Poker Flat MST radar data.
Huaman, M.M., Balsley, B.B., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.947-950, 26 refs.
Atmospheric physics, Polar atmospheres, Radar echoes, Backscattering, Orientation, Profiles, Seasonal variations, United States—Alaska—Poker Flat

52-5272
In situ measurements of the scattering phase function of stratocumulus, contrails and cirrus.
Gayet, J.F., et al, *Geophysical research letters,* Apr. 1, 1998, 25(7), p.971-974, 17 refs.
Climatology, Cloud physics, Aerial surveys, Sensors, Probes, Light scattering, Ice crystal optics, Spectra, Particles, Condensation trails, Performance

52-5273
Radar probing of cirrus and contrails: insights from 2D model simulations.
Sassen, K., Khvorostianov, V.I., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.975-978, 11 refs.
Clouds (meteorology), Cloud physics, Condensation trails, Radar echoes, Reflectivity, Ice detection, Ice crystal optics, Particles, Water content, Probes, Simulation

52-5274
Sensitivity of simulated CFC-11 distributions in a global ocean model to the treatment of salt rejected during sea-ice formation.
Caldeira, K., Duffy, P.B., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.1003-1006, 20 refs.
Oceanography, Salinity, Density (mass/volume), Air ice water interaction, Ice cover effect, Aerosols, Brines, Turbulent diffusion, Ice growth, Convection, Buoyancy, Simulation
The authors show that simulated oceanic absorption of an atmospheric gas is very sensitive to the representation of a process that occurs beneath antarctic and subantarctic sea ice. To assess the potential importance of this process to the oceanic absorption of atmospheric gases, the authors performed two idealized simulations: a Control simulation in which salt rejected during sea-ice formation is placed in the model's 25 m thick surface layer; and a Test simulation in which salt rejected during sea-ice formation is distributed uniformly through the upper 160 m beneath the forming sea ice. This treatment of rejected salt is highly idealized, and is intended to demonstrate the need for a physically-based parameterization of subgrid-scale convection for use in ocean general circulation models that takes into account the subgrid-scale heterogeneity of surface buoyancy forcing. The modeled global ocean inventory of CFC-11 for year 1990 is about 30% lower, and modeled column inventories in the southern ocean are up to 90% lower, in the Test simulation relative to the Control simulation. (Auth. mod.)

52-5275
Interannual antarctic sea-ice-ocean model.
Stössel, A., Kim, S.J., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.1007-1010, 19 refs.
Oceanography, Ocean currents, Convection, Air ice water interaction, Sea ice distribution, Ice cover effect, Ice formation, Oscillations, Climatic factors, Antarctica—Weddell Sea
By means of a global coupled sea-ice-ocean model the authors propose an oscillating mechanism in the antarctic region with the same frequency as that associated with the Antarctic Circumpolar Wave (ACW). This oscillation suggests an internal mode of the sea-ice-ocean system rather than one which is dictated by global links through the atmosphere. This mode is robust for a wide range of parameterization and forcing of southern ocean sea-ice, except for the case where higher rates of new-ice production and thus Antarctic Bottom Water (AABW) formation are enforced. The present results imply that the sea-ice-ocean system itself may produce regional oscillations at a 4-year period in climatic conditions of relatively weak rates of AABW formation, which may contribute to regionally sustaining the ACW pattern. (Auth. mod.)

52-5276
Chronology for the Dome C deep ice-core site through radio-echo layer correlation with the Vostok ice core, Antarctica.
Siegert, M.J., Hodgkins, R., Dowdeswell, J.A., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.1019-1022, 16 refs.
Paleoclimatology, Ice sheets, Stratification, Ice cores, Radio echo soundings, Stratigraphy, Ice dating, Correlation, Statistical analysis, Antarctica—Vostok Station
Ice at the new Dome C drill site is correlated directly with the Vostok ice-core record using internal radio-echo layering in the antarctic ice sheet. Layering observed on 60 MHz radar records at ice depths greater than 1000 m is a result of electro-magnetic wave reflections from acidic ice layers formed, it is assumed, by volcanic eruption-derived aerosols. These acidic layers represent isochronous surfaces within the ice sheet. Five prominent layers for over 500 km across the antarctic ice sheet, between Vostok and the new ice-core site at Dome C are traced. This correlates the stratigraphy and depth-age relationship between the two sites. The thickness of ice deposited over the last glacial cycle at Dome C is 300 m greater than at Vostok and, at comparable depths, the ice at Dome C is between about 10,000 and 25,000 years younger than at Vostok. (Auth. mod.)

52-5277
1997 ENSO event and implications for North American Laurentian Great Lakes winter severity and ice cover.
Assel, R.A., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.1031-1033, 12 refs.
Climatology, Atmospheric circulation, Air temperature, Air water interactions, Lake ice, Ice formation, Seasonal variations, Indexes (ratios), Statistical analysis, United States—Great Lakes

52-5278
Sources of crustal deformation associated with the Krafla, Iceland, eruption of September 1984.
Árnadóttir, T., Sigmundsson, F., Delaney, P.T., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.1043-1046, 19 refs.
Tectonics, Subpolar regions, Volcanoes, Earth crust, Magma, Reservoirs, Subsidence, Deformation, Geodetic surveys, Models, Iceland—Krafla

52-5279
Effects of subglacial geothermal activity observed by satellite radar interferometry.
Jónsson, S., Adam, N., Björnsson, H., *Geophysical research letters,* Apr. 1, 1998, 25(7), p.1059-1062, 12 refs.
Glacier surveys, Ice sheets, Spaceborne photography, Synthetic aperture radar, Glacial hydrology, Glacier surfaces, Ice deformation, Glacier flow, Glacier melting, Geothermal thawing, Subglacial drainage, Iceland—Vatnajökull

52-5280
Temperature field of an ice shelf in the vicinity of a hot water-drilled well.
Nagornov, O.V., Sergienko, O.V., *Journal of engineering physics and thermophysics,* Jan.-Feb. 1998(Pub. Aug. 98), 71(1), p.154-160, Translated from Inzhenerno-fizicheskiĭ zhurnal. 7 refs.
Oceanography, Ice shelves, Thermal regime, Wells, Ice water interface, Water temperature, Ice temperature, Ice melting, Thermal diffusion, Ice bottom surface, Thermal drills, Analysis (mathematics)

52-5281
Effects on plant production after addition of labile carbon to arctic/alpine soils.
Schmidt, I.K., Michelsen, A., Jonasson, S., *Oecologia,* Nov. 1997, 112(3), p.305-313, 24 refs.
Plant physiology, Growth, Tundra soils, Organic soils, Biomass, Soil microbiology, Soil chemistry, Soil analysis, Nutrient cycle, Modification, Statistical analysis, Sweden—Abisko

52-5282
Effect of step-loading history and related grain-boundary fatigue in freshwater columnar ice in the brittle deformation regime.
Gupta, V., Bergström, J., Picu, C.R., *Philosophical magazine letters,* May 1998, 77(5), p.241-247, 4 refs.
Ice physics, Ice mechanics, Ice deformation, Loads (forces), Shear stress, Ice solid interface, Sliding, Brittleness, Compressive properties, Mechanical tests

52-5283
Ice nucleation activity in the freezing-tolerant antarctic nematode *Panagrolaimus davidi*.
Wharton, D.A., Worland, M.R., *Cryobiology,* June 1998, 36(4), p.279-286, 18 refs.
Cryobiology, Biomass, Chemical properties, Cold tolerance, Ice nuclei, Organic nuclei, Ice prevention, Heterogeneous nucleation, Spectroscopy, Low temperature tests
Ice nucleation spectrometry was used to look for the presence of ice nucleating agents (INAs), and their inhibitors, in cultures of *Panagrolaimus davidi,* in an antarctic nematode which survives intracellular freezing. INA activity was absent in both nematode suspensions and homogenates. The nematodes produce a substance which inhibits the nucleation activity of organic INAs but not of an inorganic INA. The nucleation inhibitor is both released from the nematode by homogenization and excreted by them into the medium, but the former was more effective at inhibiting nucleation. The inhibitory activity was destroyed by heating. A thermal hysteresis protein, or a similar ice-active substance, may be responsible for the nucleation inhibition. (Auth. mod.)

52-5284
Heavy metals in marine sediments and biota of Spitsbergen.
Sikora, A., Zajączkowski, M., Pempkowiak, J., *Oceanological studies,* 1996, 25(3), p.97-109, 18 refs.
Oceanography, Subpolar regions, Bottom sediment, Ecosystems, Biomass, Water pollution, Metals, Sampling, Environmental tests, Statistical analysis, Norway—Spitsbergen

52-5285

Absence of an isotope effect in the two level spectrum of amorphous ice.

Agladze, N.I., Sievers, A.J., *Physical review letters,* May 11, 1998, 80(19), p.4209-4212, 26 refs.

Ice physics, Amorphous ice, Deuterium oxide ice, Phase transformations, Ice spectroscopy, Infrared spectroscopy, Radiation absorption, Spectra, Isotope analysis, Temperature effects

52-5286

Proceedings. IWAIS '98.

International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998, Eliasson, Á.J., ed, Reykjavík, RARIK (Rafmagnsveitur ríkisins) Iceland State Electricity, 1998, 372p., Refs. passim. For individual papers see 52-5287 through 52-5341.

Power line icing, Ice accretion, Icing rate, Ice loads, Ice storms, Ice forecasting, Snow loads, Wind pressure, Weather forecasting, Design criteria

52-5287

Prediction of ice/wet-snow loads on transmission line conductors along eastern corridor in southern Norway.

Krishnasamy, S., Fikke, S.M., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.3-9, 2 refs.

Power line icing, Ice accretion, Ice loads, Wet snow, Snow loads, Ice forecasting, Precipitation (meteorology), Weather forecasting, Norway

52-5288

Investigation of transmission line failure due to ice shedding effects using dynamic analysis.

Roshan Fekr, M., McClure, G., Hartmann, D., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.11-16, 4 refs.

Power line icing, Ice accretion, Ice loads, Ice breaking, Ice removal, Tensile properties, Computerized simulation

52-5289

Atmospheric icing of communication towers and masts from the perspective of a design engineer.

Marshall, D.G., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.17-20, 4 refs.

Antennas, Towers, Power line supports, Power line icing, Ice accretion, Ice loads, Glaze, Wet snow, Snow loads, Wind pressure, Design criteria

52-5290

Probabilistic modeling of ice and wind effects on electric transmission line structures.

Snæbjörnsson, J.P., Sigbjörnsson, R., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.21-26, 23 refs.

Power line icing, Power line supports, Ice accretion, Ice loads, Ice forecasting, Wind pressure, Safety, Design criteria, Statistical analysis

52-5291

HV overhead line design for severe weather environment.

Horsman, S., Wareing, J.B., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.27-33, 4 refs.

Power line icing, Power line supports, Ice accretion, Ice loads, Wind pressure, Snowstorms, Accidents, Utilities, Design criteria, Cost analysis, United Kingdom—Scotland

52-5292

Failure mechanisms in wood poles under severe conductor ice loading.

Wareing, J.B., Bracey, R.H., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.35-41, 7 refs.

Power line icing, Power line supports, Wooden structures, Ice accretion, Ice loads, Wind pressure, Snowstorms, Accidents, Design criteria, United Kingdom—Scotland

52-5293

Evaluation of rural underground cable projects using icing database.

Hjartarson, T., Eliasson, Á.J., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.43-47, 3 refs.

Power line icing, Ice accretion, Ice loads, Ice forecasting, Wet snow, Snow loads, Wind pressure, Weather forecasting, Underground cables, Utilities, Cost analysis, Data processing, Iceland

52-5294

Determining alarm levels for unbalanced snow load warnings on the Anchorage-Fairbanks Transmission Intertie.

Peabody, A.B., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.49-51, 5 refs.

Power line icing, Power line supports, Towers, Ice loads, Snow loads, Warning systems, United States—Alaska

52-5295

Forecast of marine icing on vessels.

Vefsnmo, S., Lothe, A., Viggosson, G., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.55-59, 10 refs.

Ship icing, Ice accretion, Ice loads, Ice forecasting, Safety

52-5296

Experimental study of large droplet aircraft icing in a small wind tunnel.

Henry, R., Le Berre, S., Hervy, F., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.61-66, 7 refs.

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Weather forecasting, Wind tunnels, Environmental tests

52-5297

Supercooled large drops and aircraft icing results from research flights in Germany, March 1997.

Hauf, T., Schröder, F., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.67-71, 2 refs.

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Weather forecasting, Cold weather tests, Germany

52-5298

Toward developing a standard shear test for ice adhesion.

Mulherin, N.D., Haehnel, R.B., Jones, K.F., MP 5154, International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.73-79, 16 refs.

Ice solid interface, Ice accretion, Ice adhesion, Ice loads, Ice strength, Ice prevention, Protective coatings, Shear strength, Strain tests

Lack of a standardized method for testing the adhesive strength of ice has hampered efforts to understand ice adhesion and develop low-adhesion materials. The authors report on their efforts in adapting the 0° cone test as a standard method for measuring the adhesive strength of ice. Particular care was used in controlling the strain rate, temperature, ice growth, and test surface treatment. The experimental scatter is typical of other types of ice adhesion tests. It is reasonably rapid and easy to perform so that a large sample size can be obtained to increase the significance of the results. The procedure is described and preliminary results for ice bonded to stainless steel, aluminum, and several low-energy surface coatings are offered.

52-5299

Remote sensing of aircraft icing cloud.

Ryerson, C.C., MP 5155, International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.81-85, 18 refs.

Aircraft icing, Ice accretion, Ice detection, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Water content, Lidar, Airborne equipment, Warning systems

Inflight icing is a serious hazard, as attested by recent crashes of aircraft with onboard ice protection. Remote sensing of icing conditions would provide an avoid and escape capability similar to that currently possible for thunderstorms and wind shear. Development of ground-based and aircraft-based sensing systems is occurring. Improved characterization of cloud and precipitation liquid water content, drop size spectra and temperature are necessary for sensor development. Multi-band, and differential attenuation, radars hold promise for range resolving liquid water and elements of drop size spectra. Range-resolved remote sensing of temperature in the horizontal remains a difficult problem.

52-5300

Mass of ice accretion from freezing rain simulations.

Lu, M.L., Popplewell, N., Shah, A.H., Barrett, W., Au, A., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.89-94, 14 refs.

Power line icing, Ice accretion, Ice loads, Ice forecasting, Ice storms, Glaze, Weather forecasting, Environmental tests, Mathematical models, Canada—Manitoba

52-5301

Experiment of snow accretion and geometrical analysis of the shape.

Yukino, T., Hase, Y., Matsuda, M., Nishimura, H., Imaizumi, M., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.95-99, 6 refs.

Power line icing, Ice accretion, Ice loads, Snow loads, Ice forecasting, Environmental tests, Wind tunnels

52-5302

Neural network system to estimate transmission line icing.

McComber, P., De Lafontaine, J., Laflamme, J.N., Druez, J., Paradis, A., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.101-106, 8 refs.

Power line icing, Ice accretion, Icing rate, Ice loads, Ice forecasting, Weather forecasting, Computerized simulation

52-5303

Unified numerical model of wet snow accretion on vertical cylinders and frazil icing on trash racks.

Horjen, I., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.107-112, 14 refs.

Ice accretion, Ice solid interface, Icing rate, Ice loads, Snow loads, Ice forecasting, Power line icing, Frazil ice, Water intakes, Mathematical models

52-5304

Improved real-time ground atmospheric icing measurement system.

Laforte, J.L., Laflamme, J.N., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.115-120, 6 refs.

Ice accretion, Icing rate, Ice loads, Ice forecasting, Ice detection, Frost forecasting, Ice storms, Weather forecasting, Sensors, Warning systems

52-5305

Correlation between the data of an ice detector and the mass of ice accreted on different conductors.

Druez, J., McComber, P., Farzaneh, M., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.121-126, 12 refs.

Power line icing, Ice accretion, Ice loads, Ice detection, Ice forecasting, Warning systems

52-5306

Ice accretion measurements from the Automated Surface Observing System (ASOS).

Ramsay, A.C., Ryerson, C.C., MP 5156, International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.127-130, 5 refs.

Ice accretion, Icing rate, Ice loads, Ice detection, Ice forecasting, Ice storms, Weather forecasting, Warning systems, Sensors, Monitors, Data transmission

This paper presents results of recent field testing of an automated icing detector used on the Automated Surface Observing System. Examples of ice-mass estimates are provided in the paper, in addition to a description of a potential method for disseminating reports of the mass and rate of accretion and the type ice being detected. Continued development and implementation of this capability are dependent upon statements of requirements from user communities.

52-5307

Anchorage-Fairbanks Intertie Snow Load Monitoring System.

Stein, P.J., Bahlavouni, A., Andersen, D.W., Birmann, M.R., LaRue, D., Peabody, A.B., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.131-135, 4 refs.

Power line icing, Power line supports, Ice accretion, Ice loads, Ice detection, Ice forecasting, Snow loads, Weather forecasting, Monitors, Warning systems, United States—Alaska

52-5308

Energy saving methods of anemometer with solar cells for transmission line maintenance in ice and snow area.

Sugawara, N., Hokari, K., Kagami, J., Hirota, M., Kijima, M., Tatokoro, Y., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.137-141, 3 refs.

Power line icing, Ice accretion, Ice loads, Ice detection, Ice forecasting, Snow loads, Weather forecasting, Anemometers, Japan

52-5309

Comparison of heated anemometers. Part II: a 3-D sonic anemometer.

Lehtonen, P., Makkonen, L., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.143-147, 12 refs.

Anemometers, Antennas, Towers, Ice accretion, Ice loads, Wind pressure, Meteorological instruments, Cold weather tests

52-5310

New severe weather test site in the Shetland Isles.

Wareing, J.B., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.149-154, 5 refs.

Power line supports, Utilities, Cold weather tests, Power line icing, Ice accretion, Ice loads, Ice storms, Snowstorms, Snow loads, United Kingdom—Scotland

52-5311

Using U.S. weather data for modeling ice loads from freezing rain.

Lott, J.N., Jones, K.F., MP 5157, International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.157-162, 7 refs.

Ice accretion, Ice loads, Icing rate, Ice forecasting, Ice storms, Wind velocity, Wind pressure, Weather forecasting, Weather stations, Meteorological data, Data processing, United States

In the last few years a number of researchers have developed models for determining the amount of ice accreted on structures in freezing rain storms. However, little attention has been paid to the weather data that drives these models. The authors have an ongoing project to determine design ice loads for structures throughout the United States, for which they are using historical weather data. This paper describes in detail the weather data that are collected by agencies in this country, focusing on the weather elements that are significant in modeling ice loads in freezing rain. Meteorological instruments, data accuracy and problems, data archival, and decisions that must be made by users of the data in modeling ice loads are discussed.

52-5312

Comparison of modeled ice loads in freezing rain storms with damage information.

Jones, K.F., MP 5158, International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.163-168, 10 refs.

Ice storms, Power line icing, Ice accretion, Icing rate, Ice loads, Ice forecasting, Weather forecasting, Accidents, Damage, Meteorological data, Data processing, Statistical analysis, Design criteria, United States

Historical weather data are used with ice accretion models to determine ice loads from past freezing rain storms. These modeled ice loads can then be used in an extreme value analysis to calculate extreme ice loads for the design of power lines or communication towers. The design ice load is dependent on the assumptions made in choosing the storms to model as well as on the ice accretion model applied to the data. The author compares ice loads in apparently severe freezing rain storms in the eastern United States with storm damage information. This qualitative information is used to improve the algorithm for choosing storms in which ice accretes. The effect of the improved algorithm on the extreme ice loads is shown and other applications for qualitative storm information in mapping extreme ice loads are discussed.

52-5313

Wet snow icing and local winds.

Ólafsson, H., Eliasson, Á.J., Jónsson, T., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.169-172, 4 refs.

Power line icing, Ice accretion, Ice loads, Ice forecasting, Wet snow, Snow loads, Wind factors, Meteorological data, Data processing, Weather forecasting, Iceland

52-5314

Evaluation and interpretation of a numerical weather prediction based freezing rain archive.

Hewitt, E.J., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.173-178, 5 refs.

Ice storms, Aircraft icing, Ice forecasting, Weather forecasting, Synoptic meteorology, Meteorological data, Data processing, Statistical analysis, United Kingdom

52-5315

Forecast of icing of structures by use of boundary layer model products.

Fuchs, W., Lütkebohmert, M., Schickel, K.P., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.179-183, 7 refs.

Aircraft icing, Ice accretion, Icing rate, Ice forecasting, Precipitation (meteorology), Weather forecasting, Computerized simulation, Germany

52-5316

Aspects of a model for wet-snow accretion on an overhead line conductor.

Poots, G., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.185-189, 12 refs.

Power line icing, Ice accretion, Ice loads, Wet snow, Snow water content, Snow loads, Mathematical models

52-5317

Behavior of DC arc on ice surfaces.

Farzaneh, M., Zhang, J., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.193-197, 19 refs.

Power line icing, Ice accretion, Ice loads, Ice electrical properties, Electrical insulation, Electric corona

52-5318

Electrical breakdown of heavily polluted capped snow on insulators strings.

Higashiyama, Y., Sugimoto, T., Asano, K., Johsho, M., Tachizaki, S., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.199-203, 3 refs.

Power line icing, Snow loads, Snow impurities, Snow composition, Snow electrical properties, Electrical insulation, Electric corona

52-5319

Performance of vertically installed insulator strings under ice and snow conditions.

Wu, D., Hartings, R., Fikke, S.M., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.205-208, 12 refs.

Power line icing, Ice loads, Snow loads, Ice electrical properties, Snow electrical properties, Electrical insulation, Electric corona

52-5320

DC flashover on ice surfaces at low atmospheric pressure.

Farzaneh, M., Li, Y., Zhang, J., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.209-212, 18 refs.

Power line icing, Ice accretion, Ice loads, Ice electrical properties, Atmospheric pressure, Electrical insulation, Electric corona

52-5321

Up-date on overhead cable de-icing technology.

Laforte, J.L., Allaire, M.A., Laflamme, J.N., Beaudoin, P., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.215-220, 6 refs.

Power line icing, Ice breaking, Ice removal, Electric equipment, Electric fields

52-5322

Development of new snow-melting magnetic wire for overhead transmission lines.

Hase, H., Matsui, M., Nakamura, K., Okada, H., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.221-226, 5 refs.

Power line icing, Snow loads, Artificial melting, Snow melting, Snow removal, Ice melting, Ice removal, Electric heating

52-5323

Overhead lines de-icing methods.

Goia, M.L., Goia, C.V., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.227-231, 3 refs.

Power line icing, Artificial melting, Ice melting, Ice removal, Electric heating, Romania

52-5324

Icing database—acquisition and registration of data.

Ísaksson, S.P., Elíasson, Á.J., Thorsteins, E., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.235-240, 6 refs.

Power line icing, Ice accretion, Ice loads, Ice forecasting, Wind pressure, Route surveys, Data processing, Iceland

52-5325

Experimental panel to study the influence of combined mechanical loads on overhead lines.

Goia, M.L., Gheorghita, G., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.241-246, 1 ref.

Power line icing, Ice accretion, Ice loads, Wind pressure, Environmental tests, Cold weather tests, Romania

52-5326

Observation of icing by tension recorders—comparison of conductors.

Thorsteins, E., Elíasson, Á.J., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.247-252, 13 refs.

Power line icing, Ice accretion, Icing rate, Ice loads, Ice breaking, Ice removal, Wind pressure, Cold weather tests, Design criteria, Iceland

52-5327

Observations of ice load and galloping on a full scale 500 kV test line.

Nojima, T., Shimizu, M., Nosaka, T., Shibata, Y., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Eliasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.253-258, 2 refs.

Power line icing, Ice accretion, Icing rate, Ice loads, Wind pressure, Cold weather tests, Design criteria, Japan

52-5328

Observation of icing on Mt. Takaishi test line.

Takebe, T., Fukazawa, M., Kiuchi, S., Kojima, Y., Oka, T., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.259-265, 3 refs.

Power line icing, Ice accretion, Icing rate, Ice loads, Wind pressure, Cold weather tests, Design criteria, Japan

52-5329

Study on transmission lines' icing performance and its parameters in the Three Gorges district.

Jiang, X.L., Zhang, L.H., Yang, S.X., Mei, J.P., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.267-271, 4 refs.

Power line icing, Ice accretion, Icing rate, Ice loads, Power line supports, Ice storms, Wind pressure, Accidents, China—Yangtze River Gorges

52-5330

Statistical analysis of ice observations in Quebec, Canada.

ElFashny, K.N.G., Nguyen, V.T.V., Chouinard, L.E., Laflamme, J.N., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.273-278, 8 refs.

Power line icing, Ice accretion, Ice loads, Ice forecasting, Wind pressure, Ice storms, Weather forecasting, Statistical analysis, Design criteria, Canada—Quebec

52-5331

Spatial analysis of ice observations in Quebec, Canada.

ElFashny, K.N.G., Chouinard, L.E., Nguyen, V.T.V., Laflamme, J.N., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.279-283, 8 refs.

Power line icing, Ice accretion, Ice loads, Glaze, Ice forecasting, Ice storms, Statistical analysis, Design criteria, Canada—Quebec

52-5332

Ice load measurements in test spans in Iceland—statistical analysis of data.

Thorsteins, E., Elíasson, Á.J., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.285-289, 7 refs.

Power line icing, Ice accretion, Ice loads, Ice forecasting, Cold weather tests, Statistical analysis, Design criteria, Iceland

52-5333

Overhead line galloping: field experience during one event in Belgium on last February 13th, 1997.

Lilien, J.L., Erpicum, M., Wolfs, M., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.293-298, 7 refs.

Power line icing, Ice loads, Wind pressure, Damping, Belgium

52-5334

Interaction of wind with the ice-covered structural elements.

Kazakevich, M.I., Grafskiĭ, I.Y., Vasilenko, A.G., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.299-302, 5 refs.

Power line icing, Ice accretion, Ice loads, Glaze, Wind pressure

52-5335

Effect of spiral-rods as a galloping prevention device.

Ikegawa, Y., Sakata, M., Kubokawa, H., Takeda, K., Sakamoto, Y., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.303-309.

Power line icing, Ice loads, Wind pressure, Damping, Japan

52-5336

Evaluation of galloping of transmission lines in gusty winds.

Ohkuma, T., Kagami, J., Nakauti, H., Kikuchi, T., Takeda, K., Marukawa, H., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.311-316, 7 refs.

Power line icing, Ice loads, Wind pressure, Turbulence, Damping, Statistical analysis, Japan

52-5337

Analysis of galloping conductor field data.

Havard, D.G., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.317-322, 16 refs.

Power line icing, Ice accretion, Ice loads, Wind pressure, Damping, Canada—Ontario

52-5338

Comparisons between experiments and calculations of the electrical behaviour of ice-covered high voltage insulators.

Kannus, K., Lahti, K., Nousiainen, K., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.325-331, 21 refs.

Power line icing, Ice accretion, Ice loads, Icicles, Ice electrical properties, Electrical insulation, Electric corona, Environmental tests, Cold weather tests

52-5339

Visibility as an indicator of snowfall concentration in wet snow accretion modelling.

Finstad, K.J., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.333-337, 6 refs.

Wet snow, Snowfall, Falling snow, Snowstorms, Snow loads, Snow optics, Visibility, Precipitation (meteorology), Weather forecasting

52-5340

Influence of the diameter of overhead line conductors and stranded cables on the shape and magnitude of icing.

Lehký, P., Zálešák, Z., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.339-341, 6 refs.

Power line icing, Ice accretion, Ice loads, Ice forecasting, Design criteria, Czech Republic

52-5341

Investigation of the feasibility of predicting icing episodes using numerical weather prediction model output.

Vassbø, T., Kristjánsson, J.E., Fikke, S.M., Makkonen, L., International Workshop on Atmospheric Icing of Structures, 8th, Reykjavík, Iceland, June 8-11, 1998. Proceedings. IWAIS '98. Edited by Á.J. Elíasson, Reykjavík, RARIK Iceland State Electricity, 1998, p.343-347, 3 refs.

Power line icing, Ice forecasting, Cloud physics, Supercooled clouds, Unfrozen water content, Weather forecasting, Computerized simulation, Finland

52-5342

Factors influencing the coefficient of friction between sea ice and various materials.

Terashima, T., Nakazawa, N., Honda, H., Saeki, H., International Conference on Contact Mechanics, 3rd, Madrid, Spain, July 1997. Collected papers. Contact mechanics III. Edited by M.H. Aliabadi and A. Samartin, Southampton, Computational Mechanics Publications, 1997, p.33-40, 6 refs. For another version see 48-95.

DLC TA353.I58 1997

Sea ice, Ice mechanics, Ice friction, Metal ice friction, Plastics ice friction, Protective coatings, Ice solid interface, Sliding, Ice temperature, Surface roughness, Mechanical tests, Icebreakers, Simulation

52-5343

Comparative experiments on various adfreeze bond strength tests between ice and materials.

Terashima, T., Nirasawa, K., Hara, F., Saeki, H., International Conference on Contact Mechanics, 3rd, Madrid, Spain, July 1997. Collected papers. Contact mechanics III. Edited by M.H. Aliabadi and A. Samartin, Southampton, Computational Mechanics Publications, 1997, p.207-216, 3 refs.

DLC TA353.I58 1997

Sea ice, Ice strength, Ice solid interface, Pile structures, Ice adhesion, Ice deformation, Shear stress, Stress concentration, Surface roughness, Ice temperature, Mechanical tests

52-5344

Chlorophyll *a* fluorescence and CO_2 exchange of *Umbilicaria aprina* under extreme light stress in the cold.

Kappen, L., Schroeter, B., Green, T.G.A., Seppelt, R.D., *Oecologia,* Feb. 1, 1998, 113(3), p.325-331, 39 refs.

Plant physiology, Ecosystems, Lichens, Photosynthesis, Solar radiation, Radiance, Chlorophylls, Light effects, Snow cover effect, Cold weather survival, Antarctica—Victoria Land

A lichen growing in a continental antarctic region with low temperatures and strong irradiance in summer was investigated for evidence of photoinhibition. Field experiments with *Umbilicaria aprina* from a sheltered site with heavy snowpack showed no effects of photoinhibition when the lichen was exposed to strong sun irradiance for nearly 11 h a day. This was evident from CO_2 exchange and simultaneous chlorophyll *a* fluorescence measurements. CO_2 exchange was also not affected if quartz glass allowing greater UV penetration, was used as a lid for the cuvette. The dependency of net photosynthesis on photosynthetic photon flux density suggests that the lichen is photophilous. (Auth.)

52-5345

Cold hardening reduces photoinhibition of *Eucalypts nitens* and *E. pauciflora* at frost temperatures.

Warren, C.R., Hovenden, M.J., Davidson, N.J., Beadle, C.L., *Oecologia,* Feb. 1, 1998, 113(3), p.350-359, 58 refs.

Trees (plants), Plant ecology, Plant physiology, Frost, Cold tolerance, Chlorophylls, Photosynthesis, Light effects, Temperature effects, Simulation

52-5346

Plant-microbe competition for soil amino acids in the alpine tundra: effects of freeze-thaw and dry-rewet events.

Lipson, D.A., Monson, R.K., *Oecologia,* Feb. 1, 1998, 113(3), p.406-414, 37 refs.

Plant ecology, Soil microbiology, Ecosystems, Alpine tundra, Tundra soils, Nutrient cycle, Desiccation, Moisture, Soil tests, Freeze thaw tests

52-5347

Design, manufacturing and operating experience with an electric vehicle: cold climate experience.

Jelinski, E., Olsen, P.C., *Society of Automotive Engineers. Special publication,* 1997, SP-1274, State of Alternative Fuel Technologies—1997, p.1-7, 5 refs.

DLC TP343.S73 1997

Vehicles, Cold weather performance, Cold weather tests, Electric power, Batteries, Tires, Design, Temperature effects

52-5348

State of the art electric vehicle cold weather range.

Garabedian, H., Heafitz, A., *Society of Automotive Engineers. Special publication,* 1997, SP-1274, State of Alternative Fuel Technologies—1997, p.9-12, 3 refs.

DLC TP343.S73 1997

Vehicles, Electric power, Batteries, Electric heating, Modification, Cold weather tests, Cold weather performance, Temperature effects

52-5349

Winterized methyl esters from soybean oil: an alternative diesel fuel with improved low-temperature flow properties.

Dunn, R.O., Shockley, M.W., Bagby, M.O., *Society of Automotive Engineers. Special publication,* 1997, SP-1274, State of Alternative Fuel Technologies—1997, p.133-142, 19 refs.

DLC TP343.S73 1997

Diesel engines, Fuels, Fuel additives, Hydrocarbons, Modification, Cold weather performance, Fluid flow, Viscosity, Rheology, Low temperature tests, Temperature effects, Temperature measurement

52-5350

Ohio DOT dump truck/snow plow comparative evaluations with a biodiesel blend.

Malcosky, N.D., Wald, T., *Society of Automotive Engineers. Special publication,* 1997, SP-1274, State of Alternative Fuel Technologies—1997, p.209-213.

DLC TP343.S73 1997

Snow removal equipment, Diesel engines, Fuels, Fuel additives, Coagulation, Chemical composition, Cold weather performance, Cold weather tests, Dynamometers, Temperature effects

52-5351

Dictionary of sea ice terms. [Slovar' morskikh ledovykh terminov]

Borodachev, V.E., Gavrilo, V.P., Kazanskiĭ, M.M., St. Petersburg, Gidrometeoizdat, 1994, 126p., In Russian. 35 refs. Includes 40 photographs.

Sea ice, Dictionaries

52-5352

Freezing resistance in antarctic and arctic fishes: its relation to mode of life, ecology and evolution.

Woehrmann, A., *Cybium,* Dec. 30, 1997, 21(4), p.423-442, With French summary. Refs. p.439-442.

Marine biology, Antifreezes, Acclimatization

Biological antifreezes are present in most antarctic and arctic fishes and lower the freezing point of most of their body fluids below the freezing point of seawater, without substantially increasing their osmotic pressure. In the blood of antarctic notothenioid and arctic gadiform fishes, freezing is inhibited by antifreeze glycopeptides (AFGP). Species of Liparididae, Zoarcidae, Cottidae and Pleuronectidae in the antarctic, arctic and northern-boreal waters synthesize only unglycosylated antifreeze peptides (AFP). The level of antifreeze concentration was dependent on the ambient water temperature, the depth of distribution, the life history and the level of activity of the species. Whereas the synthesis of AFGP in antarctic and arctic fish species appears to regulate by the ambient water temperature, the AFP production in arctic fish and in non-notothenioid antarctic fish will be controlled by photoperiod. (Auth. mod.)

52-5353

Twenty-five years' experience using fly ash in concrete.

Lamond, J.F., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.47-69, ACI SP-79, 21 refs.

DLC TP884.A3F59 1983

Concrete admixtures, Concrete strength, Concrete durability, Concrete freezing, Frost resistance, Frost protection, Freeze thaw tests

52-5354

Durability of fly ash concrete.

Sturrup, V.R., Hooton, R.D., Clendenning, T.G., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.71-86, ACI SP-79, 9 refs.

DLC TP884.A3F59 1983

Concrete durability, Concrete admixtures, Air entrainment, Frost resistance, Frost protection, Freeze thaw tests

52-5355

Study of a Class C fly ash concrete.

Yuan, R.L., Cook, J.E., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.307-319, ACI SP-79, 6 refs.

DLC TP884.A3F59 1983

Concrete admixtures, Concrete strength, Concrete durability, Frost resistance, Frost protection, Freeze thaw tests

52-5356

High lime fly ash as a cementing agent.

Sullentrup, M.G., Baldwin, J.W., Jr., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.321-331, ACI SP-79.

DLC TP884.A3F59 1983

Cement admixtures, Concrete admixtures, Concrete durability, Concrete strength, Frost resistance, Frost protection, Freeze thaw tests

52-5357

Roller compacted high fly ash concrete (geocrete).

Joshi, R.C., Natt, G.S., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.347-366, ACI SP-79, 12 refs.

DLC TP884.A3F59 1983

Concrete admixtures, Soil cement, Concrete strength, Concrete durability, Frost resistance, Frost protection, Freeze thaw tests

52-5358

Use of silica fume in concrete.

Jahren, P., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.2. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.625-642, ACI SP-79, 19 refs.

DLC TP884.A3F59 1983

Concrete admixtures, Concrete durability, Frost resistance, Frost protection

52-5359

Durability of concrete containing condensed silica fume.

Gjørv, O.E., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.2. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.695-708, ACI SP-79, 20 refs.

DLC TP884.A3F59 1983

Reinforced concretes, Concrete admixtures, Concrete durability, Concrete strength, Frost resistance, Frost protection, Freeze thaw tests

52-5360

Strength and durability characteristics of concrete incorporating a pelletized blast furnace slag.

Malhotra, V.M., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.2. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.891-921, ACI SP-79, 16 refs.

DLC TP884.A3F59 1983

Concrete admixtures, Concrete strength, Concrete durability, Air entrainment, Frost resistance, Frost protection, Freeze thaw tests

52-5361

Effect of the blastfurnace slag content on the frost resistance of neo-ferrite cement mortar.

Hirai, K., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 1st, Montebello, Quebec, July 31-Aug. 5, 1983. Vol.2. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1983, p.1039-1057, ACI SP-79, 11 refs.

DLC TP884.A3F59 1983

Concrete admixtures, Mortars, Concrete strength, Concrete durability, Concrete freezing, Frost resistance, Frost protection, Freeze thaw tests

52-5362

Proceedings.

International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 5th, Milwaukee, WI, June 4-9, 1995, Malhotra, V.M., ed, ACI special publication SP-153, Detroit, American Concrete Institute, 1995, 1207p. (2 vols.), Refs. passim. For selected papers see 52-5363 through 52-5367.

DLC TP884.A3F589 1995

Concrete admixtures, Concrete strength, Concrete durability, Frost resistance, Freeze thaw tests

52-5363

Properties of high-volume fly ash concrete made with high early-strength ASTM Type III cement.

Bilodeau, A., Malhotra, V.M., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 5th, Milwaukee, WI, June 4-9, 1995. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1995, p.1-23, ACI SP-153, 10 refs.

DLC TP884.A3F589 1995

Cements, Concrete admixtures, Concrete strength, Concrete durability, Frost resistance, Freeze thaw tests

52-5364

Structural concrete incorporating high volume of fly ash.

Galeota, D., Giammatteo, M.M., Marino, R., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 5th, Milwaukee, WI, June 4-9, 1995. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1995, p.25-42, ACI SP-153, 9 refs.

DLC TP884.A3F589 1995

Concrete admixtures, Concrete strength, Concrete durability, Frost resistance, Freeze thaw tests

52-5365

Properties of lightweight aggregate produced from a high calcium fly ash.

Baykal, G., Özturan, T., Savaş, M., Ramadan, K.Z., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 5th, Milwaukee, WI, June 4-9, 1995. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1995, p.269-282, ACI SP-153, 8 refs.

DLC TP884.A3F589 1995

Concrete admixtures, Concrete strength, Concrete durability, Frost resistance, Freeze thaw tests

52-5366

Properties of concrete with bagasse ash as fine aggregate.

Baguant, B.K., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 5th, Milwaukee, WI, June 4-9, 1995. Vol.1. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1995, p.315-337, ACI SP-153, 8 refs.

DLC TP884.A3F589 1995

Concrete admixtures, Concrete strength, Concrete durability, Frost resistance, Freeze thaw tests

52-5367

Effects of fly ash, blast furnace slag, and silica fume on resistance of mortar to calcium chloride attack.

Torii, K., Sasatani, T., Kawamura, M., International Conference on the Use of Fly Ash, Silica Fume, Slag and Other Mineral By-Products in Concrete, 5th, Milwaukee, WI, June 4-9, 1995. Vol.2. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1995, p.931-949, ACI SP-153, 7 refs.

DLC TP884.A3F589 1995

Concrete admixtures, Concrete strength, Concrete durability, Chemical ice prevention, Salting, Corrosion

52-5368

Response time of glaciers as a function of size and mass balance. 1. Theory.

Bahr, D.B., Pfeffer, W.T., Sassolas, C., Meier, M.F., *Journal of geophysical research,* May 10, 1998, 103(B5), p.9777-9782, 23 refs.

Glaciology, Ice sheets, Ice growth, Glacier mass balance, Glacier thickness, Glacier oscillation, Indexes (ratios), Surface properties, Physical properties, Analysis (mathematics), Theories, Climatic factors

52-5369

Response time of glaciers as a function of size and mass balance. 2. Numerical experiments.

Pfeffer, W.T., Sassolas, C., Bahr, D.B., Meier, M.F., *Journal of geophysical research,* May 10, 1998, 103(B5), p.9783-9789, 15 refs.

Glaciology, Ice sheets, Glacier mass balance, Indexes (ratios), Glacier flow, Mass transfer, Climatic factors, Ice volume, Forecasting, Mathematical models, Simulation, Theories

52-5370

Analysis of the ice-sheet surface and subsurface topography above the Vostok Station subglacial lake, central East Antarctica.

Siegert, M.J., Ridley, J.K., *Journal of geophysical research,* May 10, 1998, 103(B5), p.10,195-10,207, 20 refs.

Ice sheets, Ice surface, Limnology, Glacier flow, Velocity measurement, Lake ice, Remote sensing, Topographic surveys, Subglacial observations, Radio echo soundings, Height finding, Ice solid interface, Antarctica—Vostok Station

Radio-echo sounding (RES) and satellite radar-altimeter data were analyzed in order to identify the surface and subsurface topography around the largest known subglacial lake, at Vostok Station (Lake Vostok). In doing so, a data set was established from which a qualitative description of the flow of ice across the lake was developed. Patterns of ice flow were constructed through consideration of the ice-sheet surface from the satellite altimeter and internal layering from RES. It is concluded that Lake Vostok influences the dynamics of the overriding ice. Subglacial lakes may therefore exert a significant control on ice dynamics within central Antarctica. (Auth. mod.)

52-5371

Retreat of the cold halocline layer in the Arctic Ocean.

Steele, M., Boyd, T., *Journal of geophysical research,* May 15, 1998, 103(C5), p.10,419-10,435, 39 refs.

Oceanography, Surface waters, Ocean currents, Water temperature, Hydrography, Salinity, Stratification, Advection, Runoff, Sea ice distribution, Ice cover effect, Heat flux, Oceanographic surveys, Arctic Ocean

52-5372

Monitoring ice thickness in Fram Strait.

Vinje, T., Nordlund, N., Kvambekk, A., *Journal of geophysical research,* May 15, 1998, 103(C5), p.10,437-10,449, 43 refs.

Oceanography, Sea ice distribution, Ice cover thickness, Drift, Ice volume, Seasonal variations, Statistical analysis, Subglacial observations, Acoustic measurement, Moorings, Air ice water interaction, Arctic Ocean, Fram Strait

52-5373

Thermal effects on the location of ice stream margins.

Jacobson, H.P., Raymond, C.F., *Journal of geophysical research,* June 10, 1998, 103(B6), p.12,111-12,122, 35 refs.

Ice sheets, Thermal regime, Glacier flow, Ice edge, Migration, Basal sliding, Glacier beds, Ice solid interface, Ice temperature, Geothermal thawing, Ice heat flux, Analysis (mathematics), Antarctica—Siple Coast

West Antarctic ice streams move rapidly over beds that are thawed by heat generated by the motion. Intervening zones of slow-moving ice are probably freezing at their bases, where heat generation is absent. Heat is also generated in the shear zone between the slow and fast moving ice. Through modeling of coupled heat and mass flow, the authors show that the position of the boundary between freezing and melting at the bed is unstable for an otherwise morphologically uniform bed. Thus the ice streams can be in a delicate thermal balance with the potential of melting outward or freezing inward. Rapidly moving ice streams could expand unless blocked by bed properties that would prevent fast motion even when there is melting at the bed. (Auth. mod.)

52-5374

Precise dating of the Holmatindur cooling even in eastern Iceland: evidence for mid-Miocene bipolar glaciation.

Duncan, R.A., Helgason, J., *Journal of geophysical research,* June 10, 1998, 103(B6), p.12,397-12,404, 31 refs.

Pleistocene, Paleoclimatology, Cooling, Subpolar regions, Sediments, Magma, Glaciation, Ice rafting, Stratigraphy, Geomagnetism, Radioactive age determination, Correlation, Iceland

52-5375

Observation and simulations of winds and temperatures in the antarctic thermosphere for August 2-10, 1992.

Smith, R.W., et al, *Journal of geophysical research,* May 1, 1998, 103(A5), p.9473-9480, 19 refs.

Climatology, Polar atmospheres, Air temperature, Wind direction, Diurnal variations, Geomagnetism, Spectroscopy, Simulation, Antarctica—Amundsen-Scott Station, Antarctica—Halley Station, Antarctica—Mawson Station

Optically derived upper thermospheric wind and temperature data, collected at antarctic stations at Amundsen-Scott, Mawson and Halley, and averaged over the low-activity period Aug. 2-10, 1992, have been interpreted with the help of simulation by the National Center for Atmospheric Research thermosphere ionosphere electrodynamic general circulation model (TIEGCM). The simulation provides a global background context upon which the widely-separated optical observations can be placed. The simulation shows three large-scale structures in the polar wind field: the morning vortex, the evening vortex, and the cross-polar wind jet. Simulated wind directions were in excellent agreement with observations, although wind magnitudes frequently exceeded measured values by up to 30%. Apparent divergent flows in the data from Halley and Mawson were explained as signatures of vortices from their presence in the simulated wind fields. A significant and persistent difference between experimental and modeled temperatures was that the diurnal temperature variation observed at Amundsen-Scott peaked at the nightside crossing of the jet and was minimum a few hours before noon magnetic local time, whereas the simulation indicated minimum temperatures on the nightside, in antiphase to the measurements. No explanation for the lack of this temperature rise in the TIEGCM simulation is presently available. (Auth. mod.)

52-5376

Analytical method for small amount of polar snow and ice samples by ion chromatography.

Igarashi, M., Kanamori, N., Watanabe, O., *Antarctic record,* Mar. 1998, 42(1), p.64-80, In Japanese with English summary. 10 refs.

Snow composition, Ice composition, Chemical analysis

Ion chromatography is one of the major methods for analyzing many kinds of anions and cations in a liquid solutions in a short time. The authors measured anions and cations in snow and ice collected in

polar regions. The general concentration was under 100 µg/l. The samples were very small. By using ion chromatography, the authors could measure both anions and cations at about 1.5 ml. (Auth. mod.)

52-5377
Estimation of asthenospheric deformation law for post glacial rebound based on the deformation mechanism map of olivine.
Kubo, A., *Antarctic record,* Mar. 1998, 42(1), p.91-100, In Japanese with English summary. 24 refs.
Tectonics, Seismology, Glacial geology, Rheology
Linear deformation laws have been applied to post glacial rebound, while many speculations based on real rock samples support non-linear rheology in the upper mantle. Essential information is required to support the assumed constitutive relation. Based on a comparison between present plate motion and formation of seismic anisotropy in the asthenosphere, the critical strain rate between linear and nonlinear deformation laws has a value of about ($1\sim10 \times 10^{-17}$/s). Thus, the effective deformation mechanism in the asthenosphere for the post glacial rebound is linear rheology. (Auth.)

52-5378
BCRA'98. Proceedings.
International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998, Nordal, R.S., ed, Refsdal, G., ed, Trondheim, Norwegian University of Science and Technology (Norges teknisk-naturvitenskapelige universitet, NTNU), 1998, 1865p. (3 vols.), Refs. passim. For selected papers see 52-5379 through 52-5401.
Pavements, Concrete pavements, Bituminous concretes, Subgrade soils, Trafficability, Bearing strength, Frost penetration, Frost resistance, Frost protection, Runways, Highway planning, Road maintenance

52-5379
Lifting of axle load restrictions during spring thaw—a Norwegian experiment.
Refsdal, G., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.1. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.103-108, 5 refs.
Pavements, Thaw weakening, Trafficability, Bearing strength, Road maintenance, Highway planning, Legislation, Cost analysis, Norway

52-5380
Construction and enlargement of German airports with reference to structural and geotechnical aspects.
Floss, R., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.1. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.125-139, 9 refs.
Airports, Runways, Pavements, Chemical ice prevention, Soil pollution, Water pollution, Ground water, Water treatment, Waste disposal, Drains, Environmental protection, Germany

52-5381
PCC airfield pavement evaluation for spring thaw conditions.
Janoo, V.C., MP 5159, International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.1. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.141-148, 8 refs.
Runways, Concrete pavements, Subgrades, Thaw weakening, Trafficability, Bearing strength, Hardness tests, Impact tests, Computerized simulation, United States—Wisconsin
This paper presents an evaluation procedure for Portland cement concrete (PCC) airfield pavements in cold regions. This procedure is based on the results from field tests at two regional airports in Wisconsin and can be used to determine the bearing capacity and the load transfer across joints of PCC pavements during spring thaw. The pavement structure was instrumented with temperature sensors, and periodic surface deflection measurements using a falling weight deflectrometer (FWD) were conducted during the spring thaw period. The deflection data were used to back-calculate the coefficient of subgrade reaction (k) and the layer elastic modulus using ILLIBACK. Several relationships between FWD data, k and the subgrade modulus were developed. In addition, relationships were developed between FWD data, pavement thickness and the horizontal tensile stress at the bottom of the PCC layer for different aircraft expected to use the airport. Also, a relationship between load transfer efficiency across joints and FWD data was developed.

52-5382
Effects of de-icing agents on airfield asphalt pavement.
Rollen, J., Lange, G., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.1. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.171-174.
Runways, Bitumens, Pavements, Chemical ice prevention, Skid resistance, Traction, Road maintenance, Sweden, Norway

52-5383
Subgrade failure criteria.
Janoo, V.C., Irwin, L.H., Eaton, R.A., Richter, C.A., MP 5160, International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.695-703, 3 refs.
Pavements, Subgrade soils, Soil trafficability, Soil strength, Soil tests, Bearing tests, Strain tests, Subgrade maintenance, Road maintenance
An international group of researchers is developing a generalized subgrade failure criterion for use in mechanistic designs/evaluation of pavements. This paper presents the preliminary results from accelerated pavement testing using the heavy vehicle simulator in the Frost Effects Research Facility at the U.S. Army Cold Regions Research and Engineering Laboratory. Tests are being conducted on four soils, each tested at several moisture contents. The test sections are instrumented with stress, strain, moisture and temperature sensors. In addition, surface deformation is obtained periodically. This paper presents preliminary results from the first two (out of twelve) test sections.

52-5384
Analysis of seasonal variations in moisture state using LTPP data.
Jiang, Y.J., Tayabji, S.D., Ali, H., Richter, C.A., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.897-908, 6 refs.
Pavements, Subgrade soils, Soil water, Electromagnetic prospecting, Moisture detection, Soil temperature, Frozen ground temperature, Temperature measurement, Frost penetration, Road maintenance

52-5385
Quantification of seasonal variation effects of subgrade soil moisture and pavement temperature on pavement performance using LTPP data.
Bayomy, F.M., Richter, C.A., Lopez, A.A., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.909-918, 9 refs.
Pavements, Subgrade soils, Soil water, Soil temperature, Seasonal variations, Frozen ground temperature, Frost penetration, Trafficability, Hardness tests, Impact tests, Cracking (fracturing), Road maintenance

52-5386
Calculation of AC layer temperatures from FWD field data.
Stubstad, R.N., Lukanen, E.O., Richter, C.A., Baltzer, S., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.919-928, 3 refs.
Concrete pavements, Temperature measurement, Frost forecasting, Frost penetration, Mathematical models, Computer programs, Road maintenance

52-5387
Moisture model and critical height of highway subgrades.
Wang, X.L., Dai, H.M., Qin, X.F., Shen, D.X., Shen, J.Y., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.939-947, 3 refs.
Subgrade soils, Soil water, Unfrozen water content, Soil freezing, Frost penetration, Frost heave, Frost protection, Highway planning, Road maintenance, China

52-5388
Design methodology for urban roads in cold regions.
Konrad, J.M., Roy, M., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.949-958, 5 refs.
Pavements, Subgrade soils, Soil freezing, Frost action, Frost heave, Frost penetration, Frost resistance, Frost protection, Urban planning, Highway planning, Road maintenance, Canada—Quebec

52-5389
Prediction of pavement response in cold regions.
Simonsen, E., Janoo, V.C., Isacsson, U., MP 5161, International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.959-968, 16 refs.
Pavements, Subgrade soils, Seasonal freeze thaw, Soil freezing, Frost action, Frost heave, Thaw weakening, Frost resistance, Trafficability, Bearing strength, Highway planning, Road maintenance, Computer programs
Although the effects of climate on pavement structures are recognized as a major contributor to the deterioration of cold region pavements, only a few predictive pavement response models concerned with seasonal freezing and thawing have been developed. This paper presents a procedure for predicting response on pavements subject to seasonal freezing and thawing. The adopted procedure is based on a climatic effect analysis and a structural response analysis. The climatic effect analysis, calculating soil moisture and temperature profiles, is performed using a coupled mass and heat transfer model, FROSTB, developed by the Cold Regions Research and Engineering Laboratory. Based on results obtained, a structural response analysis is performed using ABAQUS, a commercially available all-purpose finite element computer code.

52-5390
Increasing the bearing capacity of roads in cold regions.
Bing, W.S., Wang, X.L., Lei, X.T., Shen, J.Y., Dai, H.M., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.969-976.
Pavements, Subgrade soils, Soil trafficability, Bearing strength, Frost penetration, Frost resistance, Frost protection, Highway planning, Road maintenance

52-5391
Modeling analysis on the heat stability of embankment for the continuous permafrost district of Chang Shitou Mountain in Hua Shixia Valley.
Li, D.Q., Fang, J.H., Li, Y.C., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.977-984, 11 refs.
Embankments, Earth fills, Permafrost beneath roads, Permafrost heat transfer, Permafrost preservation, Highway planning, Road maintenance, Mathematical models, China—Qinghai-Xizang Plateau

52-5392

Evaluation to the typical structures of cement concrete pavements in Heilongjiang.

Wang, X.L., et al, International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.985-993, 1 ref.

Concrete pavements, Subgrade soils, Soil trafficability, Bearing strength, Frost penetration, Frost resistance, Frost protection, Highway planning, Road maintenance, China—Heilongjiang Province

52-5393

Aging of asphalt airfield pavements in Norway—a field and laboratory study.

Aurstad, J., Andersen, E.O., Lange, G., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1005-1014, 6 refs.

Runways, Bituminous concretes, Concrete pavements, Concrete durability, Frost action, Weathering, Weatherproofing, Road maintenance, Norway

52-5394

Effect of new direct tension test protocol on the Superpave low-temperature specification for bitumen binders.

Dongre, R., D'Angelo, J., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1035-1047, 6 refs.

Bituminous concretes, Concrete pavements, Concrete freezing, Concrete strength, Low temperature tests, Strain tests, Road maintenance

52-5395

Suitability of the Superpave binder technology to Norwegian conditions.

Andersen, E.O., Bakløkk, L.J., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1049-1056, 4 refs.

Bituminous concretes, Concrete pavements, Concrete freezing, Concrete durability, Concrete strength, Frost resistance, Frost protection, Low temperature tests, Highway planning, Road maintenance, Norway

52-5396

Research of new concepts in asphalt mix design.

Hao, P.W., Zhang, D.L., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1057-1066, 2 refs.

Bituminous concretes, Concrete pavements, Concrete strength, Concrete durability, Frost resistance, Frost protection, Highway planning, Road maintenance, China

52-5397

Thermal fatigue testing of asphalt pavement overlays.

Shalaby, A., Abd El Halim, A.O., Easa, S.M., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.2. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1099-1106, 8 refs.

Bituminous concretes, Concrete pavements, Concrete strength, Concrete durability, Thermal stresses, Fatigue (materials), Strain tests, Low temperature tests, Frost resistance, Road maintenance

52-5398

Moisture susceptibility and electrical properties of base course aggregates.

Saarenketo, T., Scullion, T., Kolisoja, P., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.3. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1401-1410, 23 refs.

Pavements, Subgrade soils, Soil aggregates, Soil water, Soil trafficability, Bearing strength, Frost resistance, Freeze thaw tests, Electromagnetic prospecting

52-5399

Failure model of asphalt pavement paving on the stabilized soil base course.

Wang, D.Y., Chen, Y., Wang, M., Kou, X.B., Lei, X.T., Tian, S.T., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.3. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1411-1417, 2 refs.

Bitumens, Pavements, Subgrade soils, Liming, Soil stabilization, Soil strength, Frost resistance, Highway planning, Road maintenance, China—Heilongjiang Province

52-5400

Steel fabrics as reinforcement in road construction.

Johansson, S., Nilsson, L.E., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.3. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1513-1522, 4 refs.

Bituminous concretes, Reinforced concretes, Concrete pavements, Geotextiles, Frost heave, Frost protection, Road maintenance, Sweden

52-5401

Permanent deformation and cracking resistance characteristics of asphalt containing recycled asphalt pavement.

Lee, K.W., Soupharath, N., Shukla, A., International Conference on the Bearing Capacity of Roads and Airfields, 5th, Trondheim, Norway, July 6-8, 1998. BCRA'98. Proceedings. Vol.3. Edited by R.S. Nordal and G. Refsdal, Trondheim, Norwegian University of Science and Technology, 1998, p.1571-1580, 11 refs.

Bituminous concretes, Concrete pavements, Concrete strength, Cracking (fracturing), Frost resistance, Frost protection, Low temperature tests, Road maintenance

52-5402

Global atmospheric impacts induced by year-round open water adjacent to Antarctica.

Bromwich, D.H., Chen, B., Hines, K.M., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,173-11,189, 59 refs.

Climatology, Global change, Polar atmospheres, Air temperature, Atmospheric circulation, Gravity waves, Heat flux, Sea ice distribution, Ice melting, Ice cover effect, Computerized simulation

A sensitivity study to evaluate the greatest impact that sea-ice anomalies around Antarctica could have on the global atmospheric circulation is conducted with the National Center for Atmospheric Research Community Climate Model, Version 2. A 15-year seasonal cycle simulation is performed in which all sea ice around Antarctica is removed and replaced by year-round open water at -1.9°C. The results are compared to a standard 15-year seasonal cycle run with boundary conditions set for the present climate. The comparison shows that substantial changes in pressure, vertical circulation, and precipitation are found in both hemispheres as a result of antarctic sea-ice removal. This result is in basic agreement with an observational study that found monsoon parameters are correlated with antarctic sea-ice characteristics. Mechanisms for the global atmospheric propagation of the impact of the southern ocean surface heating anomalies are examined. (Auth. mod.)

52-5403

Atmospheric circulation anomalies associated with 1996/1997 summer precipitation events on Sajama Ice Cap, Bolivia.

Vuille, M., Hardy, D.R., Braun, C., Keimig, F., Bradley, R.S., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,191-11,204, 36 refs.

Climatology, Synoptic meteorology, Atmospheric circulation, Atmospheric pressure, Mountain glaciers, Precipitation (meteorology), Snowfall, Snow accumulation, Moisture transfer, Convection, Wind direction, Bolivia—Sajama Ice Cap

52-5404

Atmospheric circulation variability associated with shallow-core seasonal isotopic extremes near Summit, Greenland.

Rogers, J.C., Bolzan, J.F., Pohjola, V.A., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,205-11,219, 29 refs.

Climatology, Atmospheric circulation, Atmospheric pressure, Ice sheets, Firn, Ice cores, Oxygen isotopes, Isotope analysis, Seasonal variations, Statistical analysis, Correlation, Greenland—Summit

52-5405

Carbon dioxide exchange in a subarctic peatland ecosystem in northern Europe measured by the eddy covariance technique.

Aurela, M., Tuovinen, J.P., Laurila, T., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,289-11,301, 37 refs.

Climatology, Atmospheric boundary layer, Carbon dioxide, Wetlands, Forest ecosystems, Subarctic landscapes, Soil air interface, Heat flux, Vapor transfer, Photosynthesis, Microclimatology, Geochemical cycles, Finland

52-5406

Simulation of freeze-thaw cycles in a general circulation model land surface scheme.

Slater, A.G., Pitman, A.J., Desborough, C.E., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,303-11,312, 47 refs.

Climatology, Frozen ground physics, Frozen ground thermodynamics, Soil air interface, Freeze thaw cycles, Seasonal freeze thaw, Frost penetration, Soil water, Moisture transfer, Heat flux, Simulation, Russia—Khabarovsk, Russia—Ershov, Kazakhstan—Ural'sk, Russia—Ogurtsovo

52-5407

Modeling the snow cover in climate studies. 1. Long-term integrations under different climatic conditions using a multilayered snow-cover model.

Loth, B., Graf, H.F., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,313-11,327, 37 refs.

Climatology, Snow physics, Snow hydrology, Snow cover stability, Snow cover effect, Latent heat, Heat flux, Albedo, Turbulent exchange, Snow air interface, Snow depth, Models, Simulation

52-5408

Modeling the snow cover in climate studies. 2. The sensitivity to internal snow parameters and interface processes.

Loth, B., Graf, H.F., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,329-11,340, 15 refs.

Climatology, Snow physics, Snow hydrology, Snow cover effect, Snow cover structure, Snow depth, Snow water content, Snow air interface, Snow surface temperature, Heat balance, Albedo, Snow heat flux, Simulation, Models

52-5409

In situ measurements of enhanced crystal number densities in cirrus clouds caused by aircraft exhaust.

Ström, J., Ohlsson, S., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,355-11,361, 22 refs.

Climatology, Cloud physics, Atmospheric composition, Air pollution, Aerosols, Condensation trails, Ice crystals, Density (mass/volume), Turbulent exchange, Ice vapor interface, Absorption, Heterogeneous nucleation, Aerial surveys, Environmental tests

52-5410
POLDER observations of cloud bidirectional reflectances compared to a plane-parallel model using the International Satellite Cloud Climatology Project cloud phase functions.
Descloitres, J., Buriez, J.C., Parol, F., Fouquart, Y., *Journal of geophysical research,* May 27, 1998, 103(D10), p.11,411-11,418, 22 refs.
Climatology, Cloud cover, Cloud physics, Radiometry, Radiation balance, Anisotropy, Optical properties, Reflectivity, Cloud droplets, Ice crystal optics, Fractals, Models

52-5411
Investigation of the state of a river system in the Seversk region after the radiation accident at the Siberian chemical plant on April 6, 1993.
Nosov, A.V., *Atomic energy,* July 1997 (Pub. Jan. 98), 83(1), p.526-530, Translated from Atomnaia energiia. 9 refs.
Radioactivity, Fallout, Water pollution, Migration, River basins, Estuaries, River ice, Ice cover effect, Snow impurities, Sampling, Environmental tests, Russia—Siberia

52-5412
Thickness variable in sea-ice models.
Flato, G.M., *Atmosphere-ocean,* Mar. 1998, 36(1), p.29-36, With French summary. 13 refs.
Sea ice, Ice cover thickness, Distribution, Statistical analysis, Mathematical models, Ice models

52-5413
Spatial and temporal variability of Canadian monthly snow depths, 1946-1995.
Brown, R.D., Braaten, R.O., *Atmosphere-ocean,* Mar. 1998, 36(1), p.37-54, With French summary. 32 refs.
Precipitation (meteorology), Climatology, Snow accumulation, Snow depth, Snow cover distribution, Seasonal variations, Statistical analysis, Canada

52-5414
Responses of a subarctic dwarf shrub heath community to simulated environmental change.
Press, M.C., Potter, J.A., Burke, M.J.W., Callaghan, T.V., Lee, J.A., *Journal of ecology,* Apr. 1998, 86(2), p.315-327, 46 refs.
Plant ecology, Ecosystems, Subarctic landscapes, Biomass, Grasses, Mosses, Lichens, Air temperature, Nutrient cycle, Vegetation patterns, Environmental tests, Climatic changes, Simulation, Sweden

52-5415
Constraints on the abundances of various molecules in interstellar ice: laboratory studies and astrophysical implications.
Boudin, N., Schutte, W.A., Greenberg, J.M., *Astronomy and astrophysics,* Mar. 1998, 331(2), p.749-759, 51 refs.
Extraterrestrial ice, Ice physics, Cosmic dust, Ice composition, Hydrocarbons, Molecular structure, Infrared spectroscopy, Ice spectroscopy, Spectra, Simulation, Photochemical reactions

52-5416
Loess geochemistry and its implications for particle origin and composition of the upper continental crust.
Gallet, S., Jahn, B.M., Van Vliet Lanoë, B., Dia, A., Rossello, E., *Earth and planetary science letters,* Mar. 30, 1998, 156(3-4), p.157-172, 63 refs.
Geochemistry, Earth crust, Loess, Subpolar regions, Chemical composition, Weathering, Isotope analysis, Microelement content, Statistical analysis, Origin, Norway—Spitsbergen

52-5417
Organic carbon partitioning during spring phytoplankton blooms in the Ross Sea polynya and the Sargasso Sea.
Carlson, C.A., Ducklow, H.W., Hansell, D.A., Smith, W.O., Jr., *Limnology and oceanography,* May 1998, 43(3), p.375-386, 81 refs.
Oceanography, Marine biology, Water chemistry, Suspended sediments, Microbiology, Solubility, Geochemical cycles, Plankton, Biomass, Sampling, Antarctica—Ross Sea
The authors evaluate the partitioning of organic carbon between the particulate and dissolved pools during spring phytoplankton blooms in the Ross Sea and the Sargasso Sea. As part of a multidisciplinary project in the Ross Sea polynya, the dynamics of the dissolved organic carbon (DOC) pool and the role it played in the carbon cycle during the 1994 spring phytoplankton bloom were investigated. Phytoplankton biomass during the bloom was dominated by an antarctic *Phaeocystis* sp. Results from this bloom are compared to blooms observed in the Sargasso Sea in the vicinity of the Bermuda Atlantic Time-Series Study station. Presented are data that demonstrate clear differences in the production, biolability, and accumulation of DOC between the two ocean regions. There are fundamental differences in organic carbon partitioning between the two systems that may be controlled by plankton community structure and food-web dynamics. (Auth. mod.)

52-5418
Inhibition of marine photosynthesis by ultraviolet radiation: variable sensitivity of phytoplankton in the Weddell-Scotia Confluence during the austral spring.
Neale, P.J., Cullen, J.J., Davis, R.F., *Limnology and oceanography,* May 1998, 43(3), p.433-448, 55 refs.
Marine biology, Plankton, Biomass, Photosynthesis, Radiation absorption, Solar radiation, Ultraviolet radiation, Environmental impact, Environmental tests, Antarctica—Weddell Sea
To assess the potential impacts of ozone depletion on photosynthesis in the southern ocean, more data about effects of ultraviolet radiation (UV) on phytoplankton in antarctic waters are required. Toward this end, the authors quantified the responses to UV of antarctic phytoplankton in the Weddell-Scotia Confluence during the austral spring of 1993. Experimental results on spectral sensitivity of photosynthesis were fit statistically to a model that incorporated uninhibited photosynthesis as a function of photosynthetically available radiation, wavelength-dependence of inhibition, and the kinetics of photosynthesis during exposure to UV. The model described ca. 90% of the spectrally dependent experimental variation in photosynthetic rate, and yielded six biological weighting functions (BWFs) for phytoplankton in the Weddell-Scotia Confluence. Assemblages from different stations showed substantial variability in sensitivity to UV. Tolerance of UV was generally highest in assemblages from shallower mixed layers, which presumably had experienced higher irradiance, including UV, prior to sampling. The BWFs of assemblages that seemed acclimated to low irradiance showed the highest sensitivity to UV yet seen for southern ocean phytoplankton. The pattern of UV sensitivity was consistent with acclimation, but also with selection against less tolerant species. (Auth. mod.)

52-5419
Measurements of wave-cloud microphysical properties with two new aircraft probes.
Gerber, H., et al, *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1117-1120, 14 refs.
Climatology, Cloud physics, Ice crystal size, Ice crystal structure, Water content, Turbulent diffusion, Ice water interface, Probes, Aerial surveys

52-5420
Retrieval of effective microphysical properties of clouds: a wave cloud case study.
Ackerman, S.A., et al, *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1121-1124, 19 refs.
Climatology, Cloud cover, Cloud physics, Condensation trails, Remote sensing, Radiometry, Physical properties, Ice detection, Ice crystals, Particle size distribution, Water content, Infrared spectroscopy, Brightness

52-5421
Comparison of in situ and satellite-derived cloud properties during SUCCESS.
Young, D.F., Minnis, P., Baumgardner, D., Gerber, H., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1125-1128, 7 refs.
Climatology, Cloud cover, Cloud physics, Optical properties, Remote sensing, Radiometry, Ice crystal optics, Reflectivity, Ice detection, Particle size distribution

52-5422
Comparison of the microphysical and optical properties of particles in an aircraft contrail and mountain wave cloud.
Baumgardner, D., Gandrud, B.E., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1129-1132, 16 refs.
Climatology, Cloud physics, Condensation trails, Aerosols, Particles, Distribution, Physical properties, Optical properties, Light scattering, Backscattering, Ice formation, Freezing

52-5423
Examination of cirrus cloud characteristics using data from millimeter wave radar and lidar: the 24 April SUCCESS case study.
Mace, G.G., Sassen, K., Kinne, S., Ackerman, T.P., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1133-1136, 17 refs.
Climatology, Cloud cover, Cloud physics, Optical properties, Stratification, Lidar, Radar echoes, Ice detection, Water content, Particle size distribution, Microstructure

52-5424
Infrared spectral absorption of nearly invisible cirrus clouds.
Smith, W.L., et al, *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1137-1140, 13 refs.
Climatology, Cloud cover, Cloud physics, Remote sensing, Optical properties, Ice crystals, Ice detection, Radiance, Infrared radiation, Radiation absorption, Brightness, Backscattering

52-5425
Observations of the spectral distribution of solar irradiance at the ground during SUCCESS.
Pilewskie, P., Goetz, A.F.H., Beal, D.A., Bergstrom, R.W., Mariani, P., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1141-1144, 22 refs.
Climatology, Cloud physics, Cloud cover, Solar radiation, Infrared radiation, Radiance, Albedo, Radiometry, Photometry, Ice crystal optics, Radiation absorption

52-5426
Observations of cirrus clouds with airborne MIR, CLS, and MAS during SUCCESS.
Wang, J.R., Racette, P., Spinhirne, J.D., Evans, K.F., Hart, W.D., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1145-1148, 7 refs.
Climatology, Cloud cover, Cloud physics, Ice detection, Lidar, Radiometry, Backscattering, Profiles, Ice crystal optics, Classifications

52-5427
Evolution of the morphology and microphysics of contrail cirrus from airborne remote sensing.
Spinhirne, J.D., Hart, W.D., Duda, D.P., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1153-1156, 14 refs.
Climatology, Cloud physics, Condensation trails, Lidar, Radiometry, Aerosols, Ice crystals, Ice detection, Water content, Ice water interface

52-5428
Transformation of contrails into cirrus during SUCCESS.
Minnis, P., Young, D.F., Garber, D.P., Nguyen, L., Smith, W.L., Jr., Palikonda, R., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1157-1160, 6 refs.
Climatology, Cloud physics, Condensation trails, Cloud cover, Aerosols, Phase transformations, Optical properties, Ice crystal growth, Ice crystal size, Radiometry

52-5429
On the radiative properties of contrail cirrus.
Liou, K.N., Yang, P., Takano, Y., Sassen, K., Charlock, T., Arnott, W., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1161-1164, 11 refs.
Climatology, Cloud physics, Condensation trails, Optical properties, Light scattering, Albedo, Ice crystal optics, Ice crystal size, Ice crystal structure, Sampling, Replicas, Models, Particle size distribution

52-5430
Interpretation of high mixing rations of O_3 observed in the upper troposphere over Syowa Station, Antarctica using a trajectory analysis.
Murayama, S., Yamazaki, K., Nakazawa, T., Aoki, S., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1177-1180, 17 refs.
Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Ozone, Turbulent diffusion, Atmospheric circulation, Antarctica—Showa Station
High O_3 mixing ratios were observed above 6 km over Showa Station (SYO) in mid-Sep. 1989 when the tropopause was found to be higher than 10 km. From the results of a 3-dimensional trajectory analysis, it is suggested that the observed high O_3 was caused by vertical transport of O_3 from the lower stratosphere to the upper tropo-

sphere. The results imply that the transport of stratospheric air descending in the polar region to SYO plays a very important role in the increase of upper tropospheric O_3 over SYO, especially in spring and autumn, while the downward transport of stratospheric O_3 in the circumpolar region is important in summer. (Auth. mod.)

52-5431

Relationship between continuous aerosol measurements and firn core chemistry over a 10-year period at the South Pole.

Bergin, M.H., Meyerson, E.A., Dibb, J.E., Mayewski, P.A., *Geophysical research letters,* Apr. 15, 1998, 25(8), p.1189-1192, 16 refs.

Climatology, Polar atmospheres, Atmospheric composition, Optical properties, Light scattering, Aerosols, Firn, Ice cores, Snow composition, Sampling, Seasonal variations, Correlation, Antarctica—South Pole

For the first time a continuous long-term record of aerosol properties (aerosol light scattering coefficient, σ_{sp}, and Ångström exponent, å) at the South Pole are compared with the chemical record from a high resolution firn core covering the period from 1981 to 1991. Seasonal signals in å are reflected in the firn core SO_4^{2-}/Na^+ concentration ratio. Summertime ratios of σ_{sp} and aerosol optical depth, τ, to corresponding firn core sulfur concentrations are determined and the 'calibrations' are applied to sulfur concentrations in snowpits from a previous study. Results show that σ_{sp} estimates from snowpit sulfur concentrations are in agreement with atmospheric measurements while τ estimates are significantly different, which is likely due to the lack of understanding of the processes that mix surface air with air aloft. (Auth. mod.)

52-5432

Seabird distribution and oceanic features of the Amundsen and southern Bellingshausen seas.

Ainley, D.G., Jacobs, S.S., Ribic, C.A., Gaffney, I., *Antarctic science,* June 1998, 10(2), p.111-123, Refs. p.122-123.

Marine biology, Oceanography, Pack ice, Ice edge, Sea water, Salinity, Water temperature, Ocean currents, Antarctica—Amundsen Sea, Antarctica—Bellingshausen Sea

The authors describe the distribution and estimate the abundance of seabirds in the Amundsen and southern Bellingshausen seas, and attempt to identify the mesoscale and larger ocean and ice features that explain the birds' discontinuous occurrence patterns. Their general objective was to assess if ocean fronts, especially near the continental shelf break, enhance feeding opportunities for top trophic-level predators. A variety of subsurface thermohaline fronts occurred on both sides of the shelf break, at shallower depths from west to east, and with warmer and saltier water on their northern sides. Pack ice overlaid some of these fronts, especially in the Amundsen Sea. Seabirds comprised either an ice group in pack ice or in polynyas, or an open-water group in waters north of the pack. In the Amundsen Sea, bird densities were near 0 birds/km^2 in waters overlying the continental shelf, an unexplained pattern found previously in the Ross Sea but not repeated in the Bellingshausen Sea (5 birds/km^2 over the shelf). Both groups were more abundant (densities 3-9 birds/km^2) near the frontal zones, the ice edge and the shelf break. (Auth. mod.)

52-5433

Dissolved gases in perennially ice-covered lakes of the McMurdo Dry Valleys, Antarctica.

Andersen, D.T., McKay, C.P., Wharton, R.A., Jr., *Antarctic science,* June 1998, 10(2), p.124-133, Refs. p.132-133.

Ice water interface, Lake ice, Ice composition, Gases, Bubbles, Water chemistry, Atmospheric composition, Antarctica—Hoare, Lake

Measurements of dissolved N_2, O_2, Ar, Co_2 and CH_4 were made in perennially ice-covered Lake Hoare. Results confirm previous reports that O_2 concentrations in the upper water column exceed atmospheric equilibrium and that N_2 and Ar are supersaturated throughout the water column. The mean supersaturation of N_2 was found to be 2.0 and Ar was 3.8. The ratios of N_2/Ar (20.3), and O_2/Ar (22.5) at the ice-water interface are consistent with those previously measured, suggesting that bubble formation is the main process for removing gas from the lake. However, the saturations of N_2 and Ar greatly exceed those previously predicted for degassing by bubble formation only at the ice-water interface. The data support the hypothesis that removal of gas by bubbles occurs in the water column to a depth of 11 m in Lake Hoare. CO_2 concentration increases from near zero at the ice-water interface to 80-100 times saturation at and below the chemocline at ca. 28 m. (Auth. mod.)

52-5434

Diatom assemblages in surface sediments of the Ross Sea: relationship to present oceanographic conditions.

Cunningham, W.L., Leventer, A., *Antarctic science,* June 1998, 10(2), p.134-146, Refs. p.144-146.

Marine geology, Sediments, Algae, Ecology, Sea ice, Glacial geology, Polynyas, Antarctica—Ross Sea

Fifty-four surface sediment samples from the western and central Ross Sea were examined to determine relationships between modern oceanographic conditions and surface sediment diatom assemblages. A centered R mode principal components analysis demonstrates 4 geographically distinct assemblages. The assemblage just north of the Ross Ice Shelf in the central Ross Sea is most closely associated with *Stephanopyxis* spp. The algal assemblage in the western part of the central Ross Sea is most closely associated with *Thalassiosira gracilis.* The algal assemblage north of Drygalski Ice Tongue, in the western Ross Sea, is most closely associated with *Fragilariopsis curta,* suggesting that water column seeding by species melting out of coastal sea ice is important in this area. The assemblage south of Drygalski Ice Tongue is most closely associated with resting spores of *T. antarctica.* (Auth. mod.)

52-5435

Ascidians (Tunicata, Ascidiacea) of Potter Cove, South Shetland Islands, Antarctica.

Tatian, M., Sahade, R.J., Doucet, M.E., Esnal, G.B., *Antarctic science,* June 1998, 10(2), p.147-152, Refs. p.151-152.

Marine biology, Ice scoring, Icebergs, Antarctica—Potter Cove

Certain physical factors, substrate type and ice action appear to be important determinants for ascidian distribution. Three different substrate types were sampled at depths between 0-30 m by scuba diving: soft bottoms, hard bottoms and moraine deposits. The species found were *Aplidium radiatum, Synoicum adareanum, Distaplia cylindrica, Sycozoa gaimardi, Sycozoa sigillinoides, Tylobranchion speciosum, Corella eumyota, Ascidia challengeri, Cnemidocarpa verrucosa, Styela wandeli, Dicarpa insinuosa, Pyura bouvetensis, Pyura discoveryi, Pyura obesa, Pyura setosa, Molgula enodis* and *Molgula pedunculata.* Highest diversity and patchy distribution was found in less stringent environments, where epibiosis is a common phenomenon on stolidobranch ascidians. Differences in stalk development were found in the most abundant species *M. pedunculata* and *C. verrucosa.* Ice action may be the main factor that determines the absence of ascidians above 15 m in all the stations sampled. (Auth. mod.)

52-5436

Glacial trough under Larsen Ice Shelf, Antarctic Peninsula.

Del Valle, R.A., Lusky, J.C., Roura, R., *Antarctic science,* June 1998, 10(2), p.173-174, 12 refs.

Ice shelves, Subglacial observations, Bottom topography, Ocean bottom, Marine geology, Glacial geology, Antarctica—Larsen Ice Shelf

During the 1997 summer, bathymetric soundings were carried out in the area of the continental shelf covered by the Larsen Ice Shelf until 1995. The survey area was located in the northeastern part of the Weddell Sea adjacent to the Antarctic Peninsula. A large glacial trough, with an approximate maximum depth of 1000 m and an ENE orientation, and a submarine peak of possible volcanic origin, were found on the sea bed of the surveyed area. The main submarine morphological features are described.

52-5437

Semi-annual oscillation and Antarctic climate. Part 1: influence on near surface temperatures (1957-79).

Van Den Broeke, M.R., *Antarctic science,* June 1998, 10(2), p.175-183, Refs. p.182-183.

Polar atmospheres, Air temperature, Atmospheric circulation, Climate, Atmospheric pressure, Ice air interface

The author studied the influence of the semiannual oscillation (SAO) on near-surface temperatures in Antarctica, using observations of 27 stations that were operational during the period 1957-79. A significant coupling between the half-yearly wave in surface pressure and that in surface temperature is found for coastal East Antarctica, which can be directly explained by the changes in meridional circulation brought about by the SAO. It is shown that the coupling of antarctic temperatures to the meridional circulation is not only valid on the seasonal time scale of the SAO, but probably also on daily and interannual time scales. This has important implications for the interpretation of time series of antarctic temperatures. (Auth. mod.)

52-5438

Automated observatories for geospace research in polar regions.

Dudeney, J.R., Kressman, R.I., Rodger, A.S., *Antarctic science,* June 1998, 10(2), p.192-203, 21 refs.

Design, Design criteria, Cold weather performance, Cold weather operation, Measuring instruments

The specification, development and deployment of an automated observatory designed to operate unattended for a year in the extreme climatic conditions of the polar regions is presented. Solar- and wind-powered electric generators are used to charge lead/acid batteries to provide a nominal 100 W of electrical power for operating scientific sensors. The equipment is housed in a highly insulated caboose (3 by 2 by 2 m). The temperature in the latter is regulated using a unique thermal control system which utilizes the latent heat of 500 l of water stored in 25-l plastic containers. Data are logged to optical disks for collection once per year. The observatory is designed to be air-deployed using a DHC-6 aircraft. The paper discusses the rationale for designing such automated systems, the operational experience gained from several years of operation, and the application of a network of observatories to solar-terrestrial physics research. (Auth.)

52-5439

Intercomparison of Antarctic sea ice extent datasets from the US Joint Ice Center (JIC) and satellite passive microwave observations for 1979-88.

Harangozo, S.A., *Antarctic science,* June 1998, 10(2), p.204-214, Refs. p.213-214.

Sea ice distribution, Ice conditions, Ice edge, Ice air interface, Data processing, Data transmission, Microwaves

US Joint Ice Center (JIC) antarctic sea ice extent data, the longest continuous series of its kind for this part of the world, are compared with direct passive microwave-based estimates to assess their overall consistency both spatially and temporally in the period 1979-88. Using ice edge position as a proxy for ice extent, the comparison reveals close agreement in most years, in monthly averaged ice edge positions in all antarctic regions at the time of maximum ice extent, and also in autumn and spring in the Ross and Weddell seas. Unexpectedly, JIC relative overestimation prevails during both autumn and spring in some other areas. Previously noted differences in JIC and passive microwave total antarctic extent in 1979-80 result mainly from problems in the Ross Sea. Reasons for the various discrepancies may lie in differences in the methods used to produce the datasets especially in spring but those in autumn seem to often arise for other reasons. (Auth. mod.)

52-5440

Calendar age estimate of the Younger Dryas-Holocene boundary at Kråkenes, western Norway.

Gulliksen, S., Birks, H.H., Possnert, G., Mangerud, J., *Holocene,* May 1998, 8(3), p.249-259, 56 refs.

Pleistocene, Lacustrine deposits, Quaternary deposits, Stratigraphy, Lithology, Paleobotany, Paleoecology, Drill core analysis, Radioactive age determination, Geochronology, Statistical analysis, Norway—Kråknes Lake

52-5441

Synchronous Holocene climatic oscillations recorded on the Swiss Plateau and at timberline in the Alps.

Haas, J.N., Richoz, I., Tinner, W., Wick, L., *Holocene,* May 1998, 8(3), p.301-309, 51 refs.

Paleoclimatology, Climatic changes, Paleoecology, Palynology, Lacustrine deposits, Water level, Alpine landscapes, Forest lines, Radioactive age determination, Geochronology, Statistical analysis, Switzerland—Alps, Switzerland—Seedorf, Lake

52-5442

Lateglacial and early-Holocene environments of Novaya Zemlya and the Kara Sea region of the Russian Arctic.

Serebriannyĭ, L.R., Andreev, A., Maliasova, E., Tarasov, P., Romanenko, F., *Holocene,* May 1998, 8(3), p.323-330, 15 refs.

Pleistocene, Paleoclimatology, Paleoecology, Palynology, Vegetation patterns, Quaternary deposits, Tundra soils, Tundra climate, Peat, Radioactive age determination, Statistical analysis, Russia—Novaya Zemlya, Russia—Kara Sea

52-5443

CO_2 snowfall on Mars: simulation with a general circulation model.

Forget, F., Hourdin, F., Talagrand, O., *Icarus,* Feb. 1998, 131(2), p.302-316, 48 refs.

Mars (planet), Extraterrestrial ice, Polar regions, Climatology, Cloud physics, Atmospheric pressure, Light scattering, Snowfall, Snow optics, Ice sublimation, Carbon dioxide, Condensation, Simulation, Theories

52-5444

Assessment of the benefits of weather forecasting for British Antarctic Survey operations.

McLure, A., Lachlan-Cope, T., *Meteorological applications,* June 1998, 5(2), p.95-102, 7 refs.

Precipitation (meteorology), Weather forecasting, Polar atmospheres, Weather stations, Cloud cover, Snowfall, Accuracy, Cold weather operation, Antarctica—Rothera Station

The British Antarctic Survey operates both aircraft and ships in the Antarctic. High quality weather forecasts can have a large impact on safe operations at high southern latitudes. This paper assesses the benefits the weather forecasts have had on safety and on costs in the Antarctic during the 1995-96 season. The forecasts of cloud amount,

cloud base and weather have a greater accuracy than persistence although the accuracy is lower than might be expected for an airfield in the United Kingdom. (Auth. mod.)

52-5445
Rare snowmelt estimation in the United Kingdom.
Hough, M.N., Hollis, D., *Meteorological applications,* June 1998, 5(2), p.127-138, 9 refs.
Climatology, Snow hydrology, Snowmelt, Periodic variations, Weather forecasting, Flood forecasting, Runoff forecasting, Statistical analysis, Long range forecasting, Wind factors, United Kingdom

52-5446
Southern ocean synoptics—observations and analyses.
Radok, U., Smith, C.A., Wendler, G., *Meteorological applications,* Mar. 1998, 5(1), p.33-36, 5 refs.
Synoptic meteorology, Polar atmospheres, Oceanographic surveys, Spaceborne photography, Marine meteorology, Atmospheric pressure, Correlation, Antarctica—McMurdo Station, Antarctica—Dumont d'Urville Station
Synoptic surface pressure analyses for the southern ocean have been raised to a new level of realism by satellite imagery and NWP models, but the rare ship observations remain important analysis ingredients. The authors illustrate this with observed and analysis pressures for an icebreaker journey from Hobart (Tasmania) to Dumont d'Urville and McMurdo stations. (Auth.)

52-5447
Radiometric and structural measurements of snow samples.
Wiesmann, A., Mätzler, C., Weise, T., *Radio science,* Mar.-Apr. 1998, 33(2), p.273-289, 15 refs.
Snow cover structure, Snow surveys, Snow optics, Remote sensing, Radiometry, Brightness, Scattering, Radiation absorption, Snow density, Depth hoar, Grain size, Classifications, Simulation

52-5448
Combined radiative transfer model for sea ice, open ocean, and atmosphere.
Fuhrhop, R., et al, *Radio science,* Mar.-Apr. 1998, 33(2), p.303-316, 32 refs.
Sea ice distribution, Surface structure, Remote sensing, Ice surveys, Ice optics, Radiometry, Microwaves, Brightness, Radiation balance, Polarization (waves), Mathematical models, Simulation

52-5449
Metalloids in the high latitude North Atlantic Ocean: sources and internal cycling.
Cutter, G.A., Cutter, L.S., *Marine chemistry,* June 1998, 61(1-2), p.25-36, 31 refs.
Oceanography, Subpolar regions, Oceanographic surveys, Water chemistry, Metals, Geochemical cycles, Sampling, Microelement content, Profiles, Atlantic Ocean

52-5450
Distribution of Al in the IOC stations of the North Atlantic and Norwegian Sea between 52° and 65° North.
Hall, I.R., Measures, C.I., *Marine chemistry,* June 1998, 61(1-2), p.69-85, 61 refs.
Oceanography, Subpolar regions, Water chemistry, Metals, Distribution, Microelement content, Ocean currents, Advection, Mass balance, Oceanographic surveys, Sampling, Atlantic Ocean, Norwegian Sea

52-5451
Ultrahigh vacuum studies of the surfaces of ice and sulfuric acid.
Roberts, J.T., *SPIE—The International Society for Optical Engineering. Proceedings,* 1995, Vol.2547, Laser techniques for surface science II. Edited by J.M. Hicks et al, p.125-134, 31 refs.
DLC TA418.7.L358 1995
Climatology, Polar stratospheric clouds, Ice vapor interface, Aerosols, Adsorption, Amorphous ice, Ice physics, Surface properties, Ice spectroscopy, Infrared spectroscopy, Molecular structure, Hydrogen bonds, Simulation, Spectra
The surface chemical properties of ice and sulfuric acid in ultrahigh vacuum have been studied using temperature programmed desorption and Fourier transform infrared reflection absorption spectroscopy (FTIRAS). Ice and sulfuric acid were deposited on Pt(111) and W(100) as films between 10 and 100 monolayers thick. FTIRAS measurements imply that amorphous ice has a greater density of "dangling," surface OH groups than crystalline ice. The adsorption of OClO on ice was investigated in order to estimate the coverage of adsorbed OClO on stratospheric ice particles in arctic and antarctic regions. The coverage of OClO on stratospheric ice particles is probably so low that thermal- and photochemistry are unimportant in the atmosphere. For H_2SO_4, the dangling OH group cannot be spectroscopically observed, nor does HCl adsorb or absorb at 100 K. (Auth. mod.)

52-5452
Second harmonic generation studies of the ice/water interface.
Bouchez, C.M., Hicks, J.M., *SPIE—The International Society for Optical Engineering. Proceedings,* 1995, Vol.2547, Laser techniques for surface science II. Edited by J.M. Hicks et al, p.152-163, 25 refs.
DLC TA418.7.L358 1995
Ice physics, Ice water interface, Solutions, Adsorption, Antifreezes, Cryobiology, Molecular structure, Lasers, Reflectivity, Molecular energy levels

52-5453
Pollen and isotope investigations of an ice core from Vavilov Ice Cap, October Revolution Island, Severnaya Zemlya Archipelago, Russia.
Andreev, A.A., Nikolaev, V.I., Bol'shiianov, D.IU., Petrov, V.N., *Géographie physique et Quaternaire,* 1997, 51(3), p.379-389, With French and Russian summaries. 54 refs.
Pleistocene, Ice sheets, Ice cores, Paleoecology, Palynology, Drill core analysis, Ice dating, Isotope analysis, Stratigraphy, Spectra, Russia—Severnaya Zemlya

52-5454
Postglacial development of Kazakhstan pine forests.
Kremenetskiĭ, K.V., Tarasov, P.E., Cherkinskiĭ, A.E., *Géographie physique et Quaternaire,* 1997, 51(3), p.391-404, With French and German summaries. 38 refs.
Pleistocene, Paleoecology, Palynology, Forest ecosystems, Quaternary deposits, Peat, Lacustrine deposits, Radioactive age determination, Vegetation patterns, Correlation, Kazakhstan

52-5455
Moderate Resolution Imaging Spectroradiometer (MODIS): land remote sensing for global change research.
Justice, C.O., et al, *IEEE transactions on geoscience and remote sensing,* July 1998, 36(4), p.1228-1249, 96 refs.
Remote sensing, Global change, Geophysical surveys, Spaceborne photography, Radiometry, Sea ice distribution, Snow cover distribution, Resolution, Sensor mapping, Performance

52-5456
ASTER polar cloud mask.
Logar, A.M., et al, *IEEE transactions on geoscience and remote sensing,* July 1998, 36(4), p.1302-1312, 31 refs.
Climatology, Spaceborne photography, Cloud cover, Detection, Image processing, Classifications, Sea ice distribution, Snow cover distribution, Ice cover effect, Resolution, Accuracy
This research is concerned with the problem of producing polar cloud masks for satellite imagery. The results presented are for Thematic Mapper data from the northern and southern polar regions. A series of classification techniques have been implemented and tested, the most promising of which is a neural network classifier. The Interactive Visual Image Classification System was developed specifically for this project to make this task simpler for the human expert. This system achieved 96.2% accuracy on the fundamental problem of distinguishing cloud from noncloud classes. The time required to classify 468,750 pixels in a satellite image was 50 s. (Auth. mod.)

52-5457
Past and future climates simulated with the Adem thermodynamic model.
Garduño, R., *Quaternary international,* Sep.-Nov. 1997, Vol.43-44, International Conference on Climate Change in Mexico, 1st, Taxo, Mexico, 1993. Collected papers. Edited by J. Urrutia-Fucugauchi, S.E. Metcalfe and M. Caballero-Miranda, p.19-24, 20 refs.
Paleoclimatology, Pleistocene, Climatic changes, Air temperature, Carbon dioxide, Insolation, Snow cover effect, Ice cover effect, Simulation, Thermodynamics, Weather forecasting

52-5458
Glaciers of Popocatépetl volcano (Mexico): changes and causes.
Granados, H.D., *Quaternary international,* Sep.-Nov. 1997, Vol.43-44, International Conference on Climate Change in Mexico, 1st, Taxo, Mexico, 1993. Collected papers. Edited by J. Urrutia-Fucugauchi, S.E. Metcalfe and M. Caballero-Miranda, p.53-60, 19 refs.
Glacier surveys, Mountain glaciers, Permafrost surveys, Glacier oscillation, Altitude, Classifications, Volcanoes, Geothermy, Climatic changes, Mexico—Popocatépetl

52-5459
Late Quaternary glaciations of Téyotl volcano, central Mexico.
Vázquez-Selem, L., *Quaternary international,* Sep.-Nov. 1997, Vol.43-44, International Conference on Climate Change in Mexico, 1st, Taxo, Mexico, 1993. Collected papers. Edited by J. Urrutia-Fucugauchi, S.E. Metcalfe and M. Caballero-Miranda, p.67-73, 36 refs.
Pleistocene, Glacial geology, Mountain glaciers, Glacier oscillation, Glacial deposits, Moraines, Rock glaciers, Volcanic ash, Radioactive age determination, Geomorphology, Stratigraphy, Correlation, Mexico—Iztaccíhuatl

52-5460
Palaeomagnetic secular variation record from Late Pleistocene-Holocene lacustrine sediments from Chalco Lake, Basin of Mexico.
Ortega-Guerrero, B., Urrutia-Fucugauchi, J., *Quaternary international,* Sep.-Nov. 1997, Vol.43-44, International Conference on Climate Change in Mexico, 1st, Taxo, Mexico, 1993. Collected papers. Edited by J. Urrutia-Fucugauchi, S.E. Metcalfe and M. Caballero-Miranda, p.87-96, 21 refs.
Pleistocene, Quaternary deposits, Lacustrine deposits, Geomagnetism, Orientation, Oscillations, Rock magnetism, Drill core analysis, Stratigraphy, Radioactive age determination, Spectra, Mexico—Mexico, Basin of

52-5461
Sources of glacial moisture in Mesoamerica.
Bradbury, J.P., *Quaternary international,* Sep.-Nov. 1997, Vol.43-44, International Conference on Climate Change in Mexico, 1st, Taxo, Mexico, 1993. Collected papers. Edited by J. Urrutia-Fucugauchi, S.E. Metcalfe and M. Caballero-Miranda, p.97-110, 35 refs.
Paleoclimatology, Climatic changes, Precipitation (meteorology), Glacial meteorology, Humidity, Moisture transfer, Atmospheric circulation, Wind factors, Palynology, Profiles, Lacustrine deposits, Radioactive age determination, Mexico, Guatemala, Colombia, Venezuela

52-5462
Last glacial maximum in the Basin of Mexico: the diatom record between 34,000 and 15,000 years BP from Lake Chalco.
Caballero-Miranda, M., *Quaternary international,* Sep.-Nov. 1997, Vol.43-44, International Conference on Climate Change in Mexico, 1st, Taxo, Mexico, 1993. Collected papers. Edited by J. Urrutia-Fucugauchi, S.E. Metcalfe and M. Caballero-Miranda, p.125-136, 36 refs.
Pleistocene, Quaternary deposits, Limnology, Lacustrine deposits, Water level, Paleoecology, Classifications, Drill core analysis, Stratigraphy, Radioactive age determination, Geochronology, Glacier oscillation, Mexico—Mexico, Basin of

52-5463

Research into the Quaternary sediments and climatic variations in NE Mexico.

Ruiz Martinez, M.A., Werner, J., *Quaternary international,* Sep.-Nov. 1997, Vol.43-44, International Conference on Climate Change in Mexico, 1st, Taxo, Mexico, 1993. Collected papers. Edited by J. Urrutia-Fucugauchi, S.E. Metcalfe and M. Caballero-Miranda, p.145-151, 6 refs.

Paleoclimatology, Climatic changes, Pleistocene, Sedimentation, Geomorphology, Landscape development, Quaternary deposits, Lacustrine deposits, Terraces, Erosion, Theories, Mexico

52-5464

Core questions.

Howard, J., *Explorations,* Fall 1997, 4(2), p.18-25.

Paleoclimatology, Climatic changes, Atmospheric composition, Carbon dioxide, Ice sheets, Ice cores, Stratigraphy, Chemical analysis, Antarctica—Vostok Station, Greenland

This paper describes the efforts of climatologists to utilize ice sheet core chemistry to deduce CO_2 variations during previous climatic cycles. The ice is derived from ice sheets in Antarctica and Greenland.

52-5465

Around the Corps. Ice jams. MP 5162, *Engineer update,* Apr. 1996, 20(4), p.11.

River ice, Ice jams, Ice control, International cooperation, Latvia

52-5466

Effectiveness of bioremediation for oil-polluted Antarctic seawater.

Delille, D., Bassères, A., Dessommes, A., *Polar biology,* Apr. 1998, 19(4), p.237-241, Refs. p.240-241.

