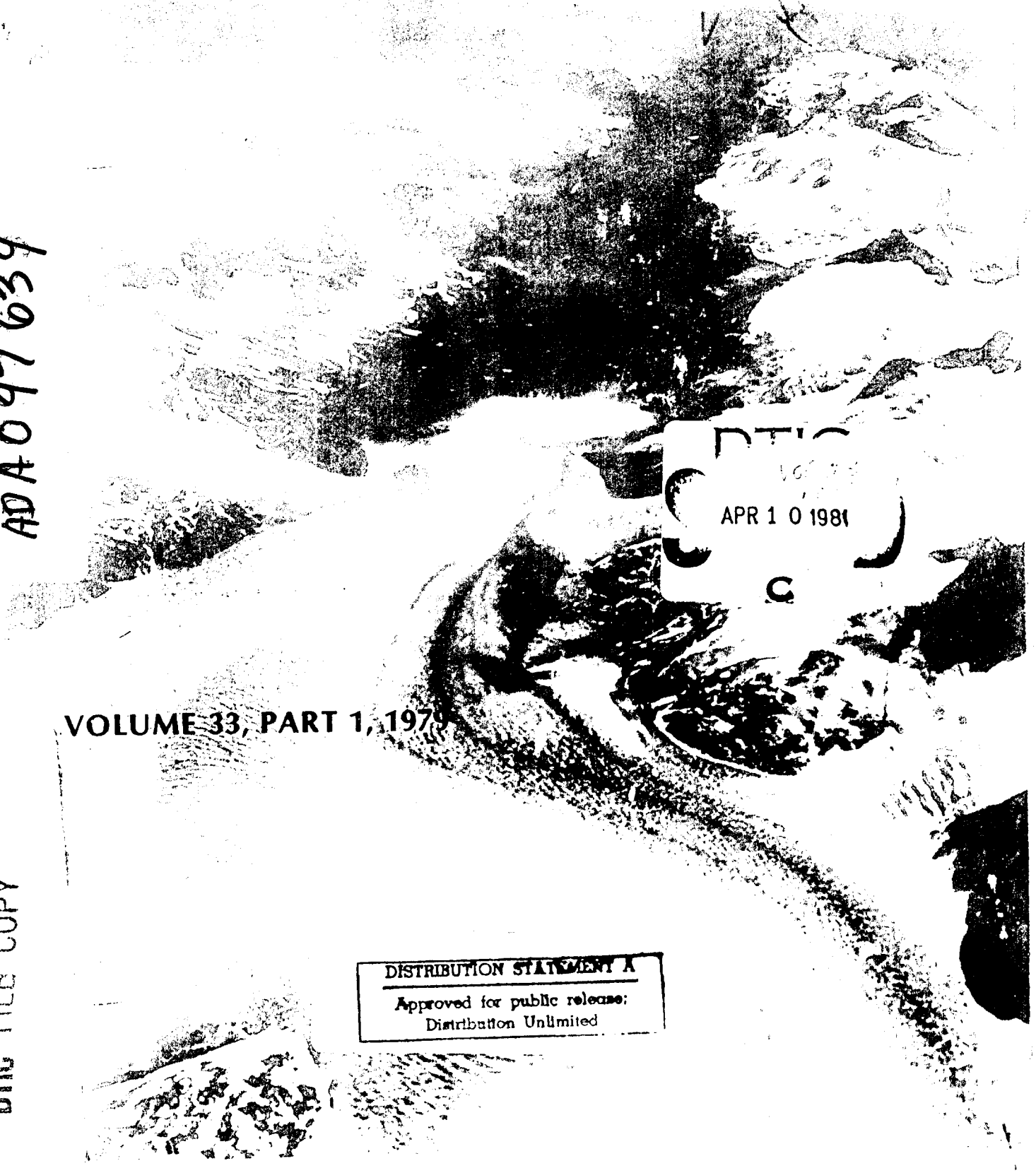
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INTRODUCTION

The *Bibliography on Cold Regions Science and Technology*, CRREL Report 12, was first published in 1951 and is a continuing publication of the Cold Regions Bibliography Project in the Science and Technology Division of the Library of Congress. It is sponsored by and prepared for the Cold Regions Research and Engineering Laboratory (formerly Snow, Ice and Permafrost Research Establishment) of the U.S. Army Corps of Engineers. Volumes 1-15 were issued as the *Bibliography on Snow, Ice and Permafrost*, SIPRE Report 12. Beginning with volume 16 the designation was changed to CRREL Report 12. With volume 20 the title was changed to *Bibliography on Snow, Ice and Frozen Ground, with Abstracts*, and with volume 23 the current title was adopted.

The present volume contains material accessioned between October 1978 and September 1979. It contains the full citation of 4770 items, in many cases with abstracts. Pt. 2 is an index section divided into author and subject indexes. In the author index principal and joint personal and corporate authors are listed along with the title, date, pagination, and language of the document and the accession number. The subject index is composed of three basic elements: (1) terms taken from a controlled vocabulary based on the *Thesaurus of Engineering and Scientific Terms* (LEX-E JC), (2) free terms added as needed, (3) geographic names, generally entered under countries. The terms are listed in a single alphabetical arrangement, along with title (original, translated, abridged, expanded, or supplied), principal author, date, pagination, and language of pertinent documents, and their accession numbers.

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Frozen ground physics, Ultrasonic tests, Frozen ground strength, Shear strength, Compressive strength.

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Frozen fines, Clays, Ice accretion, Unfrozen water content, Ice structure, Microelement content.

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Sea ice, Ice salinity, Unfrozen water content, Ice strength, Ultrasonic tests.

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Concrete structures, Frost resistance, Concrete freezing, Freeze thaw cycles, Concrete strength, Loads (forces), Analysis (mathematics).

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Railroads, Permafrost beneath roads, Frost heave, Design.

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Permafrost beneath structures, Tunnels, Linings, Hydraulic structures, Baykal Amur railroad, Design.

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Bridges, Reinforced concrete, Concrete freezing, Frost shattering, Frost resistance.

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Buildings, Permafrost beneath structures, Baykal Amur railroad, Design, Earthquakes, Snow loads.

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Using balloons in railroad construction under difficult conditions. [Nekotorye voprosy primeneniia aerostatov pri stroitel'stve zheleznykh dorog v slozhnykh usloviiakh],
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Transportation, Balloons, Baykal Amur railroad.

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Local sources of sand and gravel for the construction of the Kunerma-Chara section of the Baykal Amur railroad (263-994 km). [Voprosy obespecheniia kondiitsionnymi peschanymi i graviĭnymi materialami iz mestnykh mestorozhdeniĭ stroitel'stva BAM na uchastke Kunerma-Chara (263-994 km)],
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Construction materials, Sands, Gravel, Mining, Baykal Amur railroad, Permafrost.

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Roads, Snowdrifts, Snow accumulation, Snow fences, Baykal Amur railroad, Snowstorms, Wind factors.

33-328
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Railroads, Embankments, Permafrost beneath structures, Permafrost hydrology, Avalanches, Avalanche engineering, Snow cover structure, Metamorphism (snow).

33-329
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Snow cover structure, Firn stratification, Metamorphism (snow), Heat transfer, Mass transfer, Mathematical models.

33-330
Experimental studies of snow structure changes in wind tunnels. [Eksperimental'nye issledovaniia izmeneniia struktury snega v aerodinamicheskom kanale],
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Metamorphism (snow), Snow cover structure, Wind tunnels, Test equipment, Laboratory techniques.

33-331
Economic basis for the dates and organization of the Surgut-Urengoi railroad construction. [Ob ekonomicheskom obosnovanii organizatsii i srokov stroitel'stva zheleznoĭ dorogi Surgut-Urengoĭ],
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Railroads, Permafrost beneath roads, Cost analysis.

33-332
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33-333
Evaluating snow transfer in mountainous areas of the Sakhalin railroad. [Otsenka snegoperenosa na gornykh uchastkakh zheleznodorozhnogo puti na Sakhaline],
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Railroad tracks, Snow cover distribution, Snowdrifts, Snow accumulation, Railroads, Mountains.

33-334
Theoretical models of snow and avalanches. [O teoreticheskikh modeliakh snega i lavin],
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Slope processes, Mathematical models, Avalanche mechanics, Snow cover distribution, Avalanche formation, Snow depth, Snow cover structure, Avalanche engineering.

33-335
Interaction between experimental embankments and ice-saturated bearing ground at the Baykal Amur railroad during the initial construction stage. [Vzaimodeĭstvie opytnykh nasypeĭ s l'donasyshchennymi gruntami osnovaniĭ na BAMe v nachal'nyĭ period stroitel'stva],
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Tsernant, A.A., Gordienko, A.A.
Embankments, Permafrost beneath structures, Ground ice, Frost heave, Settlement (structural), Baykal Amur railroad, Freeze thaw cycles.

33-336
Thermophysical calculation of heating devices designed for melting snow. [Teplofizicheskiĭ raschet obogrevaiushchikh ustroĭstv prednaznachennykh dlia snegotaianiia],
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Railroad tracks, Snow accumulation, Deicing, Snow melting, Electric heating.

33-337
Present state of snow science as reflected in the last international glaciological conferences. [Sovremennoe sostoianie snegovedeniia, otrazhennoe na poslednikh mezhdunarodnykh gliatsiologicheskikh soveshchaniiakh],
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Meetings, Glaciology, Arctic regions, Snow cover distribution, Snow depth, Snowdrifts, Snow surveys, Snow density, Theories, Avalanche engineering.

33-338
Establishing the height of road embankments built in the snowdrift areas of Kamchatka. [K metodike naznacheniia vysoty nasypi zemlianogo polotna dorog vozvodimykh v snegozanosimykh raĭonakh Kamchatskoĭ oblasti],
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Roads, Railroads, Embankments, Snowdrifts, Snow accumulation, Design, USSR—Kamchatka Peninsula.

33-339
Proceedings, Vol.2.
International Symposium on Frost Action in Soils, Luleå, Sweden, Feb. 1977, University of Luleå, 1977, 119p., Includes discussions. For individual papers see 33-340 through 33-346.
Meetings, Frost action, Frozen ground mechanics, Soil moisture migration, Frost heave.

33-340
General aspects of the physical state of water and water movement in frozen soils.
Anderson, D.M., International Symposium on Frost Action in Soils, Luleå, Sweden, Feb. 1977. Proceedings, Vol.2, University of Luleå, 1977, p.2-16.
Frozen ground physics, Heat transfer, Mass transfer, Soil moisture migration, Frozen ground chemistry, Interfaces.

33-341
Fundamental aspects of frost action.
Penner, E., International Symposium on Frost Action in Soils, Luleå, Sweden, Feb. 1977. Proceedings, Vol.2, University of Luleå, 1977, p.17-28, 35 refs.
Frozen ground mechanics, Frost heave, Ice lenses, Mathematical models, Ice formation.

33-342
Mechanical analogy of a constant heave rate.
Ueda, T., et al, International Symposium on Frost Action in Soils, Luleå, Sweden, Feb. 1977. Proceedings, Vol.2, University of Luleå, 1977, p.57-67, 2 refs.
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Frost heave, Soil moisture migration, Mathematical models.

33-343
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Ice lenses, Ice formation, Frost heave, Mathematical models.

33-344
Numerical modelling of the ice lensing process.
Outcalt, S., International Symposium on Frost Action in Soils, Luleå, Sweden, Feb. 1977. Proceedings, Vol.2, University of Luleå, 1977, p.75-91, 12 refs.
Ice lenses, Ice formation, Phase transformations, Mathematical models, Computer applications.

33-345
Mathematical model to predict frost heave.
Berg, R.L., et al, MP 1131, International Symposium on Frost Action in Soils, Luleå, Sweden, Feb. 1977. Proceedings, Vol.2, University of Luleå, 1977, p.92-109, 14 refs.
Gartner, K.E., Guymon, G.L.
Mathematical models, Soil moisture migration, Heat transfer, Frost heave, Frost penetration.
A mathematical model of coupled heat and moisture flow in soils has been developed. The model includes algorithms for phase change of soil moisture and frost heave, and several types of boundary and initial conditions are permitted. The finite element method of weighted residuals (Galerkin procedure) was chosen to simulate the spatial regime and the Crank-Nicolson method was used for the time domain portion of the model. Comparison of simulated and experimental data illustrates the importance of unsaturated hydraulic conductivity. It is one parameter which is difficult to measure and for which only a few laboratory test results are available. Therefore, unsaturated hydraulic conductivities calculated in the computer model may be a significant source of error in calculations of frost heave.

33-346
Outdoor-laboratory soil freezing experiments.
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Subgrade soils, Cold weather performance, Freeze thaw cycles, Frost heave.

33-347
On-site plant at Prudhoe Bay produces preinsulated pipe.
Hale, D., *Pipeline and gas journal,* Sep. 1978, 205(11), p.24-26.
Pipes (tubes), Pipeline insulation, Hot oil lines.

33-348
Arctic line pipe requirements are very special, very demanding.
Nakazawa, M., *Pipeline and gas journal,* Sep. 1978, 205(11), p.27-30, 34.
Pipes (tubes), Manufacturing, Strength.

33-349
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Liegois, J., et al, *Pipeline and gas journal,* Sep. 1978, 205(11), p.36-42.
Leclerc, J., Bourdillon, F., Lafrance, M.
Pipes (tubes), Steels, Welding, Cold weather performance.

33-350
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Wind pressure, Snow loads, Loads (forces), Statistical data.

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Kaufmann, J.M.
Ice breaking, Icebreakers, Slush, Ice friction, Coatings.

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Meetings, Sea ice, River ice, Ice mechanics, Ports, Estuaries, Ice pressure, Hydraulic structures, Ice cover effect, Water temperature, Thermal regime.

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Ice physics, Ice mechanics, Ice formation, Ice pressure, Loads (forces), International cooperation.

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Ice pressure, Offshore structures, Artificial islands, Stresses.

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Sea ice, Ice mechanics, Ice creep, Flexural strength, Ice elasticity.

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Ice pressure, Loads (forces), Offshore structures, Statistical analysis, Theories, Ice solid interface.

33-367
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Sea ice, Ice creep, Thermal expansion, Ice mechanics.

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Sea ice, Strain measuring instruments, Mechanical properties, Beaufort Sea.

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Modeling the interaction between pressure ridges and conical shaped structures.
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Crossdale, K.R.
Pressure ridges, Sea ice, Offshore structures, Ice models, Loads (forces), Cracking (fracturing).

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Sea ice, Flexural strength, Strain tests, Ice elasticity.

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Procedure for the determination of ice forces—illustrated for polycrystalline ice.
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Remer, R.
Ice crystal structure, Ice strength, Ice plasticity, Ice bearing capacity.

33-374
Effect of ice formation on hydraulic structure elements.
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Hydraulic structures, Ice pressure, Static loads, Dynamic loads.

33-375
Sea ice pressure ridges in the Beaufort Sea.
Wright, B.D., et al, MP 1132, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.249-271, 10 refs.
Hnatiuk, J., Kovacs, A.
Sea ice, Pressure ridges, Ice models.
The ice cover in the Beaufort Sea is characterized by extreme irregularities in thickness which are produced by the motion and resulting deformation of the sea ice. Pressure ridges, which are an integral part of this irregular and formidable ice cover, are recognized as the largest and most hazardous ice formations. Here, a number of cross-sectional profiles of first and multi-year pressure ridges in the Beaufort Sea are presented, which include both free-floating and grounded ice forms. The cross-sections of these multi-year ridges suggest that they can be adequately described by one ridge model with a constant sail to keel ratio and geometry. It is shown that the ice comprising multi-year ridges is solid, with the interblock voids existing at the time of their formation being completely filled with ice. Several first-year pressure ridge profiles are also discussed, which indicate that these ridges cannot be represented by any one geometric model as their sail to keel ratios and geometries are quite variable.

33-376
Mechanical properties of impure ice single crystals at high temperatures.
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Ice crystal structure, Tensile strength, Strain tests, Temperature effects.

33-377
New icebreaking concept.
Freitas, A., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.293-317, 5 refs.
Schwarz, J.
Ships, Icebreakers, Ice breaking, Ice cover, Shear stress.

33-378
Ice-structure interaction studies on a lighthouse in the Gulf of Bothnia using response spectrum and power spectral density function analyses.
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Offshore structures, Sea ice, Ice pressure, Loads (forces), Bothnia, Gulf.

33-379
Mode of failure and the analysis of ice loads on bridge piers.
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Ice loads, Bridges, Piers, Ice pressure, Offshore structures, Ice breakup.

33-380
Probabilities of thermal ice pressures in five Swedish lakes.
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Wernersson, L.
Lake ice, Ice pressure, Thermal expansion.

33-381
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Building codes, Offshore structures, Ice pressure, Static loads, Dynamic loads.

33-382
Mathematical and physical modelling of ice.
Kivisild, H.R., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.379-391, 9 refs.
Iyer, S.H.
Offshore structures, Floating ice, Ice pressure, Ice models, Mathematical models, Rheology.

33-383
Ice and navigation related sedimentation.
Wuebben, J.L., et al, MP 1133, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.393-403, 5 refs.
Alger, G.R., Hodek, R.J.
Ice cover effect, Ice navigation, Sediment transport.
This paper examines the hydrodynamics of vessel passage through a restricted channel and the resulting potential for sediment translocation. Examples of field measurements are presented which show a complex pattern of changes in water current magnitude and direction. The constriction of the channel by a ship creates a drop in the water surface that travels with the ship. The application of the concepts of effective stress and upward seepage forces to the river-bed material predicts that the potential for sediment translocation increases upon the passage of this moving trough. Three modes of granular bottom sediment transport were observed: bed load, saltation, and a process referred to as explosive liquefaction.

33-384
Factors governing ice ride-up on sloping beaches.
Croasdale, K.R., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.405-420, 11 refs.
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Sea ice, Beaches, Slopes, Ice push.

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Iceberg threat to ocean floor structures.
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Muthukrishnaiah, K.
Icebergs, Offshore structures, Hydraulic structures, Ice scoring, Models.

33-386
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Siniavskaia, V.M.
Ice pressure, Ice floes, Hydraulic structures, Ice deformation.

33-387
Acoustic methods of recording ice formation and break-up processes.
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Gavrilo V.P.
Ice formation, Ice breakup, Ice acoustics.

33-388
Effect of ice impact forces on the supports of structures in estuaries and shelf zones.
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Dolgopolov, IU.V., Shmeleva, L.A., Khrapaty, N.G., Tsuprik, V.G.
Hydraulic structures, Ice pressure, Impact strength, Supports, Ice shelves.

33-389
Estimation of sea ice forces on pile structures.
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Ono, T., Ozaki, A.
Sea ice, Ice pressure, Loads (forces), Pile structures.

33-390
Icebreaking capability of large ships.
Walter, W.G., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.479-493, 12 refs.
Reischauer, H.J.
Ships, Ice breaking, Models, Design.

33-391
Arching of model ice floes at bridge piers.
Calkins, D.J., MP 1134, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.495-507, 7 refs.
River ice, Ice floes, Bridges, Piers, Ice pressure, Ice models, Ice deformation.
A model study of the formation of ice arching at the upstream faces of rounded bridge piers was conducted in a hydraulic flume. Polyethylene plastic was used to simulate square ice floes of two sizes, 37 mm and 74 mm. A power function relating the upstream surface ice concentration to a size ratio (characteristic block size over pier span opening) distinguishes between the arching and non-arching conditions at velocities below the critical value for underturning of individual ice floes.

33-392
Forces an ice cover exerts on rows or clusters of piles due to a change in water level.
Kerr, A.D., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 1, International Association for Hydraulic Research, 1978, p.509-525, 3 refs.
Ice pressure, Pile structures, Water level.

33-393
Ice regime studies in the mouths of Arctic rivers.
Ivanov, V.V., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.3-12, 11 refs.
Nalimov, IU.V.
Ice conditions, Ice navigation, Estuaries.

33-394
Ice formation in fresh water cooled by a more saline underflow.
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Ice formation, Sea water, Ground water, Interfaces.

33-395
Formation of frazil ice in the mouths of regulated rivers.
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Shatalina, I.N.
Frazil ice, Ice formation, Salt water, Rivers, Interfaces.

33-396
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Hydraulic structures, Ice formation, Ice control.

33-397
Ways of preventing ice rolls formation on lock chamber walls.
Balanin, V., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.47-56.
Zhidkikh, M.
Ice prevention, Ice control, Locks (waterways).

33-398
Hydraulic calculations of navigation canals made of soft bottom film.
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Channels (waterways), Temperature distribution.

33-399
Investigation of breaking and maintaining ice channels on water storages and lakes.
Tronin, V., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.67-82.
Treushnikov, IU., Sandakov, IU., Ginzburg, B.
Ice breaking, Ice navigation, Lake ice, Ice cover thickness.

33-400
Frazil initiation.
Hanley, T.O., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.85-94, 15 refs.
Frazil ice, Ice formation, Ice physics.

33-401
Early detection of frazil.
Hanley, T.O., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.95-102, 6 refs.
Frazil ice, Ice formation, Ice acoustics.

33-402
Heat storage of Lake Mjösa, Norway: interactions between ice cover, climate and the energy exchange processes.
Tvede, A.M., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.103-115, 11 refs.
Heat measurement, Ice cover effect, Heat loss, Lake water.

33-403
Statistical analysis and predictions methods for ice cover formation and growth on Saguenay River.
Watte, C., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.117-129, 8 refs.
Marche, C.
River ice, Ice formation, Statistical analysis, Forecasting.

33-404
Thermal discharges in winter conditions interaction with the ice cover.
Robillard, L., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.131-141, 6 refs.
Vasseur, P.
Heat transfer, Thermal pollution, Ice cover, Mathematical models, Water temperature, Density (mass/volume).

33-405
Development of a thermodynamic model for the ice regime of Lake Erie.
Wake, A., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.143-161, 27 refs.
Rumer, R.R., Jr.
Lake ice, Ice cover, Thermodynamic properties, Heat transfer, Interfaces, Models.

33-406
Ice regime at Churchill Falls, Labrador—a comparison of design expectations with actual performance.
Atkinson, C.H., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.163-186, 4 refs.
Waters, T.W.
Hydroelectric power generation, Reservoirs, Ice cover, Water flow, Flow rate.

33-407
Frazil ice formation in aerated jets downstream of a spillway.
Billfalk, L., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.187-193, 7 refs.
Desmond, R.M.
Frazil ice, Ice formation, Ice crystals, Ice nuclei.

33-408
Characteristics of ice covered steams in connection with water discharge measurements.
Hirayama, K.-I., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.195-217, 13 refs.
River ice, Ice cover effect, Water level, Water flow.

33-409
Frazil ice formation in turbulent flow.
Müller, A., et al, MP 1135, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.219-234, 9 refs.
Calkins, D.J.
Frazil ice, Ice formation, Turbulent flow, Supercooled water, Ice nuclei.
To study ice nucleation and heat transfer, frazil ice was produced experimentally under controlled conditions. Turbulence was generated by a moving grid in a turbulence jar, where water could be cooled below the freezing point. Frazil was observed by means of a schlieren system and the number of ice particles was counted on photographs. No frazil ice formed, regardless of turbulence and foreign material, unless the water was seeded with ice nuclei. The number of particles grew during the experiment; the growth rate increased with greater supercooling and higher velocity of the grid. This indicates a multiplication process induced by secondary nucleation. The heat transfer per particle normalized with supercooling, and the size of the particles was constant in all experiments within the accuracy of measurement. From these observations, it can be concluded that the total ice production is predictable if the heat transfer per particle can be estimated from turbulence data and if the number of particles can be calculated. A nucleation theory is, however, not available and is regarded as the crucial question.

33-410
Ice problems in Swedish hydro power operation.
Larsen, P., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.235-243, 15 refs.
Billfalk, L.
Hydroelectric power generation, Frazil ice, Ice formation, Water intakes.

33-411
Thermal regime of a polar ice-dammed lake.
Blachut, S.P., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.245-255, 19 refs.
Lake ice, Ice dams, Thermal regime.

33-412
Natural convection in water near the freezing point.
Vasseur, P., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.257-270, 11 refs.
Robillard, L.
Heat transfer, Convection, Water temperature, Analysis (mathematics), Boundary value problems, Phase transformations.

33-413
Righting moment in a rectangular ice boom timber or pontoon.
Perham, R.E., MP 1136, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.273-289, 5 refs.
Ice booms, Floating structures.
The ability of an ice boom timber to restrain ice floes is governed by its capacity to float and to resist being overturned. Six mathematical equations that describe this capacity for a rectangular-shaped timber have been worked out and are presented here. The limits of each equation are also given. They are called righting moment equations, and from them dimensionless values of righting moment may be calculated. The equations have been evaluated for some general conditions, and for a few specific cases involving water and wood, and for one case concerned with designing a steel pontoon boom. The calculations were done by a computer program which is not included. The data provided include three graphs and two tables of dimensionless values. All in all, the information should be very useful in evaluating new designs of ice boom timbers and pontoons.

33-414
Entrainment of ice floes into a submerged outlet.
Stewart, D.M., et al, MP 1137, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.291-299, 2 refs.
Ashton, G.D.
Floating ice, Water intakes, Water flow.
Results of a series of laboratory experiments in a flume to determine the conditions under which floating ice floes are entrained into a submerged outlet are reported. Entrainment is found to occur when a Froude number based on outlet velocity and submergence depth is exceeded and that critical Froude number is a function of the ratio of outlet height to upstream flow depth. The critical Froude number is also shown to asymptotically approach the Froude number corresponding to equilibrium accumulation thicknesses of ice floes at a surface obstruction as the outlet height approaches the flow depth. Interpretation and application to design of submerged outlets is discussed.

33-415
Ice accumulations at freeze-up or break-up.
Michel, B., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.301-317, 19 refs.
River ice, Ice jams, Floating ice, Slush, Ice mechanics.

33-416
Ice jam occurrence on the Danube River downstream from Bratislava after the completion of the Reservoir Hrušov-Dunakiliti.
Brachtl, I., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.319-334.
River ice, Ice jams, Countermeasures, Ice breaking, Reservoirs.

33-417
Experimental model-scale study of the compressible, frictional and cohesive behaviour of broken ice mass.
Keinonen, A., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.335-353, 9 refs.
Nyman, T.
Sea ice, Cohesion, Pressure ridges, Shear strength, Compressive strength, Experimental data.

33-418
Field investigations of river ice jams.
Beltaos, S., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.355-371, 13 refs.
River ice, Ice jams, Ice friction, Ice cover thickness, Models.

33-419
Instability characteristics of ice blocks.
Chee, S.P., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.373-388, 6 refs.
Haggag, M.R.I.
Ice mechanics, River ice, Underwater ice, Ice cover thickness, Ice floes.

33-420
Peculiarities of ice jam formation at controlled river stretches.
Donchenko, R.V., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.389-396, 4 refs.
Ice jams, Ice formation, Heat transfer, Ice edge, Electric power plants, Water pollution.

33-421
Mechanism of artificial ice jamming.
Karnovich, V.N., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.397-401, 3 refs.
Sokolov, I.N.
River ice, Ice jams, Countermeasures, Earth dams.

33-422
Approach to stream resistance in case of jammed ice motion.
Zsilák, E., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 2, International Association for Hydraulic Research, 1978, p.403-414, 8 refs.
Ice jams, Drift, Stream flow, Ice floes.

33-423
Ice arching and the drift of pack ice through channels.
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Mohtadi, M.F.
Oil spills, Oil pollution, Environmental impact, Continuous permafrost, Permeability.

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33-485
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Glacier mass balance, Ablation, Snow accumulation, Freeze thaw cycles.

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33-492
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Alaska possesses a diversity and magnitude of water resources unmatched in any other state. With over 15% of the area of the whole United States, and 40% of the nation's total fresh water supply, but an extreme lack of basic hydrologic and climatologic data, cooperation among agencies and individuals concerned with evaluating, planning, and carrying out water resources programs is essential. Toward this end, the Inter-Agency Technical Committee for Alaska (IATCA) was established under charter from the Water Resources Council. Representation in IATCA includes virtually all Federal, State, and academic entities in Alaska having an interest in the water resources of the State. Existence of IATCA has permitted or facilitated numerous Alaskan water resources programs. Several are described briefly in this paper.

33-493
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Ebel, W.
Soil freezing, Soil strength, Soil moisture, Freeze thaw cycles, Frozen sand, Frozen gravel, Frost heave, Frost resistance.

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33-495
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Forest soils, Permafrost distribution, Permafrost structure, Snow cover distribution, Microclimatology, Landscape development, Tundra soils, Cryogenic processes, Landscape types, Tundra vegetation, Forest tundra, Submarine permafrost, Surface temperature, Surface structure.

33-496
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Snow cover distribution, Snow depth, Snow hydrology, Radiation, Thermal regime, USSR—Yakutia.

33-498
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Skachkov, IU.B.
Ice conditions, Water temperature, Radiation balance, USSR—Syrdakh Lake.

33-499
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33-500
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Forest tundra, Tundra soils, Tundra vegetation, Snow cover distribution, Snow hydrology, Thermal regime.

33-501
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Submarine permafrost, Permafrost structure, Permafrost transformation, Laptev Sea.

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Ground ice, Permafrost origin, Active layer, Seasonal freeze thaw, Heat transfer, Mass transfer, Analysis (mathematics).

33-504
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Mathematical models, Computer applications, Microclimatology, Soil air interface, Heat transfer, Permafrost, Cryogenic processes.

33-505
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Maps, Geological surveys, Engineering geology, Permafrost distribution, Permafrost structure, Permafrost hydrology, Permafrost depth, Permafrost thickness, Active layer, Soil erosion, Human factors, Site surveys, Baykal Amur railroad.

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Geological surveys, Engineering geology, Permafrost distribution, Permafrost structure, Permafrost hydrology, Permafrost depth, Permafrost thickness.

33-507
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Maps, Geological surveys, Engineering geology, Permafrost distribution, Permafrost structure, Permafrost thickness, Permafrost depth, Permafrost hydrology.

33-508
Sensitivity of surface to technical development of land in permafrost areas, and methods of its presentation on maps. (Chuvstvitel'nost' poverkhnosti k tekhnogennomu vozdeĭstviiu v oblasti vechnoĭ merzloty, priemy i metody otrazheniia ee na kartakh),
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Cryogenic soils, Soil erosion, Human factors, Active layer, Mapping.

33-509
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33-510
Methods of engineering-geocryological investigations used in exploring routes of linear structures in West Siberia. (Metodika inzhenerno-geokriologicheskikh issledovaniĭ pri izyskanii trass lineĭnykh sooruzheniĭ (na primere Zapadnoĭ Sibiri)),
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Pipelines, Roads, Railroads, Geological surveys, Engineering geology, Permafrost beneath structures, Permafrost distribution, Permafrost structure, Permafrost hydrolgy.

33-511
Basic map of the USSR (scale 1:2,500,000) for the engineering-geological evaluation of permafrost territories. (Geokriologicheskaia karta SSSR masshtaba 1:2,500,000 - osnova inzhenerno-geologicheskoĭ otsenki territorii kriolitozony),
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Geological maps, Permafrost distribution, Permafrost structure, Permafrost hydrology.

33-512
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Romanovskiĭ, N.N.
Permafrost beneath structures, Geological surveys, Cryogenic processes, Permafrost distribution, Baykal Amur railroad.

33-513
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Maps, Permafrost distribution, Permafrost structure, Baykal Amur railroad.

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Engineering geology, Permafrost beneath structures, Surveys, Buildings, Baykal Amur railroad.

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Demidiuk, L.M., Shaumian, L.V.
Mining, Maps, Geological surveys, Permafrost.

33-516
Infrared aerial photography in engineering-geological studies of permafrost areas. (Primenenie teplovoĭ aeros"emki dlia tseleĭ inzhenerno-geologicheskikh issledovaniĭ v raĭonakh razvitiia mnogoletneĭ merzloty),
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Shilin, B.V.
Infrared reconnaissance, Aerial photography, Infrared equipment, Aerial surveys, Permafrost.

33-517
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Taĭbashev, V.N.
Foundations, Permafrost bases, Active layer, Settlement (structural).

33-518
Basic engineering-geocryological problems in power plant construction in permafrost areas. (Nekotorye osnovnye inzhenerno-geokriologicheskie problemy v energeticheskom stroitel'stve v oblasti vechnoĭ merzloty),
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Ground ice, Permafrost forecrasting, Permafrost distribution, Permafrost depth, Permafrost structure, Permafrost hydrology, Permafrost thickness.

33-520
Forecasting changes in permafrost-engineering-geological conditions during road construction. [Osobennosti prognoza izmenenii merzlotno-inzhenerno-geologicheskikh uslovii pri stroitel'stve avtomobil'nykh dorog],
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Roads, Embankments, Permafrost beneath structures, Permafrost transformation, Permafrost forecasting.

33-521
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Mel'nikov, E.S., et al, Metodika inzhenerno-geologicheskikh issledovanii i kartirovaniia oblasti vechnoĭ merzloty (Methods of engineering-geological investigations and mapping of permafrost areas), Yakutsk, Inst. Merzlotovedeniia, 1978, p.132-139, In Russian. 8 refs.
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Maps, Engineering geology, Cryogenic processes, Permafrost distribution, Landscape types, Permafrost forecasting, Permafrost structure, Permafrost hydrology.

33-522
Methodical bases for compiling maps of permafrost-engineering-geological evaluation of territories for surface construction, from aerial photographs. [Metodicheskie osnovy sostavleniia kart merzlotno-inzhenerno-geologicheskoĭ otsenki territorii dlia nazemnogo stroitel'stva s pomoshch'iu aerofotomaterialov],
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Maps, Aerial photography, Engineering geology, Mapping, Permafrost distribution, Permafrost hydrology, Permafrost structure.

33-523
General problems of procedures and peculiarities of engineering-geological investigations and mapping of permafrost areas. [Obshchie voprosy metodiki i osobennosti inzhenerno-geologicheskikh issledovanii i kartirovaniia oblasti vechnoĭ merzloty],
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Mapping, Geological surveys, Permafrost distribution, Engineering geology, Permafrost structure, Permafrost hydrology.

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Methods of field and laboratory investigations of frozen ground properties. [Metodika polevykh i laboratornykh issledovanii svoĭstv merzlykh gruntov],
Voĭtkovskiĭ, K.F., et al, Metodika inzhenerno-geologicheskikh issledovanii i kartirovaniia oblasti vechnoĭ merzloty (Methods of engineering-geological investigations and mapping of permafrost areas), Yakutsk, Inst. Merzlotovedeniia, 1978, p.161-170, In Russian.
Shusherina, E.P.
Frozen ground mechanics, Tests, Laboratory techniques.

33-525
Applying geophysical and mathematical methods to engineering-geological investigations. [Primenenie geofizicheskikh i matematicheskikh metodov pri inzhenerno-geologicheskikh issledovaniiakh],
Akimov, A.T., et al, Metodika inzhenerno-geologicheskikh issledovanii i kartirovaniia oblasti vechnoĭ merzloty (Methods of engineering-geological investigations and mapping of permafrost areas), Yakutsk, Inst. Merzlotovedeniia, 1978, p.170-180, In Russian.
Balobaev, V.T., Melamed, V.G.
Permafrost structure, Permafrost distribution, Engineering geology, Geophysical surveys, Mathematical models.

33-526
Engineering-geocryological forecasting. [Inzhenerno-geokriologicheskiĭ prognoz],
Garagulia, L.S., et al, Metodika inzhenerno-geologicheskikh issledovanii i kartirovaniia oblasti vechnoĭ merzloty (Methods of engineering-geological investigations and mapping of permafrost areas), Yakutsk, Inst. Merzlotovedeniia, 1978, p.180-182, In Russian.
Dubikov, G.I., Maksimova, L.N.
Permafrost forecasting, Permafrost transformation, Ground ice, Permafrost control, Permafrost structure, Permafrost hydrology.

33-527
Iceberg calving from floating glaciers by a vibrating mechanism.
Holdsworth, G., et al, *Nature*, Aug. 3, 1978, 274(5670), p.464-466, 18 refs.
Glynn, J.
Icebergs, Calving, Glacier tongues, Ice elasticity.
Observations of antarctic super tabular icebergs have shown that their origin can frequently be traced to previously existing super ice tongues, which are a class of massive seawards-extending ice shelves. A mechanism for generating significant bending stresses at locations along an ice tongue far from the grounding zone is, by vibration of the glacier, in a mode higher than the fundamental. In this report, an approximate analysis of the modes of free vibration of a buoyant, elastic, tapering ice tongue floating in shallow water of variable depth is outlined. It is suggested that the proposed vibration mechanism, although normally giving rise to weak bending stresses, may, under high incident wave energy, cause calving.

33-528
Inland ice sheet thinning due to Holocene warmth.
Whillans, I.M., *Science*, Sep. 15, 1978, 201(4350), p.1014-1016, 13 refs.
Ice sheets, Ice temperature, Ice volume, Paleoclimatology.
The climatic warming of 10,000 years ago is now affecting the central portions of ice sheets, causing ice-flow acceleration. This process explains the present-day thinning of the ice sheet in West Antarctica. Former ice sheets must have also responded to climatic warming with a delay of thousands of years. This lag in response is important in the climatic interpretation of glacial deposits and of changes in ice volume obtained from deep-sea cores. (Auth. mod.)

33-529
Studies of the consolidation of thawing ice-saturated soils.
Tsytovich, N.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, 1970, TL 428, 67p., FSTC-HT-23-833-70, For Russian original see SIP 25548.
Grigor'eva, V.G., Zaretskiĭ, IU.K.
Ground thawing, Frozen ground settling, Soil stabilization, Settlement (structural), Permafrost beneath structures, Thawing rate, Soil creep, Frozen ground mechanics.
Permafrost settlement is decisive in planning for permanent structures; therefore, consolidation studies were carried out. Consolidation depends more on ice content than on load. The process is dependent on the thawing rate in proportion to the square root of t. Secondary consolidation depends mainly on the type of soil. Residual pressure may be produced by filtration consolidation. Thawed soil deformation obeys laws of one-phase creep theory.

33-530
Natural purification of sewage and the economic effectiveness of its utilization for irrigation; a collection of articles.
Novikov, V.M., ed, *U.S. Army Cold Regions Research and Engineering Laboratory*, Oct. 1975, TL 491, 160p., Translation from Russian.
Sewage disposal, Water treatment, Waste treatment, Irrigation, Agriculture.

33-531
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Shamont'ev, V.A.
Research projects.
The scientific and engineering activities of the Arctic and Antarctic Institute in Leningrad for 1971-75 are reviewed; the aim of this program is to investigate fully the natural conditions and resources of southern and northern polar regions. The main scientific concern of the Institute during the 10th 5-Year Plan is to study large-scale variations in the hydrometeorological regime around both poles. From 1976-1980 its area of concentration will be prediction of changes in the environment and natural phenomena and hydrometeorological support for arctic navigation. The POLEX program will remain a top priority.

33-598
Polar experiment results and plans. [Itogi i perspektivy Poliarnogo eksperimenta],
Treshnikov, A.F., et al, *Problemy Arktiki i Antarktiki*, 1978, No.54, p.16-24, In Russian.
Sarukhanian, E.I., Smirnov, N.P.
Research projects.
The main results of studies carried out recently in north and south polar regions under the POLEX program are presented. Full-scale POLEX-North-76 and the Southern Ocean experiments of similar importance are described in the greatest detail. Research topics to be incorporated into POLEX plans for the future are also outlined. A proposal for an international "Southern Ocean" program is offered.

33-599
Basic results and research problems of lowland and estuarine areas of arctic rivers. [Osnovnye itogi i ocherednye zadachi issledovanii nizov'ev i ust'evykh oblastei rek Arktiki],
Ivanov, V.V., *Problemy Arktiki i Antarktiki*, 1978, No.54, p.30-41, In Russian. 70 refs.
Rivers, River basins, River flow, Arctic regions.

33-600
Collecting and processing hydrometeorological data in polar regions. [Metodicheskoe obespechenie polucheniia i obrabotki gidrometeorologicheskoi informatsii v poliarnykh oblastiakh],
Koptev, A.P., et al, *Problemy Arktiki i Antarktiki*, 1978, No.54, p.42-51, In Russian. 9 refs.
Samushkin, V.A.
Data processing, Meteorological data, Computer applications.
Management studies were conducted to identify semiautomatic methods for transmittal and processing of hydrometeorological data in polar regions. Particular attention was paid to forecasting the development and implementation of ADP in this area and to fundamental methodological research questions.

33-601
Estimating navigation feasibility using data on sea ice thickness. [Ispol'zovanie dannykh o tolshchinakh l'da dlia otsenki prokhodimosti ledovykh trass sudami],
Sergeev, G.N., *Problemy Arktiki i Antarktiki*, 1978, No.54, p.52-56, In Russian. 3 refs.
Sea ice, Ice navigation, Ice cover thickness, Young ice.

33-602
Using side-looking radar for studying ice undersurfaces. [Ispol'zovanie gidrolokatora bokovogo obzora dlia issledovaniia podvodnykh poverkhnostei],
Popov, I.K., et al, *Problemy Arktiki i Antarktiki*, 1978, No.54, p.88-92, In Russian. 2 refs.
Rosliakov, V.N., Bogorodskii, P.V.
Sea ice, Ice bottom surface, Ice cover, Icebergs, Ice shelves, Side looking radar, Underwater ice.
Described herein is a technique by which side-looking radar can be used to explore the undersurface of ice shelves, floating ice and icebergs. The method, successfully practiced during the 24th voyage of the research vessel *Professor Vize*, is essentially similar to that used to define the ocean bottom.

33-603
Avalanche control, forecasting, and safety—proceedings of a workshop held in Banff, Alberta, 1-4 November 1976.
Perla, R., ed, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, 301p.
For selected papers see 33-604 through 33-619.
Meetings, Avalanches.

33-604
Avalanche control and hazard forecasting techniques.
Anderson, D., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.2-18.
FitzGerald, L., Hoopingarner, K., Stratton, J.
Avalanche countermeasures, Avalanche forecasting, Explosives.

33-605
Approach to ski area avalanche control.
Israelson, C., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.19-23.
Avalanche countermeasures, Metamorphism (snow).

33-606
Mountain avalanche control programme.
Steinemann, C., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.24-29.
Hetherington, J.
Avalanche countermeasures, Avalanche mechanics, Climate.

33-607
Research and development of avalanche control methods in Banff National Park.
Everts, K., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.30-41.
Laidlaw, B.
Avalanche countermeasures, Avalanche triggering, Explosives, Bombing.

33-608
High explosives and artillery in avalanche control.
Perla, R., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.42-49, 3 refs.
Avalanche countermeasures, Explosives, Avalanche triggering, Artillery.

33-609
Time-delay method of avalanche control.
Kobayashi, F., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.50-55, 1 ref.
Avalanche countermeasures, Explosives, Time factor, Avalanche triggering.

33-610
Use of snow fences to reduce avalanche hazards.
Norem, H., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.67-72, 1 ref.
Avalanche countermeasures, Snow fences, Wind factors, Topographic factors.

33-611
Avalanche forecasting at Jackson Hole ski area.
Simms, J., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.77-86.
Avalanche forecasting, Meteorological data, Snow mechanics.

33-612
Meteorological support to avalanche forecasting in British Columbia.
Gigliotti, T., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.97-100, 1 ref.
Parent, L.
Avalanche forecasting, Meteorological data.

33-613
Avalanche forecasting in Juneau, Alaska.
Hutcheon, R., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.101-115, 7 refs.
Lie, L.
Avalanche forecasting, Meteorological data.

33-614
Colorado avalanche warning program.
Williams, K., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.116-131, 6 refs.
Avalanche forecasting, Weather forecasting, Snowfall, Models.

33-615
Time series models for avalanche hazard evaluation.
Salway, A.A., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.132-143, 6 refs.
Moyse, J.S.
Avalanche modeling, Meteorological data, Mathematical models.

33-616
Relationship between snow structure and avalanche release.
Armstrong, R.L., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.144-160, 7 refs.
Avalanche triggering, Snow cover structure, Snow stratigraphy, Snow strength, Freeze thaw cycles.

33-617
Application of numerical wind models to snow avalanche forecasting: overview.
Tesche, T.W., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.161-176, 15 refs.
Yocke, M.A.
Avalanche forecasting, Mathematical models, Wind factors, Snowstorms.

33-618
Liquid water distribution in a high altitude spring snowpack.
Carrol, T., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.177-185, 8 refs.
Snow cover distribution, Snow water content, Measurement.

33-619
Discussion of deformation measurements in relation to snow slab release.
McClung, D.M., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.186-192, 7 refs.
Snow deformation, Measurement, Avalanche triggering, Snow strength.

33-620
Proceedings of the 34th annual meeting.
Eastern Snow Conference, Belleville, Ontario, 1977, 174p., For individual papers see 32-1106, 32-3942, and 33-621 through 33-631.
Meetings, Snow mechanics, Snow physics, River ice.

33-621
Historical development of ground snow loads in Canada.
Boyd, D.W., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.3-4.
Snow loads, Measurement, History.

33-622
Snow loads on building structures— comparison of selected U.S. standards, moral codes and U.S. Federal standards.
Crist, R., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.4-8.
Snow loads, Building codes, Structures, Roofs.

33-623
Relationship between roof and ground snow loads—new NBC specifications—problem areas.
Schriever, W.R., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.8-9.
Snow loads, Roofs, Building codes.

33-624
Update on snow load research at CRREL.
Tobiasson, W., et al, *Eastern Snow Conference. Proceedings*, 1977, 34th, MP 1142, p.9-13, 20 refs.
Redfield, R.
Snow loads, Research projects, Snow density.

33-625
Alternative method for predicting roof snow loads and their variability.
Isyumov, N., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.14-24, Includes discussion. 4 refs.
Snow loads, Roofs, Snow depth, Snow accumulation, Wind factors.

33-626
Ground to roof conversion factors for snow loads.
O'Rourke, M., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.25-38.
Snow loads, Snow density, Wind factors, Roofs.

33-627
Measurement of ice growth on the Saint John River at Fredericton, N.B.
Bray, D.I., et al, *Eastern Snow Conference. Proceedings,* 1977, 34th, p.55-68, 5 refs.
Boyer, D.
River ice, Ice cover thickness, Ice creep, Air temperature, Ice strength, Thermal stresses.

33-628
Effect of clearcutting deciduous forest on radiation exchange and snowmelt in Canada.
DeWalle, D.R., et al, *Eastern Snow Conference. Proceedings,* 1977, 34th, p.105-117, 4 refs.
Parrott, H.A., Peters, J.G.
Forests, Solar radiation, Snow melting, Albedo.

33-629
Measurements of the water equivalent of freshly fallen snow.
MacNeil, C.F., et al, *Eastern Snow Conference. Proceedings,* 1977, 34th, p.118-129, 4 refs.
O'Neill, A.D.J.
Snowfall, Snow density, Snow water content.

33-630
Determination of snow storage for small eastern High Arctic basins.
Woo, M.-K., et al, *Eastern Snow Conference. Proceedings,* 1977, 34th, p.147-162, 9 refs.
Marsh, P.
Snow surveys, Storage, River basins, Measurement, Snow depth, Snow density, Snow retention.

33-631
Methodology used in generation of snow load case histories.
McLaughlin, D., et al, *Eastern Snow Conference. Proceedings,* 1977, 34th, MP 1143, p.163-174.
Duggan, G.
Snow loads, Roofs, Data processing.

33-632
Observations of polygonal fissuring in non-permafrost areas of the Nordon countries.
Svensson, H., *Akademie der Wissenschaften, Göttingen. Mathematisch-Physikalische Klasse. Abhandlungen, Folge 3,* 1977, No.31, p.63-76, In English with German summary. 27 refs.
Patterned ground, Frost shattering, Seasonal freeze thaw.

33-633
Study of the strength and stability of unbound mineral aggregates under spatial stress. (Studie zum Stand- und Zeitfestigkeitsverhalten von ungenbundenen Mineralgemischen bei räumlicher Beanspruchung),
Jessberger, H.L., et al, Bochum, West Germany, Ruhr-Universität. Lehrstuhl für Grundbau und Bodenmechanik, 1978, c65 leaves, In German. 27 refs.
Dörr, R., Jordan, P.
Construction materials, Minerals, Soil strength, Laboratory techniques, Test equipment, Stresses.

33-634
Water vapor adsorption by sodium montmorillonite at -5C.
Anderson, D.M., et al, *Icarus,* 1978, Vol.34, MP 981, p.638-644, 8 refs.
Schwarz, M.J., Tice, A.R.
Water vapor, Adsorption, Low temperature tests, Clay minerals, Mars (planet).
A large amount of interest has recently been expressed pertaining to the quantity of physically adsorbed water by the Martian regolith. Thermodynamic calculations based on experimentally determined adsorption and desorption isotherms and extrapolated to subzero temperatures indicate that physical adsorption of more than one or two monomolecular layers is highly unlikely under Martian conditions. Any additional water would find ice to be the state of lowest energy and therefore the most stable form. To test the validity of the thermodynamic calculations, we have measured adsorption and desorption isotherms of sodium montmorillonite at -5C. To a first approximation it was found to be valid.

33-635
Sulfate in antarctic snow: spatio-temporal distribution.
Delmas, R., et al, *Atmospheric environment,* 1978, 12(1-3), p.723-728, 23 refs.
Boutron, C.
Snow composition, Snow impurities, Volcanic ash, Antarctica.

33-636
Arctic continental shelf morphology related to sea-ice zonation, Beaufort Sea, Alaska.
Reimnitz, E., et al, *Marine geology,* Oct. 1978, 28(3/4), p.179-210, 38 refs.
Toimil, L., Barnes, P.
Ice shelves, Pack ice, Bottom topography, Classifications, Bottom ice, Ice scoring, Pressure ridges.

33-637
Effect of stress on strain at the onset of tertiary creep in frozen soils.
Rein, R.G., Jr., et al, *Canadian geotechnical journal,* Aug. 1978, 15(3), p.424-426, In English with French summary. 4 refs.
Hathi, V.V.
Frozen ground mechanics, Soil creep, Stresses, Strains.

33-638
Technique for measuring radial deformation during repeated load triaxial testing.
Cole, D.M., *Canadian geotechnical journal,* Aug. 1978, 15(3), MP 1157, p.426-429, In English with French summary. 3 refs.
Electric measuring instruments, Dynamic loads, Deformation.
A system of non-contacting displacement transducers has been used to record radial deformation in repeated load triaxial tests. Operating principle, system capabilities, and installation technique are discussed. Results of tests on clay and silt subgrade materials are presented and Poisson's ratio is calculated directly from test data.

33-639
Water pressure in ripe snowpacks.
Wankiewicz, A., *Water resources research,* Aug. 1978, 14(4), p.593-600, 14 refs.
Snow water content, Snow melting, Water pressure, Snow permeability.

33-640
Chemistry of snow meltwater: changes in concentration during melting.
Johannessen, M., et al, *Water resources research,* Aug. 1978, 14(4), p.615-619, 12 refs.
Henriksen, A.
Snow melting, Meltwater, Snow composition, Fallout, Water pollution, Impurities, Environmental impact.

33-641
Physical measurements of river ice jams.
Calkins, D.J., *Water resources research,* Aug. 1978, 14(4), MP 1159, p.693-695, 5 refs.
River ice, Ice jams, Measurement, Ice cover thickness.
River ice jam measurements have always been relatively difficult to obtain because of the uncertain stability of the floating ice mass. But recently two ice jams resolidified for about 3 weeks, allowing the ice thickness to be measured at several cross sections along their longitudinal profiles. The size distribution of surface ice floes in one of the jams was also evaluated from low-level aerial photography. The ice jams were found to be thickest at the downstream end, of the order of 4-5 times the thickness of the ice cover before breakup, and decreased almost linearly in thickness upstream. The largest surface ice floes measured in one ice jam ranged from 0.27 to 0.05 of the river's average width (45m). The largest floes were at the downstream end, and floe size decreased progressively with distance upstream.

33-642
Seismic response of frozen ground.
Finn, W.D.L., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal,* Oct. 1978, 104(GT10), p.1225-1241, 39 refs. For another version of this paper see 32-558.
Yong, R.N.
Frozen ground mechanics, Seismic prospecting, Soil moisture migration, Permafrost distribution, Soil freezing.

33-643
Liquefaction of thawed layer of frozen soils.
Finn, W.D.L., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal,* Oct. 1978, 104(GT10), p.1243-1255, 17 refs. For another version of this paper see 32-563.
Yong, R.N., Lee, K.W.
Permafrost structure, Unfrozen water content, Ground thawing, Thixotropy.

33-644
Temporary tunnel support by artificial ground freezing.
Jones, J.S., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal,* Oct. 1978, 104(GT10), p.1257-1276, 44 refs. For another version of this report see 32-561.
Brown, R.E.
Soil freezing, Artificial freezing, Tunneling (excavation), Soil strength, Dynamic loads.

33-645
Repetitive loading tests on membrane enveloped road sections during freeze-thaw cycles.
Smith, N., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal,* Oct. 1978, 104(GT10), MP 1158, p.1277-1288, 15 refs. For other versions of this paper see 32-562 (MP 962) and/or 32-4407 (CR 78-12, ADA-056 744).
Eaton, R.A., Stubstad, J.
Freeze thaw tests, Roads, Subgrade preparation, Protective coatings, Dynamic loads.
Road test sections of impermeable membrane-enveloped silt and clay soils overlain with asphalt cement concrete were subjected to repetitive dynamic plate-bearing loadings to determine strength variations of the pavement systems during freeze-thaw cycles. The modulus values of the asphalt cement concrete vary inversely with its temperature by an order of magnitude in the temperature range of 110F to 30F. The resilient stiffness of the pavement system varied in the same manner by nearly a factor of eight. Despite the wide strength variations of the sections during freeze-thaw cycles, membrane enveloped fine-grained soils can be utilized instead of granular materials as base and subbase layers in flexible pavements in cold regions where moisture migration is a major concern. Without the membrane protection such fine-grained soils that experience frost heaving suffer severe bearing strength loss during thawing.

33-646
Parameter effects on dynamic properties of frozen soils.
Vinson, T.S., *American Society of Civil Engineers. Geotechnical Engineering Division. Journal,* Oct. 1978, 104(GT10), p.1289-1306, 37 refs. For another version of this paper see 32-560.
Dynamic loads, Seismic velocity, Soil composition, Soil temperature, Ground ice.

33-647
River temperature variation with freezing and storage.
Song, C.C.S., et al, *American Society of Civil Engineers. Environmental Engineering Division. Journal,* Oct. 1978, 104(EE5), p.879-888, 4 refs.
Leung, K.S.
Water temperature, Air temperature, Temperature variations, Freezing points.

33-648
Capillary freezing and melting.
Entüstün, V., et al, *Journal of colloid and interface science,* July 1978, 65(3), p.509-516, 15 refs.
Sentürk, H.S., Yurdakul, O.
Capillary ice, Ice formation, Ice melting, Interfaces.

33-649
Erosion by continental ice sheets.
Whillans, I.M., *Journal of geology,* July 1978, 86(4), p.516-524, 31 refs.
Ice sheets, Ice erosion, Glacial till, Theories.

33-650
State of knowledge on land treatment of wastewater.
International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire, MP 1145, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, 2 vols., For selected papers see 33-651 through 33-661.
Meetings, Waste treatment, Water treatment, Agriculture, Forest land, Mathematical models, Land development.
The objectives of this Symposium are to summarize the state of knowledge of the practical aspects of the treatment of wastewater by land application and to identify the suitable approaches for the design of such land treatment systems. The topics included are: site selection considerations, case studies of national and international concern, health effects of land treatment systems, pretreatment considerations, uses of wastewaters in agricultural and forest systems, monitoring, modeling and design criteria. The Proceedings are published in two volumes. Volume 1 contains the invited papers presented and discussed at the conference. Volume 2 contains shorter papers about ongoing research that were selected from the responses received following a call for abstracts.

33-651
Use of remote sensing techniques and other information sources in regional site selection of potential land treatment areas.
Merry, C.J., MP 1146, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.107-119, 27 refs.
Site surveys, Water treatment, Waste treatment, Remote sensing, Spaceborne photography.
Landsat, Skylab S190A Multispectral Photographic Camera, and Skylab S190B Earth Terrain Camera satellite data products, enlarged to scales of 1:500,000 and 1:250,000, were used to prepare land use maps for regional site selection of potential land treatment areas. Interpretation of tonal and textural characteristics on the photography corresponded to vegetation, ur-

ban and agricultural land use categories. Color and color infrared transparencies augmented the land use mapping, which was accomplished on black and white photographic prints. The three systems are compared in terms of areal coverage, resolution, and time of product preparation.

33-652
Evaluation of the moving boundary theory for Darcy's flow through porous media.
Nakano, Y., MP 1147, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.142-151, 22 refs.
Boundary value problems, Soil moisture migration, Porous materials, Analysis (mathematics), Theories.
Traditionally in hydrology and soil physics, neither the water table nor the wetting front in Darcy's flow were believed to be singular surfaces. Recently, a new and conflicting theory has been advanced, using two different approaches. It has been shown, based upon continuum physics, that across both the water table and the wetting front local acceleration generally suffers a non-zero jump, and these two boundaries can be interpreted as acceleration waves. This interpretation was found consistent with reported regularity results obtained from a purely mathematical viewpoint.

33-653
Evaluation of N models for prediction of No3-N in percolate water in land treatment.
Iskandar, I.K., et al, MP 1148, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.163-169, 51 refs.
Selim, H.M.
Water treatment, Soil chemistry, Seepage, Mathematical models.
Nitrogen simulation models developed to describe one or more processes in agricultural soils can be adopted for land treatment. The most important processes in the simulation of N transformations for prediction of N in percolate water in land treatment are: nitrification, denitrification, plant uptake and exchange of NH4 with the soil. The N model must be incorporated into a moisture flow model. It was concluded that the Michaelis-Menten type model is the most appropriate, although the first order kinetic may be used to describe the nitrification process. Modeling the denitrification process in slow infiltration must include biodegradable carbon and dissolved oxygen as limiting factors. Although several large models are available to simulate and predict N in leachate in land treatment, a need for a simplified model that can be tested in the field is apparent.

33-654
Nitrogen behavior in land treatment of wastewater: a simplified model.
Selim, H.M., et al, MP 1149, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.171-179, 15 refs.
Iskandar, I.K.
Waste treatment, Water treatment, Soil chemistry, Seepage, Mathematical models.
A simplified mathematical model was developed to describe transformations and transport of nitrogen under transient soil water flow conditions. Kinetic reactions were assumed to govern the nitrification and denitrification processes. A macroscopic approach was used to incorporate plant uptake of water as well as NO3-N and NH4-N from the soil solution. The sensitivity of the model to changes in rate of N transformation, N uptake by plants, and schedule and amounts of N application were also investigated. The model can be used as a tool to predict the fate of nitrogen in land treatment systems. The model is flexible and can be adapted to incorporate various nitrogen transformation mechanisms as well as layerings in the soil profile.

33-655
Overview of existing land treatment systems.
Iskandar, I.K., MP 1150, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.193-200, 34 refs.
Waste treatment, Water treatment, Soil chemistry, History.
This paper reviews existing systems of land application of wastewater. Particular emphasis is placed upon the historical philosophy of the utilization of the natural soil-plant system for purifying wastewater, reasons for the success or failure of the older systems, and experience gained from their design, construction and operation.

33-656
Uptake of nutrients by plants irrigated with municipal wastewater effluent.
Clapp, C.E., et al, MP 1151, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.395-404, 21 refs.
Palazzo, A.J., Larson, W.E., Marten, G.C., Linden, D.R.
Nutrient cycle, Irrigation, Wastes, Water treatment, Soil chemistry.
We present comparisons of plant nutrient uptake by corn and forage grasses when these crops were irrigated with secondary municipal wastewater effluent or treated with inorganic fertilizer. Characteristic analyses of effluent from various locations are given for the macro plant nutrients as well as for quality indicators. The importance of the presence of varying amounts of N, P, and K in effluent studies is discussed. Micro elements in effluent are considered for their use to meet nutrient requirements of these crops as well as for their potential for environmental contamination.