Environmental impact, Oil spills, Sea water, Water pollution, Ice cover effect, Microbiology, Marine biology, Bacteria, Antarctica—Adélie Coast

Mesocosm studies were conducted to evaluate the effects of "Arabian light" crude oil contamination on coastal bacterioplanktonic communities. After oil addition, regular surveys of the bacterial changes of the oil-contaminated sea water were performed in 5-week periods during the summers of 1992-94 off the Adélie Coast. All results clearly revealed a significant response of antarctic bacterial communities to hydrocarbon contamination. A 1 order of magnitude increase of bacterial microflora occurred in sea water after crude oil contamination. A concomitant enrichment in oil-degrading bacteria was generally observed. Chemical analysis of the residual hydrocarbon fractions confirmed that fertilizer application increased the rate of oil biodegradation. (Auth. mod.)

52-5467

Profiles of soluble carbohydrates and their adaptive role in maritime Antarctic terrestrial arthropods.

Montiel, P.O., *Polar biology,* Apr. 1998, 19(4), p.250-256, Refs. p.256.

Acclimatization, Cryobiology, Cold tolerance, Antarctica—Signy Island

The existence of seasonal changes in concentrations of water-soluble carbohydrates in arthropods (both freezing-tolerant and intolerant species) from Signy I. was demonstrated. Seasonal patterns of variation, imposed by seasonality of the maritime antarctic environment, in the production of soluble carbohydrates in response to low temperatures and/or dehydration for a range of terrestrial arthropods were confirmed. The freshwater copepod *Pseudoboeckella poppei* exhibited much lower levels of soluble carbohydrates, with glycerol as the main component, and smaller seasonal fluctuations relative to the four terrestrial species. The two antarctic mites *(Alaskozetes antarcticus* and *Gamasellus racovitzai)* accumulated glycerol (as a single-component cryoprotective system), in agreement with previous work reporting increased glycerol levels and lowering of the supercooling point in *A. antarcticus.* In the case of *G. racovitzai,* increased levels of glycerol may function in a different manner. (Auth. mod.)

52-5468

Gas hydrates: review of physical/chemical properties.

Sloan, E.D., Jr., *Energy & fuels,* Mar.-Apr. 1998, 12(2), p.191-196, 27 refs.

Clathrates, Hydrates, Natural gas, Molecular structure, Crystals, Molecular energy levels, Indexes (ratios), Physical properties, Thermodynamic properties, Ice physics

52-5469

Polycrystalline methane hydrate: synthesis from superheated ice, and low-temperature mechanical properties.

Stern, L.A., Kirby, S.H., Durham, W.B., *Energy & fuels,* Mar.-Apr. 1998, 12(2), p.201-211, 27 refs.

Clathrates, Hydrates, Mechanical properties, Ice physics, Superheated ice, Ice melting, Grain size, Natural gas, Stability, Plastic deformation, Ice strength, X ray analysis, Rheology

52-5470

Simple method for predicting gas-hydrate-forming conditions in aqueous mixed-electrolyte solutions.

Javanmardi, J., Moshfeghian, M., Maddox, R.N., *Energy & fuels,* Mar.-Apr. 1998, 12(2), p.219-222, 26 refs.

Natural gas, Hydrates, Clathrates, Solutions, Solubility, Ion diffusion, Phase transformations, Temperature effects, Thermodynamics, Mathematical models, Forecasting

52-5471

Relative diffusion and memory effects in supercooled water.

De Santis, A., Ercoli, A., Rocca, D., *Physical review E,* May 1998, 57(5)pt.A, p.R4871-R4874, 29 refs.

Water structure, Supercooling, Thermodynamic properties, Molecular structure, Molecular energy levels, Orientation, Hydrogen bonds, Self diffusion, Analysis (mathematics)

52-5472

Impact of grazing and neighbour removal on a heath plant community transplanted onto a snowbed site, NW Finnish Lapland.

Virtanen, R., *Oikos,* Mar. 1998, 81(2), p.359-367, 54 refs.

Plant physiology, Arctic landscapes, Vegetation patterns, Ecosystems, Forest lines, Biomass, Snowmelt, Snow cover effect, Cold stress, Degradation, Simulation, Finland—Lapland

52-5473

Significance of resorption of leaf resources for shoot growth in evergreen and deciduous woody plants from a subarctic environment.

Eckstein, R.L., Karlsson, P.S., Weih, M., *Oikos,* Apr. 1998, 81(3), p.567-575, 36 refs.

Plant physiology, Plant ecology, Trees (plants), Subarctic landscapes, Plant tissues, Biomass, Storage, Nutrient cycle, Absorption, Simulation, Statistical analysis, Sweden—Abisko

52-5474

Elastic moduli calculation and instability in structure I methane clathrate hydrate.

Shpakov, V.P., Tse, J.S., Tulk, C.A., Kvamme, B., Belosludov, V.R., *Chemical physics letters,* Jan. 9, 1998, 282(2), p.107-114, 26 refs.

Clathrates, Hydrates, Natural gas, Latticed structures, Stability, Thermodynamic properties, Thermal expansion, Elastic properties, Dynamic properties, Temperature effects, Analysis (mathematics)

52-5475

Incoherent inelastic neutron scattering measurements on ice XI: the proton-ordered phase of ice I_h doped with KOH.

Fukazawa, H., Ikeda, S., Mae, S., *Chemical physics letters,* Jan. 9, 1998, 282(2), p.215-218, 12 refs.

Ice physics, Doped ice, Molecular structure, Hydrogen bonds, Protons, Ice crystal structure, Ice spectroscopy, Neutron scattering, Spectra, Vibration, Ice models

52-5476

Spatial patterns and structure of the mountain birch tree-limit in the southern Swedish Scandes—a regional perspective.

Kjällgren, L., Kullman, L., *Geografiska annaler,* 1998, 80A(1), p.1-16, 82 refs.

Forest ecosystems, Subpolar regions, Forest lines, Altitude, Slope orientation, Vegetation patterns, Snow cover effect, Topographic effects, Sampling, Statistical analysis, Sweden—Scandes Mountains

52-5477

Channel form, bed material and sediment sources of the Sprongdøla, southern Norway: evidence for a distinct periglacio-fluvial system.

McEwen, L.J., Matthews, J.A., *Geografiska annaler,* 1998, 80A(1), p.17-36, 54 refs.

Geomorphology, Alpine landscapes, River flow, Sediment transport, Channels (waterways), Bedrock, Avalanche deposits, Frost shattering, Lithology, Periglacial processes, Norway—Sprongdøla River

52-5478

Small glacier as an index of regional mass balance: Baby Glacier, Axel Heiberg Island, 1959-1992.

Adams, W.P., Cogley, J.G., Ecclestone, M.A., Demuth, M.N., *Geografiska annaler,* 1998, 80A(1), p.37-50, With French summary. 25 refs.

Glacial hydrology, Glacier surveys, Markers, Glacier mass balance, Altitude, Glacier oscillation, Periodic variations, Statistical analysis, Canada—Northwest Territories—Axel Heiberg Island

52-5479

Reconstructing the palaeoclimate of Jæren, southwestern Norway, for the period 1821-1850, from historical documentary records.

Kastellet, E., Nesje, A., Pedersen, E.S., *Geografiska annaler,* 1998, 80A(1), p.51-65, 41 refs.

Paleoclimatology, Subpolar regions, Air temperature, History, Recording, Weather observations, Statistical analysis, Norway—Jæren

52-5480

On the parameterization of basal heat flux for sea-ice modelling.

Holland, D.M., *Geophysica,* 1998, 34(1-2), p.1-21, 19 refs.

Climatology, Sea ice, Ice models, Ice cover thickness, Ice heat flux, Ice bottom surface, Ice water interface, Ice friction, Thermodynamics, Turbulent exchange, Mathematical models, Ice cover effect, Arctic Ocean

52-5481

Oulujärvi magnetic station.

Pajunpää, K., Kultima, J., Posio, P., Tiikkainen, J., Yliniemi, J., *Geophysica,* 1998, 34(1-2), p.39-50, 10 refs.

Geophysical surveys, Polar atmospheres, Atmospheric electricity, Stations, Geomagnetism, Magnetometers, Data processing, Performance, Finland—Oulujärvi

52-5482

Seismotectonics and lithospheric stresses in the northern Fennoscandian Shield.

Wahlström, R., Assinovskaia, B.A., *Geophysica,* 1998, 34(1-2), p.51-61, 32 refs.

Tectonics, Seismology, Earth crust, Subpolar regions, Earthquakes, Deformation, Stress concentration, Mapping, Sweden, Norway, Russia—Kola Peninsula, Finland

52-5483

Bound water content and water binding strength on sludge flocs.

Wu, C.C., Huang, C.P., Lee, D.J., *Water research,* Mar. 1998, 32(3), p.900-904, 14 refs.

Waste treatment, Sewage treatment, Sludges, Unfrozen water content, Hygroscopic water, Thermodynamic properties, Thermal expansion, Temperature measurement, Freezing points, Temperature effects

52-5484

Devonian stromatoporoid fauna of the Bent Horn oilfield, Cameron Island, Northwest Territories.

Stearn, C.W., *Canadian journal of earth sciences,* Jan. 1998, 35(1), p.16-22, With French summary. 23 refs.

Pleistocene, Arctic landscapes, Earth crust, Stratigraphy, Paleoecology, Migration, Classifications, Sedimentation, Reservoirs, Sampling, Thin sections, Canada—Northwest Territories—Cameron Island

52-5485

Mysterious iron-nickel-zinc arctic spherules.

Darby, D.A., *Canadian journal of earth sciences,* Jan. 1998, 35(1), p.23-29, With French summary. 25 refs.

Geological surveys, Subpolar regions, Marine deposits, Sedimentation, Diagenesis, Ice rafting, Minerals, Chemical composition, Sampling, Origin, Explosion effects, Theories, Arctic Ocean

52-5486

Constraints on the timing of thrusting during the Eurekan orogeny, Canadian Arctic Archipelago: an integrated approach to thermal history analysis.

Arne, D.C., Zentilli, M., Grist, A.M., Collins, M., *Canadian journal of earth sciences,* Jan. 1998, 35(1), p.30-38, With French summary. 33 refs.

Pleistocene, Geological surveys, Earth crust, Tectonics, Subpolar regions, Deformation, Sedimentation, Hydrocarbons, Reservoirs, Radioactive age determination, Geochronology, Thermal analysis, Canada—Northwest Territories—Ellesmere Island

52-5487

Terrestrial record of rapid mass movements in the Sawtooth Range, Ellesmere Island, Northwest Territories, Canada.

Lewkowicz, A.G., Hartshorn, J., *Canadian journal of earth sciences,* Jan. 1998, 35(1), p.55-64, With French summary. 33 refs.

Geomorphology, Subpolar regions, Mass movements (geology), Soil erosion, Slope processes, Periglacial processes, Talus, Ice wedges, Sediments, Lichens, Age determination, Canada—Northwest Territories—Ellesmere Island

52-5488

Radiometrically determined sedimentary fluxes in the sub-polar North Atlantic during the last 140,000 years.

McManus, J.F., Anderson, R.F., Broecker, W.S., Fleisher, M.Q., Higgins, S.M., *Earth and planetary science letters,* Feb. 15, 1998, 155(1-2), p.29-43, 55 refs.

Pleistocene, Oceanography, Paleoecology, Quaternary deposits, Bottom sediment, Sedimentation, Mass transfer, Ice rafting, Drill core analysis, Radioactive age determination, Geochemistry, Atlantic Ocean

52-5489

Holocene sea-level change and ice-sheet history in the Vestfold Hills, East Antarctica.

Zwartz, D., Bird, M., Stone, J., Lambeck, K., *Earth and planetary science letters,* Feb. 15, 1998, 155(1-2), p.131-145, 44 refs.

Oceanography, Sea level, Isostasy, Lacustrine deposits, Ice sheets, Glacier ablation, Drill core analysis, Radioactive age determination, Correlation, Antarctica—Vestfold Hills

A new Holocene sea-level record from the Vestfold Hills has been obtained by dating the lacustrine-marine and marine-lacustrine transitions that occur in sediment cores from lakes which were formerly connected to the sea. From an elevation of ca. 7.5 m 8000 yr ago, relative sea-level rose to a maximum ca. 9 m above present sea-level 6200 yr ago. Since then, sea-level has fallen monotonically. The precision of the new record makes it suitable for constraining the recent history of the ice sheet in that region, using numerical models of glacio-hydro-isostasy. Simplified regional models suggest that the ice-sheet margin has retreated 30-40 km since the last glacial maximum. (Auth. mod.)

52-5490

Cloud processes associated with past and future climate changes.

Ramstein, G., Serafini-Le Treut, Y., Le Treut, H., Forichon, M., Joussaume, S., *Climate dynamics,* Apr. 1998, 14(4), p.233-247, 45 refs.

Paleoclimatology, Climatic changes, Clouds (meteorology), Cloud cover, Optical properties, Water vapor, Carbon dioxide, Surface temperature, Ice sheets, Ice cover effect, Insolation, Radiation balance, Models

52-5491

Periodically synchronously coupled integrations with the atmosphere-ocean general circulation model ECHAM3/LSG.

Voss, R., Sausen, R., Cubasch, U., *Climate dynamics,* Apr. 1998, 14(4), p.249-266, 29 refs.

Climatology, Climatic changes, Heat flux, Air temperature, Water temperature, Surface temperature, Marine atmospheres, Atmospheric composition, Carbon dioxide, Sea ice distribution, Models, Statistical analysis, Computerized simulation

52-5492

Modelling the response of glaciers to climate warming.

Oerlemans, J., et al, *Climate dynamics,* Apr. 1998, 14(4), p.267-274, 26 refs.

Climatology, Ice sheets, Climatic changes, Global warming, Glacier mass balance, Glacier melting, Glacier ablation, Ice volume, Ice air interface, Topographic effects, Temperature effects, Statistical analysis, Models

52-5493

Early Maastrichtian organic-walled phytoplankton cyst assemblage from an organic-rich black mud in Core Fl-533, Alpha Ridge: evidence for upwelling conditions in the Cretaceous Arctic Ocean.

Firth, J.V., Clark, D.L., *Marine micropaleontology,* June 1998, 34(1-2), p.1-27, 72 refs.

Pleistocene, Oceanography, Paleoecology, Palynology, Biomass, Ocean currents, Upwelling, Bottom sediment, Plankton, Classifications, Indexes (ratios), Age determination, Drill core analysis, Arctic Ocean

52-5494

Microwave dielectric properties of the ice core from Dome Fuji, Antarctica.

Matsuoka, T., Mae, S., Fukazawa, H., Fujita, S., Watanabe, O., *Geophysical research letters,* May 15, 1998, 25(10), p.1573-1576, 12 refs.

Ice dielectrics, Glacier ice, Ice sheets, Ice cores, Microwaves, Radar echoes, Ice spectroscopy, Simulation, Temperature effects, Antarctica—Queen Maud Land

Measurements of relative complex dielectric permittivities of an ice core recovered from Dome Fuji were carried out at 33 GHz in the temperature range 210-260 K. The open resonator method was used for precise measurement of temperature dependence of the real part and imaginary part of dielectric permittivities. Also, Raman spectra measurements were carried out and the results showed that the increase rate of frequency of translational lattice vibrations with an increase of temperature changed at around 238 K. (Auth. mod.)

52-5495

Dry stratosphere: a limit on cometary water influx.

Hannegan, B., Olsen, S., Prather, M., Zhu, X., Rind, D., Lerner, J., *Geophysical research letters,* May 15, 1998, 25(10), p.1649-1652, 33 refs.

Climatology, Atmospheric composition, Stratosphere, Water vapor, Extraterrestrial ice, Water transport, Origin, Theories, Simulation

52-5496

Phase transformations of the ternary system $(NH_4)_2SO_4$-H_2SO_4-H_2O and the implications for cirrus cloud formation.

Martin, S.T., *Geophysical research letters,* May 15, 1998, 25(10), p.1657-1660, 17 refs.

Climatology, Cloud physics, Phase transformations, Aerosols, Homogeneous nucleation, Heterogeneous nucleation, Ice formation, Ion exchange, Particle size distribution, Thermodynamic properties, Models, Optical properties

52-5497

Effects of ice particle shape and orientation on polarized microwave radiation for off-nadir problems.

Czekala, H., *Geophysical research letters,* May 15, 1998, 25(10), p.1669-1672, 13 refs.

Climatology, Cloud cover, Cloud physics, Radiation balance, Ice crystal optics, Ice crystal structure, Indexes (ratios), Orientation, Microwaves, Brightness, Polarization (waves), Scattering, Models

52-5498

Possible change in cloud radiative forcing due to aircraft exhaust.

Wyser, K., Ström, J., *Geophysical research letters,* May 15, 1998, 25(10), p.1673-1676, 17 refs.

Climatology, Air pollution, Cloud physics, Cloud cover, Optical properties, Condensation trails, Heterogeneous nucleation, Aerosols, Ice crystal size, Water content, Reflectivity, Mathematical models

52-5499

Uptake of NO_y on wave-cloud ice particles.

Weinheimer, A.J., et al, *Geophysical research letters,* May 15, 1998, 25(10), p.1725-1728, 19 refs.

Climatology, Cloud physics, Atmospheric composition, Aerosols, Ozone, Condensation, Ice nuclei, Ice crystal growth, Ice vapor interface, Heterogeneous nucleation, Sampling, Probes

52-5500

Freshening of the upper ocean in the Arctic: is perennial sea ice disappearing?

McPhee, M.G., Stanton, T.P., Morison, J.H., Martinson, D.G., *Geophysical research letters,* May 15, 1998, 25(10), p.1729-1732, 18 refs.

Oceanography, Oceanographic surveys, Sea ice distribution, Ice cover thickness, Ice melting, Salinity, Water temperature, Ice water interface, Theories, Climatic factors, Arctic Ocean

52-5501

Warming of the Arctic Ocean by a strengthened Atlantic inflow: model results.

Zhang, J.L., Rothrock, D.A., Steele, M., *Geophysical research letters,* May 15, 1998, 25(10), p.1745-1748, 10 refs.

Climatology, Oceanography, Ocean currents, Water temperature, Heating, Salinity, Heat flux, Ice water interface, Models, Arctic Ocean, Atlantic Ocean

52-5502

Little ice age clearly recorded in northern Greenland ice cores.

Fischer, H., et al, *Geophysical research letters,* May 15, 1998, 25(10), p.1749-1752, 23 refs.

Paleoclimatology, Climatic changes, Air temperature, Cooling, Aerosols, Volcanic ash, Ice sheets, Ice cores, Ice composition, Isotope analysis, Correlation, Greenland

52-5503

Investigation of the small ice cap instability in the southern hemisphere with a coupled atmosphere-sea ice-ocean-terrestrial ice model.

Morales Maqueda, M.A., Willmott, A.J., Bamber, J.L., Darby, M.S., *Climate dynamics,* May 1998, 14(5), p.329-352, 46 refs.

Climatology, Heat balance, Surface temperature, Ice sheets, Glacier mass balance, Glacier oscillation, Stability, Insolation, Albedo, Snow cover effect, Ice cover effect, Air ice water interaction, Simulation, Mathematical models

A simple climate model has been developed to investigate the existence of the small ice cap instability in the Southern Hemisphere. The model consists of four coupled components: an atmospheric energy balance model, a thermodynamic snow-sea ice model, an oceanic mixed layer model and a terrestrial ice model. Results show that the instability appears only in those cases when an explicit representation of the antarctic ice sheet is not included in the model. Several sensitivity experiments suggest that the feedback between the elevation of the ice sheet and the snow accumulation-ice ablation balance is responsible for the disappearance of the small ice cap instability in the simulation. These results suggest that the small ice cap instability mechanism could be unsuitable for explaining the inception of glaciation in Antarctica. (Auth. mod.)

52-5504

Changes in mid-latitude variability due to increasing greenhouse gases and sulphate aerosols.

Carnell, R.E., Senior, C.A., *Climate dynamics,* May 1998, 14(5), p.369-383, 57 refs.

Climatology, Synoptic meteorology, Climatic changes, Storms, Fronts (meteorology), Atmospheric pressure, Aerosols, Carbon dioxide, Greenhouse effect, Sea ice distribution, Albedo, Ice cover effect, Seasonal variations, Models

52-5505

Stratigraphy, palaeomagnetism and age of volcanics in the upper regions of Pjórsárdalur valley, central southern Iceland.

Kristjánsson, L., Duncan, R.A., Gudmundsson, Á., *Boreas,* Mar. 1998, 27(1), p.1-13, 36 refs.

Pleistocene, Geological surveys, Geologic structures, Earth crust, Subpolar regions, Magma, Bedrock, Stratigraphy, Profiles, Geomagnetism, Geochronology, Radioactive age determination, Iceland

52-5506

Dense-media separation as a more efficient pollen extraction method for use with organic sediment/deposit samples: comparison with the conventional method.

Nakagawa, T., Brugiapaglia, E., Digerfeldt, G., Reille, M., De Beaulieu, J.L., Yasuda, Y., *Boreas,* Mar. 1998, 27(1), p.15-24, 15 refs.

Paleoecology, Palynology, Sediments, Peat, Sampling, Microscope slides, Laboratory techniques, Impurities, Correlation, Statistical analysis

52-5507

Ice-dammed lakes of Ossian Sarsfjellet (Svalbard): their geomorphology and significance.

Bennett, M.R., Hambrey, M.J., Huddart, D., Glasser, N.F., Crawford, K., *Boreas,* Mar. 1998, 27(1), p.25-43, 73 refs.

Pleistocene, Geomorphology, Glacial geology, Glacier oscillation, Glacial lakes, Ice dams, Shoreline modification, Water level, Moraines, Water erosion, Sedimentation, Profiles, Lithology, Norway—Svalbard

52-5508

Sediment record of short-lived ice-contact lakes, Burroughs Glacier, Alaska.

Syverson, K.M., *Boreas,* Mar. 1998, 27(1), p.44-54, 42 refs.

Glacial hydrology, Glacial lakes, Sedimentation, Lacustrine deposits, Suspended sediments, Ice edge, Meltwater, Calving, Ice scoring, Grain size, United States—Alaska—Burroughs Glacier

52-5509

Genesis of hummocky moraine in the Bolmen area, southwestern Sweden.

Andersson, G., *Boreas,* Mar. 1998, 27(1), p.55-67, 55 refs.

Pleistocene, Glacial geology, Geomorphology, Glacial deposits, Sedimentation, Glacier oscillation, Moraines, Hummocks, Bedrock, Frost shattering, Landscape development, Lithology, Grain size, Sweden

52-5510

Lake-tilting, a method for estimation of glacio-isostatic uplift.

Påsse, T., *Boreas,* Mar. 1998, 27(1), p.69-80, 27 refs.

Pleistocene, Isostasy, Lakes, Shoreline modification, Water level, Stratigraphy, Peat, Lacustrine deposits, Radioactive age determination, Statistical analysis, Sweden

52-5514

Measurement of water transport during freezing in cell suspensions using a differential scanning calorimeter.

Devireddy, R.V., Raha, D., Bischof, J.C., *Cryobiology,* Mar. 1998, 36(2), p.124-155, 51 refs.

Cryobiology, Solutions, Frozen liquids, Freezing, Cooling rate, Water transport, Ice water interface, Hygroscopic water, Heat flux, Temperature measurement, Water temperature, Supercooling, Analysis (mathematics)

52-5515

Ice and thermal regimes on the stretch between the Ust'-Ilim hydroelectric station and mouth of the Angara River under streamflow regulation conditions.

Gotlib, IA.L., Khudiakova, A.I., *Hydrotechnical construction,* Sep. 1997 (Pub. Mar. 98), 31(9), p.578-582, Translated from Gidrotekhnicheskoe stroitel'stvo.

River flow, Electric power, Reservoirs, Ice jams, Ice control, Water level, Flow control, Thermal regime, Seasonal variations, Russia—Angara River

52-5516

Analysis of linear and monoclinal river wave solutions.

Ferrick, M.G., Goodman, N.J., MP 5163, *Journal of hydraulic engineering,* July 1998, 124(7), p.728-741, 22 refs. For another version see 52-3972.

River flow, Hydraulics, Channels (waterways), Water waves, Wave propagation, Unsteady flow, Dynamic properties, Fluid mechanics, Diffusion, Profiles, Analysis (mathematics)

Linear dynamic wave and diffusion wave analytical solutions are obtained for a small, abrupt river flow increase from an initial to a higher steady flow. Equations for the celerities of points along the wave profiles are developed from the solutions and are related to the kinematic wave and dynamic wave celerities. The linear solutions are compared systematically in a series of case studies to evaluate the differences caused by inertia. These comparisons use the celerities of selected profile points, the paths of these points on the x-t plane, and complete profiles at selected times, and indicate general agreement between the solutions. A monoclinal-diffusion solution for the diffusion wave equations is developed and dynamic wave-diffusion wave comparisons are made over a range of amplitudes with the same case studies used for linear waves. Inertial effects on the monoclinal profiles occur near the leading edge, increase with the wave amplitude and Froude number, and are responsible for the differences between the dimensionless profiles.

52-5517

Upper-mantle stratigraphy of the Slave craton, Canada: insights into a new kimberlite province.

Kopylova, M.G., Russell, J.K., Cookenboo, H., *Geology,* Apr. 1998, 26(4), p.315-318, 42 refs.

Pleistocene, Geological surveys, Geologic structures, Geologic processes, Magma, Thermal regime, Boundary layer, Lithology, Mineralogy, Stratigraphy, Classifications, Canada—Northwest Territories

52-5518

Quantification of sulfur and phosphorus within secondary gold rims on Yukon placer gold.

Southam, G., *Geology,* Apr. 1998, 26(4), p.339-342, 30 refs.

Geological surveys, Mineralogy, Sediments, Gold, Crystals, Geochemical cycles, Microbiology, Electron microscopy, Microstructure, Canada—Yukon Territory—Stewart River

52-5519

Ridge-forming, ice-bounded lava flows at Mount Rainier, Washington.

Lescinsky, D.T., Sisson, T.W., *Geology,* Apr. 1998, 26(4), p.351-354, 17 refs.

Pleistocene, Geomorphology, Glacial geology, Glacier ice, Ice dams, Volcanoes, Magma, Mass flow, Ice solid interface, Theories, Models, United States—Washington—Rainier, Mount

52-5520

Proceedings of the Joint 54th Annual Eastern Snow Conference and 65th Annual Western Snow Conference, Banff, Alberta, May 4-8, 1997.

Eastern Snow Conference and Western Snow Conference, Albert, M.R., ed, Taylor, S., ed, MP 5164, 372p., Refs. passim. For individual papers see 52-5521 through 52-5558.

Snow surveys, Snow cover distribution, Snow depth, Snowfall, Snow accumulation, Snow hydrology, Snow water equivalent, Snowmelt, Runoff forecasting

52-5521

Characteristics of snowmelt from NRCS SNOTEL (SNOwTELemetry) sites.

Cooley, K.R., Palmer, P.L., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.1-11, 5 refs.

Snow surveys, Snow hydrology, Snow water equivalent, Snowmelt, Runoff forecasting, Flood forecasting, Data processing, Data transmission, Computerized simulation, United States

52-5522

"Hydro-fuels-", maintenance-, and pricing risk management—changing times in snow zone water management.

Freeman, G.J., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.12-19, 5 refs.

Snow surveys, Snow water equivalent, Snow hydrology, Snowmelt, Runoff forecasting, Water storage, Water reserves, Electric power, Utilities, Cost analysis, Statistical analysis, United States—California

52-5523

Spatially-distributed modeling of snow in the boreal forest: a simple approach.

Davis, R.E., Woodcock, C.E., Hardy, J.P., Ni, W.G., Jordan, R., McKenzie, J.C., MP 5165, *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.20-28, 31 refs.

Snow cover distribution, Snow hydrology, Snow melting, Snow cover effect, Snow air interface, Snow heat flux, Taiga, Forest land, Forest canopy, Vegetation factors, Radiation balance, Statistical analysis, Computerized simulation

Simulations using physics-based, coupled canopy-snow models provided the basis for developing simple regression models of net energy transfer to snow cover in the boreal forest. The simple models were driven by incoming solar radiation to the top of forest canopies, forest species, tree height and canopy density. Maps of the forest characteristics provided the basis for spatially distributing snow predictions over two test areas in the boreal forest. Over both test areas, variation of incoming solar radiation explained much of the variance in net energy transfer to snow cover. The authors found the strongest correlations for the relatively open, discontinuous canopies of the northern boreal forest.

52-5524

Estimating the spatial distribution of snow water equivalence in a montane watershed.

Elder, K., Rosenthal, W., Davis, R.E., MP 5166, *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.29-41, 35 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow density, Snow water equivalent, Snow hydrology, Snowmelt, Runoff forecasting, Statistical analysis, Image processing, Computerized simulation, United States—California—Sierra Nevada

The authors describe an approach to model distributed snow water equivalence (SWE) that merges field measurements of depth and density with remotely sensed snow-covered area (SCA). In 1993 two teams conducted a snow survey in the Blackcap Basin of the Kings River. They measured snow depth and density. Regression tree models showed that net radiation, elevation, and slope angle account for 60-70% of the variance in the depth and density measurements. The gridded depth estimates combined with modeled density produced spatially distributed estimates of SWE. An unsupervised spectral unmixing algorithm estimated snow cover fractions from Landsat-5 Thematic Mapper data acquired at the time of the snow survey. This method provides a snow cover fraction estimate for every pixel. The authors used this subpixel map as their best estimate for SCA and combining it with the SWE map allowed them to compute SWE volume. They compared the estimated volume using the subpixel SCA map with several SCA maps produced with simulations of binary SCA mapping techniques.

52-5525

Snow accumulation under various forest stand densities at Tenderfoot Creek Experimental Forest, Montana, USA.

Moore, C.A., McCaughey, W.W., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.42-51, 30 refs.

Snow surveys, Snow cover distribution, Snow accumulation, Snow hydrology, Snow water equivalent, Forest land, Forest canopy, Vegetation factors, Interception, Statistical analysis, United States—Montana

52-5526

Historic role of fire in determining annual water yield from Tenderfoot Creek Experimental Forest, Montana, USA.

McCaughey, W.W., Farnes, P.E., Hansen, K.J., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.52-60, 18 refs.

Forest land, Forest canopy, Vegetation factors, Forest fires, Precipitation (meteorology), Snowfall, Snow water equivalent, Runoff, Water balance, Statistical analysis, United States—Montana

52-5527

Field measurements of snowdrift development rate.

Haehnel, R.B., Lever, J.H., Tabler, R.D., MP 5167, *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.61-68, 18 refs.

Snowdrifts, Blowing snow, Snow erosion, Wind erosion, Snow fences, Snow loads, Wind tunnels, Environmental tests

For successful snow drift modeling, similitude of drift geometry and development rate must be preserved between model and prototype. Earlier work revealed that field data documenting drift development are scarce, yet such data are necessary to validate proposed modeling methods. This requires measurement of the evolving drift topography and concurrent measurement of the incident mass transport and flow field throughout the drifting event. The authors established a field program to measure drift development on a two-dimensional solid fence during the winters of 1996 and 1997 at two field sites located in Wyoming. The developing drift topography was measured using graduated snow stakes placed around the objects. The incident mass transport was measured using a Wyoming snow fence as a snow trap. The incident flow field was also documented. The authors compare prototype drift geometries and development rates with corresponding preliminary model data obtained in a snow drifting wind tunnel. The field data revealed some inaccuracies in the model drift geometry and development rate which might result from distortion in snow transport concentrations and particle trajectory lengths. Further work is required to minimize the effects of model distortions. The field data obtained in this work will serve as benchmark data for evaluating modeling methodologies.

52-5528

Atlantic Ocean-atmosphere interactions and snowfall in southern New England.

Hartley, S., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.69-79, 22 refs.

Snowfall, Snowstorms, Marine atmospheres, Atmospheric circulation, Air temperature, Water temperature, Surface temperature, Air water interactions, Climatic changes, Long range forecasting, United States—New England

52-5529

Effects of light intensity and blue, green and red wavelengths on mating strategies in the snow alga, *Chloromonas* sp.-D, from the Tughill Plateau, New York State.

Hoham, R.W., et al, *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.80-90, 37 refs.

Snow composition, Snowmelt, Snow optics, Snow cover effect, Light (visible radiation), Light effects, Algae, Cryobiology, Ecology, Photosynthesis, Biomass, United States—New York

52-5530

Impact of glacier recession upon the discharge of the Bow River above Banff, Alberta, 1951-1993.

Hopkinson, C., Young, G.J., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.91-102, 18 refs.

Glacier surveys, Glacier mass balance, Glacial hydrology, Glacier melting, Glacial rivers, Meltwater, Runoff forecasting, Water reserves, Canada—Alberta—Banff

52-5531

Snowpack chemistry as an indicator of pollutant emission levels from motorized winter vehicles in Yellowstone National Park.

Ingersoll, G.P., Turk, J.T., McClure, C., Lawlor, S., Clow, D.W., Mast, M.A., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.103-113, 21 refs.

Snow vehicles, Human factors, Air pollution, Snow composition, Snow impurities, United States—Wyoming—Yellowstone National Park

52-5532

Snow ablation modeling in conifer and deciduous stands of the boreal forest.

Hardy, J.P., Davis, R.E., Jordan, R., Ni, W.G., Woodcock, C.E., MP 5168, *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.114-124, 28 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow accumulation, Snow hydrology, Snow heat flux, Snow melting, Snow air interface, Snow evaporation, Taiga, Forest land, Forest canopy, Litter, Vegetation factors, Interception, Albedo, Computerized simulation

Both coniferous and deciduous forests alter the energy exchange and the accumulation and ablation of snow on the ground. Snow ablation modeling at the stand scale presents challenges to account for the variability in snow cover and the large variations of solar and thermal radiation incident to the forest floor. Previous work by the authors coupled a one-dimensional snow process model (SNTHERM), modified for forested conditions, with a model of radiation interactions with forest canopies to successfully predict snow ablation in a mature jack pine stand. Now, the authors use the same approach and model snow ablation in black spruce and aspen stands and verify the modeling effort by comparison with field data. A new routine is added to SNTHERM to account for forest litter on the snow surface, thereby affecting the albedo. They measured incoming solar and thermal irradiance beneath the forest canopy. At peak accumulation, snow depths in black spruce tree wells were approximately 65% of that measured in forest gaps. Snow in the aspen stand ablated 26 days before snow in the black spruce stand and both results compare favorably with available measured data.

52-5533

Very warm storms and Sierra Nevada snowpacks.

Kattelmann, R., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.125-129, 19 refs.

Snowstorms, Snowfall, Precipitation (meteorology), Rain, Snow hydrology, Snow melting, Stream flow, Floods, Accidents, Cost analysis, United States—California—Sierra Nevada

52-5534

Accumulation of intercepted snow in the boreal forest: measurements and modelling.

Hedstrom, N.R., Pomeroy, J.W., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.130-141, 23 refs.

Snow surveys, Snow hydrology, Snowmelt, Snow evaporation, Snow water equivalent, Taiga, Forest land, Forest canopy, Vegetation factors, Interception, Runoff forecasting, Mathematical models

52-5535

Application of SLURP hydrological model to a sub-arctic basin.

Li, B., Kite, G.W., Haberlandt, U., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.142-151, 11 refs.

Snow hydrology, Snow water equivalent, Snowmelt, Watersheds, River basins, Precipitation (meteorology), Water balance, Stream flow, Runoff forecasting, Computerized simulation, Canada—Yukon Territory—Whitehorse

52-5536

Operational distributed snow dynamics model for the Sava River, Bosnia.

Melloh, R.A., Daly, S.F., Davis, R.E., Jordan, R., Koenig, G.G., MP 5169, *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.152-162, 21 refs.

Snowstorms, Snowfall, Snow depth, Snow hydrology, Snow water equivalent, Snowmelt, River flow, Stream flow, Runoff forecasting, Flood forecasting, Computerized simulation, Bosnia, Sava River

A method of estimating and forecasting snow pack dynamics for a large remote basin in Bosnia was developed and consists of a highly automated, spatially distributed model for operational simulation and forecasting of snow pack depth, snow water equivalent, soil freeze-thaw state, and flux of snow melt and rain infiltration to the base of the pack. The model, applied to hydrologic forecasts in Bosnia during the winter of 1996-97, has potential use in domestic flood and water supply forecasting. SNTHERM, a complex one-dimensional energy balance model that takes into account most physical processes within the snow cover, was used for snow pack computations. The model was distributed across the landscape by 1-km pixels, using a categorical classification of the basin into 216 slope, aspect and meteorology types. The model system was highly automated. Runoff ratios (runoff/rainfall) for the winter of 1996-97 compared well to long term average runoff coefficients, indicating precipitation data used to drive the model were reasonable. Supporting research issues are discussed.

52-5537

Spatially-distributed snowmelt rates in a boreal forest basin.

Metcalfe, R.A., Buttle, J.M., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.163-174, 22 refs.

Snow surveys, Snow hydrology, Snow water equivalent, Snow heat flux, Snow melting, Snowmelt, Taiga, Forest land, Forest canopy, Vegetation factors, Runoff forecasting

52-5538

Local advection of sensible heat during snowmelt.

Neumann, N., Marsh, P., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.175-185, 27 refs.

Snow hydrology, Snow heat flux, Snowmelt, Snow melting, Snow cover effect, Forest tundra, Albedo, Heat balance, Advection, Mathematical models

52-5539

Development of the Prairie Blowing Snow Model for application in climatological and hydrological models.

Pomeroy, J.W., Li, L., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.186-197, 26 refs.

Snow surveys, Snow cover distribution, Snowfall, Snow accumulation, Snow air interface, Blowing snow, Snow erosion, Wind erosion, Snow evaporation, Snowmelt, Snow water equivalent, Computerized simulation

52-5540

Interactive Multisensor Snow and Ice Mapping System.

Ramsay, B.H., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.198-209, 19 refs. Incl. 6 Internet sites.

Snow surveys, Snow cover distribution, Snow depth, Ice surveys, Sea ice distribution, Terrain identification, Spaceborne photography, Sensor mapping, Image processing, Data processing, Data transmission, Computer applications

52-5541

Experiment in use of seasonal long-range weather forecasts for water supply forecasts in northern California.

Roos, M., Ross, C., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.210-220, 4 refs.

Snow surveys, Snowfall, Snow hydrology, Snowmelt, Precipitation (meteorology), Weather forecasting, Long range forecasting, Water reserves, Stream flow, Runoff forecasting, Statistical analysis, United States—California—Sierra Nevada

52-5542

Effects of climate change on water resources and runoff in an alpine basin.

Seidel, K., Ehrler, C., Martinec, J., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.221-229, 8 refs.

Snow hydrology, Snow accumulation, Snowmelt, Precipitation (meteorology), Global warming, Water reserves, Runoff forecasting, Computerized simulation, Switzerland

52-5543

Learning scientific writing through snowpack study.

Chisholm, R.M., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.230-237, 21 refs.

Snow surveys, Research projects, Education

52-5544

Stepwise multiple regression snow models: GIS applications in the Marmot Creek Basin, (Kananaskis Country, Alberta) Canada and the National Park Berchtesgaden, (Bayern) Germany.

Forsythe, K.W., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.238-247, 42 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow accumulation, Snow hydrology, Snow water equivalent, Runoff forecasting, Spaceborne photography, Image processing, Computer applications, Statistical analysis, Canada—Alberta, Germany

52-5545

Spatial and temporal variability of Canadian monthly snow depths, 1946-1995.

Brown, R.D., Braaten, R.O., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.248-259, 30 refs.

Snow surveys, Snow cover distribution, Snow depth, Climatic changes, Atmospheric circulation, Meteorological data, Data processing, Statistical analysis, Canada

52-5546

Impact of climatic warming to the droughts of Canadian prairies.

Gan, T.Y., Singh, P.R., Seneka, M., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.260-269, 16 refs.

Plains, Air temperature, Precipitation (meteorology), Snowmelt, Stream flow, Water balance, Desiccation, Climatic changes, Global warming, Statistical analysis, Canada—Alberta, Canada—Saskatchewan, Canada—Manitoba

52-5547

Net volumetric loss of glacier cover within the Bow Valley above Banff, 1951-1993.

Hopkinson, C., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.270-278, 16 refs.

Glacier surveys, Glacial hydrology, Glacier mass balance, Glacier melting, Glacial rivers, Global warming, Water reserves, Runoff forecasting, Canada—Alberta—Banff

52-5548

Coal Lake outlet freeze-up, containment of winter inflows and estimates of related outburst flood on Wolf Creek, Yukon Territory.

Jasek, M., Ford, G., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.279-288, 4 refs.

Frozen lakes, Lake ice, Freezeup, Naleds, Ice dams, Lake bursts, Floods, Flood forecasting, Canada—Yukon Territory—Whitehorse

52-5549

Detector for determining snow water content based on attenuation of cosmic radiation.

Gehrke, F., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.289-293, 6 refs.

Snow surveys, Snow hydrology, Snow water content, Snow optics, Gamma irradiation, Attenuation, Radiation measurement, Radiation measuring instruments

52-5550

Comparison of average annual precipitation distributed by different GIS models for the Bitterroot watershed, Montana.

Hammer, R.G., Farnes, P.E., McLeod, R.A., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.294-309, 5 refs.

Watersheds, Precipitation (meteorology), Computerized simulation, Statistical analysis, United States—Montana

52-5551

River basin variations in Sierra Nevada snowpack accumulation trends.

Johnson, T., Dozier, J., Michaelsen, J., Fohl, P., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.310-316, 11 refs.

Snow surveys, Snow hydrology, Snow water equivalent, Snowmelt, Global warming, Water reserves, Runoff forecasting, Computerized simulation, Statistical analysis, United States—California—Sierra Nevada

52-5552

Scale effects in a distributed SWE and snowmelt model for mountain basins.

Cline, D.W., Elder, K., Bales, R.C., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.317-328, 9 refs.

Snow surveys, Snow cover distribution, Snow hydrology, Snow water equivalent, Snowmelt, Runoff forecasting, Computerized simulation, United States—California—Sierra Nevada

52-5553

Determination of snow covered area using RADARSAT imagery on two small test sites in southern Ontario.

Seglenieks, F., Soulis, E.D., Kouwen, N., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.329-337, 10 refs.

Snow surveys, Snow cover distribution, Terrain identification, Spaceborne photography, Image processing, Canada—Ontario

52-5554

Measurement of differences in snow accumulation, melt, and micrometeorology between clearcut and mature forest stands.

Storck, P., Kern, T., Bolton, S., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.338-343, 4 refs.

Snow surveys, Snow accumulation, Snow hydrology, Snowmelt, Snow water equivalent, Forest land, Vegetation factors, Runoff forecasting, United States—Washington, United States—Oregon

52-5555

Spatially distributed snowmelt inputs to a semiarid mountain watershed.

Luce, C.H., Tarboton, D.G., Cooley, K.R., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.344-353, 17 refs.

Snow surveys, Snow cover distribution, Snow accumulation, Snowdrifts, Snow hydrology, Snow water equivalent, Snowmelt, Topographic effects, Stream flow, Computerized simulation, Runoff forecasting, United States—Idaho

52-5556

Overcollection of solid precipitation by a standard precipitation gage, Niwot Ridge, Colorado.

Bardsley, T., Williams, M.W., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.354-362, 7 refs.

Snow surveys, Snowfall, Blowing snow, Precipitation (meteorology), Snow survey tools, Precipitation gages, United States—Colorado—Front Range

52-5557

Snowpack characteristics of an alpine site in the Sierra Nevada.

Kattelmann, R., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.363-366, 17 refs.

Snow surveys, Snow cover distribution, Snow accumulation, Snow depth, Snow hydrology, Snow water equivalent, Snowmelt, United States—California—Sierra Nevada

52-5558

Investigation of the thermal properties of traditional snow shelters.

Mueller, D., *Eastern Snow Conference and Western Snow Conference. Proceedings,* 1997, Joint 54th and 65th, p.367-372, 10 refs.

Snow houses, Shelters, Snow (construction material), Snow thermal properties

52-5559

Alpine permafrost: concepts, morphology and methods of identification (with three representative studies in the upper Valtellina). [Il permafrost alpino: concetti, morfologia e metodi di individuazione (con tre indagini esemplificative in alta Valtellina)]

Guglielmin, M., Notarpietro, A., Quaderni di geodinamica alpina e quaternaria (Notebooks on alpine and Quaternary geodynamics), Vol.5, Milan, Consiglio Nazionale delle Ricerche, Centro di Studio per la Geodinamica Alpina e Quaternaria, 1997, 117p., In Italian with captions in English. Refs. passim.

Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost dating, Permafrost heat balance, Periglacial processes, Rock glaciers, Ground ice, Italy

52-5560

Forced air de-icing trials for the 1994-1995 winter.

Dawson, P., D'Avirro, J., *Transport Canada. Dryden Commission Implementation Project. Publication,* Dec. 1995, TP 12655E, 35p + appends., With French summary.

Aircraft icing, Artificial melting, Ice removal, Defrosting, Cold weather tests, Environmental tests

52-5561

Influence of flaws in reducing loads in ice/structure interaction events.

Timco, G.W., *National Research Council Canada. Division of Mechanical Engineering. Hydraulics Laboratory. Technical report,* Mar. 1988, TR-HY-020, 51p., With French summary. 24 refs.

Offshore structures, Artificial islands, Ice solid interface, Ice loads, Ice pressure, Ice cracks, Ice cover strength, Ice deformation, Ice breaking, Stress concentration, Environmental tests, Penetration tests

52-5562

Prospecting and mining activity in the Rampart, Manley Hot Springs and Fort Gibbon mining districts of Alaska, 1894 to the present era.

L'Ecuyer, R.E., *U.S. Bureau of Land Management. Alaska State Office, Anchorage. BLM-Alaska open file report,* Feb. 1997, No.61, 179p., Refs. p.155-179.

Exploration, Gold, Mining, History, United States—Alaska

52-5563

Emergency response and related issues for the Bilibino Nuclear Power Plant; overview report.

Perrigo, L.D., Lewin, J., Nelson, B.K., Tedford, C.F., Anchorage, University of Alaska, Environment and Natural Resources Institute, 1994, 51p., 5 refs.

Nuclear power, Accidents, Air pollution, Fallout, Safety, Health, Warning systems, Radioactive wastes, Waste disposal, Regional planning, International cooperation, Russia—Chukotskiy Peninsula, United States—Alaska

52-5564

Power station at Meråker: possible effects on water temperature and ice conditions. [Kraftverkene i Meråker: mulige virkninger på vanntemperatur- og isforhold]

Asvall, R.P., *Norges vassdrags- og energiverk. Hydrologisk avdeling (Norwegian Water Resources and Energy Administration. Hydrology Department). Oppdragsrapport,* 1986, No.6-86, 21p., In Norwegian. 2 refs.

Electric power, Thermal pollution, Water temperature, River ice, Ice conditions, Regional planning, Norway

52-5565
Ice and water temperature conditions in the Rana River watercourse before and after the Svartis development. [Is- og vanntemperaturforhold i Ranavassdraget før og etter Svartis-utbyggingen]
Wold, K., *Norges vassdrags- og elektrisitetsvesen. Hydrologisk avdeling (Norwegian Water Resources and Electricity Board. Hydrology Department). Oppdragsrapport,* 1980, No.3-80, 42p., In Norwegian.
River ice, Ice conditions, Electric power, Thermal pollution, Water temperature, Regional planning, Norway

52-5566
Kobb River development: possible effects on water temperature and ice conditions in the affected watercourse and fjord. [Kobbelvutbyggingen: mulige virkninger på vanntemperatur- og isforhold i berørte vassdrag og i fjorden]
Asvall, R.P., *Norges vassdrags- og elektrisitetsvesen. Hydrologisk avdeling (Norwegian Water Resources and Electricity Board. Hydrology Department). Oppdragsrapport,* 1979, No.1-79, 54p., In Norwegian. 5 refs.
River ice, Ice conditions, Electric power, Thermal pollution, Water temperature, Regional planning, Norway

52-5567
Water temperature and ice conditions in the Vefsna River watercourse: description of current conditions and assessment of the conditions after planned development. [Vanntemperatur-og isforhold i Vefsnavassdraget: beskrivelse av nåværende forhold og vurdering av forholdene etter en planlagt utbygging]
Wold, K., *Norges vassdrags- og elektrisitetsvesen. Hydrologisk avdeling (Norwegian Water Resources and Electricity Board. Hydrology Department). Rapport,* Mar. 1978, No.1-78, 64p., In Norwegian.
River ice, Ice conditions, Electric power, Thermal pollution, Water temperature, Regional planning, Norway

52-5568
Viscoelastic constitutive model for creep of frozen soil.
Sun, Q.X., Domaschuk, L., Shields, D.H., Rahman, M., International Symposium on Numerical Models in Geomechanics, 3rd, Niagara Falls, Ontario, May 5-8, 1989, London, Elsevier Applied Science, 1989, p.179-186, 6 refs.
Frozen ground strength, Frozen ground compression, Soil creep, Soil tests, Strain tests, Stress strain diagrams, Mathematical models

52-5569
Friction on the ski slopes.
Allen, J., *Physics world,* Mar. 1997, 10(3), p.17.
Skis, Wood snow friction, Plastics snow friction

52-5570
Rehabilitation of Hodenpyl tailrace retaining walls.
Amthor, J.C., Roarty, C.J., Jr., Stadnicar, J.B., International Conference on Hydropower. Waterpower '97. Atlanta, GA, Aug. 5-8, 1997. Proceedings. Edited by D.J. Mahoney, New York, American Society of Civil Engineers, 1997, p.1600-1609, 2 refs.
DLC TK1081.W36a Vol.3 1997
Banks (waterways), Spillways, Walls, Concrete structures, Earth fills, Freeze thaw cycles, Damage, Modification, Anchors, Construction materials, United States—Michigan

52-5571
Utilizing the Internet for reservoir management during rain-on-snow events.
Freeman, G., International Conference on Hydropower. Waterpower '97. Atlanta, GA, Aug. 5-8, 1997. Proceedings. Edited by D.J. Mahoney, New York, American Society of Civil ENgineers, 1997, p.1757-1766, 2 refs.
DLC TK1081.W36a Vol.3 1997
Precipitation (meteorology), Rain, River basins, Weather forecasting, Runoff forecasting, Snow cover effect, Ice water interface, Electric power, Water supply, Flow control, Reservoirs, Telecommunication, Computer applications, United States—California

52-5572
Significant soil properties in the thermal and structural design of building foundations.
Goldberg, L.F., Innovative Design and Construction for Foundations and Substructures Subject to Freezing and Frost, Minneapolis, MN, Oct. 5-8, 1997. Proceedings. Edited by C.K. Tan and Geotechnical Special Publication No.73, Reston, American Society of Civil Engineers, 1997, p.1-18, 6 refs.
DLC TH2101.I53 1997
Construction, Buildings, Foundations, Soil freezing, Frost heave, Frost protection, Soil composition, Thermal properties, Computerized simulation, Mechanical tests, Design criteria, Specifications

52-5573
Status of ASCE Standard on design and construction of frost protected shallow foundations.
Danyluk, L.S., Crandell, J.H., MP 5170, Innovative Design and Construction for Foundations and Substructures Subject to Freezing and Frost, Minneapolis, MN, Oct. 5-8, 1997. Proceedings. Edited by C.K. Tan and Geotechnical Special Publication No.73, Reston, American Society of Civil Engineers, 1997, p.19-31, 15 refs.
DLC TH2101.I53 1997
Cold weather construction, Buildings, Footings, Foundations, Insulation, Frost heave, Heat transfer, Frost protection, Standards, Building codes, Design criteria
A Frost-Protected Shallow Foundation (FPSF) is a practical alternative to deeper, more costly foundations in cold regions having seasonal ground freezing and the potential for frost heave. An FPSF incorporates strategically placed insulation to raise the frost depth around a building, thereby allowing foundations as shallow as 16 in., even in the most severe climates. This procedure has been used extensively in the Scandinavian countries over the last 40 years. ASCE is currently developing a Standard that would be used in the design of FPSFs. The Standard is based on proven Scandinavian practices and various studies performed in the U.S., including computer modeling and field verification tests.

52-5574
Aspects of geotechnical engineering in permafrost regions.
Oswell, J.M., Hanna, A.J., Innovative Design and Construction for Foundations and Substructures Subject to Freezing and Frost, Minneapolis, MN, Oct. 5-8, 1997. Proceedings. Edited by C.K. Tan and Geotechnical Special Publication No.73, Reston, American Society of Civil Engineers, 1997, p.32-50, 31 refs.
DLC TH2101.I53 1997
Cold weather construction, Permafrost bases, Permafrost beneath structures, Permafrost physics, Foundations, Footings, Insulation, Frost heave, Frost protection, Snow cover effect, Engineering, Design, Environmental protection

52-5575
Spatial and temporal variability of estimated maximum soil freezing depths in the northeastern U.S.
DeGaetano, A.T., Wilks, D.S., Innovative Design and Construction for Foundations and Substructures Subject to Freezing and Frost, Minneapolis, MN, Oct. 5-8, 1997. Proceedings. Edited by C.K. Tan and Geotechnical Special Publication No.73, Reston, American Society of Civil Engineers, 1997, p.51-62, 11 refs.
DLC TH2101.I53 1997
Soil freezing, Distribution, Frozen ground thermodynamics, Frost penetration, Thermal diffusion, Records (extremes), Statistical analysis, Mathematical models, Simulation, Frost forecasting, Seasonal variations, United States

52-5576
Floods in river valleys of eastern Siberia.
Korytnyĭ, L.M., Kichigina, N.V., *Water resources,* Mar.-Apr. 1998, 25(2), p.143-147, Translated from Vodnye resursy. 17 refs.
River basins, Subarctic landscapes, Flooding, Water level, Ice jams, Snowmelt, Runoff, Classifications, Statistical analysis, Russia—Siberia

52-5577
Mechanisms of the cycle of natural and human-introduced metals in surface waters of the Arctic Basin.
Moĭseenko, T.I., Dauvalter, V.A., Rodushkin, I.V., *Water resources,* Mar.-Apr. 1998, 25(2), p.212-224, Translated from Vodnye resursy. 24 refs.
Air pollution, Water pollution, Subarctic landscapes, Surface waters, Lake water, Waste disposal, Aerosols, Metals, Ion diffusion, Migration, Sedimentation, Environmental impact, Environmental tests, Sampling, Russia—Kola Peninsula

52-5578
Assessment of the degree of surface water acidification by the zoobenthic reaction in the northeastern part of Fennoscandia.
IAkovlev, V.A., *Water resources,* Mar.-Apr. 1998, 25(2), p.225-231, Translated from Vodnye resursy. 17 refs.
Water pollution, Subpolar regions, Surface waters, Lake water, Ecology, Biomass, Aerosols, Sedimentation, Sampling, Hydrogeochemistry, Environmental tests, Environmental impact, Finland, Norway, Russia—Kola Peninsula

52-5579
Deuterated water in Comet C/1996 B2 (Hyakutake) and its implications for the origin of comets.
Bockelée-Morvan, D., et al, *Icarus,* May 1998, 133(1), p.147-162, Refs. p.160-162.
Extraterrestrial ice, Cosmic dust, Ice composition, Ice sublimation, Vapor diffusion, Water chemistry, Indexes (ratios), Ice detection, Ice spectroscopy, Spectra, Theories

52-5580
1997 PMSE season—its relation to wind, temperature and water vapour.
Kirkwood, S., et al, *Geophysical research letters,* June 1, 1998, 25(11), p.1867-1870, 19 refs.
Climatology, Polar atmospheres, Cloud physics, Stratosphere, Air temperature, Ice crystals, Ice detection, Water vapor, Radio echo soundings, Wind factors, Seasonal variations, Sweden—Kiruna

52-5581
Impact of subvisible cirrus clouds near the tropical tropopause on stratospheric water vapor.
Rosenfield, J.E., Considine, D.B., Schoeberl, M.R., Browell, E.V., *Geophysical research letters,* June 1, 1998, 25(11), p.1883-1886, 16 refs.
Climatology, Stratosphere, Cloud cover, Optical properties, Cloud physics, Ice crystal optics, Particle size distribution, Radiant heating, Water vapor, Condensation, Sedimentation, Models

52-5582
Ice foot development at temperate tidewater margins in Alaska.
Hunter, L.E., Powell, R.D., MP 5171, *Geophysical research letters,* June 1, 1998, 25(11), p.1923-1926, 29 refs.
Glaciology, Glacier ice, Glacier beds, Ice edge, Ice water interface, Bottom ice, Icebergs, Calving, Sedimentation, Profiles, Origin, United States—Alaska—Glacier Bay
This paper presents evidence demonstrating ice feet at tidewater margins in Glacier Bay, AK. Ice feet are likely sources of many submarine icebergs originating at the ice margin. The cause of ice foot development is unclear, but may represent a change in fracture behavior near the bed where higher debris concentrations affect fracture propagation and calving. Ice foot formation can be favored by englacial discharge and sediment ramps along the glacier margin that can cause differential melting of the ice cliff. The presence of ice feet is important to understanding ice-proximal sediment dynamics because they are a primary source of debris-rich icebergs and their calving affects sediment redistribution patterns.

52-5583
North Atlantic Oscillation and its imprint on precipitation and ice accumulation in Greenland.
Appenzeller, C., Schwander, J., Sommer, S., Stocker, T.F., *Geophysical research letters,* June 1, 1998, 25(11), p.1939-1942, 22 refs.
Climatology, Atmospheric circulation, Precipitation (meteorology), Glacial meteorology, Snow accumulation, Glacier thickness, Ice sheets, Ice cores, Seasonal variations, Statistical analysis, Correlation, Greenland

52-5584
Stacked mixing sequence at the base of the Dye 3 core, Greenland.
Souchez, R., Bouzette, A., Clausen, H.B., Johnsen, S.J., Jouzel, J., *Geophysical research letters,* June 1, 1998, 25(11), p.1943-1946, 14 refs.
Glacial geology, Ice sheets, Ice cores, Ice deformation, Bottom ice, Ice composition, Vapor diffusion, Ice solid interface, Bedrock, Isotope analysis, Profiles, Greenland—Dye 3

52-5585
Lateral asthenospheric viscosity variations and postglacial rebound: a case study for the Barents Sea.
Kaufmann, G., Wu, P., *Geophysical research letters,* June 1, 1998, 25(11), p.1963-1966, 19 refs.
Marine geology, Isostasy, Subpolar regions, Rheology, Viscosity, Gravity anomalies, Profiles, Models, Barents Sea

52-5586
Mobility of "unfreezable" and "freezable" water in waxy corn starch by ^{2}H and ^{1}H NMR.
Li, S., Dickinson, L.C., Chinachoti, P., *Journal of agricultural and food chemistry,* Jan. 1998, 46(1), p.62-71, 62 refs.
Polymers, Solutions, Phase transformations, Molecular energy levels, Hygroscopic water, Unfrozen water content, Freezing points, Nuclear magnetic resonance, Spectra, Temperature effects, Thermal analysis, Thermodynamics

52-5587
Original active contour algorithm applied to snow avalanches.
Latombe, B., Ladret, P., Granada, F., Villemain, P., International Conference on Image Processing and its Applications, 6th, Dublin, Ireland, July 14-17, 1997. Collected papers. Publication No.443, Bedfordshire, Institution of Electrical Engineers, 1997, p.404-408, 12 refs.
DLC TA1637.I553a 6th ed.Vol.1
Avalanche modeling, Avalanche mechanics, Boundary layer, Velocity, Surface properties, Deformation, Image processing, Data processing, Mathematical models, Correlation

52-5588
Common macrofaunal dominant species in the sediments of some north Norwegian and Svalbard glacial fjords.
Holte, B., Gulliksen, B., *Polar biology,* June 1998, 19(6), p.375-382, 29 refs.
Glacial deposits, Meltwater, Bottom sediment, Marine deposits, Marine biology, Ecology, Ecosystems, Nutrient cycle, Norway, Norway—Svalbard

52-5589
Macrofauna communities in the Amundsen Basin, at the Morris Jesup Rise and at the Yermak Plateau (Eurasian Arctic Ocean).
Kröncke, I., *Polar biology,* June 1998, 19(6), p.383-392, 41 refs.
Ocean environments, Marine biology, Ecology, Ecosystems, Biogeography, Nutrient cycle, Biomass, Sea ice, Ice cover effect, Arctic Ocean

52-5590
Krill (*Euphausia superba*) density, proportional and absolute recruitment and biomass in the Elephant Island region (Antarctic Peninsula) during the period 1977 to 1997.
Siegel, V., Loeb, V., Gröger, J., *Polar biology,* June 1998, 19(6), p.393-398, 27 refs.
Marine biology, Biomass, Ice cover effect, Antarctica—Elephant Island

The Elephant I. region was selected as a long-term monitoring site to describe the interannual variability of important krill stock parameters. The analysis reviewed and updated krill density and proportional recruitment indices. Krill absolute recruitment and biomass from net sampling surveys are introduced as additional indices from this time series. New survey results from the past two seasons indicate a very successful 1994/95 year-class and slightly below average proportional recruitment of the 1995-96 krill year-class. Absolute recruitment of the 1995-96 year-class was high compared to preceding years, because total stock size was relatively high in 1996-97. After a period of low krill density and biomass in the area for almost a decade, krill density and biomass have increased. Caution is expressed as to whether this observed increase represents a long-term recovery of the stock. (Auth.)

52-5591
Antarctic Geoscience: present status and future opportunities.
Thomson, M.R.A., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.13-20, With Spanish summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al.
Research projects, International cooperation, Economic development, Global change
It is pointed out that working in Antarctica is expensive, and that it behoves the scientist to undertake research that is of the best quality and the most relevant that is achievable. It is argued that there are still cases of low-quality and repetitive science being carried out in Antarctica and that such activity reflects badly not only on those directly responsible but, because antarctic science is something of an international activity, it can also reflect poorly on those doing really good science. The international political climate is such that the time has never been better for multinational collaboration in Antarctica, a mechanism for increasing both the level and quality of scientific output, and of sharing the increasing logistic costs. Opportunities for research in the fields of Global Change (especially on geological time-scales), Earth processes, and the evolution of antarctic marine biotas are briefly reviewed. (Auth.mod.)

52-5592
Evolutionary characteristics of high-latitude Cenozoic sedimentation: the example of the Powell Basin (northeastern Antarctic Peninsula). [Características evolutivas de la sedimentación cenozoica en altas latitudes: el ejemplo de la Cuenca Powell y su entorno (Península Antártica nororiental)]
Viseras, C., Maldonado, A., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.21-29, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 13 refs.
Marine geology, Glacial geology, Geochronology, Bottom topography, Stratigraphy, Tectonics, Seismic surveys, Paleoclimatology, Antarctica—Antarctic Peninsula
Based on the analysis of multichannel seismic profiles of the Powell Basin, five stratigraphic sequences and their geological ages are determined. The seismic facies reveal ten architectonic elements; their distribution through the five sequences indicate the influence of different allogenic factors on sedimentation. The characteristic features, attributed to long-term climatic changes, are described.

52-5593
Continuous record of near-bottom temperature variations in a submarine volcano (Bransfield Strait, Antarctica). [Registro continuo de las variaciones de temperatura del agua de fondo en un volcán submarino (Estrecho de Bransfield, Antártida)]
Calafat, A., Durrieu de Madron, X., Canals, M., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.63-71, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 7 refs.
Marine geology, Ocean currents, Volcanoes, Water temperature, Oceanography, Antarctica—Bransfield Strait
Two short thermistor lines were submerged into a submarine volcano in the Bransfield Strait to monitor deep-water temperature variations. Continuous recording was carried out during 282 days in 1995, with a sampling interval of 20 minutes. Surficial waters coming from the Bellingshausen Sea form a 50 m thick layer of warm, fresh waters, with decreasing temperature down to 200 m depth, where a warmer, saltier and oxygen depleted layer about 200 m thick appears. The temperature variation range measured by the moored thermistors is about 0.8°C. For both thermistors, the temperature time series show a clear seasonal signal with a continuous increase between Feb. and July, from -1.29°C to -0.80°C, followed by a sharp decrease down to -1.6°C from July to Sep. (Auth. mod.)

52-5594
Seismostratigraphy and sedimentation of the SE margin and basin floor of the central Bransfield Strait (Western Antarctica). [Sismoestratigrafía y edificación sedimentaria del margen SE y fondo de cuenca de la Cuenca Central de Bransfield (Antártida Occidental)]
Prieto, M.J., Canals, M., Ercilla, G., Gràcia, E., De Batist, M., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.73-84, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 20 refs.
Glacial geology, Marine geology, Bottom topography, Tectonics, Glacial deposits, Stratigraphy, Seismic surveys, Antarctica—Bransfield Strait
The SE margin of the central Bransfield Basin shows a complex morphology, with a narrow, 200 m deep shelf and a step-like slope. A wide, wavy platform, developed down to 700 m depth, is dominated by sedimentary progradation. It is cut by several glacial troughs. Beneath the platform, a steep slope leads down to an irregular sedimentary rise. The basin floor is mostly flat and descends from 1000 to 1950 m deep towards the NE. Six large volcanoes form a discontinuous NNE-SSW-trending lineation which separates the basin floor into two parts, northwards and southwards of the volcanic lineament. Overlying a complex acoustic basement, the sedimentary cover of the SE margin and basin floor of the central Bransfield Basin reveals the presence of a Lower Sequence whose distribution, internal and configuration and fracturation indicate its syntectonic origin. (Auth. mod.)

52-5595
Pre-Quaternary basement morphology and structure of the Caleta Española, Hurd Peninsula, Livingston Island. [Morfología y estructura del basamento precuaternario de la Caleta Española, Península Hurd, Isla Livingston]
Bergamín, J.F., Durán, J.J., González-Casado, J.M., López-Martínez, J., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.189-196, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 17 refs.
Quaternary deposits, Glacial geology, Geochronology, Geomorphology, Antarctica—Hurd Peninsula
Several Holocene raised beaches, developed on Quaternary sediments with a basement of permotriassic age, the Miers-Bluff Formation, have been investigated on Hurd Peninsula. To determine the characteristics of the Quaternary sediments, their thickness and the geometry of the basement under the raised beaches, geophysical methods were used and the main structural features were mapped. The presence of an ESE-WNW trending buried trough, of approximately 72 m of depth below sea level, is reported as one of the most salient features. (Auth. mod.)

52-5596
Geomorphological maps of Antarctica; comparative analysis. [Los mapas geomorfológicos de la Antártida. Análisis comparativo]
Bruschi, G., López-Martínez, J., Baroni, C., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.197-205, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 26 refs.
Glacial geology, Geomorphology, Geological maps
Existing geomorphological maps of Antarctica published as independent documents have been compiled and analyzed comparatively. The maps have been grouped into two categories: geomorphological maps in the strict sense (s.s.), from which one can obtain information about the dimension, geometry, origin and in some cases, the age of the landforms and mapped deposits; and thematic geomorphological maps, which represent a limited number of geomorphological elements and morphogenetic environments. In total, 10 geomorphological maps s.s. and 6 geomorphological thematic maps have been analyzed. Of the 16 maps considered, 11 correspond to East Antarctica, 2 to West Antarctica, 2 to the subantarctic islands and 1 to most of the antarctic continent. (Auth. mod.)

52-5597

Landforms and Quaternary surface deposits evolution in Half Moon Island, South Shetland Islands. [Evolución de las formas del relieve y los depósitos superficiales cuaternarios en la Isla Media Luna, Islas Shetland del Sur]

Serrano, E., López-Martínez, J., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.207-218, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 17 refs.

Geomorphology, Landforms, Mapping, Glacial deposits, Topographic surveys, Glacial geology, Glaciers, Periglacial processes, Antarctica—Half Moon Island

The authors present a geomorphological map on a 1:10,000 scale, 14 profiles of raised beaches, and an interpretation of the geomorphological evolution of Half Moon I. based on the analysis of the landforms and the surface deposits. Marine landforms are the most characteristic features of the island. Three main groups of marine landforms and deposits have been distinguished: upper platforms (70-90 m), middle platforms (approx. 40 m) and lower raised beaches (<18 m). The two first platforms are pre-Holocene and the third group is Holocene. Glacial processes have retouched the upper zones and periglacial landforms have recently occupied the deglaciated areas. (Auth. mod.)

52-5598

Design considerations of radio-echo sounders for studying temperate glaciers; application to Livingston Island. [Consideraciones de diseño de radioecosondas para el estudio de glaciares templados. Aplicación al sistema glaciar de la Isla Livingston]

Navarro, F.J., Herrero, M.T., Sàbat, F., *Real Sociedad Española de Historia Natural. Boletín. Sección Geológica,* 1997, 93(1-4), p.219-227, In Spanish with English summary. Proceedings of the Spanish Symposium of Antarctic Studies, 6th, Madrid, Sep. 11-14, 1996, edited by A. Perejón, et al. 11 refs.

Glacier surveys, Radio echo soundings, Equipment, Ice electrical properties, Glaciers, Design, Antarctica—Livingston Island

The electrical properties of ice allow the use of electromagnetic waves for the study of glaciers. Temperate glaciers, however, present problems because partial melting produces ice lenses with electrical properties different from those of the surrounding medium, giving rise to scattering difficulties. Problems encountered on Livingston I., whose glaciers are clearly temperate, are outlined: in addition to the measurements of ice thickness at 4 specific points of the island during a British Antarctic Survey airborne radio-glaciological survey in 1975, only 5 ground-based radar profiles were obtained, during the summer of 1992-1993, with results not fully satisfactory. In the study presented here, to improve the equipment and the results, the authors focused on 3 main topics: the baseband radar characteristic of the radio-echo sounder, the resistively loaded antennas and their radiation pattern, and the analysis of the spurious signals appearing in the field data. Block diagrams of emitter and receiver of the radio-echo sounder employed during the field season 92-93 are shown in figures. (Auth. mod.)

52-5599

Proceedings of the NIPR Symposium on Polar Biology, No.11.

Fukuchi, M., Imura, S., NIPR Symposium on Polar Biology, 19th, Tokyo, Dec. 5-6, 1996, Tokyo, National Institute of Polar Research, Feb. 1998, 173p., Refs. passim. For selected papers see B-59656 through B-59660 or 52-5600 through 52-5608.

Sea ice, Marine biology, Plankton, Microbiology, Lake ice, Ecosystems, Ecology, Limnology

The Nineteenth Symposium on Polar Biology was held in Tokyo on Dec. 5-6, 1996. The symposium aimed to compile new scientific results in all fields of biological research in the polar and subpolar regions. Sea ice ecology and flux study and lake ecosystems in polar regions were the main themes of the symposium. The present volume of the proceedings includes 5 full-length papers pertinent to Antarctica.

52-5600

Photosynthetic pigment composition of ice algal and phytoplankton assemblages in early spring in Saroma Ko Lagoon, Hokkaido, Japan.

Kashino, Y., Fujimoto, K., Akamatsu, A., Koike, H., Satoh, K., Kudoh, S., NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.22-32, 24 refs.

Sea ice, Ice optics, Ice cover effect, Algae, Plankton, Photosynthesis, Chlorophylls, Light effects, Physiological effects, Ecology, Biomass, Japan—Hokkaido

52-5601

Trophic status of lakes in Thala Hills, Antarctica—records from the year 1967-68 and 1988.

Kaup, E., NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.82-91, 19 refs.

Biomass, Geochemistry, Plankton, Ice cover effect, Lake ice, Limnology, Antarctica—Glubokoye, Lake, Antarctica—Lagernoye, Lake

Major ions, nutrients and primary production of phytoplankton investigated in lakes of the Thala Hills during 1967-68 and 1988 were compared to discuss changes in environmental conditions. Lakes Glubokoye and Lagernoye revealed chemical stratification during the former and uniform chemical profiles during the latter period. The contents of phosphates in lake waters during the 1967-68 period reached 750 µg P/l and those of ammonia 1300 µg N/l, 1-2 orders of magnitude higher than in the 1988 period. These high contents are explained by higher summer air temperatures which brought about more intensive flushing of the active layer of permafrost with meltwater, and possibly triggered accumulated human impact. (Auth. mod.)

52-5602

Effects of natural UV radiation on Antarctic cyanobacterial mats.

Quesada, A., Goff, L., Karentz, D., NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.98-111, Refs. p.110-111.

Bacteria, Microbiology, Photosynthesis, Ultraviolet radiation, Antarctica—McMurdo Sound

The ultraviolet radiation increase may affect drastically the organisms living in the polar regions, especially those of terrestrial ecosystems exposed to full sunshine. The aim of this work was to investigate the effect of UV radiation on terrestrial cyanobacterial mats. Dominant species in these microbial assemblages belonged to the filamentous, non-heterocystous cyanobacteria group. Heterocystous and coccoid cyanobacteria were subdominant. Although statistical analyses revealed that mats under the 4 UV regimes assayed were not significantly different in community structure nor in pigment composition, their surface appearance changed between treatments. Physiological analyses indicated that the photosynthesis/respiration balance might be affected by UV radiation. (Auth. mod.)

52-5603

Freezing resistance among isolates of a psychrophilic fungus, *Typhula ishikariensis*, from Norway.

Hoshino, T., et al, NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.112-118, 13 refs.

Snow composition, Snow cover effect, Fungi, Plant physiology, Plant ecology, Cryobiology, Acclimatization, Frost resistance, Cold tolerance, Norway

52-5604

Relationship between plant occurrences and surface conditions on a recently deglaciated moraine at Ny-Ålesund, Svalbard, arctic Norway.

Okitsu, S., Minami, Y., Kanda, H., NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.119-127, 29 refs.

Glacier melting, Moraines, Tundra soils, Tundra vegetation, Plant ecology, Vegetation patterns, Revegetation, Norway—Spitsbergen

52-5605

Sun-tracking flower movement and seed production of mountain avens, *Dryas octopetala* L. in the high Arctic, Ny-Ålesund, Svalbard.

Wada, N., NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.128-136, 19 refs.

Tundra vegetation, Plant ecology, Plant physiology, Sunlight, Light effects, Physiological effects, Norway—Spitsbergen

52-5606

Responses of reproductive traits to short-term artificial warming in a deciduous alpine shrub *Geum pentapetalum* (Rosaceae).

Wada, N., Miyamoto, M., Kojima, S., NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.137-146, 17 refs.

Alpine tundra, Tundra vegetation, Plant ecology, Plant physiology, Growth, Phenology, Global warming

52-5607

Short-term effects of wind shield on phenology and growth of alpine plants in Mount Kiso-Komagatake, central Japan.

Fukuyo, S., et al, NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.147-158, 10 refs.

Alpine tundra, Tundra vegetation, Plant ecology, Plant physiology, Growth, Phenology, Wind factors, Climatic changes, Japan

52-5608

Distribution and growth of *Pinus pumila* Regel along the *Larix gmelinii* (Rupr.) Rupr. timberline ecotone of Mt. Dal'nyaya Ploskaya, central Kamchatka.

Okitsu, S., NIPR Symposium on Polar Biology. Proceedings. No.11, Tokyo, National Institute of Polar Research, Feb. 1998, p.159-168, 26 refs.

Forest tundra, Alpine tundra, Tundra vegetation, Plant ecology, Vegetation patterns, Forest lines, Forest strips, Russia—Kamchatka Peninsula

52-5609

Snow and ice science in hydrology.

Nakawo, M., ed, Hayakawa, N., ed, Goodrich, L.E., ed, United Nations Educational Scientific and Cultural Organization (UNESCO). International Hydrological Programme. IHP Training Course on Snow Hydrology, 7th, Nagoya and Myoko, Japan, Mar. 9-22, 1998, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, 135p., Refs. passim. For individual chapters see 52-5610 through 52-5618.

Snow hydrology, Glacial hydrology, Snow heat flux, Snow air interface, Snowmelt, Hydrologic cycle, Atmospheric circulation, Radiation balance, Global warming

52-5610

Water circulation over the earth: the roles of snow and ice.

Nakawo, M., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.1-17, 25 refs.

Hydrologic cycle, Snow cover distribution, Sea ice distribution, Snow cover effect, Ice cover effect, Global warming, Sea level

52-5611

Glaciers and the water cycle.

Ageta, Y., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.19-31, 8 refs.

Glacial hydrology, Glacial meteorology, Glacier mass balance, Glacier oscillation, Global warming, Hydrologic cycle

52-5612

Precipitation processes.

Takeda, T., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.33-46, 5 refs.

Precipitation (meteorology), Clouds (meteorology), Cloud physics, Atmospheric circulation, Global warming, Hydrologic cycle

52-5613

Synoptic conditions and snowfall precipitation processes.

Mizuno, H., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.47-54, 11 refs.

Snowfall, Snow pellets, Snowstorms, Atmospheric circulation, Synoptic meteorology, Weather forecasting, Japan

52-5614
Radiation processes and remote sensing of snow.
Aoki, T., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.55-68, 18 refs.
Snow surface temperature, Snow heat flux, Snow air interface, Snow optics, Albedo, Radiation balance, Radiometry, Spaceborne photography

52-5615
Heat budget of a snow pack.
Ohno, H., Nakawo, M., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.69-88, 16 refs.
Snow heat flux, Snow thermal properties, Snow temperature, Snow air interface, Albedo, Radiation balance, Mathematical models

52-5616
Metamorphism of deposited snow.
Kobayashi, S., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.89-105, 37 refs.
Metamorphism (snow), Snow stratigraphy, Snow morphology, Snow hydrology, Depth hoar, Snow recrystallization, Snow permeability

52-5617
Snowmelt hydrology.
Hayakawa, N., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.107-118, 7 refs.
Snow hydrology, Snow heat flux, Snowmelt, Snow water equivalent, Runoff forecasting, Mathematical models

52-5618
Changes in snow pack and melt water chemistry during snowmelt.
Goto-Azuma, K., Snow and ice science in hydrology. Edited by M. Nakawo, N. Hayakawa, and L.E. Goodrich, Nagoya, University, Institute for Hydrospheric-Atmospheric Sciences, 1998, p.119-133, 24 refs.
Air pollution, Scavenging, Snow hydrology, Snowmelt, Snow composition, Snow impurities, Water chemistry

52-5619
Modelling soil erosion, sediment transport and closely related hydrological processes.
Summer, W., ed, Klaghofer, E., ed, Zhang, W., ed, *International Association of Hydrological Sciences. IAHS publication,* 1998, No.249, 453p., Refs. passim. Proceedings of an international symposium in Vienna, July 13-17, 1998. For selected papers see 52-5620 through 52-5624.
Soil erosion, Water erosion, River flow, Sediment transport, Suspended sediments, Bottom sediment, Alluvium, Gullies

52-5620
Freeze-thaw effects on vehicular ruts and natural rills: importance to soil-erosion and terrain modelling.
Gatto, L.W., MP 5172, *International Association of Hydrological Sciences. IAHS publication,* 1998, No.249, Modelling soil erosion, sediment transport and closely related hydrological processes. Edited by W. Summer, E. Klaghofer, and W. Zhang, p.71-79, 14 refs. Proceedings of an international symposium in Vienna, July 13-17, 1998.
Soil freezing, Frost action, Frost penetration, Soil strength, Soil trafficability, Frost resistance, Freeze thaw tests, Soil erosion, Water erosion, Gullies
Overland flows in vehicle ruts and naturally formed rills can be the dominant carriers of sediment down a hillslope. This research addresses the effects of soil freeze-thaw (FT) on rill and rut geometry, soil density, and infiltration, which partially determine water runoff quantity and velocity, and soil erodibility. Laboratory experiments and field observations showed that soil FT (a) decreased the channel hydraulic radius of a rectangular rill and wheel ruts up to 33%, (b) increased infiltration in wheel ruts by 62%, (c) decreased unconfined compression strength and shear strength in wheel ruts up to 81% and 57%, respectively, and unconfined compression strength in track ruts up to 60%, and (d) formed a V-shaped, 11-cm deep rill in a track rut on a 17° slope during spring thaw, while uncompacted soil adjacent to that rut showed no evidence of rill formation. These results can be used in soil-erosion and terrain-evolution models to account for overwinter modifications to hillslope hydrology and soils.

52-5621
Application of formulae of transporting flow capacity for the computation of suspended sediment in the Lena River.
Bobrovitskaia, N.N., Zubkova, K.M., *International Association of Hydrological Sciences. IAHS publication,* 1998, No.249, Modelling soil erosion, sediment transport and closely related hydrological processes. Edited by W. Summer, E. Klaghofer, and W. Zhang, p.149-156, 9 refs. Proceedings of an international symposium in Vienna, July 13-17, 1998.
River flow, Water erosion, Soil erosion, Suspended sediments, Alluvium, Sediment transport, Permafrost hydrology, Flood forecasting, Russia—Lena River

52-5622
Model for estimating gully morphology.
Sidorchuk, A.IU., Sidorchuk, A., *International Association of Hydrological Sciences. IAHS publication,* 1998, No.249, Modelling soil erosion, sediment transport and closely related hydrological processes. Edited by W. Summer, E. Klaghofer, and W. Zhang, p.333-343, 17 refs. Proceedings of an international symposium in Vienna, July 13-17, 1998.
Permafrost hydrology, Permafrost weathering, Permafrost preservation, Frost action, Snowmelt, Soil erosion, Water erosion, Gullies, Soil conservation, Mathematical models, Russia—Yamal Peninsula

52-5623
Characterization of sediment transport and storage in the upstream portion of the Fraser River (British Columbia, Canada).
Petticrew, E.L., Biickert, S.L., *International Association of Hydrological Sciences. IAHS publication,* 1998, No.249, Modelling soil erosion, sediment transport and closely related hydrological processes. Edited by W. Summer, E. Klaghofer, and W. Zhang, p.383-391, 15 refs. Proceedings of an international symposium in Vienna, July 13-17, 1998.
Human factors, Water pollution, River flow, Suspended sediments, Bottom sediment, Alluvium, Sediment transport, River ice, Ice breakup, Ice cover effect, Canada—British Columbia—Fraser River

52-5624
Process-based estimation of suspended-sediment concentration during the thaw season in a small headwater basin.
Kurashige, Y., *International Association of Hydrological Sciences. IAHS publication,* 1998, No.249, Modelling soil erosion, sediment transport and closely related hydrological processes. Edited by W. Summer, E. Klaghofer, and W. Zhang, p.415-422, 12 refs. Proceedings of an international symposium in Vienna, July 13-17, 1998.
Snowmelt, Snow cover effect, Soil erosion, River basins, River flow, Drainage, Bottom sediment, Suspended sediments, Sediment transport, Japan—Hokkaido

52-5625
On sea ice drift from the wavelet analysis of the Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave Imager (SSM/I) data.
Liu, A.K., Cavalieri, D.J., *International journal of remote sensing,* May 10, 1998, 19(7), p.1415-1423, 15 refs.
Oceanography, Ice surveys, Sea ice distribution, Drift, Polynyas, Spaceborne photography, Synthetic aperture radar, Image processing, Radiance, Sensor mapping, Data processing, Arctic Ocean, Antarctica—Weddell Sea
Wavelet analysis of DMSP SSM/I 85 GHz radiance data is used to obtain daily sea ice drift information for both the northern and southern polar regions. This technique provides improved spatial coverage over the existing array of Arctic Ocean buoys and better temporal resolution over techniques utilizing data from satellite synthetic aperture radars. Examples of derived ice-drift maps for both hemispheres illustrate large-scale circulation reversals over a period of one month. Comparisons with ice displacements derived from buoys give good quantitative agreement. (Auth.)

52-5626
Heavy metal content of meltwaters from the Ross Dependency, Antarctica.
Sheppard, D.S., Deely, J.M., Edgerley, W.H.L., *New Zealand journal of marine and freshwater research,* Sep. 1997, 31(3), P.313-325, 28 Refs.
Environmental tests, Water pollution, Meltwater, Surface waters, Glacier melting, Metals, Sampling, Microelement content, Geochemistry, Antarctica—Ross Island, Antarctica—Wright Valley
Twenty-eight meltwater samples were collected from Scott Base, Cape Evans, Cape Royds, Marble Point, Vanda Station, and along the length of the Onyx River, in the McMurdo Sound area during the summers of 1992-93 and 1993-94. Samples were analyzed for major components and for heavy metals at ultra-trace levels. The sample sites included biologically active ponds, glacier melt water, lake water, roadside drains, and rivers. Sample salinities varied widely, but heavy-metal concentrations were uniformly low except where significant human impacts would have been expected. Concentrations of silver, mercury, lead, copper, cadmium, chromium, nickel and zinc were higher at Scott Base than in the other areas and were dominantly associated with coarse particulates. Natural sources of metals may be local lithology, but chemical and mechanical processes within the soils and solutions affect the distributions of different metals. (Auth.)

52-5627
Semi-empirical model for electric defrosting of a cylindrical coil cooler.
Sherif, S.A., Hertz, M.G., *International journal of energy research,* Jan. 1998, 22(1), p.85-92, 14 refs.
Heat pumps, Refrigeration, Pipes (tubes), Frost, Surface temperature, Defrosting, Electric heating, Ice air interface, Ice solid interface, Ice cover thickness, Ice cover effect, Heat transfer, Mathematical models

52-5628
Visualisation of freezing behaviours in flower bud tissues of cold-hardy *Rhododendron japonicum* by nuclear magnetic resonance micro-imaging.
Price, W.S., Ide, H., Arata, Y., Ishikawa, M., *Australian journal of plant physiology,* 1997, 24(5), p.599-605, 29 refs.
Plant physiology, Cold tolerance, Plant tissues, Thermal analysis, Structural analysis, Supercooling, Imaging, Nuclear magnetic resonance, Low temperature tests

52-5629
Snow crystal habit changes explained by layer nucleation.
Nelson, J., Knight, C., *Journal of the atmospheric sciences,* Apr. 15, 1998, 55(8), p.1452-1465, 69 refs.
Snow physics, Snow crystal growth, Snow crystal structure, Layers, Nucleation, Ice vapor interface, Ice air interface, Supersaturation, Vapor diffusion, Mathematical models, Indexes (ratios)

52-5630
Dynamical constraints on katabatic wind cessation in Adélie Land, Antarctica.
Gallée, H., Pettré, P., *Journal of the atmospheric sciences,* May 15, 1998, 55(10), p.1755-1770, 37 refs.
Wind (meteorology), Polar atmospheres, Turbulent boundary layer, Ice sheets, Ice air interface, Air temperature, Wind velocity, Wind direction, Buoyancy, Diurnal variations, Topographic effects, Mathematical models, Ice cover effect, Antarctica—Adélie Coast
The katabatic wind events observed in the coastal zone of Adélie Land on Nov. 27 and Dec. 3, 1985 are simulated with a hydrostatic mesoscale atmospheric model coupled to a snow model. The diurnal cycle of insolation is strong. The main difference in the forcing between the two events is the large-scale wind, which is weak on Nov. 27 and moderate on Dec. 3. In both cases temperature and wind are characterized by well-marked diurnal cycles. In particular, katabatic winds blow during nighttime and upslope winds during daytime. In both cases the katabatic airstream slows down progressively over the ocean. Consequently, continental air piles up and this generates a pool of cold air responsible for a pressure gradient force opposing the katabatic wind. The results of the simulations are used in order to refine a simple parameterization of antarctic katabatic winds. (Auth. mod.)

52-5631

Cirrus cloud simulation using explicit microphysics and radiation. Part I: model description.

Khvorostianov, V.I., Sassen, K., *Journal of the atmospheric sciences,* May 15, 1998, 55(10), p.1808-1821, 39 refs.

Climatology, Cloud physics, Radiation balance, Optical properties, Ice crystal optics, Ice vapor interface, Supersaturation, Homogeneous nucleation, Heterogeneous nucleation, Thermodynamics, Mathematical models

52-5632

Cirrus cloud simulation using explicit microphysics and radiation. Part II: microphysics, vapor and ice mass budgets, and optical and radiative properties.

Khvorostianov, V.I., Sassen, K., *Journal of the atmospheric sciences,* May 15, 1998, 55(10), p.1822-1845, 35 refs.

Climatology, Cloud physics, Radiation balance, Albedo, Synoptic meteorology, Gravity waves, Turbulent exchange, Ice vapor interface, Ice crystal optics, Radiation absorption, Condensation, Supersaturation, Simulation

52-5633

Improved radiative transfer calculations from information provided by bulk microphysical schemes.

Petch, J.C., *Journal of the atmospheric sciences,* May 15, 1998, 55(10), p.1846-1858, 27 refs.

Climatology, Cloud physics, Precipitation (meteorology), Radiation balance, Radiant heating, Ice crystal optics, Snow optics, Ice water interface, Ice crystal structure, Albedo, Profiles, Mathematical models, Turbulent diffusion

52-5634

On the scattering greenhouse effect of CO_2 ice clouds.

Pierrehumbert, R.T., Erlick, C., *Journal of the atmospheric sciences,* May 15, 1998, 55(10), p.1897-1903, 27 refs.

Climatology, Mars (planet), Extraterrestrial ice, Theories, Cloud cover, Optical properties, Radiation balance, Greenhouse effect, Carbon dioxide, Infrared radiation, Scattering, Ice crystal optics, Albedo, Analysis (mathematics)

52-5635

Effect of electric fields on adhesion of ice to mercury.

Petrenko, V.F., *Journal of applied physics,* July 1, 1998, 84(1), p.261-267, 24 refs.

Ice physics, Ice adhesion, Metals, Ice solid interface, Doped ice, Vapor transfer, Ice electrical properties, Electric fields, Electric charge, Polarization (charge separation), Electrical measurement, Ice control

52-5636

Weakened hydrogen bond interactions in the high pressure phase of ice: ice II.

Dong, S.L., Wang, Y., Kolesnikov, A.I., Li, J.C., *Journal of chemical physics,* July 1, 1998, 109(1), p.235-240, 30 refs.

Water structure, Ice physics, High pressure ice, Molecular structure, Hydrogen bonds, Vibration, Molecular energy levels, Neutron scattering, Spectra, Simulation, High pressure tests

52-5637

Reorientations in supercooled glycerol studied by two-dimensional time-domain deuteron nuclear magnetic resonance spectroscopy.

Böhmer, R., Hinze, G., *Journal of chemical physics,* July 1, 1998, 109(1), p.241-248, 46 refs.

Polymers, Liquid cooling, Supercooling, Phase transformations, Molecular structure, Orientation, Molecular energy levels, Nuclear magnetic resonance, Spectroscopy

52-5638

Anisotropic model of the melting layer.

D'Amico, M.M.G., Holt, A.R., Capsoni, C., *Radio science,* May-June 1998, 33(3), p.535-552, 35 refs.

Precipitation (meteorology), Remote sensing, Radar echoes, Atmospheric composition, Particle size distribution, Ice melting, Ice water interface, Ice crystal structure, Electromagnetic properties, Wave propagation, Anisotropy, Profiles, Thermodynamics, Mathematical models

52-5639

Limiting-state design of permafrost beds for global warming.

Pustovoĭt, G.P., *Soil mechanics and foundation engineering,* Sep.-Oct. 1997(Pub. Mar. 98), 34(5), p.163-166, Translated from Osnovaniia, fundamenty i mekhanika gruntov. 7 refs.

Permafrost bases, Permafrost beneath structures, Frozen ground temperature, Air temperature, Foundations, Global warming, Bearing strength, Thaw weakening, Forecasting, Analysis (mathematics), Safety, Design criteria

52-5640

Consideration of temperature variation in determining the bearing capacity of permafrost beds.

Khrustalev, L.N., Shumilishskiĭ, M.V., *Soil mechanics and foundation engineering,* Sep.-Oct. 1997(Pub. Mar. 98), 34(5), p.167-169, Translated from Osnovaniia, fundamenty i mekhanika gruntov.

Permafrost bases, Permafrost beneath structures, Bearing strength, Frozen ground strength, Frozen ground temperature, Air temperature, Snow cover effect, Pile structures, Design criteria, Building codes, Temperature effects

52-5641

Suspended sediment yield and transfer processes in a small High-Arctic glacier basin, Svalbard.

Hodson, A., Gurnell, A., Tranter, M., Bogen, J., Hagen, J.O., Clark, M., *Hydrological processes,* Jan. 1998, 12(1), p.73-86, 26 refs.

Glacial hydrology, Arctic landscapes, Glacial rivers, Glacier ablation, Meltwater, Sediment transport, Suspended sediments, Hydrography, Statistical analysis, Seasonal variations, Norway—Svalbard

52-5642

Hydrochemistry of runoff from a 'cold-based' glacier in the High Arctic (Scott Turnerbreen, Svalbard).

Hodgkins, R., Tranter, M., Dowdeswell, J.A., *Hydrological processes,* Jan. 1998, 12(1), p.87-103, 22 refs.

Glacial hydrology, Arctic landscapes, Hydrogeochemistry, Glacier melting, Snowmelt, Runoff, Meltwater, Leaching, Solubility, Sampling, Ion density (concentration), Norway—Spitsbergen

52-5643

Seasonal reorganization of subglacial drainage inferred from measurements in boreholes.

Gordon, S., Sharp, M., Hubbard, B., Smart, C., Ketterling, B., Willis, I., *Hydrological processes,* Jan. 1998, 12(1), p.105-133, 34 refs.

Glacial hydrology, Subglacial drainage, Channels (waterways), Meltwater, Turbidity, Electrical resistivity, Boreholes, Hydraulic structures, Water level, Sampling, Seasonal variations, Statistical analysis, Switzerland—Haut Glacier d'Arolla

52-5644

Solute provenance, transport and denudation in a High Arctic glacierized catchment.

Hodgkins, R., Tranter, M., Dowdeswell, J.A., *Hydrological processes,* Nov. 1997, 11(14), p.1813-1832, 45 refs.

Glacial hydrology, Glacial rivers, Runoff, Carbon dioxide, Sediment transport, Weathering, Snow composition, Meltwater, Solubility, Sampling, Hydrogeochemistry, Ion density (concentration), Statistical analysis, Norway—Svalbard

52-5645

Meteorological and runoff time-series characteristics in a small, high-arctic glaciated basin, Svalbard.

Hodson, A.J., Gurnell, A.M., Washington, R., Tranter, M., Clark, M.J., Hagen, J.O., *Hydrological processes,* Mar. 15, 1998, 12(3), p.509-526, 27 refs.

Glacial hydrology, Arctic landscapes, Glacial rivers, Snowmelt, Meltwater, Runoff, Air temperature, Radiation balance, Heat balance, Advection, Seasonal variations, Sampling, Statistical analysis, Norway—Svalbard

52-5646

Field performance of containerized black spruce seedlings with root systems damaged by freezing or pruning.

Bigras, F.J., *New forests,* Jan. 1998, 15(1), p.1-9, 16 refs.

Plant physiology, Forestry, Trees (plants), Growth, Roots, Freezing, Damage, Viability, Cold weather survival, Cold weather tests

52-5647

Effects of plantation location and population on the seasonal freezing tolerance of yellow-cedar (*Chamaecyparis nootkatensis*) stecklings.

Davradou, M., Hawkins, B.J., *New forests,* Jan. 1998, 15(1), p.77-87, 22 refs.

Trees (plants), Plant physiology, Plant ecology, Forestry, Growth, Altitude, Air temperature, Freezing, Damage, Frost resistance, Temperature effects, Statistical analysis, Canada—British Columbia—Vancouver Island

52-5648

Relationships within the coastal and terrestrial geoecosystem of Admiralty Bay, King George Island, South Shetland Islands, maritime Antarctica.

Rakusa-Suszczewski, S., *Oceanological studies,* 1997, 26(1), p.119-125, 9 refs.

Marine biology, Sea ice, Ocean currents, Ecosystems, Antarctica—Admiralty Bay

The main paths by which matter is transported between the shore of Admiralty Bay and the coastal and shelf waters are discussed in terms of trophic relations, physical forces, and fluctuations over long time scales and climatic changes. (Auth.)

52-5649

Transport mechanisms of radiocaesium(^{137}CS) in a land-sea system (the Baltic).

Knapińska-Skiba, D., Radecki, Z., Bojanowski, R., *Oceanological studies,* 1997, 26(1), p.187-194, 7 refs.

Radioactive isotopes, Littoral zone, Sediments, Soil pollution, Fallout, Snowmelt, Sea water, Leaching, Poland—Hel, Poland—Krynica Morska, Poland—Sopot, Poland—Ustka

52-5650

Long term monitoring of atmospheric aerosol particles in the Antarctic Peninsula.

Lima Correia, A., Artaxo, P., Maenhaut, W., *Academia Brasileira de Ciências. Anais,* 1996, 68(1), p.207-222, Refs. p.221-222.

Aerosols, Air pollution, Atmospheric composition, Polar atmospheres, Antarctica—Antarctic Peninsula

Atmospheric aerosols were sampled continuously from Dec. 1985 to Dec. 1993 at the Comandante Ferraz Station. Stacked filter units fitted with 10 μm inlets were used to collect a total of 301 samples in the fine and coarse particle-size modes. Principal factor analyses identified four different types of antarctic aerosols: sea-salt in the coarse and fine particle-size modes, soil dust and sulfates. The concentration of some trace elements appeared too high, indicating the existence of sources of regional or long-range transported pollution in the Antarctic Peninsula. (Auth. mod.)

52-5651

Isolation and characterization of an antifreeze protein with ice nucleation activity from the plant growth promoting rhizobacterium *Pseudomonas putida* GR12-2.

Xu, H., Griffith, M., Patten, C.L., Glick, B.R., *Canadian journal of microbiology,* Jan. 1998, 44(1), p.64-73, With French summary. 45 refs.