33-657
Performance of overland flow land treatment in cold climates.
Jenkins, T.F., et al, MP 1152, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.61-70, 15 refs.
Martel, C.J., Gaskin, D.A., Fisk, D.J., McKim, H.L.
Water treatment, Waste treatment, Soil chemistry, Cold weather performance.
The objective of this study was to evaluate the performance of overland flow systems, especially during the winter months. Operation of the CRREL overland flow facility began in May 1977 and continued through the winter of 1977-78. The results of this study indicated that satisfactory BOD removal did not occur at soil temperatures below 4C. Based on this criterion, 105 days of storage would be needed at the CRREL site. This is 30 days less than the storage needs predicted by the EPA-1 computer program

33-658
Growth and nutrient uptake of forage grasses when receiving various application rates of wastewater.
Palazzo, A.J., et al, MP 1153, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.157-163, 10 refs.
McKim, H.L.
Nutrient cycle, Soil chemistry, Waste treatment, Grasses.
This study reports on the growth and nutrient removal of forage grasses receiving three years of wastewater applications. The forages received wastewater at various application rates and schedules and were grown in either a Windsor sandy loam or a Charlton silt loam soil. Plant and soil analyses were performed on representative samples during the study

33-659
Microbiological aerosols from a field source during sprinkler irrigation with wastewater.
Bausum, H.T., et al, MP 1154, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.273-280, 14 refs.
Brockett, B.E., Schumacher, P.W., Schaub, S.A., McKim, H.L., Bates, R.E.
Waste treatment, Water treatment, Irrigation, Aerosols.
Measurements were made of the strength and dispersion of bacterial aerosols resulting from land application of chlorinated, ponded wastewater by spray irrigation. An approximately square 2.1 hectare area was covered by 96 impact sprinklers, thus creating a multi-point or field aerosol source. Viable-type and large volume electrostatic precipitator air samplers were deployed upwind and on 3 m centers in each of three downwind transects. In four runs, water to be sprayed was seeded with fluorescent dye to characterize the aerosol cloud without the effect of biological decay. During aerosol studies, continuous on-site meteorological measurements were made, and wastewater chemical parameters were monitored

33-660
Computer procedure for comparison of land treatment and conventional treatment: preliminary designs, cost analysis and effluent quality predictions.
Spaine, P.A., et al, MP 1155, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.335-340, 4 refs.
Merry, C.J.
Waste treatment, Water treatment, Computer programs.
During 1972 a manual for the design of wastewater treatment facilities was developed by the U.S. Army Engineer Waterways Experiment Station. To complement the design manual and assist the field design engineer, the computer model CAPDET (Computer Assisted Procedure for the Design and Evaluation of Wastewater Treatment Systems) was developed. In response to field users' request, a land treatment module was developed and implemented into CAPDET. The CAPDET program provides planning level design and cost evaluations for any wastewater treatment system.

33-661
Simulation of the movement of conservative chemicals in soil solution.
Nakano, Y., et al, MP 1156, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.371-380, 14 refs.
Iskandar, I.K.
Soil moisture migration, Soil chemistry, Mathematical models.
A numerical method is introduced to simulate the movement of conservative chemicals in soil by water. The method is essentially based upon a finite element aproximation to the equation of continuity, and each element constitutes a complete mixing cell. The number of cells represents a degree of mixing. The theoretical justification of the method is presented and the accuracy of the method is examined, using experimental data obtained from a large lysimeter. It is found that the method can simulate the general trend of the movement of chemicals reasonably well, but fails to simulate the high frequency of variations that occur near the soil surface.

33-662
Snowfall induced by a power plant plume.
Parungo, F.P., et al, *Geophysical research letters*, June 1978, 5(6), p.515-517, 6 refs.
Allee, P.A., Weickmann, H.K.
Snow crystals, Ice nuclei, Aerosols, Cloud seeding.

33-663
Features of summer ice processes in the Pacific sector of Antarctica. [Ob osobennostiakh ledovykh protsessov v tikhookeanskom sektore Antarktiki letom].
Lutsenko, E.I., *Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy*, 1978, Vol.345, p.133-137, In Russian. 7 refs.
Sea ice, Pack ice, Polynyas, Antarctica, South Pacific Ocean.
Summer sea ice dynamics in the Pacific sector are analyzed and compared with those in the eastern sector. The author concludes that, compared to East Antarctic ice, the Pacific pack is a more intact and cohesive mass with extensive polynyas inside the pack. The polynyas at the divergence, characteristic of East Antarctica, are not found in the Pacific Ocean. The dynamics of the northern edge of the Pacific pack are less pronounced. Polynyas play a large role in sea ice destruction.

33-664
Thermal stresses near the surface of a glacier.
Sanderson, T.J.O., *Journal of glaciology*, 1978, 20(83), p.257-283, In English with French and German summaries. 47 refs.
Glacier ice, Thermal stresses, Glacier heat balance, Temperature variations, Antarctica—George VI Ice Shelf.
Stresses occur in the uppermost 10 m of a glacier as a result of temperature fluctuations at the surface. A model is set up of a typical year's surface temperature variation, and the progress of temperature waves through the glacier is calculated using Fourier theory of heat conduction. Short-period fluctuations are rapidly attenuated, and at 10 m depth the annual cycle is reduced to 5% of its surface amplitude. As the temperature of the ice varies it undergoes small volume changes; stresses are calculated on the assumption that any tendency of the ice to expand or contract laterally results in the creation of just enough stress to cause the ice to remain unstrained. It is found that in the top 2 or 3 m stresses of thermal origin are generally in excess of those due to gross deformation or overburden pressure. Cracks of thermal origin may be responsible for the initial formation of crevasses, and they also provide an explanation for background noise encountered when seismic shooting at low temperatures. Calculations are made of the strain-rate field surrounding a crack, and it is found that thermal effects can lead to appreciable strain-rate anomalies for strain-rate measurements near cracks. The magnitude of the effect is easily sufficient to account for anomalous fluctuating strain-rates found by workers using wire strainmeters on the Barnes Ice Cap. (Auth. mod.)

33-665
Origin of foliation in glaciers.
Hooke, R.L., et al, *Journal of glaciology*, 1978, 20(83), p 285-299, In English with French and German summaries. 45 refs.
Hudleston, P.J.
Glacier ice, Ice structure, Layers, Bubbles, Sediments.

33-666
Surface mass-balance variability near "Byrd" Station, Antarctica, and its importance to ice core stratigraphy.
Whillans, I.M., *Journal of glaciology*, 1978, 20(83), p.301-310, In English with French and German summaries. 22 refs.
Ice cores, Drill core analysis, Mass balance, Ice sheets, Antarctica—Byrd Station.
The local variability in surface mass balance (net snow accumulation) up-glacier from Byrd Station, Antarctica, is due to the combined effects of year-to-year "climate" variations and of the surface microrelief due to snow drifts and sastrugi. These variabilities are consistent with the variability in surface mass balance obtained from core stratigraphy, and are used in a discussion of the difficulties encountered with the deep Byrd Station core in detecting annual layering by the stable oxygen-isotope ratio and the microparticle concentration techniques. The recognition of annual layers by these techniques requires that the snows of certain seasons be present in the measured section, but near Byrd Station the microrelief is such that summer snow layers are not horizontally continuous and may be absent from a given section. At other sites on ice sheets, where the microrelief is less (less wind activity) or where the surface mass balance is larger, or both, less difficulty is anticipated in using the stable oxygen-isotope ratio and micro-particle-concentration techniques to identify annual layers. (Auth.)

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Spatial distribution of 10 m temperatures in the Antarctic Peninsula.
Martin, P.J., et al, *Journal of glaciology*, 1978, 20(83), p.311-317, In English with French and German summaries. 19 refs.
Peel. D.A.
Boreholes, Temperature variations, Climate, Antarctica—Antarctic Peninsula.
Temperatures from 10 m bore holes have been analyzed to determine the spacial variation of mean annual surface temperature over the Antarctic Peninsula. In general there is a decrease in temperature of 0.84 deg per degree latitude southwards combined with an altitude lapse rate of 0.68 deg per 100 m. There is a sharp divide between the continental type climate of the east coast and a maritime climate of the central and western regions. Temperatures are approximately 7 deg lower along the east coast compared with those at sites of a similar altitude and latitude on the west. (Auth.)

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Origin of the basal ice layer from alpine glaciers indicated by its chemistry.
Souchez, R.A., et al, *Journal of glaciology*, 1978, 20(83), p.319-328, In English with French and German summaries. 20 refs.
Lorrain, R.D.
Glacier ice, Ice composition, Geochemistry.

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Determination of the mean number of bonds per snow grain and the dependence of the tensile strength of snow on stereological parameters.
Gubler, H., *Journal of glaciology*, 1978, 20(83), p.329-341, In English with French and German summaries. 10 refs.
Snow crystal structure, Tensile strength.

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Bourgeois, S., Evrard, G.
Ice dielectrics, Ice microstructure, Dielectric properties.

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Glacial erosion by the Laurentide Ice Sheet.
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Glacial erosion, Ice sheets, Landscape types, Glacial till, Models.

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Former ice shelves in the Canadian High Arctic.
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Bradley, R.S., Miller, G.H.
Ice shelves, Moraines, Radioactive age determination, History.

33-674
Recording wire strainmeters on the Barnes Ice Cap, Baffin Island, Canada.
Evans, K., et al, *Journal of glaciology*, 1978, 20(83), p.409-423, In English with French and German summaries. 12 refs.
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Strain measuring instruments, Ice sheets, Recording instruments.

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Investigation into the use of strain rosettes for the measurement of propagating cyclic strains.
Squire, V.A., *Journal of glaciology*, 1978, 20(83), p.425-431, In English with French and German summaries. 11 refs.
Strain measuring instruments, Sea ice, Periodic variations.

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Smith, F.W.
Strain measuring instruments, Snow mechanics, Avalanche mechanics.

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Temperature measurements on the Barnes Ice Cap, Baffin Island, Canada, and on Sukkertoppen Iskappe, Greenland.
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Koci, B.R.
Temperature measurement, Boreholes, Ice sheets.

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On the non-linearity of glacier length response to climatic changes: comments on a paper by H.W.Possementier.
Kuhn, M., *Journal of glaciology*, 1978, 20(83), p.443-445, 11 refs. For the paper being commented on see 31-3357.
Glacier oscillation, Climatic changes, Glacier mass balance.

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Chaichanavong, T.
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Frozen ground mechanics, Dynamic loads, Periodic variations, Strain tests, Soil moisture, Frozen sand, Sediments.

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Snow crystal nuclei, Snow composition, Chemical analysis, Antarctica—Amundsen-Scott Station.

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Investigation of precipitating ice crystals from natural and seeded winter orographic clouds.
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Cloud seeding, Ice crystal structure, Cloud physics, Ice nuclei, Nucleating agents, Artificial nucleation.

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Natural regimes as information sources for modeling & forecasting the state of geosystems. [Prirodnye ...zhimy—istochnik informatsii dlia modelirovaniia i prognozirovaniia sostoianii geosistem],
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Enviroamental protection, Terrain analysis, Landscape types, Ecosystems, Human factors, Landscape development, Mathematical models, Forecasting, Computer applications.

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Landscape types, Research projects, Taiga soils, Taiga vegetation, Mapping, Ecosystems, USSR—Sayan Mountains.

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Economic development, Environmental protection, Landscape types, Human factors, USSR—Altai Mountains.

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Improving the stability of excavators during operation under difficult earthwork conditions. ¡Povyshenie ustoĭchivosti ekskavatorov pri rabote v trudnorazrabatyvaemykh gruntakh¡,
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Basic trends in improving the design and technology of building power line supports under northern conditions. ¡Osnovnye napravleniia sovershenstvovaniia konstruktivnykh reshenĭ i tekhnologii sooruzheniia fundamentov opor linĭ elektroperedachi v severnykh usloviiakh¡,
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Ice temperature, Ice electrical properties, Pack ice, Ice salinity, Sea ice, Greenland Sea.

33-721
Side-scattered and ordinary waves in electromagnetic pulse sounding of sea ice. [Bokovye i normal'nye volny pri impul'snom elektromagnitnom zondirovanii morskogo l'da],
Bogorodskiĭ, V.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.45-47, In Russian. 2 refs.
Tripol'nikov, V.P.
Sea ice, Electromagnetic prospecting, Scattering.

33-722
Measuring mean vertical velocity of radiosignals in Severnaia Zemlia glaciers. [Ob izmerenii srednei skorosti vertikal'nogo rasprostraneniia impul'snykh radiosignalov v lednikakh Severnoĭ Zemli],
Fedorov, B.A., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.48-55, In Russian. 2 refs.
Radio echo soundings, Ice dielectrics, Glacier ice, Glacier thickness, USSR—Severnaya Zemlya.

33-723
Features of return signals during radio echo soundings of Severnaya Zemlya glaciers. [Nekotorye osobennosti otrazhennykh radiolokatsionnykh signalov pri zondirovanii lednikov Severnoĭ Zemli],
Boĭcrskiĭ, V.I., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.56-60, In Russian.
Fedorov, B.A.
Radio echo soundings, Glacier ice, Glacier thickness, USSR—Severnaya Zemlya.

33-724
Experiments on wave diffusion in radio echo soundings of layered media with the transceivers widely spaced in comparison to depth of layers under study. [Eksperimental'noe issledovanie rasprostraneniia voln pri impul'snom radiozondirovanii sloistykh sred s ispol'zovaniem bol'shogo, po sravneniiu s tolshchinoĭ sloia, raznosa izluchaiushchego i priemnogo punktov],
Bogorodskiĭ, V.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.61-68, In Russian. 4 refs.
Trepov, G.V.
Radio echo soundings, Glacier ice, Ice dielectrics.

33-725
Laser study of optical properties of snow. [Issledovanie opticheskikh svoĭstv snega s pomoshch'iu lazerov],
Bogorodskiĭ, V.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.69-74, In Russian. 6 refs.
Kropotkin, M.A.
Snow optics, Lasers.

33-726
Methodological and semi-field studies of the hydrophysical characteristics of Lake Ladoga. [Metodicheskie i polunaturnye issledovaniia gidrofizicheskikh kharakteristik na Ladozhskom ozere],
Chebotareva, V.A., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.75-80, In Russian. 5 refs.
Ice acoustics, Acoustic properties, Lake ice, USSR—Ladoga Lake.

33-727
Area of illumination under thin freshwater ice. [Prostranstvennoe telo iarkosti pod tonkim presnovodnym l'dom],
Gaĭtskhoki, B.IA., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.96-98, In Russian. 2 refs.
Ivashnev, A.G.
Lake ice, River ice, Light scattering, Ice optics.

33-728
Measuring light energy under the ice at the edge of a drifting island. [Nekotorye rezul'taty izmereniĭ luchistoĭ energii podo l'dom u kromki dreĭfuiushchengo "ostrova"],
Gaĭtskhoki, B.IA., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.99-103, In Russian. 2 refs.
Grigor'ev, A.I., Grishchenko, V.D.
Ice islands, Ice optics, Light (visible radiation).

33-729
Determining elements of ice drift with acoustic transponder and phase range-finder. [Opredelenie elementov dreĭfa l'da otnositel'no akusticheskogo otvetchika s ispol'zovaniem fazovogo pelengatora],
Nikolaenko, IU.A., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.104-109, In Russian. 1 ref.
Ostroukhov, A.A., Smirnov, G.E.
Drift, Sea ice, Ice acoustics, Acoustic properties.

33-730
Using side-looking radar for studying underwater relief. [Primenenie metoda bokovogo obzora dlia issledovaniia podvodnogo rel'efa],
Smirnov, S.A., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.110-117, In Russian. 12 refs.
Popov, I.K.
Ice bottom surface, Glacier ice, Icebergs, Side looking radar.

33-731
Acoustic emissions as indicators of ice deformation and destruction processes. [Akusticheskaia emissiia kak pokazatel' protsessa deformirovaniia i razrusheniia l'da],
Gavrilo, V.P., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.118-126, In Russian. 13 refs.
Gusev, A.V., Zaretskiĭ, IU.K., Fish, A.M.
Ice acoustics, Ice deformation, Ice strength, Noise (sound), Stresses, Acoustic properties.

33-732
Instruments for studying underwater portions of Southern Ocean icebergs. [Instrumental'nye issledovaniia podvodnykh chastei aĭsbergov IUzhnogo okeana],
Bogorodskiĭ, A.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.134-138, In Russian. 1 ref.
Popov, I.K.
Icebergs, Underwater ice, Ice bottom surface, Side looking radar.
For the first time side-looking radar has been successfully used to study the underside of Southern Ocean icebergs. The results of studies into extent of immersion of medium-sized glaciers are analyzed.

33-733
Electrical sounding methods applied to ice and glacier research. Results from 1962 to 1965. [Les méthodes électriques de prospection appliquées a l'étude de la glace et des glaciers. Résultats obtenus de 1962 à 1965],
Andrieux, P., *Comité national français des recherches antarctiques. CNFRA,* 1970, No.24, 64p., In French. Refs. p.57-59.
Ice resistivity, Ice electrical properties, Glacier ice, Sounding, Artificial ice, Greenland, Kerguelen Islands.
General considerations in electrical prospecting of ice and glaciers are discussed first. Then the results of field studies in Switzerland, the Kerguelen Islands, Greenland, Baffin, Axel Heiberg and Meighen Islands are reported. The second portion of the monograph is concerned with the electrical properties of ice, both that prepared in the laboratory and that found in glaciers in both temperate and polar regions.

33-734
Antarctic glaciation and its role in world water regime and climate formation. [Oledenenie Antarktiki i ego rol' v formirovanii klimata i vodnogo rezhima Zemli (problemy gliatsiologicheskikh issledovanii)],
Aver'ianov, V.G., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten',* 1978, No.97, p.6-14, In Russian. 12 refs.
Korotkevich, E.S., Kotliakov, V.M.
Glaciation, Glacial meteorology, Heat balance.
The history of antarctic glaciation is reviewed and its role in global climatology discussed in order to define the primary research problems and point the way to their resolution. The two major scientific puzzles in antarctic glaciology are the energy exchange between the ice sheet and the atmosphere and ocean, and the water budget of the ice sheet and its possible exploitation for human use. A deeper understanding of paleoclimatology would provide a foundation for long-range weather forecasting and for the evolution of a theory of global climate formation. From a practical viewpoint the goals to be reached in the near future are 1) development of a conservation policy and attendant practices, 2) improved engineering on the ice (construction techniques, for example) and 3) improved drilling techniques to achieve deeper shafts for both glaciological and minerological purposes. The expected contributions of the International Antarctic Glaciological Program are outlined.

33-735
Studying the antarctic ice sheet by radio-echo sounding. [Issledovanie lednikovogo pokrova Antarktidy metodami radiolokatsionnogo zondirovaniia],
Bogorodskiĭ, V.V., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten',* 1978, No.97, p.104-123, In Russian. 19 refs.
Trepov, G.V.
Ice sheets, Ice dielectrics, Ice cover thickness, Radio echo soundings.
Studies on the thickness, flow rate, mass balance, and other parameters of the antarctic ice sheet and individual glaciers are reviewed. Also the equipment used is described and its general specifications are given. Results are summarized in charts and further research plans outlined.

33-736
Results of ice sheet vertical structure studies in the Vostok Station area. [Rezul'taty izucheniia vertikal'noĭ struktury lednikovogo pokrova Antarktidy v raione stantsii Vostok],
Korotkevich, E.S., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten',* 1978, No.97, p.135-148, In Russian. 7 refs.
Ice sheets, Ice cores, Ice structure, Ice composition, Antarctica—Vostok Station.
Core studies carried out near Vostok Station are discussed. First, attention is paid to various features of the core itself—deformation of the walls, temperature, etc. The characteristics of the ice are then discussed: density, texture, optical orientation of the crystals, chemical composition, isotope composition, air inclusions, and micropaleontological analysis.

33-737
Bering Sea oceanography: an update, 1972-1974.
Seminar and Workshop on Bering Sea Oceanography under Auspices of the U.S.-Japan Program, Fairbanks, Alaska, Oct. 7-11, 1974, Alaska. University. Institute of Marine Science. IMS report, No.75-2, Fairbanks, Alaska, [1974], 292p., Refs. passim. For selected papers see 33-738 through 33-740.
Hood, D.W., ed, Takenouti, Y., ed.
Biomass, Ocean currents, Sea ice distribution, Circulation, Water temperature, Salinity, Water chemistry.

33-738
Recent Japanese physical oceanographic studies of the Bering Sea.
Takenouti, Y., Seminar and Workshop on Bering Sea Oceanography under Auspices of the U.S.-Japan Program, Fairbanks, Alaska, Oct. 7-11, 1974. Results. Edited by D.W. Hood and Y. Takenouti, Fairbanks, University of Alaska, Institute of Marine Science, [1974], p.45-50, 10 refs.
Water temperature, Ocean currents, Salinity, Oceanographic surveys, Flowmeters, Bering Sea.

33-739
Recent studies on Bering Sea circulation.
Coachman, L.K., Seminar and Workshop on Bering Sea Oceanography under Auspices of the U.S.-Japan Program, Fairbanks, Alaska, Oct. 7-11, 1974. Results. Edited by D.W. Hood and Y. Takenouti, Fairbanks, University of Alaska, Institute of Marine Science, [1974], p.51-73, 2 refs.
Favorite, F.
Sea water, Wind factors, Circulation, Ocean currents, Flowmeters, Meteorological factors, Bering Sea.

33-740
Bering Sea shelf dynamics—an overview.
Muench, R.D., Seminar and Workshop on Bering Sea Oceanography under Auspices of the U.S.-Japan Program, Fairbanks, Alaska, Oct. 7-11, 1974. Results. Edited by D.W. Hood and Y. Takenouti, Fairbanks, University of Alaska, Institute of Marine Science, [1974], p.75-80.
Galt, J.A.
Coastal topographic features, Ice shelves, Sea ice distribution, Seasonal variations, Ocean currents, Wind factors, Bering Sea.

33-741
Particulate formation due to freezing humic waters.
Giesy, J.P., et al, *Water resources research,* June 1978, 14(3), p.542-544, 28 refs.
Briese, L.A.
Artificial freezing, Organic nuclei, Particles.

33-742
On thermal stratification in reservoirs during the winter season.
Rahman, M., *Water resources research,* Apr. 1978, 14(2), p.377-380, 5 refs.
Reservoirs, Thermal regime, Layers, Seasonal variations.

33-743
Acoustic studies from an ice floe near Barrow, Alaska, in April 1974.
Garrison, G.R., et al, *Washington (State). University. Applied Physics Laboratory. Report,* Feb. 1978, APL-UW-7514, 137p., ADB-041 157L, Distribution limited to U.S. Government agencies only.
Pence, E.A., Early, E.W.
Sea ice, Ice acoustics, Sound waves, Attenuation, Backscattering, Ice bottom surface.

33-744
Mission report—Spring 1976. Arctic airborne remote sensing program and preliminary analysis of high resolution passive microwave sea ice imagery.
Ketchum, R.D., Jr., et al, *U.S. Naval Ocean Research and Development Activity. Technical note,* June 1976, NORDA-TN-1, 24p., ADB-014 111L, Distribution limited to U.S. Government agencies only.
Tooma, S.G., Jr., Li, H.
Remote sensing, Microwaves, Aerial reconnaissance, Sea ice, Spaceborne photography, Photointerpretation.

33-745
State-of-the-art of freezing processes, their potential and future.
Johnson, W.E., *Desalination,* Dec. 1976, 19(1/2/3), Desalination Congress of the American Continent, 1st, Mexico City, October 24-29, 1976. Proceedings, Vol.1, p.349-358.
Desalting, Artificial freezing.

33-746
Force measurements on a navigable ice boom.
Uzuner, M.S., et al, *Journal of hydraulic research,* 1977, 15(2), p.179-187, In English with French summary. 4 refs.
Peter, J.J., Robb, D.C.N.
Ice booms, Ice pressure, Dynamic loads, Ice navigation, River ice.

33-747
Environmental assessment of the Alaskan continental shelf, Vol.2. Boulder, Colorado, Environmental Research Laboratories, 1976, 896p., Principal investigators' reports April-June 1976. For selected reports see 33-748 through 33-762.
Research projects, Water chemistry, Microbiology, Oceanography, Geology, Sea ice.

33-748
Assessment of potential interactions of microorganisms and pollutants resulting from petroleum development on the outer continental shelf in the Beaufort Sea.
Atlas, R.M., Environmental assessment of the Alaskan continental shelf, Vol. 2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.103-113.
Oil pollution, Marine biology, Microbiology, Ice cover, Beaufort Sea.

33-749
Baseline study of microbial activity in the Beaufort Sea and the Gulf of Alaska and analysis of crude oil degradation by psychrophilic bacteria.
Morita, R.Y., et al, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Labratories, 1976, p.202-223, 4 refs.
Griffiths, R.P.
Oil pollution, Microbiology, Water chemistry, Chemical reactions.

33-750
Gulf of Alaska study of mesoscale oceanographic processes (GAS-MOP).
Hayes, S.P., et al, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado Environmental Research Laboratories, 1976, p.253-286, Includes Preliminary description of circulation on the continental shelf in the N.E. Gulf of Alaska: February-May 1975 by Hayes and Schumacher. 23 refs.
Schumacher, J.D.
Ocean currents, Wind factors, Water pressure, United States—Alaska—Gulf of Alaska.

33-751
Bristol Bay oceanographic processes (B-BOP).
Coachman, L.K., et al, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.289-315.
Schumacher, J.D.
Sea water, Ocean currents, Circulation.

33-752
Historical and statistical data analysis and ship of opportunity program.
Muench, R.D., Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.447-451.
Oceanography, Sea ice, Water temperature, Salinity, United States—Alaska—Bristol Bay.

33-753
Transport of pollutants in the vicinity of Prudhoe Bay, Alaska.
Callaway, R.J., et al, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.452-460.
Koblinsky, C.
Sea water, Water pollution, Ocean currents, United States—Alaska—Prudhoe Bay.

33-754
Marine climatology of the Gulf of Alaska and the Bering and Beaufort Seas.
Searby, H.W., et al, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.461-485.
Brower, W.A., Jr.
Climatology, Meteorological data, Marine meteorology.

33-755
Delineation and engineering characteristics of permafrost beneath the Beaufort Sea.
Sellmann, P.V., et al, MP 735, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.640-651.
Permafrost distribution, Submarine permafrost, Offshore drilling, Drill core analysis.

33-756
Distribution, composition and transport of suspended particulate matter in the Gulf of Alaska and southeastern Bering shelf.
Feely, R.A., et al, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.653-691, 13 refs.
Cline, J.D.
Suspended sediments, Water chemistry, Minerals.

33-757
Offshore permafrost studies Beaufort Sea, Alaska.
Hopkins, D.M., Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.692-709.
Offshore drilling, Drill core analysis, Submarine permafrost, Geomagnetism.

33-758
Marine environmental problems in the ice covered Beaufort Sea shelf and coastal regions.
Barnes, P., et al, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.710-738, 3 refs.
Reimnitz, E., Drake, D
Ice cover effect, Suspended sediments, Bottom sediment, Ocean currents, Turbidity.

33-759
Beaufort Sea coast permafrost studies.
Rogers, J.C., Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.760-764.
Submarine permafrost, Seismic surveys, Offshore land forms.

33-760
Dynamics of near-shore ice.
Weeks, W.F., et al, MP 736, Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.781-789.
Kovacs, A.
Sea ice, Ice mechanics, Remote sensing.

33-761
Dynamics of near shore ice (data buoys).
Untersteiner, N., Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.793-824, Includes Arctic odyssey-five years of data buoys in AIDJEX by P. Martin and C.R. Gillespie, q.v. 32-4558.
Sea ice, Drift, Remote sensing, Buoys.

33-762
Study of climatic effects on fast ice extent and its seasonal decay in the Beaufort Sea area.
Barry, R.G., Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports April-June 1976, Boulder, Colorado, Environmental Research Laboratories, 1976, p.825-838.
Sea ice, Ice deterioration, Climate.

33-763
Report of the International Ice Patrol Service in the North Atlantic Ocean. Season of 1974.
U.S. Coast Guard, *U.S. Coast Guard. Report,* CG-188-29, Bulletin No.60, 62p., Numerous refs. passim.
Ice reporting, Ice conditions, Drift, Icebergs, ERTS imagery.

33-764
Ice ridge formation: probable control by nearshore bars.
Seibel, E., et al, *Journal of Great Lakes research,* 1976, 2(2), p.384-392, 13 refs.
Carlson, C.T., Maresca, J.W., Jr.
Ice push, Lake ice, Shore erosion, Sediments, Pressure ridges.

33-765
APL Arctic SEV subsystem development program (final summary report).
Thompson, T., et al, *Johns Hopkins University. Applied Physics Laboratory. Report,* June 1977, APL/-JHU/APL 005; 322p. ADA-045 615.
Warnke, L.L.
Air cushion vehicles, Ice navigation, Telecommunication, Arctic terrain, Terrain identification.

33-766
Winter currents in Lake Huron.
Saylor, J.H., et al, *U.S. National Oceanic and Atmospheric Administration. Technical memorandum,* Dec. 1976, ERL-GLERL-15, 107p., PB-275 847, 21 refs.
Miller, G.S.
Lake water, Water flow, Low temperature research, Water temperature.

33-767
Cratering and ditching with explosives in frozen soils.
Bauer, A., et al, *Canada. Defence Research Board. Defence Research Establishment, Valcartier. DREV report,* July 1973, DREV R-699/73, n.p. AD-913 283.
Calder, P.N., MacLachlan, R.R., Halupka, M.
Frozen ground mechanics, Explosion effects.

33-768
Coastal geomorphology of high latitudes.
John B.S., et al, Progress in geography, Vol.7, New York St. Martin's Press, 1975, p.53-132, Refs. p.112-132.
Sugde, D.E.
DGS, 309.P943
Coasta. topographic features, Shoreline modification, Ice erosion, Isostasy, Geomorphology.
This study of the geomorphological features common to ice-bound coasts is divided into the following portions: short-term marine variables (such as ice, waves, climate); terrestrial variables (such as river sediments); long-term variables (such as plate tectonics); long-term processes (erosion and deposition); and short-term erosion and deposition.

33-769
Periglacial processes. Benchmark papers in geology, No.27, Stroudsburg, Pa., Dowden, Hutchinson and Ross, 1976, 459p., Consists of reprints and reviews of articles. Refs. passim.
King, C.A.M., ed.
Periglacial processes, Frost heave, Ice wedges, Patterned ground, Permafrost weathering, Avalanche erosion, Wind factors.

33-770
Numerical simulation of the annual cycle of sea ice in the Arctic and Antarctic.
Parkinson, C.L., NCAR cooperative thesis No.46, Columbus, Ohio State University, 1978, 191p., Ph.D thesis. Refs. p.179-191.
Sea ice, Ice models, Ice cover thickness, Dynamic properties, Thermodynamic properties.
This work describes the construction of and results from a numerical model simulating the yearly cycle of sea ice in both the northern and southern hemispheres. The model employs a rectangular grid with 200 km horizontal resolution, an 8 hr timestep, and four vertical layers—ice, snow, ocean, and atmosphere. Both thermodynamic and dynamic processes are incorporated, the thermodynamics being based on energy balances at the various interfaces and the dynamics being based on the following five stresses: wind stress, water stress, Coriolis force, internal ice resistance, and the stress from the tilt of the sea surface. The model simulates a reasonable yearly cycle of sea ice thickness and extent in both the Arctic and Antarctic. The Antarctic ice grows from a minimum in March to a maximum in late August, while the Arctic ice expands from a September minimum to a March maximum. Overall, both thicknesses and concentrations are greater in the Arctic than in the Antarctic. Maps are presented of modeled thicknesses, concentrations, and velocities, and surface energy budgets are analyzed. (Auth.)

33-771
Initial report on geological materials collected at RISP site J9, 1977-78.
Webb, P.N., comp, RISP Technical report 78-1, Dekalb, Northern Illinois University, Sep. 1978, 46p., 9 refs.
Ice shelves, Sediments, Cores, Geology.
This report summarizes the coring operations, field work, laboratory analyses and results obtained by the Ross Ice Shelf Project investigations at Site J9. Eleven gravity cores, ten sphincter cores and one bottom dredge sample were obtained at the site during Dec. 1977. Core descriptions, geological site data and the results of paleontological analyses are presented. Preliminary results indicate that fossil-rich mid-Miocene glaciomarine sediments are exposed at the seafloor. There is apparently no Pliocene or Pleistocene exposed at this site, presumably the result of relatively recent grounding and erosion during the latest phase of Ross Ice Shelf history.

33-772
Dissipation of tidal energy by antarctic ice shelves.
Doake, C.S.M., *Nature,* Sep. 28, 1978, 275(5678), 304-305, 17 refs.
Ice shelves, Tides.
The possibility of tidal bending of antarctic ice shelves is examined. Using equations derived by Holdsworth (1977; 31-4440 or F-18701) for surface bending stress, average strain rate and exponential damping factor, the dissipation rate for tidal bending of antarctic ice shelves is estimated to be 2.0 x 10 exp 12 W. The uncertainties associated with this figure are discussed. Within the constraints imposed by the lack of data, it is suggested that extensive glaciation occurs in the periods preceding "turning points", when the Earth increases its spin velocity.

33-773
Melting of antarctic icebergs.
Donaldson, P.B., *Nature,* Sep. 28, 1978, 275(5678), p.305-306, 13 refs.
Icebergs, Ice melting, Sea water, Salinity, Calving.
This note reports some initial studies of iceberg melting relevant to towing proposals. If under-sea melting is an important ablation mechanism, then one or more of the following three effects might be detectable. (1) The lighter freshwater could rise up the sides of the iceberg with little mixing to produce a pool of less saline water. If this happens, then it would be possible for meltwater to be collected in warm waters by building a shallow pen around the iceberg. (2) The lighter freshwater may entrain warmer, saltier water from the surrounding sea and thus be responsible for considerable vertical transport of deep water and nutrients. (3) Melting could occur in a stratified manner and the freshwater may then disseminate in layers. Thus evidence of gross salinity variation near an iceberg would support mechanism (1), and a temperature rise would support mechanism (2). To test for these two mechanisms, salinities were measured around three icebergs in the northern Ross Sea/Southern Ocean. Mechanism (3), suggested only recently, was not tested. No variation of salinity with distance from icebergs was found. A temperature inversion at a depth of 50-60 m around iceberg no. 3 was recorded, but this extended for at least 2 km. It is suggested that calving is probably the most important ablation mechanism in both northern and southern waters.

33-774
Design of roads with a frost-accumulating bark layer. ⟨Dimensjonering av veger med frostakkumulerende underlag⟩,
Knutson, Å., *Norway. Veglaboratoriet. Meddelelser,* Dec. 1972, No.43, p.3-13, In Norwegian and English. 12 ref.s.
Thermal insulation, Roadbeds, Frost protection, Subgrade preparation, Bark, Design.

33-775
Durability of bark in road construction. ⟨Barkens bestandighet i vegfundamenter⟩,
Solbraa, K., *Norway. Veglaboratoriet. Meddelelser,* Dec. 1972, No.43, 15-26, In Norwegian with English summary. 15 refs.
Roadbeds, Frost protection, Construction, Subgrade preparation, Bearing strength, Bark, Thermal insulation, Decomposition.

33-776
Bark in Norway. ⟨Bark i Norge⟩,
Klem, G.S., *Norway. Veglaboratoriet. Meddelelser,* Dec. 1972, No.43, p.27-29, In Norwegian with English summary. 2 refs.
Thermal insulation, Subgrade preparation, Roadbeds, Bark.

33-777
Australia may benefit as iceberg idea is reflonted.
World water, June 1978, p.32-34.
Icebergs, Water supply, Ice (water storage).
This discussion focuses on various aspects of the studies being conducted by Iceberg Transport International (ITI) chaired by Prince Faisal of Saudi Arabia, on the feasibility of towing antarctic icebergs. ITI has earmarked Bouvet I. and Australia's Heard I. as pick-up fields for tabular icebergs. An estimated 3-mo journey would bring them to the Australian coast where the best reception sites discovered so far—determined by depressions in the continental shelf sufficient to allow passage of the bergs' huge draught—are 35 km from Robe in South Australia and Rottnest I. in Western Australia. Further surveying will determine the feasibility of other sites. Proposed methods for locating and insulating icebergs, and delivering the water to shore are outlined. The utilization of iceberg water to fill oil tankers returning to Saudi Arabia from South African ports is briefly considered, as are the legal, ecological, and economic aspects of iceberg transport.

33-778
Icebergs to Arabia.
Dodson, R.H.T., *Focus,* Sep.-Oct. 1978, 29(1), p.10-16, 5 refs.
Icebergs, Ice (water storage), Insulation, Water supply, Economic development, Iceberg towing.
The prospect of transporting icebergs from Antarctica as a means of relieving the world's fresh water shortage is examined. Iceberg supply, towing methods, towing dynamics, the problem of insulation, the potential of icebergs for generating electric power, and the economics of such a venture are discussed. Prince Mohammed al-Faisal of Saudi Arabia is committed to backing the necessary research, and is dedicated to the idea that iceberg water can be practical, not only for the Middle East but for Australia, California, Chile and other developing countries as well. Prince Faisal has formed a group called Iceberg Technology International, headquartered in Paris, to pursue his goal.

33-779
Thermal fields of the inland and peripheral seas of the USSR (observation and interpretation of two-dimensional inhomogeneities). ⟨Teplovye polia vnutrennikh i okrainnykh morei SSSR (Sostoianie nabliudenii i teoriia interpretatsii dvumernykh neodnorodnostei)⟩,
Liubimova, E.A., et al, Moscow, Nauka, 1976, 224p., In Russian with English table of contents enclosed. Refs. p.218-222.
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Water transport, Heat flux, Ocean currents, Ice conditions, Drift stations, Ocean bottom, Geothermometry, Bottom topography, Bottom sediment, Temperature distribution, Analysis (mathematics), Arctic Ocean, Okhotsk Sea, USSR—Baykal Lake.

33-780
Air heaters for contruction purposes. ⟨Stroitel'nye vozdukhonagrevateli⟩,
Postnov, M.T., Moscow, Stroiizdat, 1977, 113p., In Russian with English table of contents enclosed. 10 refs.
Cold weather construction, Residential buildings, Industrial buildings, Drying, Electric heating, Concrete heating, Construction equipment.

33-781
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Pliat, Sh.N., Moscow, Energiia, 1978, 199p., In Russian with English table of contents enclosed. 39 refs.
Hydraulic structures, Hydroelectric power generation, Concrete structures, Dams, Thermal regime, Foundations, Heat transfer, Thermal conductivity, Analysis (mathematics).

33-782
Calculating settlement and strength of foundations of buildings and structures. ⟨Raschety osakok i prochnosti osnovanii zdanii i sooruzhenii⟩,
Gol'dshtein, M.N., et al, Kiev, Budivel'nik, 1977, 208p., In Russian with English table of contents enclosed. 94 refs.
Kushner, S.G., Shevchenko, M.I.
Buildings, Concrete structures, Foundations, Footings, Clays, Sands, Bearing strength, Settlement (structural), Design, Deformation.

33-783
Construction of an industrial complex (the steel wheel production plant in Vyks). ⟨Vozvedenie promyshlennogo kompleksa (na primere stroitel'stva kolesoprokatnogo kompleksa v g. Vykse)⟩,
Zil'berberg, S.D., Moscow, Strolizdat, 1977, 79p., In Russian with English table of contents enclosed. 10 refs.
Cold weather construction, Industrial buildings, Foundations, Reinforced concrete, Winter concreting, Earthwork, Hydraulic fill, Soil freezing, Concrete heating, Concrete admixtures, Peat, Swamps.

33-784
Designing optimal nonrigid pavements. ⟨Proektirovanie optimal'nykh nezhestkikh dorozhnykh odezhd⟩,
Tulaev, A.IA., ed, Moscow, Transport, 1977, 117p., In Russian with English table of contents enclosed. 24 refs.
Roads, Pavements, Frost heave, Thermal insulation, Design, Computer applications.

33-785
Environmental assessment of the Alaskan continental shelf, Vol.2. Boulder, Colorado, Environmental Research Laboratories, 1977, 604p., Principal investigators' reports October-December 1977. For selected individual reports see 33-786 through 33-804.
Oil spills, Sea ice, Oceanography, Remote sensing, Meteorology, Sediments.

33-786
Development and operation of HF ocean current mapping radar units.
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Surface waters, Radar, Mapping, Flow rate.

33-787
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Ruby, C.H.
Sediment transport, Oil spills, Shores, Marine biology.

33-788
Reconnaissance evaluation of longshore sediment transport, northeast Gulf of Alaska.
Nummedal, D., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Enivronmental Research Laboratories, 1978, p.51-62, 12 refs.
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Sediment transport, Aerial reconnaissance, Geomorphology.

33-789
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Schumacher, J.D.
Cold weather tests, Oceanographic surveys, Suspended sediments, Hydrography.

33-790
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33-791
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Barry, R.G., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Enivronmental Research Laboratories, 1978, p.141-171, 11 refs.
Mapping, Ice conditions, Climatic factors, Wind factors, Pack ice, Fast ice.

33-792
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Periodic variations, Precipitation (meteorology), Atmospheric circulation, Wind (meteorology).

33-793
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Sediment transport, Clay minerals, Statistical data, Grain size, Chemical analysis.

33-794
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33-795
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33-796
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33-797
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33-798
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Bottom sediment, Salinity, Temperature gradients, Estuaries, Sea ice, Suspended sediments, Submarine permafrost.

33-799
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Bottom sediment, Mapping, Geological maps, Seismic surveys.

33-800
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33-802
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33-803
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33-805
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Atmospheric circulation, Heat balance, Ice air interface.
A review of major meteorological features of the Southern Ocean area is undertaken with a view to identifying problems requiring further research. The following topics are offered as bases for international efforts in the meteorological study of the Southern Ocean: circulation and heat exchange mechanisms over Antarctica; estimates of magnitude and temporal and spatial variability of advective heat flow, humidity and energy exchange and their balance; radiation balance research and establishment of standard actinometric atmospheric information so that non-adiabatic components of temperature change can be assessed; relative effect of land and sea on climate; variability of physical mechanisms such as aerosols, ice and snow and their effect on climate; and development of climatic and atmospheric circulation models for forecasting purposes.

33-845
Characteristics of Antarctic coastal pack ice formation. [Nekotorye osobennosti obrazovaniia i formirovaniia mnogoletnego pripaia u poberezh'ia Antarktidy],
Kozlovskiĭ, A.M., *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten',* 1978, No.98, p.35-42, In Russian. 8 refs.
Sea ice distribution, Ice structure, Pack ice, Ice salinity, Antarctica.
First-year ice is compared with multi-year pack ice in terms of its formation, crystal structure, thickness, salinity, density, and other features. It appears that in nearly all respects, they differ, older pack ice sharing its characteristics with shelf ice, whose formation and conditions it resembles more than it does the formation and physical characteristics of first-year pack.

33-846
Salt and phase composition of pack ice during growth and destruction. [Solevoĭ i fazovyĭ sostav pripaĭnogo l'da v protsesse ego rosta i razrusheniia],
Nazintsev, IU.L., *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten'*, 1978, No.98, p.43-48, In Russian. 5 refs.
Ice salinity, Phase transformations, Pack ice, Antarctica—Alasheyev Bight.
Monthly changes in salinity of pack ice around Molodezhnaya Station were monitored and trends in salt migration through the ice were measured. Salt concentration in congelation-type forming ice in the Alasheyev Bight is shown in a chart. Vertical salt concentration is also presented.

33-847
Drilling through shelf ice near Novolazarevskaya Station. [Skvoznoe burenie shel'fovogo lednika v raĭone stantsii Novolazarevskoĭ],
Korotkevich, E.S., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten'*, 1978, No.98, p.49-52, In Russian.
Savatiugin, L.M., Morev, V.A.
Ice temperature, Ice cores, Drilling, Ice shelves, Antarctica—Lazarev Ice Shelf.
Two cores were drilled through the Lazarev ice shelf and ice temperature, texture and other parameters studied. The ice shelf at these two points was 370 and 374 m thick, respectively, and the ice was determined to be of continental origin, an outgrowth of the glacier and not a result of bottom freezing.

33-848
Deformation of the sides of a deep borehole in the antarctic ice cover at Vostok Station. [Deformatsiia stenok glubokoĭ skvazhiny v antarkticheskom lednikovom pokrove na stantsii Vostok],
Dmitriev, D.N., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten'*, 1978, No.98, p.53-57, In Russian. 5 refs.
Vostretsov, R.N., Petukhov, I.A.
Drilling, Ice deformation, Plastic deformation, Deformation, Antarctica—Vostok Station.
Measurements were taken at intervals up until more than one year after drilling of deep (500-900m) boreholes in the antarctic ice sheet to determine the extent of side deformation. The results are set forth in graphs.

33-849
Selecting drills for microbiological studies of deep glacier layers at Vostok Station. [Otbor prob dlia mikrobiologicheskikh issledovaniĭ glubokikh gorizontov lednikovoĭ tolshchi na stantsii Vostok],
Kudriashov, B.B., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten'*, 1978, No.98, p.58-62, In Russian. 2 refs.
Abyzov, S.S., Bobin, N.E.
Ice sampling, Ice coring drills, Cryobiology, Antarctica—Vostok Station.
The technical problems of selecting and preparing drills for deep microbiological boring of the ice sheet are discussed. Maintaining sterility of equipment, surrounding snow and samples requires constant vigilance. 720 samples were taken and preliminary analysis reveals the presence of microbes.

33-850
Snow accumulation from 1970 to 1973 around Vostok Station. [Nakoplenie snega v raĭone stantsii Vostok v 1970-1973 gg.],
Barkov, N.I., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Informatsionnyĭ biulleten'*, 1978, No.98, p.63-68, In Russian. 5 refs.
Lipenkov, V.IA.
Snowfall, Snow accumulation, Antarctica—Vostok Station.
Snow accumulation data was measured at Vostok over a four-year period. It is analyzed here and the results shown in charts and graphs. Statistical analysis suggests that such small-scale observations cannot be used for describing monthly and yearly averages, but are useful for computing long-term means.

33-851
Subpolar glaciers of Spitsbergen seen against the climate of this region.
Baranowski, S., *Universytet Wroclawski. Acta Universitatis Wratislaviensis,* 1977, No.410, 94p., In English with French and Russian summaries. Refs. p.86-91.
Glaciation, Glacier ablation, Glacier oscillation, Glacial hydrology, Climatic factors, Temperature effects, Norway—Spitsbergen.

33-852
Ice breaking capability of CCGS "Labrador" in Western Barrow Strait, October 23-28, 1973.
Bradford, J.D., *Canada. Dept. of Fisheries and the Environment. Marine Sciences Directorate. Manuscript report series,* 1978, No.50, 12p., With French summary. 16 refs.
Pack ice, Icebreakers, Ice navigation, Ice pressure, Ships, Canada—Northwest Territories—Barrow Strait.

33-853
Styrene-butadiene latex modifiers for bridge deck overlay concrete. Interim report.
Clear, K.C., et al, *U.S. Federal Highway Administration. Office of Research and Development. Report,* Apr. 1978, FHWA-RD-78-35, 124p., 2 refs.
Chollar, B.H.
Winter concreting, Corrosion inhibitors, Bridges, Polymers, Permeability, Concrete durability.

33-854
Using anchors and shotcrete in tunnel construction under severe climatic conditions. [Primenenie ankernoĭ krepi i nabryzgbetona pri stroitel'stve tunneleĭ v surovykh klimaticheskikh usloviiakh],
Gevirts, G.IA., *Transportnoe stroitel'stvo,* 1978, No.8, p.43-48, In Russian.
Tunnels, Concretes, Anchors, Permafrost beneath structures.

33-855
Strength of clay ground at different loading regimes. [O prochnosti glinistogo grunta pri razlichnykh rezhimakh nagruzheniia],
Gol'dshteĭn, L.E., *Energeticheskoe stroitel'stvo,* 1978, No.8, p.64-67, In Russian. 5 refs.
Clay soils, Soil strength, Compressive properties, Soil moisture, Earth dams, Soil compacting, Tests, Analysis (mathematics).

33-856
Calculating temperature regime of permafrost bases. [Raschet temperaturnogo rezhima vechnomerzlykh osnovaniĭ],
Plotnikov, A.A., *Energeticheskoe stroitel'stvo,* 1978, No.8, p.70-73, In Russian. 2 refs.
Permafrost bases, Thermal regime, Permafrost beneath structures, Permafrost thermal properties.

33-857
Reserves for the expansion of reservoir construction in West Siberia. [Rezervy rasshireniia stroitel'stva rezervuarov v Zapadnoĭ Sibiri],
Ivantsov, O.M., et al, *Stroitel'stvo truboprovodov,* Aug. 1978, No.8, p.4-7, In Russian.
Altakaev, T.G., Popovskiĭ, B.V., Chizhevskiĭ, M.V.
Petroleum industry, Petroleum products, Storage tanks, Design, Permafrost beneath structures.

33-858
Designing impervious dikes for underground gas storage in mines. [Zadachi proektirovaniia germetichnykh peremychek podzemnykh shakhtnykh gazokhranilishch],
Bashilova, I.E., et al, *Stroitel'stvo truboprovodov,* Aug. 1978, No.8, p.17-18, In Russian. 5 refs.
Sokhranskiĭ, V.B., Cherkasheninov, V.I., Shustrov, V.P.
Liquefied gases, Underground storage, Mines (excavations).

33-859
Fastening the Vyngapur-Chelyabinsk pipeline with expanding anchors. [Zakreplenie gazoprovoda Vyngapur-Cheliabinsk raskryvaiushchimisia ankeramiĭ],
Brun, A.I., et al, *Stroitel'stvo truboprovodov,* Aug. 1978, No.8, p.30-32, In Russian.
Zykov, V.F.
Pipelines, Permafrost beneath structures, Anchors, Construction equipment.

33-860
Installing anchors for the Urengoy-Chelyabinsk pipeline section. [Ustanovka ankerov na uchastke gazoprovoda Urengoĭ-Cheliabinsk],
Kovalenko, V., et al, *Stroitel'stvo truboprovodov,* Aug. 1978, No.8, p.32, In Russian.
Tarasova, L.
Pipelines, Permafrost beneath structures, Anchors.

33-861
Establishing sharper differences between depreciation norms. [Ustanovit' bol'shuiu differentsiatsiiu norm amortizatsionnykh otchisleniĭ],
Kuramin, V.P., *Stroitel'stvo truboprovodov,* Aug. 1978, No.8, p.33, In Russian.
Cost analysis, Construction equipment, Transportation, Motor vehicles, Cold weather performance.

33-862
Protection of underground metallic structures from corrosion. [Zashchita podzemnykh metallicheskikh konstruktsiĭ ot korrozii],
Genkin, G.L., et al, *Stroitel'stvo truboprovodov,* Aug. 1978, No.8, p.35-38, In Russian.
Belogolovskiĭ, A.D.
Underground facilities, Construction materials, Thermal insulation, Corrosion prevention, Pipelines.

33-863
Hydrothermal regimes above and below the Ust'-Ilim reservoir during its filling.
Gotlib, IA.L., et al, *Hydrotechnical construction,* Feb. 1978, No.2, p.113-117, Translated from Gidrotekhnicheskoe stroitel'stvo. 3 refs.
Gorina, M.V., Katukhova, A.K.
Dams, Reservoirs, Thermal regime, Hydroelectric power generation, Permafrost.

33-864
Effect of weak rocks in coarse aggregate on the frost resistance of concrete.
Gladkov, V.S., et al, *Hydrotechnical construction,* Feb. 1978, No.2, p.161-163, Translated from Gidrotekhnicheskoe stroitel'stvo. 2 refs.
Poliakov, B.I., Sviridov, V.N., Maliuk, V.D.
Concretes, Concrete aggregates, Frost resistance, Concrete strength.

33-865
Removing river ice when filling partially submerged dams for the Baykal Amur railroad in freezing weather. [Udalenie rechnogo l'da pri zimneĭ otsypke podtopliaemykh nasypeĭ na BAMe],
Tkachevskiĭ, I.D., et al, *Transportnoe stroitel'stvo,* Sep. 1978, No.9, p.3-5, In Russian.
Grinchik, A.A., Budanov, I.V., Gusev, V.V.
Hydraulic structures, Earth dams, River ice, Ice pressure, Ice prevention, Cold weather construction.

33-866
Lowering the costs of tunnel construction under complicated hydrogeological conditions. [Snizhenie zatrat pri sooruzhenii tonnelia v slozhnykh gidrogeologicheskikh usloviiakh],
Aminov, E.Kh., *Transportnoe stroitel'stvo,* Sep. 1978, No.9, p.15-17, In Russian.
Swamps, Tunnels, Construction costs.

33-867
Using inflatable structures at the Baykal Amur railroad construction sites. [O primenenii pnevmoobolochek na BAMe],
Makeev, A.M., *Transportnoe stroitel'stvo,* Sep. 1978, No.9, p.21-23.
Inflatable structures, Permafrost beneath structures, Baykal Amur railroad.

33-868
Accuracy of computing the thermal regime of buildings for the Baykal Amur railroad. [Nadezhnost' raschetov teplovogo rezhima zdaniĭ v usloviiakh BAMa],
Peker, IA.D., et al, *Transportnoe stroitel'stvo,* Sep. 1978, No.9, p.48-50, In Russian. 3 refs.
IArmul'nik, F.V.
Buildings, Permafrost beneath structures, Thermal regime, Baykal Amur railroad, Analysis (mathematics).

33-869
Development and evaluation of an experimental frazil ice measurement instrument.
Tsang, G., *Canada. Inland Waters Directorate. Scientific series,* 1977, No.78, 35p., In English with French summary. 5 refs. For another version of this report see 31-3433.
Frazil ice, Measuring instruments, Ice crystal structure, Ice dielectrics.

33-870
Ultrasonic investigations on ice cores from central Greenland. [Untersuchungen mit Ultraschall an Eisbohrkernen aus Zentralgrönland],
Kohnen, H., et al, *Polarforschung,* 1977, 47(1/2), p.1-10, In German with English summary. 17 refs.
Langway, C.C., Jr.
Ice cores, Ice structure, Ultrasonic tests, Anisotropy, Ice density.

33-871
Arctic soils in western Greenland: pedovariance as a function of the geoecological environment. [Arktische Böden West-Grönlands: Pedovarianz in Abhängigkeit vom geoökologischen Milieu],
Stäblein, G., *Polarforschung,* 1977, 47(1/2), p.11-25, In German with English summary. 30 refs.
Soil classification, Soil profiles, Permafrost distribution, Cryogenic soils, Patterned ground.

33-872
Tracked vehicle "Bandvagn 206" driving test and force testing in bare and snow-covered mountain terrain.
Karlström, L., *U.S. Army Foreign Science and Technology Center. Translation,* Nov. 3, 1977, FSTC 734-77, 6p., Translation of Forsvaretsmaterielverk, Huvudavdelningen for Hjulfordonsbyran. Research report dated 18 May 1975. Distribution limited to U.S. Government agencies only.
Tracked vehicles, Cold weather tests, Mountains, Snow cover.

33-873
Indirect effects of soil invertebrates on litter decomposition: elaboration via analysis of a tundra model.
Douce, G.K., et al, *Ecological modelling,* 1978, Vol.4, p.339-359, Numerous refs.
Webb, D.P.
Tundra vegetation, Litter, Decomposition, Animals, Models.

33-874
Fourth annual meeting of the European Geophysical Society. [Vierte Jahresversammlung der europäischen geophysikalischen Gesellschaft],
Symposium über die Dynamik temperierter Gletscher, 4th, Munich, Sep. 8-9, 1977, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), 290p., In English, German and French. Refs. passim.
For selected papers see 33-875 through 33-891.
Glacier mass balance, Glacial hydrology, Alpine glaciation, Subglacial drainage, Glacier movement.

33-875
Ice velocity measurements in glaciers of high Asia. History—Technique—Results. [Eisgeschwindigkeitsmessungen an Gletschern Hochasiens. Geschichte—Technik—Ergebnisse],
Kick, W., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.7-22, In German with English summary. 24 refs.
Glacier movement, Velocity measurement, Stereophotography, Glacier flow.

33-876
Variations of surface velocities of some alpine glaciers measured at intervals of a few hours. Comparison with Arctic glaciers.
Iken, A., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.23-25, In English with German summary. 16 refs.
Glacier movement, Velocity measurement, Periodic variations.

33-877
Bedrock topography of Ampère Glacier (Kerguelen Islands, T.A.A.F.). [Topographie sous-glaciaire du Glacier Ampère (Iles Kerguelen, T.A.A.F.)],
Vallon, M., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.37-55, In French with English and German summaries. 15 refs.
Subglacial observations, Glacier beds, Seismic reflection, Seismic refraction, Topographic surveys, Kerguelen Islands.
A seismic reflection survey with a TRIO SX 12, a seismic refraction equipment for civil engineering, gives the topography of the bedrock under 100 to 650 m of Ampère Glacier, Kerguelen Is. With geophones placed in an hexagonal pattern, each shot gives 2 independent reflecting elements. A simple method to calculate errors on each of the 3 coordinates of each mirrorpoint is given. The velocity of P-wave is 3730 m/s parallel to the surface of the glacier, a little faster for an angle of incidence of 45 deg, a little slower for the other orientations. There is no intermediate layer between the ice and the bedrock. Depths reach 200 m under sea level at 6 km of the snout.

33-878
Mass balance and recent fluctuations of Ampère Glacier (Kerguelen Islands, T.A.A.F.). [Bilan de masse et fluctuations récentes du Glacier Ampère (Iles Kerguelen, T.A.A.F.)],
Vallon, M., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.57-85, In French with English and German summary. 38 refs.
Glacier mass balance, Glacier oscillation, Glacier ablation, Kerguelen Islands.
From 1970 to 1974 the equilibrium line of Ampère Glacier, Kerguelen Is., was near 700 m a.s.l, the ablation gradient being 0.02 m w.e /m. During these four years the tongue had been thinning from 2 to 5 m each year. From 1962 to 1974 the snout receded about 25 to 50 m each year, and it is possible that the recession had been going on since 1910. In the accumulation area, between 450 and 1050 m a.s.l, the mean balance is 1.9 m of ice/year.

33-879
Comparison of energy balance measurements at two stations on the Ampère Glacier (Kerguelen Islands). [Etude comparative du bilan thermique en deux stations du Glacier Ampère (Iles Kerguelen)],
Poggi, A., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.87-97, In French with English and German summaries. 12 refs.
Glacier heat balance, Wind factors, Air temperature, Wind direction, Kerguelen Islands.
This paper presents the results of energy balance studies of two stations at Ampère Glacier, Kerguelen Is. Linear regressions have been established for the data of the two stations (temperature, vapor pressure, their vertical gradients, net radiation and friction velocity). The wind profiles of the lowest 4 m become logarithmic if a certain displacement height of the instruments is allowed for. The values of friction velocity are closely dependent on this displacement height and on wind direction. Energy fluxes are expressed in terms of wind speed, temperatures and vapor pressure at one level.

33-880
Relations between mass-balance and meteorological variables on Peyto Glacier, Alberta, 1967/1974.
Young, G.J., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.111-125, In English with German summary. 16 refs.
Glacier mass balance, Meteorological factors, Snow depth, Air temperature.

33-881
Analysis and reconstruction of Glacier de Sarennes annual mass balance; their relation with glacier variations of Massif du Mont-Blanc (Bossons, Argentière, Mer de Glace). [Analyse et reconstitution de la série des bilans annuels du Glacier de Sarennes, sa relation avec les fluctuations du niveau de trois glaciers du Massif du Mont-Blanc (Bossons, Argentière, Mer de Glace)],
Martin, S., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.127-153, In French with English and German summaries. 18 refs.
Glacier mass balance, Glacier oscillation, Climatic factors, Glacier surfaces.

33-882
Glacier fluctuations in the Mont Blanc area (French Alps).
Reynaud, L., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.155-166, In English with German and French summaries. 7 refs.
Glacier oscillation, Velocity measurement, Glacier surfaces, Climatic factors, France—Alps.

33-883
Glacial-hydrological investigations in the Oetztal Alps made between 1968 and 1975.
Moser, H., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.167-179, In English with German summary. 29 refs.
Ambach, W.
Glacial hydrology, Glacier melting, Runoff, Meltwater, Subglacial drainage.