Plant physiology, Frost resistance, Soil microbiology, Roots, Bacteria, Ice nuclei, Heterogeneous nucleation, Antifreezes, Chemical composition, Chemical analysis, Temperature effects

52-5652
Effects of abscisic acid and abscisic acid analogs on the induction of freezing tolerance of winter rye (*Secale cereale* L.) seedlings.
Churchill, G.C., Reaney, M.J.T., Abrams, S.R., Gusta, L.V., *Plant growth regulation,* June 1998, 25(1), p.35-45, 46 refs.
Plant physiology, Grasses, Frost resistance, Cold tolerance, Acclimatization, Plant tissues, Modification, Molecular structure, Chemical composition, Chemical analysis

52-5653
Stratigraphy of the Neill Klinter Group; a Lower-lower Middle Jurassic tidal embayment succession, Jameson Land, East Greenland.
Dam, G., Surlyk, F., *Geology of Greenland survey bulletin,* 1998, No.175, 80p. + plates, Refs. p.74-78.
Pleistocene, Subpolar regions, Geological surveys, Earth crust, Quaternary deposits, Marine geology, Sedimentation, Sea level, Water erosion, Tides, Stratigraphy, Lithology, Classifications, Correlation, Greenland—Jameson Land

52-5654
Late-Weichselian ice sheets in arctic and Pacific Siberia.
Grosval'd, M.G., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.3-18, 81 refs.
Pleistocene, Subpolar regions, Ice sheets, Glaciation, Geological surveys, Glacial geology, Geomorphology, Glacial erosion, Moraines, Striations, Space-borne photography, Ice age theory, Russia—Siberia

52-5655
Last ice sheet of the Kara Sea: terrestrial constraints on its age.
Astakhov, V., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.19-28, 49 refs.
Pleistocene, Ice sheets, Glaciation, Subpolar regions, Glacial geology, Marine geology, Geomorphology, Quaternary deposits, Geochronology, Radioactive age determination, Accuracy, Ice age theory, Russia—Kara Sea

52-5656
Stratigraphy and paleogeography of the Sartan glaciation in West Siberia.
Arkhipov, S.A., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.29-42, 54 refs.
Pleistocene, Ice sheets, Glaciation, Geomorphology, Quaternary deposits, Glacial geology, Moraines, Terraces, Stratigraphy, Profiles, Radioactive age determination, Geochronology, Ice age theory, Russia—Siberia

52-5657
Relationship of massive ground ice and the Late Pleistocene history of northwest Siberia.
Michel, F.A., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.43-48, 18 refs.
Pleistocene, Ice sheets, Glaciation, Ice edge, Subpolar regions, Quaternary deposits, Ground ice, Ice wedges, Fossil ice, Stratigraphy, Isotope analysis, Profiles, Geochronology, Ice age theory, Russia—Siberia

52-5658
Scanning electron microscopy of Pleistocene sands from Yamal and Taz peninsulas, Ob River estuary, northwestern Siberia.
Mahaney, W.C., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.49-58, 32 refs.
Pleistocene, Quaternary deposits, Subpolar regions, Sands, Estuaries, Shores, Stratigraphy, Lithology, Scanning electron microscopy, Ice age theory, Russia—Siberia

52-5659
Quaternary vegetation and landscape evolution of Novaya Zemlya in the light of palynological records.
Serebriannyĭ, L.R., Maliasova, E.S., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.59-70, 14 refs.
Pleistocene, Paleoclimatology, Paleoecology, Palynology, Vegetation patterns, Quaternary deposits, Littoral zone, Geochronology, Radioactive age determination, Correlation, Russia—Novaya Zemlya

52-5660
Reconstruction of the 2.4 million km^2 Late Pleistocene ice sheet on the Tibetan Plateau and its impact on the global climate.
Kuhle, M., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.71-108, Refs. p.106-108.
Pleistocene, Paleoclimatology, Ice sheets, Glacial geology, Glaciation, Geomorphology, Mountain glaciers, Ice volume, Moraines, Isostasy, Ice cover effect, Ice age theory, Models, China—Tibet

52-5661
On the problem of Quaternary glaciations, and the extent and patterns of Pleistocene ice cover in the Qinghai-Xizang (Tibet) Plateau.
Zheng, B.X., Rutter, N., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.109-122, 59 refs.
Pleistocene, Ice sheets, Glacial geology, Glaciation, Snow line, Geomorphology, Quaternary deposits, Profiles, Ice age theory, China—Tibet

52-5662
Extent and spatial distribution of Pleistocene glaciations in eastern Tibet.
Lehmkuhl, F., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.123-134, 45 refs.
Pleistocene, Ice sheets, Glaciation, Ice edge, Glacial geology, Geomorphology, Moraines, Profiles, Snow line, Altitude, Ice age theory, China—Tibet

52-5663
Sequence of Quaternary glaciation in the Bayan Har Mountains.
Zhou, S.Z., Li, J.J., *Quaternary international,* Jan.-Feb. 1998, Vol.45-46, p.135-142, 13 refs.
Pleistocene, Ice sheets, Glaciation, Paleoclimatology, Mountain glaciers, Glacial geology, Quaternary deposits, Geochronology, Ice age theory, China—Qinghai Province, China—Bayan Har Mountains

52-5664
Seasonal variability of the long-chain alkenone flux and the effect on the $U^{k'}_{37}$-index in the Norwegian Sea.
Thomsen, C., Schulz-Bull, D.E., Petrick, G., Duinker, J.C., *Organic geochemistry,* 1998, 28(5), p.311-323, 67 refs.
Oceanography, Paleoecology, Sediment transport, Suspended sediments, Sedimentation, Subpolar regions, Hydrocarbons, Organic nuclei, Radioactive isotopes, Geochemical cycles, Seasonal variations, Isotope analysis, Indexes (ratios), Norwegian Sea, Barents Sea

52-5665
Magnitude and sources of sediment input to the Mackenzie Delta, Northwest Territories, 1974-94.
Carson, M.A., Jasper, J.N., Conly, F.M., *Arctic,* June 1998, 51(2), p.116-124, With French summary. 29 refs.
River basins, Estuaries, Deltas, Sediment transport, River flow, Suspended sediments, Sampling, Seasonal variations, Statistical analysis, Canada—Northwest Territories—Mackenzie Delta

52-5666
Prevalence of freshwater flocculation in cold regions: a case study from the Mackenzie River Delta, northwest Territories, Canada.
Droppo, I.G., Jeffries, D., Jaskot, C., Backus, S., *Arctic,* June 1998, 51(2), p.155-164, With French summary. 47 refs.
Sediment transport, River basins, River flow, Suspended sediments, Aggregates, Coalescence, Grain size, Particle size distribution, Hydrodynamics, Hydrogeochemistry, Sampling, Canada—Northwest Territories—Mackenzie River

52-5667
Arctic sea ice microstructure observations relevant to microwave scattering.
Shokr, M.E., Sinha, N.K., *Arctic,* Sep. 1994, 47(3), p.265-279, With French summary. 41 refs.
Sea ice, Ice floes, Ice microstructure, Ice surface, Ice crystal structure, Brines, Bubbles, Ice optics, Thin sections, Imaging, Backscattering, Statistical analysis, Arctic Ocean

52-5668
Ice flow and rock glaciers on Mars.
Colaprete, A., Jakosky, B.M., *Journal of geophysical research,* Mar. 25, 1998, 103(E3), p.5897-5909, 23 refs.
Mars (planet), Extraterrestrial ice, Ice mechanics, Ice creep, Geomorphology, Regolith, Rock glaciers, Ground ice, Interstitial ice, Rheology, Temperature effects, Mathematical models

52-5669
Physically based modeling of atmosphere-to-snow-to-firn transfer of H_2O_2 at South Pole.
McConnell, J.R., Bales, R.C., Stewart, R.W., Thompson, A.M., Albert, M.R., Ramos, R., MP 5173, *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,561-10,570, 31 refs.
Climatology, Polar atmospheres, Gases, Snow air interface, Vapor diffusion, Mass transfer, Ventilation, Snow composition, Photochemical reactions, Seasonal variations, Sampling, Profiles, Models, Antarctica—South Pole
A unique, 2 year set of year-round surface snow samples at South Pole and snow pits, with associated accumulation histories, were used to test a physically based model for atmosphere-to-firn transfer of H_2O_2. The model, which extends previous transfer modeling at South Pole into the snowpack, is based on the advection-dispersion equation and spherical diffusion within representative snow grains. Required physical characteristics of the snowpack, such as snow temperature and ventilation, were estimated independently using established physical models. The surface snow samples and related model simulations show that there is a repeatable annual cycle in H_2O_2 in the surface snow at South Pole. The snow pits and associated model simulations point out the importance of accumulation timing and annual accumulation rate in understanding the deposition and preservation of H_2O_2 and $\delta^{18}O$ at South Pole. Long-term snowpack simulations suggest that the firn continues to lose H_2O_2 to the atmosphere for at least 10-12 years after burial at current South Pole temperatures and accumulation rates. (Auth. mod.)

52-5670
Global simulation of tropospheric O_3-NO_x-hydrocarbon chemistry. 2. Model evaluation and global ozone budget.
Wang, Y.H., Logan, J.A., Jacob, D.J., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,727-10,755, 71 refs.
Climatology, Atmospheric composition, Polar atmospheres, Aerosols, Hydrocarbons, Ozone, Sounding, Simulation, Antarctica—Palmer Station, Antarctica—Neumayer Station, Antarctica—Showa Station, Antarctica—Amundsen-Scott Station, United States—Alaska—Barrow, Iceland—Reykjavik
Results from a global three-dimensional model for tropospheric O_3-NO_x-hydrocarbon chemistry are presented and evaluated with surface, ozonesonde, and aircraft measurements. The model reproduces well the observed concentrations and seasonal variations of ozone in the troposphere, with some exceptions including an underestimate of the vertical gradient across the tropical trade wind inversion. A global budget analysis in the model indicates that the supply and loss of tropospheric ozone are dominated by photochemistry within the troposphere and that NO_x emitted in the Southern Hemisphere, including Antarctica, is twice as efficient at producing ozone as NO_x emitted in the Northern Hemisphere. (Auth. mod.)

52-5671
Interactions between sulfur and soot emissions from aircraft and their role in contrail formation. 2. Development.
Andronache, C., Chameides, W.L., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,787-10,802, 45 refs.
Climatology, Air pollution, Condensation trails, Aerosols, Heterogeneous nucleation, Ice vapor interface, Ice sublimation, Coagulation, Chemical properties, Air entrainment, Mathematical models

52-5672
Physical properties of stratospheric clouds during the antarctic winter of 1995.
Gobbi, G.P., Di Donfrancesco, G., Adriani, A., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,859-10,873, 34 refs.
Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Physical properties, Aerosols, Particles, Classifications, Heterogeneous nucleation, Ice formation, Lidar, Backscattering, Profiles, Antarctica—McMurdo Station
Lidar observations collected during winter 1995 at McMurdo Station are analyzed to determine polar stratospheric cloud (PSC) physical properties. A scheme to infer PSC phase from lidar depolarization and backscatter profiles is presented. The analysis shows that first appearance of PSC is consistent with frozen sulfates, mixing with

liquid ternary solutions when temperature lowers. Finally, solids consistent with HNO_3 mixing ratios form as mixed phases first, then followed by full solid phases. The considerable denitrification and halogen activation observed in the antarctic lower stratosphere, where the ozone hole takes place, appears to be well correlated with the action of this kind of PSC. (Auth. mod.)

52-5673
Turnbull correlation and the freezing of stratospheric aerosol droplets.
MacKenzie, A.R., Laaksonen, A., Batris, E., Kulmala, M., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,875-10,884, 41 refs.
Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Homogeneous nucleation, Ice formation, Freezing points, Ice vapor interface, Interfacial tension, Indexes (ratios), Correlation, Theories

52-5674
Coastal antarctic aerosol and snowfall chemistry.
Wolff, E.W., Legrand, M.R., Wagenbach, D., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,927-10,934, 28 refs.
Climatology, Polar atmospheres, Aerosols, Chemical properties, Precipitation (meteorology), Snowfall, Firn, Snow composition, Sampling, Research projects, Antarctica—Neumayer Station, Antarctica—Halley Station, Antarctica—Dumont d'Urville Station
Aerosol samples have been collected at three stations on the coast of Antarctica. At Dumont d'Urville Station, samples have been collected for 4 years, at Halley Station for 2 years, and at Neumayer Station for 12 years. Fresh snow samples have also been collected at the three sites. The data from the three stations have been combined in order to make general statements about the chemistry of aerosol in coastal Antarctica, about the differences between sectors of Antarctica, and about the relationship between air concentrations and the chemistry that is eventually seen in ice cores. This paper summarizes the samples collected and the sampling methods used at the three sites. (Auth. mod.)

52-5675
Climatology of the three coastal antarctic stations Dumont d'Urville, Neumayer, and Halley.
König-Langlo, G., King, J.C., Pettré, P., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,935-10,946, 20 refs.
Climatology, Polar atmospheres, Synoptic meteorology, Atmospheric composition, Wind velocity, Wind direction, Air temperature, Radio echo soundings, Seasonal variations, Climatic factors, Antarctica—Dumont d'Urville Station, Antarctica—Neumayer Station, Antarctica—Halley Station
Long term air and snowfall chemistry measurements have been performed at the three coastal antarctic stations Dumont d'Urville, Neumayer and Halley. The results have to be interpreted and compared with respect to the regional meteorological conditions. In this study the 3-hourly synoptic surface observations taken at the three stations between 1991 and 1995, as well as the daily upper air soundings from 1993, are analyzed to describe the aspects of station climatologies relevant for the air and snowfall chemistry measurements. (Auth. mod.)

52-5676
Trajectories in the antarctic lower troposphere.
Kottmeier, C., Fay, B., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,947-10,959, 24 refs.
Climatology, Polar atmospheres, Atmospheric boundary layer, Air masses, Atmospheric circulation, Origin, Wind direction, Wind velocity, Topographic effects, Statistical analysis, Correlation, Antarctica—Neumayer Station
The statistics of air mass transport to the Neumayer Station are derived from three-dimensional 5-day backward trajectories on the basis of a numerical weather prediction model, the Global Model of the German Weather Service, for the period Apr. 1993 to Mar. 1996. Trajectory errors are discussed in detail and errors of individual trajectories may sum up to from a few hundred to more than a thousand kilometers during 5 days' traveling time despite the high quality of the Global Model and trajectory module described. (Auth. mod.)

52-5677
Sea-salt aerosol in coastal antarctic regions.
Wagenbach, D., et al, *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,961-10,974, 51 refs.
Climatology, Polar atmospheres, Atmospheric boundary layer, Aerosols, Sea water, Snow composition, Brines, Marine meteorology, Snow air interface, Ion diffusion, Decomposition, Sampling, Antarctica—Halley Station, Antarctica—Neumayer Station, Antarctica—Dumont d'Urville Station
Continuous year round records of atmospheric sea-salt concentrations have been recovered at three coastal antarctic stations (Halley, Dumont d'Urville and Neumayer) at temporal resolutions typically between 1 day and 2 weeks. The records were evaluated in terms of their spatial and seasonal variability as well as with respect to changes in the relative ion composition of airborne sea-salt particles. In accordance with the ice core evidence, the seasonal change in the atmospheric sea-salt load is found to be clearly out of phase with the seasonal cycle of the open water fraction offshore from the station as (with the exception of Dumont d'Urville) the lowest concentrations are generally observed during the local summer months. It is suggested therefore that the mobilization of brine from the sea ice surface constitutes an important sea-salt source in winter which may dominate the atmospheric sea-salt load at high latitudes of coastal Antarctica. (Auth. mod.)

52-5678
Sulfur-containing species (sulfate and methanesulfonate) in coastal antarctic aerosols and precipitation.
Minikin, A., et al, *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,975-10,990, 61 refs.
Climatology, Polar atmospheres, Atmospheric boundary layer, Snow composition, Ice cores, Aerosols, Sedimentation, Chemical composition, Snow air interface, Biomass, Seasonal variations, Sampling, Antarctica—Neumayer Station, Antarctica—Dumont d'Urville Station, Antarctica—Halley Station
The concentration of sulfur-containing species (sulfate and methanesulfonate (MSA)) of aerosols collected at three coastal antarctic sites (Neumayer, Dumont d'Urville and Halley) have been studied in order to investigate the natural sulfur cycle at high southern latitudes. These data, together with radionuclide studies indicate that the marine biogenic source dominates the sulfur budget of the boundary layer of these regions throughout the year. The contribution of other sources, such as the long-range transported sulfur from continents and to a lesser extent the stratospheric sulfate reservoir, remains weak when averaged over the year. A strong correlation is found between the chlorophyll content of the antarctic ocean and the level of total nss sulfur. Furthermore, nss sulfate and MSA deposition fluxes determined from firn and ice cores extracted at sites located at various distances from the ocean and various altitudes allow assessment of the spatial variation of the marine biogenic sulfur input in Antarctica. (Auth. mod.)

52-5679
Methane sulfonic acid to non-sea-salt sulfate ratio in coastal antarctic aerosols and surface snow.
Legrand, M., Pasteur, E.C., *Journal of geophysical research,* May 20, 1998, 103(D9), p.10,991-11,006, 36 refs.
Climatology, Polar atmospheres, Marine atmospheres, Aerosols, Chemical composition, Indexes (ratios), Snow composition, Snow air interface, Sampling, Seasonal variations, Biomass, Antarctica—Neumayer Station, Antarctica—Dumont d'Urville Station, Antarctica—Halley Station
Multiple-year time series of the weight ratio R of methane sulfonic acid (MSA) to non-sea-salt sulfate (nss SO_4) in aerosols collected at three coastal antarctic stations Neumayer, Halley and Dumont d'Urville are presented here. The interpretation of these R values in terms of relative abundance of MSA and nss SO_4 produced by the oxidation of dimethylsulfide (DMS) at high southern latitudes is not straightforward. These baseline data obtained at coastal antarctic sites facilitates the investigation of the role of various parameters that modulate seasonal variations of R at high southern latitudes including the oxidative capacity of the atmosphere, the temperature of the atmospheric oxidation of DMS, and the aging of marine air masses during their transport from source regions toward coastal antarctic regions. (Auth. mod.)

52-5680
Atmospheric near-surface nitrate at coastal antarctic sites.
Wagenbach, D., Legrand, M., Fischer, H., Pichlmayer, F., Wolff, E.W., *Journal of geophysical research,* May 20, 1998, 103(D9), p.11,007-11,020, 71 refs.
Climatology, Polar atmospheres, Aerosols, Stratosphere, Sedimentation, Atmospheric boundary layer, Snow composition, Sampling, Isotope analysis, Seasonal variations, Antarctica—Neumayer Station, Antarctica—Dumont d'Urville Station
Records of atmospheric nitrate were obtained by year-round aerosol sampling at Neumayer and Dumont d'Urville stations, located in the Atlantic and Pacific sector of coastal Antarctica, respectively. Where possible, evaluation of the nitrate records is mainly based on concurrently measured radioisotopes. Stratospheric nitrate influx rates seen at coastal sites, deduced from Neumayer $^{10}Be/^{7}Be$ records for stratospheric air mass intrusions and from tritium for the sedimentation of polar stratospheric clouds (PSC), are found to be in close agreement with the observed surface nitrate flux, implying again that the continental source contribution is relatively unimportant. Evaluation of the mean seasonal nitrate pattern, based on concurrent ^{10}Be, ^{210}Pb and $\delta^{15}N$ records at Neumayer and on tritium in precipitation at Halley, suggests that the period of significant enhancement above the background mainly reflects inputs of stratospheric nitrate with secondary peaks in winter and late summer most likely dominated by PSC sedimentation and stratospheric air mass intrusions, respectively. (Auth. mod.)

52-5681
Postdepositional change in snowpack nitrate from observation of year-round near-surface snow in coastal Antarctica.
Mulvaney, R., Wagenbach, D., Wolff, E.W., *Journal of geophysical research,* May 20, 1998, 103(D9), p.11,021-11,031, 40 refs.
Climatology, Aerosols, Snow surface, Snow composition, Ice cores, Snow air interface, Sedimentation, Attenuation, Seasonal variations, Sampling, Antarctica—Halley Station, Antarctica—Neumayer Station
This paper examines the year-round deposition of nitrate at the snow surface at a coastal antarctic site and discusses the degree and timing of nitrate loss at Halley Station. The observation of a reduction in high nitrate concentrations in new snowfall over a few days does not appear to be general, and at Halley, there is evidence of both uptake and loss of nitrate in the surface snow layer, possibly indicating an equilibrium with changing air concentrations. However, there is attenuation of the nitrate signal over the longer period, with concentrations in the ice core taken at the end of the sampling never reaching values seen in the upper surface layer. (Auth. mod.)

52-5682
Concentrations and seasonal cycle of black carbon in aerosol at a coastal antarctic station.
Wolff, E.W., Cachier, H., *Journal of geophysical research,* May 20, 1998, 103(D9), p.11,033-11,041, 29 refs.
Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Atmospheric boundary layer, Carbon black, Forest fires, Atmospheric circulation, Sampling, Seasonal variations, Correlation, Antarctica—Halley Station, Antarctica—Neumayer Station
Aerosol black carbon concentrations have been measured between 1992 and 1995 at Halley Station using an aethalometer. The data show a clear seasonal cycle, with monthly mean values slightly higher than those recorded at South Pole. The cycle peaks in summer, with a possible doublet, and an overall maximum in Oct. This pattern is similar to that of South Pole and of mineral dust at the coastal Neumayer Station. The pattern seems to be controlled by the timing of biomass burning in the tropics, strongly modulated by the efficiency of transport to Antarctica. The similarity of the Halley and South Pole data suggest that ice cores should give a historical record of black carbon that is rather representative of the Antarctic as a whole and therefore indicative of trends in biomass burning throughout the Southern Hemisphere. (Auth. mod.)

52-5683
Ammonium in coastal antarctic aerosols and snow: role of polar ocean and penguin emissions.
Legrand, M., Ducroz, F., Wagenbach, D., Mulvaney, R., Hall, J., *Journal of geophysical research,* May 20, 1998, 103(D9), p.11,043-11,056, 45 refs.
Climatology, Polar atmospheres, Marine atmospheres, Aerosols, Atmospheric composition, Snow composition, Soil chemistry, Biomass, Decomposition, Seasonal variations, Environmental impact, Sampling, Antarctica—Dumont d'Urville Station, Antarctica—Neumayer Station, Antarctica—Halley Station
Year-round aerosol samples collected in the boundary layer at coastal antarctic sites (Dumont d'Urville, Neumayer and Halley) indicate a seasonal cycle of ammonium concentrations. Such a composition of aerosols present in the boundary layer at Dumont d'Urville in summer is linked to the presence of a large Adélie penguin population from the end of Oct. to Mar. at the site. Ornithogenic soils (defined as guano-enriched soils), together with the bacterial decomposition of uric acid, are a source of ammonium, oxalate, and cation (such as potassium and calcium) aerosol, in addition to a subsequent large ammonia loss from ornithogenic soils to the atmosphere. This study indicates a very limited ammonia neutralization of acidic sulfate aerosols at high southern latitudes, except in the vicinity of ornithogenic soils occupied by large penguin colonies. (Auth. mod.)

52-5684
Relationship between chemistry of air, fresh snow and firn cores for aerosol species in coastal Antarctica.
Wolff, E.W., Hall, J.S., Mulvaney, R., Pasteur, E.C., Wagenbach, D., Legrand, M., *Journal of geophysical research,* May 20, 1998, 103(D9), p.11,057-11,070, 38 refs.
Climatology, Polar atmospheres, Snow composition, Precipitation (meteorology), Aerosols, Snow air interface, Snowfall, Ion density (concentration), Scavenging, Statistical analysis, Antarctica—Dumont d'Urville Station, Antarctica—Halley Station, Antarctica—Neumayer Station

Aerosol and fresh snow concentrations have been determined at three coastal antarctic stations, Dumont d'Urville, Halley and Neumayer. Model estimates suggest that dry deposition, including that caused by wind pumping, is only a minor contributor to chemical fluxes at these sites with relatively high snow accumulation. Wet deposition in falling snow appears to be by far the major contributor. There is a general seasonal coincidence of high aerosol concentrations and high snow concentrations. Although some major snowfall events may be missing, it seems that, as expected, there is no significant postdepositional modification of chemistry for aerosol species in the top meter of firn. (Auth. mod.)

52-5685

Analysis of streamflow hydrology in the Kuparuk River Basin, arctic Alaska: a nested watershed approach.

McNamara, J.P., Kane, D.L., Hinzman, L.D., *Journal of hydrology,* Apr. 1998, 206(1-2), p.39-57, 35 refs.

Watersheds, River basins, Arctic landscapes, Snow hydrology, Storms, Permafrost hydrology, Stream flow, Snowmelt, Runoff, Hydrography, Models, Seasonal variations, United States—Alaska—Kuparuk River

52-5686

Size dependence of restitution coefficients of ice in relation to collision strength.

Higa, M., Arakawa, M., Maeno, N., *Icarus,* June 1998, 133(2), p.310-320, 32 refs.

Extraterrestrial ice, Atmospheric physics, Ice physics, Ice mechanics, Ice strength, Ice elasticity, Indexes (ratios), Spheres, Deformation, Impact tests, Ice solid interface, Cracking (fracturing), Simulation

52-5687

Lignin phenols in sediments of Lake Baikal, Siberia: application to paleoenvironmental studies.

Orem, W.H., Colman, S.M., Lerch, H.E., *Organic geochemistry,* Sep.-Oct. 1997, 27(3-4), V.M. Goldschmidt Conference, University Park, PA, May 25, 1995. Proceedings. Organic geochemistry of paleoclimatic markers: production, preservation and modeling. Edited by S.A. Macko and H.R. Harvey, p.153-172, 61 refs.

Pleistocene, Paleoclimatology, Climatic changes, Paleoecology, Lacustrine deposits, Hydrocarbons, Drill core analysis, Geochemistry, Radioactive age determination, Russia—Baykal, Lake

52-5688

Molecular paleoclimatology: reconstruction of climate variabilities in the late Quaternary.

Ohkouchi, N., Kawamura, K., Taira, A., *Organic geochemistry,* Sep.-Oct. 1997, 27(3-4), V.M. Goldschmidt Conference, University Park, PA, May 25, 1995. Proceedings. Organic geochemistry of paleoclimatic markers: production, preservation and modeling. Edited by S.A. Macko and H.R. Harvey, p.173-183, 73 refs.

Paleoclimatology, Climatic changes, Surface temperature, Paleoecology, Biomass, Marine deposits, Aerosols, Drill core analysis, Hydrocarbons, Chemical composition, Geochemical cycles, Pacific Ocean

52-5690

Report of the Sixteenth Meeting of the Commission, Hobart, Australia, 27 October-7 November, 1997.

Commission for the Conservation of Antarctic Marine Living Resources, Hobart, Tasmania, CCAMLR, 1997, 152p.

Marine biology, Legislation, Environmental impact, Environmental protection, International cooperation, Meetings

This document presents the adopted record of the Sixteenth Meeting of the Commission for the Conservation of Antarctic Mari .e Living Resources held in Hobart, Australia from Oct. 27 to Nov. 7, 1997. Major topics discussed include: review of the Report of the Scientific Committee; illegal, unreported and unregulated fishing in the Convention Area; assessment and avoidance of incidental mortality of antarctic marine living resources; new and exploratory fisheries; current operation of the Systems of Inspection and International Scientific Observation; compliance with conservation measures in force; review of existing conservation measures and adoption of new conservation measures; management under conditions of uncertainty; and cooperation with other international organizations including the Antarctic Treaty System. The Reports of the Standing Committee on Administration and Finance and the Standing Committee on Observation and Inspection are appended. (Auth.)

52-5691

Report of the Sixteenth Meeting of the Scientific Committee, Hobart, Australia, 27-31 October, 1997.

Scientific Committee for the Conservation of Antarctic Marine Living Resources, Hobart, Tasmania, CCAMLR, 1997, 438p., 2 refs.

Marine biology, International cooperation, Environmental impact, Environmental protection, Research projects, Ecosystems, Meetings

This document presents the adopted report of the Sixteenth Meeting of the Scientific Committee for the Conservation of Antarctic Marine Living Resources held in Hobart, Australia, Oct. 27-31, 1997. Major topics discussed include: fishery status and trends, CCAMLR Scheme of International Scientific Observation, dependent species, harvested species, ecosystem monitoring and management, scientific research exemption, new and exploratory fisheries, CCAMLR data management, cooperation with other organizations, and publications. Reports of meetings and intersessional activities of subsidiary bodies of the Scientific Committee, including the Working Groups on Ecosystem Monitoring and Management and on Fish Stock Assessment, are appended. (Auth. mod.)

52-5692

Biogeochemical controls and feedbacks on ocean primary production.

Falkowski, P.G., Barber, R.T., Smetacek, V., *Science,* July 10, 1998, 281(5374), p.200-206, Refs. p.205-206.

Oceanography, Biomass, Sea water, Geochemistry, Plankton, Ocean currents

Changes in oceanic primary production, linked to changes in the network of global biogeochemical cycles, have profoundly influenced the geochemistry of Earth for over 3 billion years. In the contemporary ocean, photosynthetic carbon fixation by marine phytoplankton leads to formation of ~45 gigatons of organic carbon per annum, of which 16 gigatons are exported to the ocean interior. Changes in the magnitude of total and export production can strongly influence atmospheric CO_2 levels (and hence climate) on geological time scales, as well as set upper bounds for sustainable fisheries harvest. Elucidating the biogeochemical controls and feedbacks on primary production is essential to understanding how oceanic biota responded to and affected natural climatic variability in the geological past, and will respond to anthropogenically influenced changes in coming decades. The authors include the southern ocean in their discussion. (Auth. mod.)

52-5693

Geographical and diapause-related cold tolerance in the blow-fly, *Calliphora vicina*.

Saunders, D.S., Hayward, S.A.L., *Journal of insect physiology,* July-Aug. 1998, 44(7-8), p.541-551, 24 refs.

Acclimatization, Cryobiology, Cold tolerance, Cold weather survival

52-5694

Interactions between desiccation resistance, host-plant contact and the thermal biology of a leaf-dwelling sub-antarctic caterpillar, *Embryonopsis halticella* (Lepidoptera: Yponomeutidae).

Klok, C.J., Chown, S.L., *Journal of insect physiology,* July-Aug. 1998, 44(7-8), p.615-628, Refs. p.626-628.

Acclimatization, Cryobiology, Cold tolerance, Cold weather survival, —Marion Island

During May 1997 thermal tolerance, supercooling point (SCP), low and high temperature survival, and desiccation resistance were examined in field-fresh *Embryonopsis halticella* Eaton larvae from Marion I. SCPs were also examined in acclimated larvae, larvae starved for 7 days, larvae within their leaf mines, and in larvae exposed to ice crystals. Mean SCP of field-fresh caterpillars was -20.5°C and this did not change with starvation. Field-fresh larvae did not survive freezing and their lower lethal temperatures (70% mortality below -21°C) and survival of exposure to constant low temperatures (100% mortality after 12 hrs at -19°C) indicated that they are moderately chill tolerant. SCP frequency distributions were unimodal for field-fresh larvae, but became bimodal at higher acclimation temperatures. It is suggested that the low SCPs of *E. halticella* larvae may have evolved as a consequence of pronounced desiccation resistance. (Auth. mod.)

52-5695

Development of a neural network based algorithm for radar snowfall estimation.

Xiao, R.G., Chandrasekar, V., Liu, H.P., *IEEE transactions on geoscience and remote sensing,* May 1998, 36(3), p.716-724, 15 refs.

Precipitation (meteorology), Snowfall, Snow accumulation, Remote sensing, Radar echoes, Reflectivity, Profiles, Snow optics, Atmospheric composition, Stratification, Data processing, Mathematical models, Weather forecasting

52-5696

Backscattering measurements of alpine snowcovers at 5.3 and 35 GHz.

Strozzi, T., Mätzler, C., *IEEE transactions on geoscience and remote sensing,* May 1998, 36(3), p.838-848, 30 refs.

Snow surveys, Alpine landscapes, Sensors, Snow cover distribution, Snow cover structure, Stratification, Radar echoes, Backscattering, Accuracy, Design

52-5697

Application of ERS-1 Wind Scatterometer data to soil frost and soil moisture monitoring in boreal forest zone.

Pulliainen, J.T., Manninen, T., Hallikainen, M.T., *IEEE transactions on geoscience and remote sensing,* May 1998, 36(3), p.849-863, 20 refs.

Soil surveys, Forest land, Biomass, Spaceborne photography, Radar echoes, Sensor mapping, Soil water, Soil freezing, Frost penetration, Detection, Snow cover effect, Backscattering, Statistical analysis, Seasonal variations, Finland

52-5698

Radar measurements of snow: experiment and analysis.

Kendra, J.R., Sarabandi, K., Ulaby, F.T., *IEEE transactions on geoscience and remote sensing,* May 1998, 36(3), p.864-879, 39 refs.

Remote sensing, Snow surveys, Radar echoes, Snow cover structure, Wet snow, Artificial snow, Snow water content, Backscattering, Attenuation, Diurnal variations, Mathematical models, Accuracy, Correlation

52-5699

Validation of alpine glacier velocity measurements using ERS tandem-mission SAR data.

Mattar, K.E., Vachon, P.W., Geudtner, D., Gray, A.L., Cumming, I.G., Brugman, M., *IEEE transactions on geoscience and remote sensing,* May 1998, 36(3), p.974-984, 34 refs.

Spaceborne photography, Synthetic aperture radar, Alpine glaciation, Glacier surveys, Glacier flow, Velocity measurement, Accuracy, Data processing, Image processing, Canada—Saskatchewan—Saskatchewan Glacier

52-5700

Ab initio model study of the mechanism of chlorine nitrate hydrolysis on ice.

Bianco, R., Hynes, J.T., *Journal of physical chemistry A,* Jan. 8, 1998, 102(2), p.309-314, 51 refs.

Climatology, Polar atmospheres, Cloud physics, Aerosols, Molecular energy levels, Polar stratospheric clouds, Ice nuclei, Ice vapor interface, Degradation, Proton transport, Simulation, Chemical analysis

The hydrolysis of chlorine nitrate $ClONO_2+H_2O \rightarrow HOCl+HNO_3$ on a type-II polar stratospheric cloud ice aerosol is modeled. The calculations suggest a fast reaction, consistent with experimental observations, and portray a transition state that involves a nucleophilic attack of a water molecule on chlorine concerted with proton transfer from the attacking water to the ice lattice. The results also give insight on the observed slow desorption of the produced HOCl and indicate a source of rate suppression on sulfate and nitrate containing type-I polar stratospheric cloud ice aerosols. (Auth. mod.)

52-5701

Reactivity at low temperature of carbon suboxide (C_3O_2) with amorphous surface of HCl hydrates monitored by FTIR spectroscopy.

Tamburelli, I., Chiavassa, T., Borget, F., Pourcin, J., *Journal of physical chemistry A,* Jan. 8, 1998, 102(2), p.422-425, 38 refs.

Ice physics, Extraterrestrial ice, Ice vapor interface, Amorphous ice, Ice sublimation, Heterogeneous nucleation, Hydrates, Molecular structure, Ionization, Proton transport, Ice spectroscopy, Infrared spectroscopy, Spectra, Simulation

52-5702

Simple physical explanation of the unusual thermodynamic behavior of liquid water.

Tanaka, H., *Physical review letters,* June 29, 1998, 80(26), p.5750-5753, 23 refs.

Water structure, Ice physics, Ice crystal structure, Thermodynamic properties, Molecular structure, Hydrogen bonds, Density (mass/volume), Temperature effects, Molecular energy levels, Mathematical models, Theories

52-5703

Amorphous water-ice relaxations measured with soft-landed ions.

Tsekouras, A.A., Iedema, M.J., Cowin, J.P., *Physical review letters,* June 29, 1998, 80(26), p.5798-5801, 21 refs.

Ice physics, Amorphous ice, Molecular structure, Ice vapor interface, Ions, Charge transfer, Ice relaxation, Ice dielectrics, Electrical measurement, Low temperature tests, Temperature effects, Ice spectroscopy

52-5704

Anharmonic dynamics in crystalline, glassy, and supercooled-liquid glycerol: a case study on the onset of relaxational behavior.

Cuello, G.J., et al, *Physical review B,* Apr. 1, 1998, 57(14)-II, p.8254-8263, 26 refs.

Liquid cooling, Supercooling, Hydrocarbons, Phase transformations, Neutron scattering, Spectra, Molecular energy levels, Vibration, Self diffusion, Low temperature tests, Thermodynamic properties

52-5705

Explicit forecasting of supercooled liquid water in winter storms using the MM5 mesoscale model.

Reisner, J., Rasmussen, R.M., Bruintjes, R.T., *Royal Meterological Society. Quarterly journal B,* Apr. 1998, 124(548), p.1071-1107, 44 refs.

Synoptic meteorology, Precipitation (meteorology), Ice storms, Ice forecasting, Cloud physics, Supercooled clouds, Ice crystal growth, Snow pellets, Classifications, Ice water interface, Water content, Particle size distribution, Mathematical models, Aircraft icing

52-5706

Retrieval of cirrus cloud properties from aircraft multi-spectral reflectance measurements during EUCREX'93.

Francis, P.N., Hignett, P., Macke, A., *Royal Meterological Society. Quarterly journal B,* Apr. 1998, 124(548), p.1273-1291, 36 refs.

Climatology, Cloud cover, Cloud physics, Optical properties, Reflectivity, Radiation absorption, Ice crystal optics, Ice crystal structure, Ice crystal size, Particle size distribution, Statistical analysis

52-5707

Graupel trajectories and charging: a new numerical approach for cloud electrification studies.

Masuelli, S., Pulido, M.A., Scavuzzo, C.M., Caranti, G.M., *Royal Meterological Society. Quarterly journal B,* Apr. 1998, 124(548), p.1329-1341, 34 refs.

Climatology, Cloud physics, Thunderstorms, Cloud electrification, Snow crystal growth, Snow pellets, Classifications, Charge transfer, Velocity, Ice water interface, Mathematical models, Computerized simulation

52-5708

Accumulation of frazil slush and velocity distribution under the ice cover.

Yamazaki, M., Koyama, S., Hirayama, K., Sugita, M., *Journal of hydroscience and hydraulic engineering,* 1996, 14(2), p.39-45, 3 refs.

Electric power, Water intakes, River ice, Water level, Water temperature, Flow control, Ice control, Slush, Frazil ice, Ice booms, Ice dams, Mechanical tests, Ice water interface

52-5709

Ozone in the troposphere and stratosphere. Part 2.

Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992, Hudson, R.D., ed, NASA conference publication 3266, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.437-965, N95-11006, Refs. passim. For selected papers see 52-5710 through 52-5753 or I-59698 through I-59717. For Part 1 see 49-3001 and 49-6286 through 49-6315 or 23I-52204 and 23I-53395 through 23I-53406.

Polar atmospheres, Atmospheric composition, Ozone, Stratosphere, Atmospheric circulation, Atmospheric disturbances, Polar stratospheric clouds, Air pollution, Aerosols

This book contains Part 2 of the papers presented at the 1992 Quadrennial Ozone Symposium held at the University of Virginia in Charlottesville, VA. Part 1 concentrated mainly on ozone in the troposphere. Part 2 concentrates mainly on ozone in the stratosphere. Of the approximately 130 papers in Part 2, 44 deal with the polar latitudes and of those, 20 are explicitly pertinent to the Antarctic. Those papers include ground-based, satellite, and balloon measurements of ozone, particularly by ultraviolet and visible spectrometry; and modeling and observational studies on the chemistry and dynamics of ozone formation and depletion in the stratosphere.

52-5710

Simulations of arctic ozone depletion with current and doubled levels of CO_2.

Butchart, N., Austin, J., Shine, K.P., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.467-470, N95-11013, 13 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Polar stratospheric clouds, Ozone, Carbon dioxide, Air pollution, Global warming, Computerized simulation

Results from idealized 3-D simulations of a dynamical-radiative-photochemical model of the stratosphere are presented for the Northern Hemisphere winter and spring. For a simulation of a quiescent winter, it is found that with current levels of CO_2 only modest polar ozone depletion occurs, consistent with observations. For a second simulation with the same planetary wave amplitudes in the upper troposphere but with doubled CO_2, the model predicts a Northern Hemisphere ozone hole comparable to that observed in Antarctica with almost complete ozone destruction at 20 km. Reasons for the marked difference between the simulations are identified. (Auth.)

52-5711

Laboratory measurements of polar stratospheric cloud rate parameters.

Kenner, R.D., Plumb, I.C., Ryan, K.R., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.471-474, N95-11014, 12 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Aerosols, Ice nuclei, Ozone

52-5712

Laboratory simulations of NAT formation approaching stratospheric conditions.

Marti, J., Mauersberger, K., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.474-478, N95-11015, 15 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ice nuclei, Ozone, Environment simulation

52-5713

Arctic polar stratospheric cloud measurements by means of a four wavelength depolarization lidar.

Stefanutti, L., et al, Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.479-482, N95-11016, 4 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ice nuclei, Ozone, Lidar

52-5714

Measurements of stratospheric ozone and aerosols above Spitsbergen.

Neuber, R., Beyerle, G., Schrems, O., Fabian, R., Von der Gathen, P., Krüger, B.C., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.483-487, N95-11017, 9 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Ozone, Aerosols, Meteorological instruments, Norway—Spitsbergen

52-5715

Balloon-borne measurements of the ultraviolet flux in the arctic stratosphere during winter.

Schiller, C., Müller, M., Klein, E., Schmidt, U., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.488-491, N95-11018, 6 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Photochemical reactions, Ozone, Solar radiation, Ultraviolet radiation, Balloons

52-5716

Calculations of arctic ozone chemistry using objectively analyzed data in a 3-D CTM.

Kamiński, J.W., McConnell, J.C., Sandilands, J.W., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.492-495, N95-11019, 9 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Polar stratospheric clouds, Ozone, Computerized simulation

52-5717

Three-dimensional modelling of trace species in the arctic lower stratosphere.

Chipperfield, M., Cariolle, D., Simon, P., Ramaroson, R., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.496-499, N95-11020, 12 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Polar stratospheric clouds, Ozone, Computerized simulation

52-5718

Investigation of the structure and dynamics of the ozone layer in the eastern arctic region during EASOE campaign.

Khattatov, V.U., IUshkov, V.A., Rudakov, V.V., Zaĭtsev, I., Rosen, J.M., Kjome, N.T., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.500-503, N95-11021, 5 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Stratosphere, Aerosols, Volcanic ash, Ozone

52-5719

Temporal development of the correlation between ozone and potential vorticity in the Arctic in the winters of 1988/89, 1989/90 and 1990/91.

Knudsen, B., et al, Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.504-507, N95-11022, 8 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Ozone, Statistical analysis

52-5720

Modelling stratospheric polar ozone using objective analysis.

Sandilands, J.W., Kamiński, J.W., McConnell, J.C., Beagley, S.R., McFarlane, N., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.508-511, N95-11023, 6 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Polar stratospheric clouds, Ozone, Computerized simulation

The authors studied the development of the austral ozone hole using a 3-D spectral chemical transport model at R15 resolution for the period Sep. 15-Oct. 15, 1991. The model is driven by objectively analyzed wind fields obtained from the Canadian Meteorological Centre and uses a chemical module. Although extensive processing of NO_y and Cl_x occurs within the model, the ozone hole that develops appears shallow and ephemeral. Analysis of the results indicate that the meridional transport of ozone is sufficient to overwhelm the substantial chemical depletion that does occur. The authors suggest that the low resolution objectively analyzed data used is unable to capture the essential isolated nature of the vortex. (Auth. mod.)

52-5721

Intercomparison between ozone profiles measured above Spitsbergen by lidar and sonde techniques.

Fabian, R., Von der Gathen, P., Ehlers, J., Krüger, B.C., Neuber, R., Beyerle, G., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.512-515, N95-11024, 8 refs.

Polar atmospheres, Atmospheric composition, Ozone, Lidar, Sounding, Norway—Spitsbergen

52-5722

Lidar measurements of ozone and aerosol distributions during the 1992 Airborne Arctic Stratospheric Expedition.

Browell, E.V., Butler, C.F., Fenn, M.A., Grant, W.B., Ismail, S., Carter, A.F., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.516-519, N95-11025, 8 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Stratosphere, Aerosols, Volcanic ash, Ozone, Lidar

52-5723

Stratospheric OClO and NO_2 measured by groundbased UV/Vis-spectroscopy in Greenland in Jan/Feb 1990 and 1991.

Roth, A., Perner, D., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.520-523, N95-11026, 18 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Air pollution, Ozone, Greenland

52-5724

Column amounts of trace gases from ground based FTIR measurements in the late north polar winters 1990 and 1991.

Adrian, G.P., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.524-527, N95-11027, 6 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Air pollution, Ozone, Infrared spectroscopy

52-5725

Stratospheric minor species vertical distributions during polar winter by balloon borne UV/Vis spectrometry.

Pommereau, J.P., Picard, J., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.528-531, N95-11028, 4 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Polar stratospheric clouds, Volcanic ash, Air pollution, Ozone

52-5726

Average ozone vertical distribution at Sodankylä based on the 1988-1991 ozone sounding data.

Kyrö, E., Rummukainen, M., Taalas, P., Supperi, A., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.532-534, N95-11029, 5 refs.

Polar atmospheres, Atmospheric composition, Ozone, Sounding, Statistical analysis

52-5727

Evolution of synoptic ozone anomalies during the European Arctic Stratospheric Ozone Experiment in winter 1991/92.

Zerefos, C.S., et al, Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.535-539, N95-11030, 3 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Ozone, Statistical analysis

52-5728

Measurements of the vertical profile, diurnal variation, and secular change of ClO in the stratosphere over Thule, Greenland, February-March, 1992.

De Zafra, R.L., Emmons, L.K., Reeves, J.M., Shindell, D.T., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.540-542, N95-11031, 6 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Volcanic ash, Aerosols, Air pollution, Ozone, Greenland

52-5729

Observed changes in the vertical profile of stratospheric nitrous oxide at Thule, Greenland, February-March, 1992.

Emmons, L.K., Reeves, J.M., Shindell, D.T., De Zafra, R.L., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.543-545, N95-11032, 8 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Air pollution, Ozone, Greenland

52-5730

Ozone laminae near the edge of the stratospheric polar vortex.

Reid, S.J., Vaughan, G., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.546-549, N95-11033, 7 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Ozone

52-5731

Ozone, aerosols and polar stratospheric clouds measurements during the EASOE campaign.

Godin, S., et al, Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.550-553, N95-11034, 4 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Volcanic ash, Aerosols, Air pollution, Ozone, Lidar, Sounding

52-5732

Reinterpretation of ozone data from "Base Roi Baudouin".

Kelder, H., Muller, C., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.557-560, N95-11035, 11 refs.

Polar atmospheres, Stratosphere, Air temperature, Atmospheric composition, Ozone, Sounding, Meteorological data, Statistical analysis, Antarctica—Roi Baudouin Station

The ozone Dobson measurements obtained in Antarctica at the Belgian station Roi Baudouin in 1965 and 1966 were retrieved from the KNMI (Royal Netherlands Meteorological Institute) archives. Despite excellent treatment at the time by the meteorologists in charge at the KNMI, a study of the original observers notes was made in order to check possible seasonal ozone phenomena. No systematic anomaly in the first analysis was found; meteorological data from the site together with Brewer-Mast ozone soundings concur that the conditions did not correspond either in 1965 nor 1966 to the current ozone hole situation, however, the data yields excellent correlation with stratospheric temperature and shows in 1966 a clear Nov. maximum in opposition to an Oct. value around 344 Dobson units. (Auth. mod.)

52-5733

Systematic stratospheric observations on the antarctic continent at Dumont d'Urville.

Godin, S., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.561-564, N95-11036, 4 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Polar stratospheric clouds, Aerosols, Volcanic ash, Air pollution, Ozone, Lidar, Sounding, Antarctica—Dumont d'Urville Station

Results of different routine measurements performed in Dumont d'Urville since 1988 are presented. They include the seasonal variation of total ozone and NO_2 as measured by a SAOZ UV-Visible spectrometer, Polar Stratospheric Cloud observations by a backscatter lidar and more recently, vertical ozone profiles by ECC sondes and ozone and aerosols stratospheric profiles by a DIAL lidar. The particular results of 1991 in relation with the volcanic events of Mount Pinatubo and Mount Hudson, and the position of the polar vortex over Dumont d'Urville are discussed. (Auth.)

52-5734

Observation of ozone and aerosols in the antarctic ozone hole of 1991 under the Polar Patrol Balloon (PPB) project—preliminary result.

Hayashi, M., Murata, I., Iwasaka, Y., Kondo, Y., Kanzawa, H., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.565-568, N95-11037, 1 ref.

Polar atmospheres, Stratosphere, Atmospheric composition, Polar stratospheric clouds, Aerosols, Air pollution, Ozone, Balloons, Sounding, Antarctica

The authors present preliminary results for the PPB (Polar Patrol Balloon) experiment. The balloon was launched on Sep. 23 and dropped on Sep. 28, 1991. During the period, ozone and aerosol concentrations were measured correspondingly along the track. During the Lagrangian type observation, drastic change of ozone concentration in 'same air mass' and positive correlation between ozone concentration and sulfate aerosol amount were obtained at the level within 80-78 hPa. During the descent motion at 80°S active PSC's were observed from 200-80 hPa. (Auth. mod.)

52-5735

Year-round measurements of ozone at 66°S with a visible spectrometer.

Roscoe, H.K., Oldham, D.J., Squires, J.A.C., Pommereau, J.P., Goutail, F., Sarkissian, A., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.569-572, N95-11038, 1 ref.

Polar atmospheres, Atmospheric composition, Atmospheric attenuation, Ozone, Meteorological instruments, Antarctica—Faraday Station

In Mar. 1990, a zenith-sky UV-visible spectrometer of the design 'Systeme Automatique d'Observation Zenithal' (SAOZ) was installed at Faraday Station. SAOZ records spectra between 290 and 600 nm during daylight. Its analysis program fits laboratory spectra of constituents, at various wavelengths, to the differential of the ratio of the observed spectrum and a reference spectrum. The least-squares fitting procedure minimizes the sum-of-squares of residuals. Ozone is deduced from absorption in its visible bands between 500 and 560 nm. The colocation of this SAOZ with the well-calibrated Dobson at Faraday has allowed the authors to examine the calibration of the zero of the SAOZ, difficult at visible wavelengths because of the small depth of absorption. They describe recent improvements and limitations to this calibration, and discuss SAOZ measurements of ozone during winter in this important location at the edge of the antarctic vortex. (Auth.)

52-5736

Ground based NO_2 and O_3 measurements by visible spectrometer at Syowa Base (69°S), Antarctica.

Kondo, Y., et al, Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.573-577, N95-11039, 4 refs.

Polar atmospheres, Atmospheric composition, Atmospheric attenuation, Air pollution, Ozone, Sounding, Meteorological instruments, Antarctica—Showa Station

The column amounts of NO_2 and ozone have been measured using visible spectroscopy at Showa Station since Mar. 1990. Ozone was also measured at the same location with a Dobson spectrometer as well as ozonesondes being flown regularly. The characteristic features of the seasonal and diurnal variations of NO_2 are presented. The column ozone values from the visible spectrometers are compared with the Dobson data. The very low values of NO_2 in midwinter and early spring are consistent with the conditions predicted to be needed for heterogeneous ozone destruction in early spring. In late spring and summer of 1991, NO_2 amounts were considerably smaller than in 1990, presumably due to the effect of Mt. Pinatubo eruption. (Auth.)

52-5737

Ozone vertical profile changes over South Pole.

Oltmans, S.J., Hofmann, D.J., Komhyr, W.D., Lathrop, J.A., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.578-581, N95-11040, 6 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Climatic changes, Ozone, Sounding, Antarctica—Amundsen-Scott Station

Important changes in the ozone vertical profile over South Pole have occurred both during the recent period of measurements, 1986-91, and since an earlier set of soundings was carried out from 1967-71. From the onset of the 'ozone hole' over Antarctica in the early 1980s, there has been a tendency for years with lower spring ozone amounts to alternate with years with somewhat higher ozone amounts. Beginning in 1989 there have been three consecutive years of strong depletion although the timing of the breakdown of the vortex has varied from year to year. Comparison of the vertical profiles between the two periods of study reveals the dramatic decreases in the ozone amounts in the stratosphere between 15-21 km during the spring. (Auth. mod.)

52-5738

Quantitative characterization of the antarctic ozone hole.

Ito, T., et al, Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.582-585, N95-11041, 6 refs.

Polar atmospheres, Atmospheric composition, Air temperature, Polar stratospheric clouds, Air pollution, Climatic changes, Ozone, Statistical analysis, Antarctica

The long-term evolution of the antarctic ozone hole is studied based on the TOMS data and the JMA data-set of stratospheric temperature in relation with the possible role of polar stratospheric clouds (PSCs). The effective mass of depleted ozone in the ozone hole at its annual mature stage reached a historical maximum of 55 Mt in 1991, 4.3 times larger than in 1981. The present result strongly suggests that the long-term evolution of the mature ozone hole is caused both by the interannual change of the latitudinal coverage of the early PSCs, which may control the latitude and date of initiation of ozone decrease, and by that of the spatial coverage of the mature PSCs which may control the ozone depletion rate in the antarctic spring. (Auth. mod.)

52-5739

PSC and volcanic aerosol routine observations in Antarctica by UV-visible ground-based spectrometry.

Sarkissian, A., Pommereau, J.P., Goutail, F., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.586-589, N95-11042, 4 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Atmospheric attenuation, Light scattering, Polar stratospheric clouds, Aerosols, Volcanic ash, Air pollution, Climatic changes, Antarctica—Dumont d'Urville Station

Polar stratospheric clouds (PSC) and stratospheric aerosol can be observed by ground-based UV-visible spectrometry by looking at the variation of the color of the sky during twilight. Reddenings are caused by high altitude (22-28 km) thin layers of scatterers, while low altitude (12-20 km) thick ones result in bluenings. Observations at Dumont d'Urville from 1988 to 1991, show that dense PSC are uncommon. More unexpected is the existence of a systematic seasonal variation of the color of the twilight sky, bluer at spring, which reveals the formation of a dense scattering layer at or just above the tropopause at the end of the winter. Large scattering layers are reported above the station in 1991, first in Aug. around 12-14 km, later in Sep. at 22-24 km. They are attributed to volcanic aerosol from Mt. Hudson and Mt. Pinatubo respectively, which erupted in 1991. (Auth. mod.)

52-5740

Ozone profiles over McMurdo Station, Antarctica, during August, September, and October of 1986-1991.

Deshler, T., Hofmann, D.J., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.590-593, N95-11043, 15 refs.

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Air temperature, Volcanic ash, Air pollution, Ozone, Antarctica—McMurdo Station

Vertical profiles of ozone and temperature have been measured at McMurdo Station during the springs of 1986 to 1991. Comparisons of temporal histories and average vertical structure for these years reveals some striking consistency in the ozone depletion process. Ozone depletion generally begins in early Sep., and with a half-life of 20-30 days, reaches its maximum in mid-Oct. The depletion occurs almost exclusively between 12 and 20 km. At the time of maximum depletion total ozone has been decreased roughly 40% while ozone between 12 and 20 km has been reduced 80%. Recovery generally begins in late Oct. with the influx, above 20 km, of ozone rich air from the lower latitudes. From this record the worst years for ozone depletion were 1987, 1989, and 1990. A new region of ozone depletion, below 12 km, was observed in 1991, coinciding with the entrainment of a volcanic cloud into the polar vortex.

52-5741

Observational study of the "ozone dilution effect": ozone transport in the austral spring stratosphere.

Atkinson, R.J., Plumb, R.A., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.594-597, N95-11044, 4 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Air masses, Ozone

The authors ascribe a sudden decrease in Southern Hemisphere mid-latitude total ozone during Dec. 1987 to an 'ozone dilution effect' brought about by the breakup of the polar stratospheric vortex at that time. The observed total ozone decrease might have been caused by the quasi-horizontal equatorward transport of 'ozone hold' air from within the vortex, and by the vertical advection from lower levels of air naturally low in ozone, a dynamical adjustment process which must accompany the equatorward outbreak of a discrete high-latitude airmass. Recent progress is reported on the precise nature, frequency and severity of such 'ozone dilution' events, and the effect that this process may have on long term ozone behavior in the Southern Hemisphere. (Auth. mod.)

52-5742

Long-term ozone and temperature correlations above SANAE, Antarctica.

Bodeker, G.E., Scourfield, M.W.J., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.598-601, N95-11045, 3 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Atmospheric circulation, Atmospheric disturbances, Air temperature, Ozone, Statistical analysis, Antarctica—SANAE Station

For the observations reported here, data from TOMS (Total Ozone Mapping Spectrometer) aboard the Nimbus 7 satellite have been used to examine the 1980 to 1990 decrease in total column ozone above the South African antarctic base of SANAE. The cooling of the antarctic stratosphere above SANAE during this period has been investigated by examining upper air temperatures at the 150, 100, 70, 50 and 30 hPa levels obtained from daily radiosonde balloon launches. Furthermore, these two data sets have been used to examine long-term, medium-term, and short-term correlations between total column ozone and the temperatures at each of the five levels. The trend in SANAE total column ozone has been found to be -4.9 DU/year, while upper air temperatures have been found to decrease at around 0.3 C/year. An analysis of monthly average SANAE total column ozone has shown the decrease to be most severe during the month of Sep. with a trend of -7.7 DU/year. Daily ozone and temperature correlations show high values from Sep. to Nov. at a time when the polar vortex is breaking down. (Auth. mod.)

52-5743

Four years of ground-based total ozone measurements by visible spectrometry in Antarctica.

Goutail, F., Pommereau, J.P., Sarkissian, A., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.602-605, N95-11046, 9 refs.

Polar atmospheres, Atmospheric composition, Atmospheric attenuation, Light scattering, Ozone, Meteorological instruments, Antarctica

Visible spectrometers SAOZ have been developed for permanent ground-based ozone monitoring at all latitudes up to the polar circle in winter. Observations are made by looking at the sunlight scattered at zenith in the visible range, twice a day, at sunrise and sunset. Compared to ozone observations in the UV generally in use, visible observations at twilight have the advantages of being independent of stratospheric temperature, little contaminated by tropospheric ozone and multiple scattering, and of permitting observations even in winter at the polar circle. SAOZ instruments have been installed since 1988 at several stations in the Antarctic and the Arctic. (Auth. mod.)

52-5744

Trajectory analysis of Polar Patrol Balloon (PPB) flights in the stratosphere over Antarctica in summer and spring: a preliminary result.

Kanzawa, H., Fujii, R., Yamazaki, K., Yamanaka, M., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.606-609, N95-11047, 14 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Wind (meteorology), Gravity waves, Balloons, Meteorological instruments, Antarctica

Actual trajectories of two PPB's (Polar Patrol Balloon) which flew in the antarctic stratosphere in austral summer and spring are compared with those calculated based on objective analysis data of Japan Meteorological Agency (JMA). The differences between the actual and calculated trajectories are discussed to check reliability of the JMA objective analysis data for the stratosphere, and to detect subsynoptic scale variability due to gravity waves and others. (Auth.)

52-5745

Measurements of stratospheric odd nitrogen at Arrival Heights, Antarctica, in 1991.

Keys, J.G., Johnston, P.V., Blatherwick, R.D., Murcray, F.J., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.610-612, N95-11048, 9 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Polar stratospheric clouds, Aerosols, Air pollution, Photochemical reactions, Ozone, Antarctica—Arrival Heights

An FTIR spectrometer was installed at Arrival Heights in Feb. 1991 to measure the evolution of stratospheric HNO_3 during the year, in particular, to make the first observations of HNO_3 trends during autumn, concurrently with ongoing measurements of column NO_2 made with a grating spectrometer. The time-series of NO_2 in the Antarctic shows a rapid decline in the column amount during autumn, and a slow recover in spring. The new nitric acid data show for the first time that during autumn the vertical column increases from approximately 1.9×10^{16} molecule/cm^2 at day 30 to approximately 3.1×10^{16} molecule/cm^2 by day 100. The autumn increase is attributed to the heterogeneous conversion of N_2O_5 to gas-phase HNO_3 on background aerosols. Low nitric acid column amounts at the start of spring suggest that the HNO_3 has moved from the gas to the condensed phase on polar stratospheric clouds with the advent of low temperatures during the polar night. (Auth. mod.)

52-5746

Measurements of stratospheric composition using a star pointing spectrometer.

Fish, D.J., Jones, R.L., Freshwater, R.A., Roscoe, H.K., Oldham, D.J., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.671-674, N95-11062, 2 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Ozone, Atmospheric attenuation, Meteorological instruments, Sweden

52-5747

Ozone ground-based measurements by the "GASCOD" near-UV and visible DOAS system.

Giovanelli, G., Bonasoni, P., Cervino, M., Evangelisti, F., Ravagnani, F., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.707-710, N95-11071, 6 refs.

Polar atmospheres, Atmospheric composition, Atmospheric attenuation, Ozone, Meteorological instruments

GASCOD (gas absorption spectrometer correlating optical differences), a near-ultraviolet and visible differential optical absorption spectrometer, was developed at CNR's FISBAT Institute in Bologna, Italy, and first tested at Terra Nova Bay Station. A comparison with coincident O_3 total column measurements taken in the same antarctic area is presented. The GASCOD can examine the spectra from 300 to 700 nm, in 50 nm steps, by moving the spectrometer's grating. At present, it takes measurements of solar zenith radiation in the 310-342 nm range for O_3 and in the 405-463 nm range for NO_2. (Auth. mod.)

52-5748

New high-sensitivity superconducting receiver for mm-wave remote sensing spectroscopy of the stratosphere.

De Zafra, R.L., Mallison, W.H., Jaramillo, M., Reeves, J.M., Emmons, L.K., Shindell, D.T., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.719-722, N95-11074, 11 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Sounding, Superconductivity, Meteorological instruments

52-5749

Star-pointing UV-visible spectrometer for remote sensing of the stratosphere.

Roscoe, H.K., et al, Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.731-734, N95-11077.

Polar atmospheres, Stratosphere, Atmospheric composition, Ozone, Atmospheric attenuation, Meteorological instruments

52-5750

Latitudinal distribution of ozone to 35 km altitude from ECC ozonsonde observations, 1982-1990.

Komhyr, W.D., Oltmans, S.J., Lathrop, J.A., Kerr, J.B., Matthews, W.A., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.858-862, N95-11108, 9 refs.

Polar atmospheres, Atmospheric composition, Ozone, Sounding, Data processing, Statistical analysis

Electrochemical concentration cell ozone-sonde observations, made in recent years at 10 stations whose locations range from the Arctic to Antarctica, have yielded a self-consistent ozone data base from which mean seasonal and annual latitudinal ozone vertical distributions to 35 km have been derived. (Auth. mod.)

52-5751

On vertical profile of ozone at Syowa.

Chubachi, S., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.867-869, N95-11110, 5 refs.

Polar atmospheres, Atmospheric composition, Air temperature, Ozone, Statistical analysis, Antarctica—Showa Station

The difference in the vertical ozone profile at Showa Station between 1966-1981 and 1982-1988 is shown. The month-height cross section of the slope of the linear regressions between ozone partial pressure and 100-mb temperature is also shown. The vertically integrated values of the slopes are in close agreement with the slopes calculated by linear regression of Dobson total ozone on 100-mb temperature in the period of 1982-1988. (Auth.)

52-5752

Effect of stratospheric aerosol layers on the TOMS/SBUV ozone retrieval.

Torres, O., Ahmad, Z., Pan, L., Herman, J.R., Bartia, P.K., McPeters, R., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.915-918, N95-11121, 5 refs.

Polar atmospheres, Atmospheric composition, Ozone, Polar stratospheric clouds, Cloud physics, Environment simulation

52-5753

Use of visible-channel data from NOAA satellites to measure total ozone amount over Antarctica.

Boime, R.D., Warren, S.G., Gruber, A., Quadrennial Ozone Symposium, Charlottesville, VA, June 4-13, 1992. Ozone in the troposphere and stratosphere. Part 2. Edited by R.D. Hudson, Greenbelt, MD, U.S. National Aeronautics and Space Administration, Goddard Space Flight Center, 1994, p.938-941, N95-11127, 8 refs.

Polar atmospheres, Atmospheric composition, Atmospheric attenuation, Ozone, Cloud cover, Snow cover effect, Snow optics, Albedo, Radiometry, Spaceborne photography, Antarctica

Accurate, detailed maps of total ozone were not available until the launch of the Total Ozone Mapping Spectrometer in late 1978. However, the Scanning Radiometer (SR), an instrument on board the NOAA series satellites during the 1970s, had a visible channel that overlapped closely with the Chappuis absorption band of ozone. The authors suggest that data from the SR can be used to map antarctic ozone prior to 1978. (Auth. mod.)

52-5754

Ice record of a large eruption of Deception Island volcano (Antarctica) in the XVIIth century.

Aristarain, A.J., Delmas, R.J., *Journal of volcanology and geothermal research*, Jan. 1998, 80(1-2), p.17-25, 36 refs.

Ice cores, Volcanic ash, Antarctica—Amundsen-Scott Station, Antarctica—James Ross Island, Antarctica—Deception Island

A well-marked volcanic ash layer was found at 145.9 m depth in a 154.3 m ice core recovered in 1981 on James Ross I. Ash composition analysis indicates that the authors are dealing with a eruption of the Deception I. volcano located some 200 km northwestward from James Ross I. Regional lake sediments seem also to have recorded the eruption. Its date (some 350 years ago) has been determined precisely by comparison with a well-dated Amundsen-Scott Station ice core. The strength and regional to global impact of the event are discussed. It is concluded it was most probably the largest eruption of this volcano over the studied time period. This exceptional layer was used to adjust the dating of the core. (Auth.)

52-5755

Magma chambers modeled as cavities explain the formation of rift zone central volcanoes and their eruption and intrusion statistics.

Gudmundsson, A., *Journal of geophysical research*, Apr. 10, 1998, 103(B4), p.7401-7412, 50 refs.

Tectonics, Earth crust, Subpolar regions, Volcanoes, Magma, Deformation, Stress concentration, Geologic processes, Boundary value problems, Models, Fluid dynamics, Iceland

52-5756

Singularity-free interpretation of the thermodynamics of supercooled water. II. Thermal and volumetric behavior.

Rebelo, L.P.N., Debenedetti, P.G., Sastry, S., *Journal of chemical physics*, July 8, 1998, 109(2), p.626-633, 38 refs.

Liquid cooling, Supercooling, Water structure, Water temperature, Density (mass/volume), Thermal expansion, Heat capacity, Thermodynamic properties, Temperature effects, Mathematical models, Thermal analysis

52-5757
Temperature variability in lake sediments.
Fang, X., Stefan, H.G., *Water resources research,* Apr. 1998, 34(4), p.717-729, 26 refs.
Limnology, Lacustrine deposits, Bottom sediment, Icebound lakes, Water temperature, Temperature variations, Stratification, Air water interactions, Heat transfer, Ice cover effect, Simulation, Profiles, Mathematical models

52-5758
Interannual, seasonal, and spatial patterns of meltwater and solute fluxes in a seasonal snowpack.
Harrington, R., Bales, R.C., *Water resources research,* Apr. 1998, 34(4), p.823-831, 40 refs.
Snow hydrology, Snowmelt, Snow accumulation, Meltwater, Solubility, Seepage, Electrical resistivity, Snow water equivalent, Ice water interface, Seasonal variations, Ion density (concentration), Sampling, United States—California—Mammoth Mountain

52-5759
^{40}AR-^{39}Ar geochronology of Tertiary mafic intrusions along the East Greenland rifted margin: relation to flood basalts and the Iceland hotspot track.
Tegner, C., Duncan, R.A., Bernstein, S., Brooks, C.K., Bird, D.K., Storey, M., *Earth and planetary science letters,* Mar. 15, 1998, 156(1-2), p.75-88, 66 refs.
Pleistocene, Tectonics, Continental drift, Marine geology, Subpolar regions, Magma, Isotope analysis, Radioactive age determination, Geochronology, Greenland, Iceland

52-5760
Changes in stolon carbohydrates during the winter in four varieties of white clover (*Trifolium repens* L.) with contrasting hardiness.
Turner, L.B., Pollock, C.J., *Annals of botany,* Jan. 1998, 81(1), p.97-107, 23 refs.
Plants (botany), Plant physiology, Plant tissues, Grasses, Cold tolerance, Frost resistance, Growth, Chemical composition, Temperature effects, Simulation

52-5761
Erratum: combined wave-iceberg loading on offshore structures.
Foschi, R., Isaacson, M., Allyn, N., Yee, S., *Canadian journal of civil engineering,* Feb. 1998, 25(1), p.193, For pertinent paper see 51-1792.
Offshore structures, Stability, Water waves, Icebergs, Ice solid interface, Ice breaking, Loads (forces), Indexes (ratios), Forecasting

52-5762
Sorosite, Cu(Sn,Sb), a new mineral from the Baimka placer deposit, western Chukotka, Russian Far East.
Barkov, A.Y., et al, *American mineralogist,* July-Aug. 1998, 83(7-8), p.901-906, 25 refs.
Mineralogy, Metals, Geological surveys, Placer mining, Lithology, Rock properties, Sampling, Classifications, Electron microscopy, Russia—Chukotka

52-5763
Acidity status and mobility of Al in podzols near SO_2 emission sources on the Kola Peninsula, NW Russia.
Kashulina, G., De Caritat, P., Reimann, C., Raisanen, M.L., Chekushin, V., Bogatyrev, I.V., *Applied geochemistry,* May 1998, 13(3), p.391-402, 30 refs.
Air pollution, Subpolar regions, Podsol, Lithology, Geochemistry, Drainage, Soil pollution, Aerosols, Metals, Fallout, Sampling, Soil profiles, Environmental tests, Russia—Kola Peninsula

52-5764
Morphology of landscape elements as predictors of water quality in glacial/boreal lakes.
Thierfelder, T., *Journal of hydrology,* June 25, 1998, 207(3-4), p.189-203, 37 refs.
Limnology, Watersheds, Subarctic landscapes, Geomorphology, Lake water, Water chemistry, Landscape types, Classifications, Statistical analysis, Hydrogeochemistry, Sweden

52-5765
Segregation mechanism of frost heave.
Aksenov, B.G., *Applied energy,* 1997, 35(5), p.128-134, Translated from Izvestiia Rossiĭkoi Akademiĭ nauk. Energetika. 9 refs.
Geocryology, Frozen ground mechanics, Frost heave, Soil freezing, Ice formation, Ice lenses, Heat transfer, Ice water interface, Mathematical models, Forecasting

52-5766
Changes of ionic and oxygen isotopic composition of the snowpack in the glacier Austre Okstindbreen, Norway, 1995.
Raben, P., Theakstone, W.H., *Nordic hydrology,* 1998, 29(1), p.1-20, 18 refs.
Glacial hydrology, Snow hydrology, Snowmelt, Meltwater, Seepage, Ice water interface, Snow composition, Oxygen isotopes, Ion density (concentration), Ion diffusion, Isotope analysis, Indexes (ratios), Norway—Austre Okstindbreen

52-5767
Hydrography of the upper Arctic Ocean measured from the nuclear submarine U.S.S. *Pargo*.
Morison, J., Steele, M., Andersen, R., *Deep sea research I,* Jan. 1998, 45(1), p.15-38, 33 refs.
Oceanographic surveys, Hydrography, Climatology, Subsurface investigations, Submarines, Ocean currents, Salinity, Density (mass/volume), Water temperature, Boundary layer, Periodic variations, Arctic Ocean

52-5768
Nuclear magnetic resonance in Antarctica.
Callaghan, P., Eccles, C., *Australian and New Zealand physicist,* Jan./Feb. 1996, 33(1/2), p.4-8, 8 refs.
Sea ice, Measuring instruments, Nuclear magnetic resonance, Brines, Antarctica—Evans, Cape
The authors describe NMR methods and apparatus used to study the physical microstructural properties of sea ice. The authors procedures use the Earth's magnetic field to conduct the NMR experiments. The NMR signal in laboratory specimens arises solely from isolated unfrozen brine in the sea ice. Of particular interest is the extent of brine water content as well as the rotational and translational mobility of this water in the porous medium. Rotational mobility can be related to water proton relaxation times while translational mobility can, in principle, be measured using pulsed gradient spin echo methods. While such measurements are relatively routine in the laboratory, the challenge was to develop portable instrumentation for field use. (Auth.)

52-5769
Fast recession of a west antarctic glacier.
Rignot, E.J., *Science,* July 24, 1998, 281(5376), p.549-551, Refs. p.550-551.
Glacier ablation, Glacier melting, Antarctica—Pine Island Bay, Antarctica—Pine Island Glacier
Satellite radar interferometry observations of Pine Island Glacier, West Antarctica, reveal that the glacier hinge-line position retreated 1.2 km per year between 1992 and 1996, which in turn implies that the ice thinned by 3.5 m per year. The fast recession of Pine Island Glacier, predicted to be a possible trigger for the disintegration of the West Antarctic Ice Sheet, is attributed to enhanced basal melting of the glacier floating tongue by warm ocean waters. (Auth.)

52-5770
Atmospheric residence time of CH_3Br estimated from the Junge spatial variability relation.
Colman, J.J., Blake, D.R., Rowland, F.S., *Science,* July 17, 1998, 281(5375), p.392-396, Refs. p.396.
Ozone, Atmospheric composition
The atmospheric residence time for methyl bromide (CH_3Br) has been estimated as 0.8 years from its empirical spatial variability relative to C_2H_6, C_2Cl_4, $CHCl_3$ and CH_3Cl. This evaluation of the atmospheric residence time, based on Junge's 1963 general proposal, provides an estimate for CH_3Br that is independent of source and sink estimates. Methyl bromide from combined natural and anthropogenic sources furnishes about half of the bromine that enters the stratosphere, where it plays an important role in ozone destruction. This residence time is consistent with the 0.7-year value recently calculated for CH_3Br from the combined strength estimates for its known significant sinks. (Auth.)

52-5771
Water as a dense icelike component in silicate glasses.
Richet, P., Polian, A., *Science,* July 17, 1998, 281(5375), p.396-398, Refs. p.398.
Water chemistry, Hydrogen bonds, High pressure ice

52-5772
Processing of pack ice stress data: final report.
Sandwell, Inc., Calgary, Alberta, Canatech Consultants Ltd., Calgary, Alberta, Ottawa, National Research Council Canada. Institute for Mechanical Engineering, July 1993, Var. p., NRC No.92-903/5219, Sandwell No.113027, For another version see 49-4385.
Pack ice, Ice floes, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice deformation, Pressure ridges, Offshore structures, Data processing

52-5773
Ice forces and geotechnical response of the Esso Caisson Retained Island 1986/87.
Croasdale, K.R., Der, C.D., Shinde, S.B., Calgary, Alberta, Esso Resources Canada Limited, Research Department, Feb. 1988, 79p. + appends., ERCL.RS.88.05, 24 refs.
Artificial islands, Caissons, Offshore structures, Earth fills, Foundations, Ice solid interface, Ice pileup, Grounded ice, Ice loads, Ice pressure, Strain measuring instruments, Canada—Northwest Territories—Mackenzie Delta, Beaufort Sea

52-5774
Ice load modelling: development and practical implementation. Draft final report.
Jordaan, I.J., Milord, P., Johnston, M., Stone, B.M., Xiao, J., Zou, B., St. John's, Memorial University of Newfoundland, Ocean Engineering Research Centre, Mar. 1993, 72p. + append., 46 refs.
Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice cracks, Ice breaking, Ships, Offshore structures, Structural analysis, Mathematical models, Statistical analysis, Environmental tests

52-5775
Ice flaking tests conducted with a gas actuator system. Final report.
Sandwell Inc., Calgary, Alberta, Ottawa, National Research Council Canada, June 1994, Var. p., Sandwell file 113281, DSS file XAQ93-00145-(022), 8 refs.
Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice deformation, Ice cracks, Ice breaking, Impact tests, Strain tests, Environmental tests

52-5776
Theoretical-empirical modeling of dynamic ice structure interactions.
Marcellus, R.W., Heuff, D.N., Nixon, W.A., Shyam Sunder, S., Harrap, R.M., Spencerville, Ontario, C.M.E.L. Enterprises Ltd., 1990, Var. p., C.M.E.L. report No.1057, 116 refs. Submitted to Canada Oil and Gas Lands Administration (COGLA) and funded by the Interdepartmental Panel on Energy Research and Development (PERD) for the project: Development and Verification of New Ice Load Models, Phase I.
Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice creep, Ice deformation, Ice cracks, Ice breaking, Strain tests, Environmental tests, Mathematical models, Computerized simulation

52-5777
Development of new ice load models: final report.
Jordaan, I.J., et al, St. John's, Memorial University of Newfoundland, Centre for Cold Ocean Resources Engineering, 1990, 206p., Refs. p.159-167. Submitted to Canada Oil and Gas Lands Administration (COGLA) and funded by the Interdepartmental Panel on Energy Research and Development (PERD) for the project: Development and Verification of New Ice Load Models, Phase I.
Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice elasticity, Ice deformation, Ice cracks, Ice breaking, Stress concentration, Mathematical models, Computer programs

52-5778
Development of ice load algorithm.
Fleet Technology Limited, Kanata, Ontario, Selvadurai and Associates Inc., Ottawa, Ontario, 1990, 46p. + appends., 28 refs. Submitted to Canada Oil and Gas Lands Administration (COGLA) and funded by the Interdepartmental Panel on Energy Research and Development (PERD) for the project: Development and Verification of New Ice Load Models, Phase I.
Offshore structures, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Mathematical models, Computerized simulation

52-5779
Comments on cumulus glaciation papers by P.V. Hobbs and A.L. Rangno.
Blyth, A.M., Latham, J., Hobbs, P.V., Rangno, A.L., *Royal Meteorological Society. Quarterly journal A,* Apr. 1998, 124(547), p.1007-1011, 34 refs. Includes reply. For pertinent papers see 45-1802, 45-3480 and 48-4478.
Cloud physics, Ice formation, Convection, Supercooled clouds, Marine atmospheres, Ice breaking, Particles, Ice crystal collision, Cracking (fracturing), Theories, Models, Water content

52-5780
Potential role of metal-binding proteins in cadmium detoxification in *Themisto libellula* (Mandt) and *Themisto abyssorum* Boeck from the Greenland Sea.
Ritterhoff, J., Zauke, G.P., *Marine environmental research,* Mar. 1998, 45(2), p.179-191, 44 refs.
Marine biology, Subpolar regions, Biomass, Plankton, Ecology, Metals, Sampling, Chemical composition, Greenland Sea

52-5781
New method for identification of sources for chemical time series and its application to the Greenland Ice Sheet Project ice core record.
Ditlevsen, P.D., Marsh, N.D., *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5649-5659, 32 refs.
Climatology, Ice sheets, Ice cores, Chemical composition, Indexes (ratios), Aerosols, Origin, Periodic variations, Models, Statistical analysis, Correlation, Greenland

52-5782
Physicochemical structure of the Greenland summer aerosol and its relation to atmospheric processes.
Kerminen, V.M., Hillamo, R.E., Mäkelä, T., Jaffrezo, J.L., Maenhaut, W., *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5661-5670, 52 refs.
Climatology, Polar atmospheres, Atmospheric composition, Ice sheets, Aerosols, Condensation nuclei, Ice fog, Atmospheric boundary layer, Particle size distribution, Ice air interface, Sampling

52-5783
Dry deposition parameterization for sulfur oxides in a chemistry and general circulation model.
Ganzeveld, L., Lelieveld, J., Roelofs, G.J., *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5679-5694, 78 refs.
Climatology, Atmospheric boundary layer, Global change, Forest ecosystems, Aerosols, Gases, Atmospheric composition, Mass transfer, Snow cover effect, Surface roughness, Models

52-5784
Estimation of polar stratospheric cloud volume and area densities from UARS, stratospheric aerosol measurement II, and polar ozone and aerosol measurement II extinction data.
Massie, S.T., Baumgardner, D., Dye, J.E., *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5773-5783, 24 refs.
Climatology, Polar atmospheres, Stratosphere, Cloud physics, Cloud droplets, Ice detection, Aerosols, Particle size distribution, Infrared spectroscopy, Scattering, Attenuation, Statistical analysis

52-5785
Particle microphysics and chemistry in remotely observed mountain polar stratospheric clouds.
Carslaw, K.S., et al, *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5785-5796, 43 refs.
Climatology, Polar atmospheres, Lidar, Polar stratospheric clouds, Cloud physics, Aerosols, Ozone, Degradation, Gravity waves, Ice formation, Ice vapor interface, Heterogeneous nucleation, Hydrates, Norway

52-5786
Modeling ozone laminae in ground-based arctic wintertime observations using trajectory calculations and satellite data.
Manney, G.L., et al, *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5797-5814, 32 refs.
Climatology, Polar atmospheres, Stratosphere, Ozone, Atmospheric composition, Stratification, Advection, Sounding, Profiles, Turbulent diffusion, Statistical analysis, Models, Canada—Northwest Territories—Eureka

52-5787
Layering in stratospheric profiles of long-lived trace species: balloon-borne observations and modeling.
Orsolini, Y.J., Manney, G.L., Engel, A., Ovarlez, J., Claud, C., Coy, L., *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5815-5825, 25 refs.
Climatology, Atmospheric composition, Stratosphere, Air masses, Polar atmospheres, Advection, Gases, Aerosols, Stratification, Profiles, Sounding, Sampling, France

52-5788
In situ measurements of stratospheric ozone depletion rates in the arctic winter 1991/1992: a Lagrangian approach.
Rex, M., et al, *Journal of geophysical research,* Mar. 20, 1998, 103(D5), p.5843-5853, 41 refs.
Climatology, Polar atmospheres, Stratosphere, Ozone, Degradation, Wind direction, Sounding, Profiles, Turbulent diffusion, Sunlight, Photochemical reactions, Statistical analysis, Seasonal variations

52-5789
Signatures of a universal spectrum for atmospheric interannual variability in some disparate climatic regimes.
Selvam, A.M., Fadnavis, S., *Meteorology and atmospheric physics,* 1998, 66(1-2), p.87-112, Refs. p.109-112.
Climatology, Climatic changes, Atmospheric circulation, Periodic variations, Polar atmospheres, Cloud cover, Spectra, Weather forecasting, Mathematical models, Fractals
Standard models in meteorological theory cannot explain satisfactorily the observed self-organized criticality in atmospheric flows. An alternative non-deterministic cell dynamical system model for atmospheric flows described in this paper predicts the observed self-organized criticality as intrinsic to quantumlike mechanics governing flow dynamics. The model provides universal quantification for self-organized criticality in terms of the statistical normal distribution. Model predictions are in agreement with a majority of observed spectra of time series of several standard climatological data sets representative of disparate climatic regimes, including arctic and antarctic atmospheres. Universal spectrum for natural climate variability rules out linear trends. Model concepts and results of analyses are discussed with reference to possible prediction of climate change. (Auth. mod.)

52-5790
Observations of the polarization of light reflected from sea ice.
Perovich, D.K., MP 5174, *Journal of geophysical research,* Mar. 15, 1998, 103(C3), p.5563-5575, 35 refs.
Sea ice, Ice optics, Snow optics, Electromagnetic properties, Solar radiation, Radiance, Specular reflection, Polarization (waves), Albedo, Surface roughness, Snow cover effect, Radiometry, Spectroscopy
As part of a large, interdisciplinary program investigating the electromagnetic properties of sea ice, the authors made spectral measurements of the albedo, reflectance, and Stokes vector of the reflected radiance field. The overall program encompassed observations of sea ice physical properties, optical properties and microwave properties, plus an extensive modeling effort. Measurements were made of an evolution sequence including young sea ice, pancake ice, snow-covered ice, first-year ice and ponded ice. The effects of surface roughness were investigated by artificially roughening part of a smooth, young ice sheet. Spectral and total albedos were sensitive to surface conditions. Stokes vector observations exhibited the greatest variability in the plane of incidence of the solar beam. Smoother surfaces, such as melt ponds, pancakes and bare ice, exhibited a larger increase than the snow-covered cases with their "rougher" surfaces. Specularly reflected light was highly polarized. In the "smooth" ice cases, there was significant polarization associated with the increase in reflectance, implying a substantial contribution from specular reflection. This contribution was greater at longer wavelengths, where specular reflection was a larger component of the reflected radiance.

52-5791
Shallow, brine-driven free convection in polar oceans: nonhydrostatic numerical process studies.
Kämpf, J., Backhaus, J.O., *Journal of geophysical research,* Mar. 15, 1998, 103(C3), p.5577-5593, 66 refs.
Oceanography, Sea ice distribution, Polynyas, Ocean currents, Brines, Convection, Air ice water interaction, Ice water interface, Heat loss, Ice growth, Mathematical models, Thermodynamics
A three-dimensional nonhydrostatic convection model, which accounts for small-scale ice-ocean interactions, is used to study convection in shallow sea (coastal) ice formation regions which contribute significantly to water mass formation in both the Arctic and antarctic ocean. The model is applied to an initial well-mixed ocean at rest with a temperature close to the freezing point. The ocean, initially free of ice, is exposed to cold and dry polar air. Cellular convection patterns develop in the ocean, finally occupying a mean aspect ratio of 2. Convection is driven by salt release during frazil ice formation due to supercooling. Newly forming sea ice is collected along convergent (downwelling) regions at the surface, thus showing also cellular structures. This collection of ice in small fractions of the sea surface results in a latent heat polynya type, which is very effective in terms of dense water mass formation. In summary, the results of the process studies indicate that cellular features in the sea ice cover, which may be detectable by remote sensing techniques, are closely related to active brine-driven convection. (Auth. mod.)

52-5792
Simulation of sea ice transport through Fram Strait: natural variability and sensitivity to forcing.
Harder, M., Lemke, P., Hilmer, M., *Journal of geophysical research,* Mar. 15, 1998, 103(C3), p.5595-5606, 42 refs.
Oceanography, Sea ice, Drift, Air ice water interaction, Wind velocity, Ocean currents, Advection, Wind factors, Ice cover effect, Mathematical models, Thermodynamics, Seasonal variations, Arctic Ocean

52-5793
Profile of CH_4 IR bands in ice mixtures.
Mulas, G., Baratta, G.A., Palumbo, M.E., Strazzulla, G., *Astronomy and astrophysics,* May 20, 1998, 333(3), p.1025-1033, 23 refs.
Extraterrestrial ice, Cosmic dust, Ice physics, Hydrocarbons, Frozen liquids, Ice composition, Ice spectroscopy, Infrared spectroscopy, Photochemical reactions, Spectra, Profiles, Gamma irradiation, Simulation

52-5794
Influence of N_2-fixing *Trifolium* on plant species composition and biomass production in alpine tundra.
Thomas, B.D., Bowman, W.D., *Oecologia,* June 1998, 115(1-2), p.26-31, 46 refs.
Plant ecology, Ecosystems, Alpine tundra, Tundra soils, Meadow soils, Tundra vegetation, Biomass, Soil chemistry, Vegetation patterns, Nutrient cycle, Chemical analysis, United States—Colorado—Niwot Ridge

52-5795
Long-term population dynamics of two *Carex curvula* species in the Central Alps on native and alien soils.
Erschbamer, B., Buratti, U., Winkler, J., *Oecologia,* June 1998, 115(1-2), p.114-119, 27 refs.
Plant ecology, Alpine landscapes, Vegetation patterns, Biomass, Growth, Soil chemistry, Substrates, Chemical composition, Simulation, Statistical analysis, Italy—Alps

52-5796

Elevated CO_2 ameliorates birch response to high temperature and frost stress: implications for modeling climate-induced geographic range shifts.

Wayne, P.M., Reekie, E.G., Bazzaz, F.A., *Oecologia,* Apr. 11, 1998, 114(3), p.335-342, 58 refs.

Plant physiology, Trees (plants), Growth, Climatic changes, Frost resistance, Cold tolerance, Transpiration, Carbon dioxide, Air temperature, Environmental impact, Simulation, Canada—Quebec, United States—Massachusetts

52-5797

Flowering phenology in the central highland of Iceland and implications for climatic warming in the Arctic.

Thórhallsdóttir, T.E., *Oecologia,* Mar. 1998, 114(1), p.43-49, 40 refs.

Plant ecology, Phenology, Polar atmospheres, Climatic factors, Snowmelt, Thaw depth, Air temperature, Global warming, Temperature effects, Sampling, Seasonal variations, Statistical analysis, Iceland

52-5798

Effect of elevation on sexual reproduction in alpine populations of *Saxifraga oppositifolia* (Saxifragaceae).

Gugerli, F., *Oecologia,* Mar. 1998, 114(1), p.60-66, 52 refs.

Plant ecology, Plants (botany), Alpine landscapes, Growth, Pollen, Ecosystems, Altitude, Sampling, Statistical analysis, Theories, Switzerland

52-5799

Somatic costs of reproduction in eight subarctic plant species.

Hemborg, A.M., Karlsson, P.S., *Oikos,* May 1998, 82(1), p.149-157, 42 refs.

Plant ecology, Plant physiology, Grasses, Biomass, Growth, Subarctic landscapes, Nutrient cycle, Chemical analysis, Sweden—Abisko

52-5800

Antarctic fiber optic spectrometer.

Boccas, M., Ashley, M.C.B., Phillips, A., Schinckel, A., Storey, J.W.V., *Astronomical Society of the Pacific. Publications,* Mar. 1998, 110(745), p.306-316, 14 refs.

Instruments, Cold weather operation, Atmospheric physics, Ice detection, Design criteria, Cold weather performance, Antarctica—Amundsen-Scott Station

The Antarctic Fiber Optic Spectrometer (AFOS) is one of a suite of instruments of the Automated Astrophysical Site Testing Observatory (AASTO) installed at the South Pole in Dec. 1996. In 1998, the AFOS will be attached to an altitude-azimuth mount and commence regular astronomical observations. In the years 1998-2000, the AASTO will be moved to other remote locations, high on the antarctic plateau, in order to complete the site testing campaign. The AFOS experiment consists of a 30 cm Newtonian telescope injecting light into a 45 m length of optical fibers that feed a UV-visible (200-840 nm) grating spectrograph inside the warm shelter. In this paper the authors describe the instrument and the first results. The main requirement of the design was reliable operation in an extremely cold environment, without maintenance, for 12 months. This has been achieved despite the very low power (approximately 7 W) available to run the instrument. (Auth.)

52-5801

University of Alaska Fairbanks, Alaska Soil Geography Field Trip, June 18-30, 1994. Guidebook. The genesis, classification, and management of permafrost soils.

Ping, C.L., Michaelson, G.J., Shur, IU.L., Loya, W.M., Fairbanks, University of Alaska, [1994], Var. p., Refs. passim.

Permafrost surveys, Tundra soils, Cryogenic soils, Soil surveys, Soil classification, Soil formation, Tundra vegetation, Vegetation patterns, United States—Alaska—North Slope

52-5802

Investigation of techniques for continuously profiling ice features.

Comfort, G., Ottawa, National Research Council Canada, Canadian Hydraulics Centre, Program on Energy Research and Development (PERD), 1998, 53p. + appends., PERD/CHC report: 5-91, 56 refs.

Ice surveys, Ice detection, Icebergs, Pressure ridges, Hummocks, Ice cover thickness, Ice bottom surface, Ice acoustics, Underwater acoustics, Subglacial observations

52-5803

Failure of ice under impact conditions: refinement of the constitutive model.

Melanson, P.M., Meglis, I.L., Jordaan, I.J., Ottawa, National Research Council Canada, Canadian Hydraulics Centre, Program on Energy Research and Development (PERD), 1998, 100p., PERD/CHC report: 7-82, Refs. p.94-98.

Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Impact tests, Stress strain diagrams, Mathematical models

52-5804

Lattice model of ice failure.

Sayed, M., Timco, G.W., *National Research Council Canada. Canadian Hydraulics Centre. Program on Energy Research and Development (PERD). Technical report,* May 1998, HYD-TR-035, 28p., PERD/CHC report 9-77, 23 refs.

Offshore structures, Ice solid interface, Ice cover strength, Ice elasticity, Ice loads, Ice pressure, Ice deformation, Ice cracks, Ice breaking, Lattice models, Computerized simulation

52-5805

Comparison of international codes for ice loads on offshore structures.

Sandwell Engineering Inc., Vancouver, British Columbia, Central Marine Research and Design Institute, St. Petersburg, Russia, Ottawa, National Research Council Canada, Canadian Hydraulics Centre, Program on Energy Research and Development (PERD), 1998, Var. p., PERD/CHC report: 11-20, 10 refs. Appendixes include building codes in Russian and English versions.

Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice control, Safety, Building codes, Design criteria, Mathematical models

52-5806

NRC centre for ice loads on offshore structures.

Timco, G.W., *National Research Council Canada. Canadian Hydraulics Centre. Program on Energy Research and Development (PERD). Technical report,* May 1998, HYD-TR-034, 24p. + appends., PERD/CHC report 35-51, With French summary. Refs. passim. + listing of current holdings in Appendix E.

Ice solid interface, Ice loads, Ice pressure, Ice cover strength, Ice surveys, Artificial islands, Offshore structures, Offshore drilling, Exploration, Bibliographies, Data processing, Beaufort Sea

52-5807

Retrieval of precipitation from microwave airborne sensors during TOGA COARE.

Viltard, N., Obligis, E., Marecal, V., Klapisz, C., *Journal of applied meteorology,* July 1998, 37(7), p.701-717, 37 refs.

Precipitation (meteorology), Cloud physics, Radiation balance, Water content, Ice water interface, Ice density, Raindrops, Radiometry, Radar echoes, Brightness, Ice detection

52-5808

Formation and evolution of interstellar icy grain mantles.

Schutte, W.A., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.1-42, Refs. p.36-42.
DLC QB791.C674 1997

Extraterrestrial ice, Cosmic dust, Cloud physics, Ice physics, Condensation, Ice composition, Chemical composition, Vapor transfer, Radiation absorption, Gamma irradiation, Spectra, Simulation, Theories

52-5809

Core-mantle interstellar dust model.

Greenberg, J.M., Li, A.G., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.43-70, Refs. p.68-70.
DLC QB791.C674 1997

Extraterrestrial ice, Cosmic dust, Cloud physics, Ice physics, Ice composition, Grain size, Photochemical reactions, Infrared radiation, Ultraviolet radiation, Attenuation, Spectra, Models

52-5810

Infrared spectroscopy of interstellar ices.

Whittet, D.C.B., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.133-154, Refs. p.152-154.
DLC QB791.C674 1997

Extraterrestrial ice, Ice physics, Cosmic dust, Remote sensing, Infrared spectroscopy, Ice spectroscopy, Ice detection, Chemical composition, Simulation

52-5811

Observations of CO ices in molecular clouds.

Chiar, J.E., Whittet, D.C.B., Adamson, A.J., Kerr, T.H., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.171-177, 21 refs.
DLC QB791.C674 1997

Extraterrestrial ice, Ice physics, Cosmic dust, Cloud physics, Ice composition, Chemical composition, Remote sensing, Ice spectroscopy, Infrared spectroscopy, Ice detection, Attenuation, Spectra

52-5812

Determination of the optical constants of ices in the mid-infrared.

Trotta, F., Schmitt, B., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.179-184, 5 refs.
DLC QB791.C674 1997

Extraterrestrial ice, Cosmic dust, Ice physics, Ice optics, Refractivity, Optical properties, Infrared radiation, Mathematical models, Spectra, Simulation

52-5813

Some astrophysical applications of ion irradiation experiments.

Baratta, G.A., Castorina, A.C., Palumbo, M.E., Strazzulla, G., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.185-204, Refs. p.203-204.
DLC QB791.C674 1997

Extraterrestrial ice, Ice physics, Cosmic dust, Frost, Hydrocarbons, Ice spectroscopy, Infrared spectroscopy, Simulation, Photochemical reactions

52-5814
Origin and evolution of cometary ice.
Yamamoto, T., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.413-441, Refs. p.439-441.
DLC QB791.C674 1997
Extraterrestrial ice, Ice physics, Cosmic dust, Amorphous ice, Ice composition, Chemical composition, Ice formation, Phase transformations, Ice sublimation, Mathematical models, Origin, Theories

52-5815
Comets as samplers of interstellar dust.
Greenberg, J.M., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.443-458, Refs. p.456-458.
DLC QB791.C674 1997
Extraterrestrial ice, Ice physics, Cosmic dust, Ice nuclei, Ice composition, Aggregates, Chemical composition, Density (mass/volume), Porosity, Theories

52-5816
Numerical modelling of gas production curves of a dust covered comet nucleus.
Enzian, A., Cabot, H., Klinger, J., Majolet, S., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.495-503, 16 refs.
DLC QB791.C674 1997
Extraterrestrial ice, Ice physics, Ice composition, Ice sublimation, Phase transformations, Ice vapor interface, Vapor diffusion, Theories, Mathematical models

52-5817
Physical processes on grains important for the chemical evolution of interstellar clouds.
Pirronello, V., NATO Advanced Study Institute on the Cosmic Dust Connection, Erice, Italy, June 6-17, 1994. Proceedings. Edited by J.M. Greenberg and NATO ASI, Series C. Mathematical and Physical Sciences. Vol.487, Dordrecht, Kluwer Academic Publishers, 1996, p.505-521, Refs. p.519-521.
DLC QB791.C674 1997
Extraterrestrial ice, Ice physics, Cosmic dust, Cloud physics, Ice composition, Surface properties, Photochemical reactions, Phase transformations, Theories

52-5818
Planktonic Ostracoda in Croker Passage (Antarctic Peninsula) during two austral seasons: summer 1985/1986 and winter 1989.
Błachowiak-Samołyk, K., Zmijewska, I., *Polish polar research,* Feb. 1998, 18(2), p.79-87, With Polish summary. 20 refs.
Marine biology, Biomass, Plankton, Distribution, Sampling, Classifications, Antarctica—Croker Passage
The distribution of planktonic Ostracoda (Halocyprididae) was studied based on vertically-stratified zooplankton samples collected during the summers of 1985-86 and in winter of 1989, from the 1200 m deep Croker Passage off the Antarctic Peninsula. Seven species of Ostracoda were recorded: *Alacia belgicae, Alacia hettacra, Metaconchoecia isocheira, Metaconchoecia skogsbergi, Boroecia antipoda, Disconchoecia* aff. *elegans* and *Proceroecia brachyaskos.* The first 3 species, endemic to antarctic waters, were predominant (about 90%). Generally Ostracoda were most numerous in 600-200 m layer in summer and in 1000-400 m layer in winter. In the investigated area there was a clear contrast between the abundance of Ostracoda during austral summer and scarcity during austral winter. (Auth.)

52-5819
New data on the Asteroidea of Admiralty Bay, King George Island, South Shetland Islands.
Presler, P., Figielska, E., *Polish polar research,* Feb. 1998, 18(2), p.107-117, With Polish summary. Refs. p.114-117.
Marine biology, Biomass, Distribution, Sampling, Distribution, Antarctica—Admiralty Bay
In the material of nearly 2000 individuals of Asteroidea collected in Admiralty Bay, the largest bay of the South Shetlands, 36 species were determined, enriching the list of hitherto known asteroid species of this basin by 17 taxa. One of them, *Peribolaster macleani,* is recorded for the first time in West Antarctica. The most frequent and abundant asteroids of Admiralty Bay were *Odontaster validus, Psilaster charcoti, Bathybiaster loripes obesus* and *Diplasterias brucei.* The bathymetric and geographic distribution of all species are discussed. (Auth.)

52-5820
Snow cover in the vicinity of Arctowski Station, King George Island, in winter 1991.
Gonera, P., Rachlewicz, G., *Polish polar research,* Aug. 1997, 18(1), p.3-14, With Polish summary. 13 refs.
Snow cover distribution, Snow accumulation, Snow physics, Meteorological factors, Wind factors, Antarctica—Arctowski Station
Properties of a snow cover in the vicinity of Arctowski Station were studied in 1991. Variations of snow quality and physical transformations were analyzed against changes of atmospheric parameters, based on water equivalent index and examination of snow pits. Significant dependence of snow cover distribution and snow structure on local climate and terrain morphology was found. (Auth. mod.)

52-5821
Mid-winter thawing in the vicinity of Arctowski Station, King George Island.
Rachlewicz, G., *Polish polar research,* Aug. 1997, 18(1), p.15-24, With Polish summary. 12 refs.
Air temperature, Atmospheric disturbances, Meteorological factors, Snow melting, Antarctica—Arctowski Station
Mid-winter rapid rise of temperature in the vicinity of Arctowski Station was studied in 1991. Depending on circumantarctic migration of cyclones, a sudden drop in air pressure and foehn-like phenomenon, intensified by local topography, was observed. Two such events occurred on May 13 and June 28, under meteorological conditions of autumn and winter. Extreme intensification of morphogenetic processes caused degradation of snow cover, meltwater discharge, radical transformation of sloped effective aeolian activity and dynamic modifications in a maritime area. (Auth. mod.)

52-5822
Statistics of surface-layer turbulence over terrain with meter-scale heterogeneity.
Andreas, E.L., Hill, R.J., Gosz, J.R., Moore, D.I., Otto, W.D., Sarma, A.D., MP 5175, *Boundary-layer meteorology,* 1998, Vol.86, p.379-408, 50 refs.
Meteorology, Turbulent boundary layer, Soil air interface, Turbulent diffusion, Air temperature, Humidity, Heat sinks, Diurnal variations, Wind factors, Topographic effects, Mathematical models, Statistical analysis, Indexes (ratios)
The Sevilleta National Wildlife Refuge has patchy vegetation in sandy soil. During midday and at night, the surface sources and sinks for heat and moisture may thus be different. Although the Sevilleta is broad and level, its meter-scale heterogeneity could therefore violate an assumption on which Monin-Obukhov similarity theory (MOST) relies. To test the applicability of MOST in such a setting, the authors measured the standard deviations of vertical and longitudinal velocity, temperature and humidity, the temperature-humidity covariance and the temperature skewness. Dividing the former five quantities by the appropriate flux scales yielded nondimensional statistics with magnitudes and variations with stability similar to those reported in the literature and, thus, seem to obey MOST.

52-5823
Stability dependence of the eddy-accumulation coefficients for momentum and scalars.
Andreas, E.L., Hill, R.J., Gosz, J.R., Moore, D.I., Otto, W.D., Sarma, A.D., MP 5176, *Boundary-layer meteorology,* 1998, Vol.86, p.409-420, 29 refs.
Meteorology, Turbulent boundary layer, Stability, Heat flux, Turbulent exchange, Air flow, Vapor transfer, Wind velocity, Mathematical models, Analysis (mathematics), Sampling, Indexes (ratios)
From a set of turbulence data collected with a three-axis sonic anemometer/thermometer, the authors simulate the eddy-accumulation process for sensible heat and momentum fluxes. The resulting eddy-accumulation coefficient for momentum clearly depends on surface-layer stability; at neutral stability, its value is 0.63. Supplementation of the scalar eddy-accumulation coefficients derived from sensible heat flux data with values of sensible and latent heat flux coefficients reported by Businger and Oncley reveals that scalar eddy-accumulation coefficients depend on stability, though more weakly than does the momentum coefficient. The coefficients for sensible and latent heat show no significant difference, and are fitted with one function of stability whose value is 0.52 for neutral stratification.

52-5824
Proton transfer reactions at the surface of ice. Heterogeneous reactions involved in stratospheric ozone depletion.
Bianco, R., Gertner, B.J., Hynes, J.T., *Berichte der Bunsen-Gesellschaft für Physikalische Chemie,* 1998, 102(3), p.518-526, 44 refs.
Climatology, Polar stratospheric clouds, Polar atmospheres, Degradation, Ozone, Ice physics, Ice vapor interface, Adsorption, Ionization, Chemical analysis, Proton transport, Theories
Two heterogeneous reactions on an ice surface that are relevant in connection with stratospheric ozone depletion are discussed theoretically: the hydrolysis of chlorine nitrate, $ClONO_2$, to produce HOCl and HNO_3 and the acid ionization of hydrochloric acid HCl. For the former, a recently proposed proton transfer mechanism actively involving the ice lattice is supported by examination of the $ClONO_2$ hydrolysis energetics when proton transfer is prevented. For the latter, a previously proposed picture of facile HCl ionization at, but not on, the ice surface is supported by the results of a quantum treatment of the proton and of a model investigation of the free energetics of ionization atop the ice surface. (Auth.)

52-5825
Atmospheric ice ablation processes on Mt Equinox, Vermont, USA.
Ryerson, C.C., Kenyon, P., MP 5177, *Atmospheric research,* 1998, Vol.46, p.75-86, 16 refs. For another version see 50-5375.
Synoptic meteorology, Ice accretion, Glaze, Hoarfrost, Ablation, Classifications, Ice sublimation, Ice solid interface, Ice air interface, Wind direction, Wind factors, Ice cover effect, Mass transfer, United States—Vermont—Equinox, Mount
The goal of this study is to identify local and synoptic-scale weather conditions associated with rime and glaze ablation. A total of 77 ablation periods were recorded by time-lapse video for 2 winters on Mt. Equinox, VT, USA. Weather information was acquired from on-site measurements, radiosondes and synoptic charts. Sublimation was the slowest process, whereas melt and mechanical ablation events were the most rapid. Ablation occurred principally during daylight hours. Wind speeds were similar and slowest during sublimation and melt, with sublimation occurring primarily in westerly winds, and melt occurring within southerly winds. Sublimation air temperatures and relative humidities were lowest, with medians of -11°C and 57%, respectively. In general, melt is most frequent as storms approach, and sublimation is most common as storms depart.

52-5827
Structural and phase transitions on water ice surface under HCl exposure: implications for stratosphere conditions.
Persiantseva, N.M., Popovicheva, O.B., Rakhimova, T.V., *Surface review and letters,* Feb. 1998, 5(1), p.437-441, 13 refs.
Climatology, Polar atmospheres, Stratosphere, Cloud physics, Ice vapor interface, Vapor pressure, Aerosols, Absorption, Phase transformations, Ice sublimation, Simulation, Ice spectroscopy
In a simulation of arctic and antarctic stratospheric chemistry, the HCl-ice interaction has been investigated over a wide HCl pressure range of 10^{-7}-10^{-4} Torr and ice temperatures 150-240 K. The three characteristic values for HCl uptake efficiency were obtained which indicate the change of phase state and structure of the ice surface at increasing HCl pressure. The HCl uptake kinetics is analyzed. The flow of HCl molecules from the ice surface into the bulk is shown to play an important role in the redistribution of HCl molecules. It defines a low surface concentration of the adsorbed HCl molecules under stratospheric conditions at early times of interaction. (Auth. mod.)

52-5828
Neoproterozoic and Palaeozoic paleomagnetic data for the Siberian Platform: from Rodinia to Pangea.
Smethurst, M.A., Khramov, A.N., Torsvik, T.H., *Earth-science reviews,* Mar. 1998, 43(1-2), p.1-24, 53 refs.
Pleistocene, Tectonics, Magnetic surveys, Continental drift, Geomagnetism, Orientation, Sediments, Stratigraphy, Geochronology, Statistical analysis, Russia—Siberia

52-5829
Holocene-Younger Dryas transition recorded at Summit, Greenland.
Taylor, K.C., Gow, A.J., Meese, D.A., MP 5179, *Science,* Oct. 31, 1997, 278(5339), p.825-827, 26 refs.
Pleistocene, Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Atmospheric circulation, Water vapor, Isotope analysis, Geochronology, Sampling, Greenland

52-5830
Seismic and ultrasonic velocities in permafrost.
Carcione, J.M., Seriani, G., *Geophysical prospecting,* 1998, Vol.46, p.441-454, 20 refs.
Permafrost physics, Permafrost hydrology, Seismic velocity, Seismic reflection, Wave propagation, Unfrozen water content, Soil temperature, Velocity measurement, Mathematical models, Theories, Shear modulus

52-5831
Freezing and thawing in typical chernozem.
Veretel'nikov, V.P., Riadovoĭ, V.A., *Eurasian soil science,* 1997, 30(2), p.169-171, Translated from Pochvovedenie. 4 refs.
Agriculture, Chernozem, Frozen ground mechanics, Ground thawing, Freeze thaw cycles, Snowmelt, Soil erosion, Snow cover effect, Frost penetration, Soil tests, Ukraine—Sumy

52-5832
Coefficient of kinetic friction of snow skis during turning descents.
Sahashi, T., Ichino, S., *Japanese journal of applied physics,* Feb. 1998, 37(2)pt.1, p.720-727, 10 refs.
Skis, Metal snow friction, Ice friction, Loads (forces), Slope orientation, Gravity, Ice solid interface, Mechanical tests, Analysis (mathematics)

52-5833
Black pools of death: hypoxic, brine-filled ice gouge depressions become lethal traps for benthic organisms in a shallow arctic embayment.
Kvitek, R.G., Conlan, K.E., Iampietro, P.J., *Marine ecology progress series,* Feb. 12, 1998, Vol.162, p.1-10, 27 refs.
Marine biology, Ecosystems, Biomass, Ocean bottom, Pit and mound topography, Brines, Salinity, Ice scoring, Water chemistry, Stratification, Oxygen, Attenuation, Sampling, Seasonal variations, Canada—Northwest Territories—Resolute Bay

52-5834
Three-dimensional seismic structure and moment tensors of non-double-couple earthquakes at the Hengill-Grensdalur volcanic complex, Iceland.
Miller, A.D., Julian, B.R., Foulger, G.R., *Geophysical journal international,* May 1998, 133(2), p.309-325, 42 refs.
Tectonics, Earth crust, Earthquakes, Volcanoes, Subpolar regions, Seismic surveys, Seismic velocity, Elastic waves, Geothermy, Mathematical models, Origin, Iceland

52-5835
Altaian relict subnemoral forest belt and the vegetation of pre-Pleistocene mountainous landscapes.
Ermakov, N., *Phytocoenologia,* Mar. 31, 1998, 28(1), p.31-44, 21 refs.
Pleistocene, Plant ecology, Forest ecosystems, Vegetation patterns, Landscape development, Classifications, Geobotanical interpretation, Russia—Siberia

52-5836
On salt solutions in the Martian cryolithosphere.
Kuz'min, R.O., Zabalueva, E.V., *Solar system research,* May-June 1998, 32(3), p.187-197, Translated from Astronomicheskiĭ vestnik. 43 refs.
Mars (planet), Regolith, Extraterrestrial ice, Ground ice, Geocryology, Frozen ground chemistry, Temperature variations, Salt water, Solutions, Liquid phases, Freeze thaw cycles, Theories

52-5837
Millennial-scale fluctuations in North Atlantic heat flux during the last 150,000 years.
Chapman, M.R., Shackleton, N.J., *Earth and planetary science letters,* June 15, 1998, 159(1-2), p.57-70, 50 refs.
Pleistocene, Paleoclimatology, Climatic changes, Paleoecology, Oceanography, Meltwater, Ice rafting, Surface temperature, Ocean currents, Advection, Heat flux, Drill core analysis, Geochronology, Atlantic Ocean

52-5840
Adaptive strategies of lichens to cold environments. [Estrategias adaptativas de especies liquénicas a ambientes fríos]
Valladares, F., García-Sancho, L., Informe sobre las actividades científicas de España en la Antártida durante la campaña 1996-97 (Report on Spanish antarctic activities during the 1996-1997 expedition). Edited by J.R. Vericad and J. Cacho, Madrid, Comisión Interministerial de Ciencia y Tecnología, July 1997, p.13-20, In Spanish with English summary.
Lichens, Tundra vegetation, Acclimatization, Photosynthesis, Cold tolerance, Antarctica—Juan Carlos I Station
Comparisons between antarctic and European populations of certain cosmopolitan lichen species, the tolerance to the simultaneous stresses of high irradiance and low temperatures, and the estimation of the primary production of some lichens during the austral summer were investigated. It is concluded that the antarctic populations are not very productive, that both lichens and vascular plants are remarkably resistant to the combination of high irradiances and low temperatures, and that the austral summer is a period of negative carbon balance for some lichens. (Auth. mod.)

52-5841
Geological and climatic Quaternary evolution of West Antarctica. [Evolución geomorfológica, climática y tectónica durante el Cuaternario en el sector de las Islas Shetland del Sur y extremo NW de la Península Antártica]
López, J., Informe sobre las actividades científicas de España en la Antártida durante la campaña 1996-97 (Report on Spanish antarctic activities during the 1996-1997 expedition). Edited by J.R. Vericad and J. Cacho, Madrid, Comisión Interministerial de Ciencia y Tecnología, July 1997, p.57-62, In Spanish with English summary.
Geological surveys, Geological maps, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Quaternary deposits, Tectonics, Geomorphology, Paleoclimatology, Antarctica—South Shetland Islands, Antarctica—Antarctic Peninsula, Antarctica—Bransfield Strait
Preliminary results are reported of investigations carried out in the areas of the South Shetland Is., the Bransfield Strait and the Antarctic Peninsula, covering the Quaternary geomorphological evolution and the recent uplift of the archipelago. The field work is outlined as follows: mapping (scales 1:10,000 and 1:15,000) of landforms and surface deposits, as well as of structural elements in areas investigated; analysis of the characteristics and distribution of the landforms and deposits of marine, glacial and periglacial origins; measurement of profiles of raised beaches and platforms; sampling of materials relevant to the geomorphological and neotectonic studies; completing and correcting the geomorphological map of Fildes Peninsula, compiled in a previous campaign; and measuring faults, joints, dykes and other tectonic structures. (Auth. mod.)

52-5842
Glacial dynamics on Livingston Island. [Estudio de la dinámica glacial de la Isla Livingston]
Calvet, J., Informe sobre las actividades científicas de España en la Antártida durante la campaña 1996-97 (Report on Spanish antarctic activities during the 1996-1997 expedition). Edited by J.R. Vericad and J. Cacho, Madrid, Comisión Interministerial de Ciencia y Tecnología, July 1997, p.97-103, In Spanish with English summary.
Glacier flow, Glacier mass balance, Glacier oscillation, Glacier thickness, Snow cover, Ablation, Antarctica—Livingston Island
During 3 antarctic Spanish expeditions, measurements of glacier dynamics and mass balance, glacier flow and fluctuations, glacier thickness and snow cover evolution, were carried out on Livingston I. between 1994 and 1997. Also used were data obtained from aerial photographs taken in 1956 and satellite images taken in 1988 and 1991.

52-5843
Northern Sea Route, 1997.
Brigham, L.W., *Polar record,* July 1998, 34(190), p.219-224, 11 refs.
Route surveys, Ice navigation, Ice routing, Ice reporting, Ice conditions, Marine transportation, Economic development, International cooperation, Northern Sea Route

52-5844
SCAR bulletin No.130, July 1998.
Scientific Committee on Antarctic Research, *Polar record,* July 1998, 34(190), p.275-283.
International cooperation, Legislation, Environmental protection, Environmental impact
Highlights of the Meeting of the SCAR Executive Committee, held in Cape Town, South Africa, Aug. 25-29, 1997, are presented. Discussions covered global change and the Antarctic, antarctic data management and Antarctic Master Directory, COMNAP and SCALOP handbook and joint executive meeting, Group of specialists and working groups, SCAR meetings XXV and XXVI, the Antarctic Treaty Meeting, relationships with ICSU and other bodies, finance, and SCAR strategy and functions. Appendices, with additional data relevant to the discussions and a list of acronyms and abbreviations, conclude this bulletin.

52-5845
Oxidation kinetics in Uruguay and Antarctica. [Cinéticas de oxidación en zona sur-este de Uruguay y región Antártica—resultado de cuatro años de investigación]
Rivero, S., Bidegain, M., Morales, L., Diaz, V., *Montevideo. Instituto Antártico Uruguayo. Actividad científica 1996/1997 (Scientific activity 1996-1997),* July 1997, Vol.6, p.29-40, In Spanish with English summary. 8 refs.
Atmospheric composition, Air pollution, Corrosion, Metals, Low temperature research, Chemical analysis, Antarctica—Artigas Station
Uruguay's participation in a network of atmospheric corrosiveness monitoring, one of which is located at Artigas Station, is described. Standardized materials of industrial interest are exposed to different natural atmospheres, representative of rural, urban, industrial and polar marine environments. Meteorological parameters are registered, pollution (monthly sulphur dioxide and chloride deposition rates) is evaluated. Antarctic samples in direct contact with solid precipitation are periodically collected and analyzed. The mean annual corrosion rate is established for all materials; the environmental data is processed during 4-year periods.

52-5846
Background to CRP-1, Cape Roberts Project, Antarctica.
Anderson, J., et al, *Terra antartica,* 1998, 5(1), p.1-30, Refs. p.29-30.
Research projects, Drill core analysis, Marine geology, Glacial geology, Drilling, Seismic surveys, Sea ice, Antarctica—Ross Sea
The first hole of the Cape Roberts Project, CRP-1, was drilled in Oct. 1997, to a depth of 148 m below the sea floor. This part of the report outlines the geologic setting, a gently tilted sequence near the margin of the Victoria Land Basin, and describes the history of the growth of sea ice, which provided the drilling platform, as well as the history of the drilling itself. Core recovery was found 77% in soft and brittle strata to 100 m and 98% below that. Core properties that were studied include fracture patterns, porosity, sonic velocity and magnetic susceptibility. Velocity in particular was useful in relating the cored sequence to the regional seismic stratigraphy. Analytical facilities new to the Antarctic and used for processing samples for the project are described here and include a bench top palynological processing system and a palaeomagnetic laboratory. The core management and sampling system, which recorded over 2,000 samples, is also outlined. (Auth. mod.)

52-5847
Quaternary strata in CRP-1, Cape Roberts Project, Antarctica.
Anderson, J., et al, *Terra antartica,* 1998, 5(1), p.31-61, Refs. p.60-61.
Glacial geology, Glacial deposits, Ice rafting, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Paleoclimatology, Antarctica—Ross Sea
The uppermost part of the core in Cape Roberts Project-1 (CRP-1) is interpreted to be Quaternary in age. The interval comprises poorly consolidated clays, silts, sands, gravels, diamictons and an association of mixed skeletal carbonate-terrigenous clastic sediments. The interval has been divided into four principal lithostratigraphic units based on major changes in lithology. Notable within the Quaternary interval is a short section of mixed skeletal carbonate-terrigenous clastic sediment which contains a rich and diverse assemblage of benthic macroinvertebrate fossils. Petrological investigations of large clasts and sands suggests that Quaternary sediments in CRP-1 were derived from a variety of basement sources including Precambrian to Early Palaeozoic metamorphic and granitic rocks, Jurassic dolerites and the Devonian-Triassic Beacon Supergroup, with a variable though significant contribution from coeval volcanic activity associated with the McMurdo Volcanic Group. The Quaternary section of CRP-1 is dated by diatom biostratigraphy at 1.25-1.8 Ma, and has also yielded a wide variety of macrofossils and microfossils. (Auth. mod.)

52-5848

Miocene strata in CRP-1, Cape Roberts Project, Antarctica.

Anderson, J., et al, *Terra antartica,* 1998, 5(1), p.63-124, Refs. p.122-124.

Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Fossils, Geochronology, Paleoclimatology, Antarctica—Ross Sea

Based on the alternation of diamicts with other clastic sedimentary facies, the predominantly lithified Miocene section of CRP-1 has been divided into lithostratigraphic Units 5 to 7, with Unit 5 further divided into 8 subunits and Unit 6 into 3. Petrological investigations of extraformational clasts indicate provenance from probable Cambro-Ordovician granites, metamorphic rocks (Koettlitz Group?), Ferrar dolerite and rhyolites of uncertain affinity. The sand fraction is dominated by grains derived from crystalline basement and the Beacon Supergroup, but volcanic glass, abundant above 62 mbsf, is correlated with the McMurdo Volcanic Group. X-ray diffraction analysis of mud samples shows a similar change in mineralogy over the interval 60-65 mbsf from smectite-dominated above to illite and chlorite-dominated below. The Miocene section is dated by diatom biostratigraphy at 17.5-22.4 Ma, which suggests an average sediment accumulation rate of about 21 m/my. The most prevalent fossil groups are diatoms, foraminifers and palynomorphs. (Auth. mod.)

52-5849

Summary of results from CRP-1, Cape Roberts Project, Antarctica.

Anderson, J., et al, *Terra antartica,* 1998, 5(1), p.125-137, 21 refs.

Glacial geology, Glacial deposits, Marine geology, Marine deposits, Glacier oscillation, Sea level, Paleoclimatology, Antarctica—Ross Sea

Poorly consolidated diamicton, silt, sand, gravel and a mixed skeletal carbonate-terrigenous facies was cored and dated as 1.25 to 1.80 Ma from diatom biostratigraphy. At least two cycles of rise and fall in sea level are recognized. The pre-Quaternary section comprises mainly diamictite, sandstone and siltstone, organized in a cyclic fashion considered to reflect 6-8 variations in relative sea level and/or glacial advance-retreat. Depositional environments were largely shallow-water glacimarine with sedimentation associated with temperate-glacier termini. Diatom biostratigraphy and magnetostratigraphy indicate the strata range from 22.4 to 17.5 Ma in age. These strata record the first extensive Neogene volcanism in the region around 18 mya, and contain the first post-Eocene marine-dinoflagellate assemblage. (Auth. mod.)

52-5850

Human influence or natural perturbation in oceanic and coastal waters—can we distinguish between them.

Strömberg, J.O., *Hydrobiologia,* Sep. 5, 1997, Vol.352, Asia-Pacific Conference on Science and Management of Coastal Environment. Proceedings of the International Conference held in Hong Kong, 25-28 June 1996. Edited by Y.S. Wong and N.F.Y. Tam, p.181-193, Refs. p.191-193.

Marine biology, Sea water, Water pollution, Minerals, Polar regions

The review brings up several case studies on what is perceived as natural perturbations and/or human impacts on the marine biosphere. Case studies include polar seas, the greenhouse effect, introduction of new species, pollution in antarctic waters, pelagic fish stock fluctuations in oceanic waters, and eutrophication and pollution in temperate coastal systems. In coastal waters human impact is often obvious, but climatic fluctuations also influence the systems. In the open ocean the two factors are difficult to distinguish and some large scale fish stock fluctuations still need to be understood. (Auth.)

52-5851

Regional snow avalanche activity and known fatal avalanche accidents for Canada (1863 to June 1997).

Jamieson, J.B., Brooks, G.R., *Canada. Geological Survey. Open file,* 1998, No.3592, 1 sheet, 9 refs.

Avalanches, Accidents, Snow depth, Snow cover distribution, Avalanche forecasting, Maps, Canada

52-5852

Numerical study of the effects of icing on fixed and rotary wing performance.

Kwon, O.J., Sankar, L.N., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1991, 11p., AIAA-91-0662, 17 refs. Presented at the AIAA 29th Aerospace Sciences Meeting, Reno, NV, Jan. 7-10, 1991.

Aircraft icing, Ice loads, Ice air interface, Air flow

52-5853

Evaluation of aggregate performance in pavement concrete.

Sweet, H.S., Woods, K.B., *American Concrete Institute. Journal,* June 1948, 19(10), p.1033-1040, 19 refs.

Concrete pavements, Concrete aggregates, Concrete durability, Frost resistance, Freeze thaw tests

52-5854

Origin, evolution, and effects of the air void system in concrete. Part 2—influence of type and amount of air-entraining agent.

Backstrom, J.E., Burrows, R.W., Mielenz, R.C., Wolkodoff, V.E., *American Concrete Institute. Journal,* Aug. 1958, p.261-272.

Air entrainment, Concrete admixtures, Concrete durability, Frost resistance, Frost protection, Freeze thaw tests

52-5855

Origin, evolution, and effects of the air void system in concrete. Part 3—influence of water-cement ratio and compaction.

Backstrom, J.E., Burrows, R.W., Mielenz, R.C., Wolkodoff, V.E., *American Concrete Institute. Journal,* Sep. 1958, p.359-375.

Air entrainment, Water cement ratio, Concrete placing, Concrete durability, Frost resistance, Frost protection, Freeze thaw tests

52-5856

Low temperature behavior of cellular concrete.

Richard, T.G., *American Concrete Institute. Journal,* Apr. 1977, 74(4), p.173-178, 13 refs.

Cellular concretes, Concrete strength, Thermal insulation, Cryogenics, Low temperature research, Low temperature tests

52-5857

Durability of concrete containing hollow plastic microspheres.

Ozyildirim, C., Sprinkel, M.M., *ACI journal,* July-Aug. 1982, 79(4), p.307-312, 6 refs.

Concrete admixtures, Concrete durability, Frost resistance, Frost protection, Freeze thaw tests

52-5858

Ultra high-strength field placeable concrete with silica fume admixture.

Wolsiefer, J., *Concrete international: design & construction,* Apr. 1984, p.25-31, 7 refs.

Concrete admixtures, Concrete strength, Frost resistance, Freeze thaw tests

52-5859

Phenomenological aspect of concrete durability theory.

Podval'nyĭ, A.M., *Matériaux et constructions,* 1976, 9(51), p.151-162, With French summary. 40 refs.

Concrete durability, Concrete strength, Frost action, Frost resistance, Corrosion, Structural analysis, Mathematical models

52-5860

Mechanisms of frost action in concrete aggregates.

Cady, P.D., *Journal of materials,* June 1969, 4(2), p.294-311, 7 refs.

Concrete aggregates, Concrete freezing, Concrete durability, Frost action, Frost resistance, Freeze thaw tests

52-5861

Water movement in porous media towards an ice front.

Biermans, M.B.G.M., Dijkema, K.M., De Vries, D.A., *Nature,* Nov. 11, 1976, Vol.264, p.166-167, 4 refs. For another version see 33-1613.

Soil freezing, Freezing front, Soil water migration, Frozen ground thermodynamics

52-5862

Icing and the rescue helicopter.

Ringer, T.R., Stallabrass, J.R., Price, R.D., *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD conference proceedings,* [1967], No.24, Symposium on Aeromedical Aspects of Helicopter Operations in the Tactical Situation, NATO Headquarters, Paris, France, May 22-24, 1967, p.191-203, With French summary.

Helicopters, Aircraft icing, Ice forecasting, Rescue operations, Rescue equipment

52-5863

Visibility—more than meets the eye. *Transport Canada. Safety and Security. Transportation Development Centre. R&D update,* June 1998, 8(2), 1p., TP 10913, French version verso.

Aircraft icing, Snowfall, Snowstorms, Snow optics, Visibility, Safety, Weather forecasting

52-5864

Short general survey of the war between Finland and Russia in the winter of 1939-1940.

Peitsara, T., *Army quarterly,* Oct. 1941, Vol.43, p.45-62.

History, Military operation, Cold weather operation, Cold weather survival, Finland

52-5865

Struggle for lines of communications in winter.

Slesarev, P., *Military review,* July 1943, Vol.23, p.83-85, Translated from Krasnaia zvezda, Dec. 17, 1942.

History, Military operation, Military transportation, Cold weather operation, Russia

52-5866

Winter warfare training in Norway.

Flash, M., *Great Britain. Royal Artillery. Journal,* July 1950, 77(3), p.243-256.

Military operation, Education, Cold weather operation, Skis, Traverses, Norway

52-5867

Simulated and natural icing tests of an ice-protected UH-1H.

Kitchens, P.F., Adams, R.I., American Helicopter Society Annual National Forum, 33rd, Washington, D.C., May 1977, Alexandria, VA, American Helicopter Society, [1977], 32p., Preprint No.77.33-25, 10 refs.

Helicopters, Aircraft icing, Ice prevention, Ice removal, Artificial melting, Electric heating, Cold weather tests, Environmental tests

52-5868

U-Pb zircon chronology of mafic granulite from the Larsemann Hills, East Antarctica and its possible geological implications.

Tong, L.X., Liu, X.H., Zhang, L., Chen, F.K., *Terra antartica,* 1995, 2(2), p.123-126, 25 refs.

Mineralogy, Lithology, Geologic structures, Tectonics, Geomorphology, Geochronology, Soil dating, Radioactive age determination, Antarctica—Larsemann Hills

Preferentially oriented mafic granulite lenses, pods and boudins occur in gneisses in the Larsemann Hills. The rocks derived from mafic cumulate and experienced peak medium pressure granulite facies metamorphism. The U-Pb dating of 3 zircon fractions from this mafic granulite yields an age of 772 Ma, older than the Pan-African event (500 Ma). One possible explanation is that his age represents a tectonothermal event in response to granulite facies metamorphism; another explanation is that 772 Ma probably reflects a resetting age during the 500 Ma (Pan-African) event. (Auth. mod.)

52-5869

Contraption makes ice fly at South Pole: new CRREL digger great success, makes tunneling fast, safe.

Walsh, M.R., MP 5180, *Engineer update,* Feb. 1997, 21(2), p.10.

Snow tunnels, Tunneling (excavation), Ice cutting, Machinery, Construction equipment, Antarctica—Amundsen-Scott Station

52-5870

Ice jams in Alaska.

Eames, H.J., White, K.D., MP 5181, *U.S. Army Cold Regions Research and Engineering Laboratory. Ice engineering information exchange bulletin,* Feb. 1997, No.16, 4p., 8 refs.

River ice, Freezeup, Ice breakup, Ice jams, Accidents, Floods, Flood forecasting, Data processing, Statistical analysis, United States—Alaska

52-5871

Ice jams, winter 1995-96.

Eames, H.J., MP 5182, *U.S. Army Cold Regions Research and Engineering Laboratory. Ice engineering information exchange bulletin,* Aug. 1997, No.17, 4p., 9 refs.

River ice, Freezeup, Ice breakup, Ice jams, Accidents, Floods, Flood forecasting, Data processing, Statistical analysis, Cost analysis, United States

52-5872

Severe sleet-storm.

Von Schrenk, H., *Saint Louis Academy of Science. Transactions,* 1900, Vol.10, p.143-151, Footnotes passim.

Ice storms, Ice loads, Wind pressure, Trees (plants), Damage, United States—Missouri, United States—Illinois, United States—Indiana, United States—Ohio

52-5873

Northern area artillery cold weather operations.

De Franco, T.J., Morrow, T.O., *Artillery trends,* Jan. 1963, Vol.25, p.6-22.

Military operation, Cold weather operation, Cold weather survival, Military equipment, Winter maintenance

52-5874

Campaigning in arctic Russia.

Evans, F., *Royal United Service Institution. Journal,* May 1941, Vol.86, p.290-298, p.298 is missing.

Military operation, Cold weather operation, History, Russia—Murmansk, Russia—Arkhangel'sk

52-5875

Cold weather injury. *Artillery trends,* Feb. 1962, p.31,63.

Cold exposure, Frostbite, Wind chill, Physiological effects, Health

52-5876

Our arctic problem: combat in polar areas poses urgent questions requiring early answers.

Moore, R.E., *Ordnance,* Sep. 1949, Vol.34, p.112-114.

Military operation, Military research, Cold weather operation, Cold weather survival, United States—Alaska

52-5877

Man against nature: Exercise Arctic Express.

Kallunki, J.T., *NATO's fifteen nations,* Apr.-May 1978, 23(160), p.65-68.

Military operation, Education, Cold weather operation, Cold weather survival, Norway

52-5878

War in the sub-arctic.

Grafstrom, A., *Infantry School quarterly,* Oct. 1952, Vol.41, p.64-72.

Military operation, History, Cold weather operation, Cold weather survival, Finland

52-5879

Ice damage in a mixed hardwood forest in Connecticut in relation to *Vitus* infestation.

Siccama, T.G., Weir, G., Wallace, K., *Torrey Botanical Club. Bulletin,* July-Aug. 1976, 103(4), p.180-183, 17 refs.

Forest ecosystems, Plant ecology, Vegetation patterns, Revegetation, Ice storms, Ice loads, Trees (plants), Damage, United States—Connecticut

52-5880

Ice damage to slash pine, longleaf pine, and loblolly pine plantations in the Piedmont section of Georgia.

McKellar, A.D., *Journal of forestry,* [1942], Vol.40, p.794-797.

Ice storms, Ice loads, Forestry, Trees (plants), Damage, United States—Georgia

52-5881

Effect of ice storms on trees.

Chapman, H.H., *Forestry and irrigation,* Mar. 1902, Vol.8, p.130.

Ice storms, Ice loads, Trees (plants), Damage, United States—New York—Staten Island

52-5882

Chinook's trial by ice.

Parker, I., *Flight international,* Apr. 28, 1984, Vol.125, p.1160-1163.

Helicopters, Aircraft icing, Ice prevention, Ice removal, Electric heating, Artificial melting, Cold weather tests, Canada—Nova Scotia

52-5883

Cold weather operations.

Kane, P.V., *Field artillery journal,* Sep.-Oct. 1947, Vol.37, p.280-285.

Military operation, Cold weather operation, Military equipment, Motor vehicles, Winter maintenance, Shelters, Clothing, Cold weather tests, United States—Alaska

52-5884

Volume change as a measure of freezing and thawing resistance of concrete made with different aggregates.

Wills, M.H., Jr., Lepper, H.A., Jr., Gaynor, R.D., Walker, S., *American Society of Testing and Materials. Proceedings,* 1963, Vol.63, p.946-965, 12 refs.

Concrete aggregates, Concrete durability, Concrete freezing, Frost resistance, Freeze thaw tests

52-5885

Contrasting glacimarine sedimentary environments of two arctic fiords on Disko, West Greenland.

Gilbert, R., Nielsen, N., Desloges, J.R., Rasch, M., *Marine gelogy,* May 1998, 147(1-4), p.63-83, 44 refs.

Marine geology, Marine deposits, Glacial hydrology, Estuaries, Surface drainage, Sedimentation, Bottom sediment, Sounding, Underwater acoustics, Hydrography, Drill core analysis, Classifications, Greenland—Disko

52-5886

Structure and seismic stratigraphy of the Gript-arane area, Møre Basin margin, mid-Norway continental shelf.

Bøe, R., Skilbrei, J.R., *Marine gelogy,* May 1998, 147(1-4), p.85-107, 50 refs.

Marine geology, Pleistocene, Geologic processes, Subpolar regions, Tectonics, Stratigraphy, Lithology, Seismic reflection, Profiles, Norwegian Sea

52-5887

Sea-level change, glacial rebound and mantle viscosity for northern Europe.

Lambeck, K., Smither, C., Johnston, P., *Geophysical journal international,* July 1998, 134(1), p.102-144, Refs. p.141-144.

Pleistocene, Sea level, Marine geology, Glacial geology, Isostasy, Glacier thickness, Viscoelasticity, Mathematical models, Ice models, Rheology, Finland, Sweden, Norway

52-5888

Magnetostratigraphy and palaeoclimatic significance of Late Tertiary aeolian sequences in the Chinese Loess Plateau.

Sun, D.H., An, Z.S., Shaw, J., Bloemendal, J., Sun, Y.B., *Geophysical journal international,* July 1998, 134(1), p.207-212, 23 refs.

Paleoclimatology, Precipitation (meteorology), Quaternary deposits, Loess, Clay soils, Eolian soils, Remanent magnetism, Geomagnetism, Stratigraphy, Tectonics, Correlation, China—Loess Plateau

52-5889

Magnetostratigraphy of the lower Triassic volcanics from deep drill SG6 in western Siberia: evidence for long-lasting Permo-Triassic volcanic activity.

Westphal, M., Gurevitch, E.L., Samsonov, B.V., Feinberg, H., Pozzi, J.P., *Geophysical journal international,* July 1998, 134(1), p.254-266, 31 refs.

Pleistocene, Earth crust, Subpolar regions, Volcanoes, Sedimentation, Magma, Boreholes, Drill core analysis, Geomagnetism, Polarization (charge separation), Orientation, Stratigraphy, Statistical analysis, Russia—Siberia

52-5890

Deep crustal reflectors under Reydarfjördur, eastern Iceland: crustal accretion above the Iceland mantle plume.

Smallwood, J.R., White, R.S., Staples, R.K., *Geophysical journal international,* July 1998, 134(1), p.277-290, 52 refs.

Seismic surveys, Subpolar regions, Geologic processes, Earth crust, Seismic reflection, Stratigraphy, Profiles, Magma, Volcanoes, Iceland

52-5891

Large branchiopod Crustacea (Anostraca, Notostraca, Spinicaudata) of the Barents Region of Russia.

Vekhoff, N.V., *Hydrobiologia,* Dec. 30, 1997, Vol.359, International Large Branchiopod Symposium, 3rd, San Diego, CA, July 15-18, 1996. Collected papers. Studies on large Branchiopod biology and conservation. Edited by M.A. Simovich et al, p.69-74, 36 refs.

Marine biology, Subpolar regions, Biomass, Shores, Ponds, Ecology, Distribution, Classifications, Sampling, Russia—Novaya Zemlya, Russia—Franz Josef Land

52-5892

Elongate depressions on the southern slope of the Norwegian Trench (Skagerrak): morphology and evolution.

Bøe, R., Rise, L., Ottesen, D., *Marine geology,* Apr. 1998, 146(1-4), p.191-203, 42 refs.

Marine geology, Subpolar regions, Ocean bottom, Geomorphology, Radio echo soundings, Sensor mapping, Bottom topography, Bottom sediment, Ocean currents, Natural gas, Vapor diffusion, North Sea

52-5894

Global average climate forcing and temperature response since 1750.

Rowntree, P.R., *International journal of climatology,* Mar. 30, 1998, 18(4), p.355-377, 65 refs.

Climatology, Air pollution, Climatic changes, Global warming, Greenhouse effect, Carbon dioxide, Stratosphere, Aerosols, Ozone, Glacier oscillation, Radiation balance, Diffusion, Mathematical models

52-5895

Atmospheric teleconnections for annual maximum ice cover on the Laurentian Great Lakes.

Assel, R., Rodionov, S., *International journal of climatology,* Mar. 30, 1998, 18(4), p.425-442, 37 refs.

Climatology, Atmospheric circulation, Air masses, Lake ice, Ice cover, Turbulent boundary layer, Ice air interface, Seasonal variations, Statistical analysis, Correlation, Climatic factors, Great Lakes

52-5896

Transformation of four-component vertical seismic profiling records from Kola Superdeep Borehole, Russia.

Morozov, I.B., Carr, B.J., Smithson, S.B., *Computers & geosciences,* Dec. 1997, 23(10), p.1039-1049, 9 refs.

Seismic surveys, Subpolar regions, Borehole instruments, Accuracy, Profiles, Anisotropy, Sounding, Seismic velocity, Polarization (waves), Orientation, Data processing, Computer programs, Russia—Kola Peninsula

52-5897

P- and SV-wave separation by polarization-dependent velocity filtering: application to vertical seismic profiles from Kola Superdeep Borehole, Russia.

Morozov, I.B., Carr, B.J., Smithson, S.B., *Computers & geosciences,* Dec. 1997, 23(10), p.1051-1061, 16 refs.

Seismic surveys, Subpolar regions, Anisotropy, Boreholes, Profiles, Seismic velocity, Wave propagation, Filters, Damping, Data processing, Computer programs, Russia—Kola Peninsula

52-5898

Intraseasonal variation in the $\delta^{15}N$ signature of taiga trees and shrubs.

Kielland, K., Barnett, B., Schell, D., *Canadian journal of forest research,* Mar. 1998, 28(3), p.485-488, With French summary. 20 refs.

Plant ecology, Taiga, Subarctic landscapes, Phenology, Nutrient cycle, Plant tissues, Chemical composition, Classifications, Growth, Isotope analysis, United States—Alaska—Fairbanks

52-5899

Magnetostratigraphy of Quaternary and late Tertiary sediments on Banks Island, Canadian Arctic Archipelago.

Barendregt, R.W., Vincent, J.S., Irving, E., Baker, J., *Canadian journal of earth sciences,* Feb. 1998, 35(2), p.147-161, With French summary. 18 refs.

Pleistocene, Paleoclimatology, Climatic changes, Glacial geology, Glaciation, Magnetic surveys, Remanent magnetism, Geomagnetism, Polarization (waves), Quaternary deposits, Stratigraphy, Geochronology, Canada—Northwest Territories—Banks Island

52-5900

Response (1958-1997) of permafrost and near-surface ground temperatures to forest fire, Takhini River valley, southern Yukon Territory.

Burn, C.R., *Canadian journal of earth sciences,* Feb. 1998, 35(2), p.184-199, With French summary. 47 refs.

Forest fires, Environmental impact, Forest ecosystems, Discontinuous permafrost, Permafrost transformation, Degradation, Soil temperature, Surface temperature, Thermal regime, Boreholes, Temperature measurement, Correlation, Canada—Yukon Territory

52-5901

Late Palaeozoic structural development of the south-western Barents Sea.

Gudlaugsson, S.T., Faleide, J.I., Johansen, S.E., Breivik, A.J., *Marine and petroleum geology,* Feb. 1998, 15(1), p.73-102, Refs. p.98-102.

Marine geology, Pleistocene, Subpolar regions, Tectonics, Deformation, Subsidence, Seismic surveys, Seismic reflection, Profiles, Stratigraphy, Models, Barents Sea

52-5902

Ship icing and stability.

Chung, K.K., Lozowski, E.P., Pawlowski, J.S., Xu, Q., Asian Computational Fluid Dynamics Conference, 1st, Hong Kong, Jan. 16-19, 1995. Proceedings. Vol.1, Hong Kong, University of Science and Technology, 1995, p.275-280, 15 refs.

Ship icing, Ice accretion, Icing rate, Ice loads, Ocean waves, Sea spray, Mathematical models

52-5903

Design issues for commercial-scale ground-source heat pump systems.

Phetteplace, G., Kavanaugh, S., MP 5183, Heartland Technology Transfer Conference, Kansas City, MO, June 1-4, 1998, Washington, D.C., U.S. Army Corps of Engineers, 1998, 14p., 10 refs.

Buildings, Heat pumps, Heat recovery, Geothermy, Radiant heating, Cooling systems, Design criteria

52-5904

Performance of a hybrid ground-coupled heat pump system.

Phetteplace, G., Sullivan, W., MP 5184, *American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Transactions,* 1998, 104(pt.1), 8p., 4 refs.

Buildings, Heat pumps, Geothermy, Heat recovery, Radiant heating, Air conditioning, Cooling systems, Cooling towers

In climates dominated by air conditioning, a few so-called "hybrid" ground-coupled heat pump (GCHP) systems have been built. The hybrid system uses both a ground-coupled heat exchanger and a cooling tower, thereby reducing the amount of ground-coupling heat exchanger necessary. Although this concept has been shown to be feasible, the performance of such a system has not been measured in detail. Since it may be possible to achieve significant performance improvements in such systems by modifying the design and operational practices, detailed performance monitoring of such systems is needed. This paper describes a project that has been undertaken to collect performance data from a hybrid GCHP system at Fort Polk, LA. This paper presents performance data for a period of about 22 months, including data from portions of two heating and cooling seasons. The energy input to the GCHPs themselves will be presented, as well as the energy rejected to the ground in the cooling mode and that extracted from the ground in the heating mode. Energy flows in the cooling tower also will be addressed, along with the power consumption of the circulating pumps and the cooling tower.

52-5905

Low temperature behavior of thermally cycled glass-fiber-reinforced polymer concrete.

Dutta, P.K., Hui, D., Saranayan, N.C., MP 5185, International SAMPE Symposium and Exhibition, 39th, Anaheim, CA, Apr. 11-14, 1994. Moving forward with 50 years of leadership in advanced materials. Vol.39. Book 1, Covina, CA, Society for the Advancement of Material and Process Engineering, 1994, p.334-346, 6 refs.

Reinforced concretes, Polymers, Composite materials, Concrete curing, Concrete strength, Low temperature tests, Freeze thaw tests

This paper presents a preliminary evaluation of the observed mechanical behavior of several mixes of glass-fiber-reinforced polymer concrete at subzero temperatures and after a series of freeze-thaw cycles. Before evaluating at low temperature (-20°C) these materials were subjected to soaking in 33 parts per thousand concentration of salt water for 72 hours and then thermally cycled for 50 cycles between 30°C and -20°C. The results showed that both compressive and tensile strengths increased significantly as a result of thermal cycling. The increase in strength was observed both at room temperature (24°C) and at low temperature (-20°C), with the low temperature strength showing the maximum increase. In almost all cases the tensile strengths of the composite increased after thermal cycling. These results indicate a potentially improved curing of the material under low temperature thermal cycling and beneficial effects of the polymer additives for low temperature concrete.

52-5906

Effect of low temperature on the flexural fatigue and fracture of unidirectional graphite/epoxy composites.

Dutta, P.K., MP 5186, Army Symposium on Solid Mechanics, 12th, Plymouth, MA, Nov. 4-7, 1991. Proceedings. Synergism of mechanics, mathematics and materials, Columbus, OH, Battelle Press, [1991], p.573-581, 3 refs.

Composite materials, Polymers, Low temperature tests, Strain tests, Flexural strength, Fatigue (materials)

52-5907

Sampling for in-vial analysis of volatile organic compounds in soil.

Hewitt, A.D., Lukash, N.J.E., MP 5187, *American environmental laboratory,* Aug. 1996, 8p., 23 refs.

Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

52-5908

On-site estimation of the total concentration of VOCs in soil: a decision tool for sample handling.

Hewitt, A.D., MP 5188, Current protocols in field analytical chemistry, New York, John Wiley & Sons, Inc., 1998, p.1A.3.1-1A.3.8, 13 refs.

DLC QD79.C4C87 1998

Soil pollution, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

This protocol describes an on-site screening procedure using a battery-operated photoionization detector to estimate the total concentration of volatile organic compounds (VOCs) in soil, relative to a site-specific working standard at a concentration of 0.2 mg/kg. The intent of this procedure is to provide a decision tool that will allow sampling activities to incorporate the appropriate in-vial soil sample preparation protocol for conventional laboratory VOC analysis. Coupling such a method for estimating the total VOC concentration in soil with sampling procedures that limit substrate disaggregation and exposure complements efforts to achieve site-representative estimates for contamination of the vadose zone (that region between the ground surface and the saturated zone).

52-5909

Colorimetric determination of TNT and RDX in soil.

Jenkins, T.F., Walsh, M.E., MP 5189, Current protocols in field analytical chemistry, New York, John Wiley & Sons, Inc., 1998, p.2D.2.1-2D.2.9, 12 refs.

DLC QD79.C4C87 1998

Soil pollution, Explosives, Soil chemistry, Soil tests, Soil analysis, Chemical analysis

Simple colorimetric tests for onsite determination of 2,4,6-trinitrotoluene (TNT) and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in soil are based on the Janowsky reaction (for TNT) and the Griess and Franchimont reaction (for RDX). In both cases, the development of a visible reddish color indicates the presence of the target analytes, and their concentrations are estimated from absorbance measurements at 540 nm for TNT and 507 nm for RDX.

52-5910

Dielectric constants of sea ice at microwave frequencies.

Ackley, S.F., Lytle, V.I., MP 5190, Accelerated Research Initiative (ARI). Electromagnetic properties of sea ice. 3-year summary, Arlington, VA, U.S. Office of Naval Research, Jan. 1996, p.16-23, 2 refs.

Sea ice, Ice microstructure, Ice salinity, Ice dielectrics, Ice electrical properties, Brines, Microwaves, Radar echoes

52-5911

Electromagnetics and optics advanced research initiative: laboratory and field investigations into the structural and physical characteristics of saline ice sheets and their electromagnetic properties.

Gow, A.J., Perovich, D.K., MP 5191, Accelerated Research Initiative (ARI). Electromagnetic properties of sea ice. 3-year summary, Arlington, VA, U.S. Office of Naval Research, Jan. 1996, p.60-70.

Salt ice, Ice structure, Ice density, Ice salinity, Ice temperature, Ice electrical properties, Artificial ice, Environmental tests, Radiometry, Radar echoes

52-5912

Relationships of optical properties and ice structure.

Perovich, D.K., MP 5192, Accelerated Research Initiative (ARI). Electromagnetic properties of sea ice. 3-year summary, Arlington, VA, U.S. Office of Naval Research, Jan. 1996, p.101-107.

Sea ice, Ice structure, Ice optics, Snow ice interface, Ice melting, Albedo, Research projects

52-5913

Measuring sea ice draft and coverage with moored upward looking sonars.

Strass, V.H., *Deep-sea research I,* Apr./May 1998, 45(4-5), p.795-818, 10 refs.

Ice bottom surface, Measuring instruments, Moorings, Ice cover thickness, Ice acoustics, Underwater acoustics, Subglacial observations, Ice detection, Ice water interface, Sea ice distribution, Antarctica—Weddell Sea

Presented is a method to derive ice draft and coverage from acoustic measurements made with moored Upward Looking Sonars, sounding the sea surface remotely from below. The method was developed on the basis of two-year long time series obtained from four locations in the Weddell Sea. It takes into account the variations of sound speed and density that occur between the target and the instrument, the variations of the surface air pressure, and a possible bias of the mean ice draft within the ensonified window, which results from the combined effect of beam spreading and skewed ice distributions; ice and open water are differentiated by their specific echo amplitude signatures. The residual total error in the determined mean ice draft is estimated as 4 cm, compared to an initial error of almost 90 cm in the original uncorrected data. Suggestions for further instrumental improvements are made. (Auth.)

52-5914

Seasonal variation in the frost hardiness of Scots pine and Norway spruce in old provenance experiments in Finland.

Beuker, E., Valtonen, E., Repo, T., *Forest ecology and management,* Aug. 17, 1998, 107(1-3), p.87-98, 52 refs.

Forest ecosystems, Subarctic landscapes, Global warming, Trees (plants), Plant tissues, Freezing, Damage, Frost resistance, Temperature effects, Seasonal variations, Simulation, Statistical analysis, Finland

52-5915

Nutrient deficits increase frost hardiness in Sitka spruce (*Picea sitchensis*) needles.

Jalkanen, R.E., Redfern, D.B., Sheppard, L.J., *Forest ecology and management,* Aug. 17, 1998, 107(1-3), p.191-201, 38 refs.

Plant physiology, Trees (plants), Plant tissues, Chemical composition, Growth, Nutrient cycle, Frost resistance, Freezing, Damage, Cold weather tests, Seasonal variations, Viability

52-5916

***Ab initio* study of HCl and HF interaction with crystalline ice. I. Physical adsorption.**

Bussolin, G., Casassa, S., Pisani, C., Ugliengo, P., *Journal of chemical physics,* June 8, 1998, 108(22), p.9516-9528, 53 refs.

Ice physics, Cloud physics, Molecular structure, Ice crystal structure, Ice vapor interface, Adsorption, Molecular energy levels, Proton transport, Ice models, Thermodynamics, Polar stratospheric clouds, Simulation

52-5917

Late Quaternary glacial stades in the Cordillera Central, Colombia, based on glacial geomorphology, tephra-soil stratigraphy, palynology, and radiocarbon dating.

Thouret, J.C., Van der Hammen, T., Salomons, B., Juvigné, E., *Journal of Quaternary science,* Sep.-Oct. 1997, 12(5), p.347-369, 37 refs.

Pleistocene, Paleoclimatology, Glacial geology, Glacier oscillation, Geomorphology, Quaternary deposits, Moraines, Volcanic ash, Stratigraphy, Palynology, Radioactive age determination, Colombia—Cordillera Central

52-5918

Community structure of crustacean zooplankton in subarctic ponds—effects of altitude and physical heterogeneity.

Rautio, M., *Ecography,* June 1998, 21(3), p.327-335, 53 refs.

Ecosystems, Ponds, Limnology, Subarctic landscapes, Biomass, Plankton, Distribution, Altitude, Temperature effects, Sampling, Classifications, Biogeography, Finland—Lapland

52-5919

Thawing of the permafrost foundations of earth structures with water seepage present.

Klein, I.S., Chudov, L.A., *Fluid dynamics,* Sep.-Oct. 1997, 32(5), p.690-695, Translated from Rossiĭskaia akademiia nauk. Izvestiia. Mekhanika zhidkosti i gaza. 20 refs.

Earth dams, Permafrost bases, Permafrost hydrology, Foundations, Seepage, Ground thawing, Thaw depth, Phase transformations, Heat transfer, Frozen ground temperature, Stefan problem, Computerized simulation, Mathematical models

52-5920

Geology and mineralogy of ceramic clay deposits in western Siberia.

Simić , V., Jović, V., Djurić, S., *Geologica Carpathica—clays,* June 1997, 6(1), p.57-60, 6 refs.

Clay soils, Clay minerals, Sedimentation, Chemical composition, X ray diffraction, Mineralogy, Geochemistry, Russia—Siberia

52-5921

Lithological and structural controls on the surface wear characteristics of glaciated metamorphic bedrock surfaces: Ossian Sarsfjellet, Svalbard.

Glasser, N.F., Crawford, K.R., Hambrey, M.J., Bennett, M.R., Huddart, D., *Journal of geology,* May 1998, 106(3), p.319-329, 26 refs.

Glacial geology, Subpolar regions, Bedrock, Surface properties, Glacial erosion, Microstructure, Striations, Geologic structures, Lithology, Sampling, Norway—Svalbard

52-5922

Late Pleistocene sediments and environmental change at Plaza Creek, Falkland Islands, South Atlantic.

Clark, R., Huber, U.M., Wilson, P., *Journal of Quaternary science,* Mar.-Apr. 1998, 13(2), p.95-105, 45 refs.

Pleistocene, Paleoclimatology, Climatic changes, Quaternary deposits, Periglacial processes, Palynology, Radioactive age determination, Stratigraphy, Grain size, Geochronology, —Falkland Islands

Late Pleistocene organic-rich sediments exposed in coastal bluffs near the head of Plaza Creek, East Falkland, have yielded conventional and AMS ^{14}C dates of between and 36 and 28 ka BP, and possess a pollen spectrum dominated by grasses, indicating a vegetation assemblage similar to that of the present day. Although some sample dates are anomalous and contamination by non-contemporaneous carbon cannot be ruled out entirely, the age estimates are consistent with evidence and dates from Antarctica, South America and the amphi-North Atlantic for climate shifts to interstadial conditions at around that time. The organic-rich units are developed in and enclosed by deposits attributed to processes of periglacial mass wasting. The similarity between late Pleistocene interstadial, Holocene and present-day pollen assemblages, and the lack of vegetation change within these periods, is characteristic of most cool temperate southern ocean islands, and may reflect the lack of sensitivity of the vegetation to climate change and/or a lack of climate variability for the time intervals covered. (Auth. mod.)

52-5923

Reconstruction of Holocene sea-surface salinity in the Skagerrak-Kattegat: a climatic and environmental record of Scandinavia.

Jiang, H., Björck, S., Svensson, N.O., *Journal of Quaternary science,* Mar.-Apr. 1998, 13(2), p.107-114, 32 refs.

Paleoclimatology, Oceanography, Salinity, Seasonal variations, Ocean currents, Quaternary deposits, Drill core analysis, Paleoecology, Classifications, Statistical analysis, Denmark—Kattegat

52-5924

Pitfalls in the AMS radiocarbon-dating of terrestrial macrofossils.

Wohlfarth, B., Skog, G., Possnert, G., Holmquist, B., *Journal of Quaternary science,* Mar.-Apr. 1998, 13(2), p.137-145, 16 refs.

Geochronology, Quaternary deposits, Paleoecology, Fossils, Carbon isotopes, Radioactive age determination, Laboratory techniques, Storage, Accuracy

52-5925

Regional 8200 cal. yr BP cooling event in northwest Europe, induced by final stages of the Laurentide ice-sheet deglaciation?

Klitgaard-Kristensen, K., Sejrup, H.P., Haflidason, H., Johnsen, S., Spurk, M., *Journal of Quaternary science,* Mar.-Apr. 1998, 13(2), p.165-169, 31 refs.

Paleoclimatology, Climatic changes, Cooling, Ice sheets, Meltwater, Air ice water interaction, Ocean currents, Paleoecology, Drill core analysis, Ice cores, Radioactive age determination, Correlation, North Sea, Greenland

52-5926

Skaergaard Layered Series. Part IV. Reaction-transport simulations of foundered blocks.

Sonnenthal, E.L., McBirney, A.R., *Journal of petrology,* Apr. 1998, 39(4), p.633-661, 57 refs.

Geologic processes, Earth crust, Subpolar regions, Magma, Fluid flow, Stratification, Convection, Solidification, Geochemistry, Lithology, Mathematical models, Greenland

52-5927

Late Ordovician brachiopods from Taimyr, arctic Russia, and their palaeogeographical significance.

Cocks, L.R.M., Modzalevskaia, T.L., *Palaeontology,* Nov. 1997, 40(pt.4), p.1061-1093, Refs. p.1090-1093.

Pleistocene, Paleoecology, Subpolar regions, Earth crust, Stratigraphy, Fossils, Classifications, Biogeography, Continental drift, Correlation, Russia—Siberia

52-5928

Decomposition of gas hydrates in low-temperature reservoirs.

Tsypkin, G.G., *Fluid dynamics,* Jan.-Feb. 1998, 33(1), p.82-90, Translated from Rossiĭskaia akademiia nauk. Izvestiia. Mekhanika zhidkosti i gaza. 7 refs.

Frozen ground chemistry, Reservoirs, Natural gas, Hydrates, Decomposition, Ice vapor interface, Porosity, Atmospheric pressure, Phase transformations, Mathematical models, Thermodynamics

52-5929

Influence of fish antifreeze proteins on the freezing of cell suspensions with cryoprotectant penetrating cells.

Ishiguro, H., Rubinsky, B., *International journal of heat and mass transfer,* July 1998, 41(13), p.1907-1915, 12 refs.

Cryobiology, Antifreezes, Solutions, Polymers, Preserving, Damage, Solidification, Dendritic ice, Ice crystal growth, Ice crystal structure, Freeze thaw cycles, Viability

52-5930

Estimating the spatial distribution of snow in mountain basins using remote sensing and energy balance modeling.

Cline, D.W., Bales, R.C., Dozier, J., *Water resources research,* May 1998, 34(5), p.1275-1285, 28 refs.

Snow hydrology, Snow cover distribution, Snow water equivalent, Mountains, Spaceborne photography, LANDSAT, Snowmelt, Radiation balance, Albedo, Snow air interface, Surface energy, Models, Sensor mapping

52-5931

Monthly streamflow model.

Mohseni, O., Stefan, H.G., *Water resources research,* May 1998, 34(5), p.1287-1298, 33 refs.

Watersheds, Precipitation (meteorology), Stream flow, Snow hydrology, Snowmelt, Seasonal variations, Runoff forecasting, Mathematical models

52-5932

Effects of boreal vegetation and podzolic soils on hydrochemistry at Høylandet (mid-Norway).

Anderson, H.A., et al, *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.5-17, 55 refs.

Hydrogeochemistry, Subarctic landscapes, Ecosystems, Streams, Podsol, Soil formation, Soil water, Metals, Absorption, Sampling, Ion density (concentration), Environmental tests, Water pollution, Norway—Høylandet

52-5933

Soil and stream water chemistry in a pristine and boggy site in mid-Norway.

Vogt, R.D., Muniz, I.P., *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.19-38, 47 refs.

Hydrogeochemistry, Precipitation (meteorology), Subarctic landscapes, Watersheds, Stream flow, Snowmelt, Runoff, Soil chemistry, Soil water, Sampling, Absorption, Ion exchange, Statistical analysis, Water pollution, Norway—Høylandet

52-5934

On the chemical water quality in Høylandet, a reference area for acidification research.

Blakar, I.A., Hongve, D., *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.39-47, 31 refs.

Watersheds, Subarctic landscapes, Hydrogeochemistry, Precipitation (meteorology), Sedimentation, Surface waters, Lake water, Runoff, Absorption, Minerals, Solubility, Sampling, Ion density (concentration), Water pollution, Norway—Høylandet

52-5935

Surface water chemistry characteristics in the Lake Storgrønningen drainage area, Høylandet, during periods of high and low discharge.

Muniz, I.P., Framstad, E., *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.49-68, 21 refs.

Watersheds, Subarctic landscapes, Hydrogeochemistry, Surface waters, Runoff, Lake water, Sampling, Microanalysis, Statistical analysis, Water pollution, Norway—Høylandet

52-5936

Relationship between diatoms and surface water quality in the Høylandet area of Nord-Trøndelag, Norway.

Battarbee, R.W., Flower, R.J., Juggins, S., Patrick, S.T., Stevenson, A.C., *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.69-80, 38 refs.

Plant ecology, Algae, Subarctic landscapes, Limnology, Hydrogeochemistry, Water chemistry, Lake water, Streams, Sampling, Biomass, Classifications, Environmental tests, Water pollution, Norway—Trøndelag

52-5937

Macrobenthos of the pristine stream, Skiftesåa, Høylandet, Norway.

Aagaard, K., Solem, J.O., Nøst, T., Hanssen, O., *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.81-94, 24 refs.

Ecology, Ecosystems, Biomass, Subarctic landscapes, Limnology, Streams, Sampling, Classifications, Statistical analysis, Environmental tests, Water pollution, Norway—Høylandet

52-5938

Crustacean plankton in Høylandet.

Nøst, T., Jensen, J.W., *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.95-111, 38 refs.

Limnology, Subarctic landscapes, Hydrography, Biomass, Ecosystems, Plankton, Classifications, Sampling, Water pollution, Norway—Høylandet

52-5939

Høylandet area—patterns and processes of a pristine boreal-subalpine ecosystem—a synopsis.

Muniz, I.P., *Hydrobiologia,* Aug. 1, 1997, Vol.348, p.145-154, 46 refs.

Watersheds, Subarctic landscapes, Hydrogeochemistry, Surface waters, Surface drainage, Limnology, Ecosystems, Water chemistry, Biomass, Environmental tests, Sampling, Water pollution, Norway—Høylandet

52-5940

Ice core contribution to global change research: past successes and future directions.

U.S. National Science Foundation. Ice Core Working Group (ICWG), Mayewski, P.A., Meese, D.A., MP 5193, Durham, University of New Hampshire, Science Management Office, National Ice Core Laboratory, May 1998, 48p., Refs. p.40-48. P.A. Mayewski was the chairman and D.A. Meese of CRREL was a member of the working group.

Ice cores, Ice composition, Ice dating, Drill core analysis, Atmospheric composition, Atmospheric circulation, Paleoclimatology, Global change, Research projects

This booklet summarizes current studies on reconstructing paleoclimates and predicting future global climate change from arctic and antarctic ice core records. The Ice Core Working Group proposes a schedule of antarctic ice core research activities by the United States through the year 2006, which includes U.S. ITASE, the U.S. contribution to the International Trans Antarctic Scientific Expedition, and WAISCORES, drilling on the West Antarctic Ice Sheet at Siple Dome and at a site to be selected near the inland ice divide. Further information on WAISCORES is available at http://www.maxey.dri.edu/WRC/waiscores.

52-5941

Backcountry avalanche awareness.

Jamieson, J.B., Revelstoke, British Columbia, Canadian Avalanche Association, 1997, 42p., 25 refs.

Snow cover stability, Avalanche forecasting, Skis, Safety

52-5942

Evaluation of ice load sensors in the arctic environment.

Witney, K., *Canada. Department of Public Works. Architectural and Engineering Services. Technical report,* July 1986, AES/SAG 1-2:86-8, 220p., With French summary.

Docks, Ice solid interface, Ice loads, Ice pressure, Strain measuring instruments, Sensors, Impact tests, Canada—Northwest Territories—Baffin Island

52-5943

Climatology of severe winter storms in Illinois.

Changnon, S.A., Jr., *Illinois State Water Survey. Bulletin,* 1969, No.53, 45p., PB-220 414, 29 refs.

Snowstorms, Ice storms, Lake effects, Snowfall, Snow loads, Glaze, Ice loads, Wind pressure, Weather forecasting, Design criteria, Damage, Cost analysis, United States—Illinois

52-5944

Ice-structure interaction probabilistic models: review of ice input parameters.

DF Dickins Associates Ltd., Sandwell Swan Wooster Inc., Ottawa, Canada, Department of Public Works, 1989, 135p. + appends., Refs. passim.

Offshore structures, Artificial islands, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice deformation, Ice breaking, Computerized simulation, Statistical analysis

52-5945

Propeller-ice contact model.

Soininen, H., *Finland. Technical Research Centre (Valtion teknillinen tutkimuskeskus). VTT publications,* 1998, No.343, 116p., Ph.D. thesis to be defended at the Helsinki University of Technology. Refs. p.109-116.

Icebreakers, Propellers, Ice solid interface, Metal ice friction, Ice loads, Ice pressure, Ice cover strength, Ice deformation, Ice breaking, Cavitation, Environmental tests, Mathematical models, Computerized simulation

52-5946

Investigations and load tests in silty soils: results from a series of investigations in silty soils in Sweden.

Larsson, R., *Swedish Geotechnical Institute (Statens Geotekniska Institut). SGI report,* 1997, No.54, 257p., Refs. p.251-257.

Clay soils, Sands, Subgrade soils, Foundations, Settlement (structural), Soil strength, Bearing strength, Soil tests, Penetration tests, Sweden

52-5947

Alaska Research Natural Areas. 4: Big Windy Hot Springs.

Juday, G.P., *Alaska. University, Fairbanks. Agricultural and Forestry Experiment Station. AFES miscellaneous publication,* 1998, No.98-1, 47p., 50 refs.

Hot springs, Geothermy, Forest ecosystems, Plant ecology, Vegetation patterns, Algae, Bacteria, Microclimatology, Climatic changes, United States—Alaska—Steese National Conservation Area

52-5948

Analysis of macrocracking using a boundary element program for laboratory scale ice indentation tests.

C.M.E.L. Enterprises Ltd., Canada, [Ottawa], National Energy Board, 1994, Var. p., C.M.E.L. Project #1083, 6 refs.

Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice elasticity, Ice cracks, Ice breaking, Strain tests, Computerized simulation

52-5949

Water, ice, and meteorological measurements at South Cascade Glacier, Washington, 1997 balance year.

Krimmel, R.M., *U.S. Geological Survey. Water-resources investigations report,* 1998, No.98-4090, 30p., 14 refs.

Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier oscillation, Glacial hydrology, Glacial meteorology, Meltwater, Runoff, United States—Washington—South Cascade Glacier

52-5950

Composite grids for reinforcement of concrete structures.

Dutta, P.K., et al, MP 5194, *U.S. Army Construction Engineering Research Laboratories. Technical report,* June 1998, No.98/81, Construction Productivity Advancement Research (CPAR) Program, 158p., Refs. p.86-92.

Composite materials, Polymers, Plastics, Reinforced concretes, Concrete strength, Concrete durability, Bearing strength, Flexural strength, Strain tests, Structural analysis

This research investigated a new concept that uses fiber-reinforced plastic (FRP) composite grid to reinforce concrete structural members. Prefabricated two- and three-dimensional FRP grid structures were investigated as a possible alternative to conventional one-dimensional steel reinforcement rods. Current available commercial grid manufacturing techniques were found to be inadequate due to material flaws, poor fiber volume fraction, and low strength and stiffness. Through laboratory investigations, significant improvements in fiber volume fraction in orthogrid and isogrid systems were achieved. Laboratory-scale samples demonstrated excellent results under loading tests. Concurrent investigations showed that although the FRP grid-reinforced concrete is more flexible than steel-reinforced concrete, its postfailure deformation was pseudo-ductile, characterized by continuous structural deformation through multiple low-level brittle failures before the onset of catastrophic failure. It was also found that a combined concrete/composite reinforcement structure, with a higher volume of FRP composite fraction in the concrete, would substantially increase stiffness, load capacity, and postfailure concrete containment.

52-5951

1998 IASC meeting reports.

International Arctic Science Committee, Oslo, 1998, 41p. + enclosures, Refs. passim. Reports on meetings held in Fairbanks, AK, Apr. 26-28, 1998.

Meetings, Organizations, Research projects, International cooperation, Regional planning, Global warming

52-5952

Implications of global change in Alaska and the Bering Sea region.

Weller, G., ed, Anderson, P.A., ed, Fairbanks, University of Alaska, Center for Global Change and Arctic System Research, 1998, 152p., Refs. passim. Proceedings of a workshop, University of Alaska Fairbanks, June 3-6, 1997.

Polar atmospheres, Marine atmospheres, Global warming, Ecosystems, Permafrost distribution, Taiga, Tundra vegetation, Vegetation patterns, Plant ecology, Marine biology, Regional planning, United States—Alaska, Bering Sea

52-5953

Arctic springtime depletion of mercury.

Schroeder, W.H., et al, *Nature,* July 23, 1998, 394(6691), p.331-332, 10 refs.

Ozone, Atmospheric composition, Air pollution, Mercury, Canada—Northwest Territories—Alert

52-5954

Ice on the fast track.

Bentley, C.R., *Nature,* July 2, 1998, 394(6688), p.21-22, 10 refs.

Ice sheets, Thawing, Glacier flow, Glacial geology, Glacier melting, Antarctica—West Antarctica

In this preview, the author describes and critiques two succeeding papers dealing with the possible collapse of the West Antarctica ice sheet. The papers reviewed support the position that the subglacial geology of the ice sheet must also be considered along with the meltwater lubrication concept before a reasonable estimate can be made regarding the collapse questions under consideration. The reviewer concurs in this approach.

52-5955

Influence of subglacial geology on the onset of a West Antarctic ice stream from aerogeophysical observations.

Bell, R.E., et al, *Nature,* July 2, 1998, 394(6688), p.58-62, 27 refs.

Ice shelves, Meltwater, Glacier ice, Glacier flow, Glacier beds, Basal sliding, Antarctica—West Antarctica

The West Antarctic Ice Sheet contains an amount of ice equivalent to approximately 6 m of sea-level rise, but most of the ice is in the slowly moving interior reservoir. A relatively small fraction of the ice sheet comprises several rapidly flowing ice streams which drain the ice to the sea. The evolution of this drainage system almost certainly governs the process of ice-sheet collapse. The thick and slow-moving interior ice reservoir is generally fixed to the underlying bedrock while the ice streams glide over lubricated beds at velocities of

up to several hundred meters per year. The source of the basal lubricant—water-saturated till overlain by a water system—may be linked to the underlying geology. The West Antarctic Ice Sheet rests over a geologically complex region characterized by thin crust, high heat flows, active volcanism and sedimentary basins. Aerogeophysical measurements are used to constrain the geological setting of the onset of an active West Antarctic ice stream. The onset coincides with a sediment-filled basin incised by a steep-sided valley. This observation supports the suggestion that ice-stream dynamics—and therefore the response of the West Antarctic Ice Sheet to changes in climate—are strongly modulated by the underlying geology. (Auth. mod.)

52-5956

Influence of subglacial geology on the position of a West Antarctic ice stream from seismic observations.

Anandakrishnan, S., Blankenship, D.D., Alley, R.B., Stoffa, P.L., *Nature,* July 2, 1998, 394(6688), p.62-65, 30 refs.

Glacial geology, Ice sheets, Meltwater, Seismic surveys, Glacier flow, Glacier beds, Basal sliding, Antarctica—West Antarctica

Ice streams drain much of the interior West Antarctic Ice Sheet and buffer the main ice reservoir from oceanic influences. The slow-flowing interior feeds the floating Ross Ice Shelf with ice via fast-flowing ice streams that are believed to modulate sea-level change through their control of inland ice storage. Understanding ice-stream behavior, and predicting the response to climate change, requires a better knowledge of the subglacial geology. It is known that a thawed ice-bed and high-pressure basal water are necessary, but not sufficient, conditions to cause ice streaming. Moreover, it has been hypothesized that a soft sedimentary bed is also required, because of its intrinsic low frictional resistance to flow, and owing to its high erodibility so as to generate till that can deform and lubricate ice motion, or to bury rough features and smooth the bed for sliding. The authors use seismic observations to provide evidence that one margin of the upglacier part of an ice stream is directly above the boundary of a basin with such sedimentary fill. The ice stream is within the basin and the ice outside the basin is slow-flowing. The basin fill presents an order-of-magnitude lower frictional resistance to ice flow than the subglacial material outside the basin. The authors conclude that the ice stream position is dependent on subglacial geology. (Auth. mod.)

52-5957

Ross Sea Polynya Project (RSP^2): objectives and overview.

Smith, W.O., Jr., *Antarctic journal of the United States,* 1995, 30(5), p.195-197, 3 refs.

Research projects, Marine biology, Polynyas, Antarctica—Ross Sea

The Ross Sea polynya is a recurrent feature throughout the year and the site of the initiation of ice melting in the spring. It is also the site of intense phytoplankton blooms. On Nov. 12, 1994, the R/V *Nathaniel B. Palmer* entered the Ross Sea polynya, with 32 scientists onboard engaged in a multidisciplinary project designed to assess the important factors controlling the phytoplankton bloom and biomass in the polynya and the local food web structure.

52-5958

Plumbing the Ross Sea polynya.

Jacobs, S., Giulivi, C., O'Hara, S., Ardai, J., *Antarctic journal of the United States,* 1995, 30(5), p.197-199, 7 refs.

Polynyas, Ocean currents, Water temperature, Antarctica—Ross Sea

The Ross Sea polynya is not simply the wind-driven, latent heat feature often thought to characterize near-freezing coastal regions. Warmer, lower-oxygen water is found at intermediate depths at many shelf locations. This modified circumpolar deep water (MCDW) replaces cold shelf waters that are removed near the sea surface and sea floor. It can also extend beneath the ice shelf and is sufficiently shallow and persistent to transport large icebergs. MCDW overrides the denser HSSW in the western Ross Sea, providing sensible heat at the base of the mixed layer.

52-5959

Dimethylsulfoniopropionate in ice algae from the Ross Sea polynya: November and December 1994.

DiTullio, G.R., Garrison, D.L., *Antarctic journal of the United States,* 1995, 30(5), p.201-202, 5 refs.

Marine biology, Algae, Ice cores, Chemical analysis, Polynyas, Antarctica—Ross Sea

The authors report the preliminary findings from the dimethylsulfoniopropionate (DMSP) concentrations and the high-performance liquid chromatography (HPLC) algal pigment analyses from samples obtained aboard the R/V *Nathaniel B. Palmer* during Nov. and Dec. 1994 in the Ross Sea polynya. HPLC pigment analyses indicated that the ice cores were dominated either by diatoms or by *Phaeocystic antarctica.* In general, the DMSP-to-chlorophyll-*a* ratios were lower for ice cores dominated by diatoms than for *P. antarctica.*

52-5960

Distribution patterns of dissolved organic carbon in the Ross Sea polynya: November and December 1994.

Carlson, C.A., Hansell, D., Parsons, R.J., Cullen, J.B., *Antarctic journal of the United States,* 1995, 30(5), p.203-204, 6 refs.

Sea water, Chemical analysis, Polynyas, Antarctica—Ross Sea

As part of the multidisciplinary Ross Sea polynya project conducted aboard the R/V *Nathaniel B. Palmer,* the authors investigated the dynamics of dissolved organic carbon pool and the role it plays in the carbon cycle during the spring bloom in the Ross Sea. Here, they present some preliminary results of the first year of that study.

52-5961

Onset of spring diatom bloom in the Ross Sea, November and December 1994: timing and effects on nutrient and biogenic silica distribution.

Nelson, D.M., Gordon, L.I., Arrington, J.M., Ross, A.A., *Antarctic journal of the United States,* 1995, 30(5), p.207-209, 7 refs.

Marine biology, Polynyas, Algae, Biomass, Nutrient cycle, Antarctica—Ross Sea

In the Ross Sea polynya, significant diatom growth began in early to mid-Nov. 1994 and resulted in significant increases in biogenic silica in the surface layer throughout the period from mid-Nov. to early Dec. It is also apparent from these data that in 1994, diatom biomass was higher in the northern polynya, in spite of greater ice cover in that portion of the study area.

52-5962

Assessment of the impact of nuclear wastes in the Russian Arctic.

Champ, M.A., Makeev, V.V., Brooks, J.M., Delaca, T.E., Van der Horst, K.M., Engle, M.V., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.203-221, Refs. p.219-221.

Environmental protection, Subpolar regions, Oceanography, Radioactive wastes, Waste disposal, Submarines, Environmental impact, Origin, Safety, Research projects, International cooperation, Russia, Arctic Ocean

52-5963

Assessment aspect of contamination of the arctic estuary ecosystems.

Khlebovich, V.V., Ivanov, V.V., Makeev, V.M., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.222-225, 16 refs.

Estuaries, River basins, Subpolar regions, Runoff, Water pollution, Environmental impact, Hydrography, Sampling, Environmental tests, Russia—Siberia

52-5964

Review of arctic trace metal data with implications for biological effects.

Presley, B.J., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.226-234, 48 refs.

Pollution, Subpolar regions, Oceanography, Bottom sediment, Biomass, Metals, Environmental impact, Detection, Sampling, Arctic Ocean

52-5965

Summary of IAEA-MEL's investigation of Kara Sea radioactivity and radiological assessment.

Povinec, P.P., et al, *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.235-241, 13 refs:

Radioactive wastes, Oceanography, Oceanographic surveys, Subpolar regions, Waste disposal, Water chemistry, Bottom sediment, Environmental tests, Radioactivity, Sampling, Russia—Kara Sea, Aretic Ocean

52-5966

Concentrations of Cd, Pb, Zn and Cu in pristine wetlands of the Russian Arctic.

Zhulidov, A.V., Headley, J.V., Robarts, R.D., Nikanorov, A.M., Ishchenko, A.A., Champ, M.A., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.242-251, 25 refs.

Wetlands, Tundra terrain, Subpolar regions, Snow composition, Meltwater, Frozen ground chemistry, Metals, Sampling, Statistical analysis, Russia—Siberia, Russia—Severnaya Zemlya, Russia—Wrangel Island

52-5967

Concentrations of Cd, Pb, Zn and Cu in contaminated wetlands of the Russian Arctic.

Zhulidov, A.V., Headley, J.V., Robarts, R.D., Nikanorov, A.M., Ishchenko, A.A., Champ, M.A., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.252-259, 21 refs.

Wetlands, Subpolar regions, Tundra terrain, Water pollution, Soil pollution, Bottom sediment, Peat, Metals, Environmental impact, Environmental tests, Sampling, Russia

52-5968

Heavy metals in Chukchi Sea sediments as compared to selected circum-arctic shelves.

Naidu, A.S., Blanchard, A., Kelley, J.J., Goering, J.J., Hameedi, M.J., Baskaran, M., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.260-269, 48 refs.

Oceanography, Oceanographic surveys, Subpolar regions, Water pollution, Bottom sediment, Grain size, Metals, Sampling, Environmental tests, Correlation, Chukchi Sea, Arctic Ocean

52-5969

Cd, Cr, Cu, Ni and Pb in the water column and sediments of the Ob-Irtysh Rivers, Russia.

Moran, S.B., Woods, W.L., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.270-279, 18 refs.

Rivers, Subpolar regions, Water chemistry, Suspended sediments, Hydrogeochemistry, Weathering, Metals, Sampling, Environmental tests, Microanalysis, Russia—Ob' River, Russia—Irtysh River

52-5970

Response of the arctic benthic community to excessive amounts of nontoxic organic matter.

Chivilev, S., Ivanov, M., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.280-286, 12 refs.

Oceanography, Subpolar regions, Marine biology, Ecosystems, Biomass, Bottom sediment, Organic nuclei, Geochemistry, Sampling, Biogeography, Environmental impact, Agriculture, Russia—White Sea

52-5971

Macrobenthic communities of the Pechora Sea: the past and the present on the threshold of the Prirazlomnoe oil-field exploitation.

Pogrebov, V.B., Ivanov, G.I., Nekrasova, N.N., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.287-295, 7 refs.

Oceanography, Marine biology, Biomass, Bottom sediment, Ecosystems, Distribution, Sampling, Statistical analysis, Environmental tests, Oil wells, Russia—Pechora Sea

52-5972

Radionuclide adsorption to sediments from nuclear waste dumping sites in the Kara Sea.

Carroll, J., Boisson, F., Fowler, S.W., Teyssie, J.L., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.296-304, 28 refs.

Oceanography, Water pollution, Subpolar regions, Radioactive wastes, Waste disposal, Water chemistry, Bottom sediment, Adsorption, Radioactive isotopes, Isotope analysis, Distribution, Russia—Kara Sea

52-5973

Influence of temperature on the accumulation and retention of 11 radionuclides by the marine alga *Fucus vesiculosus* (L.).

Boisson, F., Hutchins, D.A., Fowler, S.W., Fisher, N.S., Teyssie, J.L., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.313-321, 30 refs.

Oceanography, Marine biology, Water chemistry, Algae, Adsorption, Radioactive isotopes, Temperature effects, Subpolar regions, Radioactive wastes, Simulation, Environmental impact

52-5974

Long-term benthic population changes (1920-1930s-present) in the Barents and Kara Seas.

Kiiko, O.A., Pogrebov, V.B., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.322-332, 17 refs.

Oceanography, Marine biology, Ecosystems, Biomass, Bottom sediment, Sampling, Distribution, Periodic variations, Statistical analysis, Environmental tests, Barents Sea, Russia—Kara Sea

52-5975

Benthic communities as influenced by nuclear testing and radioactive waste disposal off Novaya Zemlya in the Russian Arctic.

Pogrebov, V.B., Fokin, S.I., Galtsova, V.V., Ivanov, G.I., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.333-339, 11 refs.

Oceanography, Water pollution, Subpolar regions, Marine biology, Biomass, Radioactive wastes, Waste disposal, Nuclear explosions, Environmental impact, Environmental tests, Damage, Sampling, Russia—Novaya Zemlya

52-5976

Persistent organic pollutant, trace metal and radionuclide concentration in bottom organisms of the Barents Sea and adjacent areas.

Kiiko, O.A., Pogrebov, V.B., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.340-344, 15 refs.

Oceanography, Subpolar regions, Marine biology, Bottom sediment, Biomass, Radioactivity, Metals, Water pollution, Sampling, Environmental tests, Barents Sea

52-5977

New Satellite derived sea ice motion tracks arctic contamination.

Emery, W.J., Fowler, C., Maslanik, J., Pfirman, S., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.345-352, 29 refs.

Sea ice distribution, Ice surveys, Drift, Ocean currents, Water pollution, Spaceborne photography, Seasonal variations, Advection, Dispersions, Simulation, Ice forecasting, Environmental tests, Arctic Ocean

52-5978

Potential radionuclide transport pathways from seafloor dumpsites: Kamchatka region of the North Pacific Ocean.

Morehead, M.D., Muench, R.D., Bacastow, R., Dewey, R.K., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.353-364, 25 refs.

Oceanography, Water pollution, Radioactivity, Radioactive wastes, Waste disposal, Ocean bottom, Ocean currents, Advection, Dispersions, Forecasting, Mathematical models, Pacific Ocean, Russia—Kamchatka Strait

52-5979

Modelling the release to the Kara Sea of radioactive waste from the icebreaker *Lenin*: Version II.

Timms, S.J., Lynn, N.M., Mount, M.E., Sivintsev, IU.V., Warden, J.M., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.365-373, 15 refs.

Oceanography, Water pollution, Subpolar regions, Icebreakers, Nuclear power, Radioactive wastes, Waste disposal, Tanks (containers), Radioactivity, Computer programs, Computerized simulation, Forecasting, Russia—Kara Sea

52-5980

Research needed relative to radiological assessment of the dumping of radioactive wastes in the oceans.

Templeton, W.L., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.374-380, 17 refs.

Oceanography, Water pollution, Marine biology, Ecosystems, Radioactive wastes, Waste disposal, Research projects, Oceanographic surveys, International cooperation, Sampling, Models, Environmental impact

52-5981

Selection and criteria for biological indicator species for arctic monitoring.

Khlebovich, V.V., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.381-383, 11 refs.

Oceanography, Subpolar regions, Estuaries, Ecosystems, Marine biology, Biomass, Classifications, Sampling, Environmental tests, Standards, Arctic Ocean

52-5982

Arctic Observatory CD-ROM: an interactive approach to access and demonstrate scientific data and information.

Geller, H.A., Mahootian, F., *Marine pollution bulletin,* July-Dec. 1997, 35(7-12), Conference on Contamination in the Arctic, St. Petersburg, Russia, Nov. 14-16, 1994. Collected papers, p.384-385, 3 refs. Includes compact disk.

Education, Imaging, Global change, Computer programs, Computer applications, Research projects, Polar atmospheres, Oceanography, Arctic Ocean

52-5983

World atlas of snow and ice resources. [Atlas snezhno-ledovykh resursov mira]

Kotliakov, V.M., ed, Moscow, Russian Academy of Sciences, 1997, 2 vols. (392p. + 372p.) and suppl. (144p.), In English and Russian. Supplement has subtitle "Legends and explanations" and is in English only. Refs. vol.2, p.360-372.

DLC GB2603.2.W67 1997

Glaciology, Maps, Mapping, Meltwater, Avalanches, Glacier ice, Ice shelves, Sea ice, Pleistocene, Glaciers, Snow cover distribution, Ice sheets, River ice, Lake ice, Antarctica—Queen Maud Land, Antarctica—Ross Ice Shelf, Antarctica—Antarctic Peninsula, Antarctica—South Shetland Islands, Antarctica—Law Dome

This text summarizes current scientific knowledge of the formation, spreading and regime of snow and ice throughout the Earth, ranging from the Arctic to Antarctica. It includes numerous detailed maps, diagrams and graphs dealing with such topics as snow cover, solid precipitation, avalanches, mountain glaciers and ice sheets, sea ice, river and lake ice, ground ice and aufeis, meltwater and runoff. Volume 2 includes practical recommendations for the use of snow and ice resources. (Auth. mod.)

52-5984

Construction, maintenance, and operation of a glacial runway, McMurdo Station, Antarctica.

Blaisdell, G.L., Lang, R.M., Crist, G., Kurtti, K., Harbin, R.J., Flora, D., M 98-01, *U.S. Army Cold Regions Research and Engineering Laboratory. Monograph,* Mar. 1998, 122p., ADA-348 091, Refs. passim.

Ice runways, Ice (construction material), Cold weather construction, Cold weather operation, Maintenance, Site surveys, Ice strength, Logistics, Antarctica—McMurdo Station

On Feb. 7, 1994, a C-141 departed Christchurch, New Zealand, and landed on the 3050 m Pegasus glacial ice runway, located on the Ross Ice Shelf. This event marked the final test for a five-year development program to demonstrate the feasibility of a semipermanent glacial ice runway capable of supporting heavy wheeled aircraft at a site easily accessible to McMurdo. In the later phases of developing the glacial ice runway, numerous working flights of LC-130s operating on wheels moved cargo more efficiently to the South Pole, and the LC-130 and a C-130 carried larger passenger loads to Christchurch. The primary benefit of the Pegasus runway to the U.S. Antarctic Program is its ability to support heavy wheeled aircraft for most of the period of mid-Jan. through Nov. In the past, only ski-equipped aircraft could land in the McMurdo area during this time period. The Pegasus runway allows increased payloads for the LC-130 and provides access for virtually any conventional aircraft. The technology for siting, constructing, maintaining, and operating such a runway is now well understood and is described in detail in this comprehensive report. (Auth.)

52-5985

Bioremediation of hydrocarbon-contaminated soils and groundwater in northern climates.

Reynolds, C.M., Braley, W.A., Travis, M.D., Perry, L.B., Iskandar, I.K., SR 98-05, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Mar. 1998, 18p., ADA-342 625, 23 refs.

Land reclamation, Ground water, Hydrocarbons, Soil pollution, Water pollution, Water treatment, Cost analysis, Leaching, United States—Alaska—Fairbanks

A field demonstration and research project was conducted in Fairbanks, AK, to demonstrate, evaluate, and document the construction and operation of three selected bioremediation technologies—landfarming, recirculating leachbeds, and infiltration galleries. Landfarming involves adding water and nutrients to contaminated soil to stimulate microbial activity and contaminant degradation. Infiltration galleries are dynamic *in-situ* treatment systems designed to stimulate microbial activity and subsequent hydrocarbon degradation by circulating nutrient- and oxygen-amended water through petroleum-contaminated soil. Recirculating leachbeds, in a way similar to slurry reactors, aerate and mix nutrients with contaminated soil, and can be built as on-site bioreactors. Estimated biotreatment costs in the landfarm were between $20 to $30 per cubic yard. Nutrient placement has been demonstrated to be a critical factor, even though the site is tilled and mixed frequently. Success of the infiltration gallery was more difficult to document. Benzene was detected at less than 2 ppb and BTEX levels were less than 5 ppb for water extracted from the pumping well during 1992, which is significantly lower than the 1991 levels. Problems were encountered during the brief operation of the recirculating leach bed, but a similar system has performed well. Relatively simple, low-cost techniques provided significant potential for improving degradation rates.

52-5986

***Psychroflexus torquis* gen. nov., sp. nov., a psychrophilic species from antarctic sea ice, and reclassification of *Flavobacterium gondwanense* (Dobson et al. 1993) as *Psychroflexus gondwanense* gen. nov., comb. nov.**

Bowman, J.P., et al, *Microbiology,* June 1998, 144(6), p.1601-1609, 33 refs.

Sea ice, Bacteria, Marine biology, Cryobiology, Antarctica—Vestfold Hills

A group of sea-ice derived psychrophilic bacterial strains possessing the unusual ability to synthesize the polyunsaturated fatty acids eicosapentaenoic acid and arachidonic acid belong to the family *Flavobacteriaceae*, according to 16S rRNA sequence analysis. The isolates were also found to cluster closely to the moderately halophilic and psychrotrophic species *[Flavobacterium] gondwanense.* The whole-cell fatty acid profiles of this group and *[F.] gondwanense* were very similar and distinct from other related flavobacteria. The sea ice strains and *[F.] gondwanense* differed substantially in terms of ecophysiology, possibly representing divergent adaptations to sympagic and planktonic marine habitats, respectively. Evidence based on phylogeny and fatty acid profiles supports the conclusion that the taxa are close relatives distinct from other bacterial groups. It is thus proposed that the sea ice strains represent a novel taxon designated *Psychroflexus torquis* gen. nov., sp. nov. while *[F.] gondwanense* becomes *Psychroflexus gondwanense* gen. nov. comb. nov. (Auth.)

52-5987
Mean profiles of moisture fluxes in snow-filled boundary layers.
Kristovich, D.A.R., Braham, R.R., Jr., *Boundary-layer meteorology,* May 1998, 87(2), p.195-215, 42 refs.
Precipitation (meteorology), Cloud physics, Turbulent boundary layer, Moisture transfer, Snow evaporation, Snowflakes, Snow air interface, Lake effects, Convection, Latent heat, Heat flux, Profiles, Probes, United States—Michigan—Michigan, Lake

52-5988
Radiation exchange between stratus clouds and polar marine surfaces.
Freese, D., Kottmeier, C., *Boundary-layer meteorology,* May 1998, 87(2), p.331-356, 36 refs.
Climatology, Polar atmospheres, Sea ice, Atmospheric boundary layer, Ice air interface, Cloud cover, Radiation absorption, Optical properties, Snow cover effect, Radiation balance, Radiometry, Albedo, Mathematical models, Arctic Ocean, Fram Strait

52-5989
Change in the boundaries of geotemperature zones in western Siberia during global warming.
Vialov, S.S., Fotiev, S.M., Gerasimov, A.S., Zolotar', A.I., *Hydrotechnical construction,* Nov. 1997(Pub. May 98), 31(11), p.655-659, Translated from Gidrotekhnicheskoe stroitel'stvo. 1 ref.
Geocryology, Permafrost transformation, Frozen ground temperature, Thermal regime, Ground thawing, Thaw weakening, Global warming, Soil temperature, Temperature variations, Forecasting, Russia—Siberia

52-5990
Auger electron photoion coincidence technique combined with synchrotron radiation for the study of the ion desorption mechanism in the region of resonant transitions of condensed H_2O.
Mase, K., et al, *Journal of chemical physics,* Apr. 22, 1998, 108(16), p.6550-6553, 19 refs.
Ice physics, Amorphous ice, Ice spectroscopy, Ionization, Surface properties, Ion diffusion, Resonance, Phase transformations, Molecular energy levels, Spectra

52-5991
Supercooling of aqueous solutions subjected to different thermal treatments.
Benmore, C.J., Soper, A.K., *Journal of chemical physics,* Apr. 22, 1998, 108(16), p.6558-6560, 6 refs.
Water structure, Molecular structure, Solutions, Protons, Liquid cooling, Supercooling, Neutron diffraction, Spectra

52-5992
Resistances to ozone deposition to a flark fen in the northern aapa mire zone.
Tuovinen, J.P., Aurela, M., Laurila, T., *Journal of geophysical research,* July 27, 1998, 103(D14), p.16,953-16,966, 61 refs.
Climatology, Soil air interface, Ecosystems, Ozone, Vapor transfer, Fallout, Subarctic landscapes, Wetlands, Turbulent exchange, Wind factors, Topographic effects, Theories, Diurnal variations, Finland

52-5993
Remote sensing of dust in deep ice at the South Pole.
He, Y.D., Price, P.B., *Journal of geophysical research,* July 27, 1998, 103(D14), p.17,041-17,056, 49 refs.
Ice physics, Ice sheets, Ice optics, Ice composition, Impurities, Light transmission, Light scattering, Gamma irradiation, Refractivity, Aerosols, Dust, Lasers, Mathematical models, Antarctica—South Pole
A three-dimensional array of phototubes in deep ice at the South Pole called the Antarctic Muon and Neutrino Detector Array (AMANDA) is recording Cherenkov light pulses that serve as tracers of high-energy neutrinos from throughout the Universe. The performance of this neutrino observatory will ultimately be constrained by the optical properties of the ice at near-ultraviolet and visible wavelengths. In this paper, the Mie theory is used to predict the magnitude and wavelength dependence of the scattering and absorption coefficients and mean cosine of the scattering angle for deep South Pole ice. This work provides quantitative evidence that aerosols deposited in snow and compacted into the ice account for the optical properties at wavelengths ca. 300-500 nm, and predicts optical properties of the South Pole ice at 2.5 km, a depth future AMANDA strings may reach. (Auth. mod.)

52-5994
Physicochemistry of aircraft-generated liquid aerosols, soot and ice particles. 1. Model description.
Kärcher, B., *Journal of geophysical research,* July 27, 1998, 103(D14), p.17,111-17,128, 66 refs.
Climatology, Cloud physics, Air pollution, Condensation trails, Aerosols, Particles, Ice formation, Phase transformations, Homogeneous nucleation, Heterogeneous nucleation, Coagulation, Scavenging, Mathematical models

52-5995
Physicochemistry of aircraft-generated liquid aerosols, soot, and ice particles. 2. Comparison with observations and sensitivity studies.
Kärcher, B., Busen, R., Petzold, A., Shröder, F.P., Schumann, U., Jensen, E.J., *Journal of geophysical research,* July 27, 1998, 103(D14), p.17,129-17,147, 38 refs.
Climatology, Cloud physics, Air pollution, Condensation trails, Aerosols, Ice formation, Heterogeneous nucleation, Particle size distribution, Ice crystal size, Sampling, Simulation

52-5996
Greenland Sea Odden sea ice feature: intra-annual and interannual variability.
Shuchman, R.A., et al, *Journal of geophysical research,* June 15, 1998, 103(C6), p.12,709-12,724, 45 refs.
Oceanography, Subpolar regions, Sea ice distribution, Ice formation, Ice edge, Ice conditions, Classifications, Seasonal variations, Meteorological factors, Synthetic aperture radar, Statistical analysis, Greenland Sea

52-5997
Flow variability at the continental shelf break of the Mackenzie Shelf in the Beaufort Sea.
Kulikov, E.A., Carmack, E.C., Macdonald, R.W., *Journal of geophysical research,* June 15, 1998, 103(C6), p.12,725-12,741, 36 refs.
Oceanography, Subpolar regions, Ocean currents, Shear flow, Hydrography, Wind direction, Seasonal variations, Ice cover effect, Tidal currents, Profiles, Spectra, Statistical analysis, Beaufort Sea

52-5998
Large scale circulation in the Bellingshausen and Amundsen seas as a variational inverse of climatological data.
Grotov, A.S., Nechaev, D.A., Panteleev, G.G., IAremchuk, M.I., *Journal of geophysical research,* June 15, 1998, 103(C6), p.13,011-13,022, 39 refs.
Oceanography, Ocean currents, Hydrography, Upwelling, Velocity, Wind factors, Mass transfer, Mathematical models, Antarctica—Amundsen Sea, Antarctica—Bellingshausen Sea
Atmospheric and oceanic climatological data are combined with the World Ocean Circulation Experiment S4 section hydrology in the framework of a variational data assimilation scheme into a steady state nonlinear model of the largescale circulation. The reconstructed fields of density and three-dimensional velocity are dynamically balanced and provide qualitative and quantitative estimates of the circulation features of the Amundsen and Bellingshausen seas. Natural assumptions on the spatial structure of the density covariance matrices permit the specification of realistic coastal currents near the continental slopes of Antarctica within the framework of model equations. (Auth. mod.)