33-884
Variations of isotopes in snow covers as input of temperate glaciers.
Stichler, W., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.181-191, In English with German summary. 16 refs.
Herrmann, A.
Snow composition, Isotope analysis, Alpine glaciation, Glacial hydrology.

33-885
First results from alpine core drilling projects.
Oeschger, H., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.193-208, In English with German summary. 14 refs.
Schotterer, U., Stauffer, B., Haeberli, W., Röthlisberger, H.
Alpine glaciation, Drilling, Ice cores, Drill core analysis, Research projects.

33-886
Dynamic glacier flow model and the production of internal meltwater.
Berner, W., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.209-217, In English with German summary. 7 refs.
Stauffer, B., Oeschger, H.
Glacier flow, Glacier movement, Subglacial drainage, Meltwater, Models.

33-887
Hydrology of an alpine glacier as indicated by the chemical composition of meltwater.
Collins, D.N., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.219-238, In English with German summary. 30 refs.
Glacial hydrology, Subglacial drainage, Alpine glaciation, Meltwater, Water chemistry, Spectrophotometers, Ion density (concentration).

33-888
Electrical d.c. resistivity soundings with long profiles on rock glaciers and moraines in the Alps of Switzerland.
Fisch, W., Sr., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.239-260, In English with German summary. 45 refs.
Fisch, W., Jr., Haeberli, W.
Rock glaciers, Electrical resistivity, Moraines, Permafrost thickness, Discontinuous permafrost.

33-889
Measurements of ice and firn temperatures on Hintereisferner. [Mesaungen von Eis- und Firntemperaturen am Hintereisferner (Ötztaler Alpen)],
Markl, G., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.261-265, In German with English summary. 9 refs.
Wagner, H.P.
Glacier ice, Ice temperature, Firn, Temperature variations.

33-890
New instrument for the rapid crystallographic analysis of ice thin sections.
Lile, R.C., *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.267-273, In English with German summary. 6 refs.
Ice crystal structure, Ice crystal optics, Thin sections, Measuring instruments.

33-891
Electronic measurements with pulsed echo in glaciology. [Elektronische Messungen mit Puls-Echo in der Glaziologie],
Fritzsche, W., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie,* 1977 (Pub. 1978), 13(1/2), p.275-283, In German with English summary. 5 refs.
Ostere, F.
Echo sounding, Radar echoes, Glacier surveys, Crevasse detection, Snow depth, Measuring instruments.

33-892
Eighteenth Soviet Antarctic Expedition. Seasonal research 1972/73. General description. [Vosemnadtsataia sovetskaia antarkticheskaia ekspeditsiia. Sezonnye issledovaniia 1972/73. g. Obshchee opisanie],
Sovetskaia antarkticheskaia ekspeditsiia, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.1-70, In Russian.
Sen'ko, P.K., ed.
Research projects, Glaciology, Ships, Antarctica, Sea ice.
This overview of the 18th SAE is divided into three sections. First, administrative and logistic aspects of the expedition are described. Then scientific efforts based on board the *Ob'* and the *Professor Zubov*, such as serometeorological study, satellite observations, ice studies, oceanographic research and vessel hull vibration investigations, are summarized. The third section is devoted to land-based scientific operations such as glaciological field work, botanical studies around Bellingshausen Station, and airfield construction at Molodezhnaya.

33-893
Ice conditions encountered by the d/e *Ob'* (1972/73). [Ledovye usloviia plavaniia d/e *Ob'* (1972/73 g.)],
Leont'ev, E.B., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.71-78, In Russian.
Komova, V.V.
Ice conditions, Sea ice distribution, Antarctica.
A detailed description of ice conditions along approaches to Mirnyy, Molodezhnaya, and Leningradskaya Stations and to the construction site of the new Soviet station in March and April 1973, as well as of drift conditions encountered by the *Ob'* is given. It is based on data from aerial reconnaissance, satellites and visual observations.

33-894
Ice conditions encountered by the research vessel *Professor Zubov* (Dec. 1972-Mar. 1973). [Ledovye usloviia plavaniia nauchno-issledovatel'skogo sudna *Professor Zubov* (dekabr' 1972 g.—mart 1973 g.)],
Denisov, A.S., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.79-86, In Russian. 12 refs.
Ice conditions, Pack ice, Sea ice distribution, Icebergs, Antarctica.
Ice conditions encountered by the *Professor Zubov* are described for the following routes: Montevideo-Bellingshausen-Molodezhnaya-Freemantle; Freemantle-Mirnyy-Kerguelen; Freemantle-Mirnyy-Amery camp; Amery camp-Molodezh-

naya-Africa. Several conclusions on iceberg and pack distribution are drawn from the data.

33-895
Features of the formation of the Balleny ice massif and drift of the *Ob'*. {Nekotorye zakonomernosti formirovaniia Ballenskogo ledianogo massiva i dreĭf d/e *Ob'*},
Romanov, A.A., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.87-95, In Russian. 6 refs.
Sea ice, Pack ice, Drift.
The *Ob'* was icebound from Apr. 23 until July 22, 1972, near the Balleny Islands and forced to drift in the area of the so-called Balleny Ice Massif. She drifted altogether 564 miles at a rate of 0.26 knots. Added to other available data, the observations resulting from this situation allowed several conclusions to be drawn about ice formation in the region. The best time to approach Leningradskaya Station is late January or February. The route should be chosen based on the current position of the Balleny Massif.

33-896
Results of navigability trials of antarctic ice by the *Ob'*. {Nekotorye rezul'taty ispytaniĭ khodkosti d/e *Ob'* v antarkticheskikh l'dakh},
Kudishkin, V.S., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.96-99, In Russian.
Leont'ev, E.B.
Ships, Ice cover strength, Ice cover thickness, Pack ice, Sea ice, Ice navigation, Antarctica.
Instrument readings on various characteristics of ice and on speed of the *Ob'* in antarctic waters are used to assess the effectiveness of vessels of her type for resupply missions and other work in summer pack and drifting ice.

33-897
Features of the oceanographic regime in Prydz Bay (Feb. 1973). {Osobennosti gidrologicheskogo rezhima v zalive Priuds (fevral' 1973 g.)},
Denisov, A.S., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.100-105, In Russian. 6 refs.
Myznikova, M.N.
Ice conditions, Sea ice distribution, Antarctica—Prydz Bay.
Ice and oceanological conditions in the Prydz Bay in February 1973 were studied by the *Professor Zubov.* Sea ice distribution, chemistry, temperature, salinity, and circulation of the water in the bay are analyzed.

33-898
Movement of the ice sheet around Mirnyy Station. {O dvizhenii lednikovogo pokrova v raĭone stantsii Mirnyĭ},
Ivanov, I.P., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.113-114, In Russian. 3 refs.
Glacier movement, Glacier flow, Ice deformation, Lasers, Antarctica—Mirnyy Station.
The Doppler-effect method using lasers was employed to study flow and deformation of the ice cover around Mirnyy Station. At more than 20 points, average hourly, average per-minute and momentary flow rates were recorded and the nature of glacier movement in the Vetrov Hill area was analyzed. Average hourly rates range from 0.0 to 1.2 microns/sec.

33-899
Antarctic ice sheet deformation. {K voprosu o deformatsii antarkticheskogo lednikovogo pokrova},
Ivanov, I.P., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.115-116, In Russian.
Firsov, N.T., Chudakov, V.I.
Ice deformation, Glacier ice, Glacier movement, Antarctica—Wilkes Land.
Ice sheet deformation was studied in locations along a Mirnyy-Vostok traverse. In areas with many crevasses glacier deformation resembles the virbation of springs with amplitudes of 3-10 microns on a 10 m base. Maximum deformation in crevasse free areas does not exceed 0.4 microns.

33-900
Studies of antarctic glacier structure. {Rezul'taty issledovaniia stroeniia antarkticheskogo lednika},
Trepov, G.V., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.117-121, In Russian.
Glacier beds, Glaciers, Radio echo soundings, Antarctica—Hays Glacier, Antarctica—Molodezhnaya Station.
Radio echo sounding of the antarctic ice sheet in the Hays Glacier region permitted study of the internal structure of the glacier and the diagramming of the glacier bed.

33-901
Geomagnetic measurement within a glaciological polygon. {Geomagnitnye izmereniia na gliatsiologicheskom poligone},
Burtsev, IU.A., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.122-124, In Russian.
Glacier movement, Geomagnetism, Antarctica—Wilkes Land.
The 18th Soviet Antarctic Expedition marked the beginning of a magnetic study of glacier flow velocity and direction. A geomagnetic polygon was laid out 353 km from Mirnyy on the route to Vostok and was defined by the right-angle intersection of two traverse routes. The chosen area is suitable for study but in order to improve the accuracy of this method, the cross-shaped polygon should be replaced by a right-angle network of traverse routes.

33-902
Radio echo soundings within glaciological polygons. {Rezul'taty radiolokatsionnoĭ s"emki na gliatsiologicheskikh poligonakh},
Chudakov, V.I., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.125-129, In Russian.
Radio echo soundings, Glacier thickness, Glacier beds, Antarctica.
In 1973 a glaciological field party measured glacier thickness along the Mirnyy-Vostok traverse and completed barometric leveling of its surface as far as the 357th km. A second area survey was done in polygon No.2, where the glacier thickness ranges from 1810 to 2550m, whereas in No.3 it goes from 1630 to 2670m. Surface height is 1810m in No.2 and 2860m in No.3.

33-903
Resonant hull vibrations of the *Ob'* when traversing ice cake. {Rezonansnye kolebaniia korpusa d/e *Ob'* pri dvizhenii v melkobitykh l'dakh},
Kudishkin, V.S., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.130-132, In Russian. 2 refs.
Ships, Sea ice, Ice navigation, Vibration.
Hull vibrations of the *Ob'* are studied during its passage through antarctic ice cake at various speeds. Experimental data are presented on frequency and amplitude of hull vibrations in the resonance range. Desirable (supercritical) speeds are recommended.

33-904
Interaction of the hull of the *Ob'* with compressed ice. {Osobennosti vzaimodeĭstviia korpusa d/e *Ob'* so l'dom pri szhatiiakh},
Kudishkin, V.S., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.133-139, In Russian. 2 refs.
Kosenko, N.G.
Ice pressure, Compressive strength, Ice navigation, Ships.
The *Ob'* sustained extensive damage to parts of her hull when she was icebound for 90 days off the Oates Coast. The authors analyze the stress to which she was subject from floating ice, various wind and other weather conditions, and during her entrapment.

33-905
Experimental work on ice vibration in the *Ob'*. {Eksperimental'noe izuchenie ledovoĭ vibratsii d/e *Ob'*},
Kudishkin, V.S., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.68, p.140-143, In Russian. 5 refs.
Ships, Vibration, Ice navigation, Ice pressure.
A method for studying hull vibration under ice conditions has been worked out. The initial results of the application of the method to vibration in the *Ob'* hull in antarctic ice are presented.

33-906
Arctic sea ice.
World Data Center A for Glaciology, *Glaciological data,* 1978, GD-2, 262p., Refs. passim. For individual articles see 32-2291 and 33-907 through 33-913.
Sea ice distribution, Ice conditions, Terminology, Bibliographies, Ice reporting.

33-907
Fast ice terminology.
Stringer, W.J., *Glaciological data,* 1978, GD-2, p.21-23, 9 refs.
Fast ice, Terminology, Ice conditions.

33-908
Arctic Ice Dynamics Joint Experiment.
Untersteiner, N., *Glaciological data,* 1978, GD-2, p.25-32, 4 refs.
Ice mechanics, Ice physics, Sea ice, Research projects, Meteorological data, AIDJEX, Models, Computer applications.

33-909
Sea ice observations by NOAA's National Environmental Satellite Service.
McClain, E.P., *Glaciological data,* 1978, GD-2, p.33-42, 22 refs.
Sea ice distribution, Infrared reconnaissance, Remote sensing, Spacecraft, Mapping.

33-910
U.S. Navy global ice analysis and forecasting.
O'Lenic, E.A., *Glaciological data,* 1978, GD-2, p.43-46, 11 refs.
Sea ice distribution, Ice conditions, Ice forecasting, Remote sensing, Icebergs, Seasonal variations, Spacecraft.
Since 1972 the U.S. Fleet Weather Facility Ice Operations Department has produced global sea ice analyses and forecasts on a year-round basis. The data summarized in these analyses provide useful information for planning Antarctic operations. The products and some applications are: 1. detailed "tailored" analyses and forecasts for close support of ships in the polar pack; 2. routine weekly analyses which indicate the existing trends in ice growth or recession. These also serve as bases for long-range forecasts and climatological summaries; 3. 15- and 30-day forecasts, used to update seasonal forecasts; and 4. seasonal outlook in the Ross Sea, indicating the expected rates and patterns of breakup and the expected dates for safe transit to McMurdo or the Ross Ice Shelf. (Auth.)

33-911
Canadian Government ice services.
Sowden, W.J., *Glaciological data,* 1978, GD-2, p.47-48.
Ice conditions, Ice forecasting, Ice surveys, Canada.

33-912
Data set on Northern Hemisphere sea ice extent, 1953-76.
Walsh, J.E., *Glaciological data,* 1978, GD-2, p.49-51, 12 refs.
Sea ice distribution, Mapping, Data processing.

33-913
Arctic sea ice: a selected bibliography, 1965-77. *Glaciological data,* 1978, GD-2, p.53-105, 129-239, Numerous refs.
Bibliographies, Sea ice, Drift, Freezeup, Ice breakup, Ice water interface, Remote sensing, Ice forecasting, Ice air interface.

33-914
Geometrical levelling over the Greenland icecap by Levelling Group A of the Greenland International Glaciological Expedition 1967-68. Summer season 1968. {Das geometrische Nivellement über das grönländische Inlandeis der Gruppe Nivellement A der Internationalen Glaziologischen Grönland Expedition 1967-68. Sommercampagne 1968},
Seckel, H., *Denmark. Kommissionen for videnskabelige undersögelser i Grönland. Meddelelser om Grönland,* 1977, 187(3), Expedition glaciologique internationale au Groenland. E.G.I.G. 1967-1968, 3(3), 86p., In German with English and French summaries. 11 refs.
Geodetic surveys, Ice sheets, Height finding, Traverses.

33-915
Altitude variations in the Greenland icecap between 1959 and 1968. {Höhenänderungen im grönländischen Inlandeis zwischen 1959 und 1968},
Seckel, H., *Denmark. Kommissionen for videnskabelige undersögelser i Grönland. Meddelelser om Grönland,* 1974, 187(4), Expedition glaciologique internationale au Groenland. E.G.I.G. 1967-1968, 3(5), 58p., In German with English and French summaries. 8 refs.
Ice sheets, Geodetic surveys, Height finding, Ice creep.

33-916
Investigations of energy exchange in the accumulation zone of the Greenland icecap. {Untersuchungen zum Energieumsatz in der Akkumulationszone des grönländischen Inlandeises},
Ambach, W., *Denmark. Kommissionen for videnskabelige undersögelser i Grönland. Meddelelser om Grönland,* 1977, 187(7), Expedition glaciologique internationale au Groenland. E.G.I.G. 1967-1968, 4(7), 45p., In German with English and French summaries. 16 refs.
Ice sheets, Snow cover, Snow accumulation, Heat flux, Heat balance, Snow water content, Snow temperature.

33-917
Investigations of the energy exchange in the ablation zone of the Greenland icecap: supplement. {Untersuchungen zum Energieumsatz in der Ablationszone des grönländischen Inlandeises: Nachtrag},
Ambach, W., *Denmark. Kommissionen for videnskabelige undersögelser i Grönland. Meddelelser om Grönland,* 1977, 187(5), Expedition glaciologique internationale au Groenland. E.G.I.G. 1957-1960, 4(5), 64p., In German with English and French summaries. 11 refs.
Ice sheets, Radiation balance, Seasonal ablation, Air temperature, Wind factors.

33-918
Economical and effective deicing agents for use on highway structures.
Boies, D.B., et al, *National Cooperative Highway Research Program. Report,* 1965, No.19, 19p., 21 refs.
Bortz, S.
Deicers, Chemical ice prevention, Concrete pavements, Freeze thaw cycles, Chemical reactions, Corrosion.

33-919
Liquid instability and freezing. 2. Multi-mode one dimensional analysis of a nonlinear diffusion equation.
Munakata, T., *Physical Society of Japan. Journal,* Sep. 1978, 45(3), p.749-757, 27 refs. For Part 1 see 32-1633.
Liquids, Freezing, Ice crystals, Analysis (mathematics).

33-920
Buckling of half ice sheet against a cylinder.
Wang, Y.-S., *American Society of Civil Engineers. Engineering Mechanics Division. Journal,* Oct. 1978, 104(EM5), p.1131-1145, 8 refs.
Pack ice, Flexural strength, Ice pressure, Offshore structures, Analysis (mathematics).

33-921
Freezing-melting heat transfer in a tube flow.
Yim, A., et al, *International journal of heat and mass transfer,* Sep. 1978, 21(9), p.1185-1196, In English with French, German, and Russian summaries. 19 refs.
Epstein, M., Bankoff, S.G., Lambert, G.A., Hauser, G.M.
Heat transfer, Ice melting, Pipes (tubes), Turbulent flow, Gases.

33-922
Numerical calculation of glacier flow by finite element methods.
Raymond, C.F., Seattle, University of Washington, [1978], c220p.
Computer programs, Glacier flow, Ice mechanics, Ice creep, Ice deformation, Mathematical models.

33-923
Analysis of sensible and latent heat flow in a partially frozen unsaturated soil.
Fuchs, M., et al, *Soil Science Society of America. Journal,* May-June 1978, 42(3), p.379-385, 15 refs.
Campbell, G.S., Papendick, R.I.
Heat flux, Frozen ground thermodynamics, Heat capacity, Thermal conductivity.

33-924
Water redistribution in partially frozen, saturated silt under several temperature gradients and overburden loads.
Loch, J.P.G., et al, *Soil Science Society of America. Journal,* May-June 1978, 42(3), p.400-406, 17 refs.
Kay, B.D.
Soil moisture migration, Frozen ground mechanics, Frost heave, Ice lenses, Soil pressure.

33-925
Surface water records of Cook Inlet Basin, Alaska, through September 1975.
Scully, D.R., et al, *U.S. Geological Survey. Open-file report,* 1978, 78-498, 102p.
Leveen, L.S., George, R.S.
Water supply, Natural resources, Stream flow, Water temperature.

33-926
Built-up hydraulic structures (fundamentals of design). [Namyvnye gidrotekhnicheskie sooruzheniia (osnovy rascheta i proektirovaniia)],
Melent'ev, V.A., et al, Moscow, Energiia, 1973, 247p. (Pertinent p.49-72), In Russian. 188 refs.
Kolpashnikov, N.P., Volnin, B.A.
DLC TA750.M42
Hydraulic structures, Earth dams, Cold weather construction, Permafrost beneath structures, Thermal regime, Design.

33-927
Soil formation and weathering in humid landscapes. [Pochvoobrazovanie i vyvetrivanie v gumidnykh landshaftakh],
Targul'ian, V.O., ed, Moscow, Nauka, 1978, 211p., In Russian with English summaries. For selected papers see 33-928 and 33-929. Refs. passim.
Taiga soils, Taiga vegetation, Soil formation, Peat, Podsol, Swamps, Soil chemistry, Soil composition, Soil profiles.

33-928
Origin and evolution of the second humus zone in the south taiga soils of West Siberia. [Genezis i evoliutsiia vtorogo gumusovogo gorizonta v pochvakh iuzhnoĭ taĭgi Zapadnoĭ Sibiri],
Karavaeva, N.A., Pochvoobrazovanie i vyvetrivanie v gumidnykh landshaftakh (Soil formation and weathering in humid landscapes), Moscow, Nauka, 1978, p.133-157, In Russian with English summary. Refs. p.156-157.
Soil formation, Taiga soils, Taiga vegetation, Soil composition, Soil profiles, Podsol.

33-929
Recent swamping of the south taiga soils in West Siberia and the evolution of soil cover in the Holocene. [Sovremennoe zabolachivanie v pochvakh iuzhnoĭ taĭgi Zapadnoĭ Sibiri i evoliutsiia pochvennogo pokrova v golotsene],
Karavaeva, N.A., Pochvoobrazovanie i vyvetrivanie v gumidnykh landshaftakh (Soil formation and weathering in humid landscapes), Moscow, Nauka, 1978, p.158-210, In Russian with English summary. Refs. p.209-210.
Swamps, Taiga soils, Taiga vegetation, Soil formation, Peat, Soil profiles, Soil chemistry.

33-930
Possibilities of using photoelastic sensors for measuring stresses in perennially frozen rocks. [Otsenka vozmozhnosti izmereniia napriazheniĭ fotouprugimi datchikami v usloviiakh mnogoletneĭ merzloty],
Senuk, D.P., Izmerenie napriazheniĭ v massive gornykh porod. Materialy V Vsesoiuznogo seminara, Novosibirsk, 1-3 iiulia, 1975. Chast' 1. (Measuring stresses in massive rocks. Proceedings of the 5th All-Union seminar, Novosibirsk, July 1-3, 1975. Vol.1), Novosibirsk, 1976, p.49-51, In Russian. 7 refs.
DLC TA706.5.I94
Mining, Permafrost, Shafts (excavations), Thermal stresses, Measuring instruments.

33-931
Studying overloading regimes of excavating equipment for frozen ground. [Issledovanie peregruzochnykh rezhimov zemleroĭnykh mashin dlia merzlykh gruntov],
Solomonov, S.A., *Moscow. Moskovskiĭ institut inzhenerov zheleznodorozhnogo transporta. Trudy,* 1977, Vol.559, p.41-47, In Russian.
Earthwork, Excavating equipment, Frozen ground.

33-932
Prospects for using the block-replacement method of repairing construction equipment for the Baykal Amur railroad. [Perspektivy primeneniia agregatno-uzlovogo metoda remonta stroitel'nykh mashin v usloviiakh BAMa],
Alferov, A.K., et al, *Moscow. Moskovskiĭ institut inzhenerov zheleznodorozhnogo transporta. Trudy,* 1977, Vol.559, p.72-78, In Russian.
Kochnev, E.B.
Construction equipment, Cold weather performance, Winter maintenance, Baykal Amur railroad.

33-933
Influence of concrete temperature and humidity on strength and deformation. [Vliianie temperatury i vlazhnosti betona na ego deformativnost' i prochnost'],
Aktuganov, I.Z., et al, *Novosibirsk. Institut inzhenerov zheleznodorozhnogo transporta. Trudy,* 1976, Vol.175, p.47-50, In Russian. 3 refs.
Boiazitov, R.K., Moskalev, V.V.
Concretes, Concrete strength, Low temperature tests, Deformation.

33-934
Studying creep and settlement of concrete in piers of a Norilskaya River bridge. [Issledovanie usadki i polzuchesti betona opor mosta cherez r. Noril'skuiu],
Snisar, V.Kh., *Novosibirsk. Institut inzhenerov zheleznodorozhnogo transporta. Trudy,* 1976, Vol.175, p.51-63, In Russian. 4 refs.
Bridges, Permafrost beneath structures, Concrete structures, Concrete durability, Creep properties, Settlement (structural).

33-935
Controlling the diameter of vertical open holes made by blasting plastic frozen ground for pile sinking. [Kontrol' diametrov vertikal'nykh otkrytykh polosteĭ, obrazuemykh energieĭ vzryva v plastichnomerzlykh gruntakh dlia opusknykh svaĭ],
Ul'chich, I.A., *Osnovaniia i fundamenty,* 1978, Vol.11, p.88-89, In Russian.
Concrete piles, Earthwork, Blasting, Frozen ground.

33-936
Criteria for evaluating different aspects of effectiveness of landslide control structures and measures. [O kriteriiakh otsenki razlichnykh vidov effektivnosti protivoopolznevykh sooruzheniĭ i meropriiatiĭ],
Khazin, V.I., et al, *Osnovaniia i fundamenty,* 1978, Vol.11, p.90-93, In Russian. 9 refs.
Bondar', E.G., Golub, V.P.
Slope processes, Landslides, Slope stability, Landslide control, Countermeasures, Structures.

33-937
Documents of the 15th meeting.
Scientific Committee on Antarctic Research, May 1978, 167p., Draft.
Meetings, Glaciology, Research projects, Antarctica.
This collection contains information on the meeting itself (lists of delegates, agenda, etc.) and 34 documents relating to the work of the committee and its working groups. Reports of all the working groups, financial statements, recommendations from the 14th meeting, reports of specialists' meetings, and reports from other groups, such as WMO, to SCAR are included.

33-938
Eighteenth Soviet Antarctic Expedition. Winter research 1972-1974. [Vosemnadtsataia sovetskaia antarkticheskaia ekspeditsiia. Zimovochnye issledovaniia 1972-1974 gg.],
Sovetskaia antarkticheskaia ekspeditsiia, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.67, p.7-34, In Russian.
Research projects, Antarctica.
This overall description of the winter portion of the 18th SAE is divided into three sections. The first, general questions of expedition activity, deals with logistics and international contacts. The second, concerning engineering and construction work, covers problems of power supply, surface transport, radio communication, air operations and construction and repair activities. The third summarizes organization and methods of research in atmospheric studies, geophysical and medical research, as well as the exchange programs with the United States.

33-939
Dynamics of the Balleny ice ridge. [Dinamika l'dov Ballenskogo ledovogo massiva],
Eskin, L.I., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.67, p.35-40, In Russian. 5 refs.
Pressure ridges, Sea ice distribution, Ice conditions, Antarctica—Balleny Islands.
Features of sea ice drift resulting from constant currents and wind are determined using ice observations from ships, satellite information, and data from ships icebound in the Somov Sea. The stability of the western boundary of the ridge and the wide fluctuations in the location of ice edges on the north and east sides are discussed. In addition to the previously known cyclonic circulation of ice in the northeast part of the ridge, there was also noted an anticyclonic circulation in the southeast, which is bounded by the Ninnis Glacier on the west.

33-940
Ice conditions in the Leningradskaya Station area. [Ledovye usloviia v raĭone stantsii Leningradskoĭ],
Eskin, L.I., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.67, p.41-49, In Russian.
Sea ice distribution, Ice breakup, Pack ice, Icebergs, Antarctica—Leningradskaya Station.
A description of ice conditions around Leningradskaya in 1973 using coastal observations of the pack (ice thickness, snow density and depth) is given. Pack here may not break up for several years running, partly because of large numbers of locally formed grounded icebergs. A year-round polynya lies beyond the pack to the north and northeast of the station.

33-941
Snow accumulation around Molodezhnaya Station. [Snegonakoplenie v raĭone stantsii Molodezhnoĭ],
Sen'ko, P.K., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.67, p.55-57, In Russian.
Snowfall, Snow cover distribution, Antarctica—Molodezhnaya Station.
Snow accumulation observations were carried out along three profiles (azimuth around 140 deg) on the continental ice 8-12 km from Molodezhnaya from May 1973 until Feb. 1974. Snow depth increase occurred primarily in June and July. In November, December and January there was a decrease. Snow depth reached 50 cm in low areas of the southeastern portion of the profiles.

33-942
Results of seismic observations of dynamic glacier processes at Mirnyy. [Nekotorye rezul'taty seĭsmicheskikh nabliudeniĭ za lednikovymi dinamicheskimi protsessami v Mirnom],
Sytinskiĭ, A.D., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.67, p.93-96, In Russian. 4 refs.
Shel'piakov, B.A., Oborina, S.F.
Snowquakes, Glacier ice, Icequakes, Seismology, Seasonal variations, Antarctica—Mirnyy Station.
During the 18th SAE several hydrometeorological conditions were analyzed to determine their effect on snowquakes recorded at the seismic station at Mirnyy. Such quakes occur because of dynamic glacier processes. At Mirnyy, as opposed to Novolazarevskaya, seismic glacier activity is related to season. This relation is caused by hydrometeorological conditions, to some extent by the presence of fresh water near the ice barrier, wind and sea swell. There is no indication that local wind speed affects glacier dynamics.

33-943
Great Lakes water temperatures, 1966-1975.
Grumblett, J.L., *U.S. National Oceanic and Atmospheric Administration. Technical memorandum,* Aug. 1976, ERL GLERL-11-1, 127p., PB-275 468, Full data microfiche edition available as PB-275 469.
Lake water, Water temperature, Ice formation, Ice breakup, Measuring instruments.

33-944
Geomorphic role of stone movement through snow creep, Mount Twynam, Snowy Mountains, Australia.
Jennings, J.N., *Geografiska annaler. Series A Physical geography,* 1978, 60(12), p.1-8, 12 refs.
Snow creep, Rocks, Periglacial processes.

33-945
Hydrologic significance of nivation features in permafrost areas.
Ballantyne, C.K., *Geografiska annaler. Series A Physical geography,* 1978, 60(1-2), p.51-54, 11 refs.
Permafrost hydrology, Runoff, Nivation, Active layer.

33-946
Preliminary design of an experimental containerized freeze desalination unit.
Fraser, J., et al, *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Contractor report,* Dec. 1977, CR 78.005, 76p.
Thompson, S.
Desalting, Equipment, Artificial freezing, Cost analysis.
A preliminary design of a 20,000 gpd containerized indirect contact freeze desalinator was completed. The system consists of a freezer with a defrosting cycle; wash column; indirect contact melter; and pumps, compressors, heat exchangers and controls necessary to make a complete system. At a nominal design point of 3.5% feed and at 70F, power consumption is estimated to be 77 kWhr/kgal. The construction cost of a prototype unit is estimated to be $280,000. The system is designed to operate on virtually any type of feed water. Projected performance data is given for the system operating with feed salinities from 0.5% to 5% and feed temperatures from 40F to 100F. In addition to a system with a defrosted freezer, studies were conducted of a scraped tube freezer, which indicated that both the capital and operating cost of that type of freezer would be much more expensive.

33-947
LANDSAT survey of near-shore ice conditions along the Arctic coast of Alaska. LANDSAT follow-on investigation number 21300.
Stringer, W.J., et al, *U.S. National Aeronautics and Space Administration. Contractor report,* May 31, 1978, NASA-CR-157148, 212p. E78-10136.
Barrett, S.A.
Sea ice distribution, Ice conditions, Remote sensing, Mapping, Spaceborne photography.

33-948
Tagging of Arctic icebergs.
Robe, R.Q., et al, *U.S. Coast Guard Research and Development Center. Report,* Jan. 1978, CGR&DC 1/78, 12p., ADA-054 965, 9 refs.
Ellis, T.S.
Icebergs, Tracking (position).

33-949
Friction of rubber on ice.
Southern, E., et al, *Nature physical science,* June 26, 1972, 237(78), p.142-144, 11 refs.
Walker, R.W.
Rubber ice friction, Coefficients.

33-950
Reducing permafrost thaw around Arctic wellbores.
Goodman, M.A., *World oil,* Apr. 1978, 186(5), p.71-76, 17 refs.
Boreholes, Permafrost preservation, Wells, Thermal factors, Permafrost thermal properties, Drilling fluids.

33-951
Effect of melting on heat transfer to submerged bodies.
Epstein, M., *Letters in heat and mass transfer,* Mar./Apr. 1975, 2(2), p.97-103, 9 refs.
Theories, Melting, Heat transfer.

33-952
Effects of deicing salts on plant biota and soil—experimental phase.
Hanes, R.E., et al, *National Cooperative Highway Research Program. Report,* 1976, No.170, 88p., 49 refs.
Snow removal, Salting, Damage, Plant ecology, Soil pollution.

33-953
De-icing equipment for trawlers. *Sea harvest and ocean science,* Dec./Jan. 1969/1970, p.23-25.
Ship icing, Ice removal equipment, Deicing.

33-954
Ice excavation machine.
Vaudrey, K.D., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical report,* Feb. 1977, CEL-TR-851, 28p. ADA-037 951.
Excavating equipment, Ice, Trenching, Cold weather operation, Cold weather construction, Anchors, Ice removal equipment, Snow trenches.
A 30-hp ladder-type ice trencher was selected and procured for its low ground pressure and versatility. The chain was outfitted with specifically designed conical ice teeth, and a rotating ice chipper drum was designed and fabricated for the backhoe arm. Both modifications, along with an off-the-shelf hydraulic impactor attachment, were evaluated during a field test program after undergoing shakedown performance tests in the laboratory. A similar, but larger machine with identical teeth, procured under a separate task, was observed during an extended antarctic ice-trenching operation. The CEL-designed conical teeth made both ice excavation machines very efficient trenchers, cutting over 3,000 lineal feet (900 m) of ice with an average specific energy of only 220 in.-lb/in.3 (1,500 KPA). Both backhoe attachments were effective for special applications, such as ice hummock removal and deadman anchor emplacement. (Auth.)

33-955
Economic evaluation of ice and frost on bridge decks.
Blackburn, R.R., et al, *National Cooperative Highway Research Program. Report,* May 1978, No.182, 83p. PB-282 288.
Glennon, J.C., Glautz, W.D.
Bridges, Ice control, Accidents, Countermeasures, Cost analysis.

33-956
Proceedings.
International Research Symposium on Pavement Wear, Oslo, June 6-9, 1972, *Norway. Veglaboratoriet. Meddelelser,* Mar. 1973, No.45, 226p., Refs. passim. For selected papers see 33-957 through 33-959.
Pavements, Roads, Tires, Damage, Surface properties, Temperature variations, Wear tests, Dynamic loads, Studded tires.

33-957
Wear terms.
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North Slope Borough water study—a background for planning.
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Multi-component platform construction system for use on all types of marginal terrain.
Gordon, D.T., et al, *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical note,* May 1973, N-1275, 49p. AD-764 057.
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Military engineering, Military equipment, Foundations, Portable equipment, Frozen ground.
An initial development study was completed for a versatile platform construction system to be used by the Marine Corps in any type of marginal terrain that might be encountered: marshes, drifting sand, frozen soil, etc. These platforms would be used as foundations for artillery emplacements, helicopter or VTOL pads, and various shelters. For construction at remote sites, all components of the system must be lightweight, easily handled by two men, and capable of rapid assembly without bolts or special tools. A system composed of sealed box beams covered by the interconnecting decking panels was selected for development. Both the beam and panel components would provide buoyant support on low bearing terrain. The beam substructure could be used to elevate the platforms over uncleared sites.

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Solar radiation, Radiation balance, Radiation absorption, Albedo, Ice optics, Snow optics.

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The report outlines the CEL study to find and test aggregates for use with portland cement concrete suitable for Antarctic construction. Such aggregates were found near McMurdo and samples sent stateside for testing. Mixing and curing procedures are listed and a contact for additional information is given.

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Preferred crystal orientations in the fast ice along the margins of the Arctic Ocean.
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Ice crystal structure, Crystal orientation, Ice crystal growth, Fast ice, Ocean currents, Boundary layer, Sea ice, Ice water interface.
Field observations of the growth fabrics of the fast and near-fast ice along the coasts of the Beaufort and Chukchi seas show that at depths of more than 60 cm below the upper ice surface the sea ice crystals show striking alignments within the horizontal plane. In general, the *c* axes of the crystals were aligned roughly parallel to the coast, the outlines of islands, and passes between islands. Our, and similar observations can be explained if it is assumed that the *c* axes of the crystals are aligned parallel to the 'long-term' current direction at the sea ice-seawater interface. It is hypothesized that current flow in this direction reduces the thickness of the solute boundary layer as well as the salinity in the liquid at the interface. This lowered salinity allows crystals in the favored orientation to extend farther into the melt than neighboring crystals with less favored orientations. In addition, the current tends to induce a continuous flux of supercooled seawater against the sides of the crystals that extend ahead of the interface. This favors their lateral growth. The aligned crystal aggregate that forms has the overall characteristics of a single crystal. The development of such crystal alignments results in pronounced anisotropy in the mechanical, thermal, and electrical properties of fast ice. It is suggested that such crystal orientations can be used as an aid in determining current patterns in perennially ice-covered areas such as the Canadian Archipelago.

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River ice, Ice cover thickness, Ice breakup, Ice jams, Forecasting, Analysis (mathematics).

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Permafrost distribution, Active layer thickness, Lichens, Ground water, Seismic surveys.

33-1065
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Soil compacting, Electric charge, Clay soils, Clay minerals, Desiccation.

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Pavements, Bituminous concretes, Economic analysis, Winter concreting.

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Estimation of snow temperature and mean crystal radius from remote multispectral passive microwave measurements.
Chang, A.T.C., *U.S. National Aeronautics and Space Administration. Technical paper,* June 1978, NASA-TP-1251, 13p., 10 refs.
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A statistical retrieval method has been developed in this paper to determine the snowfield temperature profile and mean crystal size by using the Scanning Multifrequency Microwave Radiometer (SMMR) on board a spacecraft. The estimated errors for retrieval are approximately 1.5 K for temperature and 0 001 cm for crystal radius in the presence of 1 K rms noise for each SMMR channel. (Auth. mod.)

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Icing, Test equipment, Cloud chambers, Wind tunnels, Cold chambers.

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Aircraft icing, Cloud physics.

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Aircraft icing, Snowfall.

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Aircraft icing, Ice formation.

33-1090
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Wind factors, Meteorological data, Boundary value problems, Sea ice, Surface roughness, Ice cover thickness, Ice air interface.

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Glacier ice, Ice structure, Glacier movement, Glacial deposits, Glacier surveys, Tectonics, Glacial features.

33-1096
Juxtaposing arctic and subantarctic island floras. [K voprosu o sopostavlenii flory ostrovov Arktiki i Subantarktiki],
Kats, N.IA., *Moskovskoe obshchestvo ispytatelei prirody. Biulleten'. Otdel biologicheskii,* May-June 1977, 81(3), p.74-81, In Russian with English summary. 20 refs.
Arctic vegetation, Plant ecology.
Coefficients of specific community of flowering plants are given for a number of arctic and subantarctic islands considered in pairs in different combinations. The coefficients of community were found to be higher the nearer to one another the islands of a given pair are. Generally they are higher in the Arctic than in the Subantarctic where the islands are farther from one another and from the continents. A comparison of the number of moss and flowering plant species showed that both in the Arctic and in the Antarctic mosses are more numerous than flowering plants. (Auth.)

33-1097
Development of disturbances on mountain slope and glacier surfaces. [O razvitii vozmushchenii na poverkhnosti sklonov i lednikov],
Bozhinskiĭ, A.N., et al, *Moscow. Universitet. Vestnik. Seriia 5 Georgrafiia,* July-Aug. 1978, No.4, p.106-109, In Russian with English summary. 6 refs.
Zeĭdis, I.M.
Slope processes, Cryogenic slope processes, Slope stability, Glacier surfaces, Mathematical models.

33-1098
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Vehicles.
Gives basic data on a van type vehicle capable of carrying twenty passengers or 2.5 tons of cargo over improved roads of snow, ice, or frozen ground. A procurement source and a CEL contact are provided.

33-1099
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U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory, *CEL techdata sheet,* Mar. 1973, 73-6, 2p., 1 ref.
Vehicles.
Describes a vehicle equipped with either a station wagon or panel-delivery body for passenger or light cargo carrying in polar regions. The wagon option gives six-passenger capacity while the panel gives three passengers and an 800-pound capacity. A procurement source and a CEL contact are provided.

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Road transitions between land, snow and ice.
U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory, *CEL techdata sheet,* Aug. 1975, 75-21, 2p., 1 ref.
Snow roads, Ice roads, Construction.
Describes CEL developed procedures for coping with problems of road transition from sea ice to shelf ice, snow to land, and sea ice to land. These include constructing a timber ramp as a transition road between these various surfaces

33-1101
Caulking compounds for application at low temperatures.
U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory, *CEL techdata sheet,* Mar. 1975, 75-3, 2p., 1 ref.
Sealing, Low temperature tests, Adhesive strength.

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Snow transport equipment model 1000 towed snowplow carrier.
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Snow roads, Construction equipment, Skis.
A towed snowplow carrier for use in construction of elevated snow roads is briefly described. The advantages of this ski-mounted equipment are listed and a CEL contact is shown.

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Electromagnetic methods for mapping shallow permafrost.
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Electromagnetic prospecting, Permafrost thickness, Mapping, Models.

33-1104
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Watts, R.D., et al, *Geophysics,* June 1978, 43(4), p.819-822, 8 refs.
Isherwood, W.
Gravimetric prospecting, Glaciers, Electronic equipment.

33-1105
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Weisman, R.N., *Water resources research,* Apr. 1977, 13(2), p.337-342, 18 refs.
Snowmelt, Turbulent diffusion, Latent heat, Heat flux, Analysis (mathematics), Models, Thermal factors.

33-1106
Water and ice potentials in frozen soils.
Groenevelt, P.H., et al, *Water resources research,* Apr. 1977, 13(2), p.445-449, 19 refs.
Kay, B.D.
Frozen ground physics, Ice pressure, Water pressure, Soil moisture, Analysis (mathematics), Frozen ground thermodynamics.

33-1107
Polar Sub-programme.
World Meteorological Organization, *Global Atmospheric Research Program. GARP publications series,* 1978, No.19, 47p., Refs. passim.
Sea ice, Ice sheets, Climate, Snow, Weather forecasting, Research projects, Weather observations, Models.
This report is intended to define a polar sub-program within the objectives and planning framework of the Global Atmospheric Research Program (GARP.) The objectives of the program are to identify and study polar processes relating to the improvement of weather prediction from general circulation models, and to develop a basis for understanding the role of arctic and antarctic ice in climate dynamics. The report provides an overview of the GARP polar sub-program and its scientific background, reviews the Polar Experiment (POLEX) to be carried out simultaneously with the First GARP Global Experiment (FGGE), discusses polar processes in climate modeling, and describes climate-related experiments and monitoring for the program.

33-1108
Flow-visualization by means of soap bubbles on snowdrift around the huts at Syowa Station.
Sato, T., et al, *Antarctic record,* Sep. 1978, No.62, p.1-22, In Japanese with English summary. 17 refs.
Hannuki, T.
Snowdrifts, Wind tunnels, Wind (meteorology), Antarctica—Showa Station.
Wind tunnel tests were conducted in order to predict profiles of snowdrift around buildings at Showa Station. Assuming that snowflakes in wind velocity fields exceeding the mean wind velocity flow along with the wind, and snowflakes in those fields not exceeding it tend to accumulate on the ground surface, the profiles of the snowdrift around the buildings can be predicted. The results of wind tunnel tests are as follows. (1) The profile of the snowdrift changes according to the surface friction velocity of the surface boundary layer and the altitude of the pileup. (2) The profile of the snowdrift can be predicted in the division of the wind velocity field at the altitude Z. (3) The variation of the snowdrift profile can also be expressed by the index K of the fluid energy of the mean wind. (Auth. mod.)

33-1109
Proceedings.
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DLC G70.4C26 1975
Meetings, Remote sensing, Ice, Snow cover distribution, Forests.

33-1110
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DLC G70.4.C26 1975
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33-1111
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Sea ice, Spaceborne photography, Data transmission.

33-1112
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33-1113
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Snow cover distribution, Mapping, Flood forecasting, Canada—New Brunswick—Saint John River.

33-1114
Proceedings.
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DLC G70.4.C26 1977
Meetings, Remote sensing, Ice, Snow cover.

33-1115
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Lapczak, S.
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Snow cover distribution, Spaceborne photography, River basins.

33-1116
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Snowmelt, Runoff.

33-1117
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Temperature variations, Sea ice, Mapping, Infrared photography.

33-1118
Detection of heat loss from buildings through aerial thermography: applications and methodology.
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33-1120
Scatterometer and SLAR results obtained over Arctic sea-ice and their relevance to the problems of Arctic ice reconnaissance.
Gray, A.L., et al, Canadian Symposium on Remote Sensing, 4th, Quebec, 1977. Proceedings, Ottawa, Canadian Aeronautics and Space Institute, 1977, p.424-443, In English with French summary. 21 refs.
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Floating ice, Ice cover thickness, Radar echoes, Airborne radar, Icebergs.

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33-1131
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Glacier ice, Pollution, Impurities, Tests.

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Dezhin, IU.V.
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Earthwork, Excavating equipment, Frozen ground, Cold weather construction.

33-1135
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Swamps, Clay soils, Peat, Drainage, Permafrost.

33-1136
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Vaseneva, V.A., Tsotsur, E.S.
Petroleum industry, Swamps, Peat, Drainage, Pipelines, Buildings, Engineering geology, USSR—Tomsk.

33-1137
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Petroleum industry, Offshore drilling, Sea ice, Drift, Ice loads, Pile foundations, Design.

33-1138
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Gromov, A.D.
Mining, Permafrost, Drilling, Blasting, Excavating equipment.

33-1139
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Os'niushkin, V.S.
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33-1142
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Mining, Hydraulic structures, Dams, Construction materials, Hydraulic fill, Thermal regime, Cold weather construction, Frost penetration, Unfrozen water content.

33-1143
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Brines, Desalting, Artificial freezing, Crystallizers, Ice crystal formation, Models.

33-1145
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Brines, Ice crystal formation, Desalting, Ice crystal growth, Artificial freezing, Crystallizers.

33-1146
Influence of the angle of cutting on the nature of frozen ground excavation. [Vliianie ugla rezaniia na kharakter razrusheniia merzlogo grunta],
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Luzgin, IU.N.
Earthwork, Excavating equipment, Frozen ground.

33-1147
Methods of studying the resistance of frozen ground layers to excavation. [K metodike issledovaniia soprotivliaemosti merzlogo sloia grunta razrusheniiu],
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Chasovskikh, M.P., Shchipunov, A.N.
Earthwork, Excavating equipment, Frozen ground.

33-1148
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Shugaeva, R.T.
Hydraulic structures, Earth dams, Permafrost bases, Thermal regime.

33-1149
Thermal regime of loam layers placed into earth dams at subzero air temperatures. [Termicheskiĭ rezhim sloev suglinka, ukladyvaemogo v plotinu pri otritsatel'nykh temperaturakh vozdukha],
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Earth dams, Frost penetration, Thermal regime, Frost protection.

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Kokorina, N.G.
DLC TC5.M668
Ground ice, Hydraulic structures, Permafrost beneath structures, Dams, Foundations, Igneous rocks.

33-1151
Seismic surveying used in engineering-geological investigations of permafrost areas. [Opyt primeneniia seismorazvedki pri inzhenerno-geologicheskikh izyskaniiakh v raionakh rasprostraneniia mnogoletnei merzloty],
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DLC TC5.M668
Seismic surveys, Engineering geology, Permafrost distribution, Permafrost structure, Permafrost hydrology, Seismic velocity, Wave propagation.

33-1152
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DLC TC5.M667
Hydraulic structures, Dams, Thermal stresses, Freeze thaw cycles, Permafrost beneath structures, Concrete structures, Concrete placing, Hydroelectric power generation, Earth dams.

33-1153
Designing arch dams for thermal stresses. [Nekotorye voprosy rascheta arochnykh plotin na temperaturnye vozdeistviia],
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DLC TC5.M667
Hydraulic structures, Dams, Thermal stresses, Design, Computer applications.

33-1154
Design and construction of underground structures in permafrost and the scientific research problems in this area. [Proektirovanie i stroitel'stvo podzemnykh gidrotekhnicheskikh sooruzhenii v usloviiakh vechnoi merzloty i zadachi nauchnykh issledovanii v etoi oblasti],
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Budaev, I.E., Chelnokov, V.L.
DLC TC5.M667
Tunnels, Blasting, Dust control, Permafrost.

33-1155
Calculating thermal stresses in concrete dams allowing for freezing and thawing. [Metodika rascheta termonapriazhennogo sostoianiia betonnykh plotin s uchetom zamorazhivaniia i ottaivaniia],
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DLC TC5.M667
Hydraulic structures, Dams, Concrete structures, Freeze thaw cycles, Permafrost beneath structures, Design.

33-1156
Structure and level of estimated costs of hydroelectric power plant construction in undeveloped regions with severe climatic conditions (The Ust'-Ilim power plant taken as an example). [Nekotorye osobennosti urovnia i struktury smetnoi stoimosti gidrostantsii, vozvodimykh v surovykh i neosvoennykh raionakh strany (na primere analiza proektno-smetnoi dokumentatsii po stroitel'stvu Ust'-Ilimskoi GES)],
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DLC TC5.M667
Economic development, Electric power plants, Construction costs, Hydroelectric power generation, Permafrost.

33-1157
Thermal regime of the stone-earth dam of the Kolyma hydroelectric power plant, with a permeable clayey loam core. [Temperaturnyi rezhim kamenno-nabrosnoi plotiny Kolymskoi GES s fil'truiushchim iadrom iz suglinka],
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DLC TC5.M667
Hydraulic structures, Earth dams, Permafrost beneath structures, Thermal regime, Hydroelectric power generation, USSR—Kolyma River.

33-1158
Controlling the stability of earth dams during construction on a weak clayey base. [O metodike kontrolia ustoichivosti zemlianykh plotin, vozvodimykh na slabom glinistom osnovanii v stroitel'nyi period],
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DLC TC5.M667
Hydraulic structures, Earth dams, Clay soils, Foundations, Stability.

33-1159
Experimental justification of the layer-by-layer erection of the concrete dam of the Toktogul hydroelectric power plant. [Eksperimental'noe obosnovanie metoda posloinoi ukladki betona v plotiny Toktogul'skoi GES],
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DLC TC5.M667
Concrete placing, Hydraulic structures, Concrete structures, Dams, Thermal regime, Hydroelectric power generation.

33-1160
Artificial freezing technique needed. [Metod zamorazhivaniia nuzhen],
Shishkin, A.A., et al, *Zhilishchnoe stroitel'stvo*, July 1978, No.7, p.13, In Russian.
Buildings, Bricks, Cold weather construction, Mortars, Antifreezes.

33-1161
Construction stages of Severobaykal'sk. [Etazhi Severobaikal'ska],
Kushnir, M.I., *Stroitel'stvo i arkhitektura Leningrada*, Apr. 1978, p.30-32, In Russian.
Urban planning, Residential buildings, Prefabrication, Large panel buildings, Foundations, Concrete structures, Permafrost beneath structures, Baykal Amur railroad.

33-1162
Humidity control in ventilated rooms with subzero temperature. [Regulirovanie vlazhnosti v ventiliruemykh pomeshcheniiakh s otritsatel'noi temperatury],
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Tikhonov, B.S., Rusanov, V.V.
Cold storage, Ventilation, Humidity.

33-1163
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Power line supports, Permafrost beneath structures, Electrical grounding, Baykal Amur railroad.

33-1164
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Navigation, Channels (waterways), Earthwork, Excavating equipment, Rivers, USSR—Irtysh River.

33-1165
Battle icebreaker *Kapitan Chechkin*. [Linеinyi ledokol "Kapitan Chechkin"],
Shamin, IU., *Rechnoi transport*, 1978, No.6, p.48-52, In Russian.
River ice, Ice navigation, Icebreakers, Design, Ice breaking.

33-1166
Requirements for steel cables and recommendations for their use in construction machines designed for the North. [Trebovaniia k stal'nym kanatam i rekomendatsii po ikh primeneniiu na stroitel'nykh mashinakh v severnom ispolnenii],
Kuz'min, G.V., *Stroitel'nye i dorozhnye mashiny*, July 1978, No.7, p.27-29, In Russian. 6 refs.
Steels, Construction equipment, Cables (ropes), Cold weather tests.

33-1167
Ways of lowering power consumption of multi-bucket excavators during trenching. [O putiakh snizheniia energoemkosti protsessa razrabotki grunta mnogokovshovymi transheinymi ekskavatorami],
Kaliagin, A.M., *Stroitel'nye i dorozhnye mashiny*, Sep. 1978, No.9, p.8-10, In Russian. 5 refs.
Earthwork, Excavating equipment, Frozen ground.

33-1168
Cutting tools of excavators designed for cemented and frozen earth. [Frezernye razrykhliteli zemsnariadov dlia razrabotki tsementirovannykh i merzlykh gruntov],
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Tsernant, A.A., Pimenov, V.T., Kuznetsov, IU.M.
Earthwork, Excavating equipment, Frozen ground.

33-1169
Methods of determining frost resistance of lining bricks. [O metodike opredeleniia morozostoikosti litsevogo kirpicha],
Sadunas, A.S., et al, *Stroitel'nye materialy*, Mar. 1978, No.3, p.22-24, In Russian.
Machiulaitis, R.V., Valiukiavichius, Ch.A.
Construction materials, Bricks, Ceramics, Linings, Frost resistance, Freeze thaw cycles.

33-1170
Studying the porosity, water absorption and frost resistance of haydite gravel. [Issledovanie poristosti, vodopogloshcheniia i morozostoikosti keramzitovogo gravia],
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Karpikova, L.I., Shoshen, N.P.
Construction materials, Concretes, Concrete aggregates, Gravel, Porosity, Water retention, Frost resistance.

33-1171
Under severe weather conditions. [V slozhnykh meteousloviiakh],
Rublevskii, M., *Tyl i snabzhenie Sovetskikh vooruzhennykh sil*, July 1978, No.7, p.77-79, In Russian.
Military transportation, Ice navigation, Icebreakers, Ice reporting, Ice edge.

33-1172
Plane phototriangulation for ice reconnaissance. [Planovaia fototrianguliatsiia dlia tselei ledovoi razvedki],
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Shirokova, T.A.
Sea ice, Drift, Ice reporting, Photographic reconnaissance, Airborne equipment, Ice navigation.

33-1173
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DLC HC337.N6S75
Economic development, Mining, Construction costs, Buildings, Roads, Foundations, Permafrost beneath structures, Microclimatology, Snow cover distribution, Transportation, Permafrost structure, Permafrost hydrology.

33-1174
Quantitative methods of evaluating the effect of regional conditions of the North on industry. [Kolichestvennye metody otsenki vliianiia regional'nykh usloviĭ Severa na proizvodstvo],
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DLC HC337.N6S75
Economic development, Construction, Foundations, Permafrost beneath structures, Snow cover distribution, Snow removal, Microclimatology.

33-1175
Influence of natural and economic conditions on the net cost of automobile transportation. [Vliianie prirodnykh i ekonomicheskikh usloviĭ na sebestoimost' *avtomobil'nykh perevozok*],
Sutt, I.V., Sotsial'no-ekonomicheskie issledovaniia raĭonov Severa (Socioeconomic studies of northern regions) edited by S.A. Rakita, Moscow, Universitet, 1977, p.29-41, In Russian. 2 refs.
DLC HC337.N6S75
Transportation, Motor vehicles, Cost analysis.

33-1176
Evaluating the effect of northern climate on estimated construction costs. [Opyt otsenki vliianiia klimaticheskikh usloviĭ Severa na smetnuiu stoimost' stroitel'stva],
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Chekalina, A.A.
DLC HC337.N6S75
Construction costs, Climate, Permafrost distribution, Permafrost structure, Permafrost hydrology, Statistical analysis.

33-1177
Evaluating territorial differences in road construction costs in the northern part of the Asiatic USSR. [Otsenka territorial'nykh razlichiĭ v stoimosti stroitel'stva avtodorog na Aziatskom Severe SSSR],
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DLC HC337.N6S75
Construction costs, Roads, Microclimatology, Topographic factors.

33-1178
Present organization of industry in the Magadan area. [Sovremennaia territorial'naia organizatsiia promyshlennogo proizvodstva v Magadanskoĭ oblasti],
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Sutt, I.V., Chekalina, A.A.
DLC HC337.N6S75
Economic development, Organizations, Mining, Construction materials, Transportation, USSR—Magadan.

33-1179
Territorial differences in natural conditions of industrial activities and the life of the population. [Territorial'nye razlichiia v prirodnykh usloviiakh proizvodstvennoĭ deiatel'nosti i zhizni naseleniia],
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Chistov, S.V.
DLC HC337.N6S75
Climate, Engineering geology, Permafrost distribution, Economic development, Mining, Construction, Permafrost control, Construction costs, USSR—Magadan.

33-1180
Seasonally and perennially frozen rocks. [Sezonno- i mnogoletnemerzlye gornye porody],
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DLC GB648.79.S49
Permafrost, Saline soils, Active layer, Cryogenic processes, Seasonal freeze thaw, Frost penetration, Ice veins, Ice wedges, Electrical properties, Frost shattering, Permafrost thickness, Permafrost structure, Permafrost hydrology.

33-1181
Basic achievements and problems in modern cryolithology. [Osnovnye dostizheniia i problemy sovremennoĭ kriolitologii],
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Vtiurin, B.I., Vtiurina, E.A.
DLC GB648.79.S49
Geocryology, Engineering geology, Permafrost origin, Cryogenic processes, Ground ice, Ice physics, Frost penetration, Ice formation.

33-1182
Geocryological description of the Tanyurer River valley. [Geokriologicheskiĭ ocherk doliny reki Taniurer],
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DLC GB648.79.S49
Permafrost distribution, Cryogenic processes, Active layer, Permafrost depth, Patterned ground, Tundra soils, Tundra vegetation, Arctic soils, Arctic vegetation, Valleys, USSR—Tanyurer River, USSR—Anadyr' River.

33-1183
Ultimate dimensions of wedge ice. [Predel'nye povtornozhil'nye l'dy],
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DLC GB648.79.S49
Permafrost structure, Ground ice, Ice wedges, Patterned ground, Ice formation, Analysis (mathematics).

33-1184
Ground ice in the Zeya River valley. [Podzemnye l'dy v doline reki Zeĭ],
Vtiurin, B.I., Sezonno- i mnogoletnemerzlye gornye porody (Seasonally and perennially frozen rocks) edited by E.A. Vtiurina, Vladivostok, 1976, p.42-44, In Russian.
DLC GB648.79.S49
Permafrost distribution, Permafrost structure, Ground ice, Ice structure, Thermokarst, Ice wedges, Valleys, Baykal Amur railroad, USSR—Zeya River.

33-1185
Magnetic measurement techniques for studying permafrost. [O primenenii magnitometrii dlia issledovaniia merzlykh tolshch],
Kalinin, V.M., et al, Sezonno- i mnogoletnemerzlye gornye porody (Seasonally and perennially frozen rocks) edited by E.A. Vtiurina, Vladivostok, 1976, p.45-58, In Russian. 6 refs.
IAkupov, V.S.
DLC GB648.79.S49
Permafrost distribution, Permafrost structure, Mapping, Magnetic surveys, Permafrost hydrology, Ground ice, Taliks.

33-1186
Reliability of electric conductivity maps used in permafrost forecasting. [O dostovernosti prognoznykh kart provodimosti merzlykh tolshch],
Volod'ko, B.V., et al, Sezonno- i mnogoletnemerzlye gornye porody (Seasonally and perennially frozen rocks) edited by E.A. Vtiurina, Vladivostok, 1976, p.59-64, In Russian. 4 refs.
Kostesha, V.E., IAkupov, V.S.
DLC GB648.79.S49
Permafrost physics, Electrical resistivity, Maps, Permafrost forecasting.

33-1187
Extrapolation technique used in determining thickness of seasonally frozen rocks. [Metod ekstrapoliatsii v opredelenii moshchnosti sezonnomerzlogo sloia gornykh porod],
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DLC GB648.79.S49
Frost penetration, Active layer thickness, Frozen ground analysis, Thickness, Seasonal freeze thaw.

33-1188
Temperature conditions of frost shattering in the Anadyr' area. [Temperaturnye usloviia morozoboĭnogo rastreskivaniia v Anadyrskom raĭone],
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Mironov, N.G., Kuznetsov, IU.V., Liubomirov, A.S.
DLC GB648.79.S49
Cryogenic processes, Frost shattering, Soil freezing, Frost penetration, Frozen ground temperature, Ice formation, USSR—Anadyr' River.

33-1189
Temporary variations in active layer thickness. [O vremennoĭ izmenchivosti moshchnosti sezonno-protaivaiushchego sloia gornykh porod],
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DLC GB648.79.S49
Active layer thickness, Thaw depth, Air temperature, Frozen ground temperature, Tundra soils, Tundra vegetation, Mosses.

33-1190
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Pshenichnikov, B.F.
DLC GB648.79.S49
Soil freezing, Frozen ground, Cryogenic processes, Soil physics, Chemical reactions, Mountain soils, Taiga soils, Taiga vegetation, Soil profiles.