52-5999
Energy and trace-gas fluxes across a soil pH boundary in the Arctic.
Walker, D.A., et al, *Nature,* July 30, 1998, 394(6692), p.469-472, 30 refs.
Soil chemistry, Ecosystems, Tundra soils, Active layer, Vegetation factors, United States—Alaska—Kuparuk River

52-6000
Antarctic plant database: a specimen and literature based information system.
Peat, H.J., *Taxon,* Feb. 1998, 47(1), p.85-93, 13 refs.
Plants (botany), Bibliographies, Data processing
The British Antarctic Survey's Antarctic Plant Database holds over 50,000 herbarium records for antarctic and subantarctic flowering plants and cryptogams held in herbaria world-wide. In addition, it holds information on species occurrences recorded in the literature for southern polar regions and synonymy indexes for relevant species. The database has been linked to a geographic information system, which can aid record validation and resource management as well as the study of species distributions and biodiversity. (Auth.)

52-6001
Production of O_2 on icy satellites by electronic excitation of low-temperature water ice.
Sieger, M.T., Simpson, W.C., Orlando, T.M., *Nature,* Aug. 6, 1998, 394(6693), p.554-556, 23 refs.
Satellites (natural), Ice, Low temperature tests, Ice composition, Extraterrestrial ice

52-6002
Nitrogen uptake in the infiltration community, an ice algal community in antarctic pack-ice.
Kristiansen, S, Farbrot, T., Kuosa, H., Myklestad, S., Von Quillfeldt, C.H., *Polar biology,* May 1998, 19(5), p.307-315, Refs. p.314-315.
Algae, Plant physiology, Nutrient cycle, Ecology, Fast ice, Snow, Chemical analysis, Antarctica—Queen Maud Land
An infiltration community was the dominating ice algal community in pack-ice off Queen Maud Land in Jan. 1993. The community was dominated by autotrophic processes, and the most common species were the prymnesiophyte *Phaeocystis antarctica* and the diatoms *Chaetoceros neglectus* and *Fragilariopsis cylindrus.* Uptake rates of nitrate, nitrite, ammonium, urea and amino acids were measured using ^{15}N. Nitrate was the major nitrogen source for ice algal growth. It is suggested that % nitrate uptake in the infiltration community decreases during the growth season, from 92% during spring to 67% during summer. Scalar irradiance in the infiltration community was high and variable. (Auth. mod.)

52-6003
Mercury, cadmium and lead accumulation in antarctic mosses growing along nutrient and moisture gradients.
Bargagli, R., Sanchez-Hernandez, J.C., Martella, L., Monaci, F., *Polar biology,* May 1998, 19(5), p.316-322, Refs. p.321-322.
Air pollution, Soil pollution, Mosses, Plant ecology, Plant tissues, Plant physiology, Antarctica—Edmonson Point
Accumulation of Hg, Cd and Pb by moss was studied in a coastal ice-free area (Edmonson Point) in relation to the water and nutrient availability and substratum characteristics. Although metal concentrations in surface soils were among the lowest ever reported from remote areas, those of Hg and Cd in mosses were higher, being in the same range as those usually reported in regional surveys in the Northern Hemisphere. By contrast, antarctic mosses showed very low Pb concentrations, and no impact from local human activities was detected. Marine aerosols, seabird guano and volcanic emissions appeared to be the more probable sources of Cd and Hg. Besides atmospheric deposition, the main pathway of metals to mosses was probably through evapo-transpiration at their surface which determines an upward migration of ions and their bioaccumulation. (Auth.)

52-6004
Simulating the Holocene lake-level record of Lake Bysjön, southern Sweden.
Vassiljev, J., Harrison, S.P., Guiot, J., *Quaternary research,* Jan. 1998, 49(1), p.62-71, 25 refs.
Paleoclimatology, Climatic changes, Precipitation (meteorology), Paleoecology, Watersheds, Water balance, Lakes, Water level, Evapotranspiration, Radioactive age determination, Mathematical models, Sweden

52-6005
Ostracode geochemical record of Holocene climatic change and implications for vegetational response in the northwestern Alaska Range.
Hu, F.S., Ito, E., Brubaker, L.B., Anderson, P.M., *Quaternary research,* Jan. 1998, 49(1), p.86-95, 49 refs.
Paleoclimatology, Climatic changes, Subarctic landscapes, Paleoecology, Palynology, Quaternary deposits, Lacustrine deposits, Vegetation patterns, Drill core analysis, Geochronology, United States—Alaska—Alaska Range

52-6006
Late Holocene lake sedimentology and climate change in southern Alberta, Canada.
Campbell, C., *Quaternary research,* Jan. 1998, 49(1), p.96-101, 27 refs.
Paleoclimatology, Climatic changes, Quaternary deposits, Lacustrine deposits, Sedimentation, Stream flow, Grain size, Lithology, Drill core analysis, Radioactive age determination, Canada—Alberta—Pine Lake

52-6007
New dates on Late Pleistocene dacitic tephra from the Mount Edgecumbe volcanic field, southeastern Alaska.
Begét, J.E., Motyka, R.J., *Quaternary research,* Jan. 1998, 49(1), p.123-125, 16 refs.
Pleistocene, Volcanoes, Quaternary deposits, Volcanic ash, Sedimentation, Radioactive age determination, Geochronology, United States—Alaska—Edgecumbe, Mount

52-6008
Vertical distribution and temporal variation of marine planktonic archaea in the Gerlache Strait, Antarctica, during early spring.
Massana, R., Taylor, L.T., Murray, A.E., Wu, K.Y., Jeffrey, W.H., DeLong, E.F., *Limnology and oceanography,* June 1998, 43(4), p.607-617, 46 refs.
Marine biology, Microbiology, Biomass, Ecosystems, Distribution, Plankton, Algae, Chlorophylls, Sampling, Statistical analysis, Antarctica—Gerlache Strait
A station located in the Gerlache Strait was sampled during early spring to determine the vertical distribution of marine planktonic archaea and to further describe the dynamic environment where they live. The relative abundance of planktonic archaeal, eucaryal and bacterial ribosomal RNA was determined by quantitative rRNA hybridization, and the performance of two different universal probes used to normalize group-specific probe hybridization response was compared. In total, these results verify that planktonic archaea are dynamic and abundant components in marine picoplankton assemblages of the Antarctic Peninsula. (Auth. mod.)

52-6009
Transparency of antarctic ice-covered lakes to solar UV radiation.
Vincent, W.F., Rae, R., Laurion, I., Howard-Williams, C., Priscu, J.C., *Limnology and oceanography,* June 1998, 43(4), p.618-624, 29 refs.
Limnology, Lake ice, Lake water, Optical properties, Transparence, Attenuation, Ultraviolet radiation, Subglacial observations, Radiometry, Profiles, Ice cover effect, Environmental impact, Antarctica—Bonney, Lake, Antarctica—Vanda, Lake, Antarctica—Hoare, Lake, Antarctica—Fryxell, Lake
Depth profiles of solar ultraviolet radiation (UVR), photosynthetically available radiation (PAR), and related variables were measured beneath the thick, permanent ice cover of four lakes in the McMurdo Dry Valleys. Calculation of the biologically effective UVR dosage rate for the upper phytoplankton community of Lake Vanda indicated that sufficient UVR penetrates through the 3.5-m thick lake ice to cause inhibition of algal growth. These results show that polar desert lakes are optical extremes in terms of their water-column transparency to UVR, and that their dilute, mostly autochthonous CDOM offers little protection against the ultraviolet-B radiation flux that is continuing to increase over the polar regions. (Auth. mod.)

52-6010
Evidence of deep circulation in two perennially ice-covered antarctic lakes.
Tyler, S.W., Cook, P.G., Butt, A.Z., Thomas, J.M., Doran, P.T., Lyons, W.B., *Limnology and oceanography,* June 1998, 43(4), p.625-635, 30 refs.
Limnology, Lake ice, Icebound lakes, Water chemistry, Convection, Subglacial observations, Geochemistry, Aerosols, Vapor diffusion, Sampling, Antarctica—Hoare, Lake, Antarctica—Fryxell, Lake
The perennial ice covers found on many of the lakes in the McMurdo Dry Valley region of the Antarctic have been postulated to severely limit mixing and convective turnover of these unique lakes. This work utilizes chlorofluorocarbon (CFC) concentration profiles from Lakes Hoare and Fryxell in the McMurdo Dry Valley to determine the extent of deep vertical mixing occurring over the last 50 years. Near the ice-water interface, CFC concentrations in both lakes were well above saturation, in accordance with atmospheric gas supersaturations resulting from freezing under the perennial ice covers. The presence of CFC-113 in the bottom waters, in conjunction with previous work detecting tritium in these waters, strongly argues for the presence of convective mixing in Lake Fryxell. The evidence for deep mixing in these lakes may be an important, yet overlooked, phenomenon in the limnology of perennially ice-covered lakes. (Auth. mod.)

52-6011
El Niño, ice cover, and Great Lakes phosphorus: implications for climate warming.
Nicholls, K.H., *Limnology and oceanography,* June 1998, 43(4), p.715-719, 27 refs.
Limnology, Climatology, Global warming, Air temperature, Lake ice, Ice air interface, Aerosols, Sedimentation, Air temperature, Water chemistry, Sampling, Statistical analysis, United States—Great Lakes

52-6012
West Spitsbergen Current as seen by SOFAR floats during the ARCTEMIZ 88 Experiment: statistics, differential kinematic properties, and potential vorticity balance.
Richez, C., *Journal of geophysical research,* July 15, 1998, 103(C8), p.15,539-15,565, 44 refs.
Oceanography, Subpolar regions, Ocean currents, Velocity measurement, Sensor mapping, Hydrography, Fluid dynamics, Statistical analysis, Arctic Ocean

52-6013
Primary production in southern ocean waters.
Arrigo, K.R., Worthen, D., Schnell, A., Lizotte, M.P., *Journal of geophysical research,* July 15, 1998, 103(C8), p.15,587-15,600, 49 refs.
Marine biology, Biomass, Plankton, Chlorophylls, Solar radiation, Photosynthesis, Nutrient cycle, Mathematical models, Sampling, Forecasting, Sensor mapping, Antarctica—Weddell Sea, Antarctica—Ross Sea, Antarctica—Bellingshausen Sea
The southern ocean forms one of the few areas where macronutrients are underutilized by phytoplankton. Paradoxically, prior estimates of annual primary production are insufficient to support the antarctic food web. The authors present results from a primary production algorithm based upon monthly climatological phytoplankton pigment concentrations from the coastal zone color scanner (CZCS). Phytoplankton production was forced using monthly temperature profiles and a radiative transfer model that computed changes in photosynthetically usable radiation at each CZCS pixel location. The Ross Sea was the most productive region, accounting for 28% of annual production. The fourfold increase in the estimate of primary production for the southern ocean likely makes the notion of an "antarctic paradox" (primary production insufficient to support the populations of southern ocean grazers, including krill, copepods, microzooplankton, etc.) obsolete. (Auth. mod.)

52-6014
Investigation of the dynamic sea ice component of a coupled atmosphere-sea ice general circulation model.
O'Farrell, S.P., *Journal of geophysical research,* July 15, 1998, 103(C8), p.15,751-15,782, 65 refs.
Oceanography, Sea ice distribution, Air ice water interaction, Ice cover thickness, Drift, Ice openings, Wind factors, Ice cover effect, Rheology, Ice models, Mathematical models, Thermodynamics, Ice forecasting, Arctic Ocean

52-6015
Evolution of new ice and turbulent fluxes over freezing winter leads.
Alam, A., Curry, J.A., *Journal of geophysical research,* July 15, 1998, 103(C8), p.15,783-15,802, 35 refs.
Oceanography, Sea ice distribution, Ice growth, Ice openings, Frazil ice, Ice bottom surface, Air ice water interaction, Turbulent exchange, Heat flux, Surface roughness, Wind factors, Mathematical models

52-6016
How much deep water is formed in the southern ocean.
Broecker, W.S., et al, *Journal of geophysical research,* July 15, 1998, 103(C8), p.15,833-15,843, 45 refs.
Oceanography, Ocean currents, Ventilation, Geochemistry, Carbon isotopes, Isotope analysis, Indexes (ratios), Mass transfer, Antarctica—Weddell Sea, Antarctica—Ross Sea
Three tracers are used to place constraints on the production rate of ventilated deep water in the southern ocean. The distribution of the water mass tracer PO_4^* in the deep sea suggests that the amount of ventilated deep water produced in the southern ocean is equal to or greater than the outflow of North Atlantic Deep Water from the Atlantic. Radiocarbon distributions yield an export flux of water from the North Atlantic which has averaged about 15 Sv over the last several hundred years. CFC inventories are used as a direct indicator of the current production rate of ventilated deep water in the southern ocean. It has been widely accepted that the major part of the deep water production in the southern ocean takes place in the Weddell Sea. However, the estimate of the southern ocean ventilated deep water flux is in conflict with previous estimates of the flux of ventilated deep water from the Weddell Sea. (Auth. mod.)

52-6017
Tritium and CFC input functions for the Weddell Sea.
Mensch, M., Simon, A., Bayer, R., *Journal of geophysical research,* July 15, 1998, 103(C8), p.15,923-15,937, 82 refs.
Oceanography, Surface waters, Precipitation (meteorology), Radioactive isotopes, Fallout, Aerosols, Vapor transfer, Air water interactions, Mathematical models, Correlation, Antarctica—Weddell Sea
On the basis of the International Atomic Energy Agency/World Meteorological Organization data set of the monthly tritium concentration in precipitation, the temporal and spatial pattern of the tritium concentration in marine precipitation of the Southern Hemisphere has been reconstructed. A numerical model that couples the tritium concentrations in the atmosphere and in the Weddell Sea's surface layer by parameterizing the relevant flux and exchange mechanisms, as well as the surface layer dynamics, has been used to calculate the time history of tritium in near-surface waters of the Weddell Sea. The calculated input functions of tritium, CFC 11 and CFC 12 provide the surface boundary conditions for numerical studies of the distributions of these transient tracers in the sub-surface water masses of the Weddell Sea. (Auth. mod.)

52-6018
CSU-CHILL polarimetric radar measurements from a severe hail storm in eastern Colorado.
Hubbert, J., Bringi, V.N., Carey, L.D., Bolen, S., *Journal of applied meteorology,* Aug. 1998, 37(8), p.749-775, 62 refs.
Precipitation (meteorology), Storms, Cloud physics, Ice detection, Raindrops, Snow pellets, Hailstone structure, Hailstone growth, Ice water interface, Radar echoes, Polarization (waves), United States—Colorado

52-6019
Reduction of enthalpy of fusion and anomalies during phase transitions in finely divided water.
Bogdan, A., Kulmala, M., Avramenko, N., *Physical review letters,* Aug. 3, 1998, 81(5), p.1042-1045, 22 refs.
Ice physics, Colloids, Phase transformations, Adsorption, Enthalpy, Ice crystal size, Surface structure, Ice water interface, Freezing points, Thermodynamics, Ice sublimation, Temperature measurement

52-6020
Anomalous temperature dependence of vibrational lifetimes in water and ice.
Woutersen, S., Emmerichs, U., Nienhuys, H.K., Bakker, H.J., *Physical review letters,* Aug. 3, 1998, 81(5), p.1106-1109, 30 refs.
Water structure, Ice physics, Deuterium oxide ice, Solutions, Phase transformations, Molecular energy levels, Vibration, Lasers, Ice spectroscopy, Infrared spectroscopy, Hydrogen bonds, Temperature effects

52-6021
Climatic implications of the S6 paleosol complex on the southernmost Chinese Loess Plateau.
Han, J.T., Fyfe, W.S., Longstaffe, F.J., *Quaternary research,* July 1998, 50(1), p.21-33, 59 refs.
Pleistocene, Paleoclimatology, Paleoecology, Climatic changes, Quaternary deposits, Loess, Soil formation, Isotope analysis, Lithology, Grain size, Mineralogy, Profiles, Correlation, China—Loess Plateau

52-6022
Evidence from Lake Baikal for Siberian glaciation during oxygen-isotope substage 5d.
Karabanov, E.B., Prokopenko, A.A., Williams, D.F., Colman, S.M., *Quaternary research,* July 1998, 50(1), p.46-55, 71 refs.
Pleistocene, Paleoclimatology, Climatic changes, Glaciation, Ice volume, Glacial geology, Lacustrine deposits, Quaternary deposits, Drill core analysis, Isotope analysis, Geochronology, Russia—Baykal, Lake

52-6023
Deglaciation of Nova Scotia: stratigraphy and chronology of lake sediment cores and buried organic sections.
Stea, R.R., Mott, R.J., *Géographie physique et Quaternaire,* 1998, 52(1), p.3-21, With French and German summaries. Refs. p.19-21.
Pleistocene, Paleoclimatology, Glacial geology, Glacier oscillation, Paleoecology, Lacustrine deposits, Sedimentation, Stratigraphy, Radioactive age determination, Geochronology, Statistical analysis, Canada—Nova Scotia

52-6024
Pattern of glaciation on the Avalon Peninsula of Newfoundland.
Catto, N.R., *Géographie physique et Quaternaire,* 1998, 52(1), p.23-45, With French and German summaries. Refs. p.43-45.
Pleistocene, Glacial geology, Glaciation, Glacier flow, Geomorphology, Glacial erosion, Striations, Lithology, Canada—Newfoundland

52-6025
Talus fabric, clast morphology, and botanical indicators of slope processes on the Chaos Crags, (California Cascades), U.S.A.
Pérez, F.L., *Géographie physique et Quaternaire,* 1998, 52(1), p.47-68, With French and Germany summaries. Refs. p.66-68.
Slope processes, Mountain soils, Geomorphology, Talus, Vegetation patterns, Sediment transport, Sorting, Rock mechanics, Profiles, Lithology, United States—California—Cascade Mountains

52-6026
Late Quaternary stratigraphy, chronology, and depositional processes on the slope of S.E. Baffin Island, detrital carbonate and Heinrich events: implications for onshore glacial history.
Andrews, J.T., Kirby, M., Jennings, A.E., Barber, D.C., *Géographie physique et Quaternaire,* 1998, 52(1), p.91-105, With French and German summaries. Refs. p.103-105.
Pleistocene, Glaciation, Marine geology, Glacial geology, Paleoecology, Sediment transport, Ice edge, Ice rafting, Lithology, Quaternary deposits, Drill core analysis, Correlation, Canada—Northwest Territories—Baffin Island

52-6027
Lithology of boulders at Mitis Bay, south shore of the lower St. Lawrence estuary: a complex example of glacial transport. [Lithologie des cailloux de la baie de Mitis, rive sud de l'estuaire maritime du Saint-Laurent (Québec): un exemple de transport glaciaire et glaciel complexe]
Dionne, J.C., Poitras, S., *Géographie physique et Quaternaire,* 1998, 52(1), p.107-122, In French with English and German summaries. 53 refs.
Pleistocene, Estuaries, Glacial geology, Sediment transport, Quaternary deposits, Rocks, Icebergs, Ice rafting, Glacial erosion, Lithology, Canada—Quebec—Saint Lawrence River

52-6028
Discovery of a middle Holocene fossilized landslide at Montmagny, southern shore of the St. Lawrence estuary. [Découverte d'un glissement de terrain fossilisé d'âge mi-holocéne, à Montmagny, moyen estuaire du Saint-Laurent, Québec]
Dionne, J.C., *Géographie physique et Quaternaire,* 1998, 52(1), p.123-130, In French with English summary. 38 refs.
Geomorphology, Quaternary deposits, Sediment transport, Landslides, Slope processes, Peat, Radioactive age determination, Canada—Quebec—Saint Lawrence River

52-6029
Grazing of arctic under-ice amphipods on sea-ice algae.
Werner, I., *Marine ecology progress series,* Dec. 15, 1997, Vol.160, p.93-99, 44 refs.
Marine biology, Biomass, Algae, Ecology, Ice bottom surface, Ice water interface, Simulation, Chemical analysis, Arctic Ocean

52-6030
Direct observation of shear-induced structures in wormlike micellar solutions by freeze-fracture electron microscopy.
Keller, S.L., Boltenhagen, P., Pine, D.J., Zasadzinski, J.A., *Physical review letters,* Mar. 23, 1998, 80(12), p.2725-2728, 26 refs.
Surfactants, Polymers, Colloids, Ice physics, Vitreous ice, Ice microstructure, Viscosity, Shear stress, Shear rate, Rheology, Electron microscopy

52-6031
Freezing processes in saturated soils.
Talamucci, F., *Mathematical models and methods in applied sciences,* Feb. 1998, 8(1), p.107-138, 9 refs.
Frozen ground thermodynamics, Soil freezing, Frost heave, Thermal expansion, Frozen ground expansion, Soil temperature, Soil water migration, Frost penetration, Ice lenses, Ice water interface, Mathematical models, Boundary value problems

52-6032
Water retention functions of four nonwoven polypropylene geotextiles.
Stormont, J.C., Henry, K.S., Evans, T.M., MP 5195, *Geosynthetics international,* 1997, 4(6), p.661-672, 11 refs.
Geotextiles, Soil stabilization, Synthetic materials, Polymers, Water retention, Saturation, Water flow, Capillarity, Surfactants, Mechanical tests
The water retention functions of four nonwoven polypropylene geotextiles were measured. Each of the four geotextile types were tested in two conditions: new and cleaned. The water retention functions of each geotextile specimen were found to be hysteretic. The new geotextile specimens always contained more water at comparable suction heads than the cleaned geotextile specimens. At zero suction head, the new specimens approached saturation, whereas the cleaned specimens were less than 20% saturated.

52-6033
Three-dimensional structures of summertime antarctic meso-scale cyclones. Part II: numerical simulations with a limited area model.
Engels, R., Heinemann, G., *Global atmosphere and ocean system,* 1996, Vol.4, p.181-208, 30 refs.
Climatology, Synoptic meteorology, Polar atmospheres, Turbulent boundary layer, Atmospheric pressure, Atmospheric disturbances, Topographic effects, Mathematical models, Wind factors, Advection, Antarctica—Weddell Sea
Numerical simulations of antarctic mesocyclones (MCs) have been carried out with the hydrostatic limited-area model of the Norwegian Meteorological Institute. The governing mechanisms in meso-scale cyclogenesis and the three-dimensional structure of three antarctic coastal MC events are investigated, representing two different types of mesocyclogenesis. Two topographically forced MCs over the ice-free part of the eastern Weddell Sea are studied. The synoptic environment in combination with the katabatic wind system is found to be the dominating forcing on the MC development and structure, and the generation of cyclonic vorticity by vortex stretching is found to be of great importance. (Auth. mod.)

52-6034
Measurement of the contact angle of water on geotextile fibers.
Henry, K.S., Patton, S., MP 5196, *Geotechnical testing journal,* Mar. 1998, 21(1), p.11-17, 16 refs.
Geotextiles, Synthetic materials, Polymers, Soil stabilization, Wettability, Capillarity, Liquid solid interfaces, Interfacial tension, Indexes (ratios), Mechanical tests, Measurement
The contact angle of water on geotextile fibers significantly influences capillary behavior. Measurements of the dynamic contact angle of tap water on geotextile fibers are reported for two geotextiles, as received from the manufacturer and after they had been treated (cleaned). There is considerable hysteresis between advancing and receding contact angles, as expected. Fibers from one geotextile have significantly lower contact angle cosines than the other, indicating that it is less wettable. The cleaning of geotextiles resulted in significant reduction in the advancing contact angles of fibers from one of the geotextiles but not the other. The heights of water capillary rise in strips of the geotextiles were also measured. Results showed that the contact angle measurements are helpful; but, information on pore sizes is also needed to predict capillary behavior.

52-6035
Nivation or cryoplanation: different terms, same features?
Hall, K., *Polar geography,* Jan.-Mar. 1998, 22(1), p.1-16, Refs. p.13-16.
Geomorphology, Periglacial processes, Landforms, Altiplanation, Nivation, Classifications, Terminology, Accuracy

52-6036
Taxonomic diversity of quarry vegetation in northwest Siberia and Chukotka.
Sumina, O.I., *Polar geography,* Jan.-Mar. 1998, 22(1), p.17-55, Refs. p.39-43.
Plant ecology, Arctic landscapes, Tundra vegetation, Revegetation, Vegetation patterns, Classifications, Quarries, Substrates, Environmental impact, Geobotanical interpretation, Statistical analysis, Russia—Siberia, Russia—Chukotka

52-6037
Landscape-geochemical changes in the taiga as a result of oil and gas exploration and development.
Nechaeva, E.G., *Polar geography,* Jan.-Mar. 1998, 22(1), p.56-64, Translated from Geografiia i prirodnye resursy. 8 refs.
Forest ecosystems, Taiga, Forest soils, Subpolar regions, Soil pollution, Oil wells, Hydrocarbons, Petroleum industry, Exploration, Geochemistry, Environmental impact, Environmental tests, Russia—Siberia

52-6038
Changes in mountain glaciers in northeast Russia from the Little Ice Age to the mid-20th century.
Solomina, O.N., Filatov, E.S., *Polar geography,* Jan.-Mar. 1998, 22(1), p.65-78, Translated from Akademiia nauk. Izvestiia. Seriia geograficheskaia. 36 refs.
Glaciology, Glacial geology, Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier ablation, Glacier tongues, Snow line, Altitude, Moraines, Photointerpretation, Russia

52-6039
What are the dominant thermomechanical processes in the basal sediment layer of large ice sheets.
Dell'Isola, F., Hutter, K., *Royal Society of London. Proceedings A,* Apr. 8, 1998, 454(1972), p.1169-1195, 32 refs.
Glaciology, Ice sheets, Glacial hydrology, Glacier beds, Sediments, Saturation, Ice melting, Ice solid interface, Basal sliding, Shear flow, Abrasion, Thermodynamics, Mathematical models, Theories

52-6040
Carbohydrate levels among winter wheat cultivars varying in freezing tolerance and snow mold resistance during autumn and winter.
Yoshida, M., Abe, J., Moriyama, M., Kuwabara, T., *Physiologia plantarum,* May 1998, 103(1), p.8-16, 38 refs.
Plant physiology, Grasses, Plant tissues, Algae, Chemical composition, Cold tolerance, Cold stress, Frost resistance, Seasonal variations, Snow cover effect, Statistical analysis

52-6041
Role of ABA in freezing tolerance and cold acclimation in barley.
Bravo, L.A., Zúñiga, G.E., Alberdi, M., Corcuera, L.J., *Physiologia plantarum,* May 1998, 103(1), p.17-23, 45 refs.
Plant physiology, Grasses, Plant tissues, Growth, Acclimatization, Cold tolerance, Frost resistance, Chemical composition, Low temperature tests, Temperature effects

52-6042
Coastal-change and glaciological map of the Bakutis Coast, Antarctica: 1972-1990.
Swithinbank, C., Williams, R.S., Jr., Ferrigno, J.G., Seekins, B.A., Lucchitta, B.K., Rosanova, C.E., Denver, CO, U.S. Department of the Interior. U.S. Geological Survey, 1997, 9p.+ map, Refs. p.4-5.
Coastal topographic features, Maps, Ice sheets, Glaciology, Velocity measurement, LANDSAT, Glacier surveys, Antarctica—Bakutis Coast

Map I-2600-F of the Bakutis Coast is presented on a 1:1,000,000 scale, with diagrams, tables and explanation of glaciological data. Landsat images and available maps have been used in the compilation of this map to produce a complete preliminary inventory of named and unnamed outlet glaciers and ice streams and to define accurately related glaciological features. An explanatory pamphlet accompanies the map.

52-6043
Abrupt changes (Heinrich events) in late Quaternary North Atlantic marine environments: a history and review of data and concepts.
Andrews, J.T., *Journal of Quaternary science,* Jan.-Feb. 1998, 13(1), p.3-16, Refs. p.13-16.
Ice age theory, Pleistocene, Ice sheets, Glacial geology, Marine geology, Sedimentation, Quaternary deposits, Sea level, Icebergs, Ice rafting, Geochronology, Ice models, Atlantic Ocean

52-6044
Late-glacial cirque glaciation in parts of western Norway.
Larsen, E., Attig, J.W., Aa, A.R., Sønstegaard, E., *Journal of Quaternary science,* Jan.-Feb. 1998, 13(1), p.17-27, 30 refs.
Pleistocene, Glacial geology, Geological surveys, Subarctic landscapes, Geomorphology, Cirque glaciers, Glacier oscillation, Ice edge, Sea level, Sedimentation, Moraines, Sampling, Norway

52-6045
First evidence of an interglacial lake of Eemian age in northeast Italy.
Sirovich, L., *Journal of Quaternary science,* Jan.-Feb. 1998, 13(1), p.65-71, 34 refs.
Pleistocene, Glacial geology, Moraines, Quaternary deposits, Lacustrine deposits, Grain size, Stratigraphy, Luminescence, Geochronology, Theories, Italy

52-6046
Micromorphology of paraglacial and periglacial slope deposits: a case study from Morfa Bychan, west Wales, UK.
Harris, C., *Journal of Quaternary science,* Jan.-Feb. 1998, 13(1), p.73-84, 53 refs.
Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Periglacial processes, Sedimentation, Mass flow, Orientation, Lithology, Thin sections, Classifications, United Kingdom—Wales

52-6047
High-resolution ^{14}C dated sediment sequence from southwest Sweden: age comparisons between different components of the sediment.
Björck, S., Bennike, O., Possnert, G., Wohlfarth, B., Digerfeldt, G., *Journal of Quaternary science,* Jan.-Feb. 1998, 13(1), p.85-89, 21 refs.
Pleistocene, Paleoecology, Quaternary deposits, Marine deposits, Lacustrine deposits, Geochronology, Radioactive age determination, Classifications, Statistical analysis, Sweden

52-6048
On freezing of the boundary between grounds saturated with solutions of different temperature and concentration.
Egorov, A.G., *Journal of applied mechanics and technical physics,* Nov.-Dec. 1997 (Pub. May 98), 38(6), p.888-894, Translated from Prikladnaia mekhanika i tekhnicheskaia Fizika. 6 refs.
Frozen ground mechanics, Permafrost mass transfer, Soil freezing, Artificial freezing, Phase transformations, Brines, Solutions, Ice lenses, Porous materials, Ice water interface, Mathematical models, Thermodynamics

52-6049
Applications of EOF analysis to the spatial estimation of circulation features in the ocean sampled by high-resolution CTD soundings.
Pedder, M., Gomis, D., *Journal of atmospheric and oceanic technology,* Aug. 1998, 15(4), p.959-978, 16 refs.
Oceanography, Ocean currents, Fluid dynamics, Profiles, Hydrography, Sounding, Statistical analysis, Antarctica—Bransfield Strait
The application of empirical orthogonal function analysis to the estimation of geostrophic circulation features in the ocean is studied with particular reference to spatial series of near-synoptic profiles of CTD (conductivity-temperature-depth) data retrieved during intensive surveys of the Alboran Sea and the Bransfield Strait. In both regions, horizontal interpolation of principal components of the observed specific volume profiles provides an efficient method of generating a fully three-dimensional representation of the dynamic height field and geostrophic flow structure, which retains the full resolution of the input profile data. (Auth. mod.)

52-6050
Sound scattering from sea ice: aspects relevant to ice-draft profiling by sonar.
Melling, H., *Journal of atmospheric and oceanic technology,* Aug. 1998, 15(4), p.1023-1034, 23 refs.
Sea ice, Ice bottom surface, Topographic features, Ice cover thickness, Ice acoustics, Underwater acoustics, Acoustic measurement, Sound waves, Backscattering, Sensors, Profiles, Statistical analysis, Performance, Beaufort Sea

52-6051
Diversity, distribution and ecology of benthic amphipods (Amphipoda, Gammaridea) in the Barents Sea sublittoral.
Briazgin, V., *Polish polar research,* 1997, 18(2), p.89-106, With Polish summary. 35 refs.
Marine biology, Ecology, Ecosystems, Ocean bottom, Biomass, Distribution, Sampling, Classifications, Statistical analysis, Barents Sea

52-6052
Peat soils in the Bellsund region, Spitsbergen.
Klimowicz, Z., Melke, J., Uziak, S., *Polish polar research,* 1997, 18(1), p.25-39, With Polish summary. 38 refs.
Tundra soils, Arctic landscapes, Soil chemistry, Soil formation, Peat, Organic soils, Chemical properties, Sampling, Statistical analysis, Norway—Spitsbergen

52-6053
Spatial variation of air temperature in the Arctic in 1951-1990.
Przybylak, R., *Polish polar research,* 1997, 18(1), p.41-63, With Polish summary. 30 refs.
Climatology, Polar atmospheres, Air temperature, Seasonal variations, Temperature measurement, Meteorological data, Statistical analysis, Correlation, Indexes (ratios)

52-6054
Benthic oxygen uptake, hydrolytic potentials and microbial biomass at the arctic continental slope.
Boetius, A., Damm, E., *Deep-sea research I,* Feb.-Mar. 1998, 45(2-3), p.239-275, Refs. p.270-275.
Oceanography, Marine biology, Microbiology, Biomass, Bottom sediment, Organic nuclei, Oxygen, Nutrient cycle, Geochemical cycles, Seasonal variations, Sampling, Subglacial observations, Arctic Ocean

52-6055
Carbon time series in the Norwegian sea.
Gislefoss, J.S., Nydal, R., Slagstad, D., Sonninen, E., Holmén, K., *Deep-sea research I,* Feb.-Mar. 1998, 45(2-3), p.433-460, 40 refs.
Oceanographic surveys, Subpolar regions, Aerosols, Air pollution, Water chemistry, Biomass, Carbon dioxide, Solubility, Air water interactions, Carbon isotopes, Isotope analysis, Simulation, Seasonal variations, Norwegian Sea

52-6056
Thermodynamics of water-cubic ice and other liquid-solid coexistence in nanometer-size particles.
Johari, G.P., *Journal of chemical physics,* July 15, 1998, 109(3), p.1070-1073, 26 refs.
Ice physics, Cubic ice, Ice water interface, Liquid solid interfaces, Surface energy, Ice melting, Melting points, Particles, Thermodynamics, Enthalpy, Mathematical models

52-6057
Midlatitude cyclonic cloud systems and their features affecting large scales and climate.
Stewart, R.E., Szeto, K.K., Reinking, R.F., Clough, S.A., Ballard, S.P., *Reviews of geophysics,* May 1998, 36(2), p.245-273, Refs. p.296-298.
Climatology, Cloud cover, Cloud physics, Supercooled clouds, Ice nuclei, Heterogeneous nucleation, Atmospheric circulation, Fronts (meteorology), Models, Simulation, Weather forecasting

52-6058
Characteristics of the mineral phase constituents of lacustrine deposits from the Fildes Peninsula of King George Island, Antarctica and their environmental implication.
Peng, W.S., Zheng, H.H., Wang, G.X., *Chinese journal of polar science,* June 1998, 9(1), p.9-18, 12 refs.
Glacial lakes, Glacial deposits, Lacustrine deposits, Mineralogy, Soil dating, Weathering, Paleoclimatology, Antarctica—Fildes Peninsula
Based on data from Tern, West and Kitezh lakes on the Fildes Peninsula, the characteristics of mineral phase constituents, material source and their environmental implication are discussed. Results indicate that lacustrine deposits came primarily from widespread volcanic rocks on the peninsula. Under cold and dry antarctic conditions, the weathering process of parent rocks in some area is mainly physical. The relation curves of abundance of kaolinite and calcite, against deposition age, change steeply at the boundary between lacustrine and glacial deposits, indicating that the corresponding environmental changes are abrupt. (Auth. mod.)

52-6059
Comparison of cations recorded in Antarctica and the Qinghai-Tibetan Plateau ice core by using fuzzy cluster analysis.
Duan, K.Q., Yao, T.D., Xu, B.Q., *Chinese journal of polar science,* June 1998, 9(1), p.27-32, 7 refs.
Ice composition, Glaciers, Climatic changes, Glacier ice, Glacial meteorology, Ice cores, Paleoclimatology, Global change, Statistical analysis, Antarctica—Nelson Island
A new approach of glacier classification is suggested on the basis of fuzzy cluster analysis of cations in ice cores. Cations in an ice core act as a synthetic index to reflect both the local and the global climate. Fuzzy cluster analysis of long-time series data of cations in ice cores, from 5 different glaciers, has been used to create a similarity scale matrix R among them. Accordingly, any change in R represents a change in environment and climate. This type of analysis can determine the relativity of samples (glaciers) according to a cluster level. Fuzzy cluster analysis of cations in ice cores collected from Antarctica and the Qinghai-Tibetan Plateau indicates drastic difference between glaciers of these two regions. (Auth.)

52-6060
Features of temperature changes at Barrow of Arctic in the last 400 a.
Wang, G., Zhang, Q.S., *Chinese journal of polar science,* June 1998, 9(1), p.33-38, 6 refs.
Polar atmospheres, Air temperature, Lacustrine deposits, Drill core analysis, Climatic changes, Statistical analysis, United States—Alaska—Barrow

52-6061
Comparison of climatic change between Svalbard in Arctic and the Qinghai-Tibetan Plateau.
Kang, S.C., Yao, T.D., Qin, D.H., *Chinese journal of polar science,* June 1998, 9(1), p.39-48, 12 refs.
Polar atmospheres, Air temperature, Precipitation (meteorology), Climatic changes, Global change, Meteorological data, Statistical analysis, Norway—Svalbard, China—Qinghai-Xizang Plateau

52-6062
Lagoon sediments geochemistry and its significance in study of climatic and environmental changes in Barrow, Alaska.
Yang, W.L., Zhang, Q.S., Wang, G., *Chinese journal of polar science,* June 1998, 9(1), p.59-65, 8 refs.
Polar atmospheres, Lacustrine deposits, Drill core analysis, Geochemistry, Soil composition, Soil dating, Climatic changes, United States—Alaska—Barrow

52-6063
Amount of hydrocarbon bacteria in the Great Wall Bay and its adjacent area.
Yuan, J.F., Li, Y.Q., Chen, H.W., Wu, B.L., *Chinese journal of polar science,* June 1998, 9(1), p.66-70, 9 refs.
Oil spills, Water pollution, Marine biology, Bacteria, Decomposition, Nutrient cycle, Antarctica—Great Wall Station
The number and species of hydrocarbon bacteria identified in the bay near the Great Wall Station during the summer of 1993-1994 are discussed. The species include *Flavobacterium, Pseudomonas, Kurthia* and *Actinetobacter*; their numbers varied from 3 cell/l to 1100 cell/l. The greatest numbers were found in the inner bay.

52-6064
Survey of SO_2, NO_2 and NH_3 concentrations in atmosphere at high latitudes and in Arctic.
Chen, L.T., Tong, Y.Q., Fang, J.Y., *Chinese journal of polar science,* June 1998, 9(1), p.71-74, 5 refs.
Polar atmospheres, Atmospheric composition, Air pollution, Weather stations, Meteorological data

52-6065
Chlorinated hydrocarbons in animal tissue samples from the arctic area.
Chu, S.G., Fang, J.Y., He, Y., Fu, S., Xu, X.B., *Chinese journal of polar science,* June 1998, 9(1), p.75-78, 7 refs.
Polar atmospheres, Atmospheric composition, Air pollution, Physiological effects, Animals, Ecology, Nutrient cycle

52-6066
Post-glacial rebound and present-day three-dimensional deformations.
Plag, H.P., Engen, B., Clark, T.A., Degnan, J.J., Richter, B., *Journal of geodynamics,* May-July 1998, 25(3-4), p.263-301, Refs. p.294-301.
Isostasy, Ice sheets, Ice loads, Ice cover effect, Glacial geology, Pleistocene, Geologic structures, Deformation, Viscoelasticity, Rheology, Ice models, Research projects

52-6067
Modeling the flow of water on aircraft in icing conditions.
Myers, T.G., Thompson, C.P., *AIAA journal,* June 1998, 36(6), p.1010-1013, 16 refs.
Aircraft icing, Fluid dynamics, Ice water interface, Glaze, Fluid flow, Air flow, Shear flow, Water films, Interfacial tension, Mathematical models

52-6068
Effect of ice on river structures with vertical and inclined faces.
Kozlov, D.V., *Hydrotechnical construction,* Dec. 1997(Pub. June 98), 31(12), p.751-755, Translated from Gidrotekhnicheskoe Stroitel'stvo. 6 refs.
Hydraulic structures, Embankments, Slope orientation, River ice, Ice cover thickness, Ice solid interface, Ice friction, Ice loads, Topographic effects, Analysis (mathematics)

52-6069
Fluvial geochemistry of the rivers of Eastern Siberia. I. Tributaries of the Lena River draining the sedimentary platform of the Siberian Craton.
Huh, Y.S., Tsoi, M.Y., Zaitsev, A., Edmond, J.M., *Geochimica et cosmochimica acta,* May 1998, 62(10), p.1657-1676, 75 refs.
Watersheds, Subpolar regions, Estuaries, Permafrost hydrology, Sediment transport, Solubility, Hydrogeochemistry, Weathering, Hydrography, Lithology, Climatic factors, Sampling, Russia—Siberia

52-6070
Water quality from an 80 ha agricultural watershed in southern Quebec.
Pesant, A.R., Bouchkina, R., Salehi, F., Lagace, R., *Géomorphologie,* Jan.-Mar. 1998, No.1, p.27-34, With French summary. 9 refs.
Watersheds, Runoff, Sedimentation, Stream flow, Hydrography, Suspended sediments, Snow hydrology, Snowmelt, Soil erosion, Hydrogeochemistry, Seasonal variations, Canada—Quebec—Lennoxville

52-6071
Ice storage cooling for campus expansion.
Evans, W.S., *ASHRAE journal,* Apr. 1998, 40(4), p.66-68.
Air conditioning, Buildings, Cooling systems, Ice formation, Latent heat, Storage tanks, Design, Performance, Cost analysis

52-6072
Stratospheric cooling and arctic ozone recovery.
Danilin, M.Y., Sze, N.D., Ko, M.K.W., Rodriguez, J.M., Tabazadeh, A., *Geophysical research letters,* June 15, 1998, 25(12), p.2141-2144, 32 refs.
Climatology, Atmospheric composition, Polar atmospheres, Polar stratospheric clouds, Cloud physics, Aerosols, Ozone, Cooling, Models, Chemical analysis

52-6073
Cloud model simulation of a contrail case study: surface cooling against upper tropospheric warming.
Khvorost'ianov, V.I., Sassen, K., *Geophysical research letters,* June 15, 1998, 25(12), p.2145-2148, 10 refs.
Climatology, Air pollution, Cloud physics, Radiometry, Condensation trails, Optical properties, Ice crystal growth, Heterogeneous nucleation, Simulation, Radiation balance, Cooling

52-6074
Effects of a discontinuous snow cover on lower atmospheric temperature and energy flux patterns.
Ellis, A.W., Leathers, D.J., *Geophysical research letters,* June 15, 1998, 25(12), p.2161-2164, 11 refs.
Climatology, Air masses, Air temperature, Surface temperature, Temperature variations, Snow cover effect, Snow air interface, Radiation absorption, Surface energy, Heat flux, Simulation

52-6075
Glacier advances at the Pleistocene/Holocene transition near Mount Rainier volcano, Cascade Range, USA.
Heine, J.T., Seattle, University of Washington, 1997, 138p., University Microfilms order No.9819246, Ph.D. thesis. Refs. p.124-133.
Alpine glaciation, Mountain glaciers, Glacial geology, Glacial meteorology, Glacier oscillation, Glacial deposits, Moraines, Outwash, Lacustrine deposits, Volcanic ash, Soil dating, Paleobotany, Geochronology, Global change, Paleoclimatology, United States—Washington—Rainier, Mount

52-6076
Analysis of synoptic-scale low pressure systems within the Antarctic Peninsula sector of the circumpolar trough.
Turner, J., Marshall, G.J., Lachlan-Cope, T.A., *International journal of climatology,* Mar. 15, 1998, 18(3), p.253-280, 32 refs.
Climatology, Synoptic meteorology, Polar atmospheres, Atmospheric circulation, Fronts (meteorology), Atmospheric pressure, Spaceborne photography, Statistical analysis, Antarctica—Antarctic Peninsula
Satellite imagery of the Antarctic Peninsula, Bellingshausen Sea, and Weddell Sea region, together with operational meteorological analyses, are used to investigate the development, tracks and structure of synoptic-scale weather systems within the Antarctic Peninsula sector of the circumpolar trough. This study confirms the large number of cyclogenesis events taking place within the circumpolar trough and, in the year examined, the mean latitude of cyclogenesis within the sector was 64°S. The greatest number of cyclogenesis events were observed over the Bellingshausen Sea, with a secondary maximum in the lee of the Antarctic Peninsula. Of the systems that formed within the area, 36% were developments within pre-existing large areas of low pressure, which were similar to the 'merry-go-round' formations of mesocyclones. A further 39% of developments consisted of waves on major frontal bands. The remaining developments comprised lee lows and some cyclogenesis events in synoptically isolated regions. (Auth. mod.)

52-6077
Synoptic associations of winter climate and snowfall variability in New England, USA, 1950-1992.
Hartley, S., Keables, M.J., *International journal of climatology,* Mar. 15, 1998, 18(3), p.281-298, 38 refs.
Climatology, Synoptic meteorology, Winter, Snowfall, Snow accumulation, Atmospheric circulation, Storms, Seasonal variations, Statistical analysis, Indexes (ratios), United States—Massachusetts

52-6078
Magnetic surveys south and southeast of Iceland.
Jónsson, G., Kristjánsson, L., *Journal of geodynamics,* Sep. 1998, 26(1), p.45-56, 21 refs.
Earth crust, Subpolar regions, Marine geology, Geophysical surveys, Aerial surveys, Geomagnetism, Magma, Remanent magnetism, Sedimentation, Gravity anomalies, Iceland

52-6079
Temperature and heat flow density in a thick cratonic lithosphere: the Sveka transect, central Fennoscandian Shield.
Kukkonen, I.T., *Journal of geodynamics,* Sep. 1998, 26(1), p.111-136, Refs. p.132-136.
Geological surveys, Subpolar regions, Earth crust, Rock properties, Geothermy, Heat transfer, Permeability, Lithology, Temperature measurement, Simulation, Finland

52-6080
Fluvial geochemistry of the rivers of eastern Siberia. II. Tributaries of the Lena, Omoloy, Yana, Indigirka, Kolyma, and Anadyr draining the collisional/accretionary zone of the Verkhoyansk and Cherskiy ranges.
Huh, Y.S., Panteleev, G., Babich, D., Zaitsev, A., Edmond, J.M., *Geochimica et cosmochimica acta,* June 1998, 62(12), p.2053-2075, Refs. p.2073-2075.
Tectonics, Arctic landscapes, Watersheds, Estuaries, Surface drainage, Hydrogeochemistry, Carbon dioxide, Geochemical cycles, Weathering, Frost action, Lithology, Sampling, Russia—Siberia

52-6081
Mode of emplacement of the Honningsvåg Intrusive Suite, Magerøya, northern Norway.
Robins, B., *Geological magazine,* Mar. 1998, 135(2), p.231-244, 49 refs.
Tectonics, Subpolar regions, Magma, Migration, Sedimentation, Stratification, Fluid dynamics, Norway

52-6082
Asynchrony of Antarctic and Greenland climate change during the last glacial period.
Blunier, T., et al, *Nature,* Aug. 20, 1998, 394(6695), p.739-743, 51 refs.
Ice cores, Ice composition, Ice dating, Geochronology, Global change, Paleoclimatology, Ice age theory, Antarctica—Byrd Station, Antarctica—Vostok Station, Greenland—Summit Station
A central issue in climate dynamics is to understand how the Northern and Southern Hemispheres are coupled during climate events. The strongest of the fast temperature changes observed in Greenland during the last glaciation have an analogue in the temperature record from Antarctica. A comparison of the global atmospheric concentration of methane as recorded in ice cores from Antarctica and Greenland permits a determination of the phase relationship (in leads or lags) of these temperature variations. Greenland warming events around 36 and 45 kyr before present lag their antarctic counterpart by more than 1 kyr. On average, antarctic climate change leads that of Greenland by 1-2.5 kyr over the period 47-23 kyr before present. (Auth.)

52-6083
Speciation of selenium in natural waters and snow by DPCSV at the hanging mercury drop electrode.
Papoff, P., Bocci, F., Lanza, F., *Microchemical journal,* May 1998, 59(1), p.50-76, 28 refs.
Water chemistry, Snow composition, Chemical composition, Measuring instruments, Antarctica
A procedure is described for the speciation of selenium in natural waters, including those from Antarctica. According to this procedure the original concentrations of Se(IV), Se(IV) + Se(VI), and Se(IV) + Se(-II) in the sample can be determined in turn. Differential pulse cathodic stripping voltammetry was used according to a method proposed earlier to measure the concentration of Se(IV), the only electrochemically active species. By properly selecting pH and reagent concentrations, severe reaction steps were accomplished under UV irradiation. Various tests were performed in natural and synthetic seawater samples. In step I, spikes of humic acid, benzene, and Triton X-100 were completely destroyed in 30 or 100 min. Trimethylselenonium ion and DL-selenomethionine, also did not oxidize to Se(IV) at the nanogram per liter level. In step 2, no losses in Se(IV) spikes were observed after irradiation at pH 10, which means that Se(VI) reduction does not proceed toward oxidation states lower than +4. In step 3, spikes of standard solutions of trimethylselenonium and DL-selenomethionine were completely recovered as Se(IV). The present procedure requires a lower UV absorbed power per sample, a shorter time of irradiation, and a lower reagent concentration. (Auth. mod.)

52-6084
Antarctic marine sediments: distribution of elements and textural characters.
Ciaralli, L., Giordano, R., Lombardi, G., Beccaloni, E., Sepe, A., Costantini, S., *Microchemical journal,* May 1998, 59(1), p.77-88, 14 refs.
Bottom sediment, Marine deposits, Chemical composition, Water pollution, Antarctica—Terra Nova Bay

The present work reports results concerning the distribution of some major (Al), (Fe), and trace (Be, Cd, Cr, Mn, Ni, Pb, Sn, Zn) elements in antarctic marine sediments. Chemical data were evaluated before and after extraction with 0.5 N HCl, taking into account the textural character of the sediments. The mean values of total metals are given. With the exception of Be, all the elements showed higher concentrations in the fraction <63 μm. The efficiency of extraction with 0.5 N HCl was generally low, as expected for unpolluted sediments. The relative percentage extraction of various elements was similar in the two fractions, with the exception of lead which presented a sensibly increased value in the fraction <63 μm. The results indicate that the samples are typical of areas not affected by anthropogenic inputs of elements and that potential polluting compounds are not bound within the structure of clay minerals. (Auth. mod.)

52-6085

Certified reference materials for research in Antarctica: the case of marine sediment.

Caroli, S., Senofonte, O., Caimi, S., Robouch, P., Pauwels, J., Kramer, G.N., *Microchemical journal,* May 1998, 59(1), p.136-143, 8 refs.

Sediments, Chemical composition, Marine geology, Water pollution, Marine deposits, Bottom sediment, Antarctica—Terra Nova Bay

Sediments collected from Terra Nova Bay in 1993-94 were subjected to a battery of examination procedures and techniques under the auspices of the Italian National Program for Research in Antarctica in cooperation with the Italian National Institute of Health. The resulting product was certified by eight laboratories of international repute, measured into 500 bottles, each containing 75g of the sediment. Trace elements in each bottle are listed and the moisture content is noted. It is believed that this batch will satisfy research requests for antarctic sediments for several years.

52-6086

Proceedings. Ice in surface waters. Vol.1.

International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998, Shen, H.T., ed, Rotterdam, A.A. Balkema, 1998, 644p., Refs. passim. For individual papers see 52-6087 through 52-6176.

River ice, Sea ice, Ice conditions, Ice forecasting, Ice control, Ice cover thickness, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice cracks, Ice breaking, Pressure ridges, Ice jams, Flood forecasting

52-6087

Seasonally installed weir to control freezeup ice jams.

Lever, J.H., Gooch, G., Foltyn, E.P., MP 5197, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.3-9, 5 refs.

River ice, Frazil ice, Freezeup, Ice jams, Ice control

Frazil ice production in small, steep rivers can lead to thick freezeup ice jams and consequent flooding. One way to control these ice jams is to collect frazil ice and promote ice-cover propagation in a safe location upstream. The authors developed a seasonally installed weir that can assist an ice boom or natural ice arching to arrest frazil floes. This "tension weir" consists of a 0.9-m high impermeable fabric mounted on wire mesh, held in shape under tension by wire rope connected to deadman anchors. Model tests were used to optimize the weir shape, seals and scour protection. Field tests of the structure showed that it performs well during both freezeup and breakup conditions. This paper describes the design, construction, and testing of the tension weir and possible improvements on its design.

52-6088

Failure and replacement of the Safe Harbor skimmer wall.

Gemperline, E.J., Matus, Z.R., O'Donel, O.L., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.11-18, 5 refs.

River ice, Ice breakup, Ice jams, Ice loads, Ice control, Flood control, Floods, Accidents, Dams, Spillways, United States—Pennsylvania

52-6089

Using a geographical information system for river ice cover management.

Ruggles, R.W., Quinn, D., Rowinski, J., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.19-23, 8 refs.

River ice, Ice conditions, Ice breakup, Ice forecasting, Ice control, Flood forecasting, Data processing, United States—Pennsylvania

52-6090

Use of SAR data at the Alaska River Forecast Center.

Lunsford, A.C., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.25-30, 3 refs.

River ice, Ice conditions, Ice breakup, Ice jams, Ice reporting, Ice forecasting, Flood forecasting, Spaceborne photography, Synthetic aperture radar, Data processing, United States—Alaska

52-6091

River ice monitoring network in the north central United States.

Connelly, B.A., Pomerleau, R.T., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.31-34, 9 refs.

River ice, Ice jams, Ice forecasting, Ice control, Flood forecasting, Data processing, United States—Minnesota

52-6092

Remote measurements of temperature and surge levels in ice-laden rivers.

Beltaos, S., Ford, J.S., Pedrosa, M., Madsen, N.K., Burrell, B.C., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.35-40, 12 refs.

River ice, Ice breakup, Ice jams, Ice cover thickness, Ice bottom surface, Ice water interface, Water temperature, River flow, Flow measurement, Ice forecasting, Flood forecasting

52-6093

Temporal changes to the ice regime of a regulated cold-regions river.

Conly, F.M., Prowse, T.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.41-48, 15 refs.

River flow, Flow control, River ice, Ice conditions, Freezeup, Ice breakup, Canada—Peace River, Canada—Slave River

52-6094

Flow in ice-covered low flowage water body.

Anisimova, E.P., Speranskaia, A.A., Dolgopolova, E.N., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.49-52, 3 refs.

Lake ice, Ice cover effect, Ice water interface, Water flow, Russia—Baykal, Lake

52-6095

Review of ice boom loads in the St. Lawrence River, 1994-1997.

Cornett, A.M., Frederking, R.M.W., Morse, B., Dumont, S., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.53-59, 6 refs.

River ice, Ice loads, Ice booms, Ice control, Ice forecasting, Statistical analysis, Canada—Quebec—Saint Lawrence River

52-6096

Physical model study of ice retention booms.

Tuthill, A.M., Gooch, G., MP 5198, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.61-66, 9 refs.

River ice, Ice control, Ice booms, Ice loads, Ice water interface, River flow, Environmental tests

A major disadvantage of conventional ice control booms is their limited effectiveness at water velocity above about 0.7 m/s and Froude number greater than about 0.1. A 1:25 scale hydraulic model study of a generic rectangular channel investigated alternatives for ice retention at open water velocities in the 0.6 to 1.0 m/s (prototype) range. Alternative boom unit geometries and boom configurations were tested, using a plastic ice material and natural ice. Boom cable tensions were measured as ice accumulated upstream of the structures. The study focused on ice restraint capacity of the boom, ice entrainment and ice erosion velocities, as well as the effect of ice friction along the channel sides. Although it was possible to increase the ice restraint capacity of model booms beyond conventional levels, ice entrainment and under ice erosion limited boom performance at higher water velocities.

52-6097

Influence of surface turbulence on the formation of ice pans.

Andreasson, P., Hammar, L., Shen, H.T., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.69-76, 17 refs.

River ice, Frazil ice, Ice formation, Freezeup, Ice growth, Ice breakup, Ice floes, Ice water interface, Turbulent boundary layer, Mathematical models

52-6098

Anchor ice formation and discharge change on a cold region river.

Yamazaki, M., Hirai, Y., Hasegawa, K., Hirayama, K., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.77-84, 7 refs.

River ice, Frazil ice, Bottom ice, Ice dams, Ice water interface, River flow, Freezing indexes, Diurnal variations, Mathematical models, Japan—Hokkaido

52-6099

Snow and ice blocking of tunnels.

Lia, L., Carstens, T., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.85-91, 13 refs.

Dams, Tunnels, Spillways, Naleds, Snowdrifts, Ice dams, Ice control, Norway

52-6100

Modelling ice jam evolution processes.

Hicks, F.E., Bonneville, C., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.93-99, 3 refs.

River ice, Ice breakup, Ice jams, Ice cover thickness, Ice water interface, River flow, Ice forecasting, Flood forecasting, Environmental tests, Environment simulation

52-6101

Simulation of river ice jam formation.

Daly, S.F., Hopkins, M.A., MP 5199, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.101-108, 19 refs.

River ice, Ice jams, Ice floes, Ice friction, Ice cover thickness, Ice loads, Ice water interface, River flow, Ice forecasting, Ice control, Flood forecasting, Computerized simulation, Mathematical models

A three-dimensional discrete element ice model has been coupled with a one-dimensional unsteady channel flow model and used to simulate ice jam formation at an ice control structure. The ice control structure consisted of three cylindrical piers placed across a straight, rectangular channel. The discrete element model is capable of modeling the behavior of several thousand, three-dimensional disk-shaped floes by resolving the inter-floe contact forces, fluid drag force, gravitational force, and buoyancy force acting on each floe. The unsteady flow model is capable of modeling open water flow, flow under an ice jam, and high Reynolds number seepage flow through an ice jam. Two types of ice jams were simulated. The first began with a single layer of floes, evenly distributed on the water surface, moving downstream in a steady, uniform flow. The second began with the release of an upstream impoundment of floes carried downstream by the resulting surge of water. During each simulation the river stage, discharge, forces, and ice jam profiles were calculated at uniformly spaced cross-sections and time intervals.

52-6102

Constitutive laws for river ice dynamics.

Lu, S.N., Shen, H.T., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.109-116, 13 refs.

River ice, Ice jams, Ice cover strength, Ice friction, Ice plasticity, Ice deformation, Ice water interface, River flow, Computerized simulation, Mathematical models

52-6103

Ice condition forecast model and its verification on the lower Yellow River.

Li, Z.X., Zhu, Q.P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.117-121, 3 refs.

River ice, Freezeup, Ice breakup, Ice conditions, Ice forecasting, Ice control, Flood control, Statistical analysis, China—Yellow River

52-6104

Velocity distribution in ice-covered flow.

Dolgopolova, E.N., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.123-129, 13 refs.

River ice, Ice cover effect, Ice water interface, River flow, Fluid dynamics, Hydrodynamics, Statistical analysis

52-6105

Summary for the river ice jam in China.

Chen, C.J., Yang, X., Li, G.F., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.131-135, 7 refs.

River ice, Ice jams, Floods, Accidents, Ice forecasting, Flood forecasting, China—Yellow River

52-6106

Study on the mechanism of the formation of ice jams at Bayangaole.

Ke, S.J., Lu, Q.G., Lu, G.Q., Yang, X.H., Zhang, X.C., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.137-141.

River ice, Freezeup, Ice breakup, Ice conditions, Ice jams, Ice forecasting, Ice control, River flow, Floods, Flood forecasting, China—Yellow River, China—Inner Mongolia

52-6107

Analysis on ice condition of the lower Yellow River in years 1986-1996.

Huo, S.Q., Zhu, Q.P., Li, Z.X., Rao, S.Q., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.143-146.

River ice, Ice conditions, Freezeup, Ice breakup, Air temperature, Ice forecasting, Flood forecasting, Statistical analysis, China—Yellow River

52-6108

Ice-on, ice-off, and ice duration for lakes and rivers with long-term records.

Assel, R.A., Herche, L.R., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.147-151, 19 refs.

Lake ice, River ice, Ice conditions, Freezeup, Ice breakup, Climatic changes, Meteorological data, Statistical analysis

52-6109

Effects of climate change on the freeze-up regime of the Peace River.

Andres, D.D., Van der Vinne, G., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.153-158, 6 refs.

River ice, Frazil ice, Freezeup, Ice conditions, Ice forecasting, Climatic changes, Climatic factors, River flow, Flow control, Statistical analysis, Canada—Alberta—Peace River

52-6110

Mitigation of ice effects of the habitat in regulated and natural rivers.

Tesaker, E., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.161-167, 14 refs.

River ice, Ice cover effect, Ice control, River flow, Flow control, Ecosystems, Ecology, Environmental protection

52-6111

Impacts of ice cover on water quality and fish life in the Songhuajiang basin.

Shen, X.C., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.169-174, 5 refs.

River ice, Ice cover effect, Ice water interface, Water chemistry, Water pollution, Ecology, Environmental protection, China—Songhua River

52-6112

Effects of hanging dams, surface ice break-up, and flooding on fish.

Brown, R.S., Power, G., McKinley, R.S., Beltaos, S., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.175-181, 11 refs.

River ice, Ice dams, Ice bottom surface, Ice water interface, Ice cover effect, River flow, Floods, Ecology, Canada—Ontario—Grand River

52-6113

Processes controlling oxygen uptake rates in frozen mine tailings in the Arctic.

Elberling, B., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.183-188, 10 refs.

Mining, Tailings, Waste disposal, Soil pollution, Frozen ground chemistry, Permafrost preservation, Canada—Northwest Territories—Baffin Island

52-6114

Observations on the role of an ice cover in sediment deposition in a northern delta.

Milburn, D., Prowse, T.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.189-196, 26 refs.

Deltas, River ice, Ice conditions, Ice cover effect, Ice water interface, River flow, Water pollution, Soil pollution, Suspended sediments, Alluvium, Bottom sediment, Sediment transport, Canada—Northwest Territories—Slave River Delta

52-6115

Isotopic characteristics of ice cover in a large northern river basin.

Gibson, J.J., Prowse, T.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.197-205, 23 refs.

River ice, Ice composition, Isotope analysis, River basins, Wetlands, Stream flow, Meltwater, Water chemistry, Canada—Northwest Territories—Liard River

52-6116

Stable environmental isotopes in lake and river ice cores.

Ferrick, M.G., Calkins, D.J., Perron, N.M., Kendall, C., MP 5200, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.207-214, 11 refs.

Lake ice, River ice, Ice formation, Ice growth, Snow ice, Ice composition, Ice cores, Isotope analysis, Mathematical models, United States—New Hampshire

In this paper the relationship between the stable isotopic signatures of river- and lake-ice cores and corresponding ice formation processes are sought. A parameter that must be determined to establish these relationships is the variable isotopic fractionation during ice growth. Ice cores obtained near the times of maximum thickness from a river impoundment and a small lake were composed predominantly of snow ice and congelation ice. Snow cover and water samples, ice thicknesses, flow velocities, and meteorological data were also obtained throughout the growth period to support the analysis. The time of initial ice cover formation differed between the two sites by about a week, and as a result the ice formation processes differed significantly. In addition, snow ice formation and highly variable met conditions led to isotopic signatures of the congelation ice that were different from others that have been reported. A diffusion model developed to simulate solute rejection by crystals grown from the melt, was used to interpret the data. The model was consistent with the field data.

52-6117

Arctic technology research and development needs.

Gudmestad, O.T., Løset, S., Mølmann, T., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.217-223, 15 refs.

Exploration, Offshore drilling, Natural resources, Petroleum industry, Economic development, Petroleum transportation, Ice conditions, Subsea permafrost, Permafrost preservation, Environmental protection, Barents Sea, Russia—Kara Sea

52-6118

Comparison of ice thickness from ship based video with field data.

Lensu, M., Haas, C., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.225-230, 7 refs.

Ice surveys, Sea ice distribution, Ice cover thickness, Ice floes, Ice conditions, Photographic reconnaissance

52-6119

Iceberg prediction model to reduce navigation hazards: Columbia Glacier, Alaska.

Tangborn, W.V., Post, A., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.231-236, 11 refs.

Glacier surveys, Glacier oscillation, Glacier mass balance, Calving, Icebergs, Drift, Ice forecasting, Ice reporting, Ice routing, United States—Alaska—Columbia Glacier

52-6120

Calculation of the size of the iceberg struck by the oil tanker Overseas Ohio.

Tangborn, A., Kan, C.D., Tangborn, W.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.237-241, 6 refs.

Tanker ships, Icebergs, Ice loads, Accidents, Impact strength, Statistical analysis, United States—Alaska—Prince William Sound

52-6121

Kara Sea ice motions.

DeFranco, S.J., Blanchet, D., Pritchard, R.S., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.243-250, 5 refs.

Ice surveys, Sea ice distribution, Drift stations, Drift, Ice forecasting, Statistical analysis, Russia—Kara Sea

52-6122

Influence of the summer river runoff on ice formation in the Kara and Laptev Seas.

Dmitrenko, I.A., Golovin, P.N., Gribanov, V.A., Kassens, H., Holeman, J., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.251-257, 18 refs.

River flow, Runoff, Salinity, Sea water freezing, Ice formation, Ice growth, Ice conditions, Fast ice, Ice water interface, Ice heat flux, Russia—Kara Sea, Russia—Laptev Sea

52-6123
1995 ice conditions in the Ob Bay in western Siberia.
Blanchet, D., Bhat, S.U., Wilkman, G., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.259-267, 7 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Icebreakers, Helicopters, Ice routing, Route surveys, Russia—Ob', Gulf

52-6124
Software of a sea ice management system for winter oil/gas production in north Bohai Sea.
Zhang, Q., Ding, H.Y., Xu, J.Z., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.269-272, 5 refs.
Sea ice distribution, Ice conditions, Ice reporting, Ice forecasting, Offshore drilling, Offshore structures, Warning systems, Data processing, Computer programs, China—Bohai Sea

52-6125
Critical sea ice state warning system for winter offshore oil production in north Bohai Sea.
Xu, J.Z., Li, T.Q., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.273-276, 7 sefs.
Sea ice distribution, Ice conditions, Ice reporting, Ice forecasting, Offshore drilling, Offshore structures, Warning systems, Computer applications, China—Bohai Sea

52-6126
Sea ice conditions, disasters and forecasts in China.
Bai, S., Li, H., Liu, Q.Z., Wu, H.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.277-282, 13 refs.
Sea ice distribution, Ice conditions, Ice cover thickness, Ice reporting, Ice forecasting, Ice navigation, Accidents, Computerized simulation, Statistical analysis, China—Bohai Sea

52-6127
Numerical sea ice forecast system for the Bohai Sea in China.
Wu, H.D., Bai, S., Li, H., Wang, Z.L., Zhang, Z.H., Li, G.Q., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.283-289, 25 refs.
Sea ice distribution, Ice conditions, Ice edge, Ice cover thickness, Drift, Ice models, Ice forecasting, Computerized simulation, Mathematical models, China—Bohai Sea

52-6128
Coupling sea ice model with atmospheric models.
Zhang, Z.D., Wu, H.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.291-296, 6 refs.
Sea ice distribution, Ice conditions, Ice edge, Ice cover thickness, Ice water interface, Drift, Wind factors, Ice models, Ice forecasting, Weather forecasting, Computerized simulation, China—Bohai Sea

52-6129
Stability of thermodynamic sea ice model on the thermodynamic forcing.
Liu, Q.Z., Bai, S., Wu, H.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.297-303, 9 refs.
Sea ice distribution, Air ice water interaction, Ice cover thickness, Ice heat flux, Atmospheric circulation, Ocean currents, Global change, Ice models, Computerized simulation, Mathematical models

52-6130
Coupling the Bohai ice model with Blumberg-Mellor model.
Li, H., Bai, S., Wu, H.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.305-311, 3 refs.
Sea ice distribution, Ice cover thickness, Drift, Air ice water interaction, Ice forecasting, Ocean currents, Ice models, Computerized simulation, Mathematical models, China—Bohai Sea

52-6131
Lagrangian sea ice model with discrete parcel method.
Wang, Z.L., Shen, H.T., Wu, H.D., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.313-320, 16 refs.
Sea ice distribution, Ice conditions, Ice cover thickness, Drift, Ice edge, Ice forecasting, Ice models, Computerized simulation, Mathematical models

52-6132
On the theory of resonance generation of flexural-gravity waves by moving pressure field.
Dias, F., Marchenko, A.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.321-326, 15 refs.
Ice roads, Ice cover strength, Ice elasticity, Ice deformation, Ice water interface, Ice loads, Dynamic loads, Flexural strength, Bearing strength, Gravity waves, Wave propagation, Mathematical models

52-6133
Floatage of a small body on the surface waves.
Marchenko, A.V., Voliak, K., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.327-330, 14 refs.
Ice floes, Drift, Ice friction, Ice water interface, Ocean waves, Wave propagation, Mathematical models

52-6134
Determination of the topography of pressure ice ridges in the Laptev Sea.
Evers, K.U., Jochmann, P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.331-337, 20 refs.
Ice surveys, Pressure ridges, Ice cover thickness, Ice surface, Ice bottom surface, Lidar, Acoustic measurement, Statistical analysis, Russia—Laptev Sea

52-6135
Geometry and physical properties of a stamucha found on Spitsbergen.
Løset, S., Langeland, A., Bergheim, B., Høyland, K.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.339-344, 4 refs.
Pressure ridges, Hummocks, Grounded ice, Ice cover thickness, Ice temperature, Norway—Spitsbergen

52-6136
Mathematical modeling of ice bottom scouring in Baydaratskaya Bay.
Beloshapkov, A.V., Marchenko, A.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.345-352, 8 refs.
Pressure ridges, Ice bottom surface, Ice erosion, Ice scoring, Ocean bottom, Bottom topography, Mathematical models, Russia—Baydaratskaya Bay

52-6137
Method of hummock age determination.
Beketskiĭ, S.P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.353-355, 4 refs.
Pressure ridges, Hummocks, Ice cover thickness, Degree days, Freezing indexes, Ice dating, Russia—Sakhalin Island

52-6138
Thickness distribution of consolidation hummock layer offshore Sakhalin.
Beketskiĭ, S.P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.357-359, 3 refs.
Pressure ridges, Hummocks, Ice cover thickness, Statistical analysis, Russia—Sakhalin Island

52-6139
Ice-tank studies of physical and biological sea-ice processes.
Eicken, H., Ackley, S.F., MP 5201, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.363-370, 16 refs.
Sea water freezing, Sea ice, Ice growth, Ice microstructure, Ice composition, Ice cover effect, Biomass, Bacteria, Algae, Cryobiology, Ecology, Research projects, Environmental tests
Ice-growth experiments were carried out in an Environmental Test Basin to study the evolution of the microstructure and physico-chemical characteristics of the ice as well as the growth and development of sea-ice biological communities as a function of the relevant boundary conditions (thermal forcing, current velocity, waves etc.). Linkages between salt and heat fluxes and ice evolution were assessed through microstructural analyses, involving also improvement of sampling and analysis techniques. As testified by measurements of biomass as well as primary and bacterial production, a viable community of arctic sea-ice organisms could be established in the ice. While currents had a considerable impact on ice structural evolution, ice organisms were mostly affected by thermal forcing and the light regime. In separate enclosures, bioremediation strategies in oil-polluted sea ice were studied. A further component of the experimental program was devoted to particle entrainment into the ice cover and wave-ice interaction.

52-6140
Supercooling of large water volumes: laboratory experiments and hypotheses.
Tyshko, K.P., Cherepanov, N.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.371-378, 40 refs.
Supercooling, Cooling rate, Artificial ice, Ice formation, Frazil ice, Ice growth, Bottom ice, Environmental tests

52-6141
Rafting of small floes.
Lensu, M., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.379-385, 9 refs.
Ice floes, Ice override, Pressure ridges, Ice pressure, Ice cover thickness, Ice loads, Ice deformation, Environmental tests

52-6142
Sediment entrainment into sea ice in arctic leads: an experimental approach.
Lindemann, F., Smedsrud, L.H., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.387-390, 9 refs.
Ice rafting, Ice openings, Ice water interface, Suspended sediments, Sediment transport, Water pollution, Environmental tests

52-6143

Growth velocity of freshwater ice and air bubble sizes linked to microwave radiometer measurements.

Darovskikh, A.N., Fedotov, V.I., Tyshko, K.P., Johnsen, K.P., Heygster, G., Eicken, H., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.391-395, 14 refs.

Lake ice, Artificial ice, Ice formation, Ice growth, Ice cover thickness, Ice heat flux, Freezing rate, Bubbles, Air ice water interaction, Ice temperature, Radiometry

52-6144

Laboratory and field studies on ridging of an ice sheet.

Tuhkuri, J., Lensu, M., Hopkins, M.A., MP 5202, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.397-404, 18 refs.

Ice floes, Pressure ridges, Ice override, Ice pressure, Ice friction, Ice loads, Ice cover strength, Ice deformation, Ice cover thickness, Environmental tests

Ridging and rafting of model ice sheets have been studied. In an ice basin, model ice sheets of uniform thickness always rafted and did not form ridges. However, in nature the thickness of level ice may not be as uniform as in the laboratory and, therefore, a non-uniform model ice field consisting of floes of thickness t_1 and thin ice of thickness t_2 connecting these floes was used in the experiments. During a test, a strip of non-uniform model ice was compressed with a pusher plate and a ridge formed at an initial cut made across the strip. The shape of the ridges that formed in the laboratory was very similar to those seen in the northern Baltic, with typical sinusoidal arches.

52-6145

Laboratory investigations of snow, shuga and ice regelation in ridges.

Strakhov, M.V., Fedotov, V.I., Cherepanov, N.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.405-410, 17 refs.

Pressure ridges, Snow ice interface, Slush, Snow ice, Regelation, Ice structure, Ice cover strength, Environmental tests, Russia—Ladoga, Lake

52-6146

Laboratory tests of oil fate in cold water, ice, and waves.

Timco, G.W., Davies, M.H., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.411-417, 20 refs. For another version see 50-51.

Oil spills, Water pollution, Ice water interface, Ice cover effect, Ocean waves, Environmental tests

52-6147

Effects of interfacial tension on the spreading of oil under an ice cover.

Izumiyama, K., Uto, S., Narita, S., Tasaki, R., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.419-426, 8 refs.

Oil spills, Water pollution, Ice water interface, Ice cover effect, Interfacial tension, Environmental tests, Mathematical models

52-6148

Some results of studies on oil spillage behavior in ice.

Sazonov, K.E., Popov, P.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.427-430, 8 refs.

Oil spills, Water pollution, Ice cover effect, Ice water interface, Environmental tests

52-6149

Model for ice thrust on dam walls.

Sodhi, D.S., Carter, D., MP 5203, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.433-439, 10 refs.

Reservoirs, Dams, Lake ice, Ice floes, Ice solid interface, Ice loads, Ice push, Ice pressure, Ice cover strength, Ice cracks, Ice deformation, Structural analysis, Mathematical models

The authors briefly describe a field program to measure both the ice thrust on dam walls and stress in the middle of an ice sheet. On the basis of good correlation found between the development of ice thrust and the rise in water level in a reservoir, and observations of parallel cracks along a dam wall, they present two theoretical models. The first estimates the upper bound force per unit width for the rotation of an ice floe between two parallel cracks, and the second is for buckling of two ice floes between three parallel cracks. They consider the wedging action attributable to the rotation of ice blocks in both cases. They postulate that it is possible for wedging to develop during the rotation of an ice floe between two cracks, but this possibility is small for two ice floes in a buckled position between three cracks. For the case of two ice floes between three parallel cracks, the estimated thrust from gravitational forces is close to the maximum ice thrust measured at two sites.

52-6150

Static ice loads on dams: loads along a dam face, and on wooden and steel stoplogs.

Comfort, G., Singh, S., Gong, Y., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.441-448, 6 refs.

Dams, Hydraulic structures, Ice solid interface, Ice loads, Ice pressure, Ice push

52-6151

Expected thermal ice loads in reservoirs.

Singh, S., Comfort, G., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.449-456, 12 refs.

Reservoirs, Lake ice, Ice thermal properties, Thermal expansion, Ice loads, Ice pressure, Ice push

52-6152

Study of thermal ice loads.

Azarnejad, A., Hrudey, T.M., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.457-464, 11 refs.

Ice thermal properties, Thermal expansion, Ice loads, Ice pressure, Ice push, Thermal analysis, Computerized simulation

52-6153

Shattering process of sea ice sheet against a pillar with cone.

Chen, S.H., Qiu, G., Chen, Z.P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.465-468, 6 refs.

Offshore structures, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice breaking

52-6154

Distribution of extreme ice loads on ice-resistant platforms.

Bekker, A.T., Komarova, O.A., Venkov, A.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.469-474, 10 refs.

Pressure ridges, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice forecasting, Offshore structures, Design criteria, Statistical analysis

52-6155

Finite element analysis of breaking ice forces on conical structures.

Sand, B., Horrigmoe, G., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.475-482, 17 refs.

Offshore structures, Ice solid interface, Ice cover strength, Ice plasticity, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice cracks, Ice breaking, Mathematical models

52-6156

Fragmentation modes for impacting ice floes.

Selvadurai, A.P.S., Sepehr, K., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.483-489, 18 refs.

Ice solid interface, Ice cover strength, Ice plasticity, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Computerized simulation

52-6157

Nonlinear numerical simulation of shattered process of sea ice.

Chen, Z.P., Yue, Q.J., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.491-495, 10 refs.

Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Mathematical models

52-6158

Method for predicting ice loads on structures based on model test data.

Alekseev, IU.N., Karulin, E.B., Karulina, M.M., Sutulo, S.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.497-502, 12 refs.

Offshore structures, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Environmental tests, Statistical analysis, Mathematical models

52-6159

Modeling sea ice ride-up and pile-up against conical caisson in Bohai Bay.

Wang, K.G., Wu, H.D., Wang, C.X., Liu, L.K., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.503-510, 12 refs.

Offshore structures, Caissons, Ice solid interface, Ice override, Ice pileup, Ice loads, Ice pressure, Ice friction, Mathematical models, China—Bohai Sea

52-6160

Numerical prediction method for ice loads on wide sloping offshore structures.

Alekseev, IU.N., Karulina, M.M., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.511-517, 7 refs.

Offshore structures, Ice solid interface, Ice pileup, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice breaking, Statistical analysis

52-6161

Effect of temperature on the ductile-to-brittle transition in columnar ice.

Qi, S., Schulson, E.M., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.521-527, 11 refs.

Ice strength, Ice loads, Ice pressure, Ice plasticity, Ice deformation, Ice cracks, Ice breaking, Ice temperature, Stress strain diagrams

52-6162

Statistical basis for the strength of columnar grain ice.

Gold, L.W., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.529-535, 18 refs.

Ice structure, Ice strength, Ice loads, Ice pressure, Ice deformation, Ice cracks, Ice breaking, Strain tests, Statistical analysis

52-6163

Grain boundary sliding and crack nucleation in ice.

Weiss, J., Schulson, E.M., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.537-545, 18 refs.

Ice structure, Ice strength, Ice loads, Ice pressure, Ice deformation, Ice creep, Ice cracks, Strain tests

52-6164

Uniaxial compressive strength of fine grain ethanol model ice.

Li, Z.J., Riska, K., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.547-552, 8 refs.

Artificial ice, Ice structure, Ice strength, Ice loads, Ice pressure, Ice deformation, Ice cracks, Ice breaking, Strain tests

52-6165

Macroscopic compressive shear faults in S2 columnar ice.

Iliescu, D., Schulson, E.M., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.553-558, 10 refs.

Ice structure, Ice strength, Ice loads, Ice pressure, Ice deformation, Ice cracks, Strain tests

52-6166

Comparison of brittle compressive failure of fresh- and salt-water columnar ice.

Gratz, E.T., Schulson, E.M., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.559-566, 22 refs.

Ice structure, Ice strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice cracks, Ice breaking, Strain tests, Environmental tests

52-6167

Fracture energy of saline ice.

Vincent, M.R., Dempsey, J.P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.567-573, 10 refs.

Salt ice, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice creep, Ice deformation, Ice cracks, Ice breaking, Strain tests, Environmental tests

52-6168

Layered flaking model of ice-structure interaction.

Kärnä, T., Kamesaki, K., Tsukuda, H., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.575-582, 22 refs.

Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice deformation, Ice cracks, Ice breaking, Offshore structures, Computerized simulation, Mathematical models

52-6169

Analysis of ice compressive tests of the Okhotsk sea ice samples.

Bekker, A.T., Gomol'skiĭ, S.G., Farafonov, A.E., Truskov, P.A., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.583-587, 7 refs.

Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Strain tests, Stress strain diagrams, Statistical analysis, Okhotsk Sea

52-6170

Observations of ice rubble behaviour in punch tests.

Azarnejad, A., Brown, T.G., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.589-596, 10 refs.

Ice solid interface, Pressure ridges, Ice pileup, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Strain tests, Impact tests

52-6171

Bond strength of an ice-solid interface loaded in shear.

Haehnel, R.B., Mulherin, N.D., MP 5204, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.597-604, 22 refs.

Steel structures, Protective coatings, Ice prevention, Ice solid interface, Ice accretion, Ice adhesion, Ice loads, Ice strength, Shear strength, Strain tests

Lack of a standardized method for testing the adhesive strength of ice has hampered efforts to understand ice adhesion and development of low-adhesion materials. However, there are numerous standards for testing adhesive joints. The authors describe an adaptation of the 0° cone test for measuring the adhesive strength of ice in shear, substituting ice for the adhesive. The main advantage is its simplicity in sample preparation and testing. This paper describes the test procedure and results for ice bonded to stainless steel, aluminum, and several coatings applied to aluminum. This study found that the measured adhesive shear strength of ice bonded to stainless steel increased with strain rate, which follows the same general trend as the cohesive shear in ice, except that the failure strengths were about one tenth that of the estimated cohesive shear strength. Coating aluminum reduced the bond strength by a factor of 3. There was little difference in the bond strength measured for the coatings that were tested. The adhesive strength of ice bonded to stainless steel is about the same as for coated aluminum.

52-6172

Linking scales in the fracture of sea ice.

Dempsey, J.P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.607-614, 17 refs.

Sea ice, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice elasticity, Ice deformation, Ice creep, Ice cracks, Ice breaking, Stress concentration, Strain tests

52-6173

Using small scale tests to predict full scale ice loads.

Churcher, A.C., Fitzpatrick, J.P., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.615-622, 8 refs.

Sea ice, Ice cover strength, Pressure ridges, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Ice sampling, Ice forecasting, Stress concentration, Statistical analysis

52-6174

Simulation of ridging and rafting in first-year ice.

Hopkins, M.A., Tuhkuri, J., MP 5205, International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.623-630, 7 refs.

Ice floes, Pressure ridges, Ice override, Ice pileup, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Environmental tests, Mathematical models

When two floating ice sheets are pushed together they either raft or ridge. In this work both processes are simulated using a two-dimensional discrete element model. During ridge formation blocks broken from the sheets accumulate to form the ridge sail and keel. During rafting events one sheet overrides the other. Frequently, the two processes alternate. The accuracy of the simulations is assessed by comparison with a series of similar model experiments. Following this comparison the computer model is used to perform simulations to explore the effect of the thickness and the thickness inhomogeneity of the ice sheets on the likelihood of occurrence of ridging and rafting. Inhomogeneity is treated using sheets composed of two thicknesses. The transitional behavior between ridging and rafting is characterized through an analysis of the energetics.

52-6175

Scale effects on river ice fracture and breakup.

Beltaos, S., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.631-636, 9 refs.

River ice, Ice breakup, Ice cover strength, Flexural strength, Stress concentration, Ice loads, Ice deterioration, Ice cracks, Ice breaking, Ice forecasting, Flood forecasting

52-6176

On large scale modeling of sea ice cover taking into account accumulation of cracks and crack-like faults.

Gol'dshteĭn, R.V., Marchenko, A.V., International Symposium on Ice, 14th, Potsdam, NY, July 27-31, 1998. Proceedings. Ice in surface waters. Vol.1. Edited by H.T. Shen, Rotterdam, A.A. Balkema, 1998, p.637-642, 20 refs.

Sea ice, Ice cover strength, Ice plasticity, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice cracks, Ice breaking, Ice models, Mathematical models

52-6177

Behavior of repaired concrete structures with advanced composites in cold environment.

Thayer, C.C., Boca Raton, Florida Atlantic University, 1997, 159p., University Microfilms order No.1387338, M.S. thesis. 23 refs.

Bridges, Concrete structures, Reinforced concretes, Concrete strength, Concrete durability, Composite materials, Plastics, Frost resistance, Cold weather construction, Cold weather performance, Freeze thaw tests, Low temperature tests, Strain tests, Structural analysis, Mathematical models

52-6178

Lake ice cover development and meltwater mixing in the spring acidification of small Canadian Precambrian Shield lakes.

Allan, C.J., Peterborough, Ontario, Trent University, 1987, 259p., National Library of Canada, Ottawa, Canadian theses MQ-21669, M.S. thesis. Refs. p.131-143.

Air pollution, Precipitation (meteorology), Rain, Snowfall, Scavenging, Snow impurities, Snow composition, Lake ice, Ice cover effect, Snowmelt, Lake water, Water chemistry, Water pollution, Canada—Ontario

52-6179

Impact of glacier recession upon the discharge of the Bow River above Banff, Alberta, 1951-1993.

Hopkinson, C., Waterloo, Ontario, Wilfrid Laurier University, 1997, 161p., National Library of Canada, Ottawa, Canadian theses MQ-21881, Master of Environment Studies thesis. Refs. p.134-140.

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier melting, Glacial hydrology, Glacial rivers, Meltwater, Water reserves, Runoff forecasting, Photogrammetry, Computerized simulation, Canada—Alberta—Banff

52-6180

High resolution record of ice-rafting from the northeast Pacific.

Hewitt, A.T., Victoria, British Columbia, University, 1996, 105p., National Library of Canada, Ottawa, Canadian theses MQ-21911, M.S. thesis. Refs. p.85-96.

Glaciation, Glacial geology, Marine geology, Icebergs, Ice rafting, Quaternary deposits, Glacial deposits, Marine deposits, Bottom sediment, Drill core analysis, Geochronology, Paleoclimatology, United States—Alaska—Alaska, Gulf, Canada—British Columbia—Queen Charlotte Sound

52-6181
Special characteristics of an on-stream stormwater management pond: winter regime and accumulation of sediment and associated contaminants.
Marsalek, P.M., Kingston, Ontario, Queen's University, 1997, 179p., National Library of Canada, Ottawa, Canadian theses MQ-22360, M.S. thesis. Refs. p.167-172.
Municipal engineering, Sanitary engineering, Water treatment, Waste disposal, Sewage disposal, Drains, Ponds, Water pollution, Ice cover effect, Cold weather operation, Canada—Ontario—Kingston

52-6182
Approaches to modelling of high arctic glaciers.
Arendt, A.A., Edmonton, University of Alberta, 1997, 222p., National Library of Canada, Ottawa, Canadian theses MQ-22565, M.S. thesis. Refs. passim.
Glacial meteorology, Glacier heat balance, Glacier mass balance, Glacier oscillation, Degree days, Albedo, Mathematical models, Computerized simulation, Canada—Northwest Territories—Ellesmere Island

52-6183
Influence of blockage and cavitation on the hydrodynamic performance of ice class propellers.
Walker, D.L.N., St. John's, Memorial University of Newfoundland, 1996, 135p., National Library of Canada, Ottawa, Canadian theses NQ-23111, Ph.D. thesis. 48 refs.
Ships, Propellers, Ice solid interface, Ice loads, Metal ice friction, Ice navigation, Hydrodynamics, Cavitation, Environmental tests

52-6184
Ships in ice: the interaction process and principles of design.
Zou, B., St. John's, Memorial University of Newfoundland, 1996, 181p., National Library of Canada, Ottawa, Canadian theses NQ-23115, Ph.D. thesis. Refs. p.174-181.
Ships, Ice solid interface, Ice loads, Ice pressure, Metal ice friction, Ice navigation, Ice cover strength, Ice deformation, Ice cracks, Ice breaking, Stress concentration, Structural analysis, Statistical analysis, Design criteria

52-6185
Models of snow distribution patterns for various types of sea ice in the Canadian high Arctic.
Iacozza, J., Winnipeg, University of Manitoba, 1997, 183p. + appends., National Library of Canada, Ottawa, Canadian theses MQ-23350, M.A. thesis. Refs. p.170-183.
Sea ice, Snow ice interface, Snow cover distribution, Snow depth, Snow cover effect, Snow optics, Ice optics, Solar radiation, Radiation absorption, Transmissivity, Photosynthesis, Statistical analysis

52-6186
Runoff from hummock-covered arctic tundra hillslopes in the continuous permafrost zone.
Quinton, W.L., Saskatoon, University of Saskatchewan, 1997, 277p., National Library of Canada, Ottawa, Canadian theses NQ-24043, Ph.D. thesis. Refs. p.214-222.
Continuous permafrost, Permafrost hydrology, Tundra terrain, Hummocks, Tundra soils, Peat, Soil water migration, Seepage, Stream flow, Runoff forecasting, Canada—Northwest Territories—Mackenzie Delta

52-6187
Investigation of the atmosphere-snow transfer process for hydrogen peroxide.
McConnell, J.R., Tucson, University of Arizona, 1997, 109p., University Microfilms order No.9814460, Ph.D. thesis. 30 refs. For papers included in thesis see 51-3373 or J-57101, 52-901 or F-58129, 52-2769, and 52-5669 or F-59673.
Polar atmospheres, Atmospheric composition, Scavenging, Snow air interface, Snow composition, Snow ice interface, Firn, Ice composition, Ice cores, Paleoclimatology, Computerized simulation, Greenland, Antarctica—South Pole
Of the three primary atmospheric oxidants, hydroxyl radical, ozone, and hydrogen peroxide (H_2O_2), only the latter is preserved in ice cores. Models of the H_2O_2 atmosphere-to-snow-to-firn transfer processes were coupled to a snow pack accumulation model. The models, tested using field data from Summit, Greenland and the South Pole, indicate that H_2O_2 is reversibly deposited to the snow surface, with subsequent uptake and release controlled by advection of air containing H_2O_2 through the top meters of the snow pack and temperature-driven diffusion within individual snow grains. This physically based model was successfully used to invert year-round surface snow concentrations to an estimate of atmospheric H_2O_2 at the South Pole. (Auth. mod.)

52-6188
34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s.
Kotliakov, V.M., ed, Moscow, Glaciological Association, 1997, 480p., Refs. passim. For individual papers see 52-6189 through 52-6223 or F-59893 through F-59898.
Glacier ice, Snow cover, Glaciers, Avalanches, Paleoclimatology
The articles selected for this collection cover such subjects as snow cover and avalanches, snowdrifts, the internal and external regimes of glaciers, and problems of paleoglaciology. The majority of the articles deal with arctic regions but six papers include antarctic locations.

52-6189
Contribution of Soviet glaciology to the world science.
Kotliakov, V.M., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.7-17.
Glaciology, History

52-6190
Energy of glacierization and the life of glaciers.
Shumskiĭ, P.A., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.19-43, 16 refs. For Russian original and another English translation see 2-1038 and 25-2259.
Glaciation, Glacier ablation, Classifications, Glacier alimentation, Snow line, Meteorological factors, Glacier oscillation, Altitude

52-6191
Experience in studies of heat and water balance of snow melting.
Kuz'min, P.P., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.44-62, Translated from the Russian: State Hydrological Institute Proceedings, 1(55), p.11-41.
Heat balance, Water balance, Snow melting, Radiation balance, Snow density, Snow thermal properties, Snow cover, Albedo, Heat transfer, Analysis (mathematics), Meltwater

52-6192
On the stability of glaciers.
Tronov, M.V., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.63-72, 16 refs. For Russian original see 8-10442.
Glaciers, Glacier oscillation, Glacier flow, Climatic factors, Microclimatology, Glacier ablation, Glacier alimentation, Russia—Altay Mountains

52-6193
Thermal state of glaciers.
Avsiuk, G.A., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.73-87, For Russian original see 8-10755.
Glaciers, Glacier ice, Classifications, Ice thermal properties, Thermal regime, Temperature measurement, Antarctica—Queen Maud Land, Antarctica—Ross Ice Shelf, Antarctica—Adélie Coast
The author presents overall characteristics of the thermal state of modern glaciers and describes the spatial distribution of glaciers with different thermal regimes. Locations include the Alps, Greenland, Antarctica, Svalbard, Iceland, Alaska, Baffin Island, Scandinavia and Tien Shan. (Auth. mod.)

52-6194
Principles of the snow drifting theory.
Diunin, A.K., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.88-99, 12 refs. For Russian original see 16-19312.
Snowdrifts, Flow rate, Snow mechanics, Analysis (mathematics)

52-6195
Plastic deformation rate of polycrystalline ice.
Voĭtkovskiĭ, K.F., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.100-112, 12 refs. For Russian original see 15-18625.
Ice elasticity, Ice deformation, Ice crystals, Temperature effects, Plastic deformation

52-6196
Ice dome of Drigalsky Island.
Shumskiĭ, P.A., Kotliakov, V.M., Evteev, S.A., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.113-131, 2 refs. For Russian original see 17-20018.
Glacier ice, Glacier mass balance, Glacier alimentation, Glacier ablation, Glacier flow, Snow accumulation, Antarctica—Drygalski Island
This detailed description of the Drygalski Island ice dome includes a discussion of the dimensions, shape and structure of the dome, snow accumulation on the island, the structure and properties of the snow-firn layer, ice formation processes, ice motion, mass balance, and the evolution and origin of the ice dome.

52-6197
Ice dome with firn nourishment in Franz Josef Land.
Krenke, A.N., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.132-144, Translated from the Russian Issledovaniia lednikov i lednikovykh raĭonov, No.1, 1961, p.70-84. 7 refs. For another English translation see 16-19696.
Glacier ice, Firn, Ice formation, Glacier mass balance, Glacier flow, Ice temperature, Thermal regime, Russia—Franz Josef Land, Russia—Hooker Island

52-6198
On the theory of glacier movement and fluctuations.
Shumskiĭ, P.A., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.145-159, For Russian original see 21-24788.
Glacier flow, Glacier oscillation, Glacier mass balance, Analysis (mathematics), Glacier ice, Thermodynamics, Glacier surfaces, Rheology, Subglacial observations

52-6199
Thermal regime of the central part of the antarctic ice sheet.
Zotikov, I.A., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.160-174, For Russian original see 20-23081 or 2F-2244. 10 refs.
Glacier ice, Glacier thickness, Ice temperature, Ice melting, Heat transfer, Glacier heat balance, Thermal regime, Bedrock, Mathematical models, Antarctica—East Antarctica
Using mathematical analysis, the author discusses heat transfer in a thick glacier, heat balance on the bottom surface, the critical thickness of a glacier, the dimensionless criterion for the subsidence of a glacier, and the thermal regime—that is, the melting of the glacier at the interface with the underlying bedrock. (Auth. mod.)

52-6200
On the notions of "chionosphere" and "365-level".
Tushinskiĭ, G.K., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.175-179, Translated from the Russian Materialy Gliatsiologicheskikh issledovanii, Khronika, Obsuzhdeniia, No.7, 1963, p.173-177. 2 refs.
Altitude, Snow line, Mountain glaciers, Snow cover stability, Snow cover distribution, CIS

52-6201
On the relationship between precipitation and its accumulation in the antarctic ice sheet.
Kotliakov, V.M., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.180-185, Translated from the Russian Gliatsiologicheskie issledovaniia, Moscow, No.13, 1964, p.12-18. For Russian original see 2F-3071. 6 refs.
Snowdrifts, Snow mechanics, Snow accumulation, Precipitation (meteorology), Wind factors, Wind velocity, Antarctica—East Antarctica
Taking into account the total amount of snow accumulated annually on the antarctic continent, the amount of snow carried away into the sea and evaporation from the slope of the ice sheet, subject to the action of katabatic winds, the author concludes that the amount of snow accumulated on the surface of the antarctic ice sheet is about 5% less than the total amount of precipitation over Antarctica. (Auth. mod.)

52-6202
Some problems concerning the motion of avalanches and other similar phenomena.
Losev, K.S., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.186-190, 7 refs. For Russian original and another English translation see 23-3970 and 26-1375.
Avalanches, Avalanche mechanics, Snow slides, Analysis (mathematics)

52-6203
On the correlation between glacier melting and air temperature.
Krenke, A.N., Khodakov, V.G., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.191-207, 62 refs. For Russian original see 23-901.
Glacier melting, Air temperature, Ice air interface, Radiation balance, Analysis (mathematics), Ablation, Glacier surfaces, Temperature effects, Correlation

52-6204
Snow cover in the northern part of the Ural and some problems of mountain snow studies.
Khodakov, V.G., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.208-218, 20 refs. For Russian original see 24-2221.
Snow cover distribution, Snow water equivalent, Snow surveys, Russia—Ural Mountains

52-6205
Method to calculate the probable developmental conditions of Quaternary glacierization.
Khodakov, V.G., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.219-228, Translated from the Russian Materialy Gliatsiologicheskikh issledovanii, Khronika, Obsuzhdeniia, No.14, 1968, p.180-187. 12 refs.
Glacier oscillation, Glacier mass balance, Glacier ablation, Climatic changes, Analysis (mathematics), Paleoclimatology, Antarctica—Mirnyy Station, Antarctica—Molodezhnaya Station
Among the profiles used in this study, there were 2 antarctic profiles (Sovetskaya-Mirnyy and the ice divide—Molodezhnaya), 3 Greenland profiles, and a series of shorter profiles through the ice sheets and domes in the Arctic and Antarctica. According to the author, the suggested calculation procedure is easy to apply to any other Quaternary ice sheets provided the necessary paleographic information is available. (Auth. mod.)