33-1191
Temperature regime of the seasonally freezing soil layer in the low-mountain area of the Central Sikhote-Alin'. [Temperaturnyĭ rezhim gruntov sezonnomerzlogo sloia v nizkogornykh raĭonakh srednego Sikhote-Alinia],
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Sorokin, V.N.
DLC GB648.79.S49
Mountain soils, Soil temperature, Seasonal freeze thaw, Frost penetration, Taiga soils, Taiga vegetation.

33-1192
Cryogenic phenomena on Kamchatka Peninsula. [Nekotorye dannye o kriogennykh iavleniiakh na Kamchatke],
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33-1195
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Ice physics, Ice crystal structure, Ice creep, Ice deformation.
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33-1199
Gas inclusions in glacier ice; their use as indicators of formation site in polar ice; climatological and rheological applications. [Les inclusions gazeuses dans la glace de glacier; leur utilisation comme indicateur du site de formation de la glace polaire; applications climatiques et rhéologiques],
Raynaud, D., *France. Centre national de la recherche scientifique. Laboratoire de glaciologie. Publication,* May 20, 1976, No.214, 110p., Ph.D. thesis. In French. Numerous refs. p.97-104.
Gas inclusions, Impurities, Ice composition.
A study was carried out on 100 ice samples taken from sites in Antarctica and Greenland to determine gas inclusions. Gas inclusions are then related to geographic location and to climatic vs. rheological effects.

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33-1204
Characteristics of the formation of river slope runnoff in permafrost regions.
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Permafrost hydrology, Active layer, Surface drainage, Soil moisture migration, Runoff, Analysis (mathematics).
This report discusses questions concerning the formation of a slope runoff in the case of a deep lie of the permafrost water confining layer and available length slope thickness of the thaw layer. It is under such conditions that most floods form in mountainous rivers of the northeastern USSR.

33-1205
Nutrition value and fodder harmlessness of plant output grown with textile industry waste water irrigation.
Saiapin, V.P., *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1978, TL 671, 4p., ADA-035 225, Translation of Pitatel'naia tsennost' i kormovaia bezvrednost' rastenievodcheskoĭ produktsii, vyrashchennoĭ pri oroshenii stochnymi vodami tekstil'nogo proizvodsta, VNIISSV, 1976, 4p.
Waste disposal, Irrigation, Water treatment, Land reclamation, Agriculture.
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33-1206
Irrigation of feed crops with animal husbandry outflow.
Dmitrieva, V.I., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1978, TL 672, 3p., ADA-053 224, Translation of Oroshenic kormovykh ugodiĭ zhivotnovodcheskimi stokami, VNIISSV, 1976, 4p.
Nikitin, V.A., Polenina, V.A.
Waste disposal, Irrigation, Water treatment, Land reclamation, Agriculture, Animals.
Several basic methods for using animal husbandry outflow in crop growing are described in this paper.

33-1207
Waste water use for feed crop land.
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Mikheeva, L.F., Demina, M.I.
Waste disposal, Irrigation, Water treatment, Agriculture, Land reclamation, Animals.
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33-1208
Method of wintertime sprinkler distribution of waste water.
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Waste disposal, Irrigation, Agriculture, Water treatment.
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33-1209
Irrigation use of food industry waste water.
Dodolina, V.T., *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1978, TL 675, 3p., ADA-053 434, Translation of Ispol'zovanie na oroshenie stochnykh vod predpriiatiĭ pishchevoĭ promyshlennosti, VNIISSV, 1978, 4p.
Waste disposal, Irrigation, Water treatment, Land reclamation, Agriculture.
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33-1210
Neutralization of organic substances in waste water by plants. *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1978, TL 676, 4p., ADA-053 435, Translation of Obezvrezhivanie organicheskikh veshchestv stochnykh vod v rasteniiakh, VNIISSV, 1975, 4p.
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Hydraulic structures, Freeze thaw cycles, Floating ice, River ice, Frazil ice.

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Ice jams, Ice cover thickness, Analysis (mathematics).

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Shafarenko, E.M.
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33-1221
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Possibilities of using aerial geologic methods in road construction. Interpretation of aerial photographs of swamps. ¡Vozmozhnosti primeneniia aerogeologicheskikh metodov pri izyskaniiakh dorog na primere deshifrirovaniia bolot¡
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Applying the common-depth point method of seismic surveying to complicated geologic conditions of permafrost in the Vilyuy syncline. ¡Metodika nabliudeniĭ OGT v usloviiakh slozhnopostroennoĭ zony mnogoletnemerzlykh porod Viliuĭskoĭ sineklizy¡
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33-1234
Equivalent materials technique of modeling the mechanical processes of deformation and failure of forzen ground and other media. ¡Modelirovanie metodami ekvivalentnykh materialov mekhanicheskikh protsessov deformirovaniia i razrusheniia merzlykh gruntov i drugikh sred¡
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Krichak, M.O.
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Allowing for the conditions of glaze-hoarfrost formation during observations and data interpretation. ¡Uchet usloviĭ obrazovaniia gololedno-izmorozevykh otlozheniĭ pri proizvodstve nabliudeniĭ i kontrole materialov¡
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33-1237
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Hydrogeology, Land reclamation, Land development, Drainage, Irrigation, Permafrost hydrology, Water supply, USSR—Siberia.

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Floating ice, Ice cover strength, Strain tests, Dynamic loads, Viscoelastic materials.

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Computer simulation of bubbler-induced melting of ice covers using experimental heat transfer results.
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Tankin, R.S., Ashton, G.D.
Ice melting, Artificial melting, Bubbling, Computerized simulation.
Results of laboratory experiments conducted to determine bubbler-induced heat transfer coefficients are reported. Implications and validity of results are discussed. As a second step, a procedure for computer-simulating the behavior of an ice sheet whose thickness is controlled by a bubbler system operating intermittently over a long period of time is developed. The simulation uses experimentally determined bubbler heat transfer coefficients, weather data, site characteristics, and desired performance as input data, and a finite difference method to solve the equations governing the ice thickness and temperature profile. Through an example simulation, the usefulness of the procedure in predicting ice thickness and temperature profile histories, and the effectiveness or suitability of a given bubbler system are demonstrated.

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Economic development, Urban planning, Oil recovery, Offshore drilling, Transportation, Water supply, United States—Alaska—Kenai Peninsula.

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33-1252
Strait of Magellan crossing completed in austral summer.
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Landsat image: Disko Sound, Western Greenland. Polar sea and arctic landscape between Disko Island and the ice sheet. {Satellitenbild: Diskobugt/Westgrönland. Polares Meer und arktische Landschaft zwischen Diskoinsel und Inlandeis},
List, F.K., et al, *Erde,* 1978, 109(2), p.122-135, In German with English summary. 30 refs.
Stäblein, G.
Sea ice distribution, Ice conditions, Landscape types, LANDSAT, Remote sensing, Polar regions, Meteorological factors, Spacecraft, Greenland.

33-1257
Cartographic representation of the polar regions up to and including the 19th century. {Die kartographische Darstellung der Polargebiete bis in das 19. Jahrhundert},
Zögner, L., *Erde,* 1978, 109(2), p.136-152, In German with English summary. 38 refs.
Maps, Polar regions, History.
Important periods in the progress of polar research and the development of geographical knowledge of the polar regions are illustrated by characteristic maps. Legends such as a terra australis and an Arctic Ocean open on all sides affected polar cartography for a long time. The geographical theories of Delisle/Buache in the 18th and A. Petermann in the 19th centuries influenced cartographic representation. In the 19th century successful research in polar regions and the use of modern scientific methods were matched by a rapid increase in knowledge and constant improvement of map faces. (Auth.)

33-1258
Earth science investigations on the sixth continent. {Über die geowissenschaftlichen Forschungen auf dem sechsten Kontinent},
Kohnen, H., *Erde,* 1978, 109(2), p.153-187, In German with English summary. Refs. p.184-187.
Glacier mass balance, Ice sheets, Ice conditions, Mapping, Tectonics, Earth crust.
The present article reviews characteristic features of the physical nature of Antarctica and outlines relevant scientific results. The discussion is, however, confined to geosciences. The progress of mapping is discussed and the essential results of tectonic and geological research, as well as investigations of the earth's crust, are reported. Much effort is devoted to the ice, which is the most widespread mineral in Antarctica, covering 98% of the continental area. Emphasis is placed on the distribution, the mass balance, the motion of the ice and the stability conditions of the sheet. Finally, a brief review of the antarctic climate is given, summarizing the most typical and harsh features. A general view of the history of exploration and of the political and economic potential of Antarctica is given. (Auth.)

33-1259
Exploration and exploitation of mineral resources in the Arctic. {Erschliessung und Gewinnung mineralischer Rohstoffe in der Arktis},
Gocht, W., et al, *Erde,* 1978, 109(2), p.188-205, In German with English summary. 38 refs.
Pluhar, E.
Economic development, Minerals, Oil recovery, Arctic regions, Ecology, Meteorological factors, Permafrost preservation.

33-1260
Baykal-Amur mainline (BAM). Route and economic development along a Soviet railway line. {Die Baikal-Amur-Eisenbahnmagistrale (BAM). Trassenverlauf und wirtschaftliche Erschliessung entlang einer sowjetischen Bahnlinie},
Liebmann, C.C., *Erde,* 1978, 109(2), p.206-228, In German with English summary. Refs. p.225-228.
Railroads, Transportation, Minerals, Baykal Amur railroad.

33-1261
Traditions and current tasks of polar research. {Traditionen und aktuelle Aufgaben der Polarforschung},
Stäblein, G., *Erde,* 1978, 109(2), p.229-267, In German with English summary. Refs. p.263-376.
Research projects, History, Expeditions, Polar regions.
Today arctic and antarctic research is less popular than at the time of the last voyages of discovery. The history of German polar research and the support given to it by the Berlin Geographical Society are described. The attempt is made to order the phases of development of polar research according to its changed aims and methods. An indication of current polar research activities is given by means of a selection of descriptions by various polar research institutions of themselves and their programs. (Auth. mod.)

33-1262
New findings on the composition and structure of the northern ice sheet. {Neue Ergebnisse zum Aufbau und zur Struktur des Nordischen Inlandeises},
Liedtke, H., *Zeitschrift für Geomorphologie,* June 1978, 22(2), p.230-235, In German.
Ice structure, Ice composition, Ice sheets, Ice mechanics.

33-1263
Generations of rock glaciers and ice-cored moraines on Nevado de Toluca Volcano, Mexico. {Blockgletscher- und Blockzungen-Generationen am Nevado de Toluca, Mexiko},
Heine, K., *Erde,* 1976, 107(4), p.330-352, In German with English summary. 23 refs.
Rock glaciers, Glacial deposits, Moraines, Paleoclimatology, Alpine glaciation, Mexico—Nevado de Toluca.

33-1264
Model for Holocene retreat of the West Antarctic Ice Sheet.
Thomas, R.H., et al, *Quaternary research,* 1978, 10(2), p.150-170, 36 refs.
Bentley, C.R.
Ice sheets, Ice shelves, Ice models.
Equations are derived that can be used to make a quantitative estimate of the maximum size of a marine ice sheet and of when and how rapidly retreat would take place under prescribed conditions. Ice sheet growth is favored by falling sea level and uplift of the seabed. In most cases the buttressing effect of a partially grounded ice shelf is a prerequisite for maximum growth out to the edge of the continental shelf. Collapse is triggered most easily by eustatic rise in sea level, but it is possible that the ice sheet may self-destruct by depressing the edge of the continental shelf so that sea depth is increased at the equilibrium grounding line. Application of the equations to a hypothetical "Ross Ice Sheet" that 18,000 yr ago may have covered the present-day Ross Ice Shelf indicates that, if the ice sheet existed, it probably extended to a line of sills parallel to the edge of the Ross Sea continental shelf. By allowing world sea level to rise from its late-Wisconsin minimum it was possible to calculate retreat rates for individual ice streams that drained the "Ross Ice Sheet". If ice shelves did not form during retreat then the analysis indicates that most of the West Antarctic Ice Sheet would have collapsed by 9000 yr B.P. Thus, the present-day Ross Ice Shelf (and probably the Ronne Ice Shelf) serves to stabilize the West Antarctic Ice Sheet which would collapse very rapidly if the ice shelves were removed. Rebound of the seabed after the ice sheet had retreated to an equilibrium position would allow the ice sheet to advance once more. (Auth. mod.)

33-1265
Implications of outer space technology on development in meteorology and meteorological services.
Johnson, A.W., *World Meteorological Organization. WMO bulletin,* July 1975, 24(3), p.162-170.
Spaceborne photography, Weather observations, Ice conditions, Icebergs, Sea ice, Weather forecasting.
Developments in the meteorological satellite program since the first TIROS satellite was launched in Apr. 1960, and the inception of geostationary satellites are summarized. Among the applications of weather satellite imagery discussed and illustrated are the following: the characteristics of the Gulf Stream; analysis of the daily ice field in the Arctic and Antarctic; iceberg formation and drift in the Antarctic; tornado and severe storm warning; vertical temperature profiles and moisture soundings; the distribution of snow; measurements of wind from cloud movements; and hurricane formation over tropical areas. The availability of the data and international cooperation in future satellite programs are discussed.

33-1266
Damage and recovery of tundra vegetation.
Webber, P.J., et al, *Environmental conservation,* Autumn 1978, 5(3), p.171-182, Refs. p.180-182.
Ives, J.D.
Tundra vegetation, Damage, Revegetation, Arctic vegetation, Ecosystems, Human factors.

33-1267
Investigation of the solubility and diffusion of hydrochloric acid in ice.
Kennedy, P.J., Philadelphia, Pa., Temple University, 1978, 123p., University Microfilms order No.7817312, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Oct. 1978, p.1780.
Ice physics, Solubility, Diffusion, Ice crystals, Impurities, Temperature effects.

33-1268
Air temperature and glacier ablation—a parametric approach.
Braithwaite, R.J., Montreal, P.Q., McGill University, 1977, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Oct. 1978, p.1685. Microfilm from the National Library of Canada.
Glacier ablation, Air temperature, Glacier mass balance, Models.

33-1269
Role of groundwater in storm and snowmelt runoff generation.
Sklash, M.G., Waterloo, Ont., University of Waterloo, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Oct. 1978, p.1682. Microfilm from the National Library of Canada.
Ground water, Runoff, Snowmelt, Hydraulics, Water table, Hydrology.

33-1270
Applications of audio frequency magnetotellurics to permafrost, crustal sounding, and mineral exploration.
Koziar, A., Toronto, University, 1976, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Oct. 1978, p.1679-1680. Microfilm from the National Library of Canada.
Permafrost thickness, Permafrost physics, Sounding, Electrical prospecting, Minerals, Very low frequencies, Electromagnetic prospecting, Permafrost structure, Exploration.

33-1271
Morphology, sedimentary facies and processes of the Northwest Atlantic Mid-Ocean Channel between 61 and 52N, Labrador Sea.
Chough, S.K., Montreal, McGill University, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Oct. 1978, p.1670.
Bottom sediment, Geomorphology, Glacial deposits, Channels (waterways), Turbidity, Exploration, Crude oil, Labrador Sea.

33-1272
Some geotechnical aspects of iceberg grounding.
Chari, T.R., St. John's, Canada, Memorial University of Newfoundland, 1975, n.p., University Microfiche No.255446, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1977, p.1367-1368. Microfilm from the National Library of Canada.
Icebergs, Ice scoring, Offshore structures, Models, Computer applications.

33-1273
Effects of freezing and cryoprotection on chloroplast thylakoid membranes and chloroplast coupling factor 1.
Lineberger, R.D., Ithaca, N.Y., Cornell University, 1978, 170p., University Microfilms order No.7809813, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, July 1978, p.19.
Plant physiology, Freeze thaw cycles, Chemical reactions.

33-1274
Boreal ecosystems of the Fort Nelson area of northeastern British Columbia.
Annas, R.M., Vancouver, University of British Columbia, 1977, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.3, July 1978, p.54. Microfilm from the National Library of Canada.
Forest ecosystems, Vegetation patterns, Classifications, Canada—British Columbia—Fort Nelson.

33-1275
Ice crystal growth in a dynamic thermal diffusion chamber.
Keller, V.W., Reno, University of Nevada, 1977, 215p., University Microfilms order No.7810013, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, July 1978, p.269-270.
Ice crystal growth, Supersaturation, Thermal diffusion, Cold chambers, Stereoscopy, Boundary layer.

33-1276
Investigation of phase change problems: A. Melting of a semi-transparent medium including radiation effects; B. Transient freezing of turbulent flow inside tubes.
Cho, C., Raleigh, North Carolina State University, 1978, 109p., University Microfilms order No.7811615, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1978, p.1430.
Freeze thaw tests, Phase transformations, Radiation, Liquid solid interfaces, Heat flux, Analysis (mathematics), Turbulent flow.

33-1277
Current voltage characteristics of gallium-arsenide metal epitaxial semiconductor field effect transistors at cryogenic temperatures.
Chu, S.-C., Buffalo, State University of New York, 1978, 175p., University Microfilms order No.7817020, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1978, p.1417.
Semiconductors (materials), Low temperature tests, Electric potential, Models, Experimentation.

33-1278
Dislocations in vapor-grown ice crystals.
McNight, C.V., Reno, University of Nevada, 1977, 148p., N78-28699, University Microfilms order No.7811010, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, July 1978, p.270.
Ice crystal growth, Ice crystal structure, X ray analysis, Artificial ice crystals.

33-1279
Study of ice growth in slightly undercooled water.
Fujioka, T., Pittsburgh, Pa., Carnegie-Mellon University, 1978, 306p., University Microfilms order No.7815199, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1978, p.1438-1439.
Ice crystal growth, Ice crystal structure, Thermal factors, Mathematical models, Experimentation.

33-1280
Sensible heat flux in convective parameterization with application to lake effect snow.
Ellenton, G.E.L., Waterloo, Ont., University of Waterloo, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Oct. 1978, p.1819. Microfilm from the National Library of Canada.
Heat flux, Lake effects, Snowstorms, Humidity, Models, Topographic effects.

33-1281
800 miles to Valdez—the building of the Alaska pipeline.
Roscow, J.P., Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1977, 227p., 40 refs.
DLC TN879.5R55
Pipelines, Cold weather construction.

33-1282
Relationship between corrosion, frost and water resistance of asphalt materials. [Vzaimosviaz' korrozionnoĭ stoĭkosti i morozoustoĭchivosti asfal'tovykh materialov s ikh vodoustoĭchivost'iu],
Kasatkina, D.N., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1977, Vol.119, p.26-32, In Russian. 3 refs.
Kasatkin, IU.N.
Construction materials, Asphalts, Bituminous concretes, Frost resistance, Waterproofing.

33-1283
Possibilities of using impervious films in earth dams at subzero temperatures. [Issledovanie vozmozhnosti ustroĭstva plenochnykh protivofil'tratsionnykh elementov gruntovykh plotin pri otritsatel'nykh temperaturakh],
Glebov, V.D., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1977, Vol.119, p.73-76, In Russian. 2 refs.
Lysenko, V.P., Losev, E.D.
Cold weather construction, Earth dams, Construction materials, Waterproofing, Plastics, Polymers.

33-1284
Properties of frost-resistant grouts for fissured perennially frozen rocks. [Svoĭstva khladostoĭkikh rastvorov dlia zakrepleniia treshchinovatykh vechnomerzlykh porod],
Shugaleĭ, R.T., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1977, Vol.119, p.88-91, In Russian. 2 refs.
Tetel'min, V.V.
Permafrost bases, Cracks, Cements, Grouting, Hydraulic structures.

33-1285
Results of first subglacial investigations in the White Sea with an aqualung. [Nekotorye rezul'taty pervykh podlednykh issledovaniĭ s akvalangom na Belom more],
Sidorov, K.S., Kompleksnye issledovaniia prirody okeana (Complex studies of life in the ocean) edited by A.D. Dobrovol'skiĭ et al, Moscow, Universitet, 1971, p.147-153, In Russian. 18 refs.
Littoral zone, Subglacial observations, Animals, Plants (botany), Sea ice, Ice cover thickness, USSR—White Sea.

33-1286
Hydraulic resistance and performance regimes of hydraulic transportation systems with pipes freezing on the inside. [Gidravlicheskie soprotivleniia i rezhim raboty gidrotransportnykh sistem pri vnutritrubnom oledenenii],
Kondakov, V.N., et al, *Gidravlika i gidrotekhnika,* 1978, Vol.26, p.13-17, In Russian. 10 refs.
Vitoshkin, IU.K., Goshtovt, V.I.
Water pipelines, Pipeline freezing.

33-1287
Stabilizing slopes of excavations in bedrocks by aerated sand-cement grouting on construction sites of the Baykal Amur railroad. [Ukreplenie otkosov skal'nykh vyemok na BAMe aerirovannymi tsementno-peschanymi rastvorami],
Omel'ianenko, N.K., et al, *Transportnoe stroitel'stvo,* Oct. 1978, No.10, p.4-5, In Russian.
IAnkovskiĭ, V.M., Pesov, A.I., Tselikov, F.I.
Slope stability, Rock excavation, Grouting, Concretes, Frost resistance, Air entrainment, Baykal Amur railroad.

33-1288
Blasting methods and technology in seismic surveying. [Metodika i tekhnika vzryvnykh rabot pri seĭsmorazvedke],
Kazakov, A.T., Moscow, Nedra, 1968, 328p. (Pertinent p.214-226), In Russian. 36 refs.
DLC TN269.K35
Ice blasting, Cold weather construction, Seismic surveys, Explosion effects, Explosives, Swamps.

33-1289
Geophysical and hydrogeological techniques in engineering geology. [Metody geofiziki v gidrogeologii i inzhenernoĭ geologii],
Plotnikov, N.I., ed, Moscow, Nedra, 1972, 295p. (Pertinent p.203-226), In Russian. 168 refs.
DLC TN269.M468
Geophysical surveys, Hydrogeology, Engineering geology, Permafrost distribution, Permafrost structure, Permafrost hydrology, Suprapermafrost ground water, Subpermafrost ground water.

33-1290
Mechanization of mining processes at the "Severnyĭ" quarry of the Chasov-IArskiĭ fire clay deposit. [Mekhanizatsiia gornykh rabot na kar'ere "Severnyĭ" Chasov-IArskogo mestorozhdeniia ogneupornoĭ gliny],
Garmash, N.Z., et al, Voprosy razrabotki nerudnykh i rudnykh mestorozhdeniĭ (Mining metallic and nonmetallic ore deposits) edited by N.A. Garmash, Moscow, Nedra, 1972, p.82-89, In Russian. 1 ref.
Maksimenko, A.IA., Khar'kovskiĭ, V.IA.
DLC TN275.1V58
Clays, Mining, Excavating equipment, Frozen ground.

33-1291
Peculiarities of cutting frozen and thawed fire clay. [Nekotorye osobennosti rezaniia talot i merzloĭ ogneupornoĭ gliny],
Moiseenko, V.G., et al. Voprosy razrabotki nerudnykh i rudnykh mestorozhdeniĭ (Mining metallic and nonmetallic ore deposits) edited by N.Z. Garmash, Moscow, Nedra, 1972, p.125-130, In Russian. 3 refs.
Seroshtan, V.I.
DLC TN275.A1V58
Clay soils, Frozen fines, Earthwork, Excavation.

33-1292
Results of magnetotelluric surveys in the West Siberian arctic. [O rezul'tatkh rabot metodom MTP v Zapadno-Sibirskom Zapoliar'e],
Kopelev, IU.S., Elektromagnitnoe zondirovanie i magnito-telluricheskie metody razvedki (Electromagnetic sounding and magnetotelluric surveys) edited by B.M. IAnovskiĭ, Leningrad, Universitet, 1963, p.149-151, In Russian.
DLC TN269.K63
Magnetic surveys, Geophysical surveys, Polar regions.

33-1293
Seasonal and weather-related dynamics of phytomass in subarctic tundra. [Sezonnaia i pogodovaia dinamika fitomassy v subarkticheskoĭ tundre],
Andreev, V.N., et al, Novosibirsk, Nauka, 1978, 191p., In Russian. Refs. p.184-190.
Arctic vegetation, Tundra vegetation, Biomass, Tundra soils, Plant ecology, Plant physiology, Soil chemistry, Soil formation, Research projects.

33-1294
Moraines of probable Miocene age, Dry Valleys, Antarctica.
Claridge, G.G.C., et al, *New Zealand antarctic record,* 1978, 1(2), p.1-5, 3 refs.
Campbell, I.B.
Moraines, Glacial deposits, Glacial geology, Soil surveys.
Recent investigations of old moraine deposits found at the mouths of all valleys between Tyrol and Niebelungen Valleys indicate a pressured ice advance westward up the Wright Valley between the time the valley was first cut during the mid-Miocene times and the Wright Upper IV episode which occurred more than 3.7 m.y.a. Features of the dry valleys displaying evidence of this very early ice advance are cited. The presence of 1300 m of ice moving in a westerly direction in the Wright

Valley implies a great depth of grounded ice in the Ross Sea associated with a low sea level during the late Miocene-early Pliocene times.

33-1295
Nature of the soil of Mars: evidence from Antarctica.
Campbell, I.B., et al, *New Zealand antarctic record,* 1978, 1(2), p.6-9, 8 refs.
Claridge, G.G.C.
Mars (planet), Soil surveys, Clay minerals, Soil moisture.
Based on observations of the Martian surface and similarities recognized between Martian soils and the older soils of Antarctica, it is concluded that the soils on Mars have been formed through long-continued weathering of basic igneous rocks, and that they consist of a mixture of coarse and fine material to a depth of several meters, of which all except the upper meter is ice-cemented. Weathering has caused exposed surfaces of all rocks to be covered with a film of iron oxides, clay minerals and other weathering products. The clay content of the Martian surface is greater than that of even the most weathered antarctic soils.

33-1296
Aluminium corrosion assessment in Antarctica.
Fahy, F.W., *New Zealand antarctic record,* 1978, 1(2), p.20-25, 5 refs.
Aluminum, Corrosion.
In order to develop cost-effective ways of protecting architectural aluminum against pollution-induced corrosion, racks of aluminum coupons have been mounted in sites widely varying in climate, i.e., New Guinea, Scott Base and Arrival Heights. The coupon material mounting system and anodizing process are briefly described, and weight changes of the coupons during atmospheric exposure at the various sites are illustrated.

33-1297
Concreting in Antarctica.
Varcoe, G.E., *New Zealand antarctic record,* 1978, 1(2), p.26-30.
Winter concreting, Concrete construction, Cold weather construction, Permafrost, Cold weather tests.
Tests of trial mixes of concrete aggregate to be used in construction at Scott Base indicated that difficulty would be experienced in making a workable concrete mix with the "red" or No.1 aggregate, but that satisfactory concrete could be made with the "black" aggregate (No.2). However, both aggregates will require a high cement content. Methods are outlined for supplying cement to Scott Base, supplying and testing aggregate, supplying and heating water, heating and drying aggregate, mixing, insulating aggregate from permafrost, and keeping placed concrete from freezing.

33-1298
Sea ice organisms and their importance to the antarctic ecosystem (Review).
Bradford, J.M., *New Zealand antarctic record,* 1978, 1(2), p.43-50, 29 refs.
Cryobiology, Microbiology.
An attempt is made to bring together existing knowledge on ice communities and show how the microscopic plant community develops in the ice, the kinds of organisms (animal and plant) which contribute to the community, and their importance to the antarctic ecosystem. Living microalgae are incorporated continuously into the underside of the annual sea ice during its progressive formation. Different species of diatoms dominate the autumn and spring communities: *Nitzschia, Fragilariopsis* and flagellates are found in the autumn and into winter, whereas *Peridinium* appears in Aug. and *Amphiprora, Stephanopyxis, Nitzschia* and *Navicula* begin to increase between Oct. and Nov. According to Andriashev (1968) there is a strict ice fauna which lives at least temporarily in the ice and a sub-ice fauna whose members never enter directly into the loose ice, but are to some degree in trophic connection with the ice community. The ice fauna may consist of polychaete worms, copepods, amphipods, fingerlings of the fish *Trematomus borchgrevinki,* ciliates, and juveniles of the foram *Globigerina.* The sub-ice fauna consists of adult *Trematomus borchgrevinki,* the krill *Euphausia crystallorophias,* and at some times of the year *E. superba.*

33-1299
United States Arctic policy.
Smith, B.D., Oceans policy study, 1:1, Charlottesville, University of Virginia, Center for Oceans Law and Policy, Jan. 1978, 40p., Numerous refs. passim.
Environments, Environmental impact, Arctic climate, Pollution, Crude oil, Natural gas, Minerals.

33-1300
Permanent flow of a non-linear viscous fluid (Glen's body) around a perfectly smooth sphere. [Ecoulement permanent d'un fluide visqueux non linéaire (corps de Glen) autour d'une sphère parfaitement lisse],
Lliboutry, L., et al, *Annales de géophysique,* Apr.-June 1978, 34(2), p.133-146, In French with English summary. 14 refs.
Ritz, C.
Glacier flow, Viscous flow, Rheology, Stresses.

33-1301
Sliding of a glacier over a plane with scattered heimspheric obstacles. [Glissement d'un glacier sur un plan parsemé d'obstacles hémisphériques],
Lliboutry, L., *Annales de géophysique,* Apr.-June 1978, 34(2), p.147-162, In French with English summary. 22 refs.
Glacier movement, Glacier flow, Plastic flow, Sliding, Viscous flow, Geothermal thawing, Glacier friction, Seasonal variations, Rheology.

33-1302
Consolidation of thawing soils.
Nixon, J.F., Edmonton, University of Alberta, 1973, 300p., Canadian theses on microfiche, No.17639, Ph.D. thesis. Refs. p.253-256.
Permafrost thermal properties, Ground thawing, Permafrost heat transfer, Freeze thaw cycles, Frozen ground settling, Stresses, Hot oil lines, Settlement (Structural), Soil mechanics.

33-1303
Eleven year chronicle of one of the world's most gigantic icebergs.
McClain, E.P., *Mariners weather log,* Sep. 1978, 22(5), p.328-333, 18 refs.
Icebergs, Sea ice distribution, Ice conditions, Drift, Photointerpretation, Spacecraft.
Data on satellite-determined positions of the Trolltunga giant iceberg during 1967 through 1978 are reported. The iceberg was formed in 1967 from the Trolltunga ice tongue at 69.5S and 1W, and was named after its origin. Chronology and dimensions of the gigantic iceberg are tabulated. The amount of melting, average speed of the iceberg along the ocean currents and sea water temperature are discussed in the context of utilizing icebergs as a source of fresh water.

33-1304
Evaluation of levels of Pb, V, Cd, Zn and Cu in the snow of Mt. Blanc during the last 25 years.
Briat, M., International Colloquium on Polluted Atmospheres, 13th, Paris, France, April 25-28, 1978. Proceedings. Edited by M.M. Benarie, Studies in environmental science, Vol.1, Amsterdam, The Netherlands, Elsevier Scientific Publishing Co., 1978, p.225-228, 10 refs.
Snow composition, Chemical analysis, Pollution.
For evaluating the influence of pollution on the atmosphere in temperate regions, samples from a snow core covering the period 1948-1974 and situated at the 4250 m level of the Mt. Blanc massif were analyzed for chemical composition. All the elements analyzed, except Cl, which is produced primarily by marine sources, are mostly of continental origin and can be explained as such. However, levels of Pb, V and Cd have increased up to a net factor of 2 since 1950, which parallels increased production of gasoline additives (Pb), increased use of heavy oils (V) and increased consumption of gasoline (Cd). Concentration of chemical elements in the snow of Mt. Blanc is compared to that of Antarctica, Greenland and Gt. Britain.

33-1305
Ice loads on bridge piers.
Watts, F.J., et al, *Public roads,* Sep. 1978, 42(2), p.63-70, 11 refs. For this report in full see 32-3862.
Podolny, W., Jr.
Ice loads, Ice pressure, Ice strength, River ice, Ice jams, Piers, Ice solid interface.

33-1306
Recent evolution of strong acidity of snow at Mt. Blanc.
Delmas, R., et al, International Colloquium on Polluted Atmospheres, 13th, Paris, France, April 25-28, 1978. Proceedings. Edited by M.M. Benarie, Studies in environmental science, Vol.1, Amsterdam, The Netherlands, Elsevier Scientific Publishing Co., 1978, p.233-237, 12 refs.
Aristarain, A.
Snow composition, Acidity, Pollution, Chemical reactions, Sulfur oxide.

33-1307
Potentiometric microdetermination of sulphate ions. [Microdosage potentiométrique de l'ion sulfate],
Delmas, R., *Mikrochimica acta (Wien),* 1978, Vol.1, p.219-228, In French with German and English summaries. 13 refs.
Snow recrystallization, Snowmelt, Chemical analysis, Ions, Microanalysis.

33-1308
Drift ice features in the Jamésie and Hudson areas, Subarctic Quebec. [Le glaciel en Jamésie et en Hudsonie, Québec subarctique],
Dionne, J.C., *Géographie physique du Quaternaire,* 1978, 32(1), p.3-70, In French. Refs. p.29-33.
Drift, Glacial deposits, Coastal topographic features, Sediments, Glacial erosion.

33-1309
Calculation of surface temperature and ice accretion rate in a mixed water droplet/ice crystal cloud.
Cansdale, J.T., et al, *Gt. Britain. Royal Aircraft Establishment. Technical report,* June 1977, No.77090, 24p. + 6p. of figures, 17 refs.
McNaughtan, I.I.
Ice accretion, Ice crystal adhesion, Surface temperature, Cloud droplets, Supercooled clouds, Cloud physics, Analysis (mathematics).

33-1310
Roof-snow behavior and ice-dam prevention in residential housing.
Grange, H.L., et al, Extension bulletin, 399-1976, U.S. Dept. of Agriculture, [1976], 19p., 25 refs.
Hendricks, L.T.
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Engineering geology, Soil mechanics, Clay soils, Thermal stresses, Deformation, Slope processes, Slope stability, Soil stabilization, Cements.

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Clays, Clay minerals, Bearing strength, Magnetic properties, Molecular structure.

33-1314
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Clay soils, Clay minerals, Clays, Bearing strength, Porosity, Ground water, Phase transformations.

33-1315
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Clay soils, Clay minerals, Soil moisture migration, Settlement (structural).

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Slope processes, Landslides, Slope stability, Soil moisture migration, Soil temperature, Earthquakes.

33-1317
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Slope processes, Models, Landslides, Slope stability, Clay soils, Loams.

33-1318
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Mamaev, IU.A.
Slope processes, Slope stability, Landslides, Models.

33-1319
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Engineering geology, Maps, Permafrost distribution, Active layer thickness, Discontinuous permafrost, Permafrost hydrology.

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Rocks, Crack propagation, Cements, Mortars, Hydraulic structures, Foundations.

33-1321
Sorption properties of sandstones as related to silicate solution and its role in the injection process. [Sorbtsionnaia sposobnost' peschanykh porod po otnosheniiu silikatnomu rastvoru i ee rol' v in"ektsionnom protsesse]
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Soil stabilization, Sands, Cements.

33-1322
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Soil stabilization, Cements, Soil composition, Soil chemistry, Electric power plants, Ashes.

33-1323
Studying texture formation during the process of clay soil stabilization with oil-shale bases. [Issledovanie protsessov strukturoobrazovaniia pri ukreplenii glinistykh gruntov aktivnoĭ zoloĭ goriuchikh slantsev]
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Mymrin, V.A.
Frost resistance, Soil stabilization, Clay soils, Freeze thaw cycles, Cements, Waste disposal, Ashes.

33-1325
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Clay soils, Clay minerals, Soil stabilization, Thermoelectric effects, Electric heating.

33-1326
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Clay soils, Soil stabilization, Electroosmosis.

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Sea ice, Ice air interface, Heat transfer, Air temperature, Ice temperature, Thermal conductivity, Solar radiation, Mathematical models, Computer applications, Arctic Ocean.

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DLC TH443.M6
Damage, Residential buildings, Industrial buildings, Large panel buildings, Prefabrication, Thermal stresses, Settlement (structural), Construction materials, Cold weather construction, Failure.

33-1329
State of stress and deformations of large block buildings caused by thermal stresses, humidity and settlement. [Napriazhennoe sostoianie i povrezhdeniia krupnoblochnykh zdaniĭ pri temperaturno-vlazhnostnykh vozdeĭstviiakh i usadke]
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DLC TH443.M6
Buildings, Foundations, Walls, Concretes, Thermal stresses, Design, Settlement (structural).

33-1330
Failure of macroporous and slag concretes under severe climatic conditions and repair techniques. [Povrezhdenie krupnoporistogo i shlakovogo betona v surovykh klimaticheskikh usloviiakh i metody ego vosstanovleniia]
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Tsitron, M.F.
DLC TH443.M6
Winter maintenance, Residential buildings, Construction materials, Frost resistance, Frost shattering, Cold weather performance, USSR—Kola Peninsula.

33-1331
Effect of temporary reinforcement on the bearing strength of structures built in freezing weather. [Issledovanie vliianiia vremennykh kreplenii na nesushchuiu sposobnost' konstruktsiĭ iz zimneĭ kladki]
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Kasimova, S.G.
DLC TH443.M6
Buildings, Bricks, Mortars, Frost resistance, Cold weather construction.

33-1332
Technical and economic effectiveness of building tall brick buildings in freezing weather without heating. [Tekhniko-ekonomicheskaia effektivnost' besprogrevnogo metoda stroitel'stva zimoĭ kirpichnykh zdaniĭ povyshennoĭ etazhnosti]
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Angarova, V.L.
DLC TH443.M6
Residential buildings, Bricks, Mortars, Cold weather construction.

33-1333
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Natakhin, V.G.
DLC TH443.M6
Residential buildings, Bricks, Mortars, Cold weather construction.

33-1334
Possibilities of building tall concrete buildings in freezing weather without heating. [Vozmozhnosti besprogrevnogo vozvedeniia betonnykh konstruktsiĭ vysokikh zdaniĭ zimoĭ]
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Gorshkov, IU.K.
DLC TH443.M6
Concrete structures, Buildings, Winter concreting, Concrete freezing, Large panel buildings, Mortars, Frost resistance.

33-1335
Erecting light-concrete walls in freezing weather without heating. [Osobennosti vozvedeniia legkobetonnykh sten v zimnikh usloviiakh bez progreva]
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DLC TH443.M6
Concrete structures, Walls, Winter concreting.

33-1336
Securing the uniformity of winter brick laying without heating, using potash-containing mortars. [Obespechenie monolitnosti zimneĭ kirpichnoĭ kladki, vozvodimoĭ bez obogreva na litom rastvore s dobavkoĭ potasha]
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Sokolov, G.K.
DLC TH443.M6
Buildings, Bricks, Cold weather construction, Mortars, Antifreezes.

33-1337
Using puzzolana and slag-portland cements, with potash and sodium nitrite admixtures in mortars and concretes, for winter construction of brick and large-panel buildings without heating. [Ob ispol'zovanii putstsolanovykh i shlakoportlandtsementov v rastvorakh i betonakh s dobavkami potasha i nitrita natriia dlia zimnego besprogrevnogo stroitel'stva kamennykh i krupnopanel'nykh zdaniĭ]
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DLC TH443.M6
Concrete structures, Cements, Concrete admixtures, Antifreezes, Winter concreting.

33-1338
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Puzyrev, IU.A., Koketkina, A.I.
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Concretes, Mortars, Winter concreting, Concrete admixtures, Antifreezes.

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Sea ice distribution, Ice conditions, Meteorological factors, Seasonal variations, Degree days, Remote sensing, Beaufort Sea.

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Meetings, Glacial geology, Glacial till, Soil science, Minerals.

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Glacial till, Geologic structures, Particle size distribution, Freeze thaw cycles.

33-1343
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Inter-university Geological Congress, 21st, University of Birmingham, 1974, Liverpool, Seel House Press, 1975, 320p., Numerous refs. For selected papers see 33-1344 and 33-1345.
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DLC QE697.I48 1974
Meetings, Ice age theory, Pleistocene, Glacial geology, Climatic changes.

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Subglacial investigations, Glacial till, Sedimentation, Suspended sediments.

33-1345
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Glacial deposits, Sedimentation, Glacial geology, Terminology.

33-1346
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Deuterium oxide ice, Amorphous ice, Ice composition, Molecular structure.

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Amorphous ice, Chemical reactions, Molecular structure, Infrared spectroscopy.

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Amorphous ice, Chemical reactions, Molecular structure, Infrared spectroscopy.

33-1349
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Palazzo, A.J., *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-20, 11p., ADA-061 878, 17 refs.
Waste disposal, Sewage disposal, Grasses, Growth, Chemical composition.
A greenhouse study was conducted to determine the effects of wastewater and sewage applications on the growth and chemical composition of two turfgrass mixtures. A mixture of tall fescue and annual ryegrass was compared to a mixture of Kentucky bluegrass, red fescue and annual ryegrass. The mixtures were grown in pots of Charlton silt loam in a greenhouse. Prior to seeding, soil in some pots was amended with sludge at rates of 45 or 90 g/pot. Commercial fertilizer supplying N, P, and K was incorporated with soil in pots designated as controls. Treated municipal wastewater was applied on unamended and sludge-amended soil at rates of 5 or 10 cm per week. Wastewater and sludge treatment increased yields, and total uptake of N, P, K, Zn, Cd, P, Cu, and Ni by the turfgrasses differed by treatment. The two grass mixtures were similar with regard to yields and composition. Larger yields corresponded to greater plant uptake of N, P, K, and metals.

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Agriculture, Economic development, Permafrost.

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Buildings, Orientation, Wind factors, Snowdrifts, Solar radiation, Subarctic climate, Climatic factors.

33-1353
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Walker, E.R.
Salinity, Water temperature, Electrical resistivity, Conductivity, Analysis (mathematics), Water pressure.

33-1354
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Sea ice, Oceanography, Submarine permafrost, Pollution, Environmental impact, Ecology, Research projects, United States—Alaska—Continental Shelf, Chukchi Sea, Beaufort Sea.

33-1355
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Barry, R.G., ed.
Sea ice distribution, Ice mechanics, Ice composition, Ice conditions, Seasonal variations, Drift, Oil spills, Models.

33-1356
Physical oceanography and meteorology.
Aagaard, K., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.56-100, Refs. p.97-100.
Oceanography, Ice conditions, Wind (meteorology), Ocean currents, Tides, Oil spills, Storms.

33-1357
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Barnes, P.W., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.101-133, 32 refs.
Hopkins, D.M., ed.
Submarine permafrost, Bottom sediment, Sediment transport, Seismic surveys, Coastal topographic features, Shoreline modification, Sea ice, United States—Alaska—Continental Shelf.

33-1358
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Lowry, L., ed.
Oil spills, Marine biology, Animals, Environmental impact, Pollution, Ecology.

33-1359
Marine biota (plankton/benthos/fish).
Carey, A.G., Jr., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.174-237, Refs. p.232-237.
Marine biology, Ecology, Plankton, Beaufort Sea, Chukchi Sea.

33-1360
Chemistry and microbiology.
Atlas, R., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.238-249, 24 refs.
Chemical composition, Microbiology, Marine biology, Ecosystems, Sea water, Beaufort Sea, Chukchi Sea.

33-1361
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Connors, P., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.253-267, 16 refs.
Ecology, Plankton, Microbiology, Fast ice, Subglacial observations, Algae, Coastal topographic features, Human factors, Pollution.

33-1362
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Burns, J.J., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.288-320, Refs. p.318-320.
Ecology, Environmental impact, Oil spills, Pack ice, Impurities, Beaufort Sea.

33-1363
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Hopkins, D.M., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.321-334, 16 refs.
Mining, Artificial islands, Gravel, Environmental impact, Construction, Offshore drilling, Offshore land forms, Roads, Human factors, Beaufort Sea.

33-1364
Environmental hazards to offshore operations.
Weeks, W.F., ed, Outer continental shelf environmental assessment program; interim synthesis report: Beaufort/Chukchi, Boulder, Colorado, Environmental Research Laboratories, Aug. 1978, p.335-362.
Offshore structures, Environmental impact, Sea ice distribution, Ice mechanics, Oceanography, Offshore drilling, Petroleum transportation.

33-1365
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Meetings, Research projects, Sea ice, Dynamic properties, Remote sensing, Meteorology, Oceanography.

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Research projects, AIDJEX.

33-1367
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Ice models, Remote sensing, LANDSAT, Strain tests, Drift.

33-1368
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33-1369
Scatterometer and imaging radar results obtained over Big Bear, AIDJEX 1975.
Ramseier, R.O., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.30-39, 12 refs.
Gray, L., Campbell, W.J.
Sea ice, Radar echoes, Acoustic scattering, Backscattering.

33-1370
Review of AIDJEX modeling.
Coon, M.D., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.40-55, 41 refs.
Sea ice, Ice models, Ice cover thickness, Drift, Ice physics, Ice mechanics.

33-1371
Perspective of the time-dependent response of the AIDJEX model.
Colony, R., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.56-64, 10 refs.
Rothrock, D.
Sea ice, Ice mechanics, Ice models, Strains, Stresses.

33-1372
Estimates of the regional heat and mass balance of the ice cover in the central Arctic.
Maykut, G.A., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.65-74, 10 refs.
Pack ice, Heat balance, Mass balance, Ice models, Heat transfer, Solar radiation.

33-1373
Simulation of the nearshore winter ice dynamics in the Beaufort Sea.
Pritchard, R.S., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.75-84, 13 refs.
Pack ice, Drift, Wind factors, Stresses, Ice models, Environment simulation.

33-1374
Range of influence of boundary parameters in the AIDJEX model.
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Thomas, D.R.
Sea ice, Ice models, Boundary value problems, Ice mechanics.

33-1375
Testing pack ice constitutive laws with stress divergence measurements.
Rothrock, D.A., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.95-104, 4 refs.
Colony, R., Thorndike, A.S.
Pack ice, Mathematical models, Ice mechanics, Ice physics.

33-1376
AIDJEX model response to axisymmetric loadings.
Schwaegler, R.T., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.105-114, 16 refs.
Pritchard, R.S.
Pack ice, Ice models, Atmospheric pressure, Ice deformation.

33-1377
Tests of the ice thickness distribution theory.
Thorndike, A.S., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.115-121, 10 refs.
Sea ice, Ice models, Ice cover thickness, Distribution.

33-1378
Large-scale ice motion in the Beaufort Sea during AIDJEX, April 1975-April 1976.
Thorndike, A.S., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.122-131, 10 refs.
Colony, R.
Sea ice, Drift, Strains.

33-1379
Geostrophic wind calculations for AIDJEX.
Albright, M., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.133-141, 7 refs.
Sea ice, Ice models, Wind pressure, Atmospheric pressure.

33-1380
Drag coefficients at AIDJEX from sonic anemometer measurements.
Banke, E.G., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.142-152, 8 refs.
Smith, S.D., Anderson, R.J.
Pack ice, Wind pressure, Measurement, Pressure ridges, Coefficients.

33-1381
Planetary boundary layer modeling for AIDJEX.
Brown, R.A., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.153-163, 23 refs.
Ice air interface, Boundary layer, Models, Surface roughness, Turbulent flow.

33-1382
Boundary layer height in air stress measurement.
Carsey, F.D., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.164-172, 16 refs.
Ice air interface, Boundary layer, Height finding, Ice surface, Surface roughness, Wind factors.

33-1383
Air stress measurements from an aircraft.
Katz, D.I., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.173-180, 6 refs.
Aerial reconnaissance, Shear stress, Wind (meteorology), Pack ice.

33-1384
Surface-based air stress measurements made during AIDJEX.
Leavitt, E., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.181-189, 11 refs.
Shear stress, Wind (meteorology), Friction, Coefficients, Pack ice.

33-1385
One year of barometry on the frozen ocean.
Martin, P., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.190-198, 5 refs.
Clarke, M., Short, D., Albright, M.
Measuring instruments, Barometers, Atmospheric pressure, Remote sensing, Pack ice.

33-1386
Review of the AIDJEX oceanographic program.
Hunkins, K., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.199-211, 20 refs.
Oceanographic surveys, Water temperature, Salinity, Ice water interface, Ocean currents.

33-1387
Salinity and temperature measurements from the AIDJEX manned array.
Hunkins, K., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.212-222, 6 refs.
Bauer, E., Amos, A.
Oceanographic surveys, Salinity, Water temperature, Subglacial observations, Pack ice.

33-1388
Ocean current profiles from the AIDJEX manned array.
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Manley, T.
Ocean currents, Subglacial observations, Data processing, Wind factors.

33-1389
Water drag coefficient at AIDJEX, Station Caribou.
Langleben, M.P., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.233-239, 10 refs.
Ocean currents, Ice water interface, Ice friction, Boundary value problems, Ultrasonic tests.

33-1390
Analysis of pack ice drift in summer.
McPhee, M.G., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.240-250, 7 refs.
Pack ice, Drift, Boundary value problems.

33-1391
Ice-water stress at Station Snow Bird, AIDJEX.
Pounder, E.R., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.1, Seattle, University of Washington, 1977, p.251-259, 4 refs.
LeBlanc, A.
Oceanographic surveys, Stresses, Sea water, Ice water interface, Ocean currents.

33-1392
Decay patterns of land-fast sea ice in Canada and Alaska.
Bilello, M.A., MP 1161, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.1-10, 11 refs.
Sea ice, Fast ice, Ice cover thickness, Ice deterioration, Meteorological factors.
Weekly measurements of the thickness of land-fast sea ice made over a period of 10 to 15 years at a number of coastal locations in Canada and Alaska were analyzed. That portion of the data relating to maximum ice thickness and decay (i.e., the decrease in ice thickness) are presented and examined. Many meteorological and marine factors affect the decay process. This study investigates the effects of two important weather elements: air temperature and solar radiation. Complete and reliable air temperature data for each station made it possible to analyze the relationship between accumulated thawing degree-days (ATDD) and sea ice ablation. The relationship between ice decrease and daily accumulated solar radiation was investigated; the results were comparable to those derived when ATDD was used as the dependent variable. Other factors affecting ice ablation and breakup, such as snow-ice formation, snow cover depth, and wind, are also discussed in the study.

33-1393
Microwave scanning the Arctic pack ice.
Ketchum, R.D., Jr., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.11-22, 6 refs.
Lohanick, A.W.
Pack ice, Ice conditions, Infrared radiation, Microwaves.

33-1394
Nearshore ice motion near Prudhoe Bay, Alaska.
Tucker, W.B., et al, MP 1162, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.23-31, 7 refs.
Weeks, W.F., Kovacs, A., Gow, A.J.
Sea ice, Drift, Ice temperature, Thermal expansion.
Shorefast and nearshore pack ice motions in the vicinity of Prudhoe Bay, Alaska, have been monitored for the spring seasons (March-June) of 1976 and 1977. From the base camp on Narwhal Island, a barrier island 25 km northeast of Prudhoe Bay, a ranging laser was used to measure distances to targets located on the fast ice within a 7 km radius of the island. To assess pack ice motions, a radar transponder system with tracking stations located on Narwhal and Cross Islands was used to monitor the positions of transponders placed on the pack ice as far as 37 km northeast of the islands. These results suggest that gyre movement or slippage of the nearshore pack ice in this area apparently does not begin until early to mid-summer. The

pack ice in this area responds slowly, and only weakly to local winds. The mesoscale displacements that occurred took place only after several days of consistent offshore winds. This indicates that a significant shoreward stress originating in the more distant pack heavily influences the dynamics of this nearshore area.

33-1395
Characterization of the surface roughness and floe geometry of the sea ice over the continental shelves of the Beaufort and Chukchi Seas.
Weeks, W.F., et al, MP 1163, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.32-41, 9 refs.
Tucker, W.B., Frank, M., Fungcharoen, S.
Sea ice distribution, Surface roughness, Side looking radar, Pressure ridges.
This paper reports on observations primarily made during the late winter and early spring of 1976 when the ice cover was at its maximum extent, and very few leads were observed. The primary sensors used were a laser profilometer and an X-band side-looking airborne radar (SLAR) system. The heaviest ridging was found at Barter Island and there was a general decrease in the number of ridges as one moved west into the Chukchi Sea. There was no strong variation in the mean ridge height along the coast. There was no systematic areal variation in mean ridge height normal to the coast. There was also no correlation between mean ridge height and the number of ridges per km as has been reported by previous investigators. An analysis was also made of the probability of encountering very large ridges. SLAR imagery gives the size distribution of multiyear ice floes within the nearshore ice pack, and the variation in the areal percentage of deformed ice as a function of distance from the coast. This latter parameter showed a steady decrease as the distance north of the coast increases.

33-1396
Comparison of sonar and laser profiles along corresponding tracks in the Arctic Ocean.
Wadhams, P., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.43-44, Extended abstract. Full paper as manuscript only. 10 leaves. 15 refs.
Sea ice, Ice bottom surface, Pressure ridges, Ice acoustics, Aerial reconnaissance, Submarines.

33-1397
Modeling pack ice as a viscous-plastic continuum: some preliminary results.
Hibler, W.D., III, MP 1164, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.46-55, 21 refs.
Pack ice, Viscous flow, Plastic flow, Ice deformation, Ice models, Mathematical models.
A dynamic-thermodynamic model of pack ice is presented, which treats the ice as a nonlinear viscous continuum characterized by both bulk and shear viscosities and a pressure term with the viscosities being functions of the deformation rate and the pressure. The pressure is parameterized as a function of the compactness and mean thickness of the ice. This formulation allows the viscous continuum approach to be retained while allowing the system to deform in a plastic manner. The model is formulated in a fixed Eulerian grid, and the dynamical equations are coupled to continuity equations for compactness and mean ice thickness which include thermodynamic source and sink terms. In the numerical scheme the dynamical equations of motion, in finite difference form, are integrated implicitly and the ice thickness equations are integrated explicitly. The model is applied to the Arctic Basin and integrated at one-day steps for up to eight years in order to obtain steady state results for both ice thickness and drift. Two cases are examined.

33-1398
Compactness and thickness effects on drift of Arctic pack ice based on two-phase flow model.
Pai, S.I., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.57-66, 11 refs.
Das, M.M., Li, H.
Fluid flow, Pack ice, Dynamic properties, Mathematical models, Ice cover thickness.

33-1399
Finite element formulation of a sea ice drift model.
Sodhi, D.S., et al, MP 1165, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.67-76, 10 refs.
Hibler, W.D., III.
Sea ice, Drift, Mathematical models.
The complete boundary value problem of a linear viscous sea ice drift model is presented, using the finite element method; and the formulation includes the inertial force term in the governing equation of motion. The results of the computations of the steady-state ice velocities in the Arctic Ocean are presented, using mean seasonal geostrophic wind data and available current information. The effect of varying boundary conditions and the viscosity parameters is examined. On a much smaller scale, this model has been applied to the study of non-steady drift of pack ice through the Strait of Belle Isle (between Newfoundland and Labrador) where strong tidal streams and ocean currents move the pack ice back and forth. Using idealized sinusoidal variations of the tidal streams, it is found that the time lag between the water and the ice velocities is related to the viscosity parameters, which indicates that the ice is not drifting freely; and the boundaries affect the time constant of the simplified first order model of the ice drift through the Strait.

33-1400
Long range ice forecasting method for the north coast of Alaska.
Barnett, D.G., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.77-86, 2 refs.
Ice forecasting, Long range forecasting, Meteorological factors.

33-1401
Techniques for predicting sea ice.
Neralla, V.R., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.87-97, 16 refs.
Liu, W.S., Venkatesh, S.
Sea ice, Ice forecasting, Drift, Mathematical models.

33-1402
Empirical orthogonal functions and the statistical predictability of sea ice extent.
Walsh, J.E., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.98-107, 14 refs.
Ice forecasting, Sea ice, Long range forecasting, Mathematical models.

33-1403
Operational determination of wind stress on the Arctic pack ice.
Denner, W.W., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.108-119, 11 refs.
Ashim, L.D.
Sea ice, Pack ice, Wind factors, Ice forecasting, Drift, Mathematical models.

33-1404
Effect of sea ice extent on the climatology of the GISS general circulation model.
Herman, G.F., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, 16 leaves, Full paper as manuscript only. 16 leaves. 13 refs.
Atmospheric circulation, Climatology, Sea ice distribution, Ice cover effect.

33-1405
Seasonal variability of Antarctic sea ice extent: its numerical modeling.
Kulakov, I.IU., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.121-127, 6 refs.
Maslovskiĭ, M.I., Timokhov, L.A.
Sea ice, Seasonal variations, Mathematical models, Meteorological factors.
Thermal factors should be considered in calculations of the antarctic ice edge position to get a good agreement between calculated results and observed positions. Effects of the dynamics of antarctic sea ice are also significant. The mechanism involves concentration changes which, in turn, affect heat fluxes directed towards lateral and bottom ice floe surfaces. The rate of ice melting and freezing in winter is determined by heat balance equations, which also influence the variability of ice concentration. The latter effect on the ice drift speed was not considered. The initial data for the calculations include seasonal climatic data on total radiation, atmospheric pressure, air temperature, and water temperature taken from the Soviet Atlas of the Antarctic. The calculation grid has 1 deg latitudinal step and 5 deg longitudinal step. The results show that consideration of dynamical factors changes the calculated ice edge positions. The largest error of calculations is for the ice edge position in the Weddell Sea. This might be attributed to the insufficient information on heat fluxes coming from the quasi-homogeneous oceanic layer. (Auth.)

33-1406
Summary of a large-scale sea-ice model.
Parkinson, C.L., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.128-136, 15 refs.
Washington, W.M.
Sea ice distribution, Ice mechanics, Mathematical models, Ice heat flux.
A summary is presented of a large-scale numerical model, which has been developed to simulate the annual cycle of sea-ice advance and retreat in both the Arctic and Southern Oceans. The model employs an 8-hour timestep and a rectangular grid with horizontal resolution approximately 190 km. Thermodynamic and dynamic adjustments are calculated sequentially, the thermodynamics being based on energy balances at the top and bottom surfaces of the ice and snow, and the dynamics being based on the following five forces: wind stress, water stress, Coriolis force, the pressure gradient due to the tilting of the sea surface, and internal ice resistance. Although each grid square is allowed only one ice thickness, each square also has a variable percentage of its area assumed ice-free, thus allowing more realistic ocean-atmosphere exchanges. (Auth.)

33-1407
Sea ice and ocean energy balance studies at Mawson, Antarctica.
Allison, I., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.137-146, 11 refs.
Akerman, G.
Sea ice, Heat transfer, Ice heat flux, Polynyas, Heat balance, Antarctica—Mawson Station.
The present program of year round energy flux and oceanic measurements over sea ice and open water near Mawson, Antarctica, is described. The importance of various terms in the energy balance at different times of year, and the application of these results to the parameterization of surface energy exchanges in the sea ice region is under investigation. Particular emphasis is placed on the study of processes over open water and forming sea ice and on the role of oceanic heat flux in the over-all energy balance. Continuation and expansion of the present studies is planned until and during the FGGE. Preliminary results of the studies are presented. Fluxes of radiation and sensible heat over open water are calculated from measurements made during a twenty-day period in February 1977 and are compared with fluxes measured during February 1970. The measurements cover a period when the net energy budget is changing rapidly from one of heat gain by the water to one of heat loss, and during which heat exchange by turbulence is becoming increasingly important as a method of heat loss by the water prior to ice formation. (Auth.)

33-1408
Yield and plastic deformation in ice crushing failure.
Ralston, T.D., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.147-156, 13 refs.
Ice deformation, Plastic deformation, Ice strength, Ice pressure, Offshore structures, Analysis (mathematics).

33-1409
Propagation of flexural gravity waves in sea ice.
Squire, V.A., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.157-166, 12 refs.
Allan, A.J.
Water waves, Wave propagation, Ice sheets, Viscoelasticity, Strain measuring instruments.

33-1410
Prediction of heat, mass, and momentum transfer during laminar forced convective melting of ice in saline water.
Wilson, N.W., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.167-176, 12 refs.
Sarma, T.S.
Heat transfer, Mass transfer, Ice melting, Salt water.

33-1411
Porous pavement.
Thelen, E., et al, Philadelphia, Franklin Institute Press, 1978, 98p., 32 refs.
Howe, L.F.
Pavement bases, Porous materials, Drainage, Soil strength, Ground thawing.

33-1412
Reuse of waste water: impact on water supply planning.
Mangan, G.F., Jr., *International Association of Hydrological Sciences. Bulletin,* June 1978, 23(2), p.235-244, In English with French summary. 8 refs.
Water supply, Urban planning, Water treatment, Waste disposal.

33-1413
Innovations used in pipeline installation under Arctic ice.
Brown, R.J., *Oil and gas journal,* Nov. 20, 1978, 76(47), p.93-94, 96, 101, 104, 109.
Pipe laying, Hydraulic structures, Offshore structures, Sleds, Trenching, Ice cover, Ice islands.

33-1414
Exxon unveils details of ice island construction. *Oil and gas journal,* Nov. 27, 1978, 78(48), p.40, 42.
Ice islands, Artificial ice.

33-1415
Frost resistance of concrete with porous aggregate.
Fagerlund, G., Stockholm, Institute of Technology, Cement and Concrete Research Institute, 1978, 189p., 63 refs.
Concrete aggregates, Porous materials, Frost resistance, Concrete curing, Freeze thaw tests, Cements, Low temperature tests.

33-1416
Influence of the liquid phase in sea ice on the conduction and displacement currents in the 1-100 Mc range. [Vliianie zhidkoĭ fazy v morskikh l'dakh na toki smeshcheniia i provodimosti v oblasti 1-100 MGts],
Tripol'nikov, V.P., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.41-44, In Russian. 4 refs.
Sea ice, Electromagnetic properties, Unfrozen water content, Brines.

33-1417
Space-time temperature variations in the upper layer of the Arctic Ocean. [Prostranstvenno-vremennaia izmenchivost' temperatury verkhnego sloia Severnogo Ledovitogo okeana],
Bogorodskiĭ, A.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.81-85, In Russian.
Gavrilo, V.P., Gusev, A.V., Fedorinchik, L.F.
Water temperature, Surface temperature, Air water interactions, Heat transfer, Ocean currents, Sea ice, Drift, Arctic Ocean.

33-1418
Infrared method of evaluating the influence of cloudy skies on surface temperatures of sea ice. [IK metod otsenki vliianiia oblachnosti na poverkhnostnuiu temperaturu morskogo l'da],
Bogorodskiĭ, V.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.359, p.127-133, In Russian.
Sea ice, Air water interactions, Ice temperature, Surface temperature, Ice air interface, Heat transfer, Infrared reconnaissance.

33-1419
Lithology of glacial deposits. [Litologiia lednikovykh otlozheniĭ],
Rukhina, E.V., Leningrad, Nedra, 1973, 176p., In Russian. 137 refs.
Glacial deposits, Alluvium, Moraines, Glacial erosion, Cryogenic structures, Lithology, Cryogenic processes, Glacial hydrology.

33-1420
Comparison of the radiation and energy balance during the growing season for an arctic and alpine tundra.
LeDrew, E.F., et al, *Arctic and alpine research,* Nov. 1978, 10(4), p.665-678, 32 refs.
Weller, G.
Arctic soils, Alpine tundra, Radiation balance, Heat balance.

33-1421
Effect of spring thaw on microorganisms in an Arctic meadow site.
Nelson, L.M., et al, *Arctic and alpine research,* Nov. 1978, 10(4), p.679-688, 37 refs.
Visser, S.
Tundra vegetation, Soil microbiology, Seasonal freeze thaw, Active layer, Fungi, Bacteria.

33-1422
Proglacial lacustrine sedimentation during winter.
Shaw, J., et al, *Arctic and alpine research,* Nov. 1978, 10(4), p.689-699, 29 refs.
Gilbert, R., Archer, J.J.
Glacial lakes, Sedimentation, Suspended sediments.

33-1423
Recent climatic fluctuations of the Canadian High Arctic and their significance for glaciology.
Bradley, R.S., et al, *Arctic and alpine research,* Nov. 1978, 10(4), p.715-731, 38 refs.
England, J.
Climatic changes, Glacier mass balance, Volcanic ash, Dust.

33-1424
Soil development as an indication of relative age of Quaternary deposits, Baffin Island, N.W.T., Canada.
Birkeland, P.W., *Arctic and alpine research,* Nov. 1978, 10(4), p.733-747, 45 refs.
Soil formation, Quaternary deposits, Soil dating, Arctic soils.

33-1425
Cirque glacier erosion rates and characteristics of neoglacial tills, Pangnirtung Fiord area, Baffin Island, N.W.T., Canada.
Anderson, L.W., *Arctic and alpine research,* Nov. 1978, 10(4), p.749-760, 36 refs.
Cirque glaciers, Glacial erosion, Glacial till.

33-1426
Test of a model of irradiance within vegetation canopies at northern latitudes.
Stoner, W.A., et al, *Arctic and alpine research,* Nov. 1978, 10(4), p.761-767, 25 refs.
Miller, P.C., Miller, P.M.
Solar radiation, Infrared radiation, Reflectance, Forest canopy, Tundra vegetation, Models.

33-1427
Seismic and pressure transducer system for monitoring velocities and impact pressures of snow avalanches.
Salway, A.A., *Arctic and alpine research,* Nov. 1978, 10(4), p.769-774, 8 refs.
Avalanche pressure, Avalanche velocities, Seismic prospecting, Monitors.

33-1428
Growth mechanisms of "Katie's Floeberg".
Barrett, S.A., et al, *Arctic and alpine research,* Nov. 1978, 10(4), p.775-783, 5 refs.
Stringer, W.J.
Pack ice, Icebergs, Ice growth, Remote sensing.

33-1429
Nutrient chemistry of a large, deep lake in subarctic Alaska.
LaPerriere, J.D., et al, *U.S. Environmental Protection Agency. Ecological research report,* Sep. 1978, EPA-600/3-78-088, 128p., Bibliography p.109-114.
Tilsworth, T., Casper, L.A.
Subarctic regions, Lake water, Water chemistry, Nutrient cycle, Thermal regime, Heat balance, Water supply, Waste disposal.

33-1430
Chemical characteristics of snow in the Yellowknife area, N.W.T. 1975.
Hazra, A.K., et al, *Canada. Environmental Protection Service. Surveillance report,* July 1977, EPS-5-NW-77-7, 27p., 6 refs.
Prokopuk, R., Hardin, M.J.
Water supply, Snow composition, Snow impurities, Chemical composition, Air pollution.

33-1431
Probable behaviour and fate of a winter oil spill in the Beaufort Sea.
NORCOR Engineering and Research Limited, Yellowknife, *Canada. Environmental Protection Service. Technology development report,* Aug. 1977, EPS 4-EC-77-5, 111p., In English with French summary. 31 refs.
Oil spills, Ice cover effect, Sea ice, Ice conditions.

33-1432
Frost resistant and chemically stable silica-polymer-concretes on the basis of oligoethylacrylates. [Morozoustoĭchivye i khimicheski stoĭkie silikatobeton-polimery na osnove oligoefirokrilatov],
Bezrukova, T.F., et al, *Energeticheskoe stroitel'stvo,* 1978, No.10, p.3-6, In Russian.
Mal'tsev, V.V., Komlev, V.K.
Concretes, Polymers, Frost resistance, Freeze thaw cycles, Laboratory techniques.

33-1433
Using bolts of strength grade 4.8 and 5.8 in power line construction in the north. [Vozmozhnost' primeneniia boltov klassov prochnosti 4.8 i 5.8 pri sooruzhenii linĭ elektroperedachi v severnykh ulsoviiakh],
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Gavrish, V.S., Mishchik, B.S.
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33-1434
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Electrical grounding, Permafrost.

33-1435
Mineral-wool thermal insulation for hot-water pipelines. [Mineralovatnye sbornye teploizoliatsionnye konstruktsii dlia izoliatsii truboprovodov teplovykh seteĭ],
Prokopovich, V.V., *Energeticheskoe stroitel'stvo,* 1978, No.10, p.56-58, In Russian.
Water supply, Thermal insulation, Pipelines.

33-1436
Allowing for thermophysical properties of artifically salted grounds used in the construction of rocky-earth dams. [Uchet teplofizicheskikh svoĭstv iskusstvenno zasolennykh gruntov pri stroitel'stve kamenno-zemlianykh plotin],
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Loseva, S.G.
Earth dams, Hydraulic structures, Cold weather construction, Frost protection, Antifreezes, Construction materials.

33-1437
Pile supports of high bearing capacity in casing on permafrost of Noril'sk.
Poluektov, V.E., *Soil mechanics and foundation engineering,* Mar.-Apr. 1978, 15(2), p.109-114, Translated from Osnovaniia, fundamenty i mekhanika gruntov. 3 refs.
Pile foundations, Concrete piles, Supports, Permafrost beneath structures, USSR—Noril'sk.

33-1438
Duration of steam thawing of frozen ground.
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Ground thawing, Soil compacting, Artificial thawing, Soil stabilization, Permafrost.

33-1439
Effective method of drilling soil exploration boreholes in frozen ground.
Kovalenko, V.I., *Soil mechanics and foundation engineering,* Mar.-Apr. 1978, 15(2), p.119-121, Translated from Osonvaniia, fundamenty i mekhanika gruntov. 4 refs.
Boreholes, Drilling, Frozen ground.

33-1440
Inflatable structures in the northern Tyumen' region. [Pnevmooporные sooruzheniia na severe Tiumenskoĭ oblasti],
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Lakota, A.M., Karimov, F.A.
Inflatable structures, Permafrost beneath structures, Foundations.

33-1441
Designing thermal insulation for walls in large component construction. [Razvitie uteplitelei dlia ograzhdaiushchikh konstruktsiĭ blochno-komplektnykh ustroĭstv],
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Large unit construction, Walls, Thermal insulation.

33-1442
Calculation of zones of cooling produced by thermopiles in plastic frozen ground. [Raschet zony okhlazhdeniia plastichnomerzlogo grunta termosvaiami],
Petrov, B.G., et al, *Stroitel'stvo truboprovodov,* Oct. 1978, No.10, p.31-32, In Russian.
Semenov, L.P.
Permafrost preservation, Artificial freezing, Thermopiles.

33-1443
Experimental studies of the effect of ice growing on inside walls of water pipelines. [Eksperimental'nye issledovaniia po vozdeĭstviiu vnutritrubnogo l'da na vodoprovodnye truby],
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Water pipelines, Pipeline freezing, Ice formation, Ice growth, Experimental data.

33-1444
Studying thermoinsulative properties of foam plastic insulation for underground thermal mains. [K issledovaniiu teplozashchitnykh svoĭstv penoplastovoĭ izoliatsii podzemnykh teploprovodov],
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Pipelines, Thermal insulation, Cellular plastics, Thermal properties, Measuring instruments.

33-1445
Possible use of aerial photo surveys for the study of ice jams.
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Ice jams, Ice forecasting, Aerial reconnaissance, Ice reporting.

33-1446
Computation of soil freezing depth in the zone of aeration.
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Soil freezing, Frost penetration, Runoff forecasting, Ground water, Soil moisture migration, Flood forecasting.

33-1447
Ecological investigations of yeasts in antarctic soils.
Atlas, R.M., et al, *American Geophysical Union. Antarctic research series,* Nov. 13, 1978, 30(2), Terrestrial biology III. Paper 2, p.27-34, 32 refs.
Di Menna, M.E., Cameron, R.E.
DLC QK615.5.A85
Soil analysis, Soil microbiology, Low temperature research.
Yeasts were identified from antarctic soil samples. *Cryptococcus* and *Aureobasidium* were widely distributed and were found in the dry valleys. Fewer yeast species were identified from antarctic soils than have been reported previously from aquatic antarctic samples. In some antarctic soils yeasts were the dominant microbial populations. Yeasts from antarctic soils have adaptive features that would allow them to grow and survive under harsh antarctic conditions, but we did not identify 'unique' species of yeasts that do not occur in other regions. (Auth.)

33-1448
Water supply and weather modifications through the use of transported icebergs from the Antarctic.
Al Faisal, M., *Desalination,* Mar. 1977, 20(1/2/3), p.415-423, 8 refs.
Water supply, Economic development, Icebergs, Weather modification, Iceberg towing.
Saudi Arabia is engaged in a wide-scale program of seawater desalinization. It is also presently considering the use of Antarctic icebergs as a source of freshwater and as a weather modifier. Suitable icebergs can be found in a zone northeast of the Weddell Sea. Means for locating and inspecting them are described. Furthermore, methods for towing such icebergs from the Antarctic to the Aden Gulf and from the Aden Gulf to any Saudi Arabian Coast are discussed. The necessary steps for protection against melting in transit are also explained. An outline of the various proposed techniques to obtain fresh water from icebergs is given. The considerable cold mass of icebergs is a powerful tool for microclimate improvement, especially on hot coastal plains with a high degree of atmospheric humidity. The lowering of the temperature through fog formation could indeed reduce the costly summer peak demands for water and electricity. Economic projections show that the operating costs of water from icebergs delivered to Saudi Arabia compares favorably with water produced by desalinization. Investments forecasts favor also the iceberg source. (Auth.)

33-1449
Regularities governing snow cover variations during melting in the high-mountain Varzob River Test Basin. {Zakonomernosti v izmeneniĭ stepeni pokrytiia gornogo basseĭna snegom v period ego taianiia (po materialam aerofotos"emok v opytnom vysokogornom basseĭne r. Varzob)},
Abal'ian, T.S., *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1974, Vol.138, p.3-11, In Russian. 7 refs.
River basins, Snow cover distribution, Aerial photography, Snow surveys, Snowmelt, USSR—Varzob River.

33-1450
Calculating the meltwater component of mountain river discharge using the meltaway coefficient (from observations in the high-mountain Varzob River Test Basin). {O raschetakh talogo stoka gornoĭ reki s ispol'zovaniem koeffitsienta staivaniia (po dannym nabliudeniĭ v opytnom vysokogornom basseĭne r. Varzob)},
Abal'ian, T.S., et al, *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1974, Vol.138, p.68-75, In Russian. 11 refs.
Kalachev, A.V., Kanushin, V.P.
River basins, Snowmelt, Snow water equivalent, Runoff, Meltwater, USSR—Varzob River.

33-1451
Recent activity of glaciers of Mount Rainier, Washington.
Sigafoos, R.S., et al, *U.S. Geological Survey. Professional paper,* 1972, No.387-B, 24p. + maps, 21 refs.
Hendricks, E.L.
Moraines, Age determination, Glacial deposits, Paleoclimatology, Glacier movement, Meltwater, Mountain glaciers, United States—Washington—Rainier, Mount.

33-1452
Application of the soil freezing method. {Anwendung des Gefrierverfahrens},
Jessberger, H.L., et al, *Bautechnik,* 1973, No.12, p.414-420, In German. 8 refs.
Nussbaumer, M.
Soil freezing, Tunneling (excavation), Excavation, Artificial freezing, Stresses, Deformation, Construction.

33-1453
On melting icebergs.
Huppert, H.E., et al, *Nature,* Jan. 5, 1978, 271(5640), p.46-48, 5 refs.
Turner, J.S.
Icebergs, Ice melting, Meltwater, Sea water, Salinity.
Relative to the feasibility of towing icebergs and melting them to provide fresh water, it has been conjectured that melt water from a penned iceberg will rise, without much mixing, to the surface, where it can be siphoned off for subsequent use. Neshyba (1977;31-4205 or F-18611) claims that the melt water will have mixed significantly with its salty environment before reaching the surface. It is suggested that both claims may be in error. In the present experiments it is shown that the melt water mixes with a large volume of salty water and spreads out close to the level at which it is produced, and little, if any, rises to the surface. The vital importance of the salinity gradient is stressed.

33-1454
Iceberg sounding by impulse radar.
Rossiter, J.R., et al, *Nature,* Jan. 5, 1978, 271(5640), p.48-50, 8 refs.
Gustajtis, K.A.
Icebergs, Radar echoes, Sounding, Airborne radar.

33-1455
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Air cushion vehicles, Arctic regions, Sea ice, Surface roughness, Engineering, Logistics.

33-1456
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Air cushion vehicles, Snow accumulation, Railroad tracks, Snow removal.

33-1457
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Péwé, T.L., *U.S. Geological Survey. Professional paper,* 1975, No.835, 145p., Bibliography p.122-139.
Quaternary deposits, Geologic structures, Glaciation, Permafrost distribution, Vegetation, Animals.

33-1458
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Alpine tundra, Alpine vegetation, Tundra vegetation, Vegetation patterns.

33-1459
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Williams, L.D., *Palaeogeography, palaeoclimatology, palaeoecology,* Oct. 1978, 25(3), p.199-207, 23 refs.
Snow line, Glaciation, Arctic vegetation, Lichens.

33-1460
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Meetings, Hydrology, Meteorology, Flood forecasting, Snow cover, Lake ice, Measurement.

33-1461
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Adams, W.P., Conference on Hydrometeorology, 2nd, Oct. 1977, Toronto, Canada. Proceedings, Boston, American Meteorological Society, 1977, p.225-230, 8 refs.
Lake ice, Measurement, Ice surveys, Snow cover effect.

33-1462
Modelling ice dissipation in eastern Lake Erie.
Rumer, R.R., Jr., et al, Conference on Hydrometorology, 2nd, Toronto, Canada. Proceedings, Boston, American Meteorological Society, 1977, p.231-238, 11 refs.
Yu, P.M.
Ice models, Ice deterioration, Lake ice, Heat transfer, Ice cover thickness.

33-1463
Effects of forest cover and topography on snow cover in the Nashwaak Experimental Watershed Project.
Dickison, R.B.B., et al, Conference on Hydrometorology, 2nd, Toronto, Canada. Proceedings, Boston, American Meteorological Society, 1977, p.245-250, 11 refs.
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Topographic effects, Forest canopy, Snow cover distribution, Snow depth.

33-1464
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33-1465
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DeWalle, D.R.
Snow water content, Runoff, Snow hydrology, Environment simulation.

33-1466
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Male, D.H.
Snowmelt, Measuring instruments, Heat transfer, Snow cover, Analysis (mathematics).

33-1467
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Power, J.M.
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Forest soils, Taiga soils, Taiga vegetation, Active layer, Biomass, Roots, Mosses, Ecosystems, Plant physiology, Cryogenic soils, Soil profiles.

33-1469
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Taiga soils, Taiga vegetation, Active layer, Solar radiation, Radiation absorption, Mosses.

33-1470
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Taiga soils, Ecosystems, Taiga vegetation, Plant physiology, Biomass, Roots.

33-1471
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Taiga soils, Taiga vegetation, Biomass, Ecosystems, Plant ecology, Solar radiation, Swamps, Podsol.

33-1472
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33-1473
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Taiga soils, Taiga vegetation, Mosses, Biomass.

33-1474
Methods of long range forecasting of dates of ice appearance on rivers of the northwestern USSR. [Metodika dolgosrochnogo prognoza srokov poiavleniia l'da na rekakh Severo-Vostoka SSSR],
Savchenkova, E.I., *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy,* 1977, Vol.186, p.71-77, In Russian. 5 refs.
Ice forecasting, Long range forecasting, Freezeup, River ice, Ice reporting.

33-1475
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Efremova, N.D., et al, *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy,* 1977, Vol.186, p.78-87, In Russian. 5 refs.
Karakash, E.S.
Ice breakup, Ice forecasting, Ice jams, Ice reporting, USSR—Lena River, USSR—Yenisey River.

33-1476
Expanding the term of short range forecasts of ice breakup on rivers of the North European USSR. [O putiakh uvelicheniia zablagovremennosti kratkosrochnogo prognoza vskrytiia rek severa Evropeiskoi territorii SSSR],
Silant'eva, T.P., *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy,* 1977, Vol.186, p.88-92, In Russian. 8 refs.
Ice breakup, Ice forecasting, Ice cover strength, Ice cover thickness, River ice, Analysis (mathematics).

33-1477
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Ice cover thickness, Ice structure, Ice growth, River ice, Analysis (mathematics).

33-1478
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Ice breakup, Runoff forecasting, Ice forecasting, River ice, Analysis (mathematics).

33-1479
Generalization and analysis of experience gained in compiling short range forecasts of date of ice phenomena. [Analiz i obobshchenie opyta sostavleniia kratkosrochnykh prognozov srokov ledovykh iavlenii],
Antipova, E.G., et al, *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy,* 1977, Vol.186, p.103-119, In Russian. 17 refs.
Balashova, I.V.
Ice formation, Ice breakup, Ice forecasting, River ice.

33-1480
Calculating air temperature and humidity over ice cover on rivers and reservoirs during the ice melting period. [Raschet temperatury i vlazhnosti vozdukha nad ledianym pokrovom rek i vodokhranilishch v period ego taianiia],
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Icebound rivers, Ice melting, Air temperature, Humidity, Ice forecasting.

33-1481
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Ice breakup, Ice jams, Aerial reconnaissance, Water level, Flood forecasting, USSR—Lena River.

33-1482
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Solar radiation, Snow cover effect, Radiation balance, Snowmelt, Snow hydrology, Climatic factors, Environments, Subarctic regions.

33-1483
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33-1484
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Supercooled fog, Power line icing, Water content, Cloud droplets, Air temperature, Icing, Equipment.

33-1485
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Equipment, Blowing snow, Snow accumulation, Snowdrifts, Icing, Design, Wind velocity, Protection.

33-1486
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Sea ice, Dynamic loads, Ice loads, Ice pressure, Offshore structures, Ice cover thickness, Freezing rate, Analysis (mathematics), Tests.

33-1487
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Bibliographies, Glaciology, Glaciers, Snow, Ice, Glacial rivers, Glacial hydrology.

33-1488
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Glacier mass balance, Alimentation, Glacier ablation, Mountain glaciers, Ice surface, Ice air interface, Heat transfer, Glacier ice.

33-1489
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Glacier mass balance, Glacier ablation, Glacial hydrology, Ice growth, Alimentation, Ice sublimation, Ice surface, Ice air interface, Heat transfer, Glacier ice.

33-1490
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Glacial erosion, Moraines, Sediment transport, Glacier ice, Distribution.

33-1491
Role of geothermal and hydrological conditions in glacier surges. [O roli geotermicheskikh i gidrologicheskikh uslovii v podvizhkakh lednikov],
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Mountain glaciers, Glacier movement, Glacier surges, Glacial hydrology, Ice temperature, Glacier ablation.

33-1492
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Mountain glaciers, Glacier mass balance, Glacier movement, Glacial erosion, Glacial deposits, Spaceborne photography, Glacier ice, USSR—Pamirs, USSR—Gando River.

33-1493
Possibility of calculating ice and snow melting in the Central Asian mountains from air temperature data. [O vozmozhnostiakh rascheta taianiia snega i l'da v gorakh Srednei Azii po dannym o temperature vozdukha],
Konovalov, V.G., et al, *Tashkend. Srednеaziatskii nauchno-issledovatel'skii gidrometeorologicheskii institut. Trudy,* 1977, Vol.53, p.41-51, In Russian. 11 refs.
Borovikova, L.N.
Glacier ablation, Snow cover distribution, Snow depth, Snow water equivalent, Snowmelt, Air temperature, Glacial hydrology, Glacier ice.

33-1494
Meltwater seepage into the snow-firn layers on the Severtsov glacier. [Infil'tratsiia taloi vody v snezhno-firnovuiu tolshchu (po nabliudeniiam na lednike Severtsova)],
Lesnik, IU.N., *Tashkend. Srednеaziatskii nauchno-issledovatel'skii gidrometeorologicheskii institut. Trudy,* 1977, Vol.53, p.52-55, In Russian. 5 refs.
Snow cover distribution, Firn stratification, Meltwater, Seepage, Snow cover structure.

33-1495
Peculiarities of meteorological and radiation regime of the Severtsov glacier. [Nekotorye osobennosti meteorologicheskogo i radiatsionnogo rezhima lednika Severtsova],
Volkova, M.V., *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.56-63, In Russian. 4 refs.
Glacier mass balance, Ice surface, Ice air interface, Solar radiation, Heat transfer, Glacier ablation, Glacial hydrology, Moraines, Radiation balance, Glacier ice.

33-1496
Shrinkage of glaciers in the Kashkadar'ia River basin. [O sokrashchenii lednikov v basseĭne r. Kashkadar'i],
Kreĭter, A.A., *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.70-73, In Russian. 1 ref.
Mountain glaciers, Glacier tongues, Glacier melting, Firn fields, Alimentation, Glacier ablation, Moraines, Ground ice, USSR—Gissar Range.

33-1497
Calculating the mean number of days with snow cover for a period of many years. [O raschete srednego mnogoletnego chisla dneĭ so snezhnym pokrovom],
Glazyrin, G.E., *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.74-83, In Russian. 5 refs.
Mountain glaciers, Alimentation, Glacier ablation, Mass balance, Heat balance, Snow accumulation, Snow water equivalent, Analysis (mathematics).

33-1498
Size distribution of snow crystals. [Voprosy statisticheskogo raspredeleniia razmerov kristallov snega],
Kanaev, L.A., et al, *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.84-96, In Russian. 10 refs.
Tupaeva, N.K.
Snow cover structure, Metamorphism (snow), Snow crystals, Snow stratigraphy, Crystal structure.

33-1499
Metamorphism and snow strength variations. [Nekotorye voprosy metamorfizma i izmeneniia prochnosti snega],
Korolev, A.I., *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.97-104, In Russian. 10 refs.
Snow cover structure, Snow strength, Metamorphism (snow), Snow stratigraphy, Snow temperature, Depth hoar.

33-1500
Determining maximum ejection distance from some morphometric characteristics of avalanche foci. [Opredeleniia maksimal'noĭ dal'nosti vybrosa lavin po nekotorym morfometricheskim kharakteristikam lavinnykh ochagov],
Zolotarev, E.A., *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.105-113, In Russian. 12 refs.
Avalanche mechanics, Avalanche engineering, Avalanche forecasting.

33-1501
Analyzing the conditions of mass occurrence of avalanches in West Tien Shan in February 1976. [Analiz usloviĭ massovogo skhoda lavin v zapadnom Tian'-Shane v fevrale 1976 g.],
Kanaev, L.A., et al, *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.114-118, In Russian. 5 refs.
IAzykov, L.E.
Avalanches, Avalanche formation, Snow accumulation, Snow surveys, USSR—Tien Shan.

33-1502
Quantitative evaluation of the relief-forming role of avalanches. [Kolichestvennaia otsenka rel'efoobrazuiushcheĭ roli snezhnykh lavin],
Troshkina, E.S., et al, *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.119-130, In Russian. 6 refs.
Salova, T.A.
Avalanche mechanics, Avalanche erosion, Avalanche deposits, Analysis (mathematics).

33-1503
Avalanches along the Ust'-Kamenogorsk - Zyrianovsk highway. [Laviny na avtodoroge Ust'-Kamenogorsk - Zyrianovsk],
Popov, V.I., et al, *Tashkend. Srednеaziatskiĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.53, p.131-138, In Russian. 3 refs.
Sagadeev, R.M., Berman, O.A.
Avalanche formation, Meteorological factors, Avalanches.

33-1504
Study of layered ice structure in arctic by radar sounding method.
Bogorodskiĭ, V.V., et al, *Akademiia nauk SSSR. Izvestiya. Atmospheric and oceanic physics,* June 1978, 13(11), p.841-843, Translated from Akademiia nauk SSSR. Izvestiia. Fizika atmosfery i okeana, 13(11):1977. 5 refs.
Tripol'nikov, V.P.
Ice structure, Ice islands, Salt ice, Radar echoes.

33-1505
Systems of hydrologic fronts in the North Atlantic. [Sistemy gidrologicheskikh frontov severnoĭ Atlantiki],
Nikiforov, E.G., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.5-16, In Russian. 18 refs.
Savchenko, V.G., Shpaĭkher, A.O.
Arctic regions, Water transport, Ocean currents, Arctic Ocean, Atlantic Ocean.

33-1506
New data on the nature of intermediate water masses in the Arctic Basin. [Novye dannye o prirode promezhutochnykh vodnykh mass Arkticheskogo basseĭna],
Nikiforov, E.G., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977. Vol.338, p.17-24, In Russian. 10 refs.
Blinov, N.I., Lukin, V.V.
Ocean currents, Water transport, Ice formation, Drift, Water temperature, Charts, Arctic Ocean.

33-1507
Seasonal variations in the thermal state of seas of the Siberian shelf. [Sezonnaia izmenchivost' teplovogo sostoianiia morei Sibirskogo shel'fa],
Shpaĭkher, A.O., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.25-31, In Russian. 11 refs.
Fedorova, Z.P.
Sea ice distribution, Drift, Ocean currents, Water transport, Arctic regions.

33-1508
Determining thermal balance components of the Chukchi Sea surface. [Opredelenie sostavliaiushchikh teplovogo balansa poverkhnosti Chukotskogo moria],
Zablotskiĭ, G.A., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.32-38, In Russian. 8 refs.
Makshtas, A.P., Khlopov, V.V., Davydov, A.A.
Air water interactions, Heat transfer, Heat balance, Measuring instruments, Heat flux, Analysis (mathematics), Chukchi Sea.

33-1509
Description of the process of formation of a quasi-homogeneous layer in the Arctic Ocean. [Ob opisanii protsessa formirovaniia kvaziodnorodnogo sloia okeana v Arktike],
Danilov, A.I., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.51-59, In Russian. 20 refs.
Water temperature, Ice temperature, Mathematical models, Heat transfer, Ice growth, Ocean currents, Arctic Ocean.

33-1510
Ice drift in the presence of grounded ice hummocks. [Dreĭf l'da pri nalichii stamukh],
Gorbunov, IU.A., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.79-94, In Russian. 5 refs.
Losev, S.M., Timokhov, L.A.
Ice navigation, Ice conditions, Drift, Arctic Ocean.

33-1511
Calculating stresses and deformations in fast ice caused by shear forces of wind and currents. [Sposob chislennogo opredeleniia napriazheniĭ i deformatsiĭ, voznikaiushchikh v pripae pod deĭstviem kasatel'nykh napriazheniĭ sil vetra i techeniĭ],
Legen'kov, A.P., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.95-108, In Russian. 3 refs.
Fast ice, Shear stress, Wind (meteorology), Ocean currents, Ice deformation, Analysis (mathematics).

33-1512
Stresses and strains in pack ice. [Napriazheniia i deformatsii splochennogo ledianogo pokrova],
Timokhov, L.A., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.109-117, In Russian. 6 refs.
Pack ice, Drift, Stress concentration, Ice deformation, Analysis (mathematics).

33-1513
Formation of fast and young ice during the fall-winter period of water cooling in the northeastern part of the Kara Sea. [Formirovanie pripaia i molodykh l'dov v period osenne-zimnego okhlazhdeniia severo-vostochnoĭ chasti Karskogo moria],
Ivanov, V.M., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.118-124, In Russian.
Fast ice, Young ice, Ice formation, Kara Sea.

33-1514
Vertical water transfer in the gradient-convection currents of the Arctic Ocean. [Vertikal'nyĭ perenos vod v gradientno-konvektsionnykh techeniiakh Severnogo Ledovitogo okeana],
Volkov, N.A., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1977, Vol.338, p.135-141, In Russian. 7 refs.
Pavlov, V.K.
Ocean currents, Water transport, Water temperature, Charts, Arctic Ocean.

33-1515
Calculating pollution distribution in semi-stagnant water bodies in winter. [K voprosu o raschete rasprostraneniia zagriazneniĭ v slaboprotochnykh vodoemakh v usloviiakh zimnego ledostava],
IAshin, V.N., *Okhrana prirodnykh vod Urala,* 1977, Vol.9, p.42-45, In Russian. 12 refs.
Water pollution, Lakes, Icebound lakes.

33-1516
Scanning electron microscopy of wet, live, and frozen objects.
Spivak, G.V., et al, *Akademiia nauk SSSR. Bulletin. Physical series,* 1977, 41(11), p.11-20, Translated from its Izvestiia. Seriia fizicheskaia. 32 refs.
Rau, E.I., Karelin, N.M., Mishustina, I.E.
Electron microscopy, Clays, Soil moisture, Frost penetration, Microstructure, Electronic equipment.

33-1517
Investigation of wet objects in a scanning electron microscope.
Kuz'min, V.A., et al, *Akademiia nauk SSSR. Bulletin. Physical series,* 1977, 41(11), p.158-163, Translated from its Izvestiia. Seriia fizicheskaia. 6 refs.
Bochko, R.A.
Electron microscopy, Clays, Clay minerals, Clay soils, Soil moisture, Soil cement, Microstructure, Electronic equipment.

33-1518
Oceanographic investigation of the marginal sea-ice zone of the Chukchi Sea: MIZPAC 1974 final report, 10 Jun. 1974-30 Jun. 1975.
Paquette, R.G., et al, Monterey, California, U S. Naval Postgraduate School, 1976, 128p. ADA-025 854.
Bourke, R.H.
Oceanography, Sea water, Salinity, Water temperature, Sea ice, Ice edge, Chukchi Sea.

33-1519
Effect of inundation on vegetation at selected New England flood control reservoirs.
McKim, H.L., et al, MP 1169, Symposium on Remote Sensing for Vegetation Damage Assessment, February 1978. Proceedings, 1978, 13p., 13 refs.
Gatto, L.W., Merry, C.J., Cooper, S.
Remote sensing, Infrared photography, Vegetation patterns, Damage, Flooding.
The effect of inundation on vegetation caused by the regulation and impoundment of water at six New England flood control reservoirs during a June-July 1973 flood was assessed from color infrared photography and corroborative ground surveys. Percent of damaged trees was assessed on a pattern recognition and coloration basis. Correlative ground truth data showed that the deciduous trees, particularly silver maple and red oak, were least affected and that coniferous trees, especially white pine, were most affected by siltation and inundation. Much of the understory vegetation, i.e., American and Eastern hop hornbeam, lost all leaves after inundation, but new buds and shoots appeared by late September 1973. A critical relationship, determined from ground transect profiles showing the relationship between species susceptibility and inundation time, was that trees completely covered by flood waters for more than 90 hours showed the most apparent damage.

33-1520
Preferred crystal orientations in the fast ice along the margins of the Arctic Ocean.
Weeks, W.F., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* June 1978, CR 78-13, 24p., ADA-059 024, 77 refs.
Gow, A.J.
Sea ice, Fast ice, Ice crystal structure, Crystal orientation, Ocean currents.
Field observations of the growth fabrics of the fast and near-fast ice along the coasts of the Beaufort and Chukchi Seas show that, at depths of more than 60 cm below the upper ice surface, the sea ice crystals show striking alignments within the horizontal plane. In general, the c-axes of the crystals were aligned roughly E-W parallel to the coast. In the vicinity of islands the alignment roughly paralleled the outlines of the islands, and in narrow passes between islands the alignment paralleled the channel. Our observations, as well as similar observations made in the Kara Sea by Cherepanov, can be explained if it is assumed that the c-axes of the crystals are aligned parallel to the "long-term" current direction at the sea ice/sea water interface. The alignments are believed to be the result of geometric selection among the growing crystals, with the most favored orientation being that in which the current flows normal to the plates of ice that make up the dendritic ice/water interface characteristic of sea ice.

33-1521
On the determination of horizontal forces a floating ice plate exerts on a structure.
Kerr, A.D., *U.S. Army Cold Regions Research and Engineering Laboratory,* Aug. 1978, CR 78-15, 9p., ADA-060 444, 26 refs. For this report from a different source see 32-4451.
Floating ice, Ice pressure, Loads (forces), Offshore structures, Ice strength.
This report first discusses the general approach for calculating horizontal forces an ice cover exerts on a structure. Ice force determination consists of two parts: (1) the analysis of the in-plane forces, assuming that the ice cover remains intact, and (2) the use of a failure criterion, since an ice force cannot be larger than the force capable of breaking up the ice cover. For an estimate of the largest ice force, an elastic plate analysis and a failure criterion are often sufficient. A review of the literature revealed that, in the majority of the analyses, it is assumed that the failure load is directly related to a "crushing strength" of the ice cover. However, observations in the field and tests in the laboratory show that in some instances the ice cover fails by buckling. This report reviews the ice force analyses based on the buckling failure mechanism and points out their shortcomings. The report then presents a new method of analysis which is based on the buckling mechanism.

33-1522
Shoreline changes along the outer shore of Cape Cod from Long Point to Monomoy Point.
Gatto, L.W., *U.S. Army Cold Regions Research and Engineering Laboratory,* July 1978, CR 78-17, 49p., ADA-060 297, 52 refs.
Shoreline modification, Aerial photography, Photointerpretation.
This investigation utilized historical and recent aerial photographs and satellite imagery in 1) estimating changes in positions of the high-water line and sea cliff break and base, in rates of accretion and/or erosion, and in volumes of transported sediment, and 2) providing a preliminary evaluation of the direction of littoral transport along the outer Cape Cod coast. This investigation has illustrated a photo interpretation technique that is useful in performing a reconnaissance of coastal change. The data obtained from this method can be used to supplement those acquired by ground surveys and are valid as first approximations for planning subsequent, more detailed surveys.

33-1523
Estuarine processes and intertidal habitats in Grays Harbor, Washington: a demonstration of remote sensing techniques.
Gatto, L.W., *U.S. Army Cold Regions Research and Engineering Laboratory,* July 1978, CR 78-18, 79p., ADA-061 823, 49 refs.
Estuaries, Shoreline modification, Remote sensing, Aerial photography, Spaceborne photography, Tidal currents, Sedimentation, Mapping.
The primary objective of this project was to demonstrate the utility of remote sensing techniques as an operational tool in the acquisition of data required by the U.S. Army Corps of Engineers, Seattle District, in the Grays Harbor dredging effects project, and related projects. Aerial imagery was used to map surface circulation and suspended sediment patterns near the hopper dredge pump site at the harbor entrance and near pulpmill outfalls in Aberdeen, and to map the areal distribution and extent of intertidal habitats. The surface circulation maps, prepared from the aerial photographs and thermal imagery, compared favorably with the large-scale circulation patterns observed in the Grays Harbor hydraulic model at the U.S. Army Engineer Waterways Experiment Station. Of the imagery provided by NASA, the thermal imagery was more useful than the color or color infrared (CIR) photographs for mapping circulation, while the CIR photographs were more useful than the thermal imagery or the color photographs for mapping intertidal habitats. Current velocities estimated from dye dispersion patterns and drifting dye drogues were comparable at some locations to velocities measured by *in situ* current meters and in the hydraulic model. Based on a cursory evaluation of LANDSAT-1 imagery acquired in January, February, and October 1973, it had limited utility in providing data on surface circulation patterns in Grays Harbor.

33-1524
Primary productivity in sea ice of the Weddell region.
Ackley, S.F., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* July 1978, CR 78-19, 17p., ADA-059 344, 24 refs.
Taguchi, S., Buck, K.R.
Sea ice, Ice cores, Biomass, Weddell Sea.
Physical and biological measurements were made of sea ice cores taken from 68S to 78S in the Weddell Sea. Fluorescence measurements indicated an algal community that was strongly associated with salinity maxima within the ice. Maximum concentration of chlorophyll *a* ranged from 0.306 to 4.54 mg/stere. Comparisons with the water column standing crop indicated that the standing crop within the ice represents a minor but significant percentage of the total standing crop for the region. The ice algal community is apparently distinct from others that have been described for land-fast ice in McMurdo Sound, sea ice in the Arctic and pack ice off East Antarctica. The highest concentrations of biological material are found in the bottom or top of the sample in those regions, whereas the Weddell Sea samples are concentrated at intermediate depths (.65 m to 2.15 m) within the ice. A qualitative model indicating the relationship between thermally-induced brine migration and subsequent algae growth is presented. This model indicates the distribution of algae within the ice is dependent on the unique thermal and physical setting for Weddell Sea pack ice where brine drainage processes are initiated by spring and summer warming, but are not carried through as completely as in other regions. (Auth.)

33-1525
Measurement and identification of aerosols collected near Barrow, Alaska.
Kumai, M., *U.S. Army Cold Regions Research and Engineering Laboratory,* July 1978, CR 78-20, 6p., ADA-058 606, 9 refs.
Aerosols, Particle size distribution, Electron microscopy.
Measurements of the concentrations of Aitken nuclei in maritime air were made near Barrow, Alaska, in June 1975, with a modified Nolan-Pollack small-particle detector. The concentrations varied from 50 to 300 particles/cu cm, depending upon meteorological conditions. The mean Aitken nuclei count was 100 particles/cu cm for diameters greater than .002 microns. Transmission electron micrographs of aerosols in maritime air near Barrow were taken. The size range was measured to be 0.01 to 2.5 microns in diameter, with the most frequently observed diameter being 0.04 microns. The volume of the maritime air and the collection efficiency of aerosol particles on filmed grids for electron microscopy were measured. The aerosol concentrations were found to be 76 to 101 particles/cu cm; the mean concentration was calculated to be 87 particles/cu cm. The aerosol particles in the maritime air were identified by electron microscopy and selected area electron diffraction analysis. About 20% of the aerosol particles were identified, and 80% of the particles were too small for electron diffraction analysis.

33-1526
Performance of the St. Marys River ice booms, 1976-77.
Perham, R.E., *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, CR 78-24, 13p., ADA-061 431, 5 refs.
Ice booms, Ice pressure, Ice navigation, Cold weather performance.
The ice booms on the St. Marys River at Sault Ste. Marie, Michigan and Ontario, were operated a second winter, 1967-77, under colder conditions, with less water flow, lower water levels, and 25% fewer ships in the river than during the previous year. The ice cover behind the booms remained frozen to shore for longer periods, and the loads registered in the booms were relatively unaffected by ship passages compared with the previous year's activity. As in the previous year, most structural load changes took place in the west ice boom and were due to movements of the ice cover immediately upstream of the boom. The cover broke free from shore on three occasions: the first and third occasions were minor events, but on the second occasion the cover cracked free, the timbers remained frozed to it, and the boom structure became damaged by the subsequent ice activity. Three anchor line assemblies broke over a period of about 4 hours; the two latter breaks occurred while a ship was operating in the ice. These events point out several factors to be considered in ice booms, such as designing the booms to withstand the action of the solid ice cover as well as the fragmented ice cover, keeping the structures and their assembly simple, and inspecting components and assemblies carefully.

33-1527
River channel characteristics at selected ice jam sites in Vermont.
Gatto, L.W., *U.S. Army Cold Regions Research and Engineering Laboratory,* Oct. 1978, CR 78-25, 52p., ADA-061 778, 30 refs.
Ice jams, Channels (waterways), Remote sensing, Photointerpretation, Topographic features, River ice.
The objectives of this investigation were to describe channel characteristics and geographic settings of ice jam sites from aerial photographic interpretation, to indicate which characteristics may be important in causing ice jams, and to suggest additional uses of aerial photographs. Uncontrolled photomosaics of each site were assembled and major river characteristics were delineated on the photomosaics. Characteristics described include: man-made structures, falls, rapids, changes in channel depths, channel islands, mid-channel shoals or bars, river bed material, river sinuosity, meanders, floodplain width, riparian vegetation, and types of development on the floodplain. River channel widths were measured from the photographs along rivers where ground truth data were available for comparison. Lengths of channel riffles and pools were measured along the rivers where variations in river depths were evident on the photographs. Aerial photographs provide a regional perspective for evaluating channel characteristics at an ice jam site and for analyzing the geographic setting at each site during ice-free conditions. Photographs taken after ice jams have formed are useful in monitoring ice jam formation, in analyzing ice characteristics, and in documenting ice jam breakup and movement.

33-1528
Fate and effects of crude oil spilled on permafrost terrain. Second annual progress report, June 1976 to July 1977.
McFadden, T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Dec 1977, SR 77-44, 46p., ADA-061 779, 4 refs. Includes progress report for the first year, CRREL SR 76-15, q.v. 32-1257.
Jenkins, T., Collins, C., Johnson, L., McCown, B., Sparrow, E.
Oil spills, Damage, Chemical reactions, Frozen ground, Environmental impact, Vegetation.
This spill was compared with one that took place in February 1976 (reported upon in the first annual progress report). Oil moved downslope at a much faster rate during the summer spill than during the winter spill. In the winter the oil cooled and pooled rapidly. The summer spill covered approximately one-third more surface area than did the winter spill in the final configuration, even though the two spills were of almost identical volume. Increases in microbial populations and activities during the months following the spill were evident. Increased counts of bacteria, yeasts, denitrifying bacteria, and petroleum-degrading bacteria following the spills were particularly evident. Analysis of oil decomposition using gas chromatography techniques indicated that the low molecular weight fractions, methane and etane, were lost almost immediately after the spill in each case. Fractions in the C3 to C9 range were reduced significantly in two months and were nearly zero at the end of five months. An obvious adverse effect on vegetation was noted in both spills. Biological damage from the summer spill appeared to exceed that from the winter spill.

33-1529
Experimental device for measuring friction between ski and snow.
Keinonen, J., *Acta polytechnica Scandinavica. Applied physics series,* 1978, No.123, 11p., 7 refs.
Friction, Snow surface, Skis, Coefficients.

33-1530
Distinctive sedimentary features of cold-climate eolian deposits, North Park, Colorado.
Ahlbrandt, T.S., et al, *Palaeogeography, palaeoclimatology, palaeoecology,* Nov. 1978, 25(4), p.327-351, 18 refs.
Andrews, S.
Eolian soils, Sands, Sedimentation, Soil freezing, Freeze thaw cycles, Snow cover effect.

33-1531
Geochemical methods of ore prospecting in cryogenic regions.
Pitul'ko, V.M., et al, *International geology review,* Oct. 1978, 20(10), p.1157-1166, Translation of Sovetskaia geologiia 3:94-107, 1977. 23 refs.
Shvartsev, S.L.
Minerals, Geochemistry, Exploration, Frozen ground chemistry.

33-1532
Calculated snowpack evaporation during chinooks along the eastern slopes of the Rocky Mountains in Alberta.
Golding, D.L., *Journal of applied meteorology,* Nov. 1978, 17(11), p.1647-16[illegible] 11 refs.
Snow evaporation, Mountains, Wind (meteorology).

33-1533
Numerical simulation of pre-ice-nucleation conditions in a settling cloud chamber.
Weickmann, K.M., et al, *Journal of applied meteorology,* Nov. 1978, 17(11), p.1667-1679, 29 refs.
Barchet, W.R.
Mathematical models, Ice nuclei, Ice crystal nucleation, Artificial nucleation, Cloud chambers.

33-1534
Recommendations for implementing roof moisture surveys in the U.S. Army.
U.S. Army CRREL/WES/FESA Roof Moisture Research Team, *U.S. Army Cold Regions Research and Engineering Laboratory,* Aug. 1978, SR 78-1, 8p., ADB-031 978L, Distribution limited to U.S. Government agencies only.
Moisture meters, Roofs, Infrared reconnaissance, Site surveys.
Nuclear, infrared, capacitance, microwave and impulse radar methods for non-destructively detecting moisture in roofs were evaluated. No system was reliable enough by itself or by cross-checking with another system to eliminate the need for a few

core samples of membrane and insulation to verify findings. Airborne infrared surveys are a cost-effective way of reconnoitering numerous roofs at a major installation. However, follow-up on-the-roof surveys are necessary. Of the several grid techniques examined, nuclear surveys were the most reliable. Hand-held infrared surveys are the most accurate on-the-roof method studied. Although an infrared camera costs significantly more than a nuclear meter ($25K vs $3K), infrared surveys can be conducted more rapidly. Since the Army has numerous roofs to survey, infrared surveys appear to be the most cost-effective method. For reasons of continuity, accuracy and economy, the Army should establish its own capability to survey roofs for moisture. Implementation should not be at the installation level. A centralized team of roof moisture surveying specialists, skilled in operating infrared equipment but, more importantly, skilled in roofing technology, should be established. The team should both conduct and contract for airborne and on-the-roof infrared surveys. The CRREL/WES/FESA roof moisture research group has initiated development of training aids for use by such a team.

33-1535

Construction equipment problems and procedures: Alaska pipeline project.

Hanamoto, B., *U.S. Army Cold Regions Research and Engineering Laboratory,* June 1978, SR 78-11, 14p., ADB-029 226, 4 refs. Distribution limited to U.S. Government agencies only.

Cold weather performance, Construction equipment, Pipelines, Engines, Human factors.

The Trans-Alaska pipeline construction project posed many problems which are not encountered in the more temperate regions. Construction equipment maintenance and operation is of major concern in the far north. Difficulties encountered were due to: extreme low temperature of -70F (-57C) and common winter temperatures of -30F (-34C), the remoteness and isolation of the work area, harsh environment, and the working personnel. This report describes some of the typical problems encountered with construction equipment on this project and some of the remedies and procedures for solving these problems.

33-1536

Soil lysimeters for validating models of wastewater renovation by land application.

Iskandar, I.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* June 1978, SR 78-12, 11p., ADA-059 994, 12 refs.

Nakano, Y.

Moisture meters, Water treatment, Waste disposal, Models.

This report describes the construction, operation and performance of large-scale (90 cm-inside diameter and 150-cm-high) lysimeters. These lysimeters can continuously monitor soil moisture flow, soil temperature and redox potential with depth, and sample soil water and soil air with depth. The rate of soil water movement to the groundwater was continuously monitored by a rain gage and a recorder. To simulate field conditon, an automatic spray system was developed; this system is also described in this report. The total cost of one lysimeter is approximately $650 (1975 estimate). The lysimeters are being used to validate a biophysical-chemical model of wastewater renovation by application to land. Detailed blueprints of the lysimeters are kept at CRREL and are available on request.

33-1537

Ecological baseline investigations along the Yukon River-Prudhoe Bay haul road, Alaska.

Brown, J., ed, *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, SR 78-13, 131p., ADA-060 255, For this item as a progress report to the U.S. Department of Energy and for individual papers see 32-3888 through 32-3896.

Research projects, Ecology, Tundra vegetation, Roads, Clay soils.

Results of the first full year's field research on five projects along the Yukon River-Prudhoe Bay Haul Road are reported. Several projects are extensions of investigations begun in 1976 and are being conducted in cooperation with a Federal Highway Administration sponsored environmental engineering study. The extent and success of weeds and weedy species along the road and in material sites has been followed for summer 1976 and 1977. In order to document the vegetation along the complex elevational and latitudinal gradient and its potential for impact and recovery, 17 vegetation maps have now been completed, and vegetation described and plots established at 120 locations along the 600-kilometer-long road. Collections of vascular plants, bryophytes and lichens were made and catalogued for an additional 9 sites. Sampling for soil invertebrates to determine their sensitivity to impact was undertaken at approximately 25 sites. A detailed study of the impact of road dust upon the vegetation was initiated at one tundra site, and four sites were established to monitor the amount of dust transported onto the tundra across 1000-meter-long transects. The clay mineralogy and chemistry of the dust and road material were investigated.

33-1538

Radar studies of Arctic ice and development of a real-time Arctic ice type identification system: final report.

Jean, B.R., *Texas. A and M University, College Station. Remote Sensing Center. Report,* Jan. 31, 1976, RSC-3005-6, 34p. ADA-025 739.

Sea ice, Radar echoes, Remote sensing, Classifications.

33-1539

Radar studies of Arctic ice and development of a real-time Arctic ice type identification system: progress report, Sep. 1974-Jan. 1975.

Jean, B.R., et al, *Texas. A and M University, College Station. Remote Sensing Center. Report,* Jan. 31, 1975, RSC-3005-5, 110p. ADA-025 862.

Reisor, G.J., Shay, M.T., Permenter, J.A.

Sea ice, Radar echoes, Remote sensing, Classifications.

33-1540

Systems for Arctic spill response.

Schultz, L.A., et al, *U.S. Coast Guard. Report,* Mar. 1978, USCG-D-44-78, 2 vols., ADA-058 782, ADA-058 783, Vol.1 contains the main body of the report while Vol.2 holds appendices.

Deslauriers, P.C., DeBord, F.W., Voelker, R.P.

Oil spills, Countermeasures, Waste disposal, Pipelines, Cold weather operation, Sea ice, Tanker ships, Cost analysis.

33-1541

Roof construction under wintertime conditions: a case study.

Bennett, F.L., *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-24, 34p. ADA-062 519.

Roofs, Cold weather construction, Insulation, Construction materials.

This report describes construction of the roof of an addition to the Interior City Branch of the First National Bank of Anchorage, located in downtown Fairbanks, Alaska, during the 1976-77 winter. The report documents the schedule and procedure for building the roof, reports successful performance of the roof to date, and presents some general comments on roof construction in the wintertime.

33-1542

Climatic survey at CRREL in association with the land treatment project.

Bilello, M.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-21, 37p., ADA-062 518, 39 refs.

Bates, R.E.

Microclimatology, Waste disposal, Water treatment, Waste treatment, Meteorological data.

During 1972, six test cells were constructed at CRREL for the purpose of studying application of wastewater on various soil types and vegetation. In conjunction with this program, a meteorological observing station was established in order to obtain basic information on the climate proximate to the test cells. This report describes the equipment and its installation, and provides a daily tabulation of the following observed parameters: maximum and minimum air temperatures, relative humidity, dew point, wind speed and direction, precipitation amounts, depth of snow on the ground, solar radiation and pan evaporation. The meteorological data collected during the period starting Oct. 1, 1972, to Mar. 31, 1974, were then summarized; and the results are presented in a series of graphs and line diagrams. The meteorological parameters recorded at CRREL were then examined to determine how weather can constrain or help year-round operation of wastewater application to the land. The positive and negative effects of air temperature, precipitation, wind speed, evaporation and snow cover, with respect to land treatment of wastewater, were evaluated. Although no specific recommendations or conclusions are given, the influences of these climatic elements as observed at the CRREL wastewater site are presented for consideration.

33-1543

Geochemistry of subsea permafrost at Prudhoe Bay, Alaska.

Page, F.W., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, SR 78-14, 70p., ADA-060 434, Refs. p.62-68.

Iskandar, I.K.

Submarine permafrost, Sediments, Sea water, Chemical analysis, Drill core analysis, Salinity.

The analytical data from sediment, interstitial water, and seawater analyses of samples collected near Prudhoe Bay, Alaska, during the period from March to May 1977, are presented. Analyses include determinations of moisture, calcium carbonate, and organic carbon contents in the sediment samples and pH, electrical conductivity, alkalinity, and concentrations of sodium, potassium, calcium, magnesium, chloride, and sulfate in the interstitial water and seawater samples. Salinity, ionic balance, and freezing point of the water samples were calculated. The marine sediments in Prudhoe Bay generally contain more calcium carbonate, organic carbon, and interstitial water than the underlying glacial and fluvial gravels. On land, a surficial layer of peat also had high organic carbon and moisture contents. The salinity of the seawater samples varied from concentrated brines near the shore where sea ice is frozen directly to, or is located near, the sea bottom to water which was 1.0 to 1.5 ppt less saline than normal seawater at a distance of approximately 10 to 15 km from shore.

33-1544

Waterproofing strain gages for low ambient temperatures.

Garfield, D.E., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, SR 78-15, 20p., ADA-061 749, 10 refs.

McLain, B.G.

Strain measuring instruments, Low temperature tests, Freeze thaw cycles, Waterproofing.

Due to recent problems experienced with strain-gage based transducers immersed in water at below-freezing ambient temperatures, a test program was conducted to determine if commercially available strain-gage waterproofing systems could withstand these conditions. A total of 96 combinations of eight waterproofing systems, three beam materials and four strain gage adhesives were evaluated. Test environments included strain cycling at temperatures from +32F to +75F and freeze-thaw cycling from -35 to +90F. Only one waterproofing system withstood all tests with no failures. Other results ranged from one installation failure on three systems to the failure of all 12 installations of one system.

33-1545

Effects of low ground pressure vehicle traffic on tundra at Lonely, Alaska.

Abele, G., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, SR 78-16, 63p., ADA-061 777, 18 refs.

Walker, D.A., Brown, J., Brewer, M.C., Atwood, D.M.

Tundra vegetation, Tires, Soil trafficability, Damage.

Traffic tests were conducted with two low-pressure-tire Rolligon-type vehicles and a small, tracked Nodwell for 1,5, and 10 vehicle passes on tundra near Lonely, Alaska. The traffic impact was limited to compression of the vegetation and the organic mat and a maximum terrain surface depression of several centimeters, with virtually no shearing or disaggregation of the mat. After one year, the visibility of the traffic signatures had increased, surface depression remained the same, and the thaw depth below the multiple pass tracks had increased a few centimeters.

33-1546

Effects of winter military operations on cold regions terrain.

Abele, G., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, SR 78-17, 34p. ADA-061 260.

Johnson, L.A., Collins, C.M., Taylor, R.A.

Cold weather operation, Military operation, Damage, Environmental impact, Vegetation.

Observations were made on the 1977 winter military maneuver sites south of Fairbanks to obtain base line data for monitoring terrain and vegetation recovery from the impact of winter trail preparation, and vehicular and troop activities in various terrains and vegetation types.

33-1547

Need for ice-going vessels intensifies as polar mineral research increases. *Shipping world and shipbuilder,* Apr. 1976, 169(3916), p.325-337.

Icebreakers, Ice breaking, Tanker ships.

This series of six short, anonymous articles reviews international aspects of icebreaking and icebreakers.

33-1548

Use of blast furnace slag as a stabilizer in earth constructions. (Masuunikuonan käyttämisestä stabilaattorina maarakenteissa),

Taivainen, O.A., *Oulun yliopisto. Tie- ja maarakennustekniikan laitos. Julkaisu,* 1978, No.26, 23p., In Finnish with English summary. 2 refs.

Moraines, Soil stabilization, Cement additives.

33-1549

Heat measurement in shallow foundations of apartment houses in Kajaani and Tornio, 1975-1977. (Kerrostalojen matalaperustusten lämpötilamittauksia Kajaanissa ja Torniossa 1975...77),

Aho, O.K., et al, *Oulun yliopisto. Tie- ja maarakennustekniikan laitos. Julkaisu,* 1977, No.25, 54p., In Finnish.

Putaala, J.

Heat transfer, Heat measurement, Foundations, Residential buildings.

33-1550

Frost protection for shallow foundations. (Matalaperustusten routasuojaus),

Aho, O.K., *Oulun yliopisto. Tie- ja maarakennustekniikan laitos. Julkaisu,* 1977, No.24, 115p., In Finnish. 28 refs.

Heat transfer, Frost protection, Soil mechanics, Frozen ground, Buildings, Foundations, Heat loss.

33-1551
Modeling of rocks with mixed conductivity for the description of electric polarization. [K printsipam modelirovaniia gornoĭ porody so smeshannoĭ provodimost'iu pri opisanii elektricheskoĭ poliarizatsii],
Gennadinik, B.I., et al, *Akademiia nauk SSSR. Doklady,* Oct. 1976, 230(4), p.807-810, In Russian. 11 refs.
Mel'nikov, V.P., Mel'nikov, P.I.
Rocks, Electrical resistivity, Models.

33-1552
Yakutian Autonomous Soviet Socialist Republic. [IAkutskaia ASSR],
Efimov, A.I., ed, Gidrogeologiia SSSR, Vol.20, Moscow, Nedra, 1970, 383p., In Russian. Refs. p.371-383.
Zaĭtsev, I.K., ed.
DLC GB1156.Y3I25
Permafrost distribution, Ground ice, Permafrost structure, Ice structure, Cryogenic processes, Cryogenic formations, Maps, Soil mapping, Geological maps, Permafrost hydrology, USSR—Yakutia.

33-1553
Heat- and mass-transfer in rocks. [Teplo- i massoobmen v gornykh porodakh],
Ivanov, N.S., Soveshchanie po geotermicheskim issledovaniiam v SSSR, 2nd, Moscow 1964. Trudy (Second conference on geothermal investigations in the USSR, Moscow, 1964. Proceedings), Moscow, Nauka, 1966, p.94-99, In Russian. 9 refs.
DLC GB1005.S65
Geothermy, Permafrost distribution, Frozen rock temperature, Permafrost thermal properties, Heat transfer, Mass transfer, Analysis (mathematics).

33-1554
Depth of frost penetration into the upper zone of the crust in Yakutia. [O glubine promerzaniia verkhneĭ zony zemnoĭ kory na territorii IAkutskoĭ ASSR],
Mel'nikov, P.I., Soveshchanie po geotermicheskim issledovaniiam v SSSR, 2nd, Moscow 1964. Trudy (Second conference on geothermal investigations in the USSR, Moscow, 1964. Proceedings), Moscow, Nauka, 1966, p.110-113, In Russian.
DLC GB1005.S65
Permafrost distribution, Active layer thickness, Geothermy, Frozen rock temperature, USSR—Yakutia.