52-6206
Nature of an air wave caused by a snow avalanche.
IAkimov, IU.L., Shurova, I.E., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.229-232, 3 refs. For Russian original and another English translation see 24-35 and 39-1379.
Avalanche wind, Avalanche mechanics, Avalanche tracks, Avalanche modeling, Mathematical models

52-6207
Hydrology of glaciers: some key aspects.
Golubev, G.N., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.233-249, 24 refs. For Russian original and another English translation see 28-438 and 28-1952.
Glacial hydrology, Glacier ice, Glacier heat balance, Ice (water storage), Snow water equivalent, Analysis (mathematics), Caucasus Mountains

52-6208
On the internal heating and sliding of glaciers.
Bozhinskiĭ, A.N., Grigorian, S.S., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.250-254, 15 refs. For Russian original see 28-2509.
Glacier flow, Ice temperature, Analysis (mathematics), Glacier beds, Glacier thickness, Basal sliding

52-6209
Mechanics of strong snow driftings.
Diunin, A.K., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.255-275, Translated from the Russian Trudy Novosibirskogo instituta inzhenerov zheleznodorozhnogo transporta, No.159, 1974, p.3-110. 22 refs.
Snowdrifts, Wind factors, Wind velocity, Snow mechanics, Theories, Diffusion, Analysis (mathematics)

52-6210
Snow and ice penitents, mechanisms of their formation and indicative significance.
Kotliakov, V.M., Lebedeva, I.M., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.276-288, 8 refs. For Russian original and another English translation with a German summary see 30-1949 and 31-464.
Snow melting, Ice melting, Mountain glaciers, Solar radiation, Evaporation, Heat balance, Heat loss, Meteorological factors, Snow cornices, Pamirs

52-6211
On the nature of an avalanche air wave.
Grigorian, S.S., Urumbaev, N.A., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.289-296, 13 refs. For Russian original see 36-1955.
Avalanche wind, Avalanche formation, Avalanche mechanics, Avalanche triggering, Impact strength, Analysis (mathematics)

52-6212
Last Eurasian ice sheet.
Grosval'd, M.G., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.297-313, Translated from the Russian Materialy Gliatsiologicheskikh issledovanii, Khronika, Obsuzhdeniia, No.30, 1977, p.45-60. 53 refs.
Glaciation, Glacial geology, Geomorphology, Ice dams, Glacial lakes, Ice cover, Paleoclimatology

52-6213
Regime of existence of old snow patches—almost-glaciers.
Glazyrin, G.E., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.314-321, 20 refs. For Russian original see 34-3383.
Snow accumulation, Analysis (mathematics), Ablation

52-6214
Mass balance of the surging Medvezhy Glacier as a basis for forecasting its surges.
Dolgushin, L.D., Osipova, G.B., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.322-330, 4 refs. For Russian original and parallel English text see 33-2341.
Glacier surges, Mountain glaciers, Glacier flow, Glacier ice, Flow rate, Glacier mass balance, Glacier ablation, Glacier surfaces, Avalanches, Alimentation, Forecasting, Pamirs

52-6215
Use of the equilibrium line altitude in hydrometeorological calculations.
Krenke, A.N., Shantykova, L.N., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.331-346, 44 refs. For Russian original see 33-4311.
Glacial hydrology, Mountain glaciers, Glacier mass balance, Glacier ablation, Glacier alimentation, Altitude

52-6216
On a procedure of evaluating average annual sums of solid precipitation on an equilibrium line of glaciers.
Severskiĭ, I.V., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.347-354, Translated from the Russian Vestnik Akademii nauk Kazakhskoĭ SSSR, 1978, No.11, p.43-50. 10 refs.
Precipitation (meteorology), Glacier alimentation, Snow line, Firn, Analysis (mathematics)

52-6217
Evolution of mountain glaciers of the McMurdo Oasis over the last million years and reasons.
Shumskiĭ, P.A., Miagkov, S.M., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.355-370, 19 refs. For Russian original and another English translation see 38-2407 or 14F-29420, and 40-2272 or 15F-33229.
Mountain glaciers, Glacier ice, Glacier tongues, Glacier thickness, Glacier oscillation, Glacier ablation, Glacier alimentation, Paleoclimatology, Climatic changes, Analysis (mathematics), Antarctica—Victoria Land
More than a hundred mountain glaciers exist in the McMurdo oasis. Their distribution, morphometric characteristics and conditions are presented in a series of tables and figures. To quantitatively estimate variations in these mountain glaciers, the authors chose the Meserve Glacier as their model. A method of reconstructing the temperature and accumulation rate of ice based on changes in the dimensions and form of glaciers was developed. This method can be modified to apply to another glacier form, to conditions of variations in the accumulation area, to nonlinear dependence of the ablation rate on temperature, etc. (Auth. mod.)

52-6218
Methods determining the internal infiltration accumulation of glaciers.
Bazhev, A.B., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.371-381, 4 refs. For Russian original with parallel English text see 35-2820.
Glacier mass balance, Glacier alimentation, Glacier melting, Meltwater, Seepage, Glacier ice, Porosity, Ice water interface, Analysis (mathematics)

52-6219
Calculation of glacierization response of Soviet Central Asia to potential climate changes.
Glazyrin, G.E., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.382-387, Translated from the Russian Materialy Gliatsiologicheskikh issledovanii. Khronika, Obsuzhdeniia, No.40, 1981, p.69-72. 10 refs. For another English translation see 42-2715.
Climatic changes, Glaciation, Climatic factors, Mountain glaciers, Analysis (mathematics), Air temperature, Glacier mass balance, River basins, Precipitation (meteorology), CIS—Central Asia

52-6220

Glacial erosion of continental margins; the origin of fjords and troughs within glaciated shelves.

Grosval'd, M.G., Glazovskiĭ, A.F., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.388-401, Translated from the Russia Geomorfologiia, 1983, No.1, p.3-14. 47 refs. For another English translation see 39-1653.

Glacial erosion, Geomorphology, Ice cover

52-6221

Snow line and formation of glacier-derived runoff in glacial basins.

Konovalov, V.G., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.402-410, 8 refs. Excerpts from *Melting and Runoff from glaciers in the river basins of Soviet Central Asia*, Leningrad: Gidrometeoizdat, 1985. For another English version see 49-2943.

Glacial hydrology, Glacier melting, Glacier mass balance, Subglacial drainage, Meltwater, Snow line, Snow ice interface, Snow hydrology, Runoff forecasting, Mathematical models, Runoff

52-6222

Probability model of snow stability on mountain slopes.

Bozhinskiĭ, A.N., Chernous, P.A., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.411-420, 13 refs. For Russian original see 41-105.

Mathematical models, Snow physics, Snow strength, Snow cover stability, Snow density, Shear strength

52-6223

Causes and mechanisms of stability of mountain glaciers.

Diurgerov, M.B., 34 selected papers on main ideas of the Soviet glaciology, 1940s-1980s. Edited by V.M. Kotliakov, Moscow, Glaciological Association, 1997, p.421-432, Translated from the Russian *Mekhanizmy ustoichivosti geosistem* (Mechanisms of the stability of geosystems), Chapter 10, Moscow, Nauka, 1992, p.92-103. 11 refs. For a Chinese translation with English summary see 46-1150.

Glacier mass balance, Mountain glaciers, Glacier oscillation

52-6224

Mobile Over Snow Transport II (MOST II).

Roach, J.S., Roberts, P.V., Singler, R., *U.S. Army Development and Employment Agency, Fort Lewis, WA. Appraisal report,* Apr. 1988, ADEA-AR-88-A223, 37p. + appends., ADB-124 242.

Snow vehicles, Sleds, Military transportation, Military equipment, Cold weather tests

52-6225

Effects of layers of cold weather clothing and type of liner on the psychomotor performance of men.

Lockhart, J.M., Bensel, C.K., *U.S. Army Natick Research and Development Command. Clothing, Equipment and Materials Laboratory (CEMEL). Technical report,* June 1977, Natick/TR-77/018, 119p., ADA-043 835, 14 refs.

Clothing, Military equipment, Cold weather survival, Physiological effects, Human factors engineering

52-6226

Huertgen Forest: offensive, deliberate attack, forest, 4th Infantry Division, 16 November 1944.

Snow, S., ed, Fort Leavenworth, KS, U.S. Army Command and General Staff College, Combat Studies Institute, May 1984, Var. p., ADA-151 627, Refs. passim.

Military operation, History, Cold weather operation, Cold weather survival, Germany

52-6227

Bradley Fighting Vehicle System winter traction test.

Alger, R.G., Osborne, M.D., *U.S. Army Tank-Automotive Command (TACOM). Research, Development and Engineering Center. Technical report,* July 1987, No.13286, 44p. + appends., ADB-119 210.

Military equipment, Military transportation, Tracked vehicles, Snow vehicles, Metal ice friction, Metal snow friction, Traction, Cold weather tests

52-6228

Getting hot to go cold.

Meyer, S.R., Newport, RI, U.S. Naval War College, Mar. 1986, 34p., ADB-102 589, Handwritten student paper. 40 refs.

Military operation, Cold weather operation, Cold weather survival, Acclimatization, Education

52-6229

Winter mobility performance evaluation of an M113 APC using the T130 E1 track and the T150 track with and without ice cleats.

Jackovich, J., Osborne, M.D., *U.S. Army Tank-Automotive Command (TACOM). Research, Development and Engineering Center. Technical report,* June 1987, No.13283, 42p. + appends., ADB-118 414.

Military equipment, Military transportation, Tracked vehicles, Snow vehicles, Metal ice friction, Metal snow friction, Traction, Skid resistance, Cold weather tests

52-6230

Winning in the cold: leaders' guide to winter combat readiness.

U.S. Army 8th Infantry Division Headquarters, 1984, 168p., ADA-323 157, 30 refs.

Military operation, Cold weather operation, Cold weather survival, Military equipment, Winter maintenance

52-6231

Variability of German winter temperature in relation to human performance and its implications for tactical military operations.

Yeshnik, M.A., University Park, Pennsylvania State University, 1988, 117p., ADA-195 410, M.S. thesis. Refs. p.110-117.

Military operation, Cold weather operation, Cold weather survival, Human factors, Physiological effects, Meteorological factors, Germany

52-6232

Preprint volume.

International Scientific Conference on the Global Energy and Water Cycle, 2nd, Washington, D.C., June 17-21, 1996, Washington, D.C., National Research Council, Global Energy and Water Cycle Experiment (GEWEX) Panel, [1996], 541p., Abstracts only.

Hydrologic cycle, Water balance, Radiation balance, Atmospheric circulation, Global warming, Air ice water interaction, Snow air interface, Runoff forecasting, Computerized simulation

52-6233

$\delta^{13}C$ variations of loess organic matter as a record of the vegetation response to climatic changes during the Weichselian.

Hatté, C., et al, *Geology,* July 1998, 26(7), p.583-586, 31 refs.

Paleoclimatology, Paleoecology, Climatic changes, Carbon dioxide, Ice cores, Loess, Organic soils, Stratigraphy, Sedimentation, Isotope analysis, Indexes (ratios), Correlation

This paper presents high-resolution records of $^{13}C/^{12}C$ ratios of organic matter from two loess sequences in northwestern Europe. This analysis is the first attempt to use organic matter $\delta^{13}C$ as a record of the response of vegetation to climatic variations in an area where climatic changes were not strong enough to induce a radical change in vegetation cover. Loess sequences accumulated at high rates and allow high correlation with climatic proxy data, like the Greenland Ice Sheet Project 2 (GISP2) $\delta^{18}O$ and the variations in CO_2 concentration recorded in the Vostok ice core. The use of absolute age control and correlations between global (Vostok-CO_2) or semi-global (GISP2-$\delta^{18}O$) climate effects, $\delta^{13}C$ values of organic matter in loess sequences offers a new tool to establish a refined chronology in continental sequences. (Auth. mod.)

52-6234

Exposure dating and validation of periglacial weathering limits, northwest Scotland.

Stone, J.O., Ballantyne, C.K., Fifield, L.K., *Geology,* July 1998, 26(7), p.587-590, 29 refs.

Pleistocene, Glacial geology, Glacial erosion, Bedrock, Weathering, Nunataks, Periglacial processes, Gamma irradiation, Radioactive age determination, Sampling, United Kingdom—Scotland

52-6235

Megaflood erosion and meltwater plumbing changes during last North American deglaciation recorded in Gulf of Mexico sediments.

Brown, P.A., Kennett, J.P., *Geology,* July 1998, 26(7), p.599-602, 24 refs.

Pleistocene, Glacial geology, Marine deposits, Glacier melting, Meltwater, Runoff, Flooding, Water erosion, Mud, Grain size, Sampling, Mexico, Gulf

52-6236

Meteoritic event recorded in antarctic ice.

Harvey, R.P., et al, MP 5178, *Geology,* July 1998, 26(7), p.607-610, 24 refs.

Glaciology, Ice sheets, Ice dating, Sediments, Projectile penetration, Stratigraphy, Geochronology, Antarctica—Allan Hills

During systematic sampling of volcanic ash (tephra) layers at a well-known antarctic meteorite collection site (the Allan Hills main ice field), a band of unusually dark and rounded (many spheroidal) particles was discovered. This debris layer (BIT-58) extends parallel to the stratigraphy of the ice established from the tephra bands, apparently marking a single depositional event. The shapes, internal texture, major element composition, and levels of cosmogenic nuclides of particles from within BIT-58 all strongly suggest that this material represents ablation debris from the passage of a large H-group ordinary chondrite. Preliminary cosmogenic isotope dating suggests an age of 2.8 Ma, implying that the East Antarctic ice sheet has been stable since that time. (Auth. mod.)

52-6237

Early Preboreal cooling in the Nordic seas regions triggered by meltwater.

Hald, M., Hagen, S., *Geology,* July 1998, 26(7), p.615-618, 37 refs.

Paleoclimatology, Climatic changes, Marine geology, Ice sheets, Glacier oscillation, Meltwater, Salinity, Ice cores, Radioactive age determination, Drill core analysis, Correlation, Atlantic Ocean

52-6238

Sinking intrusion model for the emplacement of garnet-bearing peridotites into continent collision orogens.

Brueckner, H.K., *Geology,* July 1998, 26(7), p.631-634, 32 refs.

Tectonics, Subpolar regions, Earth crust, Rock mechanics, Geologic processes, Geochemistry, Models, Norway

52-6239

Laurentide glacial landscapes: the role of ice streams.

Patterson, C.J., *Geology,* July 1998, 26(7), p.643-646, 58 refs.

Pleistocene, Ice sheets, Glacial geology, Glacial hydrology, Glacial erosion, Glacier flow, Bedrock, Landscape development, Landforms, Classifications, North America

52-6240

Terrestrial record of Laurentide ice sheet reorganization during Heinrich events: comments and reply.

Baas, J.H., et al, *Geology,* July 1998, 26(7), p.666-669, 38 refs. For pertinent paper see 52-1909.

Pleistocene, Glacier oscillation, Ice sheets, Glacial geology, Marine geology, Calving, Ice rafting, Stratigraphy, Geochronology, Ice age theory

52-6241

Dehumidification of air flow through cooling at sub-freezing temperatures.

Housiadas, C., Schrader, K.H., Drossinos, Y., *International journal of heat and mass transfer,* June 1998, 41(12), p.1821-1831, 20 refs.

Pipe flow, Cryogenics, Laminar flow, Ice formation, Particles, Water vapor, Condensation, Vapor diffusion, Aerosols, Dehumidification, Mass transfer, Temperature effects, Simulation

52-6242

Effective medium approximation for the conductivity of sensible heat in dry snow.

Arons, E.M., Colbeck, S.C., MP 5206, *International journal of heat and mass transfer,* Sep. 1998, 41(17), p.2653-2666, 27 refs.

Snow physics, Snow cover structure, Metamorphism (snow), Microstructure, Grain size, Sintering, Snow thermal properties, Thermal conductivity, Latent heat, Mathematical models

The authors developed an inductive model for thermal conductivity of sensible heat of deposited snow using random resistance network theory and parametric statistics. The model identifies the geometric quantities that determine this physical property. It allows quantitative conductivity linkage to natural transformations that are known to change conductivity and increases ability to test such theories experimentally. They are now able to show how microstructural quantities such as grain size distribution and average coordination number interact with each other to govern conductivity. These results may easily be extended to other porous geological and industrial materials.

52-6243

Spectral measurements of HCl in the plume of the antarctic volcano Mount Erebus.

Keys, J.G., Wood, S.W., Jones, N.B., Murcray, F.J., *Geophysical research letters,* July 1, 1998, 25(13), p.2421-2424, 15 refs.

Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Volcanic ash, Photometry, Scavenging, Spectra, Seasonal variations, Antarctica—Erebus, Mount

A favorable combination of circumstances on Sep. 7, 1996 allowed tracking of the sun through the plume of the active antarctic volcano, Mount Erebus. Fourier transform spectrometer measurements from approximately 30 km south of the volcano were made with the interferometer looking upwind and downwind of the summit, resulting in spectra of HCl which showed large column enhancements of the gas when the sun was viewed through the volcanic plume. The result suggests that for this quiescent type of emission from the volcano there is no evidence of rapid tropospheric scavenging of HCl, as might be expected for more explosive events and a less dry atmosphere. (Auth. mod.)

52-6244

1997 arctic ozone depletion quantified from three-dimensional model simulations.

Lefevre, F., Figarol, F., Carslaw, K.S., Peter, T., *Geophysical research letters,* July 1, 1998, 25(13), p.2425-2428, 17 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Ozone, Aerosols, Degradation, Seasonal variations, Simulation

52-6245

Southern hemisphere circulation anomalies associated with extreme Antarctic Peninsula winter temperatures.

Marshall, G.J., King, J.C., *Geophysical research letters,* July 1, 1998, 25(13), p.2437-2440, 24 refs.

Climatology, Polar atmospheres, Air temperature, Seasonal variations, Atmospheric circulation, Atmospheric disturbances, Atmospheric pressure, Statistical analysis, Antarctica—Antarctic Peninsula

The Southern Hemisphere reveals markedly different circulation patterns associated with extreme warm and cold Antarctic Peninsula winter temperatures. These hemispheric anomaly patterns bear a strong resemblance to those associated with El Niño-Southern Oscillation (ENSO) events, and their origins can be ascribed to tropical sea surface temperatures changes. However, the correspondence between warm (cold) ENSO events and cold (warm) winters is not perfect. (Auth. mod.)

52-6246

Phase behavior and lyotropic-liquid crystal structure of alkyltrimethylammonium bromide-water mixtures around freezing temperature of water.

Fukada, K., Matsuzaka, Y., Fujii, M., Kato, T., Seimiya, T., *Thermochimica acta,* Jan. 5, 1998, 308(1-2), IUPAC Conference on Chemical Thermodynamics, 14th, Osaka, Japan, Aug. 15-30, 1996. Collected papers. Interaction with water. Edited by S. Kidokoro et al, p.159-164, 18 refs.

Thermal analysis, Surfactants, Colloids, Ice water interface, Ice formation, Ice melting, Freezing points, Phase transformations, Thermodynamic properties, X ray diffraction, Temperature measurement

52-6247

Influence of saccharides and glycine betaine on freezing of photosystem 2-enriched particles: a chlorophyll fluorescence study.

Busheva, M., Apostolova, E., *Photosynthetica,* 1997, 34(4), p.591-594, 17 refs.

Plant ecology, Frost resistance, Plant tissues, Chemical composition, Chlorophylls, Polymers, Modification, Photosynthesis, Photochemical reactions, Freeze thaw tests, Protection

52-6248

Temperature dependence and rates of sulfate reduction in cold sediments of Svalbard, Artic Ocean.

Sagemann, J., Jørgensen, B.B., Greeff, O., *Geomicrobiology journal,* Apr.-June 1998, 15(2), p.85-100, 41 refs.

Oceanography, Marine biology, Microbiology, Biomass, Bottom sediment, Substrates, Geochemistry, Degradation, Water temperature, Temperature effects, Simulation, Statistical analysis, Arctic Ocean

52-6249

Postfire changes of the carbon cycle in southern tundra.

Zamolodchikov, D.G., Karelin, D.V., Ivashchenko, A.I., *Russian journal of ecology,* July-Aug. 1998, 29(4), p.236-240, Translated from Ekologiia. 16 refs.

Plant ecology, Tundra vegetation, Subarctic landscapes, Ecosystems, Lichens, Forest fires, Damage, Revegetation, Carbon dioxide, Geochemical cycles, Russia—Vorkuta

52-6250

On the choice of timescale in glacial rebound modelling: mantle viscosity estimates and the radiocarbon timescale.

Lambeck, K., *Geophysical journal international,* Aug. 1998, 134(2), p.647-651, 11 refs.

Pleistocene, Glacial geology, Earth crust, Isostasy, Sea level, Viscosity, Radioactive age determination, Accuracy, Time factor, Models

52-6251

Measurements of the downward longwave radiation spectrum over the Antarctic Plateau and comparison with a line-by-line radiative transfer model for clear skies.

Walden, V.P., Warren, S.G., Murcray, F.J., *Journal of geophysical research,* Feb. 27, 1998, 103(D4), p.3825-3846, 66 refs.

Climatology, Polar atmospheres, Atmospheric density, Infrared radiation, Radiation balance, Radiance, Spectra, Sounding, Spectroscopy

A 1-year field program was conducted at Amundsen-Scott Station in 1992 to measure the downward infrared radiance spectrum at a resolution of 1/cm over the spectral range 550-1667/cm. Three clear-sky test cases are selected, one each for summer, winter and spring, for which high-quality radiance data are available as well as ancillary data to construct model atmospheres from radiosondes, ozonesondes and other measurements. The spectral radiance calculated for each of the three test cases generally agrees with that measured, to within twice the total estimated radiance error, thus validating the model to this level of accuracy for antarctic conditions. (Auth. mod.)

52-6252

Estimation of water cloud properties from satellite microwave, infrared and visible measurements in oceanic environments. 1. Microwave brightness temperature simulations.

Lin, B., Wielicki, B., Minnis, P., Rossow, W., *Journal of geophysical research,* Feb. 27, 1998, 103(D4), p.3873-3886, 46 refs.

Climatology, Marine atmospheres, Stratification, Cloud physics, Water vapor, Air temperature, Ice crystals, Ice detection, Microwaves, Radiometry, Brightness

52-6253

Beryllium 10/beryllium 7 as a tracer of stratospheric transport.

Koch, D., Rind, D., *Journal of geophysical research,* Feb. 27, 1998, 103(D4), p.3907-3917, 23 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric circulation, Air entrainment, Gamma irradiation, Radioactive isotopes, Indexes (ratios), Models

52-6254

Environmental conditions required for contrail formation and persistence.

Jensen, E.J., et al, *Journal of geophysical research,* Feb. 27, 1998, 103(D4), p.3929-3936, 19 refs.

Climatology, Cloud physics, Air pollution, Condensation trails, Ice crystal growth, Ice nuclei, Heterogeneous nucleation, Supersaturation, Temperature effects, Simulation, Environmental tests

52-6255

Generalization of automodel and quasi-stationary solutions on modelling of freezing-melting process by perturbation methods. [Obobshchenie avtomodel'nykh i kvazistatsionarnykh reshenii͡ po modelirovaniiu sezonnogo promerzaniia-protaivaniia porod na osnove metoda vozmushcheniĭ]

Komarov, I.A., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.3-11, In Russian with English title and summary. 12 refs.

Geocryology, Mathematical models, Frozen rocks, Seasonal freeze thaw, Freeze thaw cycles, Forecasting, Phase transformations, Heat transfer, Snow cover, Stefan problem

52-6256

Relict of Late Quaternary permafrost on a former nunatak at Plateau Mountain (SW Alberta). [Relikt pozdnechetvertichnoĭ merzloty na byvshem nunatake Plato mauntin (iugo-zapadnaia Al'berta)]

Harris, S.A., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.20-27, In Russian with English title and summary. 25 refs.

Paleoclimatology, Permafrost distribution, Patterned ground, Vegetation patterns, Thermokarst, Ice wedges, Heat flux, Canada—Alberta—Plateau Mountain

52-6257

Cryogenic weathering of limestones evaluated by laboratory techniques and applied to a mountain permafrost area (Plateau Mountain, Alberta, Canada). [Laboratornoe opredelenie kriogennogo vyvetrivaniia izvestniaka v primenenii k gornoĭ merzlote (Plato Mauntin, Al'berta, Kanada)]

Prick, A., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.28-34, In Russian with English title and summary. 22 refs.

Frost weathering, Freeze thaw cycles, Saturation, Unfrozen water content, Laboratory techniques, Canada—Alberta—Plateau Mountain

52-6258

Reliability of landscape indication of engineering-geocryological conditions on transition from large- to medium-scale regional researches in West Siberia. [Otsenka dostovernosti landshaftnoĭ indikatsii inzhenerno-geokriologicheskikh usloviĭ pri perekhode ot krupnogo masshtaba k srednemu pri regional'nykh rabotakh v Zapadnoĭ Sibiri]

Drozdov, D.S., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.35-41, In Russian with English title and summary. 5 refs.

Terrain identification, Landscape types, Engineering geology, Geocryology, Statistical analysis, Lithology, Russia—Siberia

52-6259

Technique and results of large-scale eco-geological environmental research of ore fields in the cryolithozone. [Metodika i rezul'taty krupnomasshatbnykh ekologo-geologicheskikh issledovaniĭ territoriĭ rudnykh mestorozhdeniĭ v kriolitozone]

Vasil'ev, A.A., Drozdov, D.S., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.42-49, In Russian with English title and summary. 11 refs.

Geocryology, Engineering geology, Geochemistry, Environmental impact, Mining, Russia—Yakutia

52-6260
Account of climatic change in the design of the bases of structures on permafrost soils. [Uchet izmenchivosti klimata pri obespechenii nadezhnosti osnovanii sooruzhenii v kriolitozone]
Pustovoĭt, G.P., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.50-53, In Russian with English title and summary. 2 refs.
Standards, Design criteria, Design, Permafrost bases, Permafrost beneath structures, Climatic factors, Climatic changes, Analysis (mathematics), Foundations

52-6261
Stabilization of the pile basis of the local structure on the frozen ground. [Termostabilizatsiia svaĭnykh fundamentov lokal'nogo sooruzheniia na merzlykh gruntakh]
Gorelik, IA.B., Feklistov, V.N., Nesterov, A.N., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.54-58, In Russian with English title and summary. 10 refs.
Pile structures, Foundations, Seasonal freeze thaw, Thermal regime, Deformation, Frost heave, Thaw depth, Soil freezing, Artificial freezing, Soil stabilization, Permafrost beneath structures, Permafrost preservation

52-6262
Reliability of the basement of structures in cryolithozone. [Nadezhnost' osnovanii sooruzhenii v kriolitozone]
Kagan, A.A., Krivonogova, N.F., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.59-61, In Russian with English title and summary. 2 refs.
Permafrost bases, Permafrost beneath structures, Geocryology, Analysis (mathematics), Temperature effects, Design criteria, Cold weather performance, Foundations

52-6263
Improvement of the reliability of air convection type refrigeration units. [Povyshenie nadezhnosti raboty vozdushnykh okhlazhdaiushchikh ustroĭstv konvektivnogo deĭstvila]
Kuz'min, G.P., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.62-65, In Russian with English title and summary.
Refrigeration, Design, Ice formation, Ice sublimation, Analysis (mathematics)

52-6264
Deformation of earth-filled dams and low-pressure spillways in the permafrost area. [Osobennosti deformatsiĭ zemlianykh plotin i vodosbrosnykh sooruzheniĭ nizkovo napora v usloviiakh vechnoĭ merzloty]
Zhang, R.V., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.66-71, In Russian with English title and summary. 20 refs.
Earth dams, Spillways, Deformation, Permafrost beneath structures, Cracks, Moisture, Frozen ground compression, Soil water

52-6265
Deformation of roadbeds on icy permafrost ground and methods against it. [Deformatsii zemlianogo polotna dorog na sil'nol'distykh vechnomerzlykh gruntakh i metody ikh predotvrashchenila]
Kondrat'ev, V.G., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.72-78, In Russian with English title and summary. 11 refs.
Deformation, Roadbeds, Countermeasures, Snow removal, Ice removal, Permafrost beneath roads, Cooling systems, Pipes (tubes), Thaw weakening, Permafrost preservation, Artificial freezing, Soil stabilization

52-6266
Geoinformation approach to investigation of carbon fluxes in tundra landscapes. [Geoinformatsionnyĭ podkhod k izucheniiu uglerodnykh potokov v tundrovykh landshaftakh]
Zamolodchikov, D.G., Karelin, D.V., Ivashchenko, A.I., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.79-84, In Russian with English title and summary. 16 refs.
Carbon dioxide, Biomass, Tundra, Computerized simulation, Global change, Ecosystems, Temperature effects, Cloud cover, Mathematical models

52-6267
Electronic landscape basis of ecological circumpolar maps for Russian Arctic. [Elektronnaia landshaftnaia osnova tsirkumpoliarnykh kart ekologicheskogo soderzhaniia dlia territorii Rossiĭskoĭ Arktiki]
Mel'nikov, E.S., Konchenko, L.A., Molchanova, L.S., *Kriosfera zemli,* Oct.-Dec. 1997, 1(4), p.85-88, In Russian with English title and summary. 3 refs.
Geocryology, Landscape types, Maps, Lithology, Ecology, Computer programs

52-6268
Palmer Long-Term Ecological Research (LTER): Winter ecology cruise, August/September 1993 (PD93-7).
Quetin, L.B., Ross, R.M., Smith, R.C., Baker, K., *Antarctic journal of the United States,* 1995, 30(5), p.249-252, 4 refs.
Ecology, Marine biology, Sea ice, Ice cover effect
The central hypothesis of the Palmer LTER program is that variability in the annual cycle of sea ice will affect the structure and functioning of the marine pelagic ecosystem in the Antarctic. This annual advance and retreat affects a large area of the southern oceans, including all of the continental shelf. To address some specific questions on the effect of sea ice on the winter ecology of the pelagic ecosystem, the Palmer LTER conducted a pair of cruises in 1993 to compare pre- and postwinter characteristics of various aspects of the system.

52-6269
Palmer LTER: Sea-ice coverage in the Long-Term Ecological Research region.
Stammerjohn, S.E., Smith, R.C., *Antarctic journal of the United States,* 1995, 30(5), p.255-256, 2 refs.
Sea ice distribution, Ice volume
Spatial and temporal variability of ice coverage in the LTER large-scale study region has been analyzed using surface sea-ice concentrations derived from passive microwave satellite data using the NASA algorithm. The 1973-1994 time series of monthly ice area (areal coverage of sea ice only) and extent (areal coverage inside the 10% ice-concentration contour including sea ice and open water) for the LTER region are shown in a figure.

52-6270
Palmer LTER: Relationships between variability in sea-ice coverage, krill recruitment, and the foraging ecology of Adélie penguins.
Fraser, W.R., Trivelpiece, W.Z., *Antarctic journal of the United States,* 1995, 30(5), p.271-272, 13 refs.
Marine biology, Ice cover effect, Antarctica—Palmer Station
Seabird research has been an integral part of the science effort at Palmer Station since the early 1970s. Originally restricted to studies on the basic biology, ecology, and behavior of seabirds, the program now focuses on environmental variability and its relationship to short- and long-term change in seabird populations. In this article, the authors summarize the results of a recent analysis with direct relevance to ongoing investigations addressing the broader focus of this program. Changes in the populations of many southern ocean upper-trophic-level predators, such as penguins and whales, are thought to be ultimately linked to changes in the abundance of their primary prey, the antarctic krill *Euphausia superba.*

52-6271
In situ observations of a high-pressure phase of H_2O ice.
Chou, I.M., Blank, J.G., Goncharov, A.F., Mao, H.K., Hemley, R.J., *Science,* Aug. 7, 1998, 281(5378), p.809-812, Refs. p.811-812.
High pressure ice, Ice crystal structure, Ice melting

52-6272
Reception of ELF signals at antipodal distances.
Fraser-Smith, A.C., Bannister, P.R., *Radio science,* Jan./Feb. 1998, 33(1), p.83-88, 15 refs.
Radio communication, Low frequencies, Antarctica—Ross Island, Antarctica—Arrival Heights
Measurements of 82-Hz radio signals from a Russian ELF transmitter located on the Kola Peninsula are described. The measurements were made at several locations around the world, including Dunedin, New Zealand, and Arrival Heights, which are close to the antipodal point for the transmitter. This is the first time man-made ELF signals have been observed over such long distances, and their clear reception makes possible a comparison of the theoretically predicted and measured amplitudes near the antipode. The agreement is excellent. (Auth.)

52-6273
Measurements of Doppler and multipath spread on oblique high-latitude HF paths and their use in characterizing data modem performance.
Angling, M.J., Cannon, P.S., Davies, N.C., Willink, T.J., Jodalen, V., Lundborg, B., *Radio science,* Jan./Feb. 1998, 33(1), p.97-107, 18 refs.
Radio communication, Data transmission, High frequencies, Doppler, Norway—Svalbard, Norway, Sweden

52-6275
Hybrid airfoil design method to simulate full-scale ice accretion throughout a given α range.
Saeed, F., Seilg, M.S., Bragg, M.B., *Journal of aircraft,* Mar.-Apr. 1998, 35(2), p.233-239, 31 refs.
Aircraft icing, Ice prevention, Fluid dynamics, Performance, Cloud droplets, Velocity, Air flow, Flow control, Turbulent boundary layer, Design, Simulation

52-6276
Ice accretion prediction on multielement airfoils.
Mingione, G., Brandi, V., *Journal of aircraft,* Mar.-Apr. 1998, 35(2), p.240-246, 20 refs.
Aircraft icing, Ice accretion, Ice forecasting, Ice solid interface, Air flow, Fluid dynamics, Viscosity, Heat transfer coefficient, Cloud droplets, Spectra, Mathematical models

52-6277
Solubility of 1-pentene ice in liquid nitrogen and argon at the standard boiling points of the solvents.
Szczepaniec-Cięciak, E., Krzeczkowski, M., *Journal of solution chemistry,* June 1998, 27(6), p.485-494, 20 refs.
Ice physics, Cryogenics, Liquefied gases, Hydrocarbons, Frozen liquids, Solubility, Chemical analysis, Extraterrestrial ice, Simulation, Thermodynamics

52-6278
Groundwater composition near the nickel-copper smelting industry on the Kola Peninsula, central Barents region (NW Russia and NE Norway).
De Caritat, P., Danilova, S., Jæger, Ø., Reimann, C., Storrø, G., *Journal of hydrology,* July 10, 1998, 208(1-2), p.92-107, 35 refs.
Environmental tests, Air pollution, Aerosols, Water pollution, Soil water, Mining, Metals, Sampling, Chemical analysis, Statistical analysis, Russia—Kola Peninsula

52-6279
Diurnal patterns of CO_2 and H_2O exchange of the arctic sedges *Eriophorium angustifolium* and *E. vaginatum* (Cyperaceae).
Gebauer, R.L.E., Reynolds, J.F., Tenhunen, J.D., *American journal of botany,* Apr. 1998, 85(4), p.592-599, 60 refs.
Plant physiology, Tundra vegetation, Photosynthesis, Transpiration, Carbon dioxide, Vapor transfer, Vapor pressure, Diurnal variations, Light effects, Temperature effects, Water balance, United States—Alaska—Brooks Range

52-6280
Frost resistance of 'Chinese String'/'Cheyenne' chromosome substitution lines under short- and long-day hardening conditions.
Veisz, O.B., Sutka, J., *Plant breeding,* Mar. 1998, 117(1), p.93-94, 17 refs.
Plant physiology, Grasses, Frost resistance, Plant tissues, Chemical composition, Modification, Cold weather tests, Light effects

52-6281
Breakup of levitated frost particles.
Bacon, N.J., Swanson, B.D., Baker, M.B., Davis, E.J., *Journal of geophysical research,* June 27, 1998, 103(D12), p.13,763-13,775, 36 refs.
Cloud physics, Ice physics, Ice dielectrics, Frost, Dendritic ice, Particles, Ice sublimation, Ice breakup, Ice strength, Electric fields, Static electricity, Simulation

52-6282

Stratospheric aerosols observed by lidar over northern Greenland in the aftermath of the Pinatubo eruption.

Di Sarra, A., Bernardini, L., Cacciani, M., Fiocco, G., Fuà, D., *Journal of geophysical research,* June 27, 1998, 103(D12), p.13,873-13,891, 68 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Volcanic ash, Lidar, Backscattering, Sounding, Profiles, Seasonal variations, Greenland—Thule

52-6283

Laboratory studies of the influence of the rime accretion rate on charge transfer during crystal/graupel collisions.

Saunders, C.P.R., Peck, S.L., *Journal of geophysical research,* June 27, 1998, 103(D12), p.13,949-13,956, 24 refs.

Precipitation (meteorology), Thunderstorms, Cloud physics, Cloud electrification, Ice crystal collision, Snow pellets, Ice accretion, Hoarfrost, Cloud droplets, Charge transfer, Polarization (charge separation), Simulation

52-6284

Density and surface temperature of graupel and the charge separation during ice crystal interactions.

Jayaratne, E.R., *Journal of geophysical research,* June 27, 1998, 103(D12), p.13,957-13,961, 8 refs.

Precipitation (meteorology), Thunderstorms, Cloud electrification, Snow pellets, Ice crystal collision, Hoarfrost, Snow density, Surface temperature, Charge transfer, Polarization (charge separation), Ice vapor interface, Simulation

52-6285

Numerical study of thundercloud electrification by graupel-crystal collisions.

Scavuzzo, C.M., Masuelli, S., Caranti, G.M., Williams, E.R., *Journal of geophysical research,* June 27, 1998, 103(D12), p.13,963-13,973, 28 refs.

Precipitation (meteorology), Cloud physics, Thunderstorms, Cloud electrification, Ice crystal collision, Charge transfer, Polarization (charge separation), Snow pellets, Particles, Classifications, Mathematical models

52-6286

Corona emission thresholds for three types of hydrometeor interaction in thunderclouds.

Blyth, A.M., Christian, H.J., Latham, J., *Journal of geophysical research,* June 27, 1998, 103(D12), p.13,975-13,977, 8 refs.

Precipitation (meteorology), Thunderstorms, Cloud physics, Supercooled clouds, Cloud electrification, Electric corona, Lightning, Ice crystal collision, Ice crystal size, Snow pellets, Simulation, Classifications

52-6287

Electrical and multiparameter radar observations of a severe hailstorm.

Carey, L.D., Rutledge, S.A., *Journal of geophysical research,* June 27, 1998, 103(D12), p.13,979-14,000, 90 refs.

Precipitation (meteorology), Thunderstorms, Hailstone structure, Turbulent boundary layer, Cloud physics, Cloud electrification, Electric fields, Orientation, Lightning, Electric corona, Radar echoes, Theories

52-6288

Permafrost roadbed. [Zemlianoe polotno iz merzlykh gruntov]

Shuvaev, A.N., Moscow, Nedra, 1997, 155p., In Russian with English title page and summary. 112 refs.

Roadbeds, Construction, Ground thawing, Forecasting, Mathematical models, Freeze thaw cycles, Permafrost beneath roads, Frozen ground compression, Active layer, Stefan problem, Heat transfer, Pavements, Bituminous concretes

52-6289

Computer methods in engineering geocryology. [Vychislitel'nye metody inzhenernoĭ geokriologii]

Popov, F.S., Novosibirsk, Nauka, 1995, 134p., In Russian. 157 refs.

Computer applications, Engineering geology, Geocryology, Mathematical models, Frozen ground thermodynamics, Thermal regime, Mining, Cold chambers, Artificial freezing, Design

52-6290

Structural and hydrocarbon histories of the Ivishak (Sadlerochit) Reservoir, Prudhoe Bay field.

Erickson, J.W., Sneider, R.M., *SPE reservoir engineering,* Feb. 1997, 12(1), p.18-22, 3 refs.

Hydrocarbons, Quaternary deposits, Subpolar regions, Reservoirs, Stratigraphy, Permeability, Rock properties, Diagenesis, Structural analysis, United States—Alaska—Prudhoe Bay

52-6291

Validation of as-received oil-based-core water saturations from Prudhoe Bay.

Richardson, J.G., Holstein, E.D., Rathmell, J.J., Warner, H.R., Jr., *SPE reservoir engineering,* Feb. 1997, 12(1), p.31-36, 14 refs.

Hydrocarbons, Reservoirs, Subpolar regions, Water content, Saturation, Boundary layer, Well logging, Drill core analysis, Geochemistry, Drilling fluids, Sampling, Accuracy, United States—Alaska—Prudhoe Bay

52-6292

Water-salinity variations in the Ivishak and Sag River reservoirs at Prudhoe Bay.

McCoy, D.D., Warner, H.R., Jr., Fisher, T.E., *SPE reservoir engineering,* Feb. 1997, 12(1), p.37-44, 7 refs.

Hydrocarbons, Reservoirs, Subpolar regions, Brines, Water chemistry, Well logging, Salinity, Accuracy, Sampling, United States—Alaska—Prudhoe Bay

52-6293

Use of resistivity logs to calculate water saturation at Prudhoe Bay.

McCoy, D.D., Grieves, W.A., *SPE reservoir engineering,* Feb. 1997, 12(1), p.45-51, 9 refs.

Hydrocarbons, Reservoirs, Subpolar regions, Well logging, Water content, Saturation, Porosity, Electrical measurement, Statistical analysis, Indexes (ratios), United States—Alaska—Prudhoe Bay

52-6294

Chemical tracer studies to determine water saturation at Prudhoe Bay.

Deans, H.A., Mut, A.D., *SPE reservoir engineering,* Feb. 1997, 12(1), p.52-57, 8 refs.

Hydrocarbons, Oil wells, Subpolar regions, Reservoirs, Water content, Saturation, Well logging, Sampling, Chemical analysis, United States—Alaska—Prudhoe Bay

52-6295

Wettability and relative permeability of Prudhoe Bay: a case study in mixed-wet reservoirs.

Jerauld, G.R., Rathmell, J.J., *SPE reservoir engineering,* Feb. 1997, 12(1), p.58-65, 20 refs.

Hydrocarbons, Reservoirs, Subpolar regions, Permeability, Wettability, Water content, Saturation, Fluid dynamics, Lithology, Models, United States—Alaska—Prudhoe Bay

52-6296

Prudhoe Bay gas/oil relative permeability.

Jerauld, G.R., *SPE reservoir engineering,* Feb. 1997, 12(1), p.66-72, 35 refs.

Hydrocarbons, Reservoirs, Subpolar regions, Oil recovery, Natural gas, Permeability, Porosity, Gravity, Saturation, Sorting, Lithology, United States—Alaska—Prudhoe Bay

52-6297

Response of Norway spruce seedlings to simulated acid mist.

Sheppard, L.J., Leith, I.D., Murray, M.B., Cape, J.N., Kennedy, V.H., *New phytologist,* Apr. 1998, 138(4), p.709-723, 60 refs.

Plant physiology, Air pollution, Rain, Trees (plants), Growth, Frost resistance, Aerosols, Ion diffusion, Damage, Freezing points, Environmental tests, Temperature effects, Simulation

52-6298

Approach using SAR ERS images to relate extension fractures to volcanic vents: examples from Iceland and Madagascar.

Chorowicz, J., Bardintzeff, J.M., Rasamimanana, G., Chotin, P., Thouin, C., Rudant, J.P., *Tectonophysics,* Apr. 15, 1997, 271(3-4), p.263-283, 45 refs.

Tectonics, Geological surveys, Subpolar regions, Volcanoes, Fracture zones, Marine geology, Synthetic aperture radar, Sensor mapping, Spaceborne photography, Correlation, Iceland

52-6299

Longitudinal strike-slip in oceanic rifting : a mesostructural study from western to southeastern Iceland.

Passerini, P., Marcucci, M., Sguazzoni, G., Pecchioni, E., *Tectonophysics,* Jan. 30, 1997, 269(1-2), p.65-89, 66 refs.

Tectonics, Geological surveys, Subpolar regions, Marine geology, Geologic processes, Magma, Shear stress, Orientation, Lithology, Stereomapping, Iceland

52-6300

Open-top chamber and field exposure of sitka spruce to simulated acid mist: a comparison of results.

Sheppard, L.J., Leith, I.D., Morris, E., Cape, J.N., Roberts, D., *Environmental pollution,* Feb. 9, 1998, 98(2), p.185-194, 44 refs.

Plant physiology, Trees (plants), Frost resistance, Air pollution, Aerosols, Damage, Rain, Ion diffusion, Test chambers, Environmental tests, Laboratory techniques, Simulation, Accuracy

52-6301

Baltic Sea Experiment BALTEX: a brief overview and some selected results of the authors.

Raschke, E., et al, *Surveys in geophysics,* Jan. 1998, 19(1), p.1-22, 57 refs.

Oceanography, Climatology, Hydrologic cycle, Cloud cover, Climatic changes, Air water interactions, Sea ice distribution, Snow hydrology, Sampling, Remote sensing, Forecasting, Baltic Sea

52-6303

CO_2 ice clouds in the upper atmosphere of Mars.

Clancy, R.T., Sandor, B.J., *Geophysical research letters,* Feb. 15, 1998, 25(4), p.489-492, 17 refs.

Mars (planet), Extraterrestrial ice, Atmospheric composition, Air temperature, Cloud physics, Carbon dioxide, Condensation, Ice formation, Ice detection, Remote sensing

52-6304

In situ measurements of the vertical structure of a noctilucent cloud.

Gumbel, J., Witt, G., *Geophysical research letters,* Feb. 15, 1998, 25(4), p.493-496, 22 refs.

Climatology, Cloud physics, Polar atmospheres, Particle size distribution, Altitude, Ice detection, Ice sublimation, Sounding, Profiles

52-6305

Dehydration and denitrification in the arctic polar vortex during the 1995-1996 winter.

Hintsa, E.J, et al, *Geophysical research letters,* Feb. 15, 1998, 25(4), p.501-504, 19 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Water vapor, Desiccation, Degradation, Ice sublimation, Heterogeneous nucleation, Aerial surveys

52-6306
Vertical distribution of methyl bromide in the stratosphere.
Kourtidis, K., Borchers, R., Fabian, P., *Geophysical research letters,* Feb. 15, 1998, 25(4), p.505-508, 25 refs.
Climatology, Air pollution, Polar atmospheres, Stratosphere, Aerosols, Organic nuclei, Turbulent diffusion, Atmospheric composition, Profiles, Sampling, Sweden—Kiruna

52-6307
Coupling an AGCM with an ISM to investigate the ice sheets mass balance at the Last Glacial Maximum.
Fabre, A., Ramstein, G., Ritz, C., Pinot, S., Fournier, N., *Geophysical research letters,* Feb. 15, 1998, 25(4), p.531-534, 15 refs.
Pleistocene, Ice sheets, Glacier oscillation, Glacier mass balance, Snow accumulation, Ice air interface, Surface temperature, Ice models, Mathematical models, Ice cover effect

52-6308
Space geodetic target for mantle viscosity discrimination: horizontal motions induced by glacial isostatic adjustment.
Peltier, W.R., *Geophysical research letters,* Feb. 15, 1998, 25(4), p.543-546, 21 refs.
Glacial geology, Isostasy, Geodesy, Sea level, Ice cover thickness, Geologic processes, Viscosity, Models

52-6309
Methane fluxes on boreal peatlands of different fertility and the effect of long-term experimental lowering of the water table on flux rates.
Nykänen, H., Alm, J., Silvola, J., Tolonen, K., Martikainen, P.J., *Global biogeochemical cycles,* Mar. 1998, 12(1), p.53-69, 78 refs.
Soil physics, Peat, Subarctic landscapes, Soil air interface, Water table, Water level, Vapor transfer, Natural gas, Carbon dioxide, Statistical analysis, Aeration, Seasonal variations, Finland

52-6310
Relationship between ecosystem productivity and photosynthetically active radiation for northern peatlands.
Frolking, S.E., et al, *Global biogeochemical cycles,* Mar. 1998, 12(1), p.115-126, 63 refs.
Ecosystems, Peat, Soil chemistry, Biomass, Subarctic landscapes, Geochemical cycles, Carbon dioxide, Radiance, Photosynthesis, Decomposition, Sampling, Statistical analysis

52-6311
Arctic gas pipelines in Russia.
Ivantsov, O.M., Kharionovskiĭ, V.V., Moscow, "Neftegazstroĭinformreklama", 1993, 148p., Translated from the Russian "Arkticheskie gazoprovody Rossii," Moscow, 1992. 22 refs.
Gas pipelines, Underground pipelines, Design, Frost heave, Countermeasures, Cold weather performance, Environmental impact, Pipe laying, Corrosion, Frost shattering, Permafrost beneath structures, Natural gas, Cold weather construction, Russia, CIS

52-6312
Determination of sea ice forces on offshore structures. [Opredelenie ledovykh nagruzok na opory morskikh gidrotekhnicheskikh sooruzheniĭ]
Matskevich, D.G., Leningrad, Leningradskiĭ politekhnicheskiĭ institut, 1990, 222p., Ph.D. thesis. In Russian. 196 refs.
Ice loads, Ice solid interface, Offshore structures, Hydraulic structures, Supports, Mathematical models, Ice strength, Sea ice

52-6313
Proceedings.
International Containment Technology Conference, St. Petersburg, FL, Feb. 9-12, 1997, Washington, D.C., Department of Energy, [1997], 1140p., Refs. passim. For selected papers see 52-6314 through 52-6319.
Waste disposal, Earth fills, Underground storage, Soil stabilization, Soil water migration, Waterproofing

52-6314
Effect of freeze-thaw cycles on the hydraulic conductivity and structure of a 10% sand-bentonite mixture.
Zimmie, T.F., Quiroz, J.D., LaPlante, C.M., International Containment Technology Conference, St. Petersburg, FL, Feb. 9-12, 1997. Proceedings, Washington, D.C., Department of Energy, [1997], p.85-91, 12 refs.
Waste disposal, Earth fills, Sands, Clay soils, Frost resistance, Frost protection, Freeze thaw tests, Soil water migration, Permeability, Seepage

52-6315
Impact of a shallow biobarrier on water recharge patterns in a semi-arid environment.
Laundré, J.W., International Containment Technology Conference, St. Petersburg, FL, Feb. 9-12, 1997. Proceedings, Washington, D.C., Department of Energy, [1997], p.270-274, 4 refs.
Waste disposal, Earth fills, Underground storage, Snowmelt, Seepage, Soil water migration, Waterproofing, Soil stabilization

52-6316
Performance characteristics of a Self-Sealing/Self-Healing Barrier.
McGregor, R.G., Stegemann, J.A., International Containment Technology Conference, St. Petersburg, FL, Feb. 9-12, 1997. Proceedings, Washington, D.C., Department of Energy, [1997], p.312-318, 11 refs.
Waste disposal, Tailings, Earth fills, Linings, Soil stabilization, Soil water migration, Vapor barriers, Waterproofing, Frost protection, Freeze thaw tests

52-6317
Jet grouting for a groundwater cutoff wall in difficult glacial soil deposits.
Flanagan, R.F., Pepe, F., Jr., International Containment Technology Conference, St. Petersburg, FL, Feb. 9-12, 1997. Proceedings, Washington, D.C., Department of Energy, [1997], p.514-521.
Municipal engineering, Tunneling (excavation), Railroad tunnels, Glacial deposits, Glacial till, Grouting, Soil stabilization, Soil water migration, Ground water, Waterproofing, United States—New York

52-6318
Frozen soil barriers for hazardous waste confinement.
Dash, J.G., Fu, H.Y., Leger, R., International Containment Technology Conference, St. Petersburg, FL, Feb. 9-12, 1997. Proceedings, Washington, D.C., Department of Energy, [1997], p.607-613, 13 refs.
Radioactive wastes, Waste disposal, Underground storage, Soil freezing, Artificial freezing, Soil stabilization

52-6319
Ground penetrating radar investigation of a frozen earth barrier.
Lesmes, D., Cist, D., Morgan, F.D., International Containment Technology Conference, St. Petersburg, FL, Feb. 9-12, 1997. Proceedings, Washington, D.C., Department of Energy, [1997], p.1074-1080, 8 refs.
Waste disposal, Underground storage, Soil freezing, Artificial freezing, Soil stabilization, Ground ice, Ice electrical properties, Electromagnetic prospecting

52-6320
Effects of temperature on the site productivity of *Pinus sylvestris* and lodgepole pine in Finland and Sweden.
Fries, A., Ruotsalainen, S., Lindgren, D., *Scandinavian journal of forest research,* 1998, 13(2), p.128-140, 47 refs.
Plant ecology, Forest ecosystems, Trees (plants), Growth, Subarctic landscapes, Air temperature, Temperature variations, Temperature effects, Degree days, Statistical analysis, Correlation, Sweden, Finland

52-6321
Inverting improves establishment of *Pinus contorta* and *Picea abies*—10-year results from a site preparation trial in northern Sweden.
Örlander, G., Hallsby, G., Gemmel, P., Wilhelmsson, C., *Scandinavian journal of forest research,* 1998, 13(2), p.160-168, 36 refs.
Forestry, Agriculture, Soil tests, Subarctic landscapes, Trees (plants), Plant ecology, Growth, Soil structure, Surface structure, Soil temperature, Modification, Sweden

52-6322
Growth responses of seedlings of six *Betula pubescens* Ehrh. provenances to six ozone exposure regimes.
Mortensen, L.M., *Scandinavian journal of forest research,* 1998, 13(2), p.189-196, 26 refs.
Plant physiology, Arctic landscapes, Trees (plants), Growth, Ozone, Exposure, Vapor transfer, Environmental impact, Simulation, Statistical analysis, Correlation, Sweden

52-6323
Amount and quality of coarse woody debris in natural and managed coniferous forests near the timberline in Finnish Lapland.
Sippola, A.L., Siitonen, J., Kallio, R., *Scandinavian journal of forest research,* 1998, 13(2), p.204-214, 52 refs.
Forest ecosystems, Plant ecology, Forest lines, Arctic landscapes, Forest soils, Litter, Wood, Biomass, Decomposition, Sampling, Statistical analysis, Finland—Lapland

52-6324
Stratigraphy and paleomagnetism of glacial and loess-soil deposits on the West-Siberian Plain.
Arkhipov, S.A., Zykina, V.S., Krukover, A.A., Gnibidenko, Z.N., Shelkoplias, V.N., *Russian geology and geophysics,* 1997, 38(6), p.1065-1085, Translated from Geologiia i geofizika. 47 refs.
Pleistocene, Soil analysis, Subarctic landscapes, Glacial deposits, Plains, Loess, Geomagnetism, Stratigraphy, Soil formation, Isotope analysis, Geochronology, Luminescence, Correlation, Russia—Siberia

52-6325
Range of occurrence of the Sartan glacier in West Siberia.
Volkov, I.A., *Russian geology and geophysics,* 1997, 38(6), p.1086-1091, Translated from Geologiia i geofisika. 12 refs.
Pleistocene, Geomorphology, Glacial geology, Glacier formation, Quaternary deposits, Glacial deposits, Geochronology, Russia—Siberia

52-6326
New data on the stratigraphy of West-Siberian Triassic sediments.
Kirda, N.P., Fradkina, A.F., *Russian geology and geophysics,* 1997, 38(6), p.1100-1106, Translated from Geologiia i geofisika. 22 refs.
Pleistocene, Geophysical surveys, Quaternary deposits, Paleoecology, Palynology, Sedimentation, Boreholes, Lithology, Stratigraphy, Classifications, Russia—Siberia

52-6327
Soil nitrogen, microbial biomass, and respiration along an arctic toposequence.
Cheng, W.X., Virginia, R.A., Oberbauer, S.F., Gillespie, C.T., Reynolds, J.F., Tenhunen, J.D., *Soil Science Society of America. Journal,* May-June 1998, 62(3), p.654-662, 50 refs.
Soil tests, Tundra soils, Tundra vegetation, Organic soils, Soil chemistry, Soil microbiology, Biomass, Nutrient cycle, Mineralogy, Geochemical cycles, Sampling, United States—Alaska—Imnavait Creek

52-6328

Processing of icy mantles in protostellar envelopes.

Chiar, J.E., et al, *Astrophysical journal,* May 10, 1998, 498(2)pt.1, p.716-727, 78 refs.

Extraterrestrial ice, Cosmic dust, Ice composition, Carbon dioxide, Radiation absorption, Attenuation, Infrared spectroscopy, Ice detection, Ice sublimation, Spectra, Profiles

52-6329

Composite Gazetteer of Antarctica (South of latitude 60°S).

Programma Nazionale di Ricerche in Antartide, Rome, Italy, Scientific Committee on Antarctic Research. Working Group on Geodesy and Geographic Information, 1998, 555p. (2 vols.).

Geography, Gazetteers, International cooperation, Antarctica

Vol.1 of the SCAR *Composite Gazetteer of Antarctica* contains an alphabetical list of all the names that have been published in national gazetteers, plus basic information about those names. The 20 countries who contributed data to the project, and the content of their national antarctic gazetteers are listed in an Annex. The overall content of Vol.1 amounts to 21,552 geographic names. The listed names correspond to the 32,955 names found in the national gazetteers. The difference between the two figures arises from the fact that identical names assigned to the same feature by different countries are listed only once. Vol.2 contains a list of 16,563 records (reference numbers). Each record corresponds to a geographic feature recognized by at least one of the 21 cooperative sources considered. For each record (or feature) there is a list of all the names given by the different countries. The information presented in the Gazetteer is also available on the World Wide Web at the following address: www.pnra.it/SCAR_GAZE.

52-6330

Design of an image radiation monitor for ILS glide slope.

Marcum, F., *IEEE transactions on aerospace and electronic systems,* July 1998, 34(3), p.836-843, 17 refs.

Aircraft, Aircraft landing areas, Orientation, Safety, Monitors, Imaging, Radio waves, Electronic equipment, Reflectivity, Snow optics, Wet snow, Snow cover effect, Design, Analysis (mathematics), Standards

52-6331

Snow composition in eight catchments in the central Barents Euro-arctic region.

De Caritat, J.P., Äyräs, M., Niskavaara, H., Chekushin, V., Bogatyrev, I., Reimann, C., *Atmospheric environment,* Aug. 1998, 32(14/15), p.2609-2626, 39 refs.

Climatology, Air pollution, Polar atmospheres, Aerosols, Sedimentation, Metals, Snow composition, Meltwater, Impurities, Environmental tests, Sampling, Statistical analysis, Indexes (ratios), Russia—Kola Peninsula, Finland, Norway

52-6332

Postshock chemical lifetimes of outflow tracers and a possible new mechanism to produce water ice mantles.

Bergin, E.A., Melnick, G.J., Neufeld, D.A., *Astrophysical journal,* June 1, 1998, 499(2)pt.1, p.777-792, 80 refs.

Extraterrestrial ice, Cosmic dust, Ice formation, Water chemistry, Gases, Shock waves, Ionization, Photochemical reactions, Mathematical models

52-6333

Consequences of dissipation on the group velocity in a flexible ice cover.

Dixon, T.W., Squire, V.A., Watzke, O., *Cold regions science and technology,* Apr. 1998, 27(2), p.75-81, 17 refs.

Sea ice, Fast ice, Ice mechanics, Ice water interface, Ocean waves, Wave propagation, Velocity measurement, Damping, Ice cover effect, Spectra, Mathematical models

52-6334

Measurements of snow mass flux and transport rate at different particle diameters in drifting snow.

Sugiura, K., Nishimura, K., Maeno, N., Kimura, T., *Cold regions science and technology,* Apr. 1998, 27(2), p.83-89, 21 refs.

Snow physics, Blowing snow, Turbulent flow, Mass transfer, Snow air interface, Friction, Velocity measurement, Particle size distribution, Wind tunnels, Simulation

52-6335

Atmospheric icing and communication tower failure in the United States.

Mulherin, N.D., MP 5207, *Cold regions science and technology,* Apr. 1998, 27(2), p.91-104, 6 refs.

Towers, Antennas, Telecommunication, Ice storms, Ice accretion, Ice cover effect, Damage, Wind factors, Fatigue (materials), Periodic variations, Meteorological data, Statistical analysis, Structural analysis, Classifications, United States

The U.S. Army Cold Regions Research and Engineering Laboratory has established a database of communication tower collapses that have occurred in the United States due to atmospheric ice accretion. The information was compiled primarily from newspaper articles and telephone interviews but also from a multitude of other sources. The database currently lists 140 such failures of towers dating as far back as 1959. For each case, the following information is being compiled: (1) structural characteristics of the tower, (2) the geographic location and topography, (3) a description of the collapse, (4) concurrent weather and (5) damage.

52-6336

Localized pressures during ice-structure interaction: relevance to design criteria.

Johnston, M.E., Croasdale, K.R., Jordaan, I.J., *Cold regions science and technology,* Apr. 1998, 27(2), p.105-117, 19 refs.

Sea ice, Ice floes, Ice solid interface, Ice mechanics, Offshore structures, Icebreakers, Cracking (fracturing), Fracture zones, Ice loads, Ice pressure, Stress concentration, Impact tests, Design criteria

52-6337

Potential climate warming effects on ice covers of small lakes in the contiguous U.S.

Fang, X., Stefan, H.G., *Cold regions science and technology,* Apr. 1998, 27(2), p.119-140, 22 refs.

Climatology, Global warming, Limnology, Lake ice, Seasonal freeze thaw, Degree days, Snow accumulation, Simulation, Forecasting, Statistical analysis, United States

52-6338

Laboratory study of stone heave in till exposed to freezing and thawing.

Viklander, P., *Cold regions science and technology,* Apr. 1998, 27(2), p.141-152, 38 refs.

Geocryology, Frozen ground mechanics, Rock mechanics, Mass transfer, Migration, Moraines, Porosity, Frost heave, Settlement (structural), Freeze thaw cycles, Freeze thaw tests, X ray analysis, Mechanical tests

52-6339

Simultaneous measurements of CO_2, CH_4, and N_2O in air extracted by sublimation from Antarctica ice cores: confirmation of the data obtained using other extraction techniques.

Güllük, T., Slemr, F., Stauffer, B., *Journal of geophysical research,* July 20, 1998, 103(D13), p.15,971-15,978, 39 refs.

Paleoclimatology, Atmospheric composition, Gases, Carbon dioxide, Ice sheets, Ice cores, Ice composition, Ice sublimation, Chemical analysis, Laboratory techniques, Accuracy, Antarctica—Vostok Station

A sublimation technique has been developed to extract air samples from polar ice cores for subsequent simultaneous measurement of several trace gases by frequency-modulated tunable diode laser absorption spectroscopy. This extraction and analysis technique is shown to be suitable as an extraction method for the determination of concentrations of the greenhouse gases CO_2, CH_4 and N_2O in air samples recovered from ice samples. Air samples from the Siple ice core have been analyzed covering the period between 1772 and 1973. In addition, a few samples from two different ice cores from Vostok Station have been analyzed. (Auth. mod.)

52-6340

Atmospheric methane between 1000 A.D. and present: evidence of anthropogenic emissions and climatic variability.

Etheridge, D.M., Steele, L.P., Francey, R.J., Langenfelds, R.L., *Journal of geophysical research,* July 20, 1998, 103(D13), p.15,979-15,993, 65 refs.

Climatology, Air pollution, Global change, Ice sheets, Firn, Ice cores, Aerosols, Vapor diffusion, Natural gas, Sampling, Periodic variations, Isotope analysis, Greenland, Antarctica—Law Dome

Atmospheric methane mixing ratios from 1000 A.D. to present are measured in three antarctic ice cores, two Greenland ice cores, the antarctic firn layer, and archived air from Tasmania, Australia. The record is unified by using the same measurement procedure and calibration scale for all samples and by ensuring high age resolution and accuracy of the ice core and firn air. In this way, methane mixing ratios, growth rates, and interpolar differences are accurately determined. The isotopic ratio, $\delta^{13}CH_4$, measured in the archived air and firn air, increased since 1978 but the rate of increase slowed in the mid-1980s. The combined CH_4 and $\delta^{13}CH_4$ trends support the stabilization of the total CH_4 source. (Auth. mod.)

52-6341

Seven years of continuous methane observations at a remote boreal site in Ontario, Canada.

Worthy, D.E.J., Levin, I., Trivett, N.B.A., Kuhlmann, A.J., Hopper, J.F., Ernst, M.K., *Journal of geophysical research,* July 20, 1998, 103(D13), p.15,995-16,007, 41 refs.

Climatology, Subpolar regions, Atmospheric boundary layer, Atmospheric composition, Air pollution, Natural gas, Atmospheric circulation, Advection, Seasonal variations, Diurnal variations, Origin, Sampling, Environmental tests, Canada—Northwest Territories—Alert, Canada—Ontario—Fraserdale

52-6342

Diffusion coefficients for HCl and HBr in 30 wt % to 72 wt % surfuric acid at temperatures between 220 and 300 K.

Klassen, J.K., Hu, Z.J., Williams, L.R., *Journal of geophysical research,* July 20, 1998, 103(D13), p.16,197-16,202, 28 refs.

Climatology, Cloud physics, Polar atmospheres, Stratosphere, Aerosols, Degradation, Viscosity, Solubility, Vapor diffusion, Simulation, Temperature effects

52-6343

Denitrification observed inside the arctic vortex in February 1995.

Sugita, T., et al, *Journal of geophysical research,* July 20, 1998, 103(D13), p.16,221-16,233, 59 refs.

Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Ice formation, Heterogeneous nucleation, Degradation, Profiles, Vapor diffusion, Sampling, Sweden—Kiruna

52-6344

Air mass characteristics, aerosol particle number concentrations, and number size distributions at Macquarie Island during the First Aerosol Characterization Experiment (ACE 1).

Brechtel, F.J., Kreidenweis, S.M., Swan, H.B., *Journal of geophysical research,* July 20, 1998, 103(D13), p.16,351-16,367, 34 refs.

Climatology, Marine atmospheres, Atmospheric composition, Polar atmospheres, Atmospheric circulation, Aerosols, Particle size distribution, Sampling, Antarctica—Mawson Station, —Macquarie Island

During the First Aerosol Characterization Experiment (ACE 1), continuous measurements were made of the particle number size distribution and total particle number concentration on Macquarie I. Periodic real-time measurements of dimethyl sulfide were also made. Sampled air masses were separated into clean marine and those influenced by Tasmania or Antarctica. Observations were compared to those from a Southern Hemisphere mid-latitude site (Cape Grim) and to sites on the antarctic continent. Evidence for possible cloud processing of aerosol was found during two antarctic influenced periods. Variability in observed aerosol characteristics was found to coincide with changes in air mass source region as indicated by back trajectories and frontal passages. (Auth. mod.)

52-6345

Spatial distribution of dimethylsulfide and dimethylsulfoniopropionate in the Australasian sector of the southern ocean.

Curran, M.A.J., Jones, G.B., Burton, H., *Journal of geophysical research,* July 20, 1998, 103(D13), p.16,677-16,689, 71 refs.

Climatology, Polar atmospheres, Sea water, Aerosols, Sea ice, Ice composition, Biomass, Chemical analysis, Sampling, Antarctica—Mawson Station, —Macquarie Island, Antarctica—Dumont d'Urville Station

During 1991-95, seven voyages were made to the southern ocean to determine the distribution of dimethylsulfide and dimethylsulfoniopropionate (DMSP) in seawater and air in the Australasian sector. Measurements of DMSP in sea ice were also made. In the seasonal ice zone there were marked longitudinal differences possibly reflecting higher productivity and the extent of the sea ice in this region. Levels of DMSP in sea ice cores were consistent with this regional difference. High and variable concentrations of DMSP also occurred in the subantarctic zone, decreasing to lower levels around 64°S, close to the Antarctic Divergence (AD). Upwelling of deep water around the AD is suggested to have been responsible for the low biological activity and low DMSP levels. Some evidence was found that DMSP may be transported to deeper waters, close to the antarctic continent. (Auth. mod.)

52-6346

Short-term climate of the Larsemann Hills.

Bian, L.G., Xue, Z.F., Lu, C.G., Lu, L.H., Jia, P.Q., *Chinese journal of polar research,* Mar. 1998, 10(1), p.37-46, In Chinese with English summary. 17 refs.

Meteorological data, Weather observations, Sea ice distribution, Antarctica—Larsemann Hills

Short-term climate characteristics of the Larsemann Hills region are presented with reference to previous work by Chinese scientists using the data obtained at Zhongshan Station since 1989. An attempt is made to provide background knowledge for further research on climatic and environmental changes of the Hills. (Auth.)

52-6347

Analysis of transient storage subject to unsteady flow: diel flow variation in an Antarctic stream.

Runkel, R.L., McKnight, D.M., Andrews, E.D., *North American Benthological Society. Journal,* June 1998, 17(2), p.143-154, Refs. p.153-154.

Geochemistry, Hydrology, Models, Storage, Stream flow, Unsteady flow, Meltwater, Suspended sediments, Hydrogeochemistry, Antarctica—Huey Creek

Transport of dissolved material in streams and small rivers may be characterized using tracer-dilution methods and solute transport models. Recent studies have quantified stream/substream interactions using models of transient storage. These studies are based on tracer-dilution data obtained during periods of steady flow. The authors present a modeling framework for the analysis of transient storage in stream systems with unsteady flows. The framework couples a kinematic wave routing model with a solute transport model that includes transient storage. The routing model provides time-varying flows and cross-sectional areas that are used as input to the solute transport model. (Auth. mod.)

52-6348

Source and grain-size influences upon the clay mineral distribution in the Skagerrak and northern Kattegat.

Bengtsson, H., Stevens, R.L., *Clay minerals,* Mar. 1998, 33(1), Rosenqvist Symposium, Oslo, Norway, May 19-21, 1996. Selected papers, p.3-13, 34 refs.

Marine geology, Bottom sediment, Subpolar regions, Clay minerals, Sedimentation, Grain size, Drill core analysis, Mineralogy, Classifications, Origin, North Sea

52-6349

Clay mineral alteration associated with a meteorite impact in the marine environment (Barents Sea).

Dypvik, H., Ferrell, R.E., Jr., *Clay minerals,* Mar. 1998, 33(1), Rosenqvist Symposium, Oslo, Norway, May 19-21, 1996. Selected papers, p.51-64, 33 refs.

Pleistocene, Marine geology, Subpolar regions, Sedimentation, Bottom sediment, Clay minerals, Impact, Pit and mound topography, Geochemistry, Modification, Drill core analysis, X ray diffraction, Barents Sea

52-6350

First direct simultaneous HCl and $ClONO_2$ profile measurements in the arctic vortex.

Payan, S., Camy-Peyret, C., Jeseck, P., Hawat, T., Durry, G., *Geophysical research letters,* July 15, 1998, 25(14), p.2663-2666, 21 refs.

Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Turbulent diffusion, Photometry, Spectroscopy, Spectra, Profiles, Models, Sweden—Kiruna

52-6351

Particle composition of a young condensation trail and of upper tropospheric aerosol.

Kuhn, M., Petzold, A., Baumgardner, D., Schröder, F.P., *Geophysical research letters,* July 15, 1998, 25(14), p.2679-2682, 15 refs.

Climatology, Atmospheric composition, Optical properties, Aerosols, Carbon black, Condensation trails, Ice crystal optics, Refractivity, Particle size distribution, Spectroscopy

52-6352

Jakobshavn Glacier, West Greenland: 30 years of spaceborne observations.

Sohn, H.G., Jezek, K.C., Van der Veen, C.J., *Geophysical research letters,* July 15, 1998, 25(14), p.2699-2702, 22 refs.

Ice sheets, Glacier surveys, Spaceborne photography, Synthetic aperture radar, Glacier oscillation, Grounded ice, Calving, Ice edge, Periodic variations, Greenland

52-6353

Reappraisal of antarctic seasonal sea-ice at the Last Glacial Maximum.

Crosta, X., Pichon, J.J., Burckle, L.H., *Geophysical research letters,* July 15, 1998, 25(14), p.2703-2706, 18 refs.

Pleistocene, Paleoclimatology, Sea ice distribution, Paleoecology, Ice edge, Seasonal variations, Statistical analysis, —South Atlantic Ocean

The authors used a modern analog technique applied to antarctic diatoms to quantitatively reconstruct seasonal sea-ice extent at the Last Glacial Maximum. Summer maximum sea-ice extents during the last ice age and today are similar, which contradicts CLIMAP's findings. This implies a reduced summer albedo feedback of the Southern Hemisphere and a greater transfer of heat and moisture from the ocean to the atmosphere than shown by previous qualitative studies. (Auth. mod.)

52-6354

Chemistry and distribution of accessory Ni, Co, Fe arsenic minerals in the Pechenga Ni-Cu deposits, Kola Peninsula, Russia.

Abzalov, M.Z., Brewer, T.S., Polezhaeva, L.I., *Mineralogy and petrology,* 1997, 61(1-4), p.145-161, With German summary. 24 refs.

Geologic processes, Earth crust, Subpolar regions, Minerals, Metals, Geochemistry, Distribution, Hydrothermal processes, Spectroscopy, Russia—Kola Peninsula

52-6355

Air quality modelling in a stable polar environment—Ross Island, Antarctica.

Godfrey, J.J., Clarkson, T.S., *Atmospheric environment,* Sep. 1998, 32(17), p.2899-2911, 20 refs.

Climatology, Atmospheric boundary layer, Polar atmospheres, Aerosols, Air pollution, Turbulent diffusion, Wind factors, Models, Antarctica—Ross Island

The CALMET meteorological model and its puff dispersion model CALPUFF have been used in a complex orographic and very stable polar environment to confirm observed plume trajectories under worst case conditions from Scott Base, Ross I. CALMET has been used to predict the meteorological fields of two characteristic low dispersion days and CALPUFF to predict the pollutant footprint and trajectory for each event. The relationship between the synoptic scale southerly flow and the local northeasterly at Scott Base is clearly shown by the diagnostic model and the plume derived by CALPUFF for the Scott Base emissions. The model output is shown to be realistic by the trajectories of constant density balloons. (Auth. mod.)

52-6356

Measurements of C_2-C_7 hydrocarbons during the Polar Sunrise Experiment 1994: further evidence for halogen chemistry in the troposphere.

Ariya, P.A., et al, *Journal of geophysical research,* June 20, 1998, 103(D11), p.13,169-13,180, 53 refs.

Climatology, Atmospheric composition, Polar atmospheres, Hydrocarbons, Ozone, Degradation, Photochemical reactions, Aerial surveys, Sampling, Profiles, Canada—Northwest Territories—Alert

52-6357

Nucleation rate constants and freezing mechanism of nitric acid trihydrate aerosol under stratospheric conditions.

Bertram, A.K., Sloan, J.J., *Journal of geophysical research,* June 20, 1998, 103(D11), p.13,261-13,265, 35 refs.

Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Hydrates, Ice crystal growth, Homogeneous nucleation, Nucleation rate, Ice vapor interface, Phase transformations, Temperature effects, Simulation, Infrared spectroscopy

52-6358

Stratosphere over Dumont d'Urville, Antarctica, in winter 1992.

Ricaud, P., et al, *Journal of geophysical research,* June 20, 1998, 103(D11), p.13,267-13,284, 41 refs.

Climatology, Polar atmospheres, Stratosphere, Aerosols, Ozone, Degradation, Air temperature, Seasonal variations, Profiles, Sounding, Spectroscopy, Antarctica—Dumont d'Urville Station

The authors present an analysis of the temporal evolution of stratospheric constituents above Dumont d'Urville Station in 1992. Data sets include temperature profiles and aerosol mixing ratios and extinction coefficients from 46 to 1 hPa. Time evolution of these measurements is interpreted by comparison with results from the SLIMCAT three-dimensional chemical transport model. The ozone loss rate is 0.04 ppmv/d, which is consistent with other analyses of southern vortex ozone loss rates. Loss and production rates as measured by UARS are more pronounced than the ones deduced from the SLIMCAT model, probably because of the moderate model horizontal resolution which is not high enough to resolve the vortex crossings above Dumont d'Urville and which leads to a larger extent of denitrified air than indicated by the UARS data. The analysis also shows activated ClO inside the vortex at 46 hPa, a dehydrated vortex at 46 hPa, and rehydrated above, with no trace of denitrification in the lower stratosphere. (Auth. mod.)

52-6359

UARS Microwave Limb Sounder HNO_3 observations: implications for antarctic polar stratospheric clouds.

Santee, M.L., et al, *Journal of geophysical research,* June 20, 1998, 103(D11), p.13,285-13,313, Refs. p.13,311-13,313.

Climatology, Polar atmospheres, Polar stratospheric clouds, Ozone, Air temperature, Degradation, Chemical composition, Temperature effects, Radiometry

The authors present Microwave Limb Sounder measurements of gas-phase HNO_3 obtained at the beginning of five antarctic winters: 1992-96. To investigate the composition of the polar stratospheric clouds (PSCs) that formed in early winter each year, the observed evolution of HNO_3 at 465 K is compared against that predicted using nitric acid trihydrate, nitric acid dihydrate and liquid ternary solution models of PSC formation and correlated with temperature histories from three-dimensional back trajectory calculations. (Auth. mod.)

52-6360

Airborne remote sensing of NO_2 in the arctic winter of 1994-1995 and comparison with a three-dimensional chemical transport model.

Glatthor, N., et al, *Journal of geophysical research,* June 20, 1998, 103(D11), p.13,315-13,326, 26 refs.

Climatology, Polar atmospheres, Stratosphere, Aerosols, Atmospheric composition, Photochemical reactions, Degradation, Diurnal variations, Aerial surveys, Spectroscopy, Models

52-6361

Primary introduction of Antarctic subglacial lakes.

Wen, J.H., *Chinese journal of polar research,* June 1998, 10(2), p.155-160, In Chinese with English summary. 24 refs.

Subglacial observations, Subglacial drainage, Lakes, Radio echo soundings, Geothermal thawing, Basal sliding, Ice sheets, Ice deformation, Antarctica—Vostok Station

Seventy-seven antarctic subglacial lakes were identified by analysis of airborne radio-echo sounding records. The best known among these is Vostok Lake. The formation of subglacial lakes results mainly from geothermal flux and partially from heat produced from basal sliding and internal ice deformation, which raise the temperature of the basal ice to melting point and gradually melt the ice. The discovery of subglacial lakes has glaciological, geological and, especially, potential biological implications. (Auth.)

52-6362

Sediment yield from glacio-lacustrine calcareous deposits during the postglacial period in the Combe d'Ain (Jura, France).

Campy, M., Buoncristiani, J.F., Bichet, V., *Earth surface processes and landforms,* May 1998, 23(5), p.429-444, 37 refs.

Geomorphology, Pleistocene, Quaternary deposits, Glacial geology, Glacial deposits, Lacustrine deposits, Sedimentation, Lithology, Erosion, Mass flow, Theories, France—Jura Mountains

52-6363

Periodicity of deposition in the Silurian and relationships of global geological events in the Middle Paleozoic of the southwestern margin of the Siberian continent.

Elkin, E.A., Sennikov, N.V., Bakharev, N.K., Izokh, N.G., Iazikov, A.IU., *Russian geology and geophysics,* 1997, 38(3), p.636-647, Translated from Geologiia i geofizika. 35 refs.

Pleistocene, Earth crust, Quaternary deposits, Paleoecology, Sedimentation, Sea level, Isostasy, Periodic variations, Stratigraphy, Russia—Siberia

52-6364

Effect of ambient temperature and relative humidity on particle formation in the jet regime of commercial aircraft: a modelling study.

Gleitsmann, G., Zellner, R., *Atmospheric environment,* Sep. 1998, 32(18), p.3079-3087, 36 refs.

Climatology, Cloud physics, Condensation trails, Air pollution, Aerosols, Phase transformations, Ice vapor interface, Heterogeneous nucleation, Supersaturation, Humidity, Freezing points, Temperature effects, Models

52-6365

Size and polarization behaviour of optically levitated frozen water droplets.

Roth, N., Frohn, A., *Atmospheric environment,* Sep. 1998, 32(18), p.3139-3143, 6 refs.

Climatology, Cloud physics, Cloud droplets, Supercooled clouds, Ice crystal growth, Ice sublimation, Light scattering, Polarization (waves), Indexes (ratios), Condensation trails, Simulation

52-6366

Laboratory study of the effects of a kerosene-burner exhaust on ice nucleation and the evaporation rate of ice crystals.

Diehl, K., Mitra, S.K., *Atmospheric environment,* Sep. 1998, 32(18), p.3145-3151, 26 refs.

Climatology, Air pollution, Cloud physics, Supercooled clouds, Condensation trails, Ice crystal growth, Ice sublimation, Heterogeneous nucleation, Hydrocarbons, Ice nuclei, Environmental tests, Simulation

52-6367

Impact of aircraft emissions on tropospheric and stratospheric ozone. Part I: chemistry and 2-D model results.

Grooß, J.U., Brühl, C., Peter, T., *Atmospheric environment,* Sep. 1998, 32(18), p.3173-3184, 47 refs.

Climatology, Atmospheric composition, Polar atmospheres, Cloud physics, Aerosols, Condensation trails, Air pollution, Polar stratospheric clouds, Heterogeneous nucleation, Degradation, Ozone, Turbulent diffusion, Simulation

52-6368

Impact of aircraft NO_x emissions on tropospheric and stratospheric ozone. Part II: 3-D model results.

Dameris, M., et al, *Atmospheric environment,* Sep. 1998, 32(18), p.3185-3199, 47 refs.

Climatology, Cloud physics, Atmospheric composition, Air pollution, Condensation trails, Photochemical reactions, Ozone, Polar stratospheric clouds, Turbulent diffusion, Environmental impact, Models

52-6369

Gaseous and particulate oxidized and reduced nitrogen species in the atmospheric boundary layer in Scandinavia in spring.

Sorteberg, A., et al, *Journal of atmospheric chemistry,* June 1998, 30(2), p.241-271, 51 refs.

Climatology, Subpolar regions, Atmospheric boundary layer, Atmospheric composition, Aerosols, Ozone, Photochemical reactions, Air pollution, Mathematical models, Statistical analysis, Sampling, Norway, Sweden, Finland

52-6370

Changes in Russian winter snow accumulation during 1936-1983 and its spatial structure.

Ye, H.C., Cho, H.R., Gustafson, P.E., *Journal of climate,* May 1998, 11(5), p.856-863, 26 refs.

Climatology, Snow surveys, Hydrologic cycle, Subpolar regions, Snow accumulation, Snow depth, Snow water equivalent, Snow cover distribution, Statistical analysis, Periodic variations, Russia

52-6371

Climate change and the middle atmosphere. Part IV: ozone response to doubled CO_2.

Shindell, D.T., Rind, D., Lonergan, P., *Journal of climate,* May 1998, 11(5), p.895-919, 31 refs.

Climatology, Polar atmospheres, Degradation, Carbon dioxide, Ozone, Polar stratospheric clouds, Cloud physics, Photochemical reactions, Global warming, Temperature effects, Models

Parameterized stratospheric ozone photochemistry has been included in the Goddard Institute for Space Studies general circulation model to investigate the coupling between chemistry and climate change for the doubled CO_2 climate. The chemical ozone response is of opposite sign to temperature changes, so that radiative cooling in the upper stratosphere results in increased ozone, while warming reduces ozone in the lower stratosphere. The increased overhead column reduces the amount of UV reaching the lower stratosphere, resulting in further ozone decreases there. Changes of up to 15% are seen, including both photochemistry and transport. Significantly less of an increase in the high-latitude ozone column than in the other models is found. When parameterized heterogeneous chemistry on polar stratospheric clouds is also included, while maintaining current chlorine loading, it is found that the antarctic ozone hole becomes significantly larger and of longer duration. In addition, an ozone hole of approximately half the depth in percent of the current antarctic ozone hole forms in the arctic due to both chemistry and transport changes resulting from a reduction of sudden warmings seen in the doubled CO_2 atmosphere. (Auth. mod.)

52-6372

NCAR Climate System Model, version one.

Boville, B.A., Gent, P.R., *Journal of climate,* June 1998, 11(6), p.1115-1130, 44 refs.

Climatology, Climatic changes, Surface temperature, Sea ice distribution, Ice volume, Ice cover effect, Heat transfer, Air ice water interaction, Mathematical models, Simulation

The National Center for Atmospheric Research (NCAR) Climate System Model, version one, is described. The spinup for both arctic and antarctic atmosphere procedure prior to a fully coupled integration is discussed. The fully coupled model has been run for 300 yr with no surface flux corrections in momentum, heat, or freshwater. There is virtually no trend in the surface temperatures over the 300 yr, although there are significant trends in other model fields, especially in the deep ocean. The reasons for the successful integration with no surface temperature trend are discussed. (Auth. mod.)

52-6373

Polar radiation budgets of the NCAR CCM3.

Briegleb, B.P., Bromwich, D.H., *Journal of climate,* June 1998, 11(6), p.1246-1269, 44 refs.

Climatology, Polar atmospheres, Radiation balance, Radiation absorption, Cloud cover, Albedo, Sea ice distribution, Ice cover effect, Models, Simulation

Present-day arctic and antarctic radiation budgets of the National Center for Atmospheric Research Community Climate Model version 3 (CCM3) are presented. The CCM3 simulation is from a prescribed and interannually varying sea surface temperature integration from Jan. 1979 through Aug. 1993. Earth Radiation Budget Experiment (ERBE) data from 1985 through 1989 are used for validation of top-of-atmosphere (TOA) absorbed shortwave radiation (ASR) and outgoing longwave radiation. Summer ASR in both polar regions is less than the observations by about 20 W/m^2. The absence of sea-ice melt ponds results in 10-20 W/m^2 too much SW absorption during early summer and from 20 to 40 W/m^2 too little during late summer. Despite several improvements in CCM3 radiation physics, the accuracy of polar TOA annual radiation balance is degraded against the ERBE data compared to CCM2. (Auth. mod.)

52-6374

Polar climate simulation of the NCAR CCM3.

Briegleb, B.P., Bromwich, D.H., *Journal of climate,* June 1998, 11(6), p.1270-1286, 43 refs.

Climatology, Polar atmospheres, Air temperature, Surface temperature, Surface energy, Atmospheric circulation, Models, Simulation, Antarctica—McMurdo Station

Present-day arctic and antarctic climate of the National Center for Atmospheric Research (NCAR) Community Climate Model version 3 (CCM3) is presented. The CCM3 simulation is from a prescribed and interannually varying sea surface temperature integration from Jan. 1979 through Aug. 1993. Observations from a variety of sources, including the European Centre for Medium-Range Weather Forecasts analyses, rawinsonde and surface station data, are used for validation of CCM3's polar climate during this period. The antarctic circumpolar trough of low sea level pressure is slightly north of the observed position and is 2-3 hPa too low. Antarctic katabatic winds are similar to observations in magnitude and regional variation. The polar surface wind stress is estimated to be 30-50% too strong in some regions. In both polar regions, summer surface energy budgets are estimated to be low by roughly 20 W/m^2. Suggestions as to causes of simulation deficiencies are: polar heat sinks that are too strong; inadequate representation of sea-ice-atmosphere heat exchange, due to lack of fractional coverage of sea ice of variable thickness; effects of low horizontal resolution; and biased extrapolar influence. (Auth. mod.)

52-6375

Comparison of the atmospheric circulations simulated by the CCM3 and CSM1.

Boville, B.A., Hurrell, J.W., *Journal of climate,* June 1998, 11(6), p.1327-1341, 25 refs.

Climatology, Polar atmospheres, Atmospheric circulation, Surface temperature, Sea ice distribution, Ice cover thickness, Ice cover effect, Models, Simulation, Correlation

The atmospheric state simulated by the National Center for Atmospheric Research (NCAR) Community Climate Model, version 3 (CCM3), is compared to that simulated by the NCAR Climate System Model, version 1 (CSM1). It is found that the differences between CCM3 and CSM1 are quite small in most measures of the atmospheric circulation, consistent with the accurate and drift-free simulation of the sea surface temperatures in the coupled model. There are substantial temperature differences near the surface in the Arctic and over the ocean around Antarctica, resulting from different sea-ice distributions. Middle- and high-latitude circulation changes are modest, occurring mostly in winter in association with the sea-ice changes. (Auth. mod.)

52-6376

Quasi-stationary waves in the southern hemisphere: an examination of their simulation by the NCAR Climate System Models, with and without an interactive ocean.

Raphael, M.N., *Journal of climate,* June 1998, 11(6), p.1405-1418, 27 refs.

Climatology, Polar atmospheres, Atmospheric circulation, Sea ice distribution, Atmospheric pressure, Gravity waves, Marine atmospheres, Models, Simulation, Forecasting

The three primary quasi-stationary waves in the geopotential height field of the Southern Hemisphere, as simulated by the National Center for Atmospheric Research (NCAR) Climate System Model (CSM1) and the Community Climate Model, version 3 (CCM3), are examined and compared with the NCAR-National Centers for Environmental Prediction reanalyses. Fourier analysis is used to decompose the geopotential heights into its zonal harmonic components. Both models are able to simulate the mean and zonal asymmetry of the geopotential heights; however, the CSM1 simulates the interannual variability considerably better than the CCM3. The amplitude and phase of wave 1 are well simulated by the models, particularly in the subantarctic region. The success of the simulation is attributed to the models' ability to simulate well the important features of the geopotential height and temperature distributions. (Auth. mod.)

52-6377

Climate drift in a multicentury integration of the NCAR Climate System Model.

Bryan, F.O., *Journal of climate,* June 1998, 11(6), p.1455-1471, 32 refs.

Climatology, Polar atmospheres, Marine atmospheres, Ocean currents, Surface temperature, Heat transfer, Sea ice distribution, Ice cover effect, Salinity, Models, Simulation, —Drake Passage

The National Center for Atmospheric Research's Climate System Model is a comprehensive model of the physical climate system. A 300-yr integration of the model has been carried out without flux correction. The solution shows very little drift in the surface temperature distribution, sea-ice extent, or atmospheric circulation. The lack of drift in the surface climate is attributed to relatively good agreement in the estimates of meridional heat transport in the uncoupled ocean model and that implied by the uncoupled atmospheric model. On the other hand, there is significant drift in the temperature and salinity distributions of the deep ocean. The cause of this drift is an unreasonably large meridional transport of freshwater in the sea ice

model, resulting in the production of excessively cold and salty Antarctic Bottom Water. There is also significant drift in the arctic basin, with the complete erosion of the surface halocline early in the coupled integration. (Auth. mod.)

52-6378

Sea ice and polar climate in the NCAR CSM.

Weatherly, J.W., Briegleb, B.P., Large, W.G., Maslanik, J.A., *Journal of climate,* June 1998, 11(6), p.1472-1486, 39 refs.

Climatology, Polar atmospheres, Surface temperature, Sea ice distribution, Ice cover thickness, Drift, Air ice water interaction, Ice cover effect, Models, Simulation

The results of a 300-yr climate simulation are presented, with the focus on sea ice and the atmospheric forcing over sea ice in the polar regions. The atmospheric model results are compared to analyses from the European Center for Medium-Range Weather Forecasts and other observational sources. The sea-ice concentrations and velocities are compared to satellite observational data. The atmospheric sea level pressure (SLP) in the Climate System Model (CSM) exhibits a high in the central Arctic displaced poleward from the observed Beaufort high. The Southern Hemisphere SLP over sea ice is generally 5 mb lower than observed. Air temperatures over sea ice in both hemispheres exhibit cold biases of 2-4 K. The precipitation-minus-evaporation fields in both hemispheres are greatly improved over those from earlier versions of the atmospheric general circulation model. The simulated ice-covered area is close to observations in the Southern Hemisphere but too large in the Northern Hemisphere. The ice concentration fields show that the ice cover is too extensive in the North Pacific and subarctic North Atlantic Ocean. The interannual variability of the ice area is similar to observations in both hemispheres. The ice thickness pattern in the Antarctic is realistic but generally too thin away from the continent. Sensitivity tests with the sea-ice component show that both the pattern of wind forcing in CSM and the air-ice drag parameter used contribute to the biases in thickness, drift speeds, and transport. Plans for further development of the ice model to incorporate a viscous-plastic ice rheology are presented. (Auth. mod.)

52-6379

On the outgassing profile of Comet Hale-Bopp.

Flammer, K.R., Mendis, D.A., Houpis, H.L.F., *Astrophysical journal,* Feb. 20, 1998, 494(2)pt.1, p.822-827, 26 refs.

Extraterrestrial ice, Ice physics, Carbon dioxide, Ice sublimation, Vapor diffusion, Clathrates, Ice vapor interface, Photochemical reactions, Ice models, Mathematical models, Profiles

52-6380

Geophysical interpretation.

Brancolini, G., et al, Department of Geophysics of the Lithosphere. Annual report, Trieste, Italy, Osservatorio Geofisico Sperimentale, 1997, p.38-49.

Sediments, Bottom topography, Seismic surveys, Ocean currents, Tectonics, Glacial geology, Antarctica—Antarctic Peninsula, Antarctica—Ross Sea

The 1997 antarctic campaign of the r/v OGS/EXPLORA focused on the geology and seismic stratigraphy of antarctic margins and basins. The scientific results of the main research projects are summarized under "Geophysical interpretation" as follows: Gas hydrates and bottom simulating reflectors; Ocean Drilling Program Leg 178 and sediment drifts of the Antarctic Peninsula Pacific margin; Geodynamics of the Ross Sea and its Cenozoic glacial history; and The Seismic Library Data System.

52-6381

Lithofacies distribution in relation to the geomorphic provinces of Prydz Bay, East Antarctica.

Harris, P.T., Taylor, F., Pushina, Z., Leitchenkov, G., O'Brien, P.E., Smirnov, V., *Antarctic science,* Sep. 1998, 10(3), p.227-235, Refs. p.234-235.

Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Paleoclimatology, Antarctica—Prydz Bay

Over the past 15 years, Japanese, Australian and Russian expeditions to Prydz Bay have collected about 30,000 km of bathymetric data, 6000 km of sidescan sonar data and more than 250 sediment grab and core samples. These data were used in the present study to compile surficial sediment, bathymetric, and geomorphological maps of the Prydz Bay region. Lithofacies distribution was determined by surficial sediment data analysis using sample matrix (Q-mode) and cluster analysis techniques based on data from 206 sites. Data included percentage biogenic silica (opal), calcium carbonate, gravel, mud, and relative abundance of two diatom species *(Fragilariopsis curta* and *F. kerguelensis).* Five lithofacies are identified from the available data: slightly gravelly sandy mud (g)sM lithofacies; siliceous mud and diatom ooze lithofacies; *F. kerguelensis* pelagic ooze lithofacies; *F. curta* gravelly sand gmS lithofacies; and calcareous gravel lithofacies. (Auth. mod.)

52-6382

Late Quaternary sediment facies in Prydz Bay, East Antarctica and their relationship to glacial advance onto the continental shelf.

Domack, E., et al, *Antarctic science,* Sep. 1998, 10(3), p.236-246, Refs. p.245-246.

Glacial geology, Glaciation, Marine geology, Sediments, Geochronology, Glacial deposits, Marine deposits, Bottom sediment, Quaternary deposits, Paleoclimatology, Antarctica—Prydz Bay

A marine survey in Prydz Bay, provides an unparalleled view of glacigenic and marine sedimentation across Prydz Channel and Amery Depression during the Late Quaternary. Gravity cores and a suite of 8 radiocarbon dates indicate that the Late Wisconsin Glacial Maximum (LGM) was associated with grounding of a palaeo-ice shelf along the periphery of Prydz Channel. Deposition in front of the grounding line was dominated by ice-rafting. A granulated facies, containing angular clay and diamicton clasts, was produced by a combination of regelation freezing, near to the grounding line, and remelting of this basal debris in the sub-ice shelf setting. Beneath these LGM marine deposits lie two key beds of diatom ooze that are distinct in size sorting and Pliocene diatoms. These "interstadial" units can be traced across most of the Prydz Channel, and are underlain by additional glacial marine units. Debris related to the Lambert Deep is distinct from detritus from eastern Prydz Bay and deposition of these two sources within the channel oscillated during the LGM. (Auth. mod.)

52-6383

Late Holocene desiccation of Lake Hoare and Lake Fryxell, McMurdo Dry Valleys, Antarctica.

Lyons, W.B., Tyler, S.W., Wharton, R.A., Jr., McKnight, D.M., Vaughn, B.H., *Antarctic science,* Sep. 1998, 10(3), p.247-256, Refs. p.255-256.

Glacial lakes, Salt lakes, Lake water, Water chemistry, Water level, Desiccation, Isotope analysis, Paleoclimatology, Antarctica—McMurdo Dry Valleys

Stable isotope data from waters of lakes in the McMurdo Dry Valleys (MDV) are presented in order to establish the climatic history of this region over the past two millennia. New data from Lake Fryxell and Lake Hoare in Taylor Valley, along with previously published data from Lake Vanda, Wright Valley and Lake Bonney, Taylor Valley are used to infer the recent climatic history of MDV. Lakes Vanda, Fryxell and Bonney appear to have lost their ice covers and evaporated to small, hypersaline ponds by 1000 to 1200 yr BP. Lake Hoare either desiccated or did not exist prior to ca. 1200 yr BP. These data indicate a major lowering of lake level prior to ca. 1000 yr BP, followed by a warmer and/or more humid climate since then. (Auth.)

52-6384

Record of Holocene glacial oscillations in Bransfield Basin as revealed by siliceous microfossil assemblages.

Bárcena, M.A., et al, *Antarctic science,* Sep. 1998, 10(3), p.269-285, Refs. p.283-285.

Marine geology, Glacial geology, Paleobotany, Sediments, Geochemistry, Geochronology, Sea ice distribution, Paleoecology, Antarctica—Bransfield Strait

Two gravity cores, Gebra-1 and Gebra-2 from the central basins of Bransfield Strait, consist mainly of hemipelagic, laminated muds with black layers rich in sand-sized volcanic ash. Micropalaeontological (diatoms and radiolarians) and geochemical (organic and inorganic) analyses, together with radiometric dating have been performed on both cores. AMS analyses on Total Organic Carbon yielded a ^{14}C-age older than expected, 2810 yr BP for the core top of Gebra-1 and 2596 yr BP for Gebra-2. The diatom and radiolarian assemblages are related to the sequence of neoglacial events over the last three millennia. The recent significant reduction in *Chaetoceros* resting spores is interpreted as a reduction in palaeoproductivity. The progressive increase in sea-ice taxa for the last three millennia may indicate a cooling trend. (Auth. mod.)