33-1555
Geothermal heat flux and bottom thawing of glaciers. [Geotermicheskiĭ potok tepla i donnoe taianie lednikov],
Zotikov, I.A., Soveshchanie po geotermicheskim issledovaniiam v SSSR, 2nd, Moscow 1964. Trudy (Second conference on geothermal investigations in the USSR, 1964. Proceedings), Moscow, Nauka, 1966, p.113-118, In Russian. 6 refs.
DLC GB1005.S65
Geothermal thawing, Glacier ice, Ice cover thickness, Ice bottom surface, Ice melting.

33-1556
Regularities governing the distribution and development of frozen soils and rocks in the Lena River Basin. [O zakonomernostiakh rasprostraneniia i razvitiia merzlykh pochv i gornykh porod v basseĭne r. Leny],
Mel'nikov, P.I., Mezhduvedomstvennoe soveshchanie po merzlotovedeniiu, 7th, Moscow, 1956), Moscow, AN SSSR, 1959, p.91-102, In Russian.
DLC GB641.M4 1956
River basins, Permafrost distribution, Cryogenic processes, Frost penetration, Active layer thickness, Permafrost depth, Permafrost thickness, Mapping, Maps, Charts, Cryogenic soils, USSR—Lena River.

33-1557
Development of permafrost research in Yakutia. [Razvitie issledovaniĭ merzlykh zon zemnoĭ kory na territorii IAkutii],
Mel'nikov, P.I., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.5-12, In Russian.
DLC TA713.A435
Continuous permafrost, Discontinuous permafrost, Research projects, Expeditions, Permafrost structure, Permafrost physics, Cryogenic soils, Ground ice, Ice structure, Permafrost hydrology, USSR—Yakutia.

33-1558
Designing reinforced concrete foundations for permafrost. [Ob osobennostiakh proektirovaniia zhelezobetonnykh fundamentov, zakladyvaemykh v mnogoletnemerzlye grunty],
Mel'nikov, P.I., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.13-20, In Russian.
DLC TA713.A435
Buildings, Foundations, Permafrost beneath structures, Reinforced concrete, Design.

33-1559
Construction conditions in the Mirnyĭ village area in Yakutia. [Usloviia stroitel'stva v raĭone pos. Mirnogo Iakutskoĭ ASSR],
Voĭtkovskiĭ, K.F., et al, *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.21-28, In Russian.
Votiakov, I.N.
DLC TA713.A435
Mining, Permafrost distribution, Permafrost thickness, Active layer thickness, Buildings, Permafrost beneath structures, Roads, Foundations, USSR—Yakutia.

33-1560
Laboratory studies of the strength of ground adfreezing to concrete. [Laboratornye issledovaniia sil smerzaniia gruntov s betonom],
Votiakov, I.N., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.29-32, In Russian.
DLC TA713.A435
Concrete structures, Foundations, Permafrost beneath structures, Pile foundations.

33-1561
Creep of frozen ground under shear stresses. [Polzuchest' merzlykh gruntov pri chistom sdvige],
Voĭtkovskiĭ, K.F., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.35-45, In Russian. 8 refs.
DLC TA713.A435
Pile foundations, Permafrost beneath structures, Shear strength, Low temperature tests, Laboratory techniques.

33-1562
Experience in starting water systems in freezing weather in Yakutsk. [Opyt puska vodovoda v g. IAkutske v zimnee vremia],
Ogurtsova, G.A., et al, *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.46-51, In Russian.
Paul'son, A.A.
DLC TA713.A435
Water pipelines, Permafrost beneath structures, Cold weather operation, USSR—Yakutsk.

33-1563
Construction of earth dams in permafrost areas. [K voprosu o stroitel'stve zemlianykh plotin v raĭonakh rasprostraneniia mnogoletnemerzlykh gruntov],
Bogoslovskiĭ, P.A., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.52-61, In Russian. 5 refs.
DLC TA713.A435
Earth dams, Hydraulic structures, Permafrost beneath structures, Design.

33-1564
Measuring temperature in boreholes during artificial freezing of ground. [Izmerenie temperatury v termicheskikh skvazhinakh pri iskusstvennom zamorazhivanii gruntov],
Are, F.E., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.62-70, In Russian. 4 refs.
DLC TA713.A435
Artificial freezing, Cooling systems, Frozen rock temperature, Measuring instruments, Borehole instruments.

33-1565
Effective system of developing the Kangalassy brown-coal deposit in Yakutia. [Effektivnaia sistema razrabotki Kangalasskogo burougol'nogo mestorozhdeniia IAASSR],
Zil'berbord, A.F., et al, *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.71-87, In Russian. 13 refs.
Malzel', L.A.
DLC TA713.A435
Mining, Frozen coal, Ground ice, Shafts (excavations), Ice (construction material), Permafrost.

33-1566
Roadbed construction in permafrost areas. [Nekotorye voprosy stroitel'stva zemlianogo polotna avtomobil'nykh dorog v raĭonakh rasprostraneniia mnogoletnemerzlykh gruntov],
Kachurin, N.P., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.88-100, In Russian.
DLC TA713.A435
Roadbeds, Roads, Permafrost beneath structures, Design.

33-1567
Automatic multi-channel photographic recorder for geocryological observations. [Avtomaticheskiĭ mnogokanal'nyĭ fotoregistrator dlia geokriologicheskikh nabliudeniĭ],
Ivanov, N.S., et al, *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.101-110, In Russian. 4 refs.
Annenkov, IU.N.
DLC TA713.A435
Cryogenic processes, Temperature measuring instruments, Permafrost.

33-1568
Data on the interdependence between surface and ground waters in a thick permafrost area. [Novye dannye o vzaimosviazi poverkhnostnykh i podzemnykh vod na odnom iz uchastkov moshchnoĭ zony merzlykh gornykh porod],
Efimov, A.I., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.111-124, In Russian. 20 refs.
DLC TA713.A435
Permafrost thickness, Active layer thickness, Surface waters, Permafrost hydrology, Ground water, Taliks, Permafrost beneath rivers.

33-1569
Permafrost conditions of the Ust'-Yana area, Yakutia. [Nekotorye osobennosti merzlotno-geologicheskikh usloviĭ Ust'-IAnskogo raĭona IAASSR],
Grigor'ev, N.F., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.139-152, In Russian. 12 refs.
DLC TA713.A435
Ground ice, Permafrost beneath rivers, Thermokarst, Permafrost structure, Taliks, Submarine permafrost, Permafrost hydrology, Laptev Sea, USSR—Yana River.

33-1570
Geocryological characteristics of Yarok Island. [Merzlotno-geologicheskaia kharakteristika ostrova IArok],
Kuznetsova, T.P., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.153-166, In Russian. 2 refs.
DLC TA713.A435
Permafrost structure, Ground ice, Ice structure, Thermokarst, Permafrost hydrology, USSR—Yana River, USSR—Yarok Island.

33-1571
Influence of urban development on permafrost temperature in Yakutsk. [O vliianii zastroĭki goroda IAkutska na temperaturu mnogoletnemerzlykh gornykh porod],
Solov'ev, P.A., *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy,* 1958, Vol.1, p.179-191, In Russian. 13 refs.
DLC TA713.A435
Urban planning, Permafrost beneath structures, Frozen rock temperature, Permafrost depth, Active layer thickness, USSR—Yakutsk.

33-1572
Undisturbed sampling of saturated sands by freezing.
Yoshimi, Y., et al, *Soils and foundations,* Sep. 1978, 18(3), p.59-73, 26 refs.
Hatanaka, M., Oh-oka, H.
Artificial freezing, Frozen sand, Sampling, Freeze thaw tests.

33-1573
Investigation of a VLF airborne resistivity survey conducted in northern Maine.
Arcone, S.A., *Geophysics,* Dec. 1978, 43(7), MP 1166, p.1399-1417, 26 refs.
Electrical resistivity, Aerial surveys, Very low frequencies, Topographic effects, Electric fields.
Airborne wavetilt resistivity surveys and profiles at VLF have been analyzed for the effects of topography, altitude, and wavetilt phase and amplitude. Topographic relief is known to affect at least one electric field component, flight altitude often varies over relief, and phase depends on the earth's resistivity stratification and the relative strength of displacement to conduction current. A mountainous area in northern Maine of predominantly slate, but containing an igneous stock, was surveyed at

150 m mean flight altitude. The 150-m survey was repeated at 300 m and two of the 150-m flight lines were repeated at a total of three other altitudes. A comparison of the 150-m survey with the topography and with the 300-m survey revealed that although most of the resistivity information of the 150-m survey was retained at 300 m, serious differences arose due to topographic influences. Profiles of the individual electric field components at the various altitudes then revealed that topography was distorting resistivity values through its effect upon only the vertical component of the electric field. The separate influences of phase and amplitude were analyzed using the results of a ground survey of the total, complex surface impedance. The phase of the tilt proved to be important in the airborne differentiation of the rock types.

33-1574
Northern development and technology assessment systems— a study of petroleum development programs in the Mackenzie Delta-Beaufort Sea region and the Arctic Islands.
Keith, R.F., et al, Ottawa, Science Council of Canada, 1976, 219p., Numerous refs.
Fischer, D.W., De'Ath, C.E., Farkas, E.J., Francis, G.R., Lerner, S.C.
DLC TN873.C2N67
Economic development, Petroleum industry, Decision making, Canada.

33-1575
Artificial simulation of fog, mist and rain in an environmental test chamber to define icing characteristics of the external cryogenic tank of the space shuttle launch vehicle.
Toliver, R., Institute of Environmental Sciences, Annual Technical Meeting, 22nd, Philadelphia 1976. Proceedings, Mt. Prospect, Illinois, 1976, p.325-328, 4 refs.
DLC TA1.I39813
Test chambers, Environment simulation, Aircraft icing.

33-1576
Methodology for assessing land application of sludges and wastewaters.
Chatterjee, S., Institute of Environmental Sciences, Annual Technical Meeting, 23rd, Los Angeles, 1977. Proceedings, Mt. Prospect, Illinois, 1977, p.107-114, 14 refs.
Sludges, Waste disposal, Water treatment, Water pollution, Irrigation.

33-1577
Experimental determination of heat and mass transfer in large pore media with free convective movement of air. [Metodika eksperimental'nogo opredeleniia koeffitsientov teplo- i massoperenosa v krupnoporistoĭ srede pri svobodno-konvektivnom dvizhenii vozdukha],
Baĭkalov, G.N., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1975, Vol.107, p.200-209, In Russian. 8 refs.
Mukhetdinov, N.A., Ustiugov, A.N.
Hydraulic structures, Dams, Rock fills, Earth dams, Permafrost beneath structures, Heat transfer, Mass transfer, Analysis (mathematics).

33-1578
Toktogul method of concreting massive structures. [Toktogul'skiĭ metod betonirovaniia massivnykh sooruzheniĭ],
Tolkachev, L.A., et al, Moscow, Energiia, 1973, 160p., In Russian with English table of contents enclosed. 62 refs.
Sudakov, V.B.
Hydraulic structures, Dams, Concrete structures, Concrete placing, Winter concreting, Temperature control.

33-1579
Three-layer panels in construction with prefabricated parts. [Trekhsloĭnye paneli v sborno-razbornom stroitel'stve],
Brovchenko, M.D., et al, L'vov, Gos. Univ., 1978, 156p., In Russian with English table of contents enclosed. 121 refs.
Buryk, A.P., Vinnik, I.M., Tkachenko, P.A.
Prefabrication, Panels, Walls, Roofs, Large panel buildings, Thermal insulation, Construction materials.

33-1580
Studying the processes of heat and mass transfer in the earth's crust. [Issledovanie protsessov perenosa tepla i veshchestva v zemnoĭ kore],
Lial'ko, V.I., et al, Kiev, Naukova dumka, 1978, 150p., In Russian with English table of contents enclosed. Refs. p.136-148.
Mitnik, M.M.
Earth crust, Heat transfer, Mass transfer, Hydrogeology, Geothermy, Mathematical models, Computer applications.

33-1581
Studying snow cover from satellite information. [Izuchenie snezhnogo pokrova po dannym sputnikovoĭ informatsii],
Kupriianov, V.V., ed, *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Trudy,* 1978, Vol.243, 79p., In Russian with English table of contents enclosed. 21 refs.
Aerial surveys, Spaceborne photography, Aerial reconnaissance, Snow cover, Snow surveys, Airborne equipment, Snow melting, Data processing.

33-1582
Secondary dispersion halos in the cryolithozone. [Vtorichnye oreoly rasseianiia v kriolitozone],
Pitul'ko, V.M., Leningrad, Nedra, 1977, 197p., In Russian with English table of contents enclosed. 143 refs.
Taiga soils, Cryogenic soils, Soil formation, Soil chemistry, Minerals, Geochemistry, Taiga vegetation, Permafrost hydrology, Cryogenic processes, Landscape types, Periglacial processes.

33-1583
Thermal and combined methods of rock excavation. [Termicheskoe i kombinirovannoe razrushenie gornykh porod],
Dmitriev, A.P., et al, Moscow, Nedra, 1978, 303p., In Russian. 82 refs.
Goncharov, S.A.
Mining, Earthwork, Excavating equipment, Thermal drills, Blasting, Frozen ground.

33-1584
Use of remote sensing to quantify construction material and to define geologic lineaments, Dickey-Lincoln School Lakes Project, Maine.
McKim, H.L., et al, MP 1167, International Symposium on Remote Sensing of Environment, 12th, Manila. Proceedings, 1978, 9 leaves, 7 refs.
Merry, C.J., Blackey, E.A.
Remote sensing, Construction materials, Geologic structures.
Fourteen surficial geology units were delineated in a 2850 sq km area in northern Maine. These units included: alluvial fan, alluvial terrace, esker, floodplain, glacial moraine, kame, kame terrace, outwash, outwash terrace, bedrock, till, till over bedrock, wet outwash and wet till. The surficial geology units were field checked and then updated from the field reconaissance. The depths of the surficial geology units were estimated utilizing borehole data, field measurements and seismometer data. The areal extent of each surficial geology unit was quantified, using a planimetric color densitometer. The volumes of construction material were computed based upon these areal determinations and estimated depths. The volume estimates, compared with the estimates of required construction material, showed that more material could be found within the prescribed area around the dam and dike sites than was required for construction. It is believed that the east- and northeast-trending lineaments in this area are thrust faults dipping 45 deg to the northeast. The north-trending and N60W lineaments are probably strike-slip normal and reverse faults dipping 80 deg to nearly vertical. Future movement along these faults should be negligible.

33-1585
Soil deformations due to cyclic loads on offshore structures.
Andersen, K.H., et al, *Oslo. Norges geotekniske institutt. Publikasjon,* 1978, No.120, p.1-40, 13 refs.
Hansteen, O.E., Höeg, K., Prévost, J.H.
Soil strength, Dynamic loads, Offshore structures, Mathematical models, Strain tests, Deformation.

33-1586
Probabilistic considerations in the foundation engineering for offshore structures.
Höeg, K., et al, *Oslo. Norges geotekniske institutt. Publikasjon,* 1978, No.120, 27p., In English with German summary. 16 refs.
Tang, W.H.
Offshore structures, Foundations, Soil strength, Dynamic loads.

33-1587
Speed of dislocations in HF-doped ice. [Vitesse des dislocations dans la glace dopée avec HF],
Mai, C., et al, *Journal de physique,* Sep. 1978, 39(17) Suppl., p.L307-L310, In French with English summary. 14 refs.
Perez, J., Tatibouët, J., Vassoille, R.
Ice crystals, Impurities, Dislocations (materials).

33-1588
Effects of human activities on global climate; a summary, with consideration of the implications of a possibly warmer earth.
Kellogg, W.W., *World Meteorological Organization. Technical note,* 1977, No.156, 47p., WMO-No.486, Refs. p.37-47.
Climate, Human factors, Climatic changes, Ice sheets, Pack ice, Aerosols, Long range forecasting, Sea ice.
Studies of a number of different climate system models with widely varying degrees of complexity have led to the following conclusions. The largest single effect of human activities on climate is due to the increase in atmospheric carbon dioxide concentration resulting from burning fossil fuels. Virtually all of the other major activities of mankind also contribute to warming of the lower atmosphere, i.e., through injection into the atmosphere of airborne particles and of other trace gases (i.e., chlorofluoromethanes, nitrous oxide, etc.), and through the direct addition of heat. A best estimate of the resultant warming of the mean surface temperature of the earth due to human activities is about 1C by 2000 AD and about 3C by 2050 AD, with an uncertainty of roughly a factor of two. Warming of the polar regions is expected to be three to five times greater than the global average. The warming would almost certainly have a major influence on the extent of arctic and antarctic sea ice, and would eventually cause a change in the total volume of the major ice sheets of Greenland and the Antarctic, but the corresponding change in sea level cannot yet be predicted. Areas of recommended climate research are outlined.

33-1589
Engineering significance of glacier ice-thrusting.
Sauer, E.K., *Canadian geotechnical journal,* Nov. 1978, 15(4), p.457-472, In English with French summary. 42 refs.
Glacial geology, Glacier movement, Soil strength, Landslides.

33-1590
Frost penetration studies in glacial till on the James Bay hydroelectric complex.
Paré, J.J., et al, *Canadian geotechnical journal,* Nov. 1978, 15(4), p.473-493, In English with French summary. 20 refs.
Lavallée, J.G., Rosenberg, P.
Glacial till, Frost penetration, Freeze thaw tests, Thermal conductivity.

33-1591
Adfreeze strength of frozen sand to model piles.
Parameswaran, V.R., *Canadian geotechnical journal,* Nov. 1978, 15(4), p.494-500, In English with French summary. 11 refs.
Frozen sand, Frozen ground strength, Piles, Bearing strength, Frost heave, Permafrost.

33-1592
Model for coupled heat and moisture transfer during soil freezing.
Taylor, G.S., et al, *Canadian geotechnical journal,* Nov. 1978, 15(4), p.548-555, In English with French summary. 17 refs.
Luthin, J.N.
Heat transfer, Moisture transfer, Soil freezing, Models.

33-1593
Ice sheet loads on marina piles.
Doud, J.O., *Canadian geotechnical journal,* Nov. 1978, 15(4), p.599-604, In English with French summary. 6 refs.
Ice pressure, Pile structures, Offshore structures, Dynamic loads, Ice sheets.

33-1594
Measuring total volumetric strains during triaxial tests on frozen soils: a new approach: discussion.
Bozozuk, M., et al, *Canadian geotechnical journal,* Nov. 1978, 15(4), p.620-621, 2 refs. For paper being discussed see 32-3056.
Baker, T.H.W.
Strain tests, Frozen ground mechanics, Measuring instruments.

33-1595
Slope stability and soil movement, Bathurst Island, N.W.T.
Kurfurst, P.J., Canadian Geotechnical Conference, 29th, Vancouver, B.C., 1976. Proceedings, Canadian Geotechnical Society, 1977, p.II/1-II/9, In English with French summary. 5 refs.
DLC TA710.4.C2C36 1976
Slope stability, Landslides, Soil mechanics, Soil moisture, Snow melting.

33-1596
Construction and performance of platinum probes for measurement of redox potential.
Blake, B.J., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-27, 8p., ADA-062 426, 2 refs.
Brockett, B.E., Iskandar, I.K.
Soil moisture, Probes, Measuring instruments.
A simple method is described for construction and testing of platinum oxidation-reduction probes in the laboratory. The probes are "blacked" with platinic chloride to increase their lifetime. Methods of standardization and problems encountered are discussed.

33-1597
Impact of freezing and thawing soil conditions on the movement of nutrients by water from rural lands.
Bubenzer, G.D., et al, *Wisconsin. University. Water Resources Center. Technical report,* Sep. 1975, WIS WRC 75-10, 43p., PB-246 190, 23 refs.
Converse, J.C.
Soil chemistry, Nutrient cycle, Waste disposal, Freeze thaw cycles, Water flow.

33-1598
Acoustic emissions in the investigation of avalanches.
St. Lawrence, W., Canadian Geotechnical Conference, 29th, Vancouver, B.C., 1976. Proceedings, Canadian Geotechnical Society, 1977, p.VII/24-VII/33, In English with French summary. 4 refs.
DLC TA710.4.C2C36 1976
Snow deformation, Ultrasonic tests, Avalanche mechanics, Snow acoustics, Snow cover stability.

33-1599
Report on a conference-workshop *Building in Northern Communities* held at the Université de Montréal May 7-11, 1973.
Glover, M., ed, Montreal, Arctic Institute of North America, 1974, 138p.
Meetings, Construction, Permafrost distribution, Pollution, Waste disposal, Environments.
Contains discussions and summaries of a number of presented papers.

33-1600
Report on a conference-workshop *Building in Northern Communities* held in Inuvik, N.W.T., February 10-15, 1974.
Glover, M., ed, Montreal, Arctic Institute of North America, 1974, 162p.
Meetings, Buildings, Construction, Economic development, Houses, Utilities.

33-1601
Modified helicopter icing spray system evaluation. Final report, 23 Sep.-4 Dec. 1975.
Bender, G.L., et al, *U.S. Army Aviation Engineering Flight Activity. Report,* Mar. 1977, USAAEFA-75-04, 87p. ADA-055 039.
Mathews, M.S., III, Tulloch, J.S.
Aircraft icing, Helicopters, Environment simulation, Artificial ice.

33-1602
Concrete in the oceans.
Gjörv, O.E., *Marine science communications,* 1975, 1(1), p.51-74, 20 refs.
Offshore structures, Reinforced concrete, Concrete construction, Concrete durability, Freeze thaw cycles.

33-1603
Upwelling possibilities at an ice edge homogeneous model.
Gammelsröd, T., et al, *Marine science communications,* 1975, 1(2), p.115-145, 8 refs.
Mork, M., Röed, L.P.
Ice edge, Upwelling, Ocean currents, Sea ice, Wind pressure, Mathematical models, Time factor.

33-1604
Prediction of ice forces on conical offshore structures.
Bercha, F.G., et al, *Marine science communications,* 1975, 1(5), p.365-380, 8 refs. For another version see 30-2747.
Danys, J.V.
Ice pressure, Offshore structures, Flexural strength, Floating ice, Ice mechanics.

33-1605
Use of reinforced ice in constructing temporary enclosures.
Stanley, R.G., et al, *Marine science communications,* 1975, 1(6), p.447-462, 7 refs.
Glockner, P.G.
Ice (construction material), Ice loads, Ice cracks, Fibers, Deformation, Laboratory techniques, Air temperature.

33-1606
Surface tension spreading of crude oil on ice.
Chen, E.C., et al, *Marine science communications,* 1976, 2(1), p.1-11, 5 refs.
Charles, D.K.
Oil spills, Ice surface, Impurities, Crude oil, Gravity, Viscosity, Interfacial tension.

33-1607
Suspended sediment dynamics in Queen Inlet Glacier Bay, Alaska.
Hoskin, C.M., et al, *Marine science communications,* 1976, 2(2), p.95-108, 11 refs.
Burrell, D.C., Freitag, G.R.
Suspended sediments, Sediment transport, Meltwater, United States—Alaska—Queen Inlet.

33-1608
Enhancement of primary productivity by artificial upwelling.
Nevé, R.A., et al, *Marine science communications,* 1976, 2(2), p.109-124, 12 refs.
Clasby, R.C., Goering, J.J., Hood, D.W.
Biomass, Nutrient cycle, Upwelling, Ponds, Plankton, Growth, Models, United States—Alaska.

33-1609
On the flexural strength of brackish water ice by *in-situ* tests.
Määttänen, M., *Marine science communications,* 1976, 2(2), p.125-138, 3 refs.
Ice strength, Ice elasticity, Ice bearing capacity, Flexural strength, Stress concentration, Tests.

33-1610
Annual budget of primary production in the Bering Sea.
McRoy, C.P., et al, *Marine science communications,* 1976, 2(5), p.255-267, 14 refs.
Goering, J.J.
Biomass, Subglacial observations, Algae, Ice cover effect, Cryobiology, Seasonal variations, Bering Sea.

33-1611
Recent Japanese physical oceanographic studies of the Bering Sea.
Takenouti, A.Y., *Marine science communications,* 1976, 2(5), p.283-297, 15 refs.
Biomass, Marine biology, Oceanographic surveys, Seasonal variations, Water temperature, Ocean currents, Bering Sea.

33-1612
Anomalously cold winters in the southeastern Bering Sea.
McLain, D.R., et al, *Marine science communications,* 1976, 2(5), p.299-334, 19 refs.
Favorite, F.
Marine biology, Ice conditions, Atmospheric circulation, Wind factors, Water temperature, Ice cover effect, Sea ice, Marine meteorology, Bering Sea.

33-1613
Water movement in porous media towards an ice front.
Biermans, M.B.G.M., et al, *Journal of hydrology,* Apr. 1978, 37(1/2), p.137-148, 11 refs.
Dijkema, K.M., DeVries, D.A.
Ice pressure, Water pressure, Porous materials, Thermal factors, Ice water interface, Water flow, Experimentation, Ice growth.

33-1614
Hydrometeorological conditions of icing of seagoing ships. [Gidrometeorologicheskie usloviia obledeneniia morskikh sudov],
Vasil'eva, G.V., *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy,* 1971, Vol.87, p.82-92, In Russian. 5 refs. Translation by J. Lindsay, UK Meteorological Office Translation No.848, available from British Lending Library.
Ship icing, Ice accretion, Ice crystal structure, Icing rate, Meteorological factors.

33-1615
Measurement of Be-10 in 1,000- and 5,000-year-old antarctic ice.
Raisbeck, G.M., et al, *Nature,* Oct. 26, 1978, 275(5682), p.731-733, 13 refs.
Yiou, F., Fruneau, M., Lieuvin, M., Loiseaux, J.M.
Ice cores, Isotope analysis, Spectroscopy, Ice composition.
This paper reports the use of the nuclear accelerator spectrometry technique for the determination of Be-10 concentrations in ice samples from Dome C believed to be about 1,000 and 5,000 yr old. The sample preparation is described. Measurements were made using the external ion source of the cyclotron. Ice samples were analyzed by comparing their Be-10/Be-9 ratio to those of standardized Be-10/Be-9 samples. Using an estimated annual precipitation rate of 3.7 cm of water at the sample site, the average Be-10 concentration (26,000 atoms per g ice) represents a Be-10 deposition rate of 1/3100 atoms/sq cm/s. This is much less than the value of 1/200 atoms/sq cm/s measured at a Greenland site. It is also 4 to 8 times smaller than the deposition rates found in most sea sediments. Measurements of the complete Be-10 profile over the entire length of the core from which the present samples were taken (estimated to go back to 35,000 B.P.) are planned.

33-1616
Creep rupture at depth in a cold ice sheet.
Colbeck, S.C., et al, *Nature,* Oct. 26, 1978, 275(5682), MP 1168, p.733, 13 refs.
St. Lawrence, W., Gow, A.J.
Ice sheets, Ice creep, Fracturing, Seismic surveys.
Experimental evidence has not supported the hypothesis that tectonic processes operating within glaciers and ice sheets are analogous to those in the Earth. However, evidence of the existence of discrete shear planes within the antarctic ice sheet (31-1071 or F-17742) and evidence described here relating to the Greenland ice sheet indicate that faulting takes place at depth in cold ice sheets. The evidence suggests reconsideration of the concept of correspondence between flow and rupture at depth in the Earth and in cold ice sheets, as suggested earlier. Direct investigations at depth in ice sheets are made with relative ease as compared to the nearly impossible task of direct measurements in the Earth's mantle.

33-1617
Effect of pressure on the Raman spectrum of ice.
Sivakumar, T.C., et al, *Nature,* Oct. 12, 1978, 275(5680), p.524-525, 12 refs.
Chew, H.A.M., Johari, G.P.
Ice crystal optics, Ice crystal structure, Light scattering, Ice physics, Ice temperature, Lasers.

33-1618
Theoretical explanation for Z-R relationships in snow.
Passarelli, R.E., Jr., Conference on Radar Meteorology, 18th, Atlanta, Ga., Mar. 28-31, 1978, Boston, Mass., American Meteorological Society, [1978], p.332-335, Reprint from preprint volume. 4 refs.
Snowflakes, Particle size distribution, Spectra, Snow optics, Snow density, Mathematical models, Lasers, Airborne radar.

33-1619
Analytical model of snowflake growth.
Passarelli, R.E., Jr., Conference on Cloud Physics and Atmospheric Electricity, Issaquah, Wash., July 31-Aug. 4, 1978, Boston, Mass., American Meteorological Society, [1978], p.142-147, Reprint from preprint volume. 7 refs.
Snowflakes, Snow crystal growth, Spectra, Particle size distribution, Mathematical models.

33-1620
Comparison of radar and aircraft measurements of snow size spectra in a Midwest winter snowstorm.
Passarelli, R.E., Jr., et al, Conference on Radar Meteorology, 17th, Seattle, Wash., Oct. 26-29, 1976, Boston, Mass., American Meteorological Society, [1977], p.214-219, Reprint from preprint volume. 6 refs.
Carrera, N.J., Braham, R.R., Jr.
Snow crystal growth, Snowflakes, Ice growth, Particle size distribution, Snow crystal structure, Spectra, Radar, Airborne equipment.

33-1621
University of Chicago measurements of ice-forming nuclei from METROMEX.
Czys, R.R., Conference on Inadvertent and Planned Weather Modification, 6th, Champaign-Urbana, Ill., Oct. 10-13, 1977, Boston, Mass., American Meteorological Society, [1978], p.29-32, Reprint from preprint volume. 8 refs.
Ice nuclei, Ice formation, Cold chambers, Wind factors, Diurnal variations, Filters.

33-1622
Snow cover surveys, 1977-78.
U.S. Geological Survey, Silver Spring, Md., U.S. National Oceanic and Atmospheric Administration, Dec. 1978, 20p.
Snow cover distribution, Snow surveys, Snow depth, Snow water equivalent.

33-1623
Reasons for decision northern pipelines.
National Energy Board, Canada, Ottawa, Minister of Supply and Services Canada, 1977, 3 vols., Report also available in French. No microfiche available.
Gas pipelines, Cold weather construction, Frozen ground mechanics, Permafrost distribution, Discontinuous permafrost, Economic development, Environmental impact, Human factors.
The Canadian National Energy Board reports its decision on the applications of several companies to construct a gas pipeline through the Mackenzie Valley, east and south, to supply the eastern Canadian and U.S. markets. Details of the lengthy hearings are set forth in terms of identifying the many groups and individuals who gave evidence and testimony, close examination of each applicant's financial structure and technical capabilities, and thorough consideration of the social, economic, and environmental impacts which would follow construction of the pipeline.

33-1624
Proceedings: Street Salting-Urban Water Quality Workshop.
Hawkins, R.H., ed, Syracuse, NY, Syracuse University, 1971, 94p., For selected papers see 33-1625 through 33-1632.
Meetings, Deicing, Salting, Chemical ice prevention, Water supply.

33-1625
Deicing: a public works director's dilemma.
Clary, A.G., Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.1-5.
Deicing, Salting, Environmental impact.

33-1626
Environmental impact of highway deicing.
Struzeski, E.J., Jr., Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.14-19.
Road maintenance, Deicing, Environmental impact, Water pollution.

33-1627
Effect of highway salt on water quality in selected Maine rivers.
Hutchinson, F.E., Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.20-23.
Deicing, Salting, Environmental impact, Water pollution.

33-1628
Road salt as an urban tracer.
Broecker, W.S., et al, Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.24-38, 1 ref.
Schwartz, B., Sloan, N., Ancoma, P.
Salting, Water pollution, Meltwater, Runoff, Ion density (concentration).

33-1629
Runoff of deicing salt: effect on Irondequoit Bay, Rochester, New York.
Bubeck, R.C., et al, Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.39-47, 14 refs.
Diment, W.H., Deck, B.L., Baldwin, A.L., Lipton, S.D.
Runoff, Water pollution, Salting, Lake water, Deicing, Stratification.

33-1630
Effects of road salt on a Vermont stream.
Kunkle, S.H., Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.48-61, 15 refs.
Salting, Water pollution, Runoff, Ion density (concentration), Electrical resistivity.

33-1631
Street salting and water quality in Meadowbrook, Syracuse, New York.
Hawkins, R.H., Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.62-69.
Salting, Water pollution, Runoff, Stream flow.

33-1632
Effect of urban salt runoff on lake stratification.
Judd, J.H., Street Salting-Urban Water Quality Workshop, May 1971. Proceedings, Syracuse, NY, Syracuse University, 1971, p.74-79, 2 refs.
Salting, Ion density (concentration), Runoff, Lake water, Stratification, Suspended sediments, Sedimentation.

33-1633
Cracks, movements and joints in buildings.
DBR Building Science Seminar, Autumn 1972, *National Research Council, Canada. Division of Building Research. Proceedings,* Sep. 1976, No.2, c110 leaves.
Meetings, Buildings, Construction materials, Deformation, Settlement (structural), Joints (junctions), Temperature effects, Moisture factors, Loads (forces).

33-1634
Polar sub-programme.
Global Atmospheric Research Programme (GARP). WMO-ICSU Joint Organizing Committee, *World Meteorological Organization. GARP publications series,* Mar. 1978, No.19, 47p., In English with French, Russian, and Spanish summaries. Numerous refs.
Baker, D.J., Jr., ed.
Research projects, Climatology, Sea ice, Models, Measuring instruments.
Processes in the polar regions present special problems to GARP. The Polar Sub-programme is an attempt to address these problems within the terms of reference of the First GARP Global Experiment (FGGE) and the Climate Dynamics Subprogramme. The objectives of the Polar Sub-programme are: 1. To identify and study processes of particular importance in the polar regions relating to the improvement of weather prediction from general circulation models (GARP first objective); 2. To develop a basis for understanding the role of ice in climate dynamics through (a) parameterization of sea ice dynamics and related atmospheric and oceanic processes in climate models, and (b) establishment of an appropriate information base for studies of the role of sea ice and polar continental ice masses in climatic change (GARP second objective). These objectives will be met through a Polar Experiment (POLEX) designed to augment and contribute to the FGGE, and continuing studies before and after FGGE aimed at the second objective above.

33-1635
Arctic islands for oil exploration. *Consulting engineer,* Oct. 1978, 42(10), p.70, 72.
Artificial islands, Petroleum industry.

33-1636
Studies of concrete and reinforced concrete. [Issledovaniia po betonu i zhelezobetonu]
Oatula, A.A., ed, *Cheliabinsk. Politekhnicheskiĭ institut. Sbornik nauchnykh trudov,* 1974, Vol.249, Cheliabinsk, 1974, 229p., In Russian. For selected articles see 33-1637 through 33-1642. Refs. passim.
Shumilin, F.G., ed.
Concretes, Reinforced concrete, Concrete freezing, Frost resistance, Concrete strength, Freeze thaw cycles, Winter concreting.

33-1637
Osmotic pressure in cement stone. [Osmoticheskoe davlenie v tsementnom kamne]
Shumilin, F.G., et al, *Cheliabinsk. Politekhnicheskiĭ institut. Sbornik nauchnykh trudov,* 1974, Vol.149, p.3-8, In Russian. 4 refs.
Platunov, B.I., Semeniak, G.S., Ozhegov, E.K.
Cements, Cement additives, Moisture content, Freeze thaw cycles, Concrete strength.

33-1638
Influence of freeze thaw cycles of heavy concrete on the moisture diffusion coefficient. [Issledovanie vliianiia tsiklicheskogo zamorazhivaniia i ottaivaniia tiazhelogo betona na koeffitsient diffuzii vlagi]
Maliutin, V.S., et al, *Cheliabinsk. Politekhnicheskiĭ institut. Sbornik nauchnykh trudov,* 1974, Vol.149, p.9-15, In Russian. 6 refs.
Shumilin, F.G.
Concretes, Concrete aggregates, Concrete freezing, Freeze thaw cycles, Concrete strength.

33-1639
Selecting the optimal curing system for concretes before freezing, in winter concreting. [Vybor optimal'noĭ vyderzhki betonov do zamorazhivaniia pri zimnem betonirovanii]
Semeniak, G.S., et al, *Cheliabinsk. Politekhnicheskiĭ institut. Sbornik nauchnykh trudov,* 1974, Vol.149, p.30-40.
Pekker, V.I., Platunov, B.I., Ozhegov, E.K.
Winter concreting, Concrete curing, Concrete admixtures, Concrete freezing, Concrete strength, Electric heating.

33-1640
Concreting in the Far North. [Opyt proizvodstva betonnykh rabot v usloviiakh Kraĭnego Severa]
Semeniak, G.S., et al, *Cheliabinsk. Politekhnicheskiĭ institut. Sbornik nauchnykh trudov,* 1974, Vol.149, p.41-45, In Russian. 2 refs.
Winter concreting, Concrete structures, Concrete pavements, Concrete admixtures, Concrete strength.

33-1641
Influence of water saturation on frost resistance and the amount of ice in haydite. [Vliianie vodonasyshcheniia na l'distost' i morozostoĭkost' keramzita]
Serobabin, S.I., et al, *Cheliabinsk. Politekhnicheskiĭ institut. Sbornik nauchnykh trudov,* 1974, Vol.149, p.46-50, In Russian. 2 refs.
Trofimov, B.IA.
Concretes, Porosity, Moisture content, Frost resistance, Freeze thaw cycles, Concrete strength.

33-1642
Strength of hot concrete adhesion to reinforcement during intensive cooling to low subzero temperatures. [Stseplenie sterzhnevoĭ armatury s betonom pri intensivnom ostyvanii goriachego betona do nizkikh otritsatel'nykh temperatur]
Panteleev, V.M., *Cheliabinsk. Politekhnicheskiĭ institut. Sbornik nauchnykh trudov,* 1974, Vol.149, p.149-154, In Russian. 3 refs.
Concretes, Reinforced concrete, Concrete freezing, Concrete strength.

33-1643
Cryogenic and post-cryogenic formations in alluvium and their paleogeographic significance. [Kriogennye i postkriogennye obrazovanna v alliuvii i ikh paleogeograficheskoe znachenie]
Danilov, I.D., et al, *Akademiia nauk SSSR. Izvestiia. Seriia geograficheskaia,* Mar.-Apr. 1978, No.2, p.84-93, In Russian. 4 refs.
Poliakova, E.I.
Alluvium, Cryogenic processes, Frost penetration, Ground ice, Ice formation, Ice veins.

33-1644
Zonal characteristics of polygonal relief in West Siberia. [Zonal'nye osobennosti poligonal'no-zhil'nogo rel'efa v Zapadnoĭ Sibiri]
Shamanova, I.I., *Akademiia nauk SSSR. Izvestiia. Seriia geograficheskaia,* Mar.-Apr. 1978, No.2, p.115-122, In Russian. 4 refs.
Polygonal topography, Patterned ground, Ice veins, Ice wedges, Ice formation, Ground ice.

33-1645
Main railroad line as a basis for economic development of Siberia and its North. [Zheleznodorozhnaia magistral' kak baza khoziaĭstvennogo osvoeniia maloobzhitoĭ territorii (na primere Sibiri i Sibirskogo Severa)]
Sigalov, M.R., *Akademiia nauk SSSR. Izvestiia. Seriia geograficheskaia,* July-Aug. 1978, No.4, p.53-63, In Russian. 26 refs.
Economic development, Urban planning, Construction, Baykal Amur railroad, Mining.

33-1646
Mudflows in the Pamir and Pamir-Alai Mountains. [Seli na Pamire i Pamiro-Alae]
Kemmerikh, A.O., *Akademiia nauk SSSR. Izvestiia. Seriia geograficheskaia,* July-Aug. 1978, No.4, p.84-89, In Russian. 4 refs.
Slope processes, Mudflows, Glacial hydrology, Slope orientation, Alpine soils, Soil creep, Landslides, USSR—Pamir-Alai Mountains.

33-1647
Man-induced displacements of the upper forest line and their phytoindication. [Antropogennye smeshcheniia verkhneĭ granitsy lesa i ikh fitoindikatsiia]
Gorchakovskiĭ, P.L., et al, *Ekologiia,* Sep.-Oct. 1978, No.5, p.5-17, In Russian. 51 refs.
Shiiatov, S.G.
Forest lines, Alpine land forms, Alpine soils, Alpine vegetation, Plant ecology, Mosses, Lichens, Human factors, Bibliographies.

33-1648
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Bauer takes exception to Parker et al's (32-2944 or F-19915) suggestion that auroral activity is a possible source of the non-biogenic fixed nitrogen content of antarctic ice, considering it likely that a large fraction of the fixed N would be destroyed photochemically before reaching the ground. He suggests galactic cosmic ray ionization as a mechanism for explaining the fixed N in antarctic snow. Biggs, in turn, disputes Parker et al's claim that inorganic nitrogen-laden ice originating on the antarctic continent might provide a major contribution to the N budget for the epipelagic zone of the Southern Ocean. Biggs concludes that the input of non-biogenic NO3-N and NH4-N derived from continental ice is probably insignificant in the overall nitrogen budget for epipelagic antarctic seas, although enrichment from melting ice may be locally important. It is also likely that biogenic NH4-N from zooplankton and nekton excretion far outweighs NH4-N input from continental ice. Parker et al contend that Biggs' calculations were based on mean values, assuming uniform mixing to a depth of 50 m, and icebergs are not distributed uniformly through time and space, nor are their nitrogenous contents uniform. With respect to Bauer's comments, Parker et al question the photochemical destruction of NO under the given circumstances and reject the galactic cosmic ray model. El-Sayed apologizes for a misprint in his data on nutrient data, which was referenced by Parker et al in their calculations.

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33-1729
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Geological maps, Engineering geology, Mapping, Permafrost.

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Principles of compiling maps for forecasting changes in geocryologic and hydrologic and cryogenic-engineering-geological conditions for small-scale surveys of the Baykal Amur railroad area. [Printsipy sostavleniia karty prognoznykh izmeneniĭ merzlotno-gidrogeologicheskikh i merzlotno-inzhenerno-geologicheskikh usloviĭ pri melkomasshtabnoĭ s"emke zony osvoeniia BAM],
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Maps, Geological surveys, Permafrost forecasting, Long range forecasting, Cryogenic processes, Mapping, Baykal Amur railroad.

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33-1763
Support of structures in permafrost areas.
Klohn, E.J., et al, *Engineering journal,* Oct. 1978, 61(4), p.28-32.
Davison, D.M.
Permafrost beneath structures, Permafrost preservation, Foundations, Pile foundations, Soil strength, Frost heave, Active layer.

33-1764
Evaluation of the engineering design parameters for glacial clays.
Marsland, A., *Engineering geology,* 1977, 10(1), p.1-26, 33 refs.
Glacial till, Clay soils, Soil strength, Loads (forces).

33-1765
Engineering properties, groundwater conditions, and the nature of soil movement on a solifluction slope in north Norway.
Harris, C., *Engineering geology,* 1977, 10(1), p.27-43, 16 refs.
Ground thawing, Solifluction, Slope stability, Soil creep.

33-1766
Genetic influences on the properties of tills.
McGown, A., et al, *Engineering geology,* 1977, 10(4), p.389-410, 40 refs.
Derbyshire, E.
Glacial till, Soil structure, Classifications, Engineering geology.

33-1767
Hydraulic model investigation of drifting snow.
Wuebben, J.L., *U.S. Army Cold Regions Research and Engineering Laboratory,* June 1978, CR 78-16, 29p. ADA-059 175.
Hydraulic structures, Snowdrifts, Models, Boundary value problems, Snow fences.
A model investigation of drifting snow conditions was conducted in a hydraulic flume using a sand-water analog. Model results were evaluated to define modeling parameters that would allow quantitative correlation between measured prototype drift conditions and the model. Models of the fence were constructed for three heights and two geometric scales. Geometric scaling was based on terrain roughness and boundary layer thickness considerations, while velocity scaling was based on particle fall velocity and threshold of motion characteristics. Simulation of the atmospheric boundary layer was found to be of primary importance. Velocity scaling analysis suggested the use of a 'significant wind' concept, based on a combination of velocity magnitude and frequency. Similarity of precipitation rate was not essential, and could be altered within limits to adjust the time scale.

33-1768
Guide to the use of 14N and 15N in environmental research.
Edwards, A.P., *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, SR 78-18, 77p. ADA-060 385.
Wastes, Water chemistry, Isotopic labeling, Research projects.
The fate of the mineral nitrogen in wastewater can be established only through natural or artificial stable isotopic labeling. This report assesses the possibilities and problems associated with such tracer techniques applied to the small amounts of nitrogen normally present after secondary waste treatment. The methods outlined for sample processing to minimize analytical errors are applicable to other types of environmental research involving isotope ratio analysis as a means of tracing nitrogen in the biosphere.

33-1769
Precasting speeds snowshed erection.
Koehl, S., *Construction west,* Dec. 1978, Edition E, Vol.1, p.43, 45.
Prefabrication, Prestressed concrete, Avalanche engineering.

33-1770
On melting icebergs.
Neshyba, S., *Nature,* Oct. 12, 1978, 275(5680), p.567, 6 refs.
Icebergs, Ice melting, Meltwater, Sea water, Convection.
It is postulated that Huppert and Turner's laboratory studies (33-1453 or F-20907) of ice melt in warm, salt-stratified water, which demonstrate a system of tilted convection layers of melt mixture interleaved with ambient fluid, are useful in focusing research upon the complex phenomenon of iceberg melt but can not be extrapolated so directly to *in situ* antarctic iceberg melting as the authors have done, for several reasons. The reasons are enumerated.

33-1771
Seminar on methods of engineering geological investigations and mapping of permafrost regions, Yakutsk, 1977. Abstracts of papers. Vol.2. [Tezisy dokladov. Vyp.2],
Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977, Yakutskoe knizhnoe izdatel'stvo, 1977, 74p., In Russian. For selected papers see 33-1772 through 33-1784.
Permafrost forecasting, Maps, Geological surveys, Geophysical surveys, Measuring instruments, Mapping, Permafrost distribution, Permafrost transformation, Permafrost structure, Permafrost depth, Drilling, Submarine permafrost, Permafrost thermal properties, Stefan problem.

33-1772
Using electrical exploration methods in solving geocryological problems on northern sea shelves. [Primenenie elektrorazvedochnykh rabot dlia resheniia geokriologicheskikh zadach na shel'fakh severnykh morei],
Kholmianskiĭ, M.A., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.6-7, In Russian.
Neizvestnov, IA.V.
Shores, Submarine permafrost, Electrical prospecting, Permafrost distribution, Permafrost depth, Permafrost structure, Arctic Ocean.

33-1773
Geophysical methods used in combination with geocryological and engineering-geological investigations in mining exploration. [Geofizicheskie metody v komplekse merzlotno-inzhenerno-geologicheskikh issledovaniĭ pri razvedke mestorozhdeniĭ],
Demidiuk, L.M., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.7-9, In Russian.
Kovalko, V.V., Shaumian, L.V.
Permafrost distribution, Geological surveys, Geophysical surveys, Permafrost structure, Permafrost thickness, Permafrost depth.

33-1774
Radar sounding of naleds. [Radiolokatsionnoe zondirovanie naledeĭ],
Glushnev, V.G., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.13-14, In Russian.
Chizhov, A.N.
Naleds, Geophysical surveys, Radar echoes, Ice physics, Electrical properties.

33-1775
Possibilities of the induced polarization technique in permafrost investigations. [Rasshirenie vozmozhnostei metoda vyzvannoĭ poliarizatsii pri izuchenii merzlykh porod],
Butakov, L.I., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.17-18, In Russian.
Permafrost distribution, Ground ice, Permafrost structure, Geophysical surveys, Electrical prospecting, Measuring instruments.

33-1776
New method of accelerated electrical profiling developed for engineering and geocryological surveys. [Novyĭ metod uskorennogo elektroprofilirovaniia dlia tseleĭ inzhenerno-geokriologicheskoĭ s"emki],
Timofeev, V.M., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.19-20, In Russian.
Permafrost distribution, Engineering geology, Geophysical surveys, Electrical prospecting, Measuring instruments.

33-1777
Electric profiling techniques and data interpretation in engineering-geocryological surveys of northern West Siberia. [Nekotorye voprosy metodiki provedeniia i interpretatsii elektroprofilirovaniia pri inzhenerno-geokriologicheskoĭ s"emke na severe Zapadnoĭ Sibiri],
Timofeev, V.M., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.23-24, In Russian.
Pugach, V.B.
Electrical prospecting, Engineering geology, Permafrost structure, Ground ice, Permafrost forecasting, Data processing.

33-1778
Peculiarities of well logging under permafrost conditions. [Osobennosti karotazha skvazhin v usloviiakh mnogoletneĭ merzloty],
Musin, A.M., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.30-32, In Russian.
Sedov, B.M.
Permafrost physics, Electrical prospecting, Drilling, Well logging.

33-1779
Using the independent net method in solving one-dimensional Stefan problems. [Reshenie odnomernoĭ zadachi Stefana metodom nezavisimoĭ setki],
Smorygin, G.I., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.38-40, In Russian.
Fandeev, V.V.
Stefan problem, Artificial thawing, Heat transfer, Permafrost.

33-1780
Using the thermoelasticity theory in solving engineering and geocryology problems. [O primenenii teorii termouprugosti v zadachakh inzhenernoĭ geokriologii],
Kronik, IA.A., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.42-44, In Russian.
Permafrost thermal properties, Elastic properties, Rheology, Analysis (mathematics).

33-1781
Solving problems on freezing (thawing) of fine-grained ground. [Sposob reshenila zadachi na promerzanie (ottaivanie) tonkodispersnogo grunta],
Konovalov, A.A., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.45-46, In Russian.
Soil freezing, Thermal conductivity, Frost penetration, Analysis (mathematics).

33-1782
Mathematical model of ground freeze-thaw beneath plastic covers. [Matematicheskaia model' protsessa ottaivaniia-promerzaniia grunta pod plenochnymi pokrytiiami],
Smorygin, G.I., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.52-53, In Russian.
Vediaev, IU.M.
Permafrost thermal properties, Mathematical models, Frost penetration, Heat transfer, Plastics, Covering, Artificial thawing.

33-1783
Present state of geocryological forecasting. [Sovremennoe sostoianie geokriologicheskoĭ prognostiki],
Kudriavtsev, V.A., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.56-57, In Russian.
Permafrost forecasting, Theories.

33-1784
Types of engineering-geocryological forecasts. [Vidy inzhenerno-geokriologicheskogo prognoza],
Maksimova, L.N., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.57-60, In Russian.
Permafrost forecasting, Permafrost transformation, Permafrost depth, Classifications.

33-1785
Use of infrared and visible imagery for sea ice monitoring.
McClain, E.P., Washington, D.C., National Environmental Satellite Service, 17p. + 14 figs., 35 refs. Unpublished manuscript. Background material for WMO Workshop on Remote Sensing of Sea Ice, Washington, D.C., Oct. 16-20, 1978.
Sea ice distribution, Pack ice, Ice forecasting, Infrared photography, Remote sensing, Infrared mapping, Photometers, Climatic factors, Aerial reconnaissance.
This is a supplement to and an updating of "Earth satellite measurements as applied to sea ice problems" (see 29-3205 or F-14829). Emphasis is given to the mapping of pack ice conditions and to the climatic effects of ice in the Arctic and Antarctic. The use of visible and infrared scanners carried on aircraft and spacecraft is described, and special processing of satellite data is discussed. The U.S. Navy has prepared weekly operational ice analysis and forecasts for the Arctic and Antarctic since 1970. Data were assembled into atlas form and published for the Arctic since 1972, and for the Antarctic since 1973. NOAA satellite data are used also for climate or climate-related investigations, i.e., to study sea ice variations in relation to climate, finding correlations between variations of annual mean temperature and the duration and extent of sea ice.

33-1786
Alaska's engineering heritage.
American Society of Civil Engineers. Alaska Section, [1976], 140p., 43 refs.
Civil engineering, Construction, Structures, Roads, Railroads, Transportation, Telecommunication, History, United States—Alaska.

33-1787
Soil disturbance from pile driving in sensitive clay.
Bozozuk, M., et al, *Canadian geotechnical journal*, Aug. 1978, 15(3), p.346-361, 11 refs.
Fellenius, B.H., Samson, L.
Clay soils, Pile driving, Settlement (structural), Soil dynamics, Bearing capacity, Concrete slabs, Marine geology.

33-1788
Seminar on methods of engineering-geological investigations and mapping of permafrost regions, Yakutsk, 1977. Abstracts of papers. Vol.3. [Tezisy dokladov. Vyp.3],
Nauchnyĭ seminar: Metod'ka inzhenerno-geologicheskikh issledovaniĭ i kartir .vaniia oblasti vechnoĭ merzloty, Yakutsk, 1977, Yakutskoe knizhnoe izdatel'stvo, 1977, 127p., In Russian. For individual papers see 33-1789 through 33-1813.
Permafrost thermal properties, Frost heave, Unfrozen water content, Ground ice, Ice formation, Active layer, Cryogenic soils, Soil compacting, Roads, Embankments, Permafrost beneath structures, Permafrost bases, Slope processes, Slope stability, Solifluction, Earth dams, Pipelines.

33-1789
Allowing for the strength of adfreezing when forecasting the stability of frozen slopes and tailings. [Uchet prochnosti smerzaniia pri prognozirovanii ustoĭchivosti merzlykh otvalov i sklonov],
Bondarenko, G.I., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.12-13, In Russian.
Slope processes, Slope stability, Embankments, Freeze thaw cycles, Analysis (mathematics).

33-1790
Geocryological studies for planning gas-line construction in West Siberia. [Geokriologicheskie issledovaniia dlia obosnovaniia stroitel'stva gazoprovodov v Zapadnoĭ Sibiri],
Dubikov, G.I., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.18-20, In Russian.
Belopukhova, E.B., Danilova, N.S., Stremiakov, A.IA.
Pipelines, Permafrost beneath structures, Surveys, Design.

33-1791
Studying engineering-geological processes related to the construction and operation of main pipelines. [Osnovnye problemy issledovaniia nekotorykh inzhenerno-geologicheskikh protsessov v sviazi so stroitel'stvom i ekspluatatsieĭ magistral'nykh truboprovodov],
Garagulia, L.S., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.21-22, In Russian.
Parmuzin, S.IU.
Pipelines, Permafrost beneath structures, Design, Cold weather operation.

33-1792
Geocryological-engineering-geological surveying of an underground section of an operating gas-pipeline. [Opyt merzlotno-inzhenerno-geologicheskikh issledovaniĭ na podzemnom uchastke odnogo iz deĭstvuiushchikh severnykh gazoprovodov],
Kondrat'ev, V.G., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.24-25, In Russian.
Subsurface structures, Pipelines, Permafrost beneath structures.

33-1793
Basic engineering-geocryological problems of power engineering in permafrost areas. [Nekotorye osnovnye inzhenerno-geokriologicheskie problemy v praktike energeticheskogo stroitel'stva v oblasti vechnoĭ merzloty],
Tsytovich, N.A., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.33-35, In Russian.
Kronik, IA.A.
Hydroelectric power generation, Hydraulic structures, Earth dams, Frost penetration, Permafrost beneath structures.

33-1794
Evaluating the stability of coarse clastic material on slopes in seismic areas of the permafrost zone. [Predvaritel'naia otsenka ustoĭchivosti krupnooblomochnogo materiala na sklonakh v seĭsmicheskikh raĭonakh zony vechnoĭ merzloty],
Chubarova, N.P., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.47-49, In Russian.
Lavrent'eva, L.E.
Slope stability, Slope processes, Soil creep, Active layer.

33-1795
Engineering-geological classification of peat soils. [Inzhenerno-geologicheskaia klassifikatsiia torfianykh gruntov],
Roman, L.T., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.49-50, In Russian.
Swamps, Peat, Soil formation, Physical properties, Mechanical properties.

33-1796
Attachment for drilling holes in permafrost. [Prisposoblenie dlia ustroĭstva skvazhin v merzlykh gruntakh],
Gur'ev, T.A., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.50-53, In Russian.
Lukina, V.A.
Drilling, Boreholes, Permafrost.

33-1797
Changes in static and dynamic characteristics of rock deformation during the transition from thawed to frozen state. [Otsenka izmeneniĭ staticheskikh i dinamicheskikh kharakteristik deformatsionnykh svoĭstv skal'nykh porod pri ikh perekhode iz talogo sostoianiia v merzloe],
Voronkov, O.K., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977 Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.58-60, In Russian.
Nozdrin, G.I.
Frozen rocks, Ground water, Phase transformations, Frost penetration, Deformation.

33-1798
Methods of studying thermal deformations of frozen grounds. [K metodike issledovaniia teplovykh deformatsiĭ merzlykh gruntov],
Kronik, IA.A., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.68-70, In Russian.
Merzliakov, V.P., Mikhaleva, M.V.
Frozen ground thermodynamics, Analysis (mathematics).

33-1799
Sustained strength limits of frozen ground. [O metodike opredeleniia predel'no dlitel'noĭ prochnosti merzlykh gruntov],
Shusherina, E.P., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.73-75, In Russian.
Emel'ianova, L.V., Zharov, A.A.
Frozen ground strength, Compressive strength, Ultimate strength.

33-1800
Shear strength of frozen ground at surfaces of adfreezing to materials. [O metodike opredeleniia soprotivleniia merzlykh gruntov sdvigu po poverkhnosti smerzaniia s materialami],
Shusherina, E.P., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.76-79, In Russian.
Shneĭderova, V.V., Zharov, A.A., Nikolaev, A.A.
Frozen ground, Adhesive strength, Concretes, Wood, Metals, Permafrost.

33-1801
Combined method of evaluating mechanical properties of thawing grounds. [Metod kompleksnoĭ otsenki mekhanicheskikh svoĭstv ottaivaiushchikh gruntov],
Gur'ianov, I.E., Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.79-80, In Russian.
Ground thawing, Soil mechanics, Mechanical properties, Analysis (mathematics).

33-1802
Deformation of thawing bases. [Opredelenie deformatsiĭ ottaivaiushchikh osnovaniĭ],
Dubeĭkovskiĭ, S.G., et al, Nauchnyĭ seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoĭ merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.81-82, In Russian.
Nikolaev, A.M., Chaĭkin, A.A.
Permafrost bases, Permafrost beneath structures, Ground thawing, Analysis (mathematics), Thaw penetration.

33-1803
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Frozen ground strength, Compressive properties, Thaw depth, Analysis (mathematics).

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Shores, Cryogenic soils, Saline soils, Frozen ground temperature, Bearing strength, Foundations, Design, Arctic Ocean.

33-1805
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Ground thawing, Compressive strength, Analysis (mathematics).

33-1806
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Ground thawing, Compressive strength, Measuring instruments.

33-1807
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Frozen rocks, Unfrozen water content, Measuring instruments, Nuclear magnetic resonance, Ground water, Phase transformations, Molecular structure, Ice structure.

33-1808
Combined method of investigating the effect of freeze-thaw cycles on changes in the composition, structure and properties of grounds. [K metodike kompleksnogo issledovaniia vliianiia mnogokratnogo tsiklicheskogo promerzaniia-ottaivaniia na izmenenie sostava, stroeniia i svoĭstv gruntov],
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Frozen fines, Clay soils, Freeze thaw cycles, Soil composition, Soil structure.

33-1809
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Ground water, Phase transformations, Unfrozen water content, Ground ice, Permafrost.

33-1810
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Permafrost thermal properties, Heat transfer, Moisture transfer, Measuring instruments, Frozen fines, Test equipment, Laboratory techniques.

33-1811
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Buildings, Foundations, Permafrost beneath structures, Frost heave, Tundra soils, Active layer.

33-1812
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Soil freezing, Frost penetration, Frost heave, Soil tests, Laboratory techniques.

33-1813
Laboratory technique for determining frost heave coefficients of clayey grounds. ¡K metodike laboratornogo opredeleniia koeffitsienta moroznogo pucheniia glinistykh gruntov¡,
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Clay soils, Frozen fines, Frost heave, Soil tests, Laboratory techniques.

33-1814
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DLC TA682.43.I57
Winter concreting, Reinforced concrete, Prestressed concrete, Cements, Cement additives, Concretes, Concrete admixtures, Concrete aggregates, Moisture content, Concrete freezing, Electric heating, Concrete strength, Concrete hardening, Concrete structures, Concrete piles.