52-6385

Glacial-interglacial deposition on a sediment drift on the Pacific margin of the Antarctic Peninsula.

Pudsey, C.J., Camerlenghi, A., *Antarctic science,* Sep. 1998, 10(3), p.286-308, Refs. p.306-308.

Glacial geology, Glacial deposits, Ice rafting, Marine deposits, Bottom sediment, Paleoclimatology, Antarctica—West Antarctica

On the continental rise west of the Antarctic Peninsula there are 9 large mounds interpreted as sediment drifts, separated by turbidity current channels. Drift 7 is 150 km long, 70 km wide and up to 700 m high and is asymmetric. Cores on the gentle sides of the drift show a cyclicity between brown, bioturbated, diatom-bearing mud with foraminifera and radiolarians, and grey, laminated, barren mud. Biostratigraphic evidence is consistent with a Late Quaternary age. On the basis of chemostratigraphy, the brown sediment is interpreted as interglacial and the grey as glacial. Sedimentation rates are 3.0-5.5 cm/ka. Cores on the steep sides of the drift recovered a condensed section with thinner cycles and hiatuses. Fine grain size, very poor sorting and the absence of a mode in the silt size range indicate deposition from suspension with only weak current activity. (Auth. mod.)

52-6386

Glacial and marine geological evidence for the ice sheet configuration in the Weddell Sea-Antarctic Peninsula region during the Last Glacial Maximum.

Bentley, M.J., Anderson, J.B., *Antarctic science,* Sep. 1998, 10(3), p.309-325, Refs. p.323-325.

Ice sheets, Glaciation, Ice volume, Ice models, Marine geology, Seismic surveys, Geomorphology, Glacial geology, Paleoclimatology, Antarctica—Antarctic Peninsula, Antarctica—Weddell Sea

The Weddell Sea region represents the largest unknown in quantifying the antarctic contribution to the global water balance following the Last Glacial Maximum (LGM). This paper reviews the available onshore and offshore geological evidence constraining the volume of formerly expanded ice in the Weddell Sea embayment, focusing on the West Antarctic Ice Sheet (WAIS) and provides a preliminary reconstruction of the WAIS during the LGM. The WAIS reconstruction is based on the assumption that the evidence of most recent ice sheet expansion dates to the LGM, and is intended to provide initial constraints with which glaciological models can be compared; it shows grounded ice extent, flow directions, and ice surface elevations. Both marine and terrestrial geological evidence imply a substantial expansion of ice in the Weddell Sea embayment. Marine evidence shows that ice sheets were grounded in Crary Trough in the southern Weddell Sea and on the Antarctic Peninsula continental shelf during the LGM. Inland, the ice thickened by between 400 m (Ellsworth and Palmer Land) and 1900 m (Ellsworth Mountains). (Auth. mod.)

52-6387

Antarctic glacial history since the Last Glacial Maximum: an overview of the record on land.

Ingólfsson, Ó., et al, *Antarctic science,* Sep. 1998, 10(3), p.326-344, Refs. p.340-344.

Glacial geology, Glaciation, Ice sheets, Ice cover thickness, Paleoclimatology, Ice melting

This overview examines available circum-antarctic glacial history archives on land, related to developments after the Last Glacial Maximum (LGM). It considers the glacial-stratigraphic and morphologic records and also biostratigraphical information from moss banks, lake sediments and penguin rookeries, with some reference to relevant glacial marine records. It is concluded that Holocene environmental development in Antarctica differed from that in the Northern Hemisphere. The initial deglaciation of the shelf areas surrounding Antarctica took place before 10,000 ^{14}C yrs BP, and was controlled by rising global sea level. This was followed by the deglaciation of some presently ice-free inner shelf and land areas between 10,000 and 8000 yr BP. Continued deglaciation occurred gradually between 8000 yr BP and 5000 yr BP. Mid-Holocene glacial readvances are recorded from various sites around Antarctica. There are strong indications of a circum-antarctic climate warmer than today 4700-2000 yr BP. (Auth. mod.)

52-6388

Circum-Antarctic coastal environmental shifts during the Late Quaternary reflected by emerged marine deposits.

Berkman, P.A., et al, *Antarctic science,* Sep. 1998, 10(3), p.345-362, Refs. p.358-362.

Marine geology, Fossils, Sediments, Glacial geology, Climatic changes, Geochronology, Glaciation, Paleoclimatology

This review assesses the circumpolar occurrence of emerged marine macrofossils and sediments from antarctic coastal areas in relation to Late Quaternary climate changes. Radiocarbon ages of the macrofossils, which are interpreted in view of the complexities of the antarctic marine radiocarbon reservoir and resolution of this dating technique, show a bimodal distribution. The data indicate that marine species inhabited coastal environments from at least 35,000 to 20,000 yr BP. The general absence of these marine species from 20,000 to 8500 yr BP coincides with the subsequent advance of the antarctic ice sheets during the Last Glacial Maximum. Synchronous re-appearance of the antarctic marine fossils in emerged beaches around the continent, all of which have Holocene marine-limit elevations an order of magnitude lower than those in the Arctic, reflect minimal isostatic rebound as relative sea-level rise decelerated. Antarctic coastal marine habitat changes around the continent also coincided with increasing sea-ice extent and outlet glacial advances during the mid-Holocene. (Auth. mod.)

52-6389

Mesoscale variability in Denmark Strait: the PV outflow hypothesis.

Spall, M.A., Price, J.F., *Journal of physical oceanography,* Aug. 1998, 28(8), p.1598-1623, 36 refs.

Oceanography, Subpolar regions, Ocean currents, Velocity, Water transport, Fluid dynamics, Buoyancy, Hydrography, Bottom topography, Mathematical models, Theories, Greenland Sea, Norwegian Sea

52-6390

Comments on "On the obscurantist physics of 'form drag' in theorizing about the circumpolar current".

Olbers, D., Warren, B.A., LaCasce, J.H., Robbins, P.E., *Journal of physical oceanography,* Aug. 1998, 28(8), p.1647-1658, Includes reply. 37 refs. For pertinent paper see 24J-56120 or 51-930. For another version see 25J-56773 or 51-2556.

Oceanography, Ocean currents, Air water interactions, Wind factors, Water pressure, Water transport, Bottom topography, Topographic effects, Fluid dynamics, Theories, Analysis (mathematics)

This comment questions the view, expressed in the topical paper, that the form drag mechanism is relevant to calculation of the mass balance of the Antarctic Circumpolar Current. Response of the original authors to this interpretation is included.

52-6391

Interaction between stream temperature, streamflow, and groundwater exchanges in alpine streams.

Constantz, J., *Water resources research,* July 1998, 34(7), p.1609-1615, 21 refs.

Limnology, Alpine landscapes, Stream flow, Water temperature, Ground water, Seepage, Evapotranspiration, Diurnal variations, Hydrography, United States—Colorado—Rocky Mountains, United States—California—Sierra Nevada

52-6392

Modeling ionic solute transport in melting snow.

Harrington, R., Bales, R.C., *Water resources research,* July 1998, 34(7), p.1727-1736, 55 refs.

Snow hydrology, Watersheds, Snowmelt, Ice water interface, Water flow, Impurities, Mass transfer, Ion diffusion, Advection, Snow water equivalent, Solubility, Mathematical models

52-6393

Study of spatial scaling in braided river patterns using synthetic aperture radar imagery.

Nykanen, D.K., Foufoula-Georgiou, E., Sapozhnikov, V.B., *Water resources research,* July 1998, 34(7), p.1795-1807, 30 refs.

River flow, Channels (waterways), Geomorphology, Flow rate, Landscape development, Topographic effects, Spaceborne photography, Synthetic aperture radar, Image processing, Fractals, Anisotropy, Indexes (ratios), United States—Alaska—Tanana River

52-6394

Coated ice nanocrystals from water-adsorbate vapor mixtures: formation of ether-CO_2 clathrate hydrate nanocrystals at 120 K.

Hernandez, J., Uras, N., Devlin, J.P., *Journal of physical chemistry B,* June 4, 1998, 102(4), p.4526-4535, 28 refs.

Ice physics, Ice spectroscopy, Deuterium oxide ice, Clathrates, Hydrates, Ice crystal growth, Molecular structure, Ice microstructure, Adsorption, Coatings, Hydrogen bonds, Ice vapor interface, Cryogenics, Hydrocarbons

52-6395

Orientation of crustal stresses in the North Sea and Barents Sea inferred from borehole breakouts.

Gölke, M., Brudy, M., *Tectonophysics,* Dec. 15, 1996, 266(1-4), International Lithosphere Program Task Force Workshop, 5th, Tel Aviv, Israel, Sep. 29-Oct. 5, 1994. Origin of sedimentary basins in the Dead Sea rift. Collected papers, p.25-32, 20 refs.

Tectonics, Geological surveys, Earth crust, Subpolar regions, Stress concentration, Orientation, Anisotropy, Hydrocarbons, Reservoirs, Boreholes, Deformation, North Sea, Barents Sea

52-6396

Finite-element modelling of stress patterns along the Mid-Norwegian continental margin, 62° to 68°N.

Gölke, M., Cloetingh, S., Coblentz, D., *Tectonophysics,* Dec. 15, 1996, 266(1-4), International Lithosphere Program Task Force Workshop, 5th, Tel Aviv, Israel, Sep. 29-Oct. 5, 1994. Origin of sedimentary basins in the Dead Sea rift. Collected papers, p.33-53, 41 refs.

Tectonics, Subpolar regions, Earth crust, Stress concentration, Orientation, Fracture zones, Rock properties, Anisotropy, Boreholes, Models, Rheology, Norway

52-6397

Paleostress reconstruction from kinematic indicators in the Oslo Graben, southern Norway: new constraints on the mode of rifting.

Heeremans, M., Larsen, B.T., Stel, H., *Tectonophysics,* Dec. 15, 1996, 266(1-4), International Lithosphere Program Task Force Workshop, 5th, Tel Aviv, Israel, Sep. 29-Oct. 5, 1994. Origin of sedimentary basins in the Dead Sea rift. Collected papers, p.55-79, 64 refs.

Pleistocene, Tectonics, Geologic processes, Subpolar regions, Earth crust, Magma, Upwelling, Geothermy, Stress concentration, Orientation, Models, Norway

52-6398

Behaviour of compacted earth fill embankments, constructed during winter and summer conditions.

Magnusson, O., Knutsson, S., Engineered Fills '93, Newcastle upon Tyne, UK, Sep. 15-17, 1993. Proceedings. Edited by B.G. Clarke et al, London, Thomas Telford, 1993, p.320-330, 5 refs.

DLC TA760.E54 1993

Cold weather construction, Embankments, Earth fills, Fines, Frozen ground mechanics, Ground thawing, Frost penetration, Soil compaction, Settlement (structural), Deformation, Mechanical tests

52-6399

Glacier-fed(?) sandstone sheets in the Weller Coal Measures (Permian), Allan Hills, Antarctica.

Smith, N.D., Barrett, P.J., Woolfe, K.J., *Palaeogeography, palaeoclimatology, palaeoecology,* Aug. 1998, 141(1-2), p.35-51, 84 refs.

Pleistocene, Geological surveys, Coal, Sedimentation, Glacial geology, Stratigraphy, Lithology, Glacial erosion, Meltwater, Striations, Antarctica—Allan Hills

The upper member of the Weller Coal Measures (Permian) at Allan Hills, Victoria Land, consists of repetitive coal layers separated by sheetlike bodies of predominantly sandstone and subordinate siltstone and conglomerate, all of fluvial origin. Investigation of the lowermost inter-coal sheet (WCI) reveals abrupt planar basal contacts, persistent upward fining, and a strong westward palaeocurrent trend. Three lithofacies are recognized in the WCI sheet: (A) small-scale cross-bedded pebbly sandstone, which occupies most of the basal portions of the sheet; (B) large-scale cross-bedded medium-coarse sandstone, confined to a linear NE-SW belt overlying or locally replacing facies A, and (C) siltstone and rippled fine-grained sandstone, which drapes and overlaps facies A and B and contains *Glossopteris* leaves and *Vertebraria* root traces. Facies C represents low-energy floodplain sedimentation co-existing with and later succeeding facies B as deposition evolved toward abandonment and eventual renewal of peat deposition. Relatively rapid deposition of the sandstone sheet is implied by the lack of any significant hiatus markers. Outsized clasts up to 45 cm in diameter are inferred to be ice-rafted deposits which, together with other evidence, suggest meltwater influence, possibly glacial, on sediment transport and deposition. The Allan Hills exposures are believed to represent a succession of low-lying mire complexes interrupted by abrupt but infrequent incursions of coarse sediment, possibly by extreme meltwater floods. (Auth. mod.)

52-6400

New method to estimate accumulation rates of lignites in the Eocene Buchanan Lake Formation, Canadian Arctic.

Kojima, S., Sweda, T., LePage, B.A., Basinger, J.F., *Palaeogeography, palaeoclimatology, palaeoecology,* Aug. 1998, 141(1-2), p.115-122, 27 refs.

Pleistocene, Paleoecology, Geological surveys, Coal, Sedimentation, Decomposition, Litter, Compaction, Quaternary deposits, Lithology, Indexes (ratios), Sampling, Canada—Northwest Territories—Axel Heiberg Island

52-6401

Palaeoecology of postglacial treeline shifts in the northern Cascade Mountains, Canada.

Pellatt, M.G., Smith, M.J., Mathewes, R.W., Walker, I.R., *Palaeogeography, palaeoclimatology, palaeoecology,* Aug. 1998, 141(1-2), p.123-138, 63 refs.

Paleoclimatology, Paleoecology, Palynology, Climatic changes, Forest lines, Lacustrine deposits, Drill core analysis, Stratigraphy, Radioactive age determination, Vegetation patterns, Canada—British Columbia—Cascade Mountains

52-6402

Late Cretaceous-Cenozoic climatic variations of the northern Antarctic Peninsula: new geochemical evidence and review.

Dingle, R.V., Lavelle, M., *Palaeogeography, palaeoclimatology, palaeoecology,* Sep. 1998, 141(3-4), p.215-232, 57 refs.

Paleoclimatology, Climatic changes, Paleobotany, Sedimentation, Geochemistry, Weathering, X ray analysis, Indexes (ratios), Statistical analysis, Antarctica—Antarctic Peninsula

Aptian to Pliocene time-series of X-ray fluorescence data from the Antarctic Peninsula are used to assess the degree of chemical weathering and maturity of sediments deposited prior, and subsequent to the establishment of glaciation in West Antarctica. A continuous palaeoclimatic signal is inferred from comparing the results with previously published palaeotemperature and palaeobotanical data. The development of Cretaceous arboreal vegetation in the northern Antarctic Peninsula can be correlated with the major climatic cycles. (Auth. mod.)

52-6403

Deglacial paleoclimate of the American sector of the southern ocean: Late Glacial-Holocene records from the latitude of Canal Beagle (55°S), Argentine Tierra del Fuego.

Heusser, C.J., *Palaeogeography, palaeoclimatology, palaeoecology,* Sep. 1998, 141(3-4), p.277-301, 62 refs.

Paleoclimatology, Climatic changes, Stratigraphy, Palynology, Paleobotany, Forest lines, Forest tundra, Classifications, Geochronology, —Tierra del Fuego

Paleoclimate at the time of deglaciation (14,000-10,000 ^{14}C yr BP) in different sectors of the southern ocean has followed a continuous warming trend, but also warming broken by a transitory episode, the Younger Dryas stadial event, during which on the order of a millennium, colder conditions prevailed. Evidence is from antarctic ice cores, deep-sea cores, glacier fluctuations, and pollen and beetle records. Reasons for the apparent nonuniformity include differential sensitivity of each sector to climatic change, uneven dating control, and the variable forcing-response nature of biota used as climatic indicators. Within limits of the chronology in the American sector, there is no indication, as shown by marine cores from the southern ocean and by antarctic ice cores, that deglacial climatic events at higher latitudes of the Southern Hemisphere, exemplified by the Younger Dryas, lead similar events in the Northern Hemisphere.

52-6404

3-D seismic imaging of complex structures in glacial deposits.

Siahkoohi, H.R., West, G.F., *Geophysics,* May-June 1998, 63(3), p.1041-1052, 15 refs.

Engineering geology, Hydrogeology, Seismic surveys, Glacial geology, Glacial deposits, Seismic reflection, Migration, Stratigraphy, Imaging

52-6405

Evaluation of climatological snow cover characteristics by a technique based on queuing theory.

Glazirin, G.E., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.99-109, With German summary. 7 refs.

Climatology, Precipitation (meteorology), Snowfall, Snow hydrology, Snowmelt, Snow cover distribution, Snow water equivalent, Seasonal variations, Glacial meteorology, Models, Statistical analysis, Classifications

52-6406

Lichenometric and ^{14}C evidence for the Late Holocene glacier variations in the Oigaing river basin, western Tian Shan, central Asia.

Savoskul, O.S., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.111-124, With German summary. 34 refs.

Glacial geology, Pleistocene, Mountain glaciers, Glacier oscillation, Altitude, Geomorphology, Landforms, Moraines, Quaternary deposits, Lichens, Radioactive age determination, Geochronology, Kyrgyzstan, Tien Shan

52-6407
Hydrological regime of Pamir-Alai glaciers.
Konovalov, V.G., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.125-131, With German summary. 3 refs.
Glacial hydrology, Glacier mass balance, River basins, Runoff, Hydrography, Glacier oscillation, Glacier melting, Altitude, Statistical analysis, Indexes (ratios), Uzbekistan

52-6408
Past and present glaciation in the Markha valley and the northern Nimaling mountains, Ladakh (northern India). [Vorzeitliche und aktuelle Vergletscherung des Markhatales und der nördlichen Nimaling-Berge, Ladakh (Nordindien)]
Damm, B., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.133-148, In German with English summary. 29 refs.
Glacier oscillation, Glacial geology, Mountain glaciers, Geomorphology, Altitude, Snow line, Moraines, Rock glaciers, Mapping, India—Ladakh

52-6409
Influence of forests on the conditions of snow ablation in the Atlas Mountains of Morocco. [Zum Einfluß des Waldes auf die Schneeablation im Atlasgebirge Marokkos]
Becht, M., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.149-168, In German with English summary. 25 refs.
Glacial hydrology, Mountain glaciers, Snow hydrology, Glacier ablation, Snowmelt, Snow water equivalent, Snow evaporation, Forest canopy, Interception, Vegetation factors, Sampling, Morocco—Atlas Mountains

52-6410
Variations of Mount Kenya's glaciers in the 20th century.
Hastenrath, S., Greischar, L., Rostom, R., Hime, W., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.169-172, With Germany summary. 14 refs.
Mountain glaciers, Glacier oscillation, Glacier ablation, Glacier surveys, Photogrammetric surveys, Statistical analysis, Kenya

52-6411
Ablation near the equilibrium line on the Greenland ice sheet, southwest Greenland, July 1991.
Henneken, E.A.C., Meesters, A.G.C.A., Bink, N.J., Vugts, H.F., Cannemeijer, F., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.173-184, With German summary. 16 refs.
Glacial hydrology, Glacier oscillation, Ice sheets, Glacier ablation, Snowmelt, Albedo, Surface energy, Radiation balance, Snow ice interface, Degree days, Glacier surveys, Greenland

52-6412
Mass balance of the Marinet glacier, a small cirque glacier in the southern French Alps.
Assier, A., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1997, 33(2), p.185-192, With German summary. 10 refs.
Glacier oscillation, Cirque glaciers, Alpine glaciation, Glacier mass balance, Glacier ablation, Snow line, Glacier surveys, Seasonal variations, Statistical analysis, France—Alps

52-6413
Paleozoic-Mesozoic crayfish from Antarctica: earliest evidence of freshwater decapod crustaceans.
Babcock, L.E., Miller, M.F., Isbell, J.L., Collinson, J.W., Hasiotis, S.T., *Geology,* June 1998, 26(6), p.539-542, 32 refs.
Paleoclimatology, Biomass, Paleoecology, Fossils, Biogeography, Distribution, Stratigraphy, Correlation, Antarctica—Transantarctic Mountains
Discovery of an Early Permian claw from Antarctica extends the fossil record of crayfish by ca. 65 m.y. and demonstrates that decapod crustaceans had radiated into freshwater habitats by the Late Paleozoic. Burrows in Lower Triassic rocks of Antarctica are among the oldest apparently constructed by crayfish. Their morphology is similar to modern crayfish burrows, and this demonstrates that burrowing behavior was established early in the evolution of this group. The new discoveries show that the earliest Permian crayfish were distributed in high paleolatitudes of southernmost Pangea, where they lived in freshwater lakes fed by glacial meltwater. (Auth. mod.)

52-6414
Analysis of the relations between the interannual ozone anomalies and stratospheric dynamics.
Zhadin, E.A., Dianskiĭ, N.A., *Russian meteorology and hydrology,* 1997, No.9, p.16-23, Translated from Meteorologiia i gidrologiia. 26 refs.
Climatology, Polar atmospheres, Atmospheric composition, Stratosphere, Ozone, Wind direction, Seasonal variations, Correlation
The correlations between the interannual variations of total ozone and stratospheric angular momentum are studied by means of the calculations of empirical orthogonal functions and singular value decomposition analysis. It is shown that the variation in total ozone correlates with anomalies of stratospheric momentum in winter-spring seasons in the middle and high latitudes of the Northern and Southern hemispheres from 1979-1991. The causes of long-term ozone changes and trends, zonal mean circulation, stratospheric wave activity, and decadal variations in the interactive ocean-atmosphere system are discussed.

52-6415
Some results of vertical ozone measurements over Yakutsk in the winter-spring seasons of 1995 and 1997.
Tsvetkova, N.D., IUshkov, V.A., Dorokhov, V.M., Zaitsev, I.G., *Russian meteorology and hydrology,* 1997, No.9, p.32-36, Translated from Meteorologiia i gidrologiia. 11 refs.
Climatology, Subpolar regions, Stratosphere, Atmospheric composition, Ozone, Atmospheric circulation, Sampling, Sounding, Profiles, Russia—Yakutsk

52-6416
Variability of the ice transport through the Fram Strait.
Alekseev, G.V., Miakoshin, O.I., Smirnov, N.P., *Russian meteorology and hydrology,* 1997, No.9, p.37-41, Translated from Meteorologiia i gidrologiia. 13 refs.
Oceanography, Sea ice distribution, Drift, Ice surveys, Ice volume, Velocity, Seasonal variations, Oscillations, Statistical analysis, Wind factors, Fram Strait

52-6417
Estimation of water, heat, and salt balances of the White Sea.
Elisov, V.V., *Russian meteorology and hydrology,* 1997, No.9, p.51-59, Translated from Meteorologiia i gidrologiia. 18 refs.
Oceanography, Subpolar regions, Ocean currents, Water transport, Salinity, Heat balance, Water balance, Sampling, Statistical analysis, Barents Sea, Russia—White Sea

52-6418
Radiation factors of snowmelt.
Shutov, V.A., *Russian meteorology and hydrology,* 1997, No.9, p.60-67, Translated from Meteorologiia i gidrologiia. 19 refs.
Snow hydrology, Snowmelt, Snow optics, Albedo, Solar radiation, Radiation balance, Radiometry, Mathematical models, Indexes (ratios), Diurnal variations, Runoff forecasting

52-6419
Distribution of *Clostridium perfringens* and fecal sterols in a benthic coastal marine environment influenced by the sewage outfall from McMurdo Station, Antarctica.
Edwards, D.D., McFeters, G.A., Venkatesan, M.I., *Applied and environmental microbiology,* July 1998, 64(7), p.2596-2600, 40 refs.
Sewage disposal, Waste disposal, Sediments, Water pollution, Antarctica—McMurdo Sound, Antarctica—McMurdo Station
The spatial distribution, movement and impact of the untreated wastewater outfall from McMurdo Station were investigated under early austral summer conditions. The benthic environment was examined to determine the distribution of *Clostridium perfringens* in sediment cores and the intestinal contents of native invertebrates and fish along a transect of stations. These stations extended ca. 411 m south of the outfall. The findings revealed that the concentration of *C. perfringens* decreased with depth in the sediment and distance from the outfall. High percentages of tunicates and sea urchins were colonized with this bacterium along the transect. Corrostanol concentrations were also measured in sediment samples taken from each of the transect stations, and a similar trend was observed. These results are in agreement with the findings of previous studies performed with the water column and collectively provide evidence that the disposal of domestic wastes deserves special consideration in polar marine environments. (Auth.)

52-6420
Fluxes of fast and epithermal neutrons from lunar prospector: evidence for water ice at the lunar poles.
Feldman, W.C., Maurice, S., Binder, A.B., Barraclough, B.L., Elphic, R.C., Lawrence, D.J., *Science,* Sep. 4, 1998, 281(5382), p.1496-1500, Refs. p.1500.
Moon, Ice formation, Water, Polar regions, Hydrogen, Neutrons, Extraterrestrial ice

52-6421
Dark survival of marine microalgae in the High Arctic (Greenland Sea).
Zhang, Q., Gradinger, R., Spindler, M., *Polarforschung,* 1995 (Pub. 98), 65(3), p.111-116, With German summary. 31 refs.
Algae, Microbiology, Sea ice, Light effects, Greenland Sea

52-6422
Soil organic matter composition and transformation in a swamp soil from algae of coastal continental Antarctica.
Beyer, L., Vogt, B., Blume, H.P., Erlenkeuser, H., *Polarforschung,* 1995 (Pub. 98), 65(3), p.117-122, With German summary. Refs. p.121-122.
Soil science, Algae, Geocryology, Geochemistry, Organic soils, Soil composition, Soil chemistry, Soil microbiology, Antarctica—Wilkes Land, Antarctica—Casey Station
Soil organic matter (SOM) of a swamp soil (Lithic Cryofibrist) from algae in Antarctica was studied with special emphasis on soil formation processes under extreme climate conditions. An integrated approach of modern analytical methods including wet-chemical analyses and cross polarization magic angle spinning carbon-13 nuclear magnetic resonance spectroscopy (CPMAS ^{13}C-NMR) was applied to characterize the SOM composition of a Euic, Shallow Lithic Cryofibrist. The soil morphology suggested a slight humification degree. The wet-chemical litter compound analysis and CPMAS ^{13}C-NMR confirmed these observation, whereas the classical SOM alkaline extraction was not suitable to characterize the weak humified organic matter. The data suggest a predominance of proteins within the nitrogen compounds and a slight degradation of carbohydrates as well a selective preservation of alkyl units within the carbon moieties in the deeper soil layers. (Auth. mod.)

52-6423
Adopting one name per feature on maps of Antarctica: an experimental application—topographic map (satellite image map) 1:250 000 Trinity Peninsula SP21-22/13.
Sievers, J., Thomson, J.W., *Polarforschung,* 1995 (Pub. 98), 65(3), p.123-131, With German summary. 21 refs.
Gazetteers, Topographic maps, Antarctica—Antarctic Peninsula, Antarctica—Trinity Peninsula
International guidelines for proposing and using geographical names in Antarctica are being developed under the auspices of the Scientific Committee on Antarctic Research (SCAR). For newly identified features only one name per feature is being advocated. However, the multiplicity of existing names for a large number of antarctic geographical features creates problems, particularly for researchers working on international projects. In an attempt to overcome the difficulties of selecting one name per feature for displays on maps, where space is limited, the authors used the guidelines in preparation by SCAR to develop a set of rules for international use that can be applied to existing antarctic geographical names. According to these rules, historical priority should be the prime reason for selecting a name, and the name should be retained in its original language, but justification for ignoring historical priority is also given. Examples of synonyms, and their reduction to one name per feature for use on a topographic (satellite image) map of Trinity Peninsula, are cited in the paper.

52-6424
August Petermann and his hypotheses about the Arctic Ocean. [August Petermann und seine Hypothesen über das Nordpolarmeer]
Tammiksaar, E., Suchova, N.G., *Polarforschung,* 1995 (Pub. 98), 65(3), p.133-145, In German with English summary. Refs. p.142-143.
History, Ocean currents, Ice navigation, Expeditions, Greenland, Arctic Ocean, Gulf Stream

52-6425
Three-dimensional deformation measured in an Alaskan glacier.
Harper, J.T., Humphrey, N.F., Pfeffer, W.T., *Science,* Aug. 28, 1998, 281(5381), p.1340-1342, 12 refs.
Glacier ice, Ice deformation, Flow measurement, Glacier flow, Basal sliding, United States—Alaska—Worthington Glacier

52-6426
Axisymmetric numerical study of convective cloud electrification.
Masuelli, S., Caranti, G.M., Scavuzzo, C.M., *Journal of atmospheric and solar-terrestrial physics,* Apr. 1998, 60(6), p.573-583, 38 refs.
Climatology, Thunderstorms, Cloud physics, Cloud electrification, Cloud droplets, Snow pellets, Convection, Particles, Ice crystals, Charge transfer, Polarization (charge separation), Ionization, Mathematical models

52-6427
Occurrence and characteristics of high-latitude mesospheric echoes at MF: observations by Halley and Tromso dynasondes.
Jones, G.O.L., Davis, C.J., *Journal of atmospheric and solar-terrestrial physics,* Apr. 1998, 60(6), p.595-605, 34 refs.
Atmospheric electricity, Polar atmospheres, Radio echo soundings, Scattering, Seasonal variations, Antarctica—Halley Station, Norway—Tromso
The dynasonde at Halley Station is operated throughout the year making ionogram soundings every five minutes. The extensive database of observations from 1993 and 1994 has been processed to investigate ionogram echoes from mesospheric heights. The occurrence of these echoes shows a very clear seasonal trend with far more echoes observed during the winter. The echoes are shown to be predominantly dependent on the absence of direct solar illumination. The characteristics of the echoes are compared with similar observations from a Northern Hemisphere site at Tromso, Norway. The observations from Halley and Tromso are discussed in relation to Polar Mesosphere Summer Echoes (PMSE) which are seen at higher radio frequencies above Tromso. It is found that ionogram mesospheric echoes have different occurrence statistics from PMSE and there is no statistical evidence to suggest that the echoes observed during the summer are different from those observed at other times of year. (Auth.)

52-6428
Observations of the reduction in the available HF band on four high latitude paths during periods of geomagnetic disturbance.
Milan, S.E., Lester, M., Jones, T.B., Warrington, E.M., *Journal of atmospheric and solar-terrestrial physics,* Apr. 1998, 60(6), p.617-629, 31 refs.
Atmospheric electricity, Electric fields, Polar atmospheres, Radio waves, Wave propagation, Atmospheric disturbances, Geomagnetism, Sounding, United States—Alaska—Prudhoe Bay, Canada—Northwest Territories—Alert

52-6429
Comparison of GCM simulated Cretaceous 'greenhouse' and 'icehouse' climates: implications for the sedimentary record.
Price, G.D., Valdes, P.J., Sellwood, B.W., *Palaeogeography, palaeoclimatology, palaeoecology,* Oct. 15, 1998, 142(3-4), p.123-138, 60 refs.
Pleistocene, Paleoclimatology, Climatic changes, Surface temperature, Greenhouse effect, Ice cover effect, Sedimentation, Weathering, Snow accumulation, Geochemical cycles, Ice age theory, Simulation

52-6430
Simulation of the global bio-geophysical interactions during the Last Glacial Maximum.
Kubatzki, C., Claussen, M., *Climate dynamics,* July 1998, 14(7-8), p.461-471, 45 refs.
Pleistocene, Paleoclimatology, Paleoecology, Surface temperature, Vegetation patterns, Vegetation factors, Insolation, Albedo, Radiation balance, Ice cover effect, Mapping, Simulation, Correlation, Ice age theory

52-6431
Transient responses of the CSIRO climate model to two different rates of CO_2 increase.
Cai, W., Gordon, H.B., *Climate dynamics,* July 1998, 14(7-8), p.503-516, 38 refs.
Climatology, Global warming, Aerosols, Atmospheric composition, Ocean currents, Carbon dioxide, Heat flux, Air ice water interaction, Sea ice distribution, Ice melting, Simulation, Greenhouse effect
The responses of the CSIRO coupled atmosphere-ocean-sea ice model to two greenhouse gas induced warming scenarios are described and compared to a control run with the current CO_2 level. As the CO_2 increases in both scenarios, the top-of-atmosphere outgoing longwave radiation increases giving enhanced cooling of the coupled system, while the outgoing short wave radiation decreases contributing to a warming of the system. The latter overcompensates the former leading to a global mean net radiative heat gain. The distribution of this heat gain produces the well-known inter-hemispheric asymmetry in warming, despite a decrease in the sea ice around Antarctica in this model. It is found that the volume mean temperature response over the southern ocean is greater than that over the northern hemispheric oceans, and a maximum warming takes place at the subsurface rather at the surface of the ocean in the southern mid-to-high latitude region. The enhanced high-latitude freshening associated with the strengthened hydrological cycle significantly affects the latitudinal distribution of warming and other responses. (Auth. mod.)

52-6432
CO_2 and northern hemisphere ice volume variations over the middle and late Quaternary.
Li, X.S., Berger, A., Loutre, M.F., *Climate dynamics,* July 1998, 14(7-8), p.537-544, 34 refs.
Paleoclimatology, Climatic changes, Atmospheric composition, Carbon dioxide, Ice sheets, Ice volume, Glacier oscillation, Ice cores, Oxygen isotopes, Models, Simulation, Ice age theory, Antarctica—Vostok Station
The atmospheric CO_2 concentrations have been reconstructed over the past 600 ka based on regression between the Vostok CO_2 data and the SPECMAP oxygen isotope values. A polynomial of order 5 explains 66% of the Vostok CO_2 variance over the last 220 ka. The Northern Hemisphere ice-sheet volume was simulated over the past 575 ka using the LLN 2-D model, forced by insolation and these statistically reconstructed atmospheric CO_2 concentrations. The simulated ice volume fluctuations resemble the deep-sea oxygen isotope variations CO_2 of interglacial level is necessary for explaining both the interglacial at oxygen isotopic stage 11 and present-day interglacial. (Auth. mod.)

52-6433
Simulations of the Last Glacial Maximum climates using a general circulation model: prescribed versus computed sea surface temperatures.
Dong, B., Valdes, P.J., *Climate dynamics,* July 1998, 14(7-8), p.571-591, 36 refs.
Pleistocene, Paleoclimatology, Surface temperature, Atmospheric circulation, Air ice water interaction, Snow accumulation, Glacier mass balance, Ice cover effect, Models, Simulation, Ice age theory
The climate during the Last Glacial Maximum has been simulated using the UK Universities Global Atmospheric Modelling Programme general circulation model with both prescribed sea surface temperature (SSTs) based on the CLIMAP reconstruction and computed SSTs with a simple thermodynamic slab ocean. Consistent with the Paleoclimate Modelling Intercomparison Project, the other boundary conditions include the large changes in ice-sheet topography and geography, a lower sea level, a lower concentration of CO_2 in the atmosphere, and a slightly different insolation pattern at the top of the atmosphere. The results are analyzed in terms of changes in atmospheric circulation. (Auth. mod.)

52-6434
Estimation of freezing or chilling behavior.
Bart, G.C.J., *International journal of refrigeration,* Jan. 1998, 21(1), p.55-63, With French summary. 12 refs.
Freezing, Refrigeration, Thermal analysis, Frozen liquids, Porous materials, Enthalpy, Thermal conductivity, Heat transfer coefficient, Phase transformations, Analysis (mathematics), Forecasting

52-6435
***Ab initio* infrared absorption study of the hydrogen-bond symmetrization in ice.**
Bernasconi, M., Silvestrelli, P.L., Parrinello, M., *Physical review letters,* Aug. 10, 1998, 81(6), p.1235-1238, 36 refs.
Ice physics, High pressure ice, Molecular structure, Proton transport, Hydrogen bonds, Phase transformations, Ice spectroscopy, Infrared spectroscopy, Radiation absorption, Spectra, Simulation, Polarization (charge separation)

52-6436
Microbial biomass and activities in soil as affected by frozen and cold storage.
Stenberg, B., Johansson, M., Pell, M., Sjödahl-Svensson, K., Stenström, J., Torstensson, L., *Soil biology & biochemistry,* Mar. 1998, 30(3), p.393-402, 35 refs.
Soil microbiology, Soil tests, Sampling, Biomass, Cold storage, Refrigeration, Freezing, Preserving, Chemical analysis, Statistical analysis, Temperature effects

52-6437
Soil water and solute movement and bulk density changes in repacked soil columns as a result of freezing and thawing under field conditions.
Radke, J.K., Berry, E.C., *Soil science,* Aug. 1998, 163(8), p.611-624, 19 refs.
Soil mechanics, Soil structure, Ground water, Solutions, Ice lenses, Soil water migration, Freeze thaw cycles, Freeze thaw tests, Frost penetration, Density (mass/volume)

52-6438
Model comparisons to simulate soil frost depth.
Kennedy, I., Sharratt, B., *Soil science,* Aug. 1998, 163(8), p.636-645, 17 refs.
Frozen ground mechanics, Soil freezing, Ground thawing, Frost penetration, Snow depth, Snow cover effect, Thermal conductivity, Mathematical models, Frost forecasting, Simulation, Correlation

52-6439
Dynamics of the accumulation of the Mesozoic-Cenozoic sedimentary layer in the West-Siberian basin.
Surkov, V.S., Smirnov, L.V., Gurari, F.G., Deviatov, V.P., Kazakov, A.M., *Russian geology and geophysics,* 1997, 38(5), p.957-964, Tranlated from Geologiia i geofizika. 34 refs.
Pleistocene, Subpolar regions, Earth crust, Tectonics, Sedimentation, Geologic processes, Reservoirs, Hydrocarbons, Russia—Siberia

52-6440
Boreal zonal standard and biostratigraphy of the Siberian Mesozoic.
Zakharov, V.A., et al, *Russian geology and geophysics,* 1997, 38(5), p.965-993, Translated from Geologiia i geofizika. 165 refs.
Pleistocene, Biogeography, Subpolar regions, Paleobotany, Paleoecology, Sedimentation, Stratigraphy, Classifications, Correlation, Standards, Russia—Siberia

52-6441
Signals of the paleoclimates of Upper Pleistocene in the sediments of Lake Baikal.
Grachev, M.A., et al, *Russian geology and geophysics,* 1997, 38(5), p.994-1018, Translated from Geologiia i geofizika. 69 refs.
Pleistocene, Paleoclimatology, Climatic changes, Lacustrine deposits, Bottom sediment, Lithology, Paleoecology, Algae, Hydrogeochemistry, Profiles, Geochronology, Drill core analysis, Correlation, Russia—Baykal, Lake

52-6442
Continuous record of paleoclimates of the last 4.5 Ma from Lake Baikal.
Kuzmin, M.I., Grachev, M.A., Williams, D., Kawai, T., Horie, S., Oberhensli, H., *Russian geology and geophysics,* 1997, 38(5), p.1062-1064, Translated from Geologiia i geofizika. 6 refs.
Paleoclimatology, Climatic changes, Lacustrine deposits, Sedimentation, Bottom sediment, Stratigraphy, Paleoecology, Lithology, Profiles, Drill core analysis, Correlation, Russia—Baykal, Lake

52-6443
Biological responses to fertilization of Oksrukuyik Creek, a tundra stream.
Harvey, C.J., et al, *North American Benthological Society. Journal,* June 1998, 17(2), p.190-209, 39 refs.
Limnology, Streams, Arctic landscapes, Tundra terrain, Nutrient cycle, Ecosystems, Water chemistry, Modification, Algae, Biomass, Environmental impact, Sampling, United States—Alaska—Oksrukuyik Creek

52-6444
Comparison of epilithic algal and bryophyte metabolism in an arctic tundra stream, Alaska.
Arscott, D.B., Bowden, W.B., Finlay, J.C., *North American Benthological Society. Journal,* June 1998, 17(2), p.210-227, 45 refs.
Limnology, Arctic landscapes, Tundra terrain, Streams, Ecosystems, Algae, Biomass, Photosynthesis, Chlorophylls, Radiance, Nutrient cycle, Simulation, United States—Alaska—Kuparuk River

52-6445

Colloquium on "Antarctic research compared to studies in Arctic ice regions." Frankfurt am Main, Nov.4-5, 1994.

Kolloquium im Schwerpunkt "Antarktisforschung mit vergleichenden Untersuchungen in arktischen Eisgebieten" Frankfurt am Main, 4. und 5. November 1994, *Berichte zur Polarforschung,* 1995, No.170, 167p., In German. Refs. with individual reports.

Meetings, Geologic structures, Earth crust, Mineralogy, Sea ice, Ice sheets, Ice cover thickness, Antarctica

The work includes 31 individual reports. The geographic range extends to Queen Maud Land, Shackleton Range, Homefront Range, New Schwabenland, Oates Coast, Northern Victoria Land, the Ross, Weddell, and Bellingshausen seas, the Antarctic Peninsula, and Marie Byrd Land. Some of the research topics are Early Gondwanaland history; granulites, microfossils, and biostratigraphy of the Shackleton Range; geological charting of the Homefront Range; early crustal development; correlation of Queen Maud Land with southern Africa; ages of the rocks of Wilson Terranes; clastic metasediments, granite structure, and ice thickness measurements of North Victoria Land; Pb dating of zircon silicate at Marguerite Bay; Lambert-Mahandi and Ross Sea rifts; apatite age tracking in Marie Byrd Land; seismic reflections and behavior in New Schwabenland; and radio luminescence in Schirmacher Hills.

52-6446

Origin and mechanism of evolution of antifreeze glycoproteins in polar fishes.

Cheng, C.H.C., Fishes of Antarctica. A biological overview. Edited by G. di Prisco, E. Pisano and A. Clarke, Milan, Italy, Springer-Verlag, 1998, p.311-328, 48 refs.

Cryobiology, Antifreezes, Physiological effects

This chapter reviews the recent findings on the evolution of the antifreeze glycoproteins of the antarctic notothenioids, and the near-identical antifreeze glycoproteins of the unrelated northern cods.

52-6447

Immersion chilling and freezing in aqueous refrigerating media: review and future trends.

Lucas, T., Raoult-Wack, A.L., *International journal of refrigeration,* Sep. 1998, 21(6), p.419-429, With French summary. 91 refs.

Refrigeration, Solutions, Brines, Frozen liquids, Liquid cooling, Freezing front, Heat transfer coefficient, Mass transfer, Saturation, Models

52-6448

Source of the cloud produced upon adding dry ice to water.

Kohli, M., Luck, R.L., Ohtamaa, V., *Journal of chemical education,* Jan. 1998, 75(1), p.60-61, 1 ref.

Fog formation, Ice physics, Ice sublimation, Aerosols, Ice water interface, Carbon dioxide, Dry ice (trademark), Experimentation, Education

52-6449

Composition, morphology, and genesis of a moraine-like feature in the Miller Brook valley, Vermont.

Loso, M.G., Schwartz, H.K., Wright, S.F., Bierman, P.R., *Northeastern geology and environmental sciences,* Mar. 1998, 20(1), p.1-10, 35 refs.

Pleistocene, Paleoclimatology, Landforms, Glacial geology, Alpine glaciation, Moraines, Soil profiles, Lithology, Origin, Theories, United States—Vermont

52-6450

Influence of snow on the hydrology and hydrochemistry of the Allt a' Mharcaidh, Cairngorm mountains, Scotland.

Helliwell, R.C., Soulsby, C., Ferrier, R.C., Jenkins, A., Harriman, R., *Science of the total environment,* June 30, 1998, 217(1-2), p.59-70, 25 refs.

Watersheds, Subarctic landscapes, Snow hydrology, Meltwater, Runoff, Stream flow, Snow impurities, Aerosols, Hydrogeochemistry, Snow water equivalent, Snow cover effect, Sampling, United Kingdom—Scotland

52-6451

Concentrations, biomagnification and spatial variation of organochlorine compounds in a pelagic food web in the northern part of the Baltic Sea.

Strandberg, B., et al, *Science of the total environment,* June 30, 1998, 217(1-2), p.143-154, 39 refs.

Marine biology, Ecosystems, Subpolar regions, Water pollution, Hydrocarbons, Biomass, Plankton, Environmental tests, Environmental impact, Sampling, Chemical analysis, Statistical analysis, Baltic Sea

52-6452

Arctic contaminants: an unfinished agenda.

Keith, R., *Northern perspectives,* 1998, 25(2), p.1-3.

Air pollution, Water pollution, Subpolar regions, Environmental impact, Environmental protection, Research projects, Legislation, Standards, International cooperation, Canada

52-6453

Canadian Arctic Contaminants Assessment Report: overview and summary.

Furgal, C.M., Keith, R., *Northern perspectives,* 1998, 25(2), p.4-12, 18 refs.

Air pollution, Water pollution, Ecosystems, Subpolar regions, Research projects, Environmental impact, Environmental protection, International cooperation, Education, Safety, Canada—Northwest Territories

52-6454

POPs in the Arctic: turning science into policy.

Fenge, T., *Northern perspectives,* 1998, 25(2), p.21-27, 8 refs.

Air pollution, Water pollution, Aerosols, Hydrocarbons, Subpolar regions, Environmental impact, Environmental protection, International cooperation, Legislation, Human factors, Safety, Canada—Northwest Territories

52-6455

Did changes in antarctic ice volume influence Late Holocene sea-level lowering.

Goodwin, I.D., *Quaternary science reviews,* Apr.-May 1998, 17(4-5), p.319-332, 80 refs.

Sea level, Paleoclimatology, Ice sheets, Glacier oscillation, Ice volume, Ice growth, Glacier mass balance, Ice age theory

Glaciological and glacial geological field evidence indicates that during the late Holocene, the antarctic alpine glaciers, ice sheet margins and outlet glaciers have expanded, and the ice sheet interior has thickened. This is attributed to: an ice thickening in central East Antarctica throughout the Holocene; and increased ice volume supplied by higher than mean Holocene accumulation rates, associated with a warmer climatic period between 4000 to 2500 years B.P. It is estimated that these effects could account for ca. 1.0±0.2 m of the interpreted sea-level lowering on mid-oceanic islands, with ca. 0.7±0.1 m of lowering occurring between 4000 and 2500 years B.P. (Auth. mod.)

52-6456

Onset of the Quaternary: a review of new findings in the Pliocene-Pleistocene chronostratigraphy.

Mauz, B., *Quaternary science reviews,* Apr.-May 1998, 17(4-5), p.357-364, 50 refs.

Pleistocene, Paleoclimatology, Quaternary deposits, Geochronology, Paleoecology, Stratigraphy, Geomagnetism, Statistical analysis, Classifications, Standards

52-6457

Contribution of orbital forcing to the progressive intensification of northern hemisphere glaciation.

Maslin, M.A., Li, X.S., Loutre, M.F., Berger, A., *Quaternary science reviews,* Apr.-May 1998, 17(4-5), p.411-426, Refs. p.423-426.

Pleistocene, Paleoclimatology, Insolation, Ice age theory, Glaciation, Quaternary deposits, Ice rafting, Glacier oscillation, Marine deposits, Simulation

52-6458

Deglaciation of a soft-bedded Laurentide ice sheet.

Licciardi, J.M., Clark, P.U., Jenson, J.W., Macayeal, D.R., *Quaternary science reviews,* Apr.-May 1998, 17(4-5), p.427-448, Refs. p.446-448.

Pleistocene, Ice sheets, Glacial geology, Glacier oscillation, Glacier beds, Deformation, Ice volume, Topographic features, Sea level, Carbon isotopes, Isotope analysis, Mathematical models

52-6459

Visualization of cavitated vessels in winter and refilled vessels in spring in diffuse-porous trees by cryo-scanning electron microscopy.

Utsumi, Y., Sano, Y., Fujikawa, S., Funada, R., Ohtani, J., *Plant physiology,* Aug. 1998, 117(4), p.1463-1471, 35 refs.

Plant physiology, Trees (plants), Plant tissues, Cavitation, Water transport, Water balance, Temperature effects, Seasonal variations, Scanning electron microscopy, Cold weather tests

52-6460

Solid-liquid phase behavior of binary mixture of tetraethylene glycol decyl ether and water.

Nibu, Y., Inoue, T., *Journal of colloid and interface science,* Sep. 15, 1998, 205(2), p.231-240, 32 refs.

Surfactants, Colloids, Solutions, Frozen liquids, Phase transformations, Solid phases, Hydrates, Temperature measurement, Infrared spectroscopy, Spectra, Thermodynamics, Temperature effects

52-6461

IGARSS'98. Sensing and managing the environment.

International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998, New York, Institute of Electrical and Electronics Engineers, 1998, 2754p. (5 vols.), Refs. passim. For selected papers see 52-6462 through 52-6563 or C-60041, C-60043, C-60044, C-60047, C-60049, C-60062, C-60063, E-60046, F-60042, F-60045, F-60048, F-60050 through F-60061 and F-60064.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Snow surveys, Snow cover distribution, Glacier surveys, Terrain identification, Spaceborne photography, Synthetic aperture radar, Radio echo soundings, Radiometry, Backscattering, Image processing

This conference contains 24 papers pertinent to the Antarctic. They deal mainly with satellite observations of sea ice, ice sheets, and snow in Antarctica, particularly by synthetic aperture radar (SAR) and microwave radiometry.

52-6462

Extinction behaviour of dry snow at microwave range up to 90 GHz by using strong fluctuation theory.

Wang, H.N., Pulliainen, J., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.42-44, 6 refs.

Snow electrical properties, Snow temperature, Snow cover effect, Microwaves, Backscattering, Radiation absorption, Radiometry, Mathematical models

52-6463

Comparative study of the effective propagation constant in a random medium containing coated dielectric particles.

Nanbu, Y., Matsuoka, T., Tateiba, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.48-50, 9 refs.

Microwaves, Wave propagation, Snow cover effect, Snow electrical properties, Ice dielectrics, Water films, Snow water content, Mathematical models

52-6464

Correlated observations by the ERS-1 and multichannel SSM/I and data simulation from theoretical models of random media.

Jin, Y.Q., Zhang, N.X., Zheng, F.H., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.51-53, 7 refs.

Spaceborne photography, Radiometry, Backscattering, Sea states, Snow surveys, Snow cover structure, Snow water content, Mathematical models

52-6465
RADARSAT Antarctica Mapping System: system overview—an update.
Norikane, L., Wilson, B., Jezek, K.C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.265-267, 1 ref.
Mapping, Spaceborne photography, Synthetic aperture radar, Image processing, Data processing, Data transmission, Research projects
In Oct. 1997, RADARSAT mapped the entire antarctic continent from space, presenting scientists with an unprecedented snapshot of the entire continent in the microwave spectrum. NASA has charged the Byrd Polar Research Center with the goal of producing a full continental map using this data, subject to a number of constraints to maximize the utility of the data to the scientific community. To meet these requirements, a number of SAR data processing techniques shall be applied including orthorectification processing, block adjustments for ephemeris refinements, simulation techniques and radiometric balancing for automated image seam removal. These techniques are implemented in the RADARSAT Antarctica Mapping System developed by Vexcel Corporation for the Byrd Polar Research Center. This paper provides an overview of the system and preliminary results obtained by processing data from the Antarctic Mapping Mission. (Auth.)

52-6466
Last two decades of multiparameter observations in radar meteorology: prelude to an even brighter future.
Seliga, T.A., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.421-424, 82 refs.
Radar, Radio echo soundings, Cloud physics, Hail clouds, Hail, Ice detection, Weather forecasting

52-6467
Ice crystal size estimation using multiple-wavelength radar.
Sekelsky, S.M., McIntosh, R.E., Ecklund, W.L., Gage, K.S., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.425-428, 16 refs.
Radar, Radio echo soundings, Backscattering, Cloud physics, Ice crystal size, Ice detection, Weather forecasting

52-6468
Polarimetric signatures of ice crystals in clouds.
Ryzhkov, A.V., Zrnic, D.S., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.429-431, 5 refs.
Cloud physics, Ice crystal size, Ice detection, Water content, Radar echoes, Radio echo soundings, Backscattering, Polarization (waves), Weather forecasting

52-6469
Aircraft icing detection using dual-wavelength and polarization radar observations.
Vivekanandan, J., Martner, B.E., Politovich, M.K., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.432-436, 12 refs.
Aircraft icing, Ice detection, Cloud physics, Ice crystal size, Water content, Radio echo soundings, Weather forecasting

52-6470
Simultaneous multiparameter radar and 2D-video disdrometer observations of snow.
Ibrahim, I.A., et al, International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.437-439, 3 refs.
Snowstorms, Falling snow, Snowfall, Cloud physics, Ice crystal size, Ice detection, Radio echo soundings, Weather forecasting

52-6471
Separation of millimeter-wave radar reflectivities of aggregates and pristine ice crystals in a cloud.
Aydin, K., Walsh, T.M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.440-442, 8 refs.
Cloud physics, Ice crystal structure, Ice detection, Water content, Radar echoes

52-6472
Compact millimeter wave radar for airborne studies of clouds and precipitation.
Bambha, R.P., Carswell, J.R., Mead, J.B., McIntosh, R.E., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.443-445, 3 refs.
Airborne radar, Meteorological instruments, Cloud physics, Clouds (meteorology), Precipitation (meteorology), Radio echo soundings, Weather forecasting

52-6473
Preliminary results of cloud observation with millimeter wave multi-parameter cloud profiling radar (SPIDER).
Horie, H., Hanado, H., Ohsaki, Y., Iguchi, T., Kumagai, H., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.455-457, 4 refs. SPIDER is a pun on the Japanese word, *kumo*, which can mean either cloud or spider.
Airborne radar, Meteorological instruments, Radio echo soundings, Cloud physics, Clouds (meteorology), Water content, Ice detection

52-6474
Unfocused SAR using a next-generation coherent radar depth sounder for measurement of Greenland ice sheet thickness.
Legarsky, J., Gogineni, S.P., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.463-465, 2 refs.
Ice sheets, Glacier surveys, Glacier thickness, Radio echo soundings, Synthetic aperture radar, Greenland

52-6475
3-D simulation of subsurface PEC sensing for discrimination enhancement using bistatic positional, angular, and polarization diversity.
Haider, S.A., O'Neill, K., Paulsen, K.D., MP 5208, International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.1, New York, Institute of Electrical and Electronics Engineers, 1998, p.520-523, 8 refs.
Military facilities, Explosives, Waste disposal, Soil pollution, Land reclamation, Electromagnetic prospecting, Subsurface investigations, Radio echo soundings, Environment simulation
This paper presents results intended to improve understanding of the gains to be made in subsurface electromagnetic discrimination by employing bistatic positional, angular, and polarization diversity. Applying a 3-D finite element approach eliminates any restriction to axisymmetric geometries in targets and environment; and recent numerical innovations allow us to perform meaningful 3-D simulations at the workstation level. For specificity the authors assume an incident wave polarized in the (X,Z) plane of incidence, where Z is aligned with longitudinal target axis, for orientable targets. The simulations show physically explicable gains in discrimination from bistatic, polarimetric, multi-angle observation, even at a single frequency, with wavelengths an order of magnitude larger than characteristic target dimensions.

52-6476
Helsinki University of Technology synthetic aperture radiometer.
Valmu, H., Mononen, I., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.553-555, 3 refs.
Airborne radar, Synthetic aperture radar, Radiometry, Aerial surveys, Terrain identification, Snow surveys, Ice surveys, Research projects

52-6477
Lake Superior ice viewed using RADARSAT-1 ScanSAR imagery and low-altitude oblique air photos.
Pilant, A.N., Agarwal, A., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.583-585, 2 refs.
Lake ice, Ice surveys, Ice conditions, Ice detection, Synthetic aperture radar, Aerial surveys, Oblique photography, Spaceborne photography, Superior, Lake

52-6478
Automated Sea Ice Segmentation (ASIS).
Soh, L.K., Tsatsoulis, C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.586-588, 13 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice reporting, Synthetic aperture radar, Spaceborne photography, Image processing

52-6479
Research on the earth cover remote sensing problem carried out at the Altai State University.
Komarov, S.A., Mironov, V.L., Romanov, A.N., Evtiushkin, A.V., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.873-875, 4 refs.
Soil erosion, Soil pollution, Soil mapping, Snow composition, Snow impurities, Spaceborne photography, Russia—Altay

52-6480
Application of the Getis statistic to hemispheric and regional scale passive microwave derived snow water equivalent imagery.
Derksen, C., Wulder, M., LeDrew, E.F., Goodison, B.E., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.977-979, 5 refs.
Snow surveys, Snow cover distribution, Snow water equivalent, Spaceborne photography, Radiometry, Image processing, Statistical analysis

52-6481
Characteristics of the internal radio echoes in the antarctic ice sheet using a mobile VHF radio echo sounder.
Maeno, H., Uratsuka, S., Okamoto, K., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.980-982, 8 refs.
Ice sheets, Glacier surveys, Glacier thickness, Glacier flow, Glacier beds, Subglacial observations, Bottom topography, Electromagnetic prospecting, Radio echo soundings, Antarctica—Queen Maud Land
The authors developed a snowmobile-borne 179-MHz radar for radio-echo sounding of the antarctic ice sheet, aiming at measuring ice of more than 3,000 m in thickness and its internal structure. The field observation was carried out with this radar around Dome-F and along the over-snow traverse route from the coast near Showa Station to Dome-F, a distance of about 1,000 km. The bedrock topography was successfully measured under ice sheets thicker than 3,500 m, and the performance of the radar exceeded expectations. The internal radio-echoes reflected were found to be strongly polarized at 14

points along the route. In addition, a good correlation was found between the measured surface flow vectors and the orientation dependence of the attenuation. (Auth.)

52-6482
C-band backscattering signatures of Baltic Sea ice.
Mäkynen, M., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.983-985, 4 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Pressure ridges, Ice reporting, Airborne radar, Backscattering, Radio echo soundings, Baltic Sea

52-6483
Airborne observations of leads in the Beaufort Sea.
Tschudi, M.A., Curry, J.A., Maslanik, J.A., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.986-988, 7 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice openings, Ice edge, Ice heat flux, Aerial surveys, Radiometry, Image processing, Statistical analysis, Beaufort Sea

52-6484
Measuring the thermodynamic state of sea ice using synthetic aperture radar (SAR) time series data.
Yackel, J.J., Barber, D.G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.989-991.
Ice surveys, Sea ice distribution, Ice conditions, Ice heat flux, Ice temperature, Snow ice interface, Radiometry, Synthetic aperture radar, Backscattering, Radio echo soundings

52-6485
Dielectric properties of salted grounds in microwave band.
Kleshchenko, V.N., Komarov, S.A., Mironov, V.L., Romanov, A.N., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.992-994, 2 refs.
Saline soils, Frozen ground temperature, Frozen ground chemistry, Soil temperature, Salinity, Soil water, Moisture detection, Dielectric properties, Electromagnetic prospecting

52-6486
Development of interactive fly-through imaging and animation techniques for P-scope imaging radar simulation.
Henson, J.M., Stuopis, P.A., Davis, R.E., Hall, K., MP 5209, International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.2, New York, Institute of Electrical and Electronics Engineers, 1998, p.1109-1111, 5 refs.
Aerial surveys, Airborne radar, Radar photography, Photographic reconnaissance, Terrain identification, Environment simulation

52-6487
Comparison of Northern Hemisphere snow extent climatologies derived from passive microwave and visible remote sensing data.
Armstrong, R.L., Brodzik, M.J., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1255-1257, 10 refs.
Snow surveys, Snow cover distribution, Snow line, Snow water equivalent, Radiometry, Spaceborne photography, Data processing

52-6488
Mapping the spatial distribution and time evolution of snow water equivalent using neural network iterative approach and a snow hydrology model.
Chen, C.T., Nijssen, B., Wang, Y.K., Tsang, L., Hwang, J.N., Lettenmaier, D.P., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1258-1260, 4 refs.
Snow surveys, Snow cover distribution, Snow depth, Snow water equivalent, Snow hydrology, Snow temperature, Spaceborne photography, Radiometry, Computerized simulation

52-6489
Relationship between SSM/I measurements and snow conditions.
Grody, N.C., Rosenfeld, S., Basist, A., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1261-1264, 9 refs.
Snow surveys, Snow cover distribution, Snow cover structure, Snow temperature, Snow hydrology, Snow water equivalent, Spaceborne photography, Radio echo soundings, Backscattering, Radiometry

52-6490
Modeling microwave emission spectra of layered snowpacks.
Wiesmann, A., Mätzler, C., Hiltbrunner, D., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1265-1267, 6 refs.
Snow surveys, Snow cover structure, Snow temperature, Snow electrical properties, Radiometry, Spaceborne photography, Microwaves, Radar echoes, Computerized simulation

52-6491
Monitoring of the boreal regions from 1992 to 1996 with the Special Sensor Microwave Imager.
Mognard, N.M., Baillarin, S., Kerr, Y.H., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1268-1270, 6 refs.
Taiga, Forest land, Tundra climate, Phenology, Snow surveys, Snow cover distribution, Snow depth, Snow line, Surface temperature, Radiometry, Spaceborne photography

52-6492
Northern Great Plains snowpack hydrology from satellite passive microwave observations.
Josberger, E.G., Mognard, N.M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1271-1273, 9 refs.
Snow surveys, Snow cover distribution, Snow depth, Snow hydrology, Snow water equivalent, Snow temperature, Surface temperature, Radiometry, Spaceborne photography, United States—North Dakota, United States—South Dakota, United States—Minnesota

52-6493
Neuro-fuzzy approach for monitoring global snow and ice extent with the SSM/I.
Sun, C.Y., Neale, C.M.U., Cheng, H.D., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1274-1276, 11 refs.
Snow surveys, Ice surveys, Snow cover distribution, Sea ice distribution, Terrain identification, Spaceborne photography, Radiometry, Surface temperature, Data processing, Computerized simulation

52-6494
Algorithm development for satellite synthetic aperture radar (SAR) classification and mapping of Great Lakes ice cover.
Leshkevich, G.A., Nghiem, S.V., Kwok, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1397-1399, 6 refs.
Lake ice, Ice surveys, Ice conditions, Ice detection, Ice reporting, Synthetic aperture radar, Backscattering, Spaceborne photography, Data processing, Great Lakes

52-6495
C-band polarimetric backscatter observations of Great Lakes ice.
Nghiem, S.V., Leshkevich, G.A., Kwok, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1400-1402, 6 refs.
Lake ice, Ice surveys, Ice conditions, Ice detection, Ice reporting, Synthetic aperture radar, Backscattering, Spaceborne photography, Data processing, Great Lakes

52-6496
Alaska SAR Facility: overview and key geophysical applications.
Kaupp, V., Holt, B., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1424-1427.
Research projects, Synthetic aperture radar, Spaceborne photography, Terrain identification, Mapping, Data processing, Data transmission
The Alaska SAR Facility (ASF) is the NASA Distributed Active Archive Center that provides SAR (synthetic aperture radar) data and data products to polar and earth systems science communities and to operational agencies. ASF currently supports the ERS-1 and ERS-2 flown by the European Space Agency, JERS-1 flown by the National Space Development Agency of Japan, and RADARSAT flown by the Canadian Space Agency. ASF receives and archives SAR data for the US user community from ground stations at ASF and McMurdo base in Antarctica. ASF provides new acquisitions and archival data for many important geophysical disciplines, including sea ice, polar oceanography, volcanology, glaciology, wetlands ecosystems, forestry, geology, and oceanography. Examples of large scale campaigns or intense mapping projects are the Antarctic Mapping Mission, Global Rain Forest Mapping Project, and the Global Boreal Forest Mapping Project. (Auth. mod.)

52-6497
Snapshots of Antarctica from Radarsat-1.
Jezek, K.C., et al, International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1428-1430, 5 refs.
Research projects, Mapping, Terrain identification, Synthetic aperture radar, Spaceborne photography, Data processing, Data transmission, Antarctica
Carried aloft by a NASA rocket launched from Vandenburg Air Force Base on Nov. 4, 1995, the Canadian Radarsat-1 is equipped with a C-band Synthetic Aperture Radar (SAR) capable of acquiring high resolution (25 m) images of Earth's surface day or night and under all weather conditions. Along with the attributes familiar to researchers working with SAR data from the European Space Agency's Earth Remote Sensing Satellite and the Japanese Earth Resources Satellite, Radarsat-1 has enhanced flexibility to collect data using a variety of swath widths, incidence angles and resolutions. Most importantly, for scientists interested in Antarctica, Radarsat-1 can be maneuvered in orbit to rotate the normally right-looking SAR to left-looking mode. This 'Antarctic Mode' provides for the first time a nearly instantaneous, high-resolution view of the entirety of Antarctica on each of two proposed mappings separated by 2 years. The first Antarctic Imaging Campaign began on Sep. 9, 1997 and was successfully concluded on Oct. 20, 1997. (Auth.)

52-6498

Variability in sea-ice coverage and ice-motion dynamics in the PAL LTER study region west of the Antarctic Peninsula.

Stammerjohn, S.E., Smith, R.C., Drinkwater, M.R., Liu, X., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1434-1436, 7 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice openings, Drift, Air ice water interaction, Synthetic aperture radar, Spaceborne photography, Antarctica—Antarctic Peninsula

Sea-ice conditions and kinematics are studied in the Palmer Long-Term Ecological Research (PAL LTER) study region west of the Antarctic Peninsula. Remote sensing data from ERS-1 Synthetic Aperture Radar and Scatterometer and from DMSP SSM/I, are used to study the influence of synoptic weather systems on sea-ice characteristics during July-Aug. 1992. Weather records from Palmer Station on Anvers I. show large cyclonic storms moving through the western Antarctic Peninsula (WAP) region on a quasi-weekly basis. Periods of strong north-westerly to north-easterly winds caused above normal air temperatures and in turn a rapid early retreat of the sea-ice cover in the WAP region. Ice motion derived from SSM/I images reveals the large-scale sea-ice kinematics during these periods together with statistical summaries of the impact of each storm upon regional opening/closing. (Auth.)

52-6499

Evidence for the tectonic segmentation of the Antarctic Peninsula from integrated ERS-1 SAR mosaic and aeromagnetic anomaly data.

Noltimier, K.F., Jezek, K.C., Wilson, T.J., Johnson, A.C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1439-1441, 3 refs.

Tectonics, Earth crust, Continental drift, Geologic structures, Marine geology, Fracture zones, Geophysical surveys, Magnetic surveys, Topographic surveys, Synthetic aperture radar, Spaceborne photography, Antarctica—Antarctic Peninsula

The Antarctic Peninsula (AP) is a Mesozoic-Cenozoic Andean-type magmatic arc resulting from subduction of Pacific Ocean lithosphere beneath its western margin. During the past 60 million years discrete segments of the Pacific-Phoenix spreading ridge have successively collided with the western margin of the AP diachronously from south to north in a series of ridge-crest collision episodes. Previous work suggested that the AP (upper plate) was tectonically segmented due to subduction of discrete ridge-crest segments, with segments bounded by the projection of oceanic fracture zones (OFZ). An ERS-1 SAR mosaic was created over the Graham Land-Palmer Land Transition Zone and combined with aeromagnetic anomaly and mapped geologic data to study how the process of OFZ subduction modified AP structure. Correlation between the SAR and aeromagnetic lineaments and OFZ traces suggests that faulting reflects the response of the AP crust to OFZ subduction. (Auth. mod.)

52-6500

Snow measurements using the airborne HUTRAD system.

Hallikainen, M., Rautiainen, K., Koskinen, J., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1515-1517, 2 refs.

Snow surveys, Snow cover distribution, Snow temperature, Snow water equivalent, Terrain identification, Airborne radar, Radiometry

52-6501

High frequency passive microwave radiometry over a snow-covered surface in Alaska.

Tait, A., Hall, D.K., Foster, J.L., Chang, A.T.C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1518-1520, 4 refs.

Snow surveys, Snow cover distribution, Snow temperature, Terrain identification, Aerial surveys, Radiometry, Environment simulation, Image processing

52-6502

SAR tools for snowmelt modelling in the project HydAlp.

Nagler, T., Rott, H., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1521-1523, 5 refs.

Snow surveys, Snow cover distribution, Snow hydrology, Snowmelt, Runoff forecasting, Synthetic aperture radar, Spaceborne photography, Image processing, Environment simulation, Austria

52-6503

Error analysis for global snow-cover mapping in the Earth Observation System (EOS) era.

Hall, D.K., Foster, J.L., Salomonson, V.V., Klein, A.G., Chien, J.Y.L., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1524-1526, 8 refs.

Snow surveys, Snow cover distribution, Snow line, Terrain identification, Radiometry, Spaceborne photography, Image processing, Statistical analysis

52-6504

Snow-cover effects on emission from sea ice.

Fung, A.K., Tjuatja, S., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1527-1529, 5 refs.

Snow ice interface, Snow cover effect, Sea ice, Ice electrical properties, Microwaves, Wave propagation, Radiometry

52-6505

Active microwave observation and modeling of snowpack thickness on arctic sea ice.

Onstott, R.G., Barber, D.G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1530-1532, 3 refs.

Snow surveys, Ice surveys, Sea ice, Snow ice interface, Snow depth, Snow cover effect, Snow temperature, Ice heat flux, Synthetic aperture radar, Radio echo soundings, Backscattering

52-6506

Wet snow-cover mapping by C- and L-band polarimetric SAR.

Holden, M., Solberg, A.S., Solberg, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1533-1537, 7 refs.

Snow surveys, Snow cover distribution, Terrain identification, Synthetic aperture radar, Radio echo soundings, Backscattering, Image processing

52-6507

Cloude's target decomposition theorems applied to EMISAR data aquired during EMAC'95 snow campaign.

Praks, J., Koskinen, J., Arslan, A.N., Kruopis, N., Alasalmi, H., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1538-1540, 5 refs.

Snow surveys, Snow cover distribution, Snow depth, Terrain identification, Aerial surveys, Synthetic aperture radar, Backscattering, Image processing, Finland

52-6508

Estimation of snow water equivalent from SSM/I data by using a physical model-based inversion algorithm.

Pulliainen, J., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1541-1543, 9 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow water equivalent, Snow temperature, Radiometry, Radio echo soundings, Spaceborne photography, Image processing, Computerized simulation

52-6509

Investigation of passive microwave signatures over snow-covered forest areas.

Kruopis, N., Koskinen, J., Praks, J., Arslan, A.N., Alasalmi, H., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1544-1546, 5 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow water equivalent, Snow temperature, Forest land, Terrain identification, Synthetic aperture radar, Radiometry

52-6510

Correlation functions and correlation lengths for dry snow.

Wang, H.N., Pulliainen, J., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1547-1549, 6 refs.

Snow cover structure, Snow electrical properties, Microwaves, Wave propagation, Radiometry, Statistical analysis, Mathematical models

52-6511

Application of a technique, based on local image homogeneity, to delineate spatial objects in satellite images.

Williams, R.N., Crowther, P., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1602-1604, 5 refs.

Icebergs, Ice detection, Drift, Radar tracking, Terrain identification, Synthetic aperture radar, Spaceborne photography, Image processing

An object detection technique, employing a pixel bonding process guided by a local image homogeneity measure, has been used to delineate spatial objects in remotely-sensed images. The technique is based on an earlier technique, originally designed for sea ice mapping in the Arctic, and has been evaluated for more general application in the remote sensing field by attempting to use it to solve object delineation problems in two different environmental remote sensing applications. The first application involved the delineation and subsequent analysis of icebergs in synthetic aperture radar images of the antarctic coastline. The second application involved the automated tracing of paddock boundaries in SPOT images of agricultural areas in Tasmania. (Auth.)

52-6512

InSAR results from the RADARSAT Antarctic Mapping Mission data: estimation of glacier motion using a simple registration procedure.

Gray, A.L., et al, International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1638-1640, 1 ref.

Glacier surveys, Glacier flow, Ice shelves, Glacier oscillation, Synthetic aperture radar, Spaceborne photography, Image processing, Antarctica—Filchner Ice Shelf

An interferometric method is used to derive ice motion from RADARSAT data collected during the Antarctic Mapping Mission. Although one cannot solve for both topography and ice motion using one interferometric pair, it is possible to use a coarsely sampled digital terrain model to estimate ice motion using an image registration method. Less accurate than the usual fringe counting method for estimation of radial displacement, the image registration method

allows useful motion estimation in both range and azimuth. The method is described and some results shown for a large area (ca. 17,000 km^2) including ice flow into the Filchner Ice Shelf. (Auth.)

52-6513

Using repeat-pass SAR interferometry for mapping wet snowcovers.

Strozzi, T., Wegmüller, U., Mätzler, C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1650-1652, 9 refs.

Snow surveys, Snow cover distribution, Wet snow, Snow water content, Radio echo soundings, Synthetic aperture radar, Spaceborne photography

52-6514

Nonlinear multispectral statistical CLEAN-based precipitation parameter retrieval algorithm.

Skofronick-Jackson, G.M., Gasiewski, A.J., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1674-1676, 6 refs.

Cloud physics, Clouds (meteorology), Precipitation (meteorology), Ice detection, Ice crystal size, Weather forecasting, Radio echo soundings, Radiometry, Spaceborne photography, Image processing, Statistical analysis

52-6515

Sea ice mapping algorithm for QuikSCAT and Seawinds.

Remund, Q.P., Long, D.G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.3, New York, Institute of Electrical and Electronics Engineers, 1998, p.1686-1688, 6 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice edge, Radio echo soundings, Radiometry, Spaceborne photography, Image processing

52-6516

Multitemporal SAR image description: application to image compression.

Mercier, G., Mouchot, M.C., Cazuguel, G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1742-1744, 7 refs.

Icebergs, Ice detection, Ice reporting, Ice routing, Ice forecasting, Radar tracking, Synthetic aperture radar, Spaceborne photography, Data transmission, Image processing

This paper presents a new method for compressing temporal series of SAR images. The algorithm can take into consideration regions of interest specifying the local compression quality requested. Comparisons with classical compression algorithm, showed that this method gives better results especially at high compression rates of icebergs. This algorithm was applied to a set of RADARSAT images acquired over Antarctica. Those images were compressed at a rate of 0.25 bits per pixel, and brought on an icebreaker via an affordable INMARSAT connection, while still remaining of sufficient quality for ship routing usage. (Auth. mod.)

52-6517

ERS-1/2 SAR land applications: overview and main results.

Attema, E.P.W., Duchossois, G., Kohlhammer, G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1796-1798, 3 refs.

Research projects, Spacecraft, Spaceborne photography, Synthetic aperture radar, Terrain identification, Glacier surveys, Ice surveys

52-6518

Land surface process modeling and passive microwave remote sensing of arctic tundra regions.

Kim, E.J., England, A.W., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1849-1851, 17 refs.

Tundra climate, Tundra soils, Soil air interface, Soil temperature, Permafrost heat balance, Radiometry, Computerized simulation, United States—Alaska—North Slope

52-6519

Classification of snow facies on the Greenland ice sheet using passive microwave and SAR imagery.

Joshi, M.D., Bolzan, J.F., Jezek, K.C., Merry, C.J., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1852-1854, 10 refs.

Glacier surveys, Ice sheets, Snow air interface, Snow ice interface, Snow temperature, Snow water content, Glacial meteorology, Glacier oscillation, Climatic changes, Synthetic aperture radar, Radiometry, Spaceborne photography, Greenland

52-6520

Determination of the equilibrium line on an alpine glacier using remote sensing data fusion techniques.

Schaper, J., Rehrauer, H., Seidel, K., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1855-1857, 11 refs.

Mountain glaciers, Glacier surveys, Glacier mass balance, Snow ice interface, Snow line, Aerial surveys, Radio echo soundings, Image processing

52-6521

Role of Earth Observation in snowmelt runoff monitoring from high latitude basins: SAR aspects.

Caves, R., Turpin, O., Nagler, T., Miller, D., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1858-1860, 3 refs.

Snow surveys, Snow cover distribution, Snow water content, Snow hydrology, Snowmelt, Synthetic aperture radar, Backscattering, Spaceborne photography, Runoff forecasting

52-6522

Application of remote sensing data derived from NOAA-AVHRR images.

Taschner, S., Strasser, U., Mauser, W., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1861-1863, 8 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow hydrology, Snow heat flux, Snow water equivalent, Snowmelt, Spaceborne photography, Radiometry, Runoff forecasting, Germany

52-6523

Use of NOAA AVHRR imagery in snow monitoring.

Metsämäki, S., Jänne, S., Koskinen, J., Grandell, J., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1864-1866, 2 refs.

Snow surveys, Snow cover distribution, Snow temperature, Snow melting, Radiometry, Synthetic aperture radar

52-6524

Semi-operational snow melt monitoring using ERS SAR.

Koskinen, J., Metsämäki, S., Jänne, S., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1867-1869, 4 refs.

Snow surveys, Snow cover distribution, Snow hydrology, Snow melting, Spaceborne photography, Synthetic aperture radar, Radiometry, Backscattering, Runoff forecasting, Finland

52-6525

Retrieving snow water equivalence on C- and L-band SAR data for dry snow.

Arslan, A.N., Koskinen, J., Praks, J., Alasalmi, H., Kruopis, N., Hallikainen, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1870-1872, 7 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow density, Snow hydrology, Snow water equivalent, Spaceborne photography, Synthetic aperture radar, Backscattering

52-6526

Advanced ground truth for snow and glacier sensing.

Brandelik, A., Huebner, C., Doepke, G., Wunderle, S., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1873-1875, 9 refs.

Snow survey tools, Snow density, Snow electrical properties, Snow water content, Electromagnetic prospecting, Moisture meters

52-6527

Sea ice analysis and products: cooperative work at the U.S. and Canadian national ice centers.

Bertoia, C., Ramsay, B., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1944-1947, 5 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice reporting, Ice forecasting, Synthetic aperture radar, Spaceborne photography, Data processing, Data transmission

52-6528

Validation of SSM/I sea ice concentration algorithms for the Okhotsk Sea.

Cho, K., Narabu, T., Shimoda, H., Sakata, T., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1948-1950, 5 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Ice detection, Radiometry, Spaceborne photography, Image processing, Okhotsk Sea

52-6529

Arctic Ocean multiyear ice concentration changes during winters 1992-93 and 1996-97: a comparison between SSM/I estimations and scatterometer data.

Gohin, F., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1951-1953, 5 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice temperature, Radiometry, Backscattering, Spaceborne photography

52-6530

Melt pond coverage statistics from classified satellite data.

Fetterer, F., Untersteiner, N., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1954-1956, 8 refs.

Ice surveys, Sea ice distribution, Ice detection, Ice floes, Ice surface, Ice temperature, Ice melting, Ponds, Meltwater, Albedo, Spaceborne photography, Statistical analysis, Beaufort Sea

52-6531

Synoptic-scale feedbacks between the atmosphere and cryosphere based upon Q-vector diagnostics: a case study of the Beaufort Sea.

LeDrew, E.F., Derksen, C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1957-1960, 7 refs.

Ice surveys, Sea ice distribution, Ice conditions, Drift, Ice air interface, Polar atmospheres, Atmospheric circulation, Spaceborne photography, Statistical analysis, Beaufort Sea

52-6532

Arctic sea ice as a granular material.

Overland, J.E., McNutt, S.L., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1961-1963, 2 refs.

Sea ice, Ice plasticity, Ice deformation, Drift, Ice air interface, Wind factors, Drift stations, Spaceborne photography, Beaufort Sea

52-6533

Geophysical signatures from precise altimetric height measurements in the Arctic Ocean.

Peacock, N.R., Laxon, S.W., Maslowski, W., Winebrenner, D.P., Arthern, R.J., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1964-1966, 8 refs.

Ice surveys, Sea ice distribution, Ice cover thickness, Ice surface, Height finding, Topographic surveys, Radio echo soundings, Spaceborne photography

52-6534

NSCAT views land and ice.

Long, D.G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1973-1975, 4 refs.

Terrain identification, Glacier surveys, Ice surveys, Ice detection, Radio echo soundings, Spaceborne photography, Image processing

52-6535

Polar sea-ice classification using enhanced resolution NSCAT data.

Remund, Q.P., Long, D.G., Drinkwater, M.R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1976-1978, 5 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Radio echo soundings, Backscattering, Spaceborne photography, Image processing

52-6536

Interannual variability in Weddell Sea ice from ERS Wind Scatterometer.

Drinkwater, M.R., Liu, X., Low, D., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1982-1984, 8 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Ice detection, Ice melting, Ice surface, Ponds, Radio echo soundings, Backscattering, Spaceborne photography, Antarctica—Weddell Sea

ERS-1/2 SAR and Wind Scatterometer data are analyzed together with SSM/I radiometer data to investigate interannual variability in Weddell Sea ice and summer melt signatures during the period 1992-1997. Simultaneous SAR and Scatterometer images were obtained during a Feb. 1995 cruise of the H.M.S. *Endurance* and aerial photographs collected for validation of the observations. Accompanying field data are used to illustrate observed variability, and to validate the first ever observation of extensive summer melt ponding in the Weddell Sea. (Auth.)

52-6537

Time evolution of the microwave signatures of a drifting arctic ice feature in 1996-1997.

Gohin, F., Ezraty, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1985-1987, 5 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Drift, Ice temperature, Radar tracking, Radio echo soundings, Backscattering, Spaceborne photography

52-6538

Wind-induced directional anisotropy of microwave backscatter and its impact on imaging of the antarctic continental snow cover.

Hyland, G., Young, N.W., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.1988-1990, 4 refs.

Snow surveys, Snow cover distribution, Snow electrical properties, Snow ice interface, Snow melting, Ice detection, Terrain identification, Radio echo soundings, Backscattering, Spaceborne photography, Antarctica

The 500 km wide swath of the right-looking ERS wind scatterometer and the orbital geometry allows measurement of the microwave backscatter of the entire antarctic region north of latitude 79°S. The values of the backscatter coefficient depend on the incidence angle and look directions of the antenna beams. Models of microwave backscatter which omit the azimuthal modulation introduce significant biases and temporal variations into the isotropic component of the backscatter. Use of these models, therefore, is likely to mask real physical variations due to changing surface conditions in areas where directional anisotropy is significant. (Auth.)

52-6539

High spatial resolution radar altimeter for ocean and ice-sheet monitoring.

Phalippou, L., Piau, P., Wingham, D.J., Mavrocordatos, C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2020-2022, 6 refs.

Glacier surveys, Ice sheets, Glacier thickness, Glacier surfaces, Topographic surveys, Radio echo soundings, Height finding, Spaceborne photography, Greenland

52-6540

Remote sensing of sea ice surface thermal states under cloud cover.

Nghiem, S.V., et al, MP 5210, International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2219-2221, 8 refs.

Sea ice, Ice detection, Ice air interface, Ice heat flux, Ice temperature, Surface temperature, Cloud cover, Albedo, Synthetic aperture radar, Radio echo soundings, Radiometry, Backscattering, Spaceborne photography

It is necessary to know sea ice surface thermal states under cloud cover to evaluate cloud effects in the overall climatic feedback mechanisms in polar regions. The challenge is that traditional methods using radiometers such as AVHRR for surface temperature measurements fail under cloudy conditions. The authors present a new method combining C-band radar data to study sea ice surface temperature change and visible/infrared radiometer data to identify clouds. C-band radar backscatter is sensitive to sea ice surface thermal states. This relationship is utilized to develop the methodology for the sea ice surface temperature study. SAR data show an increase in sea ice surface temperature, caused by an excess in the surface heat balance under cloud cover. The method is applicable to arctic first-year ice. For antarctic sea ice, this method is particularly appropriate since the antarctic ice cover consists of vast regions of first-year ice where salinity levels are generally higher than those of arctic sea ice of similar age and structure. (Auth. mod.)

52-6541

SIR-C polarimetric radar results from the Weddell Sea, Antarctica.

Eriksson, L., Drinkwater, M.R., Holt, B., Valjavek, E., Nortier, O., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2222-2224, 3 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Spaceborne photography, Radio echo soundings, Backscattering, Antarctica—Weddell Sea

Polarimetric radar data acquired by SIR-C in the eastern Weddell Sea have been analyzed to investigate techniques for discriminating thin, recently formed sea-ice from thicker first year ice and open water. Several different parameters from both the L-band and the C-band have been studied to understand the scattering processes for different forms of ice. Results indicate that it is possible to differentiate between all the primary ice types appearing in the area (except between brash ice and deformed first year ice) by comparing a combination of the studied parameters. The best results are found when the L-band VV-polarized backscatter and HH- and VV-pol correlation coefficient, and the co-pol ratio HH/VV in C-band are combined. This increases the possibility to use these data to study how new ice evolves under these unique southern ocean conditions. (Auth. mod.)

52-6542

Analysis of glacier flow dynamics from preliminary RADARSAT InSAR data of the Antarctic Mapping Mission.

Forster, R.R., Jezek, K.C., Sohn, H.G., Gray, A.L., Matter, K.E., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2225-2227, 3 refs.

Glacier surveys, Glacier flow, Glacier friction, Glacier surfaces, Ice deformation, Topographic surveys, Synthetic aperture radar, Spaceborne photography, Antarctica—Recovery Glacier

The entire continent of Antarctica was mapped at a 25-m resolution with synthetic aperture radar (SAR) during the Radarsat Antarctic Mapping Project over a 30-day period in the fall of 1997 providing a static "snapshot" of the ice sheet. Since Radarsat-1 has a 24-day orbit cycle, repeat-pass interferometric SAR (InSAR) data was also acquired. The extensive InSAR data will provide a view of ice sheet kinematics, for use in studies of glacier dynamics over vast unexplored areas. This information is required to determine the response of the antarctic ice sheet to present and future climate change. This paper presents the results of analysis of an InSAR pair for the Recovery Glacier, East Antarctica. (Auth.)

52-6543

Change monitoring of antarctic sea ice using NSCAT dual-polarized backscatter measurements.

Yueh, S.H., Kwok, R., Nghiem, S.V., West, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2228-2230, 6 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Freezeup, Sea water freezing, Ice forecasting, Radio echo soundings, Backscattering, Spaceborne photography, Antarctica—Weddell Sea

Polar sea ice characteristics and the timing of seasonal transitions are important parameters in the study of polar processes and climate changes. NSCAT Ku-band active microwave observations of the antarctic sea ice cover are described in this article with emphasis on the monitoring of ice covers through the change of Ku-band backscatter signatures. A simple backscatter and polarization ratio threshold algorithm was used to discriminate sea ice and open water with NSCAT dual-polarized backscatter data. The estimated backscatter of classified sea ice pixels is illustrated. The new first year and pancake sea ice have a backscatter level similar to those of corresponding ice types in the Arctic, although the ice growth mechanisms are quite different. The significant changes of ice backscatter in the

Weddell Sea correlates well the timing of fall freeze-up. This should provide a useful large-scale estimate of the dates of freeze-up. A more extensive validation of the potential of this dataset is definitely suggested. (Auth.)

52-6544

Saline ice thickness retrieval under diurnal thermal cycling conditions.

Shih, S.E., Ding, K.H., Kong, J.A., Nghiem, S.V., Jordan, A.K., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2231-2233, 7 refs.

Salt ice, Sea ice, Ice thermal properties, Ice heat flux, Ice growth, Ice cover thickness, Ice forecasting, Ice surveys, Radio echo soundings, Backscattering, Mathematical models, Computerized simulation

52-6545

Representing sea ice knowledge in a Dempster-Shafer belief system.

Soh, L.K., Tsatsoulis, C., Bowers, T., Williams, A., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2234-2236, 10 refs.

Sea ice distribution, Ice conditions, Ice detection, Ice forecasting, Ice models, Spaceborne photography, Synthetic aperture radar, Image processing, Computerized simulation

52-6546

Comparison of neural network classifiers for NSCAT sea ice flag.

Park, J.D., Jones, W.L., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2237-2239, 5 refs.

Ice surveys, Sea ice distribution, Ice detection, Ice conditions, Ice edge, Terrain identification, Radio echo soundings, Backscattering, Synthetic aperture radar, Spaceborne photography, Data processing, Image processing

The NASA Scatterometer (NSCAT) is designed to measure wind vectors over ice-free oceans. To prevent contamination of the wind measurements, by the presence of sea ice, algorithms based on neural network technology have been developed to classify ice-free ocean surfaces. MultiLayer Perceptron, Radial Basis Function neural networks trained using normalized radar cross section measurements from Ku-band NSCAT Scatterometer are described and compared. Algorithm skill in locating the sea ice edge around arctic and antarctic regions is evaluated by comparisons with surface truth (SSMI and SAR images). Classification results show the usefulness of using neural network techniques in flagging ice-free cells in real time and independently of other sensors. (Auth.)

52-6547

Flow variations of the antarctic ice sheet from comparison of modern and historical satellite data.

Jezek, K.C., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2240-2242, 8 refs.

Glacier surveys, Ice sheets, Ice shelves, Glacier oscillation, Glacier flow, Glacier surfaces, Topographic surveys, Spaceborne photography, Antarctica—Ross Ice Shelf, Antarctica—Crary Ice Rise

Since 1962, high quality satellite images of the Antarctic have been acquired which cover much of the southern continent. The earliest images, from the Corona Program, have only recently become available to the science community. They reveal a rich variety of details about the ice sheet, ice shelves, grounding lines, and rocky areas. The most recent high-resolution images covering all of Antarctica were collected by the Canadian Radarsat-1 in Sep. and Oct. of 1997. That activity, a collaboration between NASA and the Canadian Space Agency, has resulted in the first, complete, high resolution SAR mapping of the Antarctic. The Radarsat images are also spectacular and graphically portray antarctic ice streams, outlet glaciers, calving margins, and mountains. This paper examines how different antarctic flow regimes have changed over the 35-year interval between Corona and Radarsat. Study areas focus on the Ross Ice Shelf and Crary Ice Rise. The comparison reveals dramatic variations in ice flow, particularly around Crary Ice Rise—an area of long standing glaciological interest because of its potential for retarding upstream flow. (Auth. mod.)

52-6548

Areal changes and motion of northern Larsen Ice Shelf, Antarctic Peninsula.

Rack, W., Rott, H., Nagler, T., Skvarca, P., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2243-2245, 7 refs.

Glacier surveys, Ice shelves, Glacier oscillation, Glacier flow, Ice breakup, Topographic surveys, Synthetic aperture radar, Spaceborne photography, Antarctica—Larsen Ice Shelf

Areal changes and motion field of the northern Larsen Ice Shelf, Antarctic Peninsula, were analyzed based on Landsat TM data from 1986 to 1989 and ERS SAR data from 1991 to 1997. During this period the ice shelf north of Jason Peninsula decreased from 16,200 km^2 to 10,600 km^2. The main single event was observed in Jan. 1995, when the two northernmost sections disintegrated almost completely. Velocities on the ice shelf were derived from TM and SAR data by feature tracking using cross-correlation techniques, based on repeat images of one-year intervals. The satellite derived motion compares well with field measurements which are available at a few sites. (Auth.)

52-6549

Ice flow in northeast Greenland derived using balance velocities as control.

Joughin, I., Fahnestock, M., Thomas, B., Kwok, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2246-2248, 4 refs.

Glacier surveys, Ice sheets, Glacier thickness, Glacier flow, Glacier oscillation, Glacier surfaces, Topographic surveys, Radio echo soundings, Spaceborne photography, Image processing, Statistical analysis, Greenland

52-6550

Satellite observations of ice sheet accumulation rate.

Arthern, R.J., Winebrenner, D.P., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2249-2251, 12 refs.

Glacier surveys, Ice sheets, Glacier alimentation, Glacial meteorology, Glacier thickness, Glacier oscillation, Snowfall, Precipitation (meteorology), Snow ice interface, Sea level, Radiometry, Spaceborne photography, Statistical analysis

Accurate predictions of sea level rise over the coming century will require improved knowledge of the process controlling accumulation upon the antarctic ice sheet. The sparsity of accumulation rate observations, both spatially and temporally, has hindered the development of this understanding. The authors describe a new method to observe accumulation rates using satellite observations of the thermal microwave emission at 4.5 cm wavelength. At this wavelength, scattering by grains is unimportant: the emissivity is controlled by reflections brought about by density stratification within the firn. The method relies upon a link between accumulation rate, and two parameters which characterize the stratification (the standard deviation of density fluctuations, and the mean layer thickness). By also linking these two parameters to the polarization ratio observed by the Scanning Multichannel Microwave Radiometer, the capability to map accumulation rates from space is developed. (Auth. mod.)

52-6551

Seasat, ERS-1/2 and NSCAT scatterometer observed changes on the large ice sheets.

Drinkwater, M.R., Long, D.G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2252-2254, 10 refs.

Glacier surveys, Ice sheets, Glacier oscillation, Glacier mass balance, Glacial meteorology, Global warming, Radio echo soundings, Backscattering, Spaceborne photography, Greenland

52-6552

Seasonal and interannual elevation change measurement of the Greenland ice sheet from satellite radar altimetry.

Davis, C.H., Segura, D.M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2255-2257, 6 refs.

Glacier surveys, Ice sheets, Glacier oscillation, Glacier thickness, Glacier mass balance, Glacier surfaces, Height finding, Topographic surveys, Radio echo soundings, Spaceborne photography, Greenland

52-6553

Coherent radar depth sounder measurements over the Greenland ice sheet.

Gogineni, S.P., Legarsky, J., Thomas, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2258-2260, 6 refs.

Glacier surveys, Ice sheets, Glacier oscillation, Glacier thickness, Glacier mass balance, Aerial surveys, Topographic surveys, Airborne radar, Radio echo soundings, Greenland

52-6554

Interannual variability of antarctic snow melt events derived from scatterometer data.

Young, N.W., Hyland, G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2261-2263, 5 refs.

Snow surveys, Snow cover distribution, Snow hydrology, Snow water content, Snow melting, Snowmelt, Radio echo soundings, Backscattering, Spaceborne photography, Statistical analysis, Antarctica

Microwave backscatter from the antarctic snow cover depends on the surface roughness, properties and structure within the snow cover, and moisture content. Small increases in moisture content produce a significant reduction in backscatter. This acts as a sensitive indicator of the occurrence of snow melt conditions. The ERS wind scatterometers provide an almost continuous sequence of observations of microwave backscatter coefficients over Antarctica north of latitude 79°S since Aug. 1991. Normalized values of the backscatter coefficient are calculated by removing the anisotropic contributions, mainly from a dependence on incidence angle. Depression of these values below a long term dry snow average indicates occurrence of snow melt. The results show a large variability between summer seasons of melt extent and duration. There was very extensive and intense melting in 1991-92, with much less melt in following seasons probably in response to a cooling following the Pinatubo eruption. 1997-98 has extensive melt with a total area approaching that for 1991-92. (Auth.)

52-6555

Mapping snow grain size on the ice sheets with a laser altimeter.

Nolin, A.W., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2264-2266, 15 refs.

Snow surveys, Snow cover structure, Snow surface, Snow optics, Snow heat flux, Snow air interface, Snow ice interface, Ice sheets, Ice crystal size, Albedo, Glacier heat balance, Lidar, Spaceborne photography

Recent development of a spaceborne laser altimeter system for mapping changes in ice sheet elevation has also provided a surprising opportunity for mapping snow grain size. This new technique exploits the relationship between snow grain size and surface reflectance in the near-infrared wavelengths. This method has been successfully tested using imaging spectrometer data at 1040 nm. An active sensor, as a Nd:YAG laser with a wavelength of 1064 nm could also be used. The Geoscience Laser Altimeter System, due to launch in 2001, will provide all the required inputs for this grain size determination method including apparent surface reflectance and slope/aspect of the ground footprint. This method should provide the most accurate estimates of snow surface layer grain size to date. For relatively clean snow, such as in Greenland and Antarctica, snow grain size has been shown to be the single most important snow property affecting the broadband snow albedo. (Auth. mod.)

52-6556
Antarctic and Greenland snow surfaces as calibration targets for the visible channel of the Advanced Very High Resolution Radiometer.
Doherty, S.J., Warren, S.G., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.4, New York, Institute of Electrical and Electronics Engineers, 1998, p.2267-2269, 12 refs.
Snow cover effect, Snow surface, Snow optics, Terrain identification, Albedo, Radiometry, Spaceborne photography, Statistical analysis, Antarctica—East Antarctica, Greenland
The snow surfaces of the high plateaus of the East Antarctic and Greenland ice sheets are used to determine multi-year drift in the sensitivity of the visible channel of the Advanced Very High Resolution Radiometer instruments on the polar-orbiting satellites NOAA-9, 10 and 11. Bidirectional reflectance distribution functions (BRDFs) are empirically derived for the months of Oct.-Feb. (Antarctica) and Apr.-Aug. (Greenland) using a simplified atmospheric model. The BRDF of the snow surface should not change from year to year for near-nadir satellite views. Therefore, drift in normalized monthly averages of the derived BRDFs is interpreted as showing a change in channel sensitivity. (Auth. mod.)

52-6557
Radarsat Antarctic Mapping Project.
Jezek, K.C., Sohn, H.G., Noltimier, K.F., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.5, New York, Institute of Electrical and Electronics Engineers, 1998, p.2462-2464, 3 refs.
Mapping, Terrain identification, Synthetic aperture radar, Spaceborne photography, Image processing, Data processing, Data transmission, Research projects
During Sep. and Oct. 1997, the Canadian Radarsat-1 was used to successfully acquire the first, high-resolution synthetic aperture radar image data set of the entire antarctic continent. This unprecedented activity was made possible by the in-orbit rotation of the SAR to look towards the South Pole and the electronic beam steering capability of the instrument to image to the Pole. These attributes, combined with the ability to operate day or night and to penetrate cloud, provide a nearly instantaneous snapshot of the southern continent. (Auth. mod.)

52-6558
Role of diurnal processes in the seasonal evolution of sea ice and its snow cover.
Hanesiak, J.M., Barber, D.G., Flato, G.M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.5, New York, Institute of Electrical and Electronics Engineers, 1998, p.2496-2498.
Sea ice distribution, Ice conditions, Snow ice interface, Ice heat flux, Snow heat flux, Ice models, Ice forecasting, Computerized simulation

52-6559
Sea ice investigations in the Laptev Sea using RADARSAT ScanSAR data.
Sandven, S., et al, International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.5, New York, Institute of Electrical and Electronics Engineers, 1998, p.2499-2501, 3 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice forecasting, Ice reporting, Ice routing, Synthetic aperture radar, Spaceborne photography, Russia—Laptev Sea

52-6560
Polarimetric C-band SAR observations of sea ice in the Greenland Sea.
Thomsen, B.B., Nghiem, S.V., Kwok, R., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.5, New York, Institute of Electrical and Electronics Engineers, 1998, p.2502-2504, 2 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Synthetic aperture radar, Backscattering, Spaceborne photography, Image processing, Greenland Sea

52-6561
Classification of sea ice types from ScanSAR RADARSAT images using pulse-coupled neural networks.
Karvonen, J., Similä, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.5, New York, Institute of Electrical and Electronics Engineers, 1998, p.2505-2508, 2 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice reporting, Synthetic aperture radar, Spaceborne photography, Image processing, Baltic Sea

52-6562
Antarctic snow reflectance from ADEOS/POLDER measurements.
Mondet, J., Leroux, C., Fily, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.5, New York, Institute of Electrical and Electronics Engineers, 1998, p.2541-2543, 8 refs.
Snow surveys, Snow surface, Snow air interface, Snow heat flux, Snow optics, Albedo, Radiometry, Spaceborne photography, Image processing, Statistical analysis
The antarctic ice sheet is very important in climatological studies especially in general circulation models. Its surface energy budget is dominated by radiation. Special attention has always been given to measurement of the snow albedo. Snow albedo may be retrieved from satellite measurements with a snow Bidirectional Distribution of Reflectance Function (BRDF) model. The French remote-sensing instrument POLDER (POLarization and Directionality of the Earth's Reflectances) is very useful to derive precisely BRDFs of any given Earth location at different viewing angles along a single path. (Auth. mod.)

52-6563
Profiles of stratospheric ClO and O_3 simultaneously retrieved from millimeter wave radiometry at Ny-Ålesund (Svalbard) during March 1997.
Hochschild, G., Berg, H., Kopp, G., Krupa, R., Kuntz, M., International Geoscience and Remote Sensing Symposium, Seattle, WA, July 6-10, 1998. IGARSS'98. Sensing and managing the environment. Vol.5, New York, Institute of Electrical and Electronics Engineers, 1998, p.2618-2620, 8 refs.
Polar atmospheres, Stratosphere, Atmospheric composition, Air pollution, Ozone, Radiometry, Meteorological instruments, Norway—Spitsbergen

52-6564
CO2 measuring method at Jubany Station. [Técnica de medición de CO2 empleada en la base Jubany]
Ozu, S.R., Ciattaglia, L., *Buenos Aires. Instituto Antártico Argentino. Contribución,* 1997, No.475, 11p. + maps and charts, In Spanish with English summary. 3 refs.
Polar atmospheres, Atmospheric composition, Air pollution, Carbon dioxide, Meteorological instruments, Antarctica—Jubany Station
This article describes the atmospheric carbon dioxide measuring system, used at the Greenhouse Effect Laboratory of the Jubany Station, from the air inlet to the gas analyzer, using the Siemens Ultramat 5 E non dispersive infrared analyzer, to the data acquisition system. (Auth. mod.)

52-6565
Forum—mining industry in the Far North of Russia.
Kirzhner, F.M., *Journal of cold regions engineering,* Sep. 1998, 12(3), p.107-113, 6 refs.
Natural resources, Minerals, Subpolar regions, Mining, Economic development, Cold weather operation, Permafrost preservation, Russia

52-6566
Recent progress in river ice engineering research at CRREL.
Tatinclaux, J.C., MP 5211, *Journal of cold regions engineering,* Sep. 1998, 12(3), p.114-137, 52 refs.
Engineering, River ice, Ice navigation, Ice jams, Ice control, Ice forecasting, Ice mechanics, Hydraulic structures, Simulation, Mechanical tests, Research projects
This paper reviews and summarizes the results of the research and development efforts in river ice engineering conducted at the U.S. Army Cold Regions Research and Engineering Laboratory over the past decade and their applications to the Civil Works mission of the U.S. Army Corps of Engineers. Topics covered include winter operation of navigation projects on the major northern U.S. waterways; river ice processes, namely ice transport and accumulation; ice jam documentation, prediction, and mitigation; and bed and bank erosion due to ice. The paper concludes with a brief discussion of future challenges and areas of needed research in river ice engineering.

52-6567
PCC airfield pavement response during thaw-weakening periods.
Janoo, V.C., Berg, R.L., MP 5212, *Journal of cold regions engineering,* Sep. 1998, 12(3), p.138-151, 13 refs.
Runways, Concrete pavements, Concrete slabs, Cements, Subgrade soils, Frost penetration, Thaw weakening, Joints (junctions), Dynamic loads, Bearing strength, Elastic properties, Mechanical tests
A field study was performed at two regional airports in Wisconsin during spring thaw to determine its effects on portland cement concrete (PCC) airport pavements. This study was part of a research program to model the performance of airfield pavements for the Federal Aviation Administration. Subsurface temperature and falling weight deflection measurements of the pavement structures were taken at both airports and used to calculate the frost penetration depths, the changes in bearing capacity, and the joint and load transfer efficiencies. This paper summarizes the findings of this study and includes several relationships between various engineering properties of the subsurface layers below the PCC layer, along with a procedure for evaluating pavement performance using falling weight deflection data for PCC pavements during spring thaw.

52-6568
Ice-tank data on brash-ice loads against barges.
Ettema, R., Schaefer, J.A., Huang, H.P., *Journal of cold regions engineering,* Sep. 1998, 12(3), p.153-161, 6 refs.
River ice, Channels (waterways), Ice navigation, Ships, Ice solid interface, Impact tests, Simulation, Mechanical tests, Loads (forces), Dynamometers, Ice cover effect

52-6569
Topographic and drainage control on Weichselian ice-wedge and sand-wedge formation, Vennebrügge, German-Dutch border.
Kasse, C., Vandenberghe, J., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.95-106, With French summary. 34 refs.
Pleistocene, Periglacial processes, Ice wedges, Patterned ground, Sands, Eolian soils, Sorting, Grain size, Topographic effects, Humidity, Soil analysis, Germany—Vennebrügge

52-6570
Thermal regimes beneath coarse blocky materials.
Harris, S.A., Pedersen, D.E., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.107-120, With French summary. 41 refs.
Permafrost thermal properties, Thermal regime, Mountain soils, Rock streams, Rock properties, Soil temperature, Air flow, Heat transfer, Temperature gradients, Boreholes, Canada—Alberta—Plateau Mountain

52-6571
Relationship between frost heave and downslope soil movement: field measurements in the Japanese Alps.
Matsuoka, N., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.121-133, With French summary. 24 refs.
Periglacial processes, Mountain soils, Freeze thaw cycles, Frost heave, Slope processes, Solifluction, Mass flow, Soil creep, Ice needles, Velocity measurement, Soil tests, Diurnal variations, Japan—Japanese Alps

52-6572
Rock glaciers on Prins Karls Forland, Svalbard. I: Internal structure, flow velocity and morphology.
Berthling, I., Etzelmüller, B., Eiken, T., Sollid, J.L., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.135-145, With French summary. 19 refs.
Periglacial processes, Rock glaciers, Talus, Permafrost mass transfer, Sediment transport, Velocity measurement, Geodetic surveys, Electrical measurement, Structural analysis, Profiles, Norway—Svalbard

52-6573
Periglacial patterned ground on the Styggedalsbreen Glacier Foreland, Jotunheimen, southern Norway: micro-topographic, paraglacial and geoecological controls.
Matthews, J.A., Shakesby, R.A., Berrisford, M.S., McEwen, L.J., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.147-166, With French summary. 73 refs.
Periglacial processes, Arctic landscapes, Patterned ground, Moraines, Landforms, Landscape development, Mapping, Vegetation factors, Surface structure, Topographic features, Classifications, Norway—Jotunheimen

52-6574
Protalus ramparts folds: bonds within rock glacier debris. [Les Bourrelets-Protalus: Liens entre les Eboulis et les Glaciers Rocheux]
Pancza, A., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.167-175, In French with English summary. 13 refs.
Periglacial processes, Rock glaciers, Talus, Slope processes, Sediment transport, Rock mechanics, Landforms, Snow cover effect, Geomorphology, Switzerland—Valais

52-6575
Oxygen-isotope and C^{14} data associated with Late Pleistocene syngenetic ice-wedges in mountains of Magadan region, Siberia.
Vasil'chuk, IU.K., Vasil'chuk, A.C., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.177-183, With French summary. 10 refs.
Pleistocene, Paleoclimatology, Permafrost structure, Periglacial processes, Landscape development, Ice wedges, Soil formation, Sedimentation, Gravity, Stratigraphy, Oxygen isotopes, Radioactive age determination, Russia—Siberia

52-6576
Periglacial processes and physical (frost) weathering in northern Mongolia.
Lomborinchen, R., *Permafrost and periglacial processes,* Apr.-June 1998, 9(2), p.185-188, With French summary. 10 refs.
Periglacial processes, Landforms, Tundra terrain, Permafrost distribution, Solifluction, Altiplanation, Frost weathering, Classifications, Mongolia

52-6577
1998-99 Science Program Summary.
U.S. National Science Foundation. United States Antarctic Program, Washington, D.C., 1998, Var. p.
Research projects, Low temperature research
This Science Program Summary contains a synopsis of the United States Antarctic Program (USAP) research projects planned for the 1998-99 season. For this season, the USAP will support about 132 projects (a few having several subgroups), involving approximately 700 deploying investigators and techniques. This document is a preseason (i.e., prior to the 1998-99 austral summer season) summary; it contains the current information available at the time of publication (i.e., late Aug. 1998). Some of this information may change throughout the austral summer and winter-over period as project planning evolves.

52-6578
U.S. Antarctic Program, 1997-1998.
U.S. National Science Foundation. Office of Polar Programs, Washington, D.C., Sep. 1997, 50p.
Research projects, Low temperature research
The 175 research projects that the U.S. Antarctic Program will field during the 1997-98 austral summer and the 1998 winter are this year's U.S. contribution to the international effort to understand the Antarctic and its role in global processes and to support other research that can be best or only performed in Antarctica. This book describes each project in scientific discipline order: biology, environmental research, ocean sciences, climate systems, geology and geophysics, glaciology, aeronomy, astronomy, and astrophysics.

52-6579
Cloud-radiation studies during the European Cloud and Radiation Experiment (EUCREX).
Raschke, E., et al, *Surveys in geophysics,* Mar. 1998, 19(2), p.89-138, Refs. p.130-138.
Climatology, Cloud physics, Cloud cover, Radiation balance, Greenhouse effect, Ice detection, Ice optics, Ice crystal structure, Radiation measurement, Spaceborne photography, Mathematical models, Research projects

52-6580
Century of erosion in Little Ice Age moraines of northwestern Spitsbergen. [Un siècle d'érosion sur les moraines du Petit Âge glaciaire au Spitsberg nord-occidental]
Mercier, D., *Géographies,* Mar. 1998, 75(1), p.96-108, In French with English summary. 9 refs.
Includes discussion.
Glacial geology, Glacial hydrology, Subpolar regions, Geomorphology, Moraines, Runoff, Meltwater, Water erosion, Frost shattering, Solifluction, Norway—Spitsbergen

52-6581
Long, cold journey of Ice Station Sheba.
Menino, H., *Smithsonian,* Sep. 1998, 29(6), p.40-51.
Climatology, Polar atmospheres, Global change, Cloud physics, Heat balance, Drift stations, Ice floes, Snow ice interface, Air ice water interaction, Ice cover effect, Snow cover effect, Research projects, Arctic Ocean

52-6582
Vertical profiles of volcanic aerosol and polar stratospheric clouds above Kiruna, Sweden: winters 1993 and 1995.
Deshler, T., Oltmans, S.J., *Journal of atmospheric chemistry,* May 1998, 30(1), p.11-23, 37 refs.
Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Aerosols, Volcanic ash, Condensation nuclei, Air temperature, Particle size distribution, Profiles, Statistical analysis, Sweden—Kiruna

52-6583
Deuterium, oxygen-18, and tritium as tracers for water vapour transport in the lower stratosphere and tropopause region.
Zahn, A., Barth, V., Pfeilsticker, K., Platt, U., *Journal of atmospheric chemistry,* May 1998, 30(1), p.25-47, Refs. p.44-47.
Climatology, Atmospheric composition, Polar atmospheres, Polar stratospheric clouds, Sedimentation, Water vapor, Particles, Turbulent exchange, Isotope analysis, Moisture transfer, Sampling

52-6584
Observations of nitric acid perturbations in the winter arctic stratosphere: evidence for PSC sedimentation.
Arnold, F., Bürger, V., Gollinger, K., Roncossek, M., Schneider, J., Spreng, S., *Journal of atmospheric chemistry,* May 1998, 30(1), p.49-59, 23 refs.
Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Ozone, Turbulent diffusion, Ice vapor interface, Aerosols, Coatings, Degradation, Sedimentation, Spectroscopy

52-6585
HNO_3 and PSC measurements from the TRANSALL: sequestering of HNO_3 in the winter of 1994/95.
Höpfner, M., et al, *Journal of atmospheric chemistry,* May 1998, 30(1), p.61-79, 24 refs.
Climatology, Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ozone, Aerosols, Sounding, Lidar, Profiles

52-6586
MIPAS-TRANSALL observations for the variability of $ClONO_2$ during the arctic winter of 1994/95.
Glatthor, N., et al, *Journal of atmospheric chemistry,* May 1998, 30(1), p.81-101, 16 refs.
Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Ozone, Turbulent diffusion, Profiles, Seasonal variations, Spectroscopy, Aerial surveys

52-6587
Column observations of stratospheric gases at Søndre Strømfjord, Greenland during winter 1994-1995.
Hannigan, J.W., Coffey, M.T., Mankin, W.G., Goodman, A., *Journal of atmospheric chemistry,* May 1998, 30(1), p.103-118, 21 refs.
Climatology, Polar atmospheres, Stratosphere, Chemical composition, Ozone, Aerosols, Seasonal variations, Profiles, Infrared spectroscopy, Spectra, Statistical analysis, Greenland—Søndre Strømfjord

52-6588
Ground-based DOAS UV/visible measurements at Kiruna (Sweden) during the SESAME winter 1993/94 and 1994/95.
Otten, C., Ferlemann, F., Platt, U., Wagner, T., Pfeilsticker, K., *Journal of atmospheric chemistry,* May 1998, 30(1), p.141-162, Refs. p.159-162.
Climatology, Polar atmospheres, Air masses, Stratosphere, Atmospheric composition, Aerosols, Ozone, Spectroscopy, Spectra, Seasonal variations, Sweden—Kiruna

52-6589
Upper limit of iodine oxide in the lower stratosphere.
Pundt, I., Pommereau, J.P., Phillips, C., Lateltin, E., *Journal of atmospheric chemistry,* May 1998, 30(1), p.173-185, 31 refs.
Climatology, Polar atmospheres, Atmospheric composition, Stratosphere, Photochemical reactions, Ozone, Aerosols, Spectroscopy, Spectra, Profiles, Sweden—Kiruna, Norway—Andøya

52-6590
Study of ozone laminae using diabatic trajectories, contour advection and photochemical trajectory model simulations.
Reid, S.J., et al, *Journal of atmospheric chemistry,* May 1998, 30(1), p.187-207, 33 refs.
Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Ozone, Stratification, Degradation, Advection, Photochemical reactions, Sounding, Simulation

52-6591
Liquid-to-glass transition in glycerol: a ^1H rotating-frame spin-lattice relaxation study.
Mendes, L.G., Engelsberg, M., De Souza, I.C.L., De Souza, R.E., *Physical review B,* Feb. 1, 1998, 57(6), p.3389-3395, 35 refs.
Polymers, Liquid cooling, Supercooling, Phase transformations, Low temperature tests, Spectroscopy, Temperature effects, Molecular energy levels, Thermodynamics, Nuclear magnetic resonance

52-6592
McMurdo LTER: The surface-energy balance of the Canada Glacier, Taylor Valley.
Lewis, K., Dana, G., Tyler, S., Fountain, A., *Antarctic Journal of the United States,* 1995, 30(5), p.280-282, 8 refs.
Glacier mass balance, Glacier melting, Meltwater, Glacier surfaces, Ice sublimation, Glacier heat balance, Antarctica—Canada Glacier
The measurements and modeling of surface energy fluxes on the ablation zone of Canada Glacier described here are comparable to those measured on other blue ice regions of Antarctica. It is suggested that sublimation is a significant factor in the mass balance of ice bodies; to predict meltwater runoff in these areas, ablation stake measurements alone are insufficient and ablation must be partitioned into melt and evaporation/sublimation.

52-6593
McMurdo LTER: The influence of stream channel characteristics on streamflow and annual water budgets for lakes in Taylor Valley.
House, H.R., McKnight, D.M., Von Guerard, P., *Antarctic Journal of the United States,* 1995, 30(5), p.284-287, 7 refs.
Limnology, Stream flow, Meltwater, Climatic factors, Glacial lakes, Antarctica—Taylor Valley
The streams in Taylor Valley are predominantly fed by alpine glaciers and provide inflow to 3 lakes, Lake Fryxell, Lake Hoare, and Lake Bonney. During the 1990-91 season, the authors began monitoring streamflow in the Lake Fryxell basin to understand the climatic response of the streams and the resulting effects on the lake ecosystem. During the 1993-94 season, the stream-gauging network was expanded to include the basins of Lake Hoare and Lake Bonney. A table presents the annual streamflow for streams in the Lake Fryxell Basin for the austral summers of 1990 to 1995, as well as annual streamflow for streams in the Lakes Hoare and Bonney basins for the austral summers of 1993-95. The 4 years of record for the Lake Fryxell basin include a range of climatic conditions, with the highest flows occurring during 1990-91 and the lowest during 1994-95.

52-6594
McMurdo LTER: Algal mat distribution in glacial meltwater streams in Taylor Valley, southern Victoria Land, Antarctica.
McKnight, D.M., Tate, C.M., *Antarctic Journal of the United States,* 1995, 30(5), p.287-289, 8 refs.
Meltwater, Photosynthesis, Algae, Mosses, Biomass, Antarctica—Taylor Valley
The authors examined the distribution of algal mats in Taylor Valley as part of the McMurdo Long-Term Ecological Research program. Most of the streams are gauged and have records beginning in 1990-94. The algal mats and mosses are perennial, remaining in a "freeze-dried" state during winter, and begin photosynthesizing within hours of being wetted. The general abundance of algal mats at these sites is summarized in a table. Except in House Creek, which flows through ice-bound moraine, the authors observed algal mats and mosses at all transects, illustrating that the presence of water allows a photosynthetically based ecosystem to exist even under the harshest conditions. In the stone pavement reaches, algal mats are abundant in the main channel.

52-6595
GIS analysis of surface chemistry susceptibility and response to industrial air pollution in the Kola Peninsula, northern Russia.
Rigina, O., *Water, air, and soil pollution,* July 1998, 105(1-2), International Symposium on Ecosystem Behavior, 3rd, Villanova, PA, June 21-25, 1997. BIOGEOMON. Selected papers, p.73-82, 10 refs.
Air pollution, Subpolar regions, Geophysical surveys, Surface waters, Aerosols, Sedimentation, Hydrogeochemistry, Environmental impact, Sampling, Ion density (concentration), Statistical analysis, Russia—Kola Peninsula

52-6596
Nitrogen and sulfate export from high elevation catchments of the Sierra Nevada, California.
Sickman, J.O., Melack, J.M., *Water, air, and soil pollution,* July 1998, 105(1-2), International Symposium on Ecosystem Behavior, 3rd, Villanova, PA, June 21-25, 1997. BIOGEOMON. Selected papers, p.217-226, 22 refs.
Watersheds, Alpine landscapes, Surface waters, Surface drainage, Hydrogeochemistry, Snowmelt, Stream flow, Ion density (concentration), Saturation, Sampling, United States—California—Sierra Nevada

52-6597
Trends in sulfate, base cations and H^+ concentrations in bulk precipitation and throughfall at integrated monitoring sites in Finland 1989-1995.
Ukonmaanaho, L., Starr, M., Ruoho-Airola, T., *Water, air, and soil pollution,* July 1998, 105(1-2), International Symposium on Ecosystem Behavior, 3rd, Villanova, PA, June 21-25, 1997. BIOGEOMON. Selected papers, p.353-363, 27 refs.
Air pollution, Subpolar regions, Forest ecosystems, Forest canopy, Aerosols, Precipitation (meteorology), Snowfall, Ion density (concentration), Sampling, Statistical analysis, Environmental tests, Seasonal variations, Finland

52-6598
Micromechanical analysis on deterioration due to freezing and thawing in porous brittle materials.
Hori, M., Morihiro, H., *International journal of engineering science,* Mar. 1998, 36(4), p.511-522, 19 refs.
Concrete durability, Concrete structures, Rock mechanics, Porous materials, Microstructure, Deformation, Degradation, Freeze thaw cycles, Strains, Stress concentration, Mathematical models, Forecasting

52-6599
Method for estimating the migration time of plant species within the time range of ^{14}C-dating.
Juvigné, E., Bastin, B., Delibrias, G., Evin, J., Streel, M., *Quaternary international,* Mar.-May 1998, Vol.47-48, INQUA-SEQS Symposium on Quaternary Stratigraphy in Volcanic Areas, Rome, Italy, Sep. 1993. Selected papers, p.147-152, 37 refs.
Pleistocene, Quaternary deposits, Volcanic ash, Paleoecology, Palynology, Stratigraphy, Vegetation patterns, Migration, Carbon isotopes, Radioactive age determination, Statistical analysis, Accuracy

52-6600
Major constraints on the use of radiocarbon dating for tephrochronology.
Calderoni, G., Turi, B., *Quaternary international,* Mar.-May 1998, Vol.47-48, INQUA-SEQS Symposium on Quaternary Stratigraphy in Volcanic Areas, Rome, Italy, Sep. 1993. Selected papers, p.153-159, 16 refs.
Pleistocene, Quaternary deposits, Volcanic ash, Aerosols, Gases, Carbon dioxide, Organic soils, Plant tissues, Stratigraphy, Carbon isotopes, Radioactive age determination, Accuracy

52-6601
Problems and perspectives of radiometric age determinations in Quaternary samples.
Ferrara, G., *Quaternary international,* Mar.-May 1998, Vol.47-48, INQUA-SEQS Symposium on Quaternary Stratigraphy in Volcanic Areas, Rome, Italy, Sep. 1993. Selected papers, p.161-163, 25 refs.
Pleistocene, Quaternary deposits, Geochronology, Radioactive isotopes, Radioactive age determination, Spectroscopy, Radiometry, Gamma irradiation, Sampling, Accuracy

52-6602
Prediction of vegetation patterns at the limits of plant life: a new view of the alpine-nival ecotone.
Gottfried, M., Pauli, H., Grabherr, G., *Arctic and alpine research,* Aug. 1998, 30(3), p.207-221, 70 refs.
Plant ecology, Ecosystems, Alpine landscapes, Vegetation patterns, Migration, Mapping, Topographic features, Classifications, Mathematical models, Statistical analysis, Forecasting, Austria—Tyrol

52-6603
Vegetation of the subnival belt of the Caucasus Mountains.
Nakhutsrishvili, G.Sh., *Arctic and alpine research,* Aug. 1998, 30(3), p.222-226, 19 refs.
Plant ecology, Alpine landscapes, Vegetation patterns, Meadow soils, Ecosystems, Classifications, Sampling, Statistical analysis, Russia—Caucasus Mountains

52-6604
Demography of a rare endemic *Myosotis*: boom and bust in the high-alpine zone of southern New Zealand.
Stanley, R.J., Dickinson, K.J.M., Mark, A.F., *Arctic and alpine research,* Aug. 1998, 30(3), p.227-240, 52 refs.
Plant ecology, Alpine landscapes, Ecosystems, Vegetation patterns, Growth, Biomass, Distribution, Seasonal variations, Snowmelt, Snow cover effect, Statistical analysis, New Zealand—Dunstan Mountains

52-6605
Subalpine climate at Smiggin Holes, Kosciusko National Park, Australia, and its influence on the biology of small mammals.
Happold, D.C.D., *Arctic and alpine research,* Aug. 1998, 30(3), p.241-251, 55 refs.
Climatology, Microclimatology, Alpine landscapes, Surface temperature, Snow depth, Biomass, Animals, Cold weather survival, Snow cover effect, Meteorological data, Statistical analysis, Australia—Australian Alps

52-6606
Upland tundra in the foothills of the Brooks Range, Alaska, U.S.A.: lichen long-term photosynthetic CO_2 uptake and net carbon gain.
Lange, O.L., Hahn, S.C., Meyer, A., Tenhunen, J.D., *Arctic and alpine research,* Aug. 1998, 30(3), p.252-261, 53 refs.
Plant physiology, Ecosystems, Tundra vegetation, Tundra terrain, Lichens, Biomass, Transpiration, Vapor transfer, Photosynthesis, Carbon dioxide, Geochemical cycles, Statistical analysis, United States—Alaska—Brooks Range

52-6607
Oil biodegradation potential in alpine habitats.
Margesin, R., Schinner, F., *Arctic and alpine research,* Aug. 1998, 30(3), p.262-265, 20 refs.
Alpine landscapes, Oil spills, Soil pollution, Hydrocarbons, Glacier ice, Bacteria, Soil microbiology, Degradation, Low temperature tests, Simulation, Environmental tests, Environmental protection

52-6608
Nitrogen transformations in alpine talus fields, Green Lakes Valley, Front Range, Colorado, U.S.A.
Bieber, A.J., Williams, M.W., Johnsson, M.J., Davinroy, T.C., *Arctic and alpine research,* Aug. 1998, 30(3), p.266-271, 21 refs.
Alpine landscapes, Soil chemistry, Talus, Minerals, Ion exchange, Vegetation factors, Altitude, Snowmelt, Leaching, Hydrogeochemistry, Drill core analysis, United States—Colorado—Front Range

52-6609
Evidence for an early Neoglacial glacier advance from rock glaciers and lake sediments in the Sierra Nevada, California, U.S.A.
Konrad, S.K., Clark, D.H., *Arctic and alpine research,* Aug. 1998, 30(3), p.272-284, 58 refs.
Glacial geology, Paleoclimatology, Glacier oscillation, Alpine glaciation, Moraines, Lacustrine deposits, Rock glaciers, Stratigraphy, Lichens, Drill core analysis, Geochronology, Radioactive age determination, United States—California—Sierra Nevada

52-6610
Spring and summer runoff hydrology of a subarctic patterned wetland.
Quinton, W.L., Roulet, N.T., *Arctic and alpine research,* Aug. 1998, 30(3), p.285-294, 25 refs.
Wetlands, Subarctic landscapes, Hydrologic cycle, Snowmelt, Ponds, Patterned ground, Water storage, Surface drainage, Subsurface drainage, Runoff, Topographic effects, Hydrography, Seasonal variations, Canada—Quebec—Schefferville

52-6611
Active layer thermal regime 1991-1996 at Qeqertarsuaq, Disko Island, central West Greenland.
Humlum, O., *Arctic and alpine research,* Aug. 1998, 30(3), p.295-305, 39 refs.
Permafrost thermal properties, Active layer, Thermal regime, Seasonal freeze thaw, Thaw depth, Soil temperature, Air temperature, Snow cover effect, Albedo, Wind factors, Temperature measurement, Statistical analysis, Greenland—Disko

52-6612
Global change and arctic ecosystems: conclusions and predictions from experiments with terrestrial invertebrates on Spitsbergen.
Hodkinson, I.D., Webb, N.R., Bale, J.S., Block, W., Coulson, S.J., Strathdee, A.T., *Arctic and alpine research,* Aug. 1998, 30(3), p.306-313, 66 refs.
Climatology, Climatic changes, Global change, Ecosystems, Arctic landscapes, Biomass, Freeze thaw cycles, Environmental tests, Environmental impact, Temperature effects, Survival, Simulation, Forecasting, Norway—Spitsbergen

52-6613
Meteorological techniques.
Reymann, M., et al, *U.S. Air Force Weather Agency, Offutt AFB, NE. Technical note,* July 1998, AFWA/TN-98/002, Var. p., Refs. p.BIB/1-BIB/6.
Weather forecasting, Snowstorms, Ice storms, Thunderstorms, Cloud physics, Precipitation (meteorology), Snowfall, Turbulence, Aircraft icing, Ice forecasting, Frost forecasting

52-6614
Measuring technique of snow- or ice-fraction by conductometric method in slurry flow. [Dodendoho ni yoru ryusui naka no seppyo bunritsu sokutei hoho]
Kitahara, T., *Seppyo,* Jan. 1998, 60(1), p.3-12, In Japanese. 9 refs.
Snow removal, Snow removal equipment, Slush, Drains, Water pipes, Channels (waterways), Flow measurement, Electrical resistivity, Mathematical models

52-6615
Estimation of depth of new snowfall based on the viscous compression theory of snow cover. [Sekisetsu no nensei asshuku riron ni yoru kosetsushin no suitei]
Kominami, Y., Endo, Y., Niwano, S., Ushioda, S., *Seppyo,* Jan. 1998, 60(1), p.13-23, In Japanese with English summary. 12 refs.
Snowfall, Snow depth, Snow compression, Snow density, Snow deformation, Mathematical models

52-6616
Evaluation of economic criteria for snow-plowing operation. [Keizaiteki na shinsetsu josetsu kijun no hyoka]
Kamimura, S., *Seppyo,* Jan. 1998, 60(1), p.25-35, In Japanese with English summary. 6 refs.
Snow removal, Road maintenance, Cold weather operation, Urban planning, Highway planning, Cost analysis, Japan

52-6617
Large-scale trench on the Shirouma-daisekkei snow patch, the northern Japanese Alps, formed by debris flow. [Dosekiryu ni yotte keisei sareta kita Arupusu Shirouma-daisekkei ue no daikibo na mizo]
Matsumoto, T., Kawashima, K., Izumi, K., Nohguchi, Y., *Seppyo,* Jan. 1998, 60(1), p.37-46, In Japanese with English summary. 14 refs.
Snow accumulation, Snow surface, Snow stratigraphy, Mudflows, Avalanche erosion, Snow erosion, Nivation, Topographic surveys, Japan

52-6618
Reconstruction of flow of alpine glaciers during the Last Glacial Maximum in the Hidaka Range, central Hokkaido. [Saishu hyoki ni okeru Hidaka sanmyaku no hyoga no ryudo no fukugen]
Liu, D.L., Ono, Y., Naruse, R., *Seppyo,* Jan. 1998, 60(1), p.47-54, In Japanese with English summary. 16 refs.
Alpine glaciation, Mountain glaciers, Glacial geology, Glacial meteorology, Glacier flow, Glacier thickness, Glacier oscillation, Snow line, Paleoclimatology, Japan—Hokkaido

52-6619
Some more words on snow countermeasures for National Highway 17 (Part 10). [Kokudo 17-go yuki taisaku yowa (sono 10)]
Abe, T., *Seppyo,* Jan. 1998, 60(1), p.71-72, In Japanese. 2 refs.
Radar tracking, Weather forecasting, Snowstorms, Snow removal, Road maintenance, Japan

52-6620
Multi-layer heat balance model of snow cover adaptable to intensely cold regions. [Genkanchi ni tekiyo kano na sekisetsu taso netsushushi moderu]
Yamazaki, T., *Seppyo,* Mar. 1998, 60(2), p.131-141, In Japanese with English summary. 33 refs.
Snow air interface, Snow heat flux, Snow thermal properties, Snow temperature, Snow stratigraphy, Depth hoar, Snow hydrology, Snow water equivalent, Mathematical models

52-6621
Chemical characterization of acid snowfall in the coast and inland areas of Akita Prefecture in Japan.
Ogawa, N., Adzuhata, T., Kajikawa, M., *Seppyo,* Mar. 1998, 60(2), p.143-156, With Japanese summary. 21 refs.
Air pollution, Precipitation (meteorology), Snowfall, Scavenging, Snow composition, Snow impurities, Japan

52-6622
Annual variation of air and ground temperatures on the Murodo-daira in the alpine zone of Mt. Hakusan, central Japan. [Hakusan kozantai no Murodo-daira ni okeru kion, chion no tsunen henka]
Higashino, T., Ogawa, H., Nogami, T., *Seppyo,* Mar. 1998, 60(2), p.157-165, In Japanese. 29 refs.
Snow air interface, Soil air interface, Soil temperature, Surface temperature, Air temperature, Degree days, Snowmelt, Ground thawing, Japan

52-6623
Morphological change of ice I_h under pressure. [Atsuryoku shita de no ropposhohyo no keitai kenka]
Kishimoto, Y., *Seppyo,* Mar. 1998, 60(2), p.167-172, In Japanese. 8 refs.
Ice crystal growth, Ice crystal structure, Ice thermal properties, Thermal analysis, Latent heat, Melting points, Ice melting, Regelation, Phase transformations, High pressure tests

52-6624
Some more words on snow countermeasures for National Highway 17 (Part 11). [Kokudo 17-go yuki taisaku yowa (sono 11)]
Abe, T., *Seppyo,* Mar. 1998, 60(2), p.193-196, In Japanese.
Tunnels, Blowing snow, Snowdrifts, Snowsheds, Artificial melting, Snow removal, Road maintenance, Japan

52-6625
Seasonal frost depth of grounds with the bare surface, snow cover and vegetation. [Rachi, sekisetsuchi, shokuseichi de no todo toketsushin]
Yamazaki, T., Nishida, A., Kondo, J., *Seppyo,* May 1998, 60(3), p.213-224, In Japanese with English summary. 16 refs.
Soil freezing, Frozen ground thermodynamics, Frost penetration, Frost forecasting, Soil air interface, Snow cover effect, Vegetation factors, Mathematical models

52-6626
Catch ratios of gauges for solid precipitation in Hokuriku region. [Hokuriku chiho ni okeru kosuiryokei no kotai kosui hosokuritsu]
Ohno, H., Yokoyama, K., Kominami, Y., Inoue, S., Takami, S., Wiesinger, T., *Seppyo,* May 1998, 60(3), p.225-231, In Japanese with English summary. 6 refs.
Snowfall, Snow depth, Snow survey tools, Precipitation gages, Statistical analysis, Japan

52-6627
Some more words on snow countermeasures for National Highway 17 (Part 12). [Kokudo 17-go yuki taisaku yowa (sono 12)]
Abe, T., *Seppyo,* May 1998, 60(3), p.236-240, In Japanese.
Avalanche engineering, Snow retention, Snow fences, Terraces, Road maintenance, Japan

52-6628
Recent variations in mass balance of the Hisago snow patch, on the Daisetsu Mountains. [Daisetsu sankei Hisago sekkei no saikin no shitsuryo shushi no hendo]
Yamaguchi, S., Shiraiwa, T., Naruse, R., *Seppyo,* July 1998, 60(4), p.279-287, In Japanese with English summary. 16 refs.
Snow cover distribution, Snow accumulation, Snow stratigraphy, Snow hydrology, Snow air interface, Snow temperature, Snow heat flux, Climatic changes, Japan

52-6629
Some more words on snow countermeasures for National Highway 17 (Part 13). [Kokudo 17-go yuki taisaku yowa (sono 13)]
Abe, T., *Seppyo,* July 1998, 60(4), p.299-307, In Japanese.
Avalanche engineering, Snow fences, Snowsheds, Road maintenance, Japan

52-6630
Report of pit-wall observations of snow cover in Sapporo 1996-97. [Sapporo heichi sekisetsu danmen sokutei shiryo—Heisei 8-nen ~ 9-nen toki]
Hachikubo, A., Kaihara, T., Ito, Y., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1997, No.56, p.1-8, In Japanese with English summary. 3 refs.
Snow surveys, Snow depth, Snow stratigraphy, Snow hardness, Snow density, Snow temperature, Snow water content, Japan—Hokkaido

52-6631
Sea ice conditions and meteorological observations at Saroma-ko Lagoon, Hokkaido, November 1996-November 1997.
Shirasawa, K., Ikeda, M., Ishikawa, M., Takatsuka, T., Aota, M., Fujiyoshi, Y., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1997, No.56, p.9-34, With Japanese summary. 3 refs.
Weather stations, Marine meteorology, Meteorological data, Air temperature, Wind velocity, Wind direction, Insolation, Ice conditions, Freezeup, Ice breakup, Japan—Hokkaido

52-6632
Distributions of pack ice in the Okhotsk Sea off Hokkaido observed using a sea-ice radar network, January-March, 1997. [Reda kansoku ni yoru Hokkaido Ohotsuku kaigan oki no ryuhyo bunpu—1997 nen 1 getsu ~ 3 getsu]
Ishikawa, M., Takatsuka, T., Ikeda, M., Shirasawa, K., Aota, M., *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1997, No.56, p.35-52, In Japanese with English summary.
Ice surveys, Sea ice distribution, Drift, Radar tracking, Japan—Hokkaido, Okhotsk Sea

52-6633
Meteorological observations by automatic weather stations (AWS) in alpine regions of Kamchatka, Russia, 1996-1997.
Matsumoto, T., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1997, No.56, p.53-68, With Japanese summary. 9 refs.
Mountain glaciers, Glacial meteorology, Snow depth, Snow cover distribution, Weather stations, Meteorological data, Insolation, Air temperature, Humidity, Wind (meteorology), Atmospheric pressure, Russia—Kamchatka Peninsula

52-6634
Glacier lake and its outburst flood in the Nepal Himalaya.
Yamada, T., *Japanese Society of Snow and Ice. Data Center for Glacier Research, Tokyo. Monograph,* Mar. 1998, No.1, 96p., 32 refs.
Glacial lakes, Icebound lakes, Ice dams, Moraines, Lake bursts, Floods, Accidents, Flood forecasting, Flood control, Nepal

52-6635
Response of glacier ELA to climate fluctuations on high Asia.
Zhang, Y.S., Fujita, K., Ageta, Y., Nakawo, M., Yao, T.D., Pu, J.C., *Bulletin of glacier research,* July 1998, No.16, p.1-11, 24 refs.
Mountain glaciers, Glacial meteorology, Glacier mass balance, Glacier heat balance, Glacier oscillation, Snow line, Climatic changes, Mathematical models

52-6636
Chemistry of the snow on Mt. Changbai, China.
Suzuki, K., Takahashi, H., Zhao, H.C., *Bulletin of glacier research,* July 1998, No.16, p.13-17, 5 refs.
Snowfall, Snow stratigraphy, Snow composition, Air pollution, Scavenging, Ion density (concentration), China—Changbai Mountains

52-6637
Topographical map of the ablation area of the Lirung Glacier in the Langtang Valley, Nepal Himalaya.
Aoki, T., Asahi, K., *Bulletin of glacier research,* July 1998, No.16, p.19-31, 14 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier ablation, Glacier surfaces, Moraines, Topographic surveys, Topographic maps, Nepal

52-6638
Changing surface features of Khumbu Glacier, Nepal Himalayas revealed by SPOT images.
Seko, K., Yabuki, H., Nakawo, M., Sakai, A., Kadota, T., Yamada, Y., *Bulletin of glacier research,* July 1998, No.16, p.33-41, 11 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier flow, Glacier surfaces, Icefalls, Ponds, Topographic surveys, Spaceborne photography, Terrain identification, Nepal

52-6639
Snow algae community on a Himalayan glacier, Glacier AX010 east Nepal: relationship with glacier summer mass balance.
Takeuchi, N., Kohshima, S., Fujita, K., *Bulletin of glacier research,* July 1998, No.16, p.43-50, 13 refs.
Mountain glaciers, Glacier oscillation, Glacier mass balance, Snow line, Snow cover effect, Cryobiology, Plant ecology, Algae, Biomass, Nepal

52-6640
Distribution and short-term variations of flow velocities at Koryto Glacier in the Kronotsky Peninsula, Kamchatka, Russia, in 1997.
Yamaguchi, S., et al, *Bulletin of glacier research,* July 1998, No.16, p.51-56, 8 refs.
Glacier surveys, Glacier flow, Glacier oscillation, Glacial hydrology, Glacial meteorology, Subglacial drainage, Basal sliding, Russia—Kamchatka Peninsula

52-6641
Melt rate of ice cliffs on the Lirung Glacier, Nepal Himalayas, 1996.
Sakai, A., Nakawo, M., Fujita, K., *Bulletin of glacier research,* July 1998, No.16, p.57-66, 8 refs.
Mountain glaciers, Glacial meteorology, Glacier heat balance, Glacier melting, Glacier surfaces, Icefalls, Insolation, Nepal

52-6642
Surface flow on the ablation area of the Lirung Glacier in Langtang Valley, Nepal Himalayas.
Naito, N., et al, *Bulletin of glacier research,* July 1998, No.16, p.67-73, 18 refs.
Mountain glaciers, Glacier surveys, Glacier flow, Glacier oscillation, Glacier surfaces, Glacier thickness, Glacier ablation, Topographic surveys, Nepal

52-6643
Glaciological observations of Yala Glacier in Langtang Valley, Nepal Himalayas, 1994 and 1996.
Fujita, K., Takeuchi, N., Seko, K., *Bulletin of glacier research,* July 1998, No.16, p.75-81, 20 refs.
Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier thickness, Glacier surfaces, Glacier flow, Nepal

52-6644
Climatic atlas of arctic sea ice extent and anomalies, 1953-1984.
Manak, D.K., Mysak, L.A., *McGill University, Montreal. Climate Research Group. CRG report,* Sep. 1987, No.87-8, 214p., 10 refs.
Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Maps

52-6645
Arctic sea ice extent and anomalies, 1953-1984.
Mysak, L.A., Manak, D.K., *McGill University, Montreal. Climate Research Group. CRG report,* June 1988, No.88-8, 39p. + figs., 36 refs. For another version see 43-4563.
Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Air ice water interaction, Climatic changes

52-6646
Experimental formation of sea ice: importance of water circulation and wave action for incorporation of phytoplankton and bacteria.
Weissenberger, J., Grossmann, S., *Polar biology,* Sep. 1998, 20(3), p.178-188, Refs. p.187-188.
Algae, Sea ice, Ice formation, Ocean currents, Ocean waves
Sea-ice formation was simulated in a 3,000 l tank under different patterns of water movement. When ice formed in an artificially generated current pattern, algal cells were substantially enriched within the ice matrix. Enrichment factors for chlorophyll *a* calculated from the ratio between the concentrations in ice and underlying water reached values of up to 53. Repeated mixing of ice crystals into the water column, as well as flow of water through the new ice layer, contributed to the enrichment of algae in the ice. Wave action during ice formation revealed lower phytoplankton enrichment factors of up to 9. Mixing of floating ice crystals with underlying water and pumping of water into the ice matrix by periodical expansion and compression of the slush ice layer were responsible for the wave-induced enrichment of algal cells. Bacterial biomass within new ice was enhanced only when the concentration of algae was high. (Auth. mod.)

52-6647
Breaking the ice: large-scale distribution of mesozooplankton after a decade of Arctic and transpolar cruises.
Mumm, N., Auel, H., Hanssen, H., Hagen, W., Richter, C., Hirche, H.J., *Polar biology,* Sep. 1998, 20(3), p.189-197, Refs. p.196-197.
Plankton, Ecology, Biomass, Marine biology, Biogeography, Ice cover effect, Arctic Ocean

52-6648
Estimation of weathering rates for critical load calculations in Finland.
Johansson, M., Tarvainen, T., *Environmental geology,* Feb. 1997, 29(3-4), p.158-164, 18 refs.
Soil chemistry, Weathering, Arctic landscapes, Geochemistry, Ion diffusion, Glacial geology, Bedrock, Fines, Soil profiles, Finland

52-6649
Mechanism of the heterogeneous reaction of hydrogen chloride with chlorine nitrate and hypochlorous acid on water ice.
Horn, A.B., Sodeau, J.R., Roddis, T.B., Williams, N.A., *Journal of physical chemistry A,* July 23, 1998, 102(30), p.6107-6120, 92 refs.
Climatology, Cloud physics, Stratosphere, Ice physics, Ice vapor interface, Heterogeneous nucleation, Aerosols, Hydrates, Adsorption, Ionization, Simulation, Infrared spectroscopy

52-6650
Coordination geometry of the copper-pyridine complex in frozen solution as studied by proton and deuterium two-dimensional hyperfine sublevel correlation electron spin resonance spectroscopy.
Pöppl, A., Hartmann, M., Böhlmann, W., Böttcher, R., *Journal of physical chemistry A,* May 14, 1998, 102(20), p.3599-3606, 23 refs.
Ice physics, Frozen liquids, Solutions, Metals, Ice spectroscopy, Electron paramagnetic resonance, Molecular structure, Molecular energy levels, Spectra

52-6651
Increasing contact-ion pairing as a supercooled water anomaly. Estimation of the fictive temperature of hyperquenched glassy water.
Fleissner, G., Hallbrucker, A., Mayer, E., *Journal of physical chemistry B,* Aug. 6, 1998, 102(32), p.6239-6247, 80 refs.
Water structure, Water temperature, Supercooling, Liquid cooling, Solutions, Ions, Phase transformations, Thermodynamics, Molecular energy levels, Infrared spectroscopy, Spectra, Temperature effects

52-6652
Estimating the initial freezing point of foods from composition data.
Miles, C.A., Mayer, Z., Morley, M.J., Houška, M., *International journal of food science & technology,* Oct. 1997, 32(5), p.389-400, 38 refs.
Solids, Liquid phases, Freezing points, Temperature variations, Chemical composition, Solubility, Phase transformations, Ice water interface, Ice crystal growth, Forecasting, Statistical analysis, Mathematical models

52-6653
Climate and biome simulations for the past 21,000 years.
Kutzbach, J., Gallimore, R., Harrison, S., Behling, P., Selin, R., Laarif, F., *Quaternary science reviews,* June-July 1998, 17(6-7), p.473-506, 84 refs.
Paleoclimatology, Surface temperature, Pleistocene, Paleoecology, Ice sheets, Glacier oscillation, Snow cover distribution, Insolation, Vegetation patterns, Mathematical models, Simulation, Ice cover effect

52-6654
Impact of ice sheets, CO_2, and orbital insolation on Late Quaternary climates: sensitivity experiments with a general circulation model.
Felzer, B., Webb, T., III, Oglesby, R.J., *Quaternary science reviews,* June-July 1998, 17(6-7), p.507-534, 38 refs.
Paleoclimatology, Pleistocene, Climatic changes, Surface temperature, Precipitation (meteorology), Ice sheets, Carbon dioxide, Insolation, Ice cover effect, Simulation

52-6655
Paleoclimate simulations for North America over the past 21,000 years: features of the simulated climate and comparisons with paleoenvironmental data.
Bartlein, P.J., et al, *Quaternary science reviews,* June-July 1998, 17(6-7), p.549-585, 32 refs.
Paleoclimatology, Pleistocene, Paleoecology, Climatic changes, Surface temperature, Atmospheric circulation, Wind direction, Precipitation (meteorology), Ice sheets, Water balance, Simulation, Ice age theory, North America

52-6656
Late Quaternary climate change in eastern North America: a comparison of pollen-derived estimates with climate model results.
Webb, T., III, Anderson, K.H., Bartlein, P.J., Webb, R.S., *Quaternary science reviews,* June-July 1998, 17(6-7), p.587-606, 25 refs.
Pleistocene, Paleoclimatology, Climatic changes, Palynology, Paleoecology, Vegetation patterns, Ice cover effect, Surface temperature, Insolation, Models, Simulation, North America

52-6657
Applying plant functional types to construct biome maps from eastern North American pollen data: comparisons with models results.
Williams, J.W., Summers, R.L., Webb, T., III, *Quaternary science reviews,* June-July 1998, 17(6-7), p.607-627, 53 refs.
Paleoclimatology, Paleoecology, Palynology, Forest ecosystems, Vegetation patterns, Mapping, Classifications, Models, Statistical analysis, Correlation, North America

52-6658
Climate and biomes of Europe at 6000 yr BP: comparison of model simulations and pollen-based reconstructions.
Prentice, I.C., Harrison, S.P., Jolly, D., Guiot, J., *Quaternary science reviews,* June-July 1998, 17(6-7), p.659-668, 44 refs.
Paleoclimatology, Climatic changes, Paleoecology, Palynology, Vegetation patterns, Carbon isotopes, Radioactive age determination, Geochronology, Simulation, Statistical analysis, Europe

52-6659
Preliminary mapped summary of Holocene pollen data for northeast China.
Ren, G.Y., Zhang, L.S., *Quaternary science reviews,* June-July 1998, 17(6-7), p.669-688, 73 refs.
Paleoclimatology, Palynology, Paleoecology, Vegetation patterns, Mapping, Statistical analysis, Geochronology, China

52-6660
Influence of the water content on the thermal behaviour of β-cyclodextrin at low and very low temperature.
Germain, P., De Brauer, C., Diot, M., Letoffe, J.M., *Journal of inclusion phenomena,* July 1998, 31(3), p.205-212, 15 refs.
Hydrates, Hydrocarbons, Water content, Water vapor, Low temperature tests, Heat capacity, Temperature measurement, Thermal analysis

52-6661
Estimating ice-affected streamflow by extended Kalman filtering.
Holtschlag, D.J., Grewal, M.S., *Journal of hydrologic engineering,* July 1998, 3(3), p.174-181, 8 refs.
Stream flow, Hydrography, Ice formation, Ice cover effect, Channels (waterways), Water level, Air temperature, Temperature effects, Indexes (ratios), Statistical analysis, Mathematical models, Forecasting

52-6662
Profile of the CO_2 bands produced after ion irradiation of ice mixtures.
Palumbo, M.E., Baratta, G.A., Brucato, J.R., Castorina, A.C., Satorre, M.A., Strazzulla, G., *Astronomy and astrophysics,* June 1, 1998, 334(1), p.247-252, 23 refs.
Ice physics, Extraterrestrial ice, Carbon dioxide, Detection, Cosmic dust, Ice spectroscopy, Infrared spectroscopy, Ionization, Profiles, Simulation

52-6663
Late Quaternary iceberg-rafted detritus events on the Denmark Strait-Southeast Greenland continental slope (~65°N): related to North Atlantic Heinrich events?
Andrews, J.T., Cooper, T.A., Jennings, A.E., Stein, A.B., Erlenkeuser, H., *Marine geology,* Aug. 1998, 149(1-4), p.211-228, 85 refs.
Marine geology, Glacial geology, Pleistocene, Subpolar regions, Marine deposits, Ice rafting, Sedimentation, Paleoecology, Stratigraphy, Radioactive age determination, Drill core analysis, North Atlantic Ocean

52-6664
Mudwave activity and current-controlled sedimentation in Powell Basin, northern Weddell Sea, Antarctica.
Howe, J.A., Livermore, R.A., Maldonado, A., *Marine geology,* Aug. 1998, 149(1-4), p.229-241, 44 refs.
Marine geology, Ocean bottom, Sedimentation, Bottom topography, Ocean currents, Turbidity, Seismic reflection, Profiles, Migration, Geomorphology, Sounding, Antarctica—Weddell Sea
An area of mudwave development has been identified from the northwestern Powell Basin, northern Weddell Sea. The wave-field is located near the base of the continental slope in water depths of 2800-3100 m, along the pathway of Antarctic Bottom Water (AABW) flow from the Weddell Sea. The waves are presently active, migrating up a low angle slope to the northwest. Swath mapping and high-resolution multi-channel seismic reflection profiling across the area show that the waves developed in association with basin floor channels and strongly current-influenced sediments. The origin construction of the waves may have been by turbidity currents predominantly supplied from the basin floor channels. Present-day deposition across the waves is maintained by fine-grained sediment as a result of the lateral transfer of distal turbidities from the basin floor channels by bottom currents. It is suggested that the initiation of current-influenced sedimentation was closely linked to the onset of AABW flow during the Early Miocene, following the separation of the South Orkney Microcontinent and the opening of the Powell Basin during the Late Oligocene. (Auth. mod.)

52-6665
Three dimensional hemispheric air pollution model used for the Arctic.
Christensen, J., International Technical Meeting on Air Pollution Modelling and its Applications, 10th, Valencia, Spain, 1993. Collected papers. Edited by S.E. Gryning and M.M. Millàn and NATO Challenges of Modern Society. Vol.18, New York, Plenum Press, 1994, p.119-127, 30 refs. Includes discussion.
DLC QC880.4.D44 A372 1994
Air pollution, Polar atmospheres, Atmospheric circulation, Atmospheric composition, Advection, Scavenging, Aerosols, Turbulent diffusion, Condensation, Origin, Mathematical models

52-6666
Chemisorbed oxygen on Au(111) produced by a novel route: reaction in condensed films of NO_2 + H_2O.
Wang, J., Voss, M.R., Busse, H., Koel, B.E., *Journal of physical chemistry B,* June 11, 1998, 102(24), p.4693-4696, 20 refs.
Ice physics, Cloud physics, Ice vapor interface, Aerosols, Adsorption, Oxygen, Monomolecular films, Surface structure, Amorphous ice, Ice spectroscopy, Temperature effects

52-6667
Liquid state of low-density pressure-amorphized ice above its T_g.
Johari, G.P., *Journal of physical chemistry B,* June 11, 1998, 102(24), p.4711-4714, 29 refs.
Ice physics, High pressure ice, Amorphous ice, Ice deformation, Ice solid interface, Viscosity, Self diffusion, Dielectric properties, Simulation, Mechanical tests

52-6668
Thermodynamics and kinetics of the solid solution of HNO_3 in ice.
Thibert, E., Dominé, F., *Journal of physical chemistry B,* May 28, 1998, 102(22), p.4432-4439, 56 refs.
Climatology, Cloud physics, Ice physics, Aerosols, Condensation trails, Ice cores, Ice vapor interface, Ion diffusion, Solubility, Thermodynamic properties, Simulation, Chemical analysis

52-6669
Shear-wave studies in glacial till.
Carr, B.J., Hajnal, Z., Prugger, A., *Geophysics,* July-Aug. 1998, 63(4), p.1273-1284, 19 refs.
Glacial geology, Earth crust, Glacial deposits, Quaternary deposits, Seismic surveys, Seismic reflection, Migration, Wave propagation, Boreholes, Stratigraphy, Lithology, Canada—Saskatchewan

52-6670
Shallow seismic reflection study of a glaciated valley.
Büker, F., Green, A.G., Horstmeyer, H., *Geophysics,* July-Aug. 1998, 63(4), p.1395-1407, 46 refs.
Glacial geology, Glacial deposits, Quaternary deposits, Valleys, Sedimentation, Seismic surveys, Seismic reflection, Boreholes, Profiles, Imaging, Switzerland—Suhre Valley

52-6671
Report of the British Antarctic Survey 1996-97.
British Antarctic Survey, Cambridge, Natural Environment Research Council, [1997], 160p., Pubs. p.134-148.
Research projects, Glaciology, Low temperature research
After summarizing BAS year's important events and scientific discoveries, the highlighted topics are reported in more depth. The following is covered: logistics, BAS operational activities and central facilities; science activities, dealing with antarctic ice cover, climate and geological history, the structure and dynamics of the southern ocean ecosystem, dynamics of antarctic terrestrial and freshwater ecosystems, energy flow and dissipation in geospace, antarctic geographic information and mapping, and humans in isolated polar communities. Several appendices provide BAS' financial background, and lists of 1996 publications and staff in various locations, divisions and ships.

52-6672
Architecture and evolution of the continental crust of East Greenland from integrated geophysical studies. [Aufbau und Entwicklungsgeschichte der kontinentalen Kruste Ostgrönlands aus integrierten geophysikalischen Untersuchungen]
Schlindwein, V., *Berichte zur Polarforschung.* 1998, No.270, 148p., With German summary. Refs. p.135-141.
Geophysical surveys, Aerial surveys, Magnetic surveys, Geologic structures, Earth crust, Greenland

52-6673
Katabatic wind and Boundary Layer Front Experiment around Greenland (*KABEG '97*).
Heinemann, G., ed, *Berichte zur Polarforschung.* 1998, No.269, 93p., 34 refs.
Aerial surveys, Ice sheets, Ice air interface, Air flow, Turbulent boundary layer, Atmospheric boundary layer, Wind (meteorology), Katabatic wind, Greenland, Davis Strait

52-6674
Numerical modelling of the interaction between atmosphere and sea ice in the arctic marginal ice zone. [Numerische Modellierung der Wechselwirkung zwischen Atmaosphäre und Meereis in der arktischen Eisrandzone]
Birnbaum, G., *Berichte zur Polarforschung,* 1998, No.268, 160p., In German with English summary. Refs. p.147-153.
Mathematical models, Sea ice, Air masses, Ice edge, Ice models, Ice air interface, Air ice water interaction, Ice heat flux

52-6675
Expedition ANTARKTIS-XIV of RV "Polarstern" in 1997, report of Leg ANT-XIV/3. [Die Expedition ANTARKTIS-XIV mit FS "Polarstern" 1997 Bericht vom Fahrtabschnitt ANT-XIV/3]
Jokat, W., ed, Oerter, H., ed, *Berichte zur Polarforschung,* 1998, No.267, 236p., In German with English summary. 18 refs.
Expeditions, Sea ice, Marine geology, Sediments, Geodetic surveys, Sounding, Antarctica—Queen Maud Land, Antarctica—Neumayer Station
Cruise leg ANT XIV/3 of RV *Polarstern* began on Jan. 4, 1997 at Punta Arenas and ended Mar. 19, 1997 at Cape Town. During this time the ship travelled approximately 10,354 NM. The leg was dominated by geophysical, glaciological, and chemical programs conducted on *Polarstern*, at Neumeyer Station, and in Queen Maud Land.

52-6676
Scientific cruise report of the Kara Sea Expedition of RV *Akademik Boris Petrov* in 1997. [Wissenschaftlicher Fahrtbericht über die Karasee-Expedition von 1987 mit FS *Akademik Boris Petrov*]
Matthiessen, J., ed, Stepanets, O., ed, *Berichte zur Polarforschung,* 1998, No.266, 102p., Introduction in Russian and English. Refs. p.72-74.
Expeditions, Sea water, Oceanography, Geochemistry, Marine geology, Sediments, Marine biology, Russia—Kara Sea

52-6677
Proceedings. POAC 95.
International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995, St. Petersburg, Russia, 1995, Vol.3: 240p., Refs. passim. For individual papers see 52-6678 through 52-6706. For Vols.1 and 2 see 49-6227 through 49-6267.
Ice navigation, Ice mechanics, Ice loads, Sea ice, Ice cover effect, Icebreakers, Design, Mapping, Ice strength, Ice floes, Marine transportation, Ice conditions, Northern Sea Route

52-6678
Assessment of reliability and safety of shipping along the NSR (eastern region) under different types of ice conditions.
Borodachev, V.E., Busuev, A.IA., Likhomanov, V.A., Smolianitskiĭ, V.M., Timofeev, O.IA., Fediakov, V.E., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.4-17.
Marine transportation, Ice navigation, Ice cover effect, Ice conditions, Sea ice distribution, Fast ice, Safety, Route surveys, Ice routing, Northern Sea Route

52-6679
Investigation on fracture mechanics and ice loads during cutting freshwater ice by indenters simulating propeller blades. Part 2: flat vertical indenters.
Beliashov, V.A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.18-30, 4 refs. For Part 1 see 48-87.
Fracturing, Ice solid interface, Ice loads, Ice cutting, Ice navigation, Metal ice friction, Propellers, Mathematical models, Ice mechanics

52-6680
Mathematical models of interaction of air cushion icebreaking platforms with the environment.
Dekhtiar, M.B., Frolovskiĭ, S., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.31-40.
Mathematical models, Ice breaking, Air cushion vehicles, Ice cover strength, Ice solid interface, Ice floes, Ice breakup

52-6681
Application of mixed models of finite elements method for solving ice-cover curvature problems.
Kniazkov, V.V., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.41-50, 2 refs.
Mathematical models, Ice deformation, Ice loads, Ice cover strength, Ice breaking, Ice elasticity

52-6682
Designing peculiarities of structures for icebreakers and ships for navigation in ice.
Shemendiuk, G.P., Babtsev, V.A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.51-59, 13 refs.
Icebreakers, Ships, Design, Damage, Countermeasures, Ice navigation

52-6683
Results of statistical analysis of satellite data on discontinuities in ice cover in the south-western Kara Sea and their possible use for planning sea operations during the winter-spring period.
Brestkin, S.V., Gorbunov, IU.A., Losev, S.M., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.60-68, 4 refs.
Ice cover, Ice conditions, Sea ice distribution, Seasonal variations, Statistical analysis, Marine transportation, Ice navigation, Spaceborne photography, Data processing, Russia—Kara Sea

52-6684
Mapping of the Barents and Kara seas by strength and bearing capacity of first-year ice.
Gavrilo, V.P., Kovalev, S.M., Lebedev, G.A., Nedoshivin, O.A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.69-77, 7 refs.
Mapping, Sea ice, Ice cover strength, Bearing strength, Ice mechanics, Analysis (mathematics), Flexural strength, Ice elasticity, Ice cover thickness, Bering Sea, Russia—Kara Sea

52-6685
Digital helicopter high resolution SLAR for ice mapping.
Darovskikh, A.N., Lebedev, G.A., Pozniak, V.I., Spitsyn, V.A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.78-80.
Side looking radar, Mapping, Sea ice, Ice cover, Airborne radar, Helicopters, Finland, Gulf

52-6686
Peculiarities of the Kara and Barents sea ice cover formation and schematic mapping of its structure and main physical properties.
Strakhov, M.V., Tyshko, K.P., Fedotov, V.I., Cherepanov, N.V., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.81-93, 8 refs.
Mapping, Sea ice, Ice cover, Ice physics, Ice formation, Ice cover thickness, Ice salinity, Ice temperature, Analysis (mathematics), Barents Sea, Russia—Kara Sea

52-6687
Seasonal variability of dynamic ice formation and probability of appearing icebreaker board ice sticking in the western part of Northern Sea Way.
Tyshko, K.P., Cherepanov, N.V., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.94-103, 8 refs.
Ice formation, Seasonal variations, Sea ice, Ice cover, Ice adhesion, Icebreakers, Ice solid interface, Frazil ice, Ice navigation, Northern Sea Route

52-6688
Use of indirect techniques for sea ice temperature and salinity measurements.
Darovskikh, A.N., Lebedev, G.A., Trepov, G.V., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.104-109.
Sea ice, Ice cover, Ice temperature, Ice salinity, Temperature measurement, Brightness, Analysis (mathematics), Remote sensing, Measuring instruments

52-6689
Method and device for ice strength measurement.
Epifanov, V.P., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.110-121, 12 refs.
Ice cover strength, Ice deformation, Measuring instruments, Design, Measurement, Analysis (mathematics), Finland, Gulf

52-6690
Ridge link distributions.
Lensu, M., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.122-133, 20 refs.
Pressure ridges, Sea ice, Ice surface, Analysis (mathematics), Measurement, Bothnia, Gulf
For ridge sail height two distribution hypotheses have been suggested; the first was proposed by Hibler and the other by Wadhams. In laser profilometer surveys the latter has been in most cases found to fit the data very well. The profilometer data refers to two-dimensional ridge cross-sections while in the derivation of the Hibler distribution the reference was to ridge segments or links. The height variation of ridge links has been measured in the Baltic. The results strongly suggest that, correctly interpreted, the two hypotheses imply each other. A table reporting ridge sail height measurements in the Arctic and Antarctic is included. (Auth. mod.)

52-6691
Filtering surface by ice floes.
Marchenko, A., Purini, R., Voliak, K., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.134-142, 6 refs.
Ice floes, Ocean waves, Wave propagation, Ice water interface, Mathematical models

52-6692
Elaboration of the automated system for interpretation of sea ice IR images.
Lebedev, G.A., Tarashkevich, V.N., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.143-151, 3 refs.
Sea ice, Infrared photography, Remote sensing, Photointerpretation, Ice cover thickness, Brightness, Snow cover effect, Snow depth, Analysis (mathematics)

52-6693
Air monitoring of ice conditions in the arctic seas.
Chernook, V.I., Zabavnikov, V.B., Bogomolov, V.IU., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.154-161, Summary, p.152-153.
Ice conditions, Sea ice, Ice navigation, Remote sensing, Aerial surveys, Data processing, Radar tracking

52-6694
Operational tracking of the oil polluted ice in the arctic seas and the Arctic Ocean.
Aleksandrov, V.IU., Brestkin, S.V., Gorbunov, IU.A., Losev, S.M., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.162-170, 8 refs.
Ice floes, Sea ice, Impurities, Drift, Simulation, Remote sensing, Radar tracking, Oil spills, Water pollution, Barents Sea, Russia—Kara Sea, Russia—Laptev Sea

52-6695
Impact of production and processing of hydrocarbon-containing raw minerals from the Shtockmanovskoye field upon the Barents Sea biota.
Novikov, M.A., Kosheleva, V.V., Migalovskiĭ, I.P., Gorbacheva, E.A., Lapteva, A.M., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.171-176, 4 refs.
Environmental impact, Ecology, Hydrocarbons, Water chemistry, Water pollution, Marine biology, Algae, Barents Sea, Russia—Kara Sea, Russia—Laptev Sea

52-6696
Influence of emergency oil spill on the Pechora Sea ecosystem.
Plotitsyna, N.F., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.177-179, 3 refs.
Oil spills, Ecology, Ecosystems, Ocean environments, Environmental impact, Water pollution, Barents Sea

52-6697
Baydaratskaya Bay ice cover and necessity of its accounting during marine hydrotechnical construction.
Bondarev, V.N., Golovin, N.V., Maĭorov, O.N., Rokos, S.I., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.180-186.
Ice cover strength, Ice conditions, Hummocks, Drift, Pressure ridges, Fast ice, Offshore structures, Ice floes, Russia—Baydaratskaya Bay

52-6698
Economics of conversion of Northern natural gas into synthetic crude oil and transport to world markets in ice-strengthened ships.
Sackinger, W.M., Kamath, V.A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.187-188, Extended summary. 1 ref.
Cost analysis, Hydrocarbons, Spectra, Natural gas, Crude oil, Fuel transport, Marine transportation

52-6699
Ecosystem baseline studies in the Pechora Sea in 1992-95.
Sandler, H., Grönlund, L., Kuznetsov, L., Denisenko, S., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.189-190.
Ecosystems, Marine biology, Environmental protection, Oil spills, Water pollution, Barents Sea, Russia—Komi, Russia—Pechora Bay

52-6700
Submerged permafrost of Pechora and Kara seas, prospective in studies of frozen soils.
Bondarev, V., Dlugach, V., Okko, O., Loktev, A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.191-194, 5 refs.
Subsea permafrost, Permafrost origin, Engineering geology, Boreholes, Barents Sea, Russia—Kara Sea

52-6701

Refined storm wave model.

Lavrenov, I., Pasechnik, T., Dymov, V., Khuduchev, L., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.195-198, 6 refs.

Mathematical models, Wave propagation, Wind velocity, Wind (meteorology), Air water interactions, Ocean waves, Storms

52-6702

Monitoring system of the Barents Sea (SEA-WATCH) and the possibilities of its development in application to the tasks of the information supply in the Arctic.

Toro, C., Berge, F., Dzheniuk, S., Zuev, A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.199-205.

Data processing, Monitors, Warning systems, Environmental protection, Water pollution, Barents Sea

52-6703

Experience of ecological impact assessment (EIA) of large-scale offshore oil and gas production based on the Stockman project.

Matishov, G.G., Denisov, V.V., Petrov, V.S., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.206-213.

Environmental impact, Gas pipelines, Natural gas, Petroleum industry, Offshore drilling, Ecosystems, Barents Sea

52-6704

Evaluating J-integrals for ice-substrate interface cracks using finite element analysis.

Whelan, A.E., Nixon, W.A., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.214-227, 15 refs.

Ice cracks, Substrates, Analysis (mathematics), Ice strength, Ice mechanics, Cracking (fracturing), Crack propagation

52-6705

Possibilities of Murmansk Joint-Stock Company in realization the fleet concepts for the development of arctic shelf.

Klimashevskiĭ, S., Shliachkov, V., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.228-230.

Ships, Ice navigation, Icebreakers, Natural resources, Petroleum industry

52-6706

Use of local-genetic methods for ice distribution forecasting in summer for providing support to shipping and engineering activities in the Kara Sea.

Spichkin, V.A., Egorov, A.G., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol.3, St. Petersburg, Russia, 1995, p.231-240, 4 refs.

Ice forecasting, Ice conditions, Sea ice distribution, Ice navigation, Ice cover, Russia—Kara Sea

52-6707

Geoid and crustal structure of Fennoscandia.

Wang, Z.T., *Finland. Finnish Geodetic Institute. Publication,* 1998, No.126, 118p., Dissertation presented at the University of Helsinki. Refs. p.110-118.

Earth crust, Geodetic surveys, Geologic structures, Subpolar regions, Isostasy, Gravity anomalies, Seismic velocity, Seismic reflection, Profiles, Topographic effects, Mathematical models, Norway, Sweden, Finland

52-6708

Radar detectability of a subsurface ocean on Europa.

Chyba, C.F., Ostro, S.J., Edwards, B.C., *Icarus,* Aug. 1998, 134(2), p.292-302, 74 refs.

Extraterrestrial ice, Ice physics, Satellites (natural), Spacecraft, Radar echoes, Attenuation, Sounding, Ice crystal optics, Ice temperature, Impurities, Oceans, Subsurface structures, Analysis (mathematics)

52-6709

Polarization lidar returns from aerosols and thin clouds: a framework for the analysis.

Gobbi, G.P., *Applied optics,* Aug. 20, 1998, 37(24), p.5505-5508, 17 refs.

Climatology, Cloud physics, Optical properties, Aerosols, Polar stratospheric clouds, Classifications, Phase transformations, Ice crystal optics, Lidar, Backscattering, Polarization (waves), Indexes (ratios), Analysis (mathematics)

52-6710

Errors in the retrieval of thin-cloud optical parameters obtained with a two-boundary algorithm.

Del Guasta, M., *Applied optics,* Aug. 20, 1998, 37(24), p.5522-5540, 17 refs.

Climatology, Cloud cover, Cloud physics, Aerosols, Optical properties, Polar stratospheric clouds, Lidar, Backscattering, Attenuation, Indexes (ratios), Correlation, Accuracy, Analysis (mathematics)

52-6711

New estimate of changing carbon storage on land since the last glacial maximum, based on global land ecosystems reconstruction.

Adams, J.M., Faure, H., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.3-24, 68 refs.

Pleistocene, Paleoecology, Global change, Ecosystems, Peat, Biomass, Carbon dioxide, Storage, Geochemical cycles, Vegetation patterns, Mapping, Statistical analysis

52-6712

Role of the southern Indian Ocean in the glacial to interglacial atmospheric CO_2 change: organic carbon isotope evidences.

Bentaleb, I., Fontugne, M., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.25-36, 66 refs.

Paleoclimatology, Global change, Atmospheric composition, Climatic changes, Carbon dioxide, Solubility, Sea water, Biomass, Ice cores, Drill core analysis, Geochemical cycles, Isotope analysis, Antarctica—Vostok Station, —Indian Ocean

Carbon isotopic composition of sedimentary organic matter from marine cores are used as a proxy for paleoproductivity and paleo-dissolved carbon dioxide concentrations in surface waters of the southern ocean during the last 50,000 years. During the glaciation and deglaciation periods, pCO_2 was 50 to 100 µatm higher in surface water than in the atmosphere as recorded in the Vostok ice core. This suggests that the southern Indian Ocean could have been a potential source of CO_2 for the glacial and deglacial atmosphere. These results, plus those of sedimentary organic carbon content suggest that the biological pump was off and unable to lower atmospheric CO_2 concentration. This indicates that a winter ice covered ocean and stratification of summer surface water caused a reduction of gas exchange with the atmosphere during that period. (Auth. mod.)

52-6713

Modelling the glacial-interglacial changes in the continental biosphere.

François, L.M., Delire, C., Warnant, P., Munhoven, G., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.37-52, 43 refs.

Pleistocene, Paleoclimatology, Geochemical cycles, Carbon dioxide, Global change, Paleoecology, Biomass, Vegetation patterns, Storage, Carbon isotopes, Photosynthesis, Mathematical models

52-6714

Changes in carbon pools of peatland and forests in northwestern Russia during the Holocene.

Kobak, K.I., Kondrasheva, N.IU., Turchinovich, I.E., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.75-84, 43 refs.

Pleistocene, Paleoclimatology, Climatic changes, Paleobotany, Geochemical cycles, Carbon dioxide, Forest ecosystems, Peat, Paludification, Biomass, Distribution, Models, Russia

52-6715

Atmospheric CO_2 consumption by continental erosion: present-day controls and implications for the last glacial maximum.

Ludwig, W., Amiotte-Suchet, P., Munhoven, G., Probst, J.L., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.107-120, 60 refs.

Paleoclimatology, Geochemical cycles, Carbon dioxide, Global change, River basins, Runoff, Water erosion, Weathering, Organic nuclei, Ion diffusion, Sediment transport, Mathematical models

52-6716

Organic carbon content in the late Pleistocene and Holocene fossil soils (reconstruction for eastern Europe).

Morozova, T.D., Velichko, A.A., Dlussky, K.G., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.131-151, 36 refs.

Pleistocene, Geochemical cycles, Carbon dioxide, Organic soils, Paleoecology, Storage, Soil composition, Soil formation, Soil classification, Europe

52-6717

Continental water cycle and carbon reservoirs and their relationships in the past.

Starkel, L., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.153-158, 26 refs.

Pleistocene, Paleoclimatology, Geochemical cycles, Hydrologic cycle, Global change, Carbon dioxide, Reservoirs, Lithology, Humidity, Biomass, Models

52-6718

Estimates of methane emission during the last 125,000 years in northern Eurasia.

Velichko, A.A., Kremenetskiĭ, K.V., Borisova, O.K., Zelikson, E.M., Nechaev, V.P., Faure, H., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.159-180, 50 refs.

Pleistocene, Paleoclimatology, Global warming, Wetlands, Tundra vegetation, Permafrost distribution, Paleobotany, Natural gas, Soil chemistry, Soil air interface, Vapor transfer, Theories, Eurasia

52-6719

Phytomass and carbon storage during the Eemian optimum, late Weichselian maximum and Holocene optimum in eastern Europe.

Zelikson, E.M., Borisova, O.K., Kremenetskiĭ, K.V., Velichko, A.A., *Global and planetary change,* May 1998, Vol.16-17, INQUA Symposium on Carbon Cycle, 15th, Berlin, Germany, Aug. 1995. Selected papers. Edited by H. Faure et al, p.181-195, 21 refs.

Pleistocene, Paleoecology, Paleobotany, Plains, Biomass, Carbon dioxide, Storage, Vegetation patterns, Tundra vegetation, Statistical analysis, Models, Europe

52-6720
Finite-element treatment of sea ice dynamics for different ice rheologies.
Schulkes, R.M.S.M., Morland, L.W., Staroszczyk, R., *International journal for numerical and analytical methods in geomechanics,* Mar. 1998, 22(3), p.153-174, 22 refs.
Sea ice, Ice mechanics, Pack ice, Drift, Viscosity, Traction, Plastic deformation, Ice solid interface, Ice water interface, Mathematical models, Rheology, Boundary value problems

52-6721
Revised formulation for the refractive index of water and steam as a function of wavelength, temperature and density.
Harvey, A.H., Gallagher, J.S., Levelt Sengers, J.M.H., *Journal of physical and chemical reference data,* July-Aug. 1998, 27(4), p.761-774, 29 refs.
Water temperature, Optical properties, Refractivity, Density (mass/volume), Supercooling, Indexes (ratios), Standards, Statistical analysis

52-6722
Semi-empirical model for heat transfer and ice accretion on aircraft wings in supercooled clouds.
Sherif, S.A., Pasumarthi, N., Bartlett, C.S., *Cold regions science and technology,* Dec. 1997, 26(3), p.165-179, 26 refs.
Aircraft icing, Ice accretion, Ice sublimation, Cloud droplets, Runoff, Ice solid interface, Turbulent flow, Laminar flow, Surface temperature, Heat transfer, Mathematical models, Ice forecasting, Thermodynamic properties

52-6723
Modelling vertical and lateral water flow in frozen and sloped forest soil plots.
Stadler, D., Flühler, H., Jansson, P.E., *Cold regions science and technology,* Dec. 1997, 26(3), p.181-194, 23 refs.
Forest land, Forest soils, Snow hydrology, Water balance, Snowmelt, Runoff, Seepage, Water transport, Soil freezing, Frost penetration, Heat transfer coefficient, Mathematical models

52-6724
Evaluation of three numerical models used in simulations of the active layer and permafrost temperature regimes.
Romanovsky, V.E., Osterkamp, T.E., Duxbury, N.S., *Cold regions science and technology,* Dec. 1997, 26(3), p.195-203, 26 refs.
Permafrost physics, Frozen ground temperature, Permafrost thermal properties, Active layer, Thermal regime, Freeze thaw cycles, Unfrozen water content, Mathematical models, Correlation, Simulation

52-6725
Onshore ice pile-up: a comparison between experiments and simulations.
Hopkins, M.A., MP 5214, *Cold regions science and technology,* Dec. 1997, 26(3), p.205-214, 7 refs.
Sea ice, Pack ice, Pressure ridges, Ice strength, Ice mechanics, Ice pileup, Sliding, Topographic effects, Ice solid interface, Loads (forces), Computerized simulation, Mechanical tests
Recently computer models have been used to simulate the arctic pressure ridging process. However, there has been no experimental data available to establish the accuracy of the simulations. This lack of data is due to the difficulty of modeling the pressure ridging process in the laboratory and of measuring ridge formation in the field. In this work the results of computer simulations of the closely related process of ice pile-up on an inclined ramp are directly compared with the results of a similar series of physical experiments conducted in an ice basin. In the experiments and simulations an inclined ramp is pushed against a long, stationary strip of intact, floating ice. The forces exerted on the ramp, the total energy expended, and the increase in the potential energy of the ice piled on the ramp are measured.

52-6726
Mechanical strength of polycrystalline ice under uniaxial compression.
Arakawa, M., Maeno, N., *Cold regions science and technology,* Dec. 1997, 26(3), p.215-229, 19 refs.
Ice mechanics, Ice strength, Ice deformation, Ice solid interface, Tensile properties, Brittleness, Phase transformations, Strain tests, Mechanical properties, Temperature effects

52-6727
UV-radiation can affect depth-zonation of antarctic macroalgae.
Bischof, K., Hanelt, D., Wiencke, C., *Marine biology,* July 1998, 131(4), p.597-605, 51 refs.
Marine biology, Biomass, Algae, Ultraviolet radiation, Radiation absorption, Photosynthesis, Acclimatization, Environmental tests, Simulation
Measurements of variable chlorophyll fluorescence were conducted to document UV-induced photoinhibition of photosystem II in cultivated macroalgae with different depth distributions in Antarctica. The reactions during artificial UV-exposure were observed on a short time scale and in light-dark cycles over several days. The nine species of investigated macroalgae show great differences in UV-tolerance of the photosynthetic process. The differences in the degree of inhibition and recovery of photosynthetic efficiency and capacity indicate that UV-radiation is one important factor affecting the vertical distribution of macroalgae in nature. (Auth. mod.)

52-6728
Seasonality of polypide recycling and sexual reproduction in some erect antarctic bryozoans.
Barnes, D.K.A., Clarke, A., *Marine biology,* July 1998, 131(4), p.647-658, 44 refs.
Marine biology, Biomass, Ocean bottom, Ecosystems, Growth, Seasonal variations, Antarctica—Signy Island
The seasonality of polypide cycling has been investigated for three species of erect bryozoans from Antarctica. Approximately ten colonies of each species were collected monthly by scuba divers over a 14 mo period during 1992-93, and the status of each individual zooid was classified as differentiating/regenerating, active (feeding autozooids), degenerate (brown body) or sexually reproductive (ovicells present, or zooid containing a larva). Polypide cycling in all three species was distinctly seasonal. The seasonal patterns of polypide cycling are related clearly to the variations in food availability, and these species appear to have the longest zooid lifetime and the slowest polypide cycling (once per year with polypide lifetimes up to 10 mo) reported for any bryozoans so far. (Auth. mod.)

52-6729
Role of stream ice on fall and winter movements and habitat use by bull trout and cutthroat trout in Montana headwater streams.
Jakober, M.J., McMahon, T.E., Thurow, R.F., Clancy, C.G., *American Fisheries Society. Transactions,* Mar. 1998, 127(2), p.223-235, 39 refs.
Limnology, Stream flow, Ecosystems, Biomass, Migration, River ice, Ice formation, Frazil ice, Bottom ice, Water temperature, Ice cover effect, Seasonal variations, Environmental tests, United States—Montana—Bitterroot River

52-6730
Study of the hydrates of H_2SO_4 using density functional theory.
Bandy, A.R., Ianni, J.C., *Journal of physical chemistry A,* Aug. 6, 1998, 102(32), p.6533-6539, 46 refs.
Hydrates, Chemical properties, Molecular structure, Hydrogen bonds, Dielectric properties, Cloud physics, Particles, Density (mass/volume), Condensation nuclei, Stratosphere, Simulation, Thermodynamics, Theories

52-6731
Molecular dynamics study of the water layers adsorbed on MgO(100).
Marmier, A., Hoang, P.N.M., Picaud, S., Giradet, C., Lynden-Bell, R.M., *Journal of chemical physics,* Aug. 22, 1998, 109(8), p.3245-3254, 44 refs.
Water structure, Adsorption, Metals, Liquid solid interfaces, Layers, Monomolecular films, Ice structure, Hydrogen bonds, Molecular structure, Orientation, Simulation

52-6732
Winter expedition to the southwestern Kara Sea—investigations on the formation and transport of turbid sea ice. [Winter Expedition in die südwestliche Kara Sea - Untersuchungen über Bildung und Transport von Sediment-beladenem Meereis]
Dethleff, D., et al, *Berichte zur Polarforschung,* 1998, No.271, 40p., 50 refs.
Expeditions, Sea ice, Suspended sediments, Sea water freezing, Ice formation, Ice openings, Drift, Ice rafting, Sediment transport, Russia—Kara Sea

52-6733
Investigations of the arctic atmosphere by FTIR-Emission spectroscopy. [FTIR-Emissionsspektroskopische Untersuchungen der arktischen Atmosphäre]
Becker, E., *Berichte zur Polarforschung,* 1998, No.272, 120p., In German with English summary. Refs. p.112-117.
Atmospheric composition, Infrared spectroscopy, Measuring instruments, Aerosols, Polar atmospheres, Air pollution, Norway—Spitsbergen

52-6734
Expedition ANTARKTIS XIV/2 of RV *Polarstern* in 1996/97.
Kattner, G., ed, *Berichte zur Polarforschung,* 1998, No.274, 87p., 1 ref.
Expeditions, Marine biology, Cold tolerance, Plankton, Ultraviolet radiation, Antarctica—Elephant Island, Antarctica—King George Island
During the RV *Polarstern* cruise ANT XIV/2, intensive investigations were conducted around Elephant and King George islands under the umbrella of CCAMLR. Additionally, other special topics were investigated: the physiological adaptation of antarctic animals to the cold environment; samples of fish eggs were collected for electron microscopical investigations; and the distribution and abundance of parasites in fishes were determined. Another part of the program were studies on the ecology and life strategies of cephalapods. The biological research also included ecological and taxonomic studies on Cumacea, Amphipoda, and Isopoda. Biochemical investigations on the lipid biosynthesis and accumulation were performed on the dominant copepod species. The abundance and distribution of whales was monitored by observations and by acoustic methods using hydrophones. Investigating the influence of UV-B radiation on phytoplankton and primary production was another main topic of the biological studies. Oceanography programs included the hydrography of this region and the use of a newly developed LIDAR system to measure dissolved organic material and "gelbstoff" as well as fluorescent pigments in algae in the upper layer of the water column. (Auth. mod.)

52-6735
Size distribution of ice fog particles.
Huffman, P.J., College, University of Alaska, 1968, 93p., M.S. thesis. 23 refs.
Ice fog, Fog formation, Ice nuclei, Homogeneous nucleation, Ice crystal growth, Ice crystal size, Ice crystal optics, Particle size distribution, Visibility, Statistical analysis, Computer programs, United States—Alaska—Fairbanks

52-6736
Structure and mechanisms of formation of snowbands during the 1994-95 winter at Cheyenne, Wyoming as revealed by NEXRAD WSR-88D radar data.
Wesley, D.A., Weiland, M.S., Evans, J.S., Conference on Radar Meteorology, 27th, Vail, CO, Oct. 9-13, 1995, Boston, American Meteorological Society, 1995, p.16-18, 2 refs.
Snowfall, Snowstorms, Cloud cover, Cloud physics, Radio echo soundings, Radar tracking, Weather forecasting, United States—Wyoming

52-6737
Scour measurements under ice.
Zabilansky, L.J., MP 5215, International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.1, Reston, VA, American Society of Civil Engineers, Water Resources Engineering Division, 1998, p.151-156, 5 refs.
DLC TC5.I696 1998
River ice, Ice breakup, Ice scoring, Ice erosion, Bridges, Piers, Monitors, Subglacial observations
The accuracy of numerical and physical models of scour around bridge piers is compromised by the lack of real-time field data correlating rate of scour with the hydrograph. Performance of scour instrumentation that penetrates through the water surface or uses an umbilical instrumentation cable is in jeopardy of damage when ice and debris are present. To minimize damage from impact, a bottom-founded, robust, radio-based scour monitoring system was developed at the Cold Regions Research and Engineering Laboratory (CRREL) and installed in the White River at White River Junction, VT. A series of tethered motion-sensitive radio transmitters were buried in the sediment upstream of a bridge pier.Although the approach was crude, it was effective in incrementally detecting depth of scour during an ice breakup event.

52-6738

Innovative instrumentation techniques for detecting and measuring the effects of sediment scour under ice.

Yankielun, N.E., Zabilansky, L.J., MP 5216, International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.1, Reston, VA, American Society of Civil Engineers, Water Resources Engineering Division, 1998, p.204-209, 7 refs.

DLC TC5.I696 1998

River ice, Ice scoring, Ice erosion, Bottom sediment, Bottom topography, Bridges, Piers, Subglacial observations, Sensors, Telemetering equipment

Sediment scour is a severe problem that creates millions of dollars of damage to bridge piers and related infrastructure annually. The effects of scour intensify during high-energy water flow beneath an ice cover. Very little is known of the dynamics of scour under these conditions, principally due to the lack of appropriate instrumentation. The authors present several innovative instrumentation techniques that were developed specifically for detecting and measuring scour under an ice cover but can also be applied to scour measurement in general. These techniques include the application of tethered, neutrally buoyant, motion-sensitive telemetry "fish", an umbilical cable-based time domain reflectometry (TDR) sensor, and a wireless frequency-modulated continuous-wave (FM-CW) reflectometry sensor. The "fish" sensor has a spatial resolution of 12 cm. The TDR- and FM-CW based sensors have spatial resolutions of 2 cm. All sensors provide continuous, unattended operation and can be uncovered and reburied by multiple sediment erosion and deposition events.

52-6739

Value of a good snow policy. *Iowa State University. Center for Transportation Research and Education. Technology news,* Aug.-Sep. 1998, p.9.

Highway planning, Urban planning, Road maintenance, Snow removal, Cold weather operation, Legislation, United States—Iowa

52-6740

Effects of wind direction on pH and electrolytic conductivity of snow in New Hampshire.

Kumai, M., MP 5217, Conference on Climate and Water Management—a critical era and Conference on the Human Consequences of 1985's Climate, Asheville, NC, Aug. 4-7, 1986. Preprint volume, Boston, American Meteorological Society, [1986], p.142-146, 7 refs.

Air pollution, Wind direction, Aerosols, Snowfall, Scavenging, Snow composition, Snow impurities, Snow electrical properties, United States—New Hampshire

This paper presents the results of an investigation of snowfalls in Hanover, NH; the pH and electrolytic conductivity of snow; fly ash and aerosol examinations by scanning electron microscope and energy dispersive x-ray analyzer; and the effects of wind direction on pH and electrolytic conductivity of snow in New Hampshire.

52-6741

CAPS: Circumpolar Active-Layer Permafrost System Version 1.0.

International Permafrost Association, Colorado. University. National Snow and Ice Data Center, Boulder, NSIDC, 1998, n.p., CD ROM only. The International Permafrost Association Web site is at http://www.geodata.soton.ac.uk/ipa and the National Snow and Ice Data Center is at http://www-nsidc.colorado.edu.

Permafrost surveys, Permafrost distribution, Permafrost heat balance, Permafrost dating, Active layer, Soil freezing, Frozen ground temperature, Frozen ground thermodynamics, Ground ice, Bibliographies, Data processing, Research projects

52-6742

Scanning electron microscope examination of growing ice needles on freezing bentonite.

Kumai, M., MP 5218, Conference on Snow, Ice and Frozen Soils, Kushiro, Japan, Oct. 4-7, 1987, Tokyo, Japanese Society of Snow and Ice, [1987], p.154, Extended abstract only.

Clay soils, Frozen ground thermodynamics, Ground ice, Ice needles, Ice crystal growth, Low temperature research, Scanning electron microscopy

52-6743

Road Weather Information Systems (RWIS) for IVHS applications and improved maintenance procedures.

Kelley, J.R., IVHS America Annual Meeting, 4th, Atlanta, GA, Apr. 17-20, 1994. Proceedings, Washington, D.C., Intelligent Vehicle Highway Society of America, [1994], p.262-269, 8 refs.

Highway planning, Road maintenance, Road icing, Ice detection, Weather forecasting, Warning systems, Data transmission

52-6744

Operational application of the NESDIS Extratropical Cyclone Precipitation Estimation Technique to west coast winter storms.

Kusselson, S.J., Conference on Hydrometeorology, 6th, Indianapolis, IN, Oct. 29-Nov. 1, 1985, Boston, American Meteorological Society, [1985], p.310-315, 7 refs.

Atmospheric disturbances, Storms, Precipitation (meteorology), Cloud cover, Weather forecasting, Flood forecasting, Spaceborne photography, Image processing

52-6745

Ice dams. *USAA magazine,* Aug.-Sep. 1998, p.12-14.

Roofs, Ice dams, Ice prevention, Ventilation, Thermal insulation, Waterproofing, Cold weather construction

52-6746

Annual report: research projects 1996.

Finnish Institute of Marine Research (Merentutkimuslaitos), *Finnish Institute of Marine Research. Report series. MERI (the sea),* 1997, No.28, 28p. + appends., List of publications in Appendix 1, 4p.

Organizations, Research projects, Oceanographic surveys, Marine atmospheres, Marine biology, Air ice water interaction, Ice surveys, Ice reporting

52-6747

Peatlands on national forests of the northern Rocky Mountains: ecology and conservation.

Chadde, S.W., et al, *U.S. Forest Service. Rocky Mountain Research Station, Ogden, UT. General technical report,* July 1998, RMRS-GTR-11, 75p., Refs. p.40-43.

Wetlands, Swamps, Paludification, Forest ecosystems, Peat, Vegetation patterns, Plant ecology, Environmental protection, United States—Rocky Mountains

52-6748

Assessment methodology for determining historical changes in mountain streams.

Smelser, M.G., Schmidt, J.C., *U.S. Forest Service. Rocky Mountain Research Station, Fort Collins, CO. General technical report,* Apr. 1998, RMRS-GTR-6, 29p., 54 refs.

Stream flow, River flow, River basins, Water reserves, Runoff forecasting, Flood forecasting, Channel stabilization, Water erosion, Hydrography

52-6749

Guidelines for evaluating air pollution impacts on wilderness within the Rocky Mountain Region: report of a workshop, 1990.

Haddow, D., ed, Musselman, R., ed, Blett, T., ed, Fisher, R., ed, *U.S. Forest Service. Rocky Mountain Research Station, Fort Collins, CO. General technical report,* Apr. 1998, RMRS-GTR-4, 31p., Refs. passim.

Air pollution, Haze, Visibility, Ecosystems, Ecology, Environmental impact, Environmental protection, United States—Rocky Mountains

52-6750

Abbreviated test report for the US Army Cold Regions Test Center chamber test of the Extreme Cold Weather Boot (ECWB) and Standard White Vapor Barrier (VB) Boot.

Molyneaux, W.W., Lynn, J.E., U.S. Army Test and Evaluation Command TECOM Project No.8-EI-495-ECB-002, Fort Greely, AK, U.S. Army Cold Regions Test Center, Aug. 1998, 6p. + appends., 5 refs.

Clothing, Military equipment, Cold weather tests, Human factors engineering

52-6751

Skier triggered slab avalanches. [Déclenchement d'avalanche de plaque par les skieurs]

Schweizer, J., *Neige et avalanches,* June 1998, No.82, p.2-7,32, In French with English summary. 5 refs.

Snow cover stability, Snow slides, Avalanche triggering, Avalanche forecasting, Skis

52-6752

Avalanche hazard perception. [La perception du risque d'avalanche]

Esculier, C., Zuanon, J.P., *Neige et avalanches,* June 1998, No.82, p.8-11,32, In French with English summary.

Avalanche forecasting, Safety, Human factors

52-6753

Judgements about mortal avalanche accidents on ski runs. [Avalanches: accidents mortels sur pistes de ski]

Sarraz-Bournet, P., *Neige et avalanches,* June 1998, No.82, p.12-15,32, In French with English summary.

Avalanches, Avalanche forecasting, Safety, Accidents, Legislation, France

52-6754

Non ordinary avalanches. [Avalanches peu ordinaires]

Zuanon, J.P., *Neige et avalanches,* June 1998, No.82, p.16-17,32, In French with English summary.

Avalanches, Accidents, History, Switzerland

52-6755

Avalanche victims localization. [A propos de la localisation des victimes d'avalanche]

Zuanon, J.P., *Neige et avalanches,* June 1998, No.82, p.18-20,32, In French with English summary. 3 refs.

Avalanches, Accidents, Rescue operations

52-6756

Overview of on-site analytical methods for explosives in soil.

Crockett, A.B., Jenkins, T.F., Craig, H.D., Sisk, W.E., SR 98-04, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Feb. 1998, 30p., ADA-351 073, Refs. p.26-30.

Military facilities, Explosives, Waste disposal, Soil pollution, Soil chemistry, Soil analysis, Chemical analysis

On-site methods for explosives in soil are reviewed. Current methods emphasize the detection of TNT and RDX. Methods that have undergone significant validation fall into two categories: colorimetric-based methods and enzyme immunoassay methods. Discussions include considerations of specificity, detection limits, extraction, cost, and ease of use. A discussion of the unique sampling design considerations is also provided as well as an overview of the most commonly employed laboratory method for analyzing explosives in soil. A short summary of ongoing development activities is provided.

52-6757

Ice damage to concrete.

Schulson, E.M., SR 98-06, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report,* Apr. 1998, 48p., ADA-351 076, Refs. p.19-22.

Concrete durability, Concrete freezing, Concrete pavements, Bridges, Frost action, Frost resistance, Salting, Corrosion, Cracking (fracturing), Road maintenance

Concrete is a porous material. When saturated with water and then cooled to below 0°C, it cracks internally. Upon repeated freezing and thawing, the cracks grow, interact, and lead eventually to macroscopic degradation, termed ice damage. This report reviews the phenomenon and considers the underlying mechanisms. New explanations are given for the deleterious effect of deicer salts and for the beneficial effect of entrained air.

52-6758

Frost-shielding methodology and demonstration for shallow burial of water and sewer utility lines.

Coutermarsh, B.A., Carbee, D.L., CR 98-04, *U.S. Army Cold Regions Research and Engineering Laboratory. Report,* June 1998, 18p., ADA-350 992, 8 refs.

Utilities, Sewage disposal, Water pipelines, Underground pipelines, Frozen ground thermodynamics, Frozen ground temperature, Frost penetration, Frost protection, Thermal insulation, Computerized simulation

Burying utility lines below the maximum frost penetration depth can be expensive when difficult digging conditions are encountered or where existing obstacles make the desired depth expensive to achieve. Protecting the pipeline from freezing by adding an insulation shield would allow a shallow burial option. This can reduce excavation costs or avoid the relocation costs of moving the pipeline to an unobstructed location. A finite-element program was developed to model various subterranean heat-flow situations. It was used to design frost shields for a water line in northern New Hampshire through a 4-year Construction Productivity Advancement Research project with the City of Berlin Water Works, the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL), and the Owens-Corning Specialty and Foam Products Division as partners.

52-6759
Variation in amount of snow, winter precipitation and winter air temperatures during the last 60 years in Shinjo, Japan.
Nakamura, T., Abe, O., *Japan. National Research Institute for Earth Science and Disaster Prevention. Report,* Mar. 1998, No.58, p.1-14, With Japanese summary. 14 refs.
Snowfall, Snow depth, Precipitation (meteorology), Air temperature, Climatic changes, Global warming, Meteorological data, Statistical analysis, Japan

52-6760
Cumulus convection model of National Research Institute for Earth Science and Disaster Prevention. [Bosai kagaku gijutsu kenkyujo sekiun tairyu moderu ni tsuite]
Kaneda, M., Misumi, R., Chiba, M., *Japan. National Research Institute for Earth Science and Disaster Prevention. Report,* Mar. 1998, No.58, p.137-148, In Japanese with English summary. 19 refs.
Clouds (meteorology), Cloud physics, Convection, Snowfall, Snowstorms, Snow pellets, Precipitation (meteorology), Weather forecasting, Mathematical models, Computerized simulation

52-6761
Accuracy of precipitation parameters estimated by vertically pointing Doppler radar observations. [Enchoku Doppura reda kansoku ni yoru kosui parameta no suitei seido ni tsuite]
Maki, M., Sasaki, Y., Iwanami, K., *Japan. National Research Institute for Earth Science and Disaster Prevention. Report,* Mar. 1998, No.58, p.149-168, In Japanese with English summary. 27 refs.
Cloud physics, Snowfall, Falling snow, Snow pellets, Precipitation (meteorology), Weather forecasting, Radar echoes, Radar tracking, Mathematical models

52-6762
Fluctuations of glaciers 1990-1995 (Vol. VII).
Haeberli, W., ed, Hoelzle, M., ed, Suter, S., ed, Frauenfelder, R., ed, Paris, IAHS/UNESCO, 1998, 296p. + maps in separate pocket, Refs. p.86-102.
Glacier surveys, Glacier oscillation, Glacier thickness, Glacier mass balance

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