33-1815
Cement hardening at low temperatures and the structure-forming role of water-soluble admixtures to concrete. ¡Tverdenie tsementov pri ponizhennykh temperaturakh i strukturoobrazuiushchaia rol' vodorastvorimykh dobavok k betonu¡,
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33-1816
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33-1817
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Frozen ground, Winter concreting, Concrete hardening, Concrete freezing, Concrete strength, Thermal regime, Concrete placing.

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DLC TA682.43.I57
Winter concreting, Concrete hardening, Concrete strength, Concrete freezing.

33-1819
Influence of freezing on physico-mechanical properties of hydraulic concretes and measures taken to ensure its frost resistance. ¡Vliianie zamorazhivaniia na fiziko-mekhanicheskie svoĭstva gidrotekhnicheskogo betona i osnovnye meropriiatiia po obespecheniiu ego morozostoĭkosti¡,
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Concrete structures, Hydraulic structures, Concrete freezing, Freeze thaw cycles, Concrete strength, Frost resistance.

33-1820
Solidification of concretes containing slag-alkali cements, at subzero temperatures. ¡Tverdenie betonov na shlakoshchelochnykh viazhushchikh pri otritsatel'nykh temperaturakh¡,
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Cement additives, Winter concreting, Concrete freezing, Concrete admixtures, Concrete hardening, Concrete strength, Cements.

33-1821
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Winter concreting, Concrete admixtures, Concrete strength, Frost resistance.

33-1822
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33-1823
Temperature fields in structures built with electrically heated concrete mixtures. ¡Temperaturnye polia v konstruktsiiakh, zabetonirovannykh s elektrorazogrevom smesi¡,
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33-1824
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DLC TA682.43.I57
Concrete hardening, Winter concreting, Concrete aggregates, Cements, Theories.

33-1825
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Winter concreting, Concrete hardening, Concrete freezing, Cements, Structural changes.

33-1826
Influence of early freezing on concrete structure. ¡Vliianie rannego zamorazhivaniia na strukturu betona¡,
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33-1827
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33-1828
Properties of cemented materials cooled during hardening. ¡O svoĭstvakh tsementnykh materialov, podvergavshikhsia okhlazhdeniiu v period tverdeniia¡,
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Winter concreting, Concrete hardening, Concrete freezing, Concrete strength, Cements, Mortars.

33-1829
Heat release of concrete during winter placing. [Teplovydelenie betona v usloviiakh zimnego betonirovaniia],
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Winter concreting, Concrete freezing, Concrete hardening, Heat loss, Concrete placing.

33-1830
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Winter concreting, Cements, Mortars, Concrete hardening, Concrete freezing, Resins.

33-1831
Cast-in-situ reinforced concrete piles deeply placed in permafrost. [Monolitnye zhelezobetonnye svai-stoĭki glubokogo zalozheniia v vechnomerzlykh gruntakh],
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Pile foundations, Concrete piles, Reinforced concrete, Concrete placing, Concrete hardening, Concrete admixtures, Permafrost beneath structures.

33-1832
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Winter concreting, Concrete hardening, Concrete admixtures, Concrete strength.

33-1833
Industrial application of new combined antifreeze admixtures to concretes. [Nekotorye aktual'nye problemy promyshlennogo primeneniia novykh kompleksnykh protivomoroznykh dobavok v betony],
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Antifreezes, Winter concreting, Concrete admixtures.

33-1834
Influence of antifreeze admixtures on physicomechanical properties of concrete frozen in a freshly placed state. [Vliianie protivomoroznykh dobavok na fiziko-mekhanicheskie svoĭstva betona, podvergaiushchegosia zamorazhivaniiu v rannem vozraste],
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DLC TA682.43.I57
Winter concreting, Concrete freezing, Concrete hardening, Concrete admixtures, Antifreezes, Concrete strength, Concret placing.

33-1835
Winter concreting at the sites of the Bratsk and Ust'-Ilimsk hydroelectric power plants. [Zimnee betonirovanie na Bratskoĭ i Ust'-Ilimskoĭ GES],
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Winter concreting, Concrete freezing, Concrete hardening, Hydraulic structures, Concrete placing.

33-1836
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Winter concreting, Concrete hardening, Concrete heating, Concret placing.

33-1837
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DLC TA682.43.I57
Winter concreting, Concrete heating, Electric heating, Concrete hardening.

33-1838
Winter concreting techniques used in the Tagilstroi Trust, Central Ural Mountains. [Praktika zimnego betonirovaniia na Srednem Urale (na opyte ordena Lenina tresta Tagilstroĭ)],
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DLC TA682.43.I57
Foundations, Concrete placing, Concrete freezing, Concrete heating, Concrete hardening, Concrete admixtures, Winter concreting.

33-1839
Erection of multistory solid concrete and masonry buildings in freezing weather without heating. [Stroitel'stvo mnogoetazhnykh monolitnobetonnykh i kamennykh zdaniĭ v zimnikh usloviiakh besprogrevnym metodom],
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DLC TA682.43.I57
Buildings, Winter concreting, Concrete strength, Concrete structures, Foundations, Concrete placing.

33-1840
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DLC TA682.43.I57
Winter concreting, Concrete heating, Electric heating, Coatings, Resins, Formwork (construction).

33-1841
Methods of placing concrete when building cast-in-situ structures of power plants at subzero temperature. [Metody betonirovaniia massivnykh monolitnykh konstruktsiĭ pri otritsatel'noĭ temperature na ob'ektakh teploenergeticheskogo stroitel'stva],
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Foundations, Winter concreting, Concrete structures, Buildings, Concrete placing.

33-1842
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Winter concreting, Economic analysis, Construction costs.

33-1843
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33-1844
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Winter concreting, Concrete curing, Concrete heating, Concrete hardening, Concrete strength.

33-1845
Improving practical methods of winter concreting with antifreeze admixtures and thermal treatment. [Sovershenstvovanie prakticheskikh metodov zimnego betonirovaniia s primeneniem protivomoroznykh dobavok i progressivnykh sposobov teplovoĭ obrabotkiy],
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DLC TA682.43.I57
Winter concreting, Concrete admixtures, Antifreezes, Concrete heating.

33-1846
No-heating method of concrete placing and grouting in bridge construction. [Bezobogrevnoe betonirovanie i omonolichivanie mostovykh konstruktsiĭ],
Kostiaev, P.S., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroĭizdat, 1975, p.283-293, In Russian. English summary p.370.
DLC TA682.43.I57
Bridges, Grouting, Winter concreting, Concrete structures, Concrete placing.

33-1847
Improving crack resistance of massive winter-placed concrete. [Povyshenie treshchinostoĭkosti massivnykh konstruktsiĭ pri zimnem betonirovaniiy],
Krylov, B.A., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroĭizdat, 1975, p.294-299, In Russian. English summary p.370. 3 refs.
DLC TA682.43.I57
Winter concreting, Concrete freezing, Fracturing, Concrete curing, Concrete placing.

33-1848
Concrete strength control in winter concreting. [Kontrol' prochnosti betona pri zimnem betonirovaniiy],
Leshchinskiĭ, M.IU., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroĭizdat, 1975, p.299-306, In Russian. English summary p.372. 7 refs.
DLC TA682.43.I57
Winter concreting, Concrete hardening, Reinforced concrete, Concrete strength.

33-1849
Manufacturing prestressed structural elements in open air at low subzero temperatures. [Sposob izgotovleniia prednapriazhennykh konstruktsiĭ na otkrytukh poligonakh pri nizkikh otritsatel'nykh temperaturakh],
Markarov, N.A., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975 Proceedings, Vol.1, Moscow, Stroĭizdat, 1975, p.306-312, In Russian. English summary p.372.
Barmin, N.N.
DLC TA682.43.I57
Winter concreting, Prefabrication, Prestressed concrete, Concrete strength, Frost resistance.

33-1850
Electric heating of mortars when grouting prestressed structures in freezing weather. [Elektroprogrev rastvora pri zimnem in"etsirovanii prednapriazhennykh konstruktsiĭ],
Matkov, N.G., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Strolizdat, 1975, p.312-322, In Russian. English summary p.374.
DLC TA682.43.I57
Cold weather construction, Prestressed concrete, Grouting, Reinforced concrete.

33-1851
Winter concreting techniques for severe climatic conditions of the Vilyuy and Ust'-Khantaika hydroelectric power plants. [Tekhnologiia zimnego betonirovaniia v surovykh klimaticheskikh usloviiakh (na stroitel'stve Viliuĭskoĭ i Ust'-Khantaĭskoĭ GES)],
Matiushin, V.M., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Strolizdat, 1975, p.322-329, In Russian. English summary p.374.
Demidov, A.N.
DLC TA682.43.I57
Hydraulic structures, Concrete structures, Dams, Winter concreting.

33-1852
Proceedings.
Symposium on the Physics and Chemistry of Ice, Cambridge, England, Sep. 1977, *Journal of glaciology,* 1978, 21(85), 714p., For individual papers see 33-1853 through 33-1903. General discussion and abstracts of papers not published in full, p.669-708.
Glen, J.W., ed, Adie, R.J., ed, Johnson, D.M., ed, Homer, D.R., ed, Macqueen, A.D., ed.
Meetings, Ice physics, Ice composition.

33-1853
Distortion of a water molecule in ice.
Whalley, E., *Journal of glaciology,* 1978, 21(85), p.13-31, In English with French and German summaries. Numerous refs.
Molecular structure, Drops (liquids), Ice formation, Ice electrical properties.

33-1854
Clathrate ices—recent results.
Davidson, D.W., et al, *Journal of glaciology,* 1978, 21(85), p.33-49, In English with French and German summaries. 35 refs.
Ripmeester, J.A.
Hydrates, Gas inclusions, Water chemistry, Nuclear magnetic resonance, Ice composition.

33-1855
X-ray determination of the structure of Ice IV.
Engelhardt, H., et al, *Journal of glaciology,* 1978, 21(85), p.51-53, 4 refs. In English with French and German summaries.
Kamb, B.
Ice structure, X ray analysis, High pressure ice.

33-1856
Origin of the high-frequency translational bands of Ice I.
Klug, D.D., et al, *Journal of glaciology,* 1978, 21(85), p.55-63, In English with French and German summaries. 25 refs.
Whalley, E.
Ice structure, Ice spectroscopy, Cubic ice.

33-1857
Translational lattice-vibration Raman spectrum of single-crystal ice Ih.
Faure, P., et al, *Journal of glaciology,* 1978, 21(85), p.65-72, In English with French and German summaries. 20 refs.
Chosson, A.
Ice crystal structure.

33-1858
Configurational statistics.
Nagle, J.F., *Journal of glaciology,* 1978, 21(85), p.73-83, In English with French and German summaries. 40 refs.
Ice crystal structure, Ice optics, High pressure ice, Ice dielectrics, Dielectric properties, Statistical data, Analysis (mathematics).

33-1859
Vacancies in pure ice studied by positron annihilation techniques.
Mogensen, O.E., et al, *Journal of glaciology,* 1978, 21(85), p.85-99, In English with French and German summaries. 27 refs.
Eldrup, M.
Ice crystal structure, Ice composition, Particles, Temperature effects.

33-1860
Vacancies in HF-doped and in irradiated ice by positron annihilation techniques.
Eldrup, M., et al, *Journal of glaciology,* 1978, 21(85), p.101-113, In English with French and German summaries. 33 refs.
Mogensen, O.E., Bilgram, J.H.
Ice deformation, Impurities, Gamma irradiation, Ice structure, Doped ice.

33-1861
Interaction of point defects in ice.
Bilgram, J.H., et al, *Journal of glaciology,* 1978, 21(85), p.115-122, In English with French and German summaries. 9 refs.
Gränicher, H.
Ice crystal structure, Ice deformation, Impurities, Ice dielectrics, Temperature effects.

33-1862
Theoretical models for interpreting the dielectric behaviour of HF-doped ice.
Camplin, G.C., et al, *Journal of glaciology,* 1978, 21(85), p.123-141, In English with French and German summaries. 21 refs.
Glen, J.W., Paren, J.G.
Ice dielectrics, Impurities, Ice composition, Models, Doped ice.

33-1863
Electrical conductivity and relaxation in ice crystals with known impurity content.
Gross, G.W., et al, *Journal of glaciology,* 1978, 21(85), p.143-160, In English with French and German summaries. 35 refs.
Hayslip, I.C., Hoy, R.N.
Ice electrical properties, Electrical resistivity, Ice composition, Impurities, Ice relaxation, Doped ice.

33-1864
Effect of pressure on the dielectric properties of ice Ih single crystals doped with NH3 and HF.
Hubmann, M., *Journal of glaciology,* 1978, 21(85), p.161-172, In English with French and German summaries. 23 refs.
Ice crystal structure, Impurities, Ice dielectrics, Ice composition, Doped ice.

33-1865
Electrical behaviour of finely divided ice.
Paren, J.G., et al, *Journal of glaciology,* 1978, 21(85), p.173-191, In English with French and German summaries. 25 refs.
Glen, J.W.
Ice structure, Ice dielectrics, Ice relaxation, Gas inclusions.
The electrical behavior of ice which has been finely ground and compressed was investigated during aging in air and over a range of temperatures. The dielectric behavior may be accurately represented as the sum of two elliptical relaxation spectra. The behavior eventually stabilizes with similar activation energies for the mean relaxation time of each spectrum *c.* 0.25 eV, and the ratio of the relaxation times is ten in samples of density *c.* 0.42 Mg/cu m. Arguments are presented on whether the higher-frequency dispersion is a consequence of the heterogeneous nature of the samples or is a bulk relaxation process. The similarities between the behavior of such finely ground ice and of deposited snow and polar glacier ice are discussed. The extent to which the results may be attributed to surface adsorption of CO2 are examined by reference to measurements of the CO2 content of finely divided ice and ice from polar regions. (Auth.)

33-1866
Electrical properties of ice surfaces.
Maeno, N., et al, *Journal of glaciology,* 1978, 21(85), p.193-205, In English with French and German summaries. 16 refs.
Nishimura, H.
Ice electrical properties, Ice resistivity, Ice temperature.

33-1867
Dielectric properties of dislocation-free ice.
Itagaki, K., *Journal of glaciology,* 1978, 21(85), MP 1171, p.207-217, In English with French and German summaries. 20 refs.
Ice crystals, Hoarfrost, Dislocations (materials), Ice dielectrics.
Dielectric properties of dislocation-free hoar-frost ice crystals were measured in the audio-frequency range. Anomalously small relaxation strength was found in the dislocation-free area of the crystal samples, while dislocations deliberately introduced by scratching the samples drastically modified the relaxation strength. Since measurements made in the area of high dislocation density indicated normal behavior, electrically charged dislocations are considered to be the source of the normally observed dielectric relaxation.

33-1868
Measurements of the electrical properties of ice Ih single crystals by admittance and thermally stimulated depolarization techniques.
Loria, A., et al, *Journal of glaciology,* 1978, 21(85), p.219-230, In English with French and German summaries. 21 refs.
Mazzega, E., Del Pennino, U., Andreotti, G.
Ice crystal structure, Ice electrical properties, Ice relaxation, Thermal effects, Ice spectroscopy.

33-1869
Inelastic neutron scattering from ice and other proton-containing substances.
Dorner, B., *Journal of glaciology,* 1978, 21(85), p.231-240, In English with French and German summaries. 23 refs.
Ice structure, Neutron scattering, Protons, Phase transformations.

33-1870
Thermal conductivity of ice in the temperature range 0.5 to 5.0K.
Varrot, M., et al, *Journal of glaciology,* 1978, 21(85), p.241-245, In English with French and German summaries. 3 refs.
Rochas, G., Klinger, J.
Ice resistivity, Thermal conductivity, Low temperature research.

33-1871
Radiation damage in ice at low temperatures studied by proton channelling.
Golecki, I., et al, *Journal of glaciology,* 1978, 21(85), p.247-258, In English with French and German summaries. 25 refs.
Jaccard, C.
Ice structure, Radiation, Protons, Backscattering.

33-1872
Orientation polarization in hexagonal ice parallel and perpendicular to the c-axis.
Johari, G.P., et al, *Journal of glaciology,* 1978, 21(85), p.259-276, In English with French and German summaries. 39 refs.
Jones, S.J.
Ice crystal structure, Polarization (charge separation), Crystal orientation, Ice electrical properties.

33-1873
Influence of the rate of deformation on the electric properties of ice monocrystals.
Noll, G., *Journal of glaciology,* 1978, 21(85), p.277-289, In English with French and German summaries. 20 refs.
Ice electrical properties, Ice deformation, Ice crystal structure, Plastic deformation.

33-1874
CO2 in natural ice.
Stauffer, B., et al, *Journal of glaciology,* 1978, 21(85), p.291-300, In English with French and German summaries. 18 refs.
Berner, W.
Ice composition, Gas inclusions, Carbon dioxide.

33-1875
Radio-frequency birefringence of polar ice.
Hargreaves, N.D., *Journal of glaciology,* 1978, 21(85), p.301-313, In English with French and German summaries. 32 refs.
Ice optics, Ice structure, Refractivity, Anisotropy.
Radio-echo observations have shown that polar ice *in situ* is birefringent. The most likely explanation of the birefringence is an anisotropy in the radio-frequency dielectric constant of the ice single crystal, combined with the ordering of the orientations of the ice crystals in polar ice. It is possible to calculate the birefringence of ice which has a distribution of crystal orientations, using a technique similar to that used to derive the dielectric properties of heterogeneous media. The experimentally observed birefringence may then be shown to be consistent with the crystal orientation fabric at the site of the observations, if the anisotopy of the dielectric constant is slightly less than 1%, that is, slightly less than the accuracy of the laboratory measurements which have failed to detect any anisotropy. Further exp. imental observations might be used to obtain information on not only the level of anisotropy of the single crystal but also on the crystal orientation fabric of the ice. (Auth.)

33-1876
Dielectric permittivity of glacier ice measured *in situ* by radar wide-angle reflection.
Jezek, K.C., et al, *Journal of glaciology,* 1978, 21(85), p.315-329, In English with French and German summaries. 28 refs.
Clough, J.W., Bentley, C.R., Shabtaie, S.
Glacier ice, Reflectivity, Ice dielectrics, Ice cover thickness, Dielecciric properties.
Values of relative permittivity measured by the wide-angle reflection technique on the Ross Ice Shelf show substantial variations between sites, from 3.09 to 2.89, with estimated errors of 0.03. The largest values, closest to those normally measured

in the laboratory, are found nearest to the grounded ice sheet; values decrease generally in the direction of thinner ice that has been longer on the ice shelf. We believe the variation reflects some real physical phenomenon in the ice shelf, either a true variation in the permittivity of the ice or a complication of the ray-path geometry, but are not able to offer a satisfactory model at present. (Auth. mod.)

33-1877
Activation energies of temperate snow samples.
Traub, L.T., et al, *Journal of glaciology*, 1978, 21(85), p.331-339, In English with French and German summaries. 11 refs.
Gribbon, P.W.F.
Snow cover structure, Snow electrical properties, Electrical resistivity, Temperature effects, Grain size.

33-1878
Core structure and the mobility of dislocations in ice.
Whitworth, R.W., *Journal of glaciology*, 1978, 21(85), p.341-359, In English with French and German summaries. 39 refs.
Ice cores, Ice structure, Dislocations (materials), Proton transport.

33-1879
Cooperative movement of H2O molecules and dynamic behaviour of dislocations in ice Ih.
Perez, J., et al, *Journal of glaciology*, 1978, 21(85), p.361-374, In English with French and German summaries. 25 refs.
Maï, C., Vassoille, R.
Hydrogen bonds, Ice structure, Ice crystals, Unfrozen water content, Dislocations (materials), Models.

33-1880
Inelastic behaviour of ice Ih single crystals in the low-frequency range due to dislocation.
Vassoille, R., et al, *Journal of glaciology*, 1978, 21(85), p.375-384, In English with French and German summaries. 18 refs.
Maï, C., Perez, J.
Ice structure, Ice dislocations, Internal friction, Plastic deformation.

33-1881
Observation of basal dislocations in ice by etching and replicating.
Sinha, N.K., *Journal of glaciology*, 1978, 21(85), p.385-395, In English with French and German summaries. 20 refs.
Ice dislocations, Ice surface, Surface roughness, Laboratory techniques.

33-1882
X-ray topographic studies of dislocations in vapor-grown ice crystals.
McKnight, C.V., et al, *Journal of glaciology*, 1978, 21(85), p.397-407, In English with French and German summaries. 21 refs.
Hallett, J.
Ice crystal structure, Dislocations (materials), Laboratory techniques, X ray analysis, Ice crystal nucleation.

33-1883
Studies of crystal imperfections in ice with reference to the growth process by the use of X-ray diffraction topography and divergent Laue method.
Mizuno, Y., *Journal of glaciology*, 1978, 21(85), p.409-418, In English with French and German summaries. 14 refs.
Ice crystal structure, Ice crystal growth, Dislocations (materials), X ray diffraction.

33-1884
Deformation mechanism map of ice.
Shoji, H., et al, *Journal of glaciology*, 1978, 21(85), p.419-427, In English with French and German summaries. 23 refs.
Higashi, A.
Ice crystals, Ice deformation, Dislocations (materials), Maps.

33-1885
Creep activation energies of ice.
Homer, D.R., et al, *Journal of glaciology*, 1978, 21(85), p.429-444, In English with French and German summaries. 47 refs.
Glen, J.W.
Ice crystals, Ice creep, Creep rate, Ice deformation, Strain tests.

33-1886
Deformation of ice single crystals close to the melting point.
Jones, S.J., et al, *Journal of glaciology*, 1978, 21(85), p.445-455, In English with French and German summaries. 12 refs.
Brunet, J.-G.
Ice crystals, Ice deformation, Strain tests, Compressive properties.

33-1887
Short-term rheology of polycrystalline ice.
Sinha, N.K., *Journal of glaciology*, 1978, 21(85), p.457-473, In English with French and German summaries. 40 refs.
Ice deformation, Ice creep, Ice models.

33-1888
Effect of anisotropy on the creep of polycrystalline ice.
Lile, R.C., *Journal of glaciology*, 1978, 21(85), p.475-483, In English with French and German summaries. 9 refs.
Ice crystal structure, Ice creep, Ice models, Anisotropy.

33-1889
Influence of ice-crystal size on creep.
Baker, R.W., *Journal of glaciology*, 1978, 21(85), p.485-500, In English with French and German summaries. 52 refs.
Ice crystal structure, Strain tests, Ice growth, Ice creep, Ice crystal size.

33-1890
Creep of NaCl-doped ice monocrystals.
Riley, N.W., et al, *Journal of glaciology*, 1978, 21(85), p.501-507, In English with French and German summaries. 18 refs.
Noll, G., Glen, J.W.
Ice creep, Impurities, Shear stress, Strains, Doped ice.

33-1891
On the relationships between low-density amorphous solid water and ice Ih.
Rice, S.A., et al, *Journal of glaciology*, 1978, 21(85), p.509-535, In English with French and German summaries. 38 refs.
Madden, W.G., McGraw, R., Sceats, M.G., Bergren, M.S.
Amorphous ice, Ice crystal structure, Ice density, Molecular structure, Ice spectroscopy.

33-1892
Dynamical processes at the ice-water interface during solidification.
Bilgram, J.H., et al, *Journal of glaciology*, 1978, 21(85), p.537-545, In English with French and German summaries. 7 refs.
Güttinger, H.
Ice water interface, Ice crystal growth, Ice optics, Light scattering.

33-1893
Charge separation by collision of ice particles on metals: electronic surface states.
Buser, O., et al, *Journal of glaciology*, 1978, 21(85), p.547-557, In English with French and German summaries. 19 refs.
Jaccard, C.
Ice electrical properties, Polarization (charge separation), Electric fields, Metals, Laboratory techniques, Wind tunnels.

33-1894
Optical absorption spectra of H2O ice doped with ytterbium chloride YbCl3.
Couture, L., *Journal of glaciology*, 1978, 21(85), p.559-563, In English with French and German summaries. 8 refs.
Doped ice, Ice composition, Impurities, Ice spectroscopy.

33-1895
Molecular orbital calculations of water-ice surface interactions.
Plummer, P.L.M., *Journal of glaciology*, 1978, 21(85), p.565-580, In English with French and German summaries. 27 refs.
Ice water interface, Molecular energy levels, Hydrogen bonds.

33-1896
Frazil nucleation mechanisms.
Hanley, T.O., *Journal of glaciology*, 1978, 21(85), p.581-587, In English with French and German summaries. 23 refs.
Frazil ice, Ice crystal nucleation, Nucleating agents, Supercooling, Turbulent flow.

33-1897
Structure and behaviour of grain boundaries in polycrystalline ice.
Higashi, A., *Journal of glaciology*, 1978, 21(85), p.589-605, In English with French and German summaries. 24 refs.
Ice crystal structure, Lattice models, Boundary value problems, X ray diffraction.

33-1898
Crystallographic structure of polycrystalline ice.
Matsuda, M., et al, *Journal of glaciology*, 1978, 21(85), p.607-620, In English with French and German summaries. 41 refs.
Wakahama, G.
Ice mechanics, Ice crystal structure, Crystal structure.

33-1899
Anelastic behaviour of polycrystalline ice.
Duval, P., *Journal of glaciology*, 1978, 21(85), p.621-628, In English with French and German summaries. 21 refs.
Ice mechanics, Ice creep, Strains.
Torsion creep tests were performed on glacier ice at temperatures above -12C. The polycrystalline ice, when unloaded, exhibits creep recovery. The time-dependent recoverable component of deformation (or anelastic strain) is described in a mathematical relationship. The anelastic modulus for times in excess of 3h is always smaller than the dynamic elastic modulus. The movement of dislocations composing the sub-boundaries or in dislocation pile-ups may produce this important reversible deformation. The time-dependent recovery is explained in a similar way to the transient creep behavior observed at low temperatures for metals. The small temperature dependence of creep recovery would arise from the existence of a distribution of internal stress values. The samples used were taken in the French Alps and in Terre Adélie, Antarctica. (Auth. mod.)

33-1900
X-ray diffraction topographic observations of the large-angle grain boundary in ice under deformation.
Hondoh, T., et al, *Journal of glaciology*, 1978, 21(85), p.629-638, In English with French and German summaries. 9 refs.
Higashi, A.
Artificial ice crystals, X ray diffraction, Ice deformation, Boundary value problems.

33-1901
Regelation and the deformation of wet snow.
Colbeck, S.C., et al, *Journal of glaciology*, 1978, 21(85), MP 1172, p.639-650, In English with French and German summaries. 17 refs.
Parssinen, N.
Wet snow, Regelation, Snow deformation, Models.
The thermodynamics of phase equilibrium control the temperature distribution around the ice particles in wet snow. When the snow is stressed, pressure melting occurs at the inter-particle contacts and the snow densifies. Densification is described by a physical model which simulates the heat flow, meltwater flow, and particle geometry. The effects of ionic impurities, liquid saturation, and particle size are demonstrated. Typical values of the temperature difference, inter-particle film size, and density are calculated as functions of time. The calculated rates of compaction are too large; hence, at some later time, the effects of simultaneous grain growth must be added to the model.

33-1902
Fracture toughness of ice: a preliminary account of some new experiments.
Goodman, D.J., et al, *Journal of glaciology*, 1978, 21(85), p.651-660, In English with French and German summaries. 17 refs.
Tabor, D.
Ice strength, Brittleness, Crack propagation, Fracturing, Temperature effects.

33-1903
Anisotropy of the kinetic friction on a single crystal of ice.
Tushima, K., *Journal of glaciology*, 1978, 21(85), p.661-668, In English with French and German summaries. 7 refs.
Ice crystals, Anisotropy, Temperature effects, Metal ice friction.

33-1904
Technology of building corrugated metal culverts. [Tekhnologiia stroitel'stva metallicheskiikh gofrirovannykh vodopropusknykh trub]
Podval'nyĭ, R.E., et al, Moscow, Transport, 1978, 78p., In Russian with English table of contents enclosed. 24 refs.
Potapov, A.S., IAnkovskiĭ, O.A.
Culverts, Permafrost beneath roads, Permafrost hydrology, Naleds, Drainage, Baykal Amur railroad, Construction materials.

33-1905
Forecasting frost penetration into loose materials during railroad transportation. [Prognozirovanie protsessov promerzaniia v sypuchikh materialakh pri zheleznodorozhnykh perevozkakh]
Kozhevnikov, N.N., et al, Novosibirsk, Nauka, 1978, 103p., In Russian with English table of contents enclosed. 200 refs.
Popov, V.I.
Frozen cargo, Railroad cars, Frost penetration, Heat transfer, Mass transfer, Stefan problem, Railroads, Mathematical models.

33-1906
Chemical method of rock consolidation. (Khimicheskiĭ sposob ukrepleniia gornykh porod),
Davydov, V.V., et al, Moscow, Nedra, 1977, 228p., In Russian with English table of contents enclosed. 23 refs.
Belousov, IU.I.
Rocks, Fracturing, Cements, Cement additives, Grouting, Fracture zones, Construction equipment.

33-1907
Exploration and design of the Baykal-Amur railroad route (Reference book). (Izyskaniia i proektirovanie trassy Baĭkalo-Amurskoĭ magistrali (spravochno-metodicheskoe posobie)),
Fedorov, D.I., ed. Moscow, Transport, 1977, 280p., In Russian with English table of contents enclosed. Refs. p.272-277.
Railroads, Permafrost beneath roads, Ground ice, Permafrost structure, Naleds, Frost heave, Permafrost hydrology, Thermokarst, Roadbeds, Slope stability, Baykal Amur railroad, Roads, Surveys, Mapping.

33-1908
Cold weather operation of tractor engines. (Osobennosti ekspluatatsii avtotraktornykh dvigateleĭ zimoĭ),
Kozlov, V.E., et al, Leningrad, Kolos, 1977, 159p., In Russian with English table of contents enclosed. 15 refs.
Kvalt, S.M., Chizhkov, IU.P.
Motor vehicles, Excavating equipment, Transportation, Tractors, Engine starters, Cold weather operation.

33-1909
Dry ice = Antarctica.
Hogan, A.W., *Frontiers,* Autumn 1978, 43(1), p.17-19.
DSI 505.73F93
Climate, Ice crystal formation, Ice fog, Cloud seeding.
This paper discusses Antarctica's unique climate with emphasis on ice crystal formation. The source of the moisture which moves over the Polar Plateau and causes the formation of the ice crystals, which are almost always in the air, is not fully understood. Some investigators hypothesize that saturated air persists because antarctic air is sometimes so clean that there are too few particles of dust or other solid substances to act as ice nuclei or centers for freezing. Others propose that saturated particle-free air is common over the Polar Plateau, and a few ice crystals from higher cirrus clouds passing over the continent precipitate to levels near the surface to provide the initial seeding of the saturated air. The crystals which result shed fragments which grow into additional crystals, creating a chain reaction of growth and producing spectacular displays. The presence of saturated air on cloudless days has been verified through seeding experiments. The importance of antarctic ice to world climate and weather is stressed.

33-1910
Moving ice.
Cadwalader, J., *Frontiers,* Autumn 1978, 43(1), p.20-22.
DSI 505.73F93
Sea ice, Icebergs, Ice shelves, Ice breaking, Icebreakers, Ice navigation, Floating ice.
The author describes the features of the ice regime of antarctic waters observed while on sea duty with Task Force 43, the U.S. Naval Support Force, Antarctica, from 1955 to 1959. Observations are made on sea and terrain ice features, icebreaker design, ice navigating, icebreaking operations, methods of mooring ships, and resupply efforts. Brief mention is also made of the sights of the journey, i.e., marine wildlife, points of historical interest, etc.

33-1911
Operation of excavating equipment in freezing weather. (Ekspluatatsiia zemleroĭnykh mashin v zimnee vremia),
Lozoveĭ, D.A., et al, Leningrad, Strolizdat, 1978, 120p., In Russian with English table of contents enclosed. 20 refs.
Zapuskalov, V.A., Pokrovskiĭ, A.A., Trushin, IU.M.
Earthwork, Excavating equipment, Cold weather operation, Frozen ground.

33-1912
Transparent structural elements for construction in the North. (Svetoprozrachnye konstruktsii dlia stroitel'stva ob"ektov na Severe),
Karateev, L.P., et al, Leningrad, Strolizdat, 1978, 183p., In Russian with English table of contents enclosed. 18 refs.
Nikitin, G.G., Suponitskiĭ, Z.G.
Plastics, Construction materials, Light transmission, Windows, Walls, Roofs, Glass, Design, Construction.

33-1913
Technical readiness of construction equipment at the Baykal-Amur railroad construction sites. (Rezervy povysheniia tekhnicheskoĭ gotovnosti mashin na stroitel'stve Baĭkalo-Amurskoĭ magistrali),
Zhurba, V.A., *Mekhanizatsiia stroitel'stva,* Nov. 1978, No.11, p.12-15, In Russian.
Construction equipment, Excavating equipment, Motor vehicles, Winter maintenance, Cold weather performance, Baykal Amur railroad, Design.

33-1914
Calculating horizontal drains preventing earth liquefaction in dams by seismic shocks. (K raschetu gorizontal'nykh dren, preduprezhdaiushchikh razvitie razzhizheniia v zemlianykh plotinkakh pri seĭsmicheskikh vozdeĭstviiakh),
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DLC SB168.R9T49
Alpine soils, Alpine vegetation, Mosses, Plant ecology.

33-1972
Vertical distribution of hepatic mosses in Pamir-Alai. {K vertikal'nomu raspredeleniiu pechenochnykh mkhov Pamiro-Alaia},
Boboradzhabov, V., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.64-65, In Russian.
DLC SB168.R9T49
Alpine soils, Deserts, Alpine vegetation, Mosses, Plant ecology, Distribution.

33-1973
Preliminary results of karyologic investigations of alpine brioflora of the USSR. {Predvaritel'nye itogi kariologicheskogo issledovaniia brioflory gornykh raĭonov SSSR},
Vysotskaia, E.I., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.73-74, In Russian.
DLC SB168.R9T49
Mosses, Plant ecology, Alpine soils, Plant physiology.

33-1974
Role of polyploidy in the origin of Pamir-Alai mosses. {O roli poliploidii v genezise flory mkhov Pamiro-Alaia},
Mamatkulov, U.K., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.76-78, In Russian.
DLC SB168.R9T49
Alpine vegetation, Plant physiology, Mosses, Alpine soils, Plant ecology, Ecosystems.

33-1975
Place of highlands in the system of botanical-geographic regionalization of mountainous regions. {K voprosu o meste vysokogoriĭ v sisteme botaniko-geograficheskogo raĭonirovaniia gornykh stran},
Sokhadze, E.V., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.101-102, In Russian.
DLC SB168.R9T49
Alpine land forms, Alpine vegetation, Geobotanical interpretation, Mapping, Plant ecology, Ecosystems.

33-1976
Large-scale mapping of alpine tundra vegetation in northern Ural Mountains at the level of phytocenosis complexes. {Krupnomasshtabnoe kartirovanie rastitel'nosti gornykh tundr Severnogo Urala na urovne kompleksov fitotsenozov},
Famelis, T.V., et al, Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.108-109, In Russian.
Nikonova, N.N.
DLC SB168.R9T49
Alpine tundra, Tundra vegetation, Alpine soils, Tundra soils, Ecosystems, Mapping.

33-1977
Fluctuation of horizontal structures of subalpine meadows. {Fliuktuatsii gorizontal'noĭ struktury subal'piĭskogo luga},
Evstratova, O.I., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.119-120, In Russian.
DLC SB168.R9T49
Alpine soils, Alpine vegetation, Plant ecology, Ecosystems, Distribution.

33-1978
Biomass and productivity of lichens in Alpine tundras of the northern Ural Mountains and their variation in the course of succession. {Fitomassa i produktivnost' lishaĭnikov v gornykh tundrakh Severnogo Urala i ikh izmenenie v khode suktsessiĭ},
Kondrat'eva, M.A., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.123-124, In Russian.
DLC SB168.R9T49
Alpine tundra, Tundra vegetation, Lichens, Biomass, Tundra soils, Plant ecology.

33-1979
Phytoindication of man induced shifts of the upper forest boundary. [Fitoindikatsiia antropogennykh smeshcheniĭ verkhneĭ granitsy lesa],
Gorchakovskiĭ, P.L., et al, Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.152-153, In Russian.
Shiiatov, S.G.
DLC SB168.R9T49
Forest lines, Vegetation, Lichens, Mosses.

33-1980
Formation of alpine spruce forests in northern Tien Shan and their vegetation. [Nekotorye osobennosti formirovaniia vysokogornykh el'nikov i ikh flory v Severnom Tian'-Shane],
Roldugin, I.I., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.161-162, In Russian.
DLC SB168.R9T49
Alpine soils, Alpine vegetation, Forest ecosystems, Forest lines, USSR—Tien Shan.

33-1981
State-of-the-art review on alpine ecosystems. [Sovremennoe sostoianie izucheniia vysokogornykh ekosistem],
Nakhutsrishvili, G.Sh., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.176-178, In Russian.
DLC SB168.R9T49
Alpine vegetation, Plant ecology, Ecosystems, Alpine soils.

33-1982
Vegetation effect on snow cover in alpine landscapes of Chernogora (Ukrainian Carpathian Mountains). [Vliianie rastitel'nosti na snezhnyĭ pokrov v vysokogornykh landshaftakh Chernogory (Ukrainskie Karpaty)],
Tretiak, P.R., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.181-182, In Russian.
DLC SB168.R9T49
Landscape types, Snow cover distribution, Vegetation factors, USSR—Carpathian Mountains.

33-1983
Guidebook for a botanical excursion to the Altai Mountains. [Putevoditel' botanicheskoĭ ekskursii v Gornyĭ Altaĭ],
Krasnoborov, I.M., et al, Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogoriĭ, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.291-309, In Russian.
Ivanina, L.I.
DLC SB168.R9T49
Maps, Alpine vegetation, Ecosystems, Distribution, Plant ecology, Alpine soils, Alpine tundra, USSR—Altai Mountains.

33-1984
Compilation of abstracts.
Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], 77p., Refs. passim. For selected abstracts see 33-1985 through 33-2001.
Permafrost hydrology, Polar regions, Mars (planet), Planetary environments, Atmospheric composition, Ice formation, Water vapor, Cryogenic processes.

33-1985
Polar groundwater—a thermo-saline system.
McGinnis, L.D., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.6-8, 11 refs.
Ground water, Permafrost hydrology, Periglacial processes, Hydrogeology, Water flow, Thermal factors, Salinity, Antarctica—McMurdo Sound.
Hydrogeologic features discovered during the course of the Dry Valley Drilling Project in the McMurdo Sound suggest a dynamic—contemporary and ancient—hydrogeologic system, despite the fact that the mean annual sea level temperature has probably not risen above -18C in the last several million years. This system is superimposed upon a static, freeze-immobilized, permafrost terrain. A hole drilled into McMurdo Sound from sea ice, over 122m of water, encountered fresh water (probably ice) at 30 m below bottom. This water is terrestrial in origin and has been preserved at least since the last sea level lowering during Pleistocene time. Hydrochemical stratification evidenced in most DVDP boreholes reveals a record that is interpreted as alternating terrestrial and marine deposition.

33-1986
Nonlinear complex resistivity as a technique to study the state and chemistry of ground water.
Olhoeft, G.R., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.9-11.
Ground water, Water chemistry, Electrical properties, Permafrost physics, Permafrost hydrology, Permafrost thermal properties.

33-1987
Diurnal and annual water cycles in cold planetary regoliths.
Philip, J.R., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.12-15, 12 refs.
Mars (planet), Ice sublimation, Ground water, Condensing, Thermal conductivity, Periodic variations, Diurnal variations.

33-1988
Distribution of water in Martian regolith minerals.
Clark, B.C., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.21-24, 4 refs.
Mars (planet), Permafrost hydrology, Soil moisture, Water vapor, Clay minerals.

33-1989
Mineralogical aspects of models for the storage of water in the Martian regolith.
Gooding, J.L., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.25-28, 8 refs.
Keil, K.
Permafrost hydrology, Mars (planet), Clay minerals, Soil moisture, Models.

33-1990
Effects of subsurface volatiles on the formation of Martian impact craters: photogeological and theoretical considerations.
Mouginis-Mark, P.J., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.29-31, 4 refs.
Mars (planet), Permafrost hydrology, Surface roughness, Geomorphology, Soil moisture migration, Vapor pressure, Mathematical models, Photointerpretation, Theories, Volcanoes.

33-1991
Possible importance of palagonization on Mars.
Wenner, D.B., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.35-37, 12 refs.
Volcanoes, Permafrost hydrology, Mars (planet), Rocks.

33-1992
Mars permafrost sampling problems.
Stephens, J., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.38-39.
Permafrost samplers, Permafrost hydrology, Mars (planet), Sampling, Soil moisture.

33-1993
Endogenic processes on low density satellites: Ganymede and Callisto.
Head, J.W., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.40-43, 5 refs.
Parmentier, E.M.
Extraterrestrial ice, Planetary environments, Thermal stresses, Gravity, Volcanoes, Topographic features.

33-1994
Comparison of some permafrost features on Earth and Mars: some cautions and restrictions.
Black, R.F., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.45-47.
Permafrost indicators, Permafrost origin, Mars (planet), Patterned ground.

33-1995
Survey of cold-climate features on Mars.
Lucchitta, B.K., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.48-51, 20 refs.
Mars (planet), Permafrost weathering, Patterned ground, Thermokarst, Volcanoes, Glacial erosion, Periglacial processes.

33-1996
Terrestrial analogs for Martian striped ground.
Rossbacher, L.A., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.52-55, 14 refs.
Patterned ground, Mars (planet), Permafrost weathering.

33-1997
Outflow features in Kasei and Maja Valles, Mars.
Baker, V.R., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.56-59, 15 refs.
Kochel, R.C.
Mars (planet), Geomorphology, Mapping, Permafrost weathering, Soil erosion.

33-1998
Frost streaks in the south polar cap of Mars.
Thomas, P., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.61-63.
Veverka, J.
Mars (planet), Frost, Seasonal variations, Albedo, Carbon dioxide, Wind direction, Atmospheric circulation, Polar atmospheres.

33-1999
Investigations of Martian polar stratigraphy, structure, and topography.
Howard, A.D., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.70-71, 2 refs.
Mars (planet), Polar regions, Stratigraphy, Structural analysis, Topographic features, Permafrost weathering, Landforms, Frost action, Wind factors.

33-2000
On the survival of organic compounds in the polar regions of Mars.
Pang, K., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.74-75, 4 refs.
Chun, S., Ajello, J.
Photochemical reactions, Planetary environments, Mars (planet), Polar regions, Laboratory techniques.
Photochemical synthesis and meteoritic infall can produce a contemporary accumulation of organic compounds on Mars. The recent discovery of pristine samples of carbonaceous chondrites in Antarctica raises the possibility that such meteorites, rich in organic compounds, may also be preserved in the polar regions of Mars, as in the blue ice of Antarctica.

33-2001
Eolian processes in the polar regions, Earth and Mars.
Grolier, M.J., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, [1978], p.76-77, 6 refs.
Breed, W.J., McCauley, J.F., Breed, C.S.
Eolian soils, Mars (planet), Ice conditions, Landforms, Permafrost weathering, Polar regions, Temperature effects, Wind factors.

33-2002
Ross Ice Shelf Project.
Clough, J.W., et al, *Science*, Feb. 2, 1979, 203(4379), p.433-434, 16 refs.
Hansen, B.L.
Ice shelves, Ice temperature, Drilling, Antarctica—Ross Ice Shelf.
A hole was drilled through the Rose Ice Shelf 450 km from the barrier. Scientific sampling through this hole revealed a sprase population of crustaceans, fish, and microbial biomass. The seabed consists of mid-Miocene glaciomarine mud. Geothermal heat flow is average. Oceanographic data indicate an active circulation and melting at the base of the ice. (Auth.)

33-2003
Miocene glaciomarine sediments from beneath the southern Ross Ice Shelf, Antarctica.
Webb, P.N., et al, *Science*, Feb. 2, 1979, 203(4379), p.435-437, 14 refs.
Ronan, T.E., Jr., Lipps, J.H., DeLaca, T.E.
Glacial deposits, Subglacial observations, Sediments, Grain size, Antarctica—Ross Ice Shelf.
Glaciomarine sediments with middle Miocene microfaunal assemblages are exposed at the sea floor below the southern Ross Ice Shelf. Plio-Pleistocene sediments are not present. Post-Miocene glacial sediments may have been deposited but removed by relatively recent ice shelf grounding. A meager Recent microfauna is present in some core tops. (Auth.)

33-2004
Ross Ice Shelf sea temperature.
Gilmour, A.E., *Science*, Feb. 2, 1979, 203(4379), p.438-439, 6 refs.
Ice shelves, Ice melting, Ice water interface, Water temperature, Antarctica—Ross Ice Shelf.
Two temperature profiles recorded by a sensitive bathythermograph at the Ross Ice Shelf Project site are presented. From the shape of the profiles it is concluded that an inflow of water at intermediate depths provides a source of heat to drive a

regime in which ice is melted from the interface at a depth of 360 m. Melting maintains the temperature of a thick layer under the ice at about -2.14C, close to the ambient freezing temperature. A very well-mixed layer about 35 m thick was found at the seabed. (Auth.)

33-2005
Circulation and melting beneath the Ross Ice Shelf.
Jacobs, S.S., et al, *Science*, Feb. 2, 1979, 203(4379), p.439-443, 23 refs.
Gordon, A.L., Ardai, J.L., Jr.
Subglacial observations, Ice shelves, Ice melting, Ice water interface, Ice heat flux, Sea water freezing, Antarctica—Ross Ice Shelf.
Heat is supplied by seawater that moves southward beneath the ice shelf from a central warm core and from a western region of high salinity. The near-freezing Ice Shelf Water produced flows northward into the Ross Sea. (Auth.)

33-2006
Terrestrial ages of four Allan Hills meteorites: consequences for antarctic ice.
Fireman, E.L., et al, *Science*, Feb. 2, 1979, 203(4379), p.453-455, 17 refs.
Rancitelli, L.A., Kirsten, T.
Ice sheets, Ice dating.
The terrestrial ages of three Allan Hills meteorites are between 30,000 and 300,000 yr and one is 1,540,000 yr old. The antarctic ice sheet is therefore older than 1,540,000 yr, and the meteorite accumulation process at Allan Hills probably began between 30,000 and 300,000 yr ago. (Auth.)

33-2007
Climatic change and variability: a southern perspective.
Pittock, A.B., ed, New York, Cambridge University Press, 1978, 455p., Based on a conference at Monash University, Melbourne, Australia, 7-12 December 1975.
DLC QC981.8.C5C56
Climatic changes, Ice sheets, Glacier surges.
This volume contains a number of papers that were presented at a conference and later organized under the following headings: physical basis of climate; long-term climatic record; patterns of short-term change and variability; models of climatic change; modification of climate; effect of climate change and variability on man; and progress and prospect. For selected papers see F-21113, I-21106 through I-21112, or 33-2008 through 33-2012.

33-2008
Role of the oceans.
Hamon, B.V., et al, Climatic change and variability: a southern perspective, New York, Cambridge University Press, 1978, p.31-52.
Godfrey, J.S.
DLC QC981.8.C5C56
Climatic changes, Ice cover effect.
Large-scale features of the structure and circulation of the southern hemisphere oceans, including the major water-mass boundaries and the antarctic pack ice, are discussed. The authors describe some implications of ocean dynamics for climatology.

33-2009
Climatic and topographic changes from glaciological data.
Jenssen, D., Climatic change and variability: a southern perspective, New York, Cambridge University Press, 1978, p.77-81.
DLC QC981.8.C5C56
Climatic changes, Ice sheets.
Isotope ratios indicating surface temperature variations will correspond to lower temperature simply due to higher surface elevations as well as to climatic change. How to separate the indications of elevation change from those of true climatic fluctuations was the problem the author addressed. He develops a theory and model, then compares results with observed data from Camp Century, Vostok and Byrd cores, showing many similarities.

33-2010
Abrupt events in climatic history.
Flohn, H., Climatic change and variability: a southern perspective, New York, Cambridge University Press, 1978, p.124-134.
DLC QC981.8.C5C56
Climatic changes, Ice sheets, Glacier surges.
Three possible external causes for abrupt climatic changes are discussed: solar events (a change in the solar constant); frequent volcanic activity; and a surge of the antarctic ice sheet. The author proposes that an antarctic surge, potentially catastrophic in its effect on world climate, could be perhaps prevented by concerted international efforts if early warning were provided by sea ice monitoring.

33-2011
Theories of Upper Quaternary ice ages.
Chappell, J., Climatic change and variability: a southern perspective, New York, Cambridge University Press, 1978, p.211-225.
DLC QC981.8.C5C56
Ice age theory, Ice sheets, Glacier surges.
The author reviews the status of various theories concerning the triggering of ice ages. With regard to the idea that periodic major surges of the antarctic ice sheet may be a causal factor, he comments that, although conclusive evidence has not been adduced for this theory yet, particularly by proving a sudden rise in a sea level followed by a slower eustatic fall, antarctic surging is still a possible explanation for ice age initiation.

33-2012
Modelling surging glaciers and periodic surging of the Antarctic ice sheet.
Budd, W., et al, Climatic change and variability: a southern perspective, New York, Cambridge University Press, 1978, p.228-233.
McInnes, B.
DLC QC981.8.C5C56
Climatic changes, Ice sheets, Glacier surges.
The authors discuss their model for glacier surge in terms of the characteristics of the Wilkes Land ice sheet, the Lambert-Amery basin, and the West Antarctic-Ross basin. It appears that, if the model is valid for the areas studied, the present profile is one typical of the post-surge slow buildup stage, not the pre-surge state considered by some glaciologists to presage an ice age.

33-2013
Effect of sanding: traffic and friction studies. (Effekter av sanding: trafik- och friktionsstudier).
Öberg, G., *Sweden. Statens väg- och trafikinstitut. Rapport*, 1978, No.164, 53p. + appends., In Swedish with English summary. 13 refs.
Antiicing additives, Sanding, Rubber ice friction, Trafficability, Winter maintenance, Road maintenance, Road icing, Friction, Tests.

33-2014
Lagoon sewage treatment for the Antarctic and sub-Arctic.
Grainge, J.W., et al, Unpublished manuscript, 30p. + figs., Prepared for the Environmental Protection Agency Technology Transfer Seminar, Anchorage, Alaska, March 28-29, 1972. 9 refs.
Greenwood, J.K., Shaw, J.W.
Ponds, Sewage treatment, Waste treatment, Permafrost preservation, Cold weather performance, Tundra, Standards.

33-2015
Cyclone switch heater for railway track switches. Part 2. Prototype performance evaluation.
Coveney, D.B., *National Research Council, Canada. Division of Mechanical Engineering. Laboratory technical report*, Jan. 1979, LTR-LT-93, 19p., 5 refs.
Railroad equipment, Cold weather operation, Electric heating.

33-2016
Sea ice laser statistics.
Welsh, J.P., et al, International Symposium on Remote Sensing of Envrionment, 7th, May 17-21, 1971, Ann Arbor, University of Michigan, p.1165-1175, 4 refs.
Tucker, W.B.
Sea ice distribution, Pack ice, Ice surface, Lasers, Airborne equipment, Computer applications, Statistical analysis.

33-2017
Proceedings: 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup).
Oil Spill Conference, New Orleans, Louisiana, March 8-10, 1977, American Petroleum Institute. Publication No.4284, Washington, D.C., American Petroleum Institute, 640p., Refs. passim. For selected papers see 33-2018 through 33-2025.
Oil spills, Countermeasures, Detection, Environmental impact, Pollution, Airborne equipment, Sea ice.

33-2018
U.S. Coast Guard airborne oil surveillance system status report.
Maurer, A.T., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.215-219, 2 refs.
Edgerton, A.T., Meeks, D.C.
Oil spills, Detection, Pollution, Airborne equipment, Sea ice distribution.

33-2019
Oil slick spreading beneath a uniform ice cover in the presence of a current.
Weiskopf, E.B., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.297-300, 6 refs.
Uzuner, M.S.
Oil spills, Subglacial observations, Dispersions, Ice cover effect, Ocean currents, Distribution.

33-2020
Development of an oil spill recovery system for arctic operation.
Scharfenstein, C.F., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.301-302.
Hoard, M.G.
Equipment, Oil spills, Oil recovery, Countermeasures, Tests, Ice conditions.

33-2021
Application of existing oil spill abatement equipment to cold regions.
Schultz, L.A., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.309-311, 6 refs.
Deslauriers, P.C.
Oil spills, Countermeasures, Equipment, Oil recovery, Detection, Cold weather tests.

33-2022
Arctic offshore oil spill countermeasures with emphasis on an oil and gas blowout in the southern Beaufort Sea.
Thornton, D.E., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.313-319, 14 refs.
Ross, S.L., Logan, W.J., Ross, C.W.
Gases, Oil spills, Countermeasures, Sea ice, Subglacial observations.

33-2023
Storm related oil spill movement on the Beaufort Sea shelf.
Hufford, G.L., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.455-460, 11 refs.
Lissauer, I.M., Thompson, B.D.
Oil spills, Dispersions, Storms, Wind factors, Distribution, Beaufort Sea.

33-2024
Fate of crude oil spilled in a simulated arctic environment.
MacGregor, C., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.461-463, 7 refs.
McLean, A.Y.
Oil spills, Low temperature tests, Monitors, Physical properties, Chemical properties, Laboratory techniques.

33-2025
Microorganisms and hydrocarbons in the North Sea during July-August 1975.
Oppenheimer, C.H., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.593-609, 1 ref.
Gunkel, W., Gassmann, G.
Oil spills, Countermeasures, Microbiology, Hydrocarbons, Bacteria, North Sea.

33-2026
JATO rocket motor Mark 6, Mod 1, Antarctic test program.
Magnelli, D.D., *U.S. Naval Ordnance Station Indian Head technical report*, Sep. 15, 1978, NOS-IHTR-510, 68p. ADB 030 113.
Airplanes, Engines, Cold weather tests, Antarctica.
A two-phase program was conducted to determine the necessity for continued structural modifications to the JATO rocket motor Mk 6 Mod 1 hangers for use in antarctic operations on LC-130 aircraft. Phase I was the acquisition of shock and vibration loads experienced by the JATO motors during actual aircraft takeoffs from antarctic field stations. The worst case conditions measured were experienced during JATO takeoff from Dome Charlie Station. Phase II was the analysis of the data and the formulation and conduct of a vibration test at Indian Head of 12 motors, simulating the worst case conditions experienced in Antarctica. It was concluded that the unmodified JATO motor hangers were adequate for use under the most extreme antarctic conditions. (Auth.)

33-2027
Proceedings, Vol.2.
International Symposium on Winter Concreting, 2d, Moscow, Oct. 14-16, 1975, Moscow, Strolizdat, 1975, 375p., In Russian, English and French with English, French and Russian summaries. For individual papers see 33-2028 through 33-2064. Refs. passim.
DLC TA682.43.I57
Winter concreting, Reinforced concrete, Prestressed concrete, Cements, Cement additives, Concretes, Concrete admixtures, Concrete aggregates, Moisture content, Concrete freezing, Electric heating, Concrete strength, Concrete hardening, Concrete structures, Concrete piles.

33-2028
Corrosion resistance of "cold" concretes. [Korrozionnaia stoĭkost' "kholodnykh" betonov],
Alimov, Sh.S, et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.7-13, In Russian. English summary p.422.
Koroleva, O.E., Kireeva, I.U.I.
DLC TA682.43.I57
Winter concreting, Concrete freezing, Concrete admixtures, Antifreezes, Concrete placing.

33-2029
Concrete hardening mechanism during early freezing. [Mekhanizm uprochneniia betona pri ego rannem zamorazhivanii],
Akhverdov, I.N., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.14-22, In Russian. English summary p.422. 13 refs.
Kaplan, E.L.
DLC TA682.43.I57
Winter concreting, Concrete freezing, Concrete hardening, Concrete strength, Concrete aggregates, Cements, Freeze thaw cycles.

33-2030
Peculiarities of concrete hardening in permafrost. [Osobennosti tverdeniia betona v vechnomerzlykh gruntakh],
Bugrim, S.F., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.23-33, In Russian. English summary p.424.
DLC TA682.43.I57
Winter concreting, Concrete hardening, Concrete placing, Moisture transfer, Cements, Ice crystal formation, Permafrost, Analysis (mathematics).

33-2031
Cements and admixtures for winter concreting. [Choix des ciments et des adjuvants pour la confection des bétons mis en oeuvre par temps froid],
Venuat, M., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.34-43, In French. Russian summary p.425.
DLC TA682.43.I57
Winter concreting, Concrete aggregates, Cements, Cement additives, Concrete freezing, Concrete hardening, Moisture transfer, Heat flux.

33-2032
Development in quality control of concrete during paving.
Wilk, W., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.43-82, Russian summary p.425.
Dobrolubov, G., Rotner, B.
DLC TA682.43.I57
Pavements, Concrete structures, Porosity, Winter concreting, Concrete hardening, Concrete strength, Tests, Laboratory techniques, Roads.

33-2033
Compressive strength of concrete in winter—a probabilistic simulation.
Visvesvaraya, H.C., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.83-103, Russian summary p.427. 15 refs.
Mullick, A.K.
DLC TA682.43.I57
Winter concreting, Mathematical models, Concrete aggregates, Cements, Concrete admixtures, Concrete hardening, Concrete freezing, Concrete strength, Compressive strength.

33-2034
Relative strength of heat cured concrete. [Issledovanie otnositel'noĭ prochnosti betona pri termosnom tverdenii],
Vylev, V.N., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.104-115, In Russian. English summary p.430.
DLC TA682.43.I57
Winter concreting, Concrete hardening, Moisture transfer, Concrete freezing, Cements, Concrete heating, Concrete strength.

33-2035
Influence of concrete freezing at early and ripe age on its strength and deformation. [Vliianie zamorazhivaniia betona v rannem i zrelom vozraste na ego prochnost' i deformativnost'],
Glazyrina, E.G., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.116-129, In Russian. English summary p.430. 6 refs.
[Armakovskiĭ, V.N.
DLC TA682.43.I57
Winter concreting, Concrete freezing, Concrete hardening, Deformation, Concrete strength.

33-2036
Thermal deformation and resistance of concrete frozen at an early age. [Temperaturnye deformatsii i stoĭkost' betonov pri zamorazhivanii v rannem vozraste],
Gorchakov, G.I., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.129-145, In Russian. English summary p.432. 5 refs.
DLC TA682.43.I57
Winter concreting, Concrete hardening, Moisture transfer, Ice crystal formation, Concrete strength.

33-2037
Progressive hardening of concretes at low temperatures. [La progression des résistances des bétons par basses températures],
Dubois, J., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.145-162, In French. Russian summary p.433. 9 refs.
Ammar, C., Dutron, P., Motteau, H.
DLC TA682.43.I57
Winter concreting, Concrete placing, Concrete hardening, Concrete curing, Concrete freezing.

33-2038
Variations in strength and deformation properties of light and heavy concretes after freezing. [Izmenenie prochnostnykh i deformativnykh kharakteristik legkogo i tiazhelogo betonov posle zamorazhivaniia],
Zhitkevich, R.K., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.163-169, In Russian. English summary p.436.
Kurasova, G.P., Istomin, A.S.
DLC TA682.43.I57
Winter concreting, Concrete freezing, Concrete hardening, Concrete strength.

33-2039
Freezing effect on the physical and mechanical properties of agloporite concretes. [Vliianie zamorazhivaniia agloporitobetona na ego fiziko-mekhanicheskie svoĭstva],
Izraelit, M.M., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.170-178, In Russian. English summary p.436. 7 refs.
Golovnev, E.A.
DLC TA682.43.I57
Concrete freezing, Concrete strength, Concrete aggregates, Cements, Concrete curing, Concretes.

33-2040
Physical and chemical processes in freezing concretes. [Fiziko-khimicheskie protsessy v betone pri ego zamerzanii],
Ivanova, O.S., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.178-191, In Russian. English summary p.438. 4 refs.
Belova, L.A.
DLC TA682.43.I57
Winter concreting, Concrete hardening, Concrete freezing, Moisture transfer, Phase transformations, Ice formation, Cements.

33-2041
Cement stone deformation due to the freezing of pore water. [Zamerzanie vody v porakh tsementnogo kamnia i ego deformatsiia],
Krasil'nikov, K.G., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.191-195, In Russian. English summary p.438. 2 refs.
Tarasov, A.F.
DLC TA682.43.I57
Winter concreting, Concrete aggregates, Cements, Concrete freezing, Moisture transfer, Phase transformations, Frost shattering.

33-2042
Technological means of decreasing deterioration of concretes frozen at an early age. [Tekhnologicheskie sposoby snizheniia destruktsii betonov, zamorozhennykh v rannem vozraste],
Lagoĭda, A.V., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.196-203, In Russian. English summary p.440.
Larina, O.P., Ukhov, E.N.
DLC TA682.43.I57
Winter concreting, Concrete freezing, Moisture transfer, Concrete hardening, Phase transformations, Damage, Concrete strength, Concrete admixtures.

33-2043
Prehardening period needed to protect fresh concrete from frost. [Durée de prédurcissement nécessaire pour protéger le béton du gel],
Mamillan, M., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.204-215, In French. English summary p.440. Russian summary p. 439.
DLC TA682.43.I57
Winter concreting, Concrete hardening, Concrete freezing, Freezing rate, Moisture content, Phase transformations.

33-2044
Thermal-image method of testing the strength of reinforced concrete articles. [Eprouvettes-images thermiques d'un ouvrage en béton-armoire de régulation],
Martinet, C., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.216-227, In French. Russian summary p.441.
DLC TA682.43.I57
Prefabrication, Reinforced concrete, Concrete strength, Concrete curing, Tests, Laboratory techniques.

33-2045
On development of concrete strength under winter concreting conditions.
Kykkänen, J., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.228-240, Russian summary p.443. 8 refs.
DLC TA682.43.I57
Winter concreting, Concrete strength, Concrete hardening, Concrete freezing, Cements, Computer applications, Analysis (mathematics).

33-2046
Use of regulated-set cement in cold weather environments.
Scanlon, J.M., Jr., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.241-252, Russian summary p.445. 10 refs.
Hoff, G.C., Houston, B.J., Sayles, F.H.
DLC TA682.43.I57
Winter concreting, Concrete aggregates, Cements, Cement additives, Concrete freezing.

33-2047
Theoretical principles of concrete and cement stone resistance to freeze-thaw cycles. [O teoreticheskikh osnovakh soprotivliaemosti tsementnogo kamnia i betonov tsiklam zamorazhivaniia i ottaivaniia],
Stol'nikov, V.V., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.253-263, In Russian. English summary p.448. 10 refs.
DLC TA682.43.I57
Porous materials, Concretes, Cements, Grouting, Freeze thaw cycles, Frost resistance.

33-2048
Application of Young's modulus in evaluation of damage to concrete from freezing.
Takabayashi, T., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.264-269, Russian summary p.447.
DLC TA682.43.I57
Frost shattering, Winter concreting, Concrete hardening, Concrete freezing, Frost resistance, Analysis (mathematics).

33-2049
High frost resistance reinforced concretes for building tall structures in freezing weather. [Betony vysokoĭ morozostoĭkosti dlia vysotnykh zhelezobetonnykh sooruzheniĭ, vozvodimykh v zimnee vremia],
Trinker, B.D., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.270-281, In Russian. English summary p.450. 10 refs.
Demina, G.G., Zhits, G.N.
DLC TA682.43.I57
Concrete structures, Reinforced concrete, Frost resistance, Winter concreting, Concrete strength, Concrete aggregates, Cements, Concrete admixtures.

33-2050
Temperature and strength fields and internal stresses originating during cooling of solid concrete foundations. [Temperaturnye i prochnostnye polia, vnutrennie napriazheniia pri okhlazhdenii monolitnykh fundamentov],
[Unusov, N.V., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.281-292, In Russian. English summary p.450. 4 refs.
Popkovich, G.E., Val't, A.B.
DLC TA682.43.I57
Concrete structures, Foundations, Concrete curing, Concrete heating, Concrete placing, Concrete freezing, Strains, Moisture transfer, Ice formation, Analysis (mathematics), Thermal stresses.

33-2051
Effect of subzero temperatures on the contact between hardening cement solutions and concrete aggregates. [Formirovanie kontakta tsementnogo kamnia s zapolniteliami v betonakh pri vozdeĭstvii otritsatel'nykh temperatur],
[Arlushkina, S.Kh., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.292-299, In Russian. English summary p.452.
DLC TA682.43.I57
Concretes, Winter concreting, Concrete aggregates, Cements, Concrete hardening, Concrete freezing, Concrete strength.

33-2052
Winter concreting north of the Arctic circle. [O zimnem betonirovanii v Zapoliar'e],
Bernshteĭn, L.B., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.299-305, In Russian. English summary p.452. 7 refs.
Usachev, I.N.
DLC TA682.43.I57
Winter concreting, Concrete aggregates, Heating, Concrete placing, Concrete curing, Concrete hardening, Concrete strength.

33-2053
Transport of fresh concrete under winter conditions.
Vaulamo, R., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.305-314, Russian summary p.453. 16 refs.
Tammiaho, P.
DLC TA682.43.I57
Transportation, Winter concreting, Concrete freezing, Concrete aggregates, Heating, Concretes.

33-2054
Winter concreting in Bulgaria. [Osobennosti betonirovaniia v zimnikh usloviiakh Narodnoĭ Respubliki Bolgarii],
Karapchanski, N.I, et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.316-323, In Russian. English summary p.454.
Tabakov, S.V.
DLC TA682.43.I57
Winter concreting, Concrete aggregates, Cements, Cement additives, Concrete placing, Concrete hardening, Concrete freezing, Concrete strength.

33-2055
Load-bearing joints between precast concrete units in winter conditions.
Kaitila, H., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.323-334, Incomplete paper. Russian summary p.455. 7 refs.
Villberg, L.
DLC TA682.43.I57
Winter concreting, Concrete aggregates, Cements, Mortars, Concrete hardening, Concrete freezing, Prefabrication, Precast concrete, Joints (junctions), Grouting.

33-2056
Heat treatment of cast-in-place structures in freezing weather. [Ispol'zovanie elektrotermoobrabotki pri zimnem betonirovanii monolitnykh konstruktsiĭ],
Li, A.I., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.335-345, In Russian. English summary p.456.
DLC TA682.43.I57
Winter concreting, Concrete placing, Concrete heating, Electric heating, Concrete hardening, Concrete strength, Frost resistance.

33-2057
Steam-curing of concrete in freezing weather. [Osobennosti teplovlazhnostnoĭ obrabotki betona v zimnikh usloviiakh],
Malinina, L.A., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.346-355, In Russian. English summary p.458. 8 refs.
Malinskiĭ, E.N.
DLC TA682.43.I57
Prefabrication, Concrete curing, Concrete heating, Reinforced concrete, Concrete placing, Concrete hardening, Concrete freezing, Concrete strength, Concretes.

33-2058
Technology of casting reinforced concrete structures in heated forms. [Tekhnologiia obogreva monolitnykh zhelezobetonnykh konstruktsiĭ v termoaktivnoĭ opalubke],
Ovsiankin, V.I., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.355-367, In Russian. English summary p.458.
DLC TA682.43.I57
Winter concreting, Formwork (construction), Electric heating, Reinforced concrete, Concrete heating, Concrete hardening, Concrete placing.

33-2059
Electrically heated large size moulds.
Penttala, V., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.367-376, Russian summary p.459. 6 refs.
Markkola, E.
DLC TA682.43.I57
Winter concreting, Concrete placing, Formwork (construction), Electric heating, Concrete heating.

33-2060
Computerized simulation of the thermos concrete curing technique. [Matematicheskoe modelirovanie rezhimov termosnogo vyderzhivaniia betona s ispol'zovaniem EVM],
Petrov-Denisov, V.G., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.377-385, In Russian. English summary p.460. 3 refs.
Dudnikov, I.V., Matilchenko, A.I.
DLC TA682.43.I57
Winter concreting, Concrete curing, Concrete placing, Concrete hardening, Computerized simulation.

33-2061
Heated forms used for steam-curing of concrete at the construction site of the Kama Motor Vehicle Complex. [Opyt primeneniia elektrotermoobrabotki betona s ispol'zovaniem greiushcheĭ opalubki na stroitel'stve Kamskogo Avtokompleksa],
Pizhov, A.I., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.386-395, In Russian. English summary p.462. 2 refs.
DLC TA682.43.I57
Winter concreting, Concrete curing, Formwork (construction), Electric heating.

33-2062
Application of the thermos technique and preliminary electric heating of mixtures in winter concreting. [Oblast' primeneniia metoda termosa i predvaritel'nogo elektrorazogreva betonnoĭ smesi pri zimnem betonirovanii],
Sizov, V.N., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.395-401, In Russian. English summary p.462.
Vegener, R.V., Mikallichenko, V.M.
DLC TA682.43.I57
Winter concreting, Concrete curing, Formwork (construction), Electric heating.

33-2063
Technical and economic evaluation of winter concreting methods in different climatic zones of the USSR. [Tekhniko-ekonomicheskaia otsenka metodov zimnego betonirovaniia v razlichnykh klimaticheskikh zonakh Sovetskogo Soiuza],
Sovalov, I.G., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.401-403, In Russian. English summary p.464.
DLC TA682.43.I57
Winter concreting, Economic analysis, Climatic factors.

33-2064
Theory and practice of building stone and large-panel structures in the USSR, in freezing weather without heating. [Teoriia i praktika zimnego stroitel'stva kamennykh i krupnopanel'nykh zdaniĭ v SSSR bez progreva],
Shishkin, A.A., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Strolizdat, 1975, p.404-413, In Russian. English summary p.464. 6 refs.
DLC TA682.43.I57
Cold weather construction, Masonry, Prefabrication, Large panel buildings, Joints (junctions), Grouting, Mortars, Cements, Cement additives, Antifreezes.

33-2065
Sulfate content in the antarctic ice cap.
Vilenskiĭ, V.D., et al, *U.S. Army Foreign Science and Technology Center. Translation,* July 1977, FSTC-430-77, 15p., ADB 025-550, For Russian original, see F-14003 or 29-892. 19 refs.
Koroleva, N.I.
Ice sheets, Ice composition, Snow composition, Sulfate.
Sulfate concentration in ice can be determined by turbidimetry or titrimetry in comparison with concentration by evaporation. Sulfate concentration in the snow of antarctic littoral regions varies within wide limits with no seasonal character. Sulfate concentration decreases with distance from the coast. It is assumed that sulfate is deposited primarily by dry precipitation.

33-2066
Large-scale numerical model of sea ice.
Parkinson, C.L., et al, *Journal of geophysical research,* Jan. 20, 1979, 84(C1), p.311-337, Refs. p.335-337.
Washington, W.M.
Sea ice distribution, Ice cover thickness, Ice models, Snow cover, Ice resistivity, Water temperature, Meteorological factors.
Work at the National Center for Atmospheric Research has resulted in the construction of a large-scale sea ice model capable of coupling with atmospheric and oceanic models of comparable resolution. The sea ice model itself simulates the yearly cycle of ice in both the northern and the southern hemispheres. Horizontally, the resolution is approx 200 km, while vertically the model includes four layers, ice, snow, ocean, and atmosphere. Both thermodynamic and dynamic processes are incorporated, the thermodynamics being based on energy balances at the various interfaces and the dynamics being based on the following five stresses: wind stress, water stress, Coriolis force, internal ice resistance, and the stress from the tilt of the sea surface. Although the ice within a given grid square is of uniform thickness, each square also has a variable percentage of its area assumed ice free. The model results produce a reasonable yearly cycle of sea ice thickness and extent in both the Arctic and the Antarctic. In the Antarctic the ice expands from a minimum in Mar. to a maximum in late Aug, remaining close to the continent in the former month and extending northward of 60S in the latter month. Maximum thicknesses are about 1.4 m. The distribution of modeled ice concentrations correctly reveals a more compact ice cover in the northern hemisphere than in the southern hemisphere. (Auth. mod.)

33-2067
Fifteenth Soviet Antarctic Expedition. Description and scientific results. Winter research 1969-1971. ¡Piatnadtsataia kontinental'naia ekspeditsiia. Opisanie i nauchnye rezul'taty. Zimovochnye issledovaniia 1969-1971 gg.¡,
Sovetskaia antarkticheskaia ekspeditsiia, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1977, Vol.64, 151p., In Russian with English table of contents. Numerous refs. passim.
Research projects, Antarctica.
This report on the activities of the 15th SAE is divided into two sections. The first, entitled "General description", includes discussions of the following phases of the winter season's work: organization of expedition activities, activities of the logistics group, construction and repair work, and organization and techniques of scientific activities, by discipline. The second section presents papers on scientific results. For individual papers, see A-21140, H-21141 through H-21146, F-21138, I-21139, K-21136, K-21137, and L-21135, or 33-2068 and 33-2069.

33-2068
Short-wave radiation attenuation by snow cover, ice and water investigated on the basis of data gathered in the Mirnyy area. ¡Oslablenie korotkovolnovoĭ radiatsii snezhnoĭ tolshcheĭ, l'dom i vodoĭ po dannym nabliudeniĭ v raĭone observatorii Mirnyĭ¡,
Adamenko, V.N., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1977, Vol.64, p.64-71, In Russian. 12 refs.
Attenuation, Radiation, Ice physics, Ice optics, Snow optics, Snow physics, Sea water, Light transmission, Antarctica—Mirnyy Station.
Results of studying short-wave radiation penetration into snow, ice and water using highly sensitive instruments are presented. Conditions of short-wave radiation attenuation in water with and without ice cover are compared. Changes in illumination up to 100-200 m are related to short-wave radiation attenuation. The basic characteristics of attenuation by water and ice of both light and short-wave radiation in pack ice of various thicknesses are identified. The problem of attenuation of light and short-wave radiation by snow cover on the continent between the 105th and 125th km along the Mirnyy-Vostok traverse route is also investigated.

33-2069
Principal findings of glaciological and geomorphological research in the McMurdo Sound region (Victoria Land). ¡Osnovnye rezul'taty gliatsiogeomorfologicheskikh issledovaniĭ v raĭone zaliva Mak-Merdo (Zemlia Viktorii)¡,
Miagkov, S.M., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1977, Vol.64, p.88-99, In Russian. 20 refs.
Glaciology, Research projects, Antarctica—McMurdo Sound.
The author participated in the 15th SAE as an exchange scientist at McMurdo. He briefly described the area and some improvements introduced in the scientific program. A summary of results is given; emphasis was placed on neotectonic variations in sea level during glaciated times, on the basic stages of relief evolution and on the history of glaciation of the continental coast of McMurdo Sound (the Dry Valleys of Victoria Land) as it reflects tectonic movement.

33-2070
Pipelines in adverse environments; a state of the art, Vol.1.
American Society of Civil Engineers Pipeline Division Speciality Conference, New Orleans, Louisiana, Jan. 15-17, 1978, New York, N.Y., American Society of Civil Engineers, 1979, 394p., Refs. passim. For selected papers see 33-2071 through 33-2080.
Pipelines, Cold weather construction, Subsurface structures, Permafrost structure, Permafrost thermal properties, Frost heave, Remote sensing, Design, Blasting.

33-2071
Arctic pipeline construction—an overview.
Huck, R.W., ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.51-62.
Pipelines, Cold weather construction, Pipe laying, Environmental impact, Drilling, Ice (construction material), Snow (construction material), Ice conditions, Snow cover distribution, Construction costs, Design.

33-2072
Controlled trench blasting in frozen ground.
Oriard, L.L., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.63-78, 18 refs.
Tart, R.G., Jr.
Frozen ground physics, Permafrost structure, Blasting, Elastic waves, Explosion effects, Vibration, Trenching.

33-2073
Heat flow around pipes buried in cold ground.
Mohan, A., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.79-102, 8 refs.
Lovell, C.W.
Permafrost thermal properties, Subsurface structures, Heat transfer, Thermal analysis, Hot oil lines, Ground thawing, Thermal effects, Pipeline insulation.

33-2074
Geotechnical engineering applications to the chilled gas *pipeline* design.
Phukan, A., ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.157-168.
Subsurface structures, Permafrost thermal properties, Gas pipelines, Cold weather construction, Geologic processes, Design, Engineering, Environmental impact.

33-2075
Reburial considerations for an exposed pipeline.
Hartig, E.P., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.238-254, 10 refs.
Nottingham, D., Swanson, J.E., Tisdale, B.C.
Subsurface structures, Hot oil lines, Trenching, Excavation, Cold weather construction, Ice loads, Floods, Structural analysis, Tides, United States—Alaska—Cook Inlet.

33-2076
Computer system to design vertical support members for Trans-Alaska pipeline.
Tart, R.G., Jr., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.255-267, 3 refs.
Ghuman, O.S.
Pipeline supports, Cold weather construction, Permafrost preservation, Permafrost thermal properties, Hot oil lines, Computer applications, Design.

33-2077
Remote detection of massive ice in permafrost along the Alyeska pipeline and the pump station feeder gas pipeline.
Kovacs, A., et al, MP 1175, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.268-279, 10 refs.
Morey, R.M.
Permafrost structure, Permafrost physics, Ice detection, Subsurface investigations, Remote sensing, Radar echoes, Ground ice, Ice formation, Sounding, Reflectivity, Pipelines.
Field soundings using an impulse radar system were carried out during May 1976 along a section of the Alyeska Pipeline near Pump Station 3 and the pump station feeder gas pipeline trench near the Happy Valley Camp, Alaska. The radar system, operating on the ground, provided a continuous profile of the near-surface geological structure of the permafrost. A unique dual antenna configuration produced two profiles, a vertical profile and an offset profile, from which the velocity of the radar signal at any point along the traverse could be calculated and from which a representative depth scale for the subsurface profile was determined. The profile results proved useful in identifying regions of massive ice in the permafrost. Logs from holes drilled for the oil pipeline's Vertical Support Members are compared with the radar profile data. This comparison shows that the radar detected the top and bottom of massive ice to a depth of approximately 30 ft.

33-2078
Chilled pipeline frost heave mitigation concepts.
Davison, B.E., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.294-306, 8 refs.
Nottingham, D., Rooney, J.W., Vita, C.L.
Frost heave, Countermeasures, Cold weather construction, Gas pipelines, Subsurface structures, Permafrost thermal properties, Permafrost preservation, Freeze thaw cycles, Frozen ground physics.

33-2079
Constructing a pipeline in northern Iran.
Stastny, F.J., ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.343-348.
Pipelines, Cold weather construction, Seismology, Temperature variations.

33-2080
Prototype pile tests in permafrost soils.
Black, W.T., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.372-383, 3 refs.
Thomas, H.P.
Pile foundations, Pipeline supports, Permafrost thermal properties, Permafrost preservation, Frozen ground mechanics, Loads (forces), Design criteria, Tests.

33-2081
Heat transfer: research and application.
Chen, J.C., ed, *American Institute of Chemical Engineers. AICHE symposium series,* 1978, 74(174), 360p., Refs. passim. For selected papers see 33-2082 through 33-2087.
National Heat Transfer Conference, 15th, San Francisco, Calif., Aug. 1975.
Permafrost heat transfer, Soil freezing, Heat flux, Thermal diffusivity, Ice refrigeration, Permafrost hydrology, Glacier flow, Heat transfer, Ice lenses.

33-2082
Natural circulation self-refrigerated pile for the direct support of buildings in permafrost regions.
Babb, A.L., et al, *American Institute of Chemical Engineers. AICHE symposium series,* 1978, 74(174), p.223-234, 12 refs.
Godal, A., Wakefield, A.W., McKee, R.E., Strand, M.J.
Permafrost heat transfer, Pile foundations, Permafrost beneath structures, Permafrost preservation, Loads (forces), Frozen liquids, Static loads, Pile structures, Convection, Analysis (mathematics).

33-2083
Fundamentals of ice lens formation.
Takagi, S., *American Institute of Chemical Engineers. AICHE symposium series,* 1978, 74(174), MP 1173, p.235-242, 27 refs. See also 32-3470 and 32-4368.
Ice lenses, Ice formation, Soil moisture, Soil freezing, Heat transfer, Frost heave, Analysis (mathematics).
A new concept of the freezing of water, called segregation freezing, is proposed to explain the creation of the suction force that draws pore water up to the interface of a growing ice lens. The temperature of segregation freezing is shown to be lower than that of normal freezing (in situ freezing). This difference determines the pressure that the ice lens exerts while growing and carrying the overlying weight. On the assumption that the soil structure is rigid, equations governing the simultaneous flow of heat and water are formulated and solved for the limit of time t to 0 with the combination of analytical and numerical methods. Numerical computation of the solution yields a result that is reasonable, compared with experience in laboratory and nature.

33-2084
Application of a finite-difference technique to thermal wave propagation.
Baumeister, K.J., *American Institute of Chemical Engineers. AICHE symposium series,* 1978, 74(174), p.243-249, 5 refs.
Heat flux, Thermal diffusivity, Soil physics, Ice cover effect, Snow cover effect, Wave propagation, Analysis (mathematics).

33-2085
Approximate solution to the moving boundary problem associated with the freezing and melting of lake ice.
Foss, S.D., *American Institute of Chemical Engineers. AICRE symposium series,* 1978, 74(174), p.250-255, 17 refs.
Lake ice, Boundary value problems, Ice air interface, Ice water interface, Ice temperature, Heat transfer, Freeze thaw cycles, Analysis (mathematics), Mathematical models.

33-2086
Isua, Greenland: glacier freezing study.
Ashton, G.D., *American Institute of Chemical Engineers. AICHE symposium series,* 1978, 74(174), MP 1174, p.256-264, 9 refs.
Glacier flow, Creep rate, Ice refrigeration, Mining, Drilling, Analysis (mathematics), Ice temperature.
A scheme for cooling the lower portion of the edge of the Greenland ice sheet, which abuts a potential mining operation is examined. At the mine site, the ore body is overlain with ice. Once the overburden is removed, however, the adjacent ice is expected to flow toward the pit. One possible means of slowing this movement is to cool the ice below its present temperature to achieve a reduction in the creep rate and a retardation of basal slip. The present study examines analytically the magnitude of cooling which may be accomplished by drilling a series of vertical holes about the periphery of the mine site. Refrigeration is accomplished by pumping a coolant downhole in a central pipe, then uphole in an annulus between the pipe and hole wall, and then through a thin walled pipe exposed to the cold surface climate above the ice sheet. Results of example calculations for various particular combinations of the free parameters are examined and include cooling requirements, hold spacing, pump requirements, and other parameters. Over a period of operation on the order of a year of more, it appears possible to cool a substantial part of the lower area of the glacier on the order of -1 to -2C, using a hole spacing that is considered reasonable. The results of the study are to be used as input to a detailed glacier flow study.

33-2087
Integral methods for the melting of permafrost by groundwater flow.
Reid, R.L., *American Institute of Chemical Engineers. AICHE symposium series,* 1978, 74(174), p.265-270, 9 refs.
Permafrost hydrology, Ground thawing, Ground water, Water flow, Permafrost heat transfer, Phase transformations, Conduction, Boundary layer, Analysis (mathematics).

33-2088
Melioration of the Tuyuksu moraine lakes in the Malaya Almatinka River Basin. {K voprosu melioratsii ozer na morene Tuiuksu v basseine r. Malaia Almatinka},
Golubovich, V.A., *Alma-Ata. Gidrometeorologicheskaia observatoriia. Sbornik rabot,* 1978, Vol.7, p.57-64, In Russian. 1 ref.
Mountain glaciers, Moraines, Glacial lakes, Slope processes, Mudflows, Glacial hydrology.

33-2089
Peculiarities of avalanche formation in the glacial zone of Zalliyskiy Alatau (Malaya Almatinka glaciers). {Osobennosti lavinoobrazovaniia v gliatsial'noi zone Zailiiskogo Alatau (na primere Maloalmatinskikh lednikov)},
Kondrashov, I.V., *Alma-Ata. Gidrometeorologicheskaia observatoriia. Sbornik rabot,* 1978, Vol.7, p.35-48, In Russian. 5 refs.
Mountain glaciers, Snow cover distribution, Avalanche formation, Snow surveys.

33-2090
Calculating snow reserves in the mountains of the Malaya Almatinka River Basin. {Raschet snegozapasov v gorakh na primere basseina r. Malaia Almatinka},
Rybkina, M.P., et al, *Alma-Ata. Gidrometeorologicheskaia observatoriia. Sbornik rabot,* 1978, Vol.7, p.27-34, In Russian. 4 refs.
Shchegoleva, N.N.
River basins, Snow cover distribution, Snow depth, Snow water equivalent, USSR—Malaya Almatinka River.

33-2091
Airborne radar technique of measuring thickness of ice covers on rivers, lakes and reservoirs. {Primenenie radiolokatsionnogo metoda pri izmerenii tolshchiny ledianogo pokrova rek, ozer i vodokhranilishch},
Chizhov, A.N., et al, *Leningrad. Gosudarstvennyi gidrologicheskii institut. Trudy,* 1977, Vol.245, p.3-29, In Russian. 11 refs.
Glushnev, V.G., Slutsker, B.D., Borodulin, V.V.
Icebound lakes, Icebound rivers, Ice cover thickness, Airborne radar, Radar echoes.

33-2092
Airborne radar surveys in hydrologic investigations. {Radiolokatsionnaia aeros"emka i ee primenenie v gidrologicheskikh issledovaniiakh},
Usachev, V.F., et al, *Leningrad. Gosudarstvennyi gidrologicheskiinstitut. Trudy,* 1977, Vol.245, p.64-75, In Russian. 5 refs.
Borodulin, V.V., Starostin, V.A.
Airborne radar, Radar echoes, Radar photography, River ice, Lake ice, Ice conditions, Ice reporting, Snow cover distribution, Snowmelt.

33-2093
Distinguishing areas of different submergence in the Ob' River flood plain. {Ispol'zovanie materialov radiolokatsionnoi s"emki dlia vydeleniia uchastkov razlichnoi zatopliaemosti v poime r. Obi},
Borodulin, V.V., et al, *Leningrad. Gosudarstvennyi gidrologicheskii institut. Trudy,* 1977, Vol.245, p.76-85, In Russian. 5 refs.
Korolev, V.M., Tereshenkov, O.M.
Flood forecasting, Radar photography, Flood control, Geobotanical interpretation, Airborne radar, Surveys, USSR—Ob' River.

33-2094
Snow and avalanches in the Swiss Alps, winter 1976-1977. {Schnee und Lawinen in den Schweizer Alpen, Winter 1976/77},
Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung, Its Winterberichte, No.41, 1978, 142p., In German. Refs. passim. For selected papers see 33-2095 through 33-2097.
Snow surveys, Avalanches, Snow depth, Switzerland—Alps.

33-2095
Snow and avalanches in the Davos area. {Schnee und Lawinen in der Region Davos},
Föhn, P., et al, *Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung. Winterberichte,* 1978, No.41, p.28-39, In German.
Beck, E.
Snow depth, Avalanche formation, Snow temperature, Snowfall, Switzerland—Davos.

33-2096
Snow and avalanche conditions in the Swiss Alps. {Schnee- und Lawinenverhältnisse im schweizerischen Alpengebiet},
Schild, M., et al, *Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung. Winterberichte,* 1978, No.41, p.40-87, In German.
Gliott, S.
Snow surveys, Snow depth, Avalanche formation, Statistical data, Observation, Switzerland—Alps.

33-2097
Accidents and damage caused by avalanches. {Durch Lawinen verursachte Unfälle und Schäden},
Schild, M., et al, *Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung. Winterberichte,* 1978, No.41, p.88-141, In German.
Etter, H.J., Gliott, S.
Avalanche formation, Damage, Snowfall, Snow depth, Switzerland—Alps.

33-2098
Arctic geophysical review.
Sweeney, J.F., ed, *Canada. Dept. of Energy, Mines and Resources. Earth Physics Branch. Publications,* 1978, 45(4), 108p., In English with French summary. Refs. passim.
Geophysical surveys, Hydrography, Seismic surveys, Heat transfer, Bottom sediment, Tectonics.

33-2099
Environmental planning for an Alaskan water-oriented recreational area.
LaPerriere, J.D., *Alaska. University. Institute of Water Resources. Report,* June 1978, IWR-90, 21p., 5 refs. Microfiche only.
Limnology, Lakes, Biomass, Watersheds, Ecology, Environments, United States—Alaska—Tanana Lakes.

33-2100
Geologic road log Alyeska haul road, Alaska, June-August, 1975.
Hamilton, T.D., *U.S. Geological Survey Open-file report,* No.79-227, 64p. + 4 maps.
Roads, Cold weather construction, Seasonal freeze thaw, Permafrost structure, Permafrost hydrology, Active layer, Mudflows, Drainage, Slope processes, United States—Alaska.

33-2101
PENNDOT portion of research on the project fundamentals of frost action in subgrade soils.
Cumberledge, G., et al, *Pennsylvania. Department of Transportation. Technical research report,* Oct. 1976, PDT-68-13, 77p. PB-266 125.
Hoffman, G.L.
Subgrade soils, Frost resistance, Frost action, Measuring instruments.

33-2102
Preliminary radio performance predictions for the Arctic Environmental Buoy (AEB).
Buck, B.M., *Polar Research Laboratory, Inc., Santa Barbara, Calif. Technical report,* June 1976, PRL-TR-5, 31p. ADA-026 552.
Drift stations, Remote sensing, Data transmission, Telemetering equipment, Pack ice.

33-2103
Research on the dynamics of the Arctic tundra ecosystem. Progress report, 1 July 1975-30 June 1976.
Miller, P.C., San Diego State University, Calif., 1976, 388p. SAN-807X6.
Tundra vegetation, Biomass, Soil chemistry, Nutrient cycle, Ecosystems, Mathematical models.

33-2104
Engineering summary of powerplant icing. Technical data.
Pfeifer, G.D., et al, *Pratt Whitney Aircraft Group, East Hartford, Conn. Report,* July 1977, PWA-5522, 203p. ADA-045 087.
Maier, G.P.
Aircraft icing, Engines, Ice prevention.

33-2105
Flexible layered pavement design procedure for Rhode Island.
Nacci, V.A., et al, *Rhode Island. University. Division of Engineering Research and Development. Report,* May 1977, URI-9804-5042, 52p. PB-272 238.
Moultrop, K., Wang, M.-C., Huston, M.T.
Pavements, Cold weather construction, Bituminous concretes, Concrete strength, Frost heave.

33-2106
Effect of antecendent conditions on frozen ground floods.
Pedersen, R., et al, *Idaho. University. Water Resources Research Institute. Report,* Jan. 1977, W77-10175, 32p. PB-270 632.
Molnau, M., Yen, E.S.
Runoff, Floods, Frozen ground, Analysis (mathematics).

33-2107
Great Lakes Winter navigation. Technical and economic analyses.
Michigan. University. Department of Naval Architecture and Marine Engineering, Ann Arbor, 1975, 6 vols. PB-270 982-SET.
Ice navigation, Ships, Economic analysis, Computer programs, Great Lakes.
Under the general title indicated, this series is composed of five numbered volumes and an annex. Vol. 1: Methods of Evaluation (PB-270 983); Vol. 2: Computer Program. Documentation and User Instructions (PB-270 984); Vol. 3: Parametric Studies (PB-270 985); Vol. 4: Strengthening Steel Plates Using Ferrocement and Reinforced Concrete (PB-270 986); Vol. 5: Ice Strengthening of Ship Hulls Using Steel, Ferrocement, or Reinforced Concrete (PB-270 987); Annex: Methods of Evaluation and Computer Program (PB-270 988). The volumes are published separately and bear report dates ranging from Dec. 1973 through Sep. 1975. The Annex summarizes revisions and modifications of the computer program as it developed.

33-2108
Study of potential ice fog and low temperature water fog occurrence at Mildred Lake, Alberta.
Murray, W.A., et al, *Syncrude Canada, Ltd. Environmental research monograph,* 1976, No.4, 69p. NP-21651.
Kurtz, J.
Ice fog, Oil recovery, Environmental impact.

33-2109
On the question of accumulation of ice meltwater south of the ice in the Chukchi Sea.
Handlers, R.G., *U.S. Naval Postgraduate School. Report,* Mar. 1977, No. NPS-68PA77031, 48p. ADA-039 155.
Sea ice, Meltwater, Water flow, Water chemistry, Salinity, Ocean currents.

33-2110
Snow mapping and land use studies in Switzerland.
Haefner, H., *U.S. National Aeronautics and Space Administration. Contractor report,* Jan. 1977, NASA-CR-152631, 55p. E77-10137.
Snow cover distribution, Mapping, Spaceborne photography, Photointerpretation, Switzerland.

33-2111
Ottawa spray rig tests of an ice protection system applied to the UH-1H helicopter.
Cotton, R.H., *U.S. Army Air Mobility Research and Development Laboratory. Technical report,* Nov. 1976, USAAMRDL-TR-76-32, 97p. ADA-034 458.
Helicopters, Aircraft icing, Ice prevention, Electric heating.

33-2112
Polar sub-programme: Global Atmospheric Research Program. *World Meteorological Organization. Publication,* Mar. 1978, GARP-Publ-19, 63p. N79-11615.
Research projects, Sea ice, Ice cover effect, Arctic climate.

33-2113
Significance of frost action and surface soil characteristics to wind erosion at Rocky Flats, Colorado. Second progress report, October 1, 1975-May 30, 1976.
Caine, N., et al, Boulder, University of Colorado, 1976, 71p. COO-2517-2.
Morin, P.
Soil erosion, Wind erosion, Frost action, Seasonal variations, Frozen ground mechanics.

33-2114
State-of-art review of basic problems for a naval architect.
Riska, K., et al, Espoo, Finland, Technical Research Centre, 1977, 74p. N79-11257.
Varsta, P.
Ice structure, Ice formation, Ships, Icebreakers, Ice mechanics, Models.

33-2115
Snow physics and avalanche prediction.
Hartline, B.K., *Science,* Jan. 26, 1979, 203(4378), p.346-348.
Avalanche mechanics, Avalanche forecasting.

33-2116
Churchill River diversion, Burntwood River waterway: studies to evaluate winter regime.
Hopper, H.R., et al, *Canadian journal of civil engineering,* Dec. 1978, 5(4), p.586-594, In English with French summary. 5 refs.
Simonsen, C.P.S., Poulier, W.J.S.
River flow, Ice cover effect, Ice dams, Computer applications.

33-2117
Snow and ice in the phosphorus budget of a lake in south central Ontario.
Adams, W.P., et al, *Water research,* 1979, 13(2), p.213-215, 9 refs.
English, M.C., Lasenby, D.C.
Snow composition, Minerals, Lake ice.

33-2118
Is the soil frozen or not—an algorithm using weather records.
Cary, J.W., et al, *Water resources research,* Dec. 1978, 14(6), p.1117-1122, 13 refs.
Campbell, G.S., Papendick, R.I.
Frozen ground hydrology, Ground ice, Soil freezing, Ground thawing, Heat transfer.

33-2119
Snowplowable raised pavement markers in New Jersey.
Jagannath, M.V., et al, *Transportation research record,* 1977, No.651, p.39-42.
Roberts, A.W.
Pavements, Markers, Snow removal equipment.

33-2120
Soil moisture and temperature regimes in soil taxonomy.
Buol, S.W., *Transportation research record,* 1977, No.642, p.9-12, 7 refs.
Soil moisture, Soil temperature, Soil classification.

33-2121
Mixing in an Arctic fjord.
Perkin, R.G., et al, *Journal of physical oceanography,* Sep. 1978, 8(5), p.873-880, 17 refs.
Lewis, E.L.
Sea ice, Shores, Ice cover effect, Brines, Salinity.

33-2122
Role of ice and snow in lake heat budgets.
Adams, W.P., et al, *Limnology and oceanography,* Sep. 1978, 23(5), p.1025-1028, 9 refs.
Lasenby, D.C.
Snow cover effect, Ice cover effect, Heat balance, Lakes.

33-2123
Fossil ice-wedge polygons in the Colorado Front Range: origin and significance.
Benedict, J.B., *Geological Society of America. Bulletin,* Feb. 1979, 90(2), p.173-180, 16 refs.
Ice wedges, Fossil ice, Patterned ground, Ice dating, Age determination.

33-2124
Antarctic airborne radio echo sounding, 1977-78.
Drewry, D.J., et al, *Polar record,* Sep. 1978, 19(120), p.267-273, 7 refs.
Meldrum, D.T.
Radio echo soundings, Subglacial observations, Glaciology, Terrain analysis, Ice cover thickness, Airborne equipment.
Radio echo sounding field work during the 1977-78 austral summer included evaluation of new radio echo sounding and magnetometer installations, extension of previous work on the 100-km grid coverage in east Antarctica, extension of the 50-100 km grid in west Antarctica; terrain analysis in the Wilkes Subglacial Basin, flow-line studies upstream of Vostok and downstream of Byrd stations, investigation of internal layering at Dome C, and studies of the Ross Ice Shelf. The radio echo sounding equipment and airborne data system are described and preliminary results are given for the glaciological, geological, and geophysical studies. The first large sub-ice lake to be discovered in west Antarctica was detected along the western flank of the Ellsworth Mts. between the Sentinel and Heritage ranges. The water body is at least 13 km in extent and occupies a bedrock hollow beneath about 3,500 m of ice.

33-2125
British Antarctic Survey, 1977-78. *Polar record,* Sep. 1978, 19(120), p.273-278.
Research projects, Glaciology, Radio echo soundings, Ice shelves.
Five main British Antarctic Survey stations were occupied throughout the year: Faraday, Halley, Signy, Grytviken, and Rothera. Studies were conducted in marine and terrestrial biology, limnology, geology and field geophysics, glaciology, and the atmospheric sciences. The main biological activity of the year was the initiation of an Offshore Biological Program (OBP), directed toward studies of the role of krill in the ecosystem, its environment, biology and biochemistry, together with the biology of some of its principal predators.

33-2126
Flow rate and ice discharge of the Hays, Campbell and Assender Glaciers, Enderby Land, Antarctica. (Ausflussgeschwindigkeit und Eisausstoss des Hays-, Campbell- und Assender-Gletschers, Enderby-Land, Antarktika).
Dressler, K., et al, *Petermanns geographische Mitteilungen,* 1977, 121(3), p.224-225, In German. 10 refs.
Meier, S.
Glacier flow, Flow rate, Calving, Geodetic surveys, Glacier mass balance, Photogrammetric surveys, Antarctica—Hays Glacier, Antarctica—Campbell Glacier, Antarctica—Assender Glacier.
This short report presents data on flow rate and calving measurements obtained from the Hays, Campbell and Assender Glaciers by Soviet and German scientists since 1972. The results of photogrammetric survey show that the velocity of the Campbell Glacier's tongue is about 300 m/yr, and the Hays, Campbell and Assender Glaciers are found in constant flow (state of permanent surge). Topographic maps of the three glaciers are given at different scales.

33-2127
Water regime of Disraeli Fiord, Ellesmere Island.
Keys, J.E., *Canada. Defence Research Establishment, Ottawa. DREO report,* Dec. 1978, DREO R 792, 62p., Refs. p.56-58.
Meltwater, Ice shelves, Frazil ice, Ice heat flux, Subglacial observations, Water flow, Sea ice, Canada—Northwest Territories—Ellesmere Island.

33-2128
Research opportunities and needs in the taiga of Alaska.
Helmer, A.E., et al, *U.S. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. U.S. Forest Service general technical report,* 1973, PNW-2, 14p., 15 refs.
Cushwa, C.T.
Taiga vegetation, Trees (plants), Plant ecology, Environments, United States—Alaska.

33-2129
Frost damage to white spruce cones in interior Alaska.
Zasada, J.C., *U.S. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. U.S. Forest Service research note,* May 1971, PNW-149, 7p., 11 refs.
Trees (plants), Frost action, Damage, United States—Alaska.

33-2130
An evaluation of ERIM X-L band airborne synthetic aperture radar imagery of sea ice.
Ketchum, R.D., *U.S. Naval Ocean Research and Development Activity. Technical note,* July 1978, No.28, 19p., 5 refs.
Sea ice distribution, Ice conditions, Remote sensing, Microwaves, Backscattering, Radar echoes, Polarization (waves), Ice surface, Airborne radar.

33-2131
Artificial icing test ice phobic coatings on UH-1H helicopter rotor blades.
Tulloch, J.S., et al, *U.S. Army Aviation Engineering Flight Activity, Edwards Air Force Base, Calif. Project,* June 1978, No.77-30, 72p., 10 refs.
Smith, R.B., Doten, F.S., Bishop, J.A.
Ice prevention, Ice accretion, Helicopters, Antiicing additives, Protective coatings, Tests, Ice loads, Temperature effects, Human factors, Mechanical ice prevention.

33-2132
Annual report No.10.
Washington (State). University. Department of Atmospheric Sciences, Seattle, Wash., Dec. 1978, 31p., 9 refs.
Sea ice, Heat balance, Desalting, Ice growth, Ice optics, Ice cover thickness, Ice forecasting, Thermodynamic properties, Research projects.

33-2133
Microbial life in extreme environments.
Kushner, D.J., ed, New York, Academic Press, 1978, 465p., Refs. passim. For selected papers see 33-2134 and 33-2135.
Microbiology, Algae, Bacteria.

33-2134
Microbial life at low temperatures: ecological aspects.
Baross, J.A., et al, Microbial life in extreme environments, ed. by D.J. Kushner, New York, Academic Press, 1978, p.9-71.
Morita, R.Y.
Bacteria, Microbiology, Algae, Ice, Snow, Rivers, Lakes, Ice caves.
Psychrophiles and the ecology of microbial activity at cold temperatures are discussed under the following headings: atmospheric environment; caves; freshwater environments; soils; rivers and streams; marine environments; and snow and ice. Antarctic species are dealt with under a number of these topics, especially in connection with microbial activity in lakes and ponds.

33-2135
Microbial life at low temperatures: mechanisms and molecular aspects.
Inniss, W.E., et al, Microbial life in extreme environments, ed. by D.J. Kushner, New York, Academic Press, 1978, p.73-104, Refs. p.99-104.
Ingraham, J.L.
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Ice islands, Offshore drilling, Oil wells, Construction equipment.

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Excavating equipment, Submarine permafrost.

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Subgrade soils, Seasonal freeze thaw, Soil mechanics, Stresses, Low temperature tests.
Values of resilient modulus and Poisson's ratio were determined for silt and clay subgrade materials subjected to seasonal freezing and thawing. A new technique employing noncontacting variable impendance transducers was employed to obtain radial strain data for calculation of Poisson's ratio. The data were analyzed using multiple linear regression and analysis of variance techniques to obtain empirical relationships between the resilient moduli and Poisson's ratio parameters and stress and material property variables. Resilient modulus data ranged from over 6,000,000 psi for the frozen condition to less than 600 psi for the thawed condition. Poisson's ratio ranged from 0.07 to 0.61, the majority of the values falling between 0.03 and 0.50.

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Ice composition, Gamma irradiation, Ions, Models.

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33-2182
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Snow cover, Runoff forecasting, Water supply, Stream flow.

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Wishart, E.R.
Ice growth, Supercooled clouds, Ice physics, Hoarfrost.

33-2184
RISP/RIGGS bypasses limits of man-made disciplines. *American Geophysical Union. Transactions,* Oct. 1978, 59(10), p.906-908.
Ice shelves, Ice cores, Ice sheets.
One of the sessions of the 1978 American Geophysical Union spring meeting focused on the Ross Ice Shelf Project (RISP). This paper briefly summarizes the presentations made at the meeting. Reports on the meteorology, geochemistry, marine geophysics, biology, and geologic history of the 500-m-deep ice shelf were included. The sampling area, site J9, is 411 km from the open waters of the Ross Sea. Biological interest in the waters and sediment below the Ross Ice Shelf focused on whether or not organisms could live under the ice at large distances from the open waters of the Ross Sea. Diatoms, microzooplankton, zooplankton, and metabolically active bacteria populations were found along with amphipods and fish.

33-2185
Lichens of cold deserts.
Lindsay, D.C., Lichen ecology, edited by M.R.D. Seaward, London, Academic Press, 1977, p.183-209, Refs. p.206-209.
DLC QK583.L5
Lichens, Deserts, Vegetation.
This chapter is concerned mainly with the lichens of the cold deserts surrounding the Poles, especially the Antarctic, which has been mentioned as a probable center of evolution of many plant groups before the onset of the Late Cenozoic glaciations. Some aspects of the ecology of cold desert lichens are discussed, present distribution patterns are outlined and compared for the lichens of both polar regions, and an attempt is made to reconstruct changes in the lichen flora of Antarctica in relation to the Late Cenozoic glaciation and to show how present-day distribution patterns were attained.

33-2186
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Urban planning, Residential buildings, Taiga terrain, Industrial buildings, Tundra terrain, Baykal Amur railroad.

33-2187
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Aleksandrov, M.G.
Hydroelectric power generation, Electric power plants, Industrial buildings, Permafrost beneath structures, USSR—Yenisey River.

33-2188
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Bridges, Embankments, Railroad tracks, Permafrost beneath structures, Taiga terrain, Tunnels, Baykal Amur railroad.

33-2189
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Vertousov, L.K., *Stroitel'stvo i arkhitektura Leningrada,* Nov. 1978, No.11, p.12-16, In Russian.
Economic development, Urban planning, Residential buildings, Roads, Industrial buildings, Charts, Design.

33-2190
Alliance of science and practice. ¡Praktika v soiuze s naukoĭ¡,
Smirnov, V.I., et al, *Stroitel'stvo i arkhitektura Leningrada,* Nov. 1978, No.11, p.16-19, In Russian.
Timofeev, L.A.
Economic development, Urban planning, Buildings, Roads, Swamps, Permafrost beneath structures.

33-2191
Towns will grow along the Baykal Amur railroad. ¡Vyrastut na BAMe goroda¡,
Antonov, A.F., *Stroitel'stvo i arkhitektura Leningrada,* Nov. 1978, No.11, p.23-25, In Russian.
Swamps, Taiga terrain, Urban planning, Transportation, Industrial buildings, Residential buildings, Baykal Amur railroad.

33-2192
Standardization reserves. ¡Rezervy unifikatsii¡,
Kopelevich, V.L., et al, *Stroitel'stvo i arkhitektura Leningrada,* Nov. 1978, No.11, p.26-28, In Russian.
L'vov, L.A.
Construction materials, Prefabrication, Large panel buildings, Large unit construction, Concrete structures, Permafrost beneath structures, Earthquakes, Design.

33-2193
Comfortable environment for taiga and tundra. {Komfortnaia sreda v taĭge i tundre},
Shipkov, A.I., *Stroitel'stvo i arkhitektura Leningrada,* Nov. 1978, No.11, p.28-31, In Russian.
Taiga terrain, Tundra terrain, Buildings, Urban planning, Design.

33-2194
Traveling houses. {Doma-puteshestvenniki},
Nelfakh, L.S., *Stroitel'stvo i arkhitektura Leningrada,* Nov. 1978, No.11, p.32-35, In Russian.
Residential buildings, Houses, Prefabrication, Construction materials, Transportation, Design.

33-2195
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Onufriev, V.K.
Residential buildings, Industrial buildings, Large panel buildings, Prefabrication, Construction materials.

33-2196
Taking care of northerners' leisure. {Zabota o dosuge severian},
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Urban planning, Buildings, Permafrost beneath structures, Design.

33-2197
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33-2267
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33-2268
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33-2271
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33-2272
Hydrogeology of deeply buried placer deposits in the northeastern USSR. ¡Gidrogeologiia glubokozalegaiushchikh rossypnykh mestorozhdeniĭ v usloviiakh Severo-Vostoka SSSR¡,
Kalmykov, P.N., et al, Soveshchanie po podzemnym vodam Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Conference on ground water in Siberia and the Far East, 7th, Abstracts), Irkutsk, 1973, p.111-113, In Russian.
Ageenkov, A.V., Motrich, L.T.
DLC GB1155.T49
Placer mining, Permafrost hydrology, Water table, Taliks, Subpermafrost ground water.

33-2273
Protection of ground water in the permafrost zone of Siberia in the system of environmental protection measures. ¡Okhrana podzemnykh vod territorii merzloĭ zony Sibiri v sisteme meropriiatiĭ po okhrane okruzhaiushcheĭ sredy¡,
Tolstikhin, O.N., et al, Soveshchanie po podzemnym vodam Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Conference on ground water in Siberia and the Far East, 7th, Abstracts), Irkutsk, 1973, p.118-119, In Russian.
Klimochkin, V.V.
DLC GB1155.T49
Permafrost hydrology, Water pollution, Environmental protection.

33-2274
Forecasting ground water regime in permafrost areas using multiple correlation analysis. ¡Vozmozhnosti primeneniia metoda mnozhestvennoĭ korreliatsii dlia prognozirovaniia rezhima podzemnykh vod v usloviiakh rasprostraneniia mnogoletnemerzlykh porod¡,
Ustinova, Z.G., Soveshchanie po podzemnym vodam Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Conference on ground water in Siberia and the Far East, 7th, Abstracts), Irkutsk, 1973, p.121, In Russian.
DLC GB1155.T49
Permafrost hydrology, Water supply, Wells, Water level, Forecasting.

33-2275
Dynamics and characteristics of the interrelationship between surface and ground water in permafrost areas. ¡Kharakternye osobennosti i dinamika vzaimosviazi poverkhnostnykh i podzemnykh vod v zone mnogoletneĭ merzloty¡,
Furman, M.Sh., Soveshchanie po podzemnym vodam Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Conference on ground water in Siberia and the Far East, 7th, Abstracts), Irkutsk, 1973, p.139-140, In Russian.
DLC GB1155.T49
Permafrost hydrology, Surface waters, Ground water, Soil moisture migration, Suprapermafrost ground water, Water transport, Subpermafrost ground water.

33-2276
Electric heating of wells as a method of pollution prevention and conservation of subpermafrost artesian waters. ¡Elektroobogrev skvazhin—odin iz metodov bor'by s istoshcheniem i zagriazneniem podmerzlotnykh artezianskikh vod¡,
Gubanov, A.A., et al, Soveshchanie po podzemnym vodam Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Conference on ground water in Siberia and the Far East, 7th, Abstracts), Irkutsk, 1973, p.140-141, In Russian.
Gubanov, B.A.
DLC GB1155.T49
Permafrost hydrology, Artesian water, Subpermafrost ground water, Water pollution, Environmental protection.

33-2277
Experimental results of creating artificial water storage in taliks beneath Central Yakutian lakes. ¡Rezul'taty opytnykh rabot po sozdaniiu iskusstvennykh zapasov podzemnykh vod v podozernykh talikakh Tsentral'noĭ Yakutii¡,
Parshin, A.P., Soveshchanie po podzemnym vodam Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Conference on ground water in Siberia and the Far East, 7th, Abstracts), Irkutsk, 1973, p.142-143, In Russian.
DLC GB1155.T49
Water supply, Taliks, Water storage, Permafrost hydrology.

33-2278
Proceedings.
High Altitude Revegetation Workshop No.3, Fort Collins, Colorado, March 13-14, 1978, *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, 213p., Refs. passim. For selected papers see 33-2279 through 33-2285.
Kenny, S.T., ed.
Revegetation, Alpine vegetation, Plant ecology, Slope stability, Grasses, Plants (botany).

33-2279
Aspects of the ecology of alpine and subalpine plants.
Billings, W.D., *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, p.1-16, 21 refs. Includes discussion.
Alpine vegetation, Plant ecology, Environmental impact, Ecosystems, Revegetation.

33-2280
Problems in the identification of threatened and endangered plant species.
Buckner, D.L., *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, p.17-24, 5 refs. Includes discussion.
Alpine vegetation, Protection, Environmental impact, Plants (botany), Ecosystems.

33-2281
Use of the Plant Information Network (PIN) in high altitude revegetation.
Dittberner, P.L., et al, *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, p.52-74, 5 refs. Includes discussion.
Bryant, G.
Revegetation, Alpine vegetation, Computer applications, Classifications.

33-2282
Grass and legume improvement for high altitude regions.
Kenny, S.T., et al, *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, p.84-100, 4 refs. Includes discussion.
Cuany, R.L.
Revegetation, Alpine vegetation, Growth, Plants (botany), Grasses.

33-2283
Development of plant materials for revegetation in Alaska.
Mitchell, W.W., *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, p.101-115, 27 refs. Includes discussion.
Revegetation, Tundra vegetation, Grasses, United States—Alaska.

33-2284
Hazard identification, chemical removal and revegetation of a toxic chemical spill on Lawson Hill, San Miguel County.
Groeneveld, D.P., et al, *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, p.142-153.
O'Boyle, P.S.
Revegetation, Plant ecology, Chemistry, Soil pollution, Glacial till, Slope processes.

33-2285
Steep slope design and revegetation techniques.
Brammer, R.L., *Colorado. State University, Fort Collins. Environmental Resources Center. Information series,* May 1978, No.28, p.162-167, Includes discussion.
Slope processes, Revegetation, Slope stability, Grasses, Design.

33-2286
Radar anisotropy of sea ice due to preferred azimuthal orientation of horizontal *c* axes of ice crystals.
Kovacs, A., et al, *Journal of geophysical research,* Dec. 20, 1978, 83(C12), MP 1139, p.6037-6046, 36 refs.
Morey, R.M.
Sea ice, Radar echoes, Anisotropy, Ice crystal structure, Electromagnetic properties, Ocean currents.
Results of impulse radar, ice crystal *c* axis, and subice current measurements on the fast ice near Narwhal Island, Alaska, are presented. The crystal structure of the ice was found to have a horizontal crystal *c* axis with a preferred azimuthal orientation. This orientation was found to align with the direction of the current at the ice-water interface. Impulse radar reflection measurements revealed that the preferred orientation of the sea ice crystal structure behaved as a microwave polarizer. It was observed that when the antenna *E* field was oriented parallel with the *c* axis of the crystal platelets, a strong reflection of the radar signal from the bottom of the ice was obtained. However, when the antenna *E* field was oriented perpendicular to the *c* axis, no bottom reflection was detected. The results of this study fully support earlier reports of sea ice inhomogeneity and anisotropy in reference to both structure and electromagnetic energy transmission.

33-2287
Oxygen isotope investigation of the origin of the basal zone of the Matanuska Glacier, Alaska.
Lawson, D.E., et al, *Journal of geology,* 1978, Vol.86, MP 1177, p.673-685, 34 refs.
Kulla, J.B.
Glacier ice, Ice structure, Oxygen isotopes, Thermodynamic properties.
An analysis of the oxygen isotope content of ice of the englacial and basal zones of the Matanuska Glacier at its terminus reveals the origin of the ice and entrained debris. The decrease with depth in the change of O18 values of ice of the diffused facies of the englacial zone and the dispersed facies of the basal zone is consistent with previous studies and indicates this ice originates in the accumulation area. Characteristics of the ice and debris of the dispersed facies indicate a subglacial source for most of the debris. The sharp increase of more than 4 per mill in the change of O18 values of ice of the lower, stratified facies of the basal zone and its young radiocarbon age indicate this facies formed by subglacial freezing of isotopically enriched meltwater, probably surface-derived, to the glacier sole. The bubble-poor, fine-grained ice, thickness, stratification, rounded pebbles, and undisturbed sedimentary structures in this facies support this conclusion. The location, extent, and rates of subglacial ice formation and sediment entrainment vary. The Matanuska Glacier is therefore thermally complex, with zones of ice at the glacier sole that are at or below the pressure-melting point.

33-2288
River ice.
Ashton, G.D., *American scientist,* Jan./Feb. 1979, 67(1), MP 1178, p.38-45, 21 refs.
River ice, Ice formation, Ice jams, Ice growth, Thermal pollution, Temperature effects.

33-2289
Low friction hull coatings for icebreakers. Phase II, Parts I and II. Laboratory and field tests.
Calabrese, S.J., et al, *U.S. Coast Guard. Technical report,* Feb. 1976, USCG-D-32-76, 90p., ADA-024 847, For Phase I, Parts I and II, see 29-1654; for Phase II, Part III, see 33-359; for Phase III, see 33-2291.
Peterson, M.B., Ling, F.F.
Ships, Icebreakers, Protective coatings, Metal ice friction.

33-2290
Water level measurement from a floating ice cover.
Serson, H., et al, *Canada. Defence Research Establishment Pacific, Victoria. Technical memorandum,* Dec. 1977, DREP-TM-77-17, 23p. ADA-056 833.
Finlayson, D.
Water level, Floating ice, Measuring instruments, Tides.

33-2291
Low friction hull coatings for icebreakers. Phase III technical report.
Calabrese, S.J., et al, *U.S. Coast Guard. Technical report,* Oct. 1978, USCG-D-69-78, 192p., ADA-061 691, For Phase I, Parts I and II, see 29-1654; for Phase II, Parts I and II, see 33-2289; for Phase II, Part III, see 33-359.
Ling, F.F.
Ships, Icebreakers, Protective coatings, Metal ice friction.

33-2292
Collection of codes prescribed for the design and construction of plants, buildings and structures in the northern construction-climatic zone, permafrost and subzero temperatures (Extracts from the All-Union Building Code Documents). (Sbornik normativnykh trebovanii po proektirovaniiu i stroitel'stvu predpriiatii, zdanii i sooruzhenii v usloviiakh severnoi stroitel'no-klimaticheskoi zony, vechnomerzlykh gruntov i otritsatel'nykh temperatur (izvlecheniia trebovanii iz obshchesoiuznykh normativnykh dokumentov)),
Russia. Gosudarstvennyi komitet po delam stroitel'stva, Moscow, 1978, 153p., In Russian.
Building codes, Standards, Houses, Residential buildings, Industrial buildings, Roads, Railroads, Airports, Electric power plants, Concrete structures, Steel structures, Masonry, Water supply, Pipelines, Sewage, Heating.

33-2293
Climatic change.
Gribbin, J., ed, London, Cambridge University Press, 1978, 280p., Refs. For selected papers see 33-2294 through 33-2298 or F-21190, I-21187 through I-21189, and I-21191.
Climatic changes, Ice sheets, Snow cover, Sea ice, Heat balance, Isotope analysis, Glaciation.
This volume contains fourteen contributions on the subject of climatic change, arranged under the following headings: studying the climates of the past, balancing the global heat budget, astronomical influences, modelling the changing climate, and climate and man. A paper by H. Flohn (1974; 30-2570 or I-16225), providing an overall model of the initiation of a glaciation, is contained in an appendix.

33-2294
Geological-geophysical framework of ice ages.
Tarling, D.H., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.3-24, Refs. p.20-25.
DLC QC981.8.C5C55
Ice age theory, Climatic changes, Glaciation, Ice sheets, Paleoclimatology.
This discussion identifies some of the characteristics of previous ice ages and evaluates the significance of various geological and geophysical factors that have influenced past climatic changes and may be responsible for current change. With the arguable exception of the Late Precambrian Ice Age(s), the most notable feature of all ice ages is that they only occur at high latitudes, mostly within 30 deg of the pole. Throughout the Mesozoic, the South Pole was close to Antarctica, but it was only after it became located inland that ice sheet formation commenced. The drift of the Gondwanan continent to the situation where the pole, by Middle Permian times, was merely on the edge of the land mass seems to coincide with the rapid, simultaneous disappearance of ice sheets throughout the Gondwanan continent, leaving only isolated mountain glaciers until the continent drifted sufficiently far back under the pole in Miocene times. It seems, therefore, that it is essential for the pole to lie well within a continental block before ice sheets can form, with shallow, epicontinental seas sufficiently near to provide a moisture supply.

33-2295
Isotope studies.
Duplessy, J.C., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.46-67, 122 refs.
DLC QC981.8.C5C55
Climatology, Ice sheets, Ice cores, Isotope analysis.
The application of oxygen isotopic analysis in benthic and pelagic foraminifera in deep sea cores is examined, with particular attention given to the factor controlling the isotopic composition of a given foraminifera specimen and to the assessment of which of these factors are likely to have changed in the past. The O-18 content of sea water is directly related to the extent of the continental ice volume; the larger the ice sheets formed on the continent, the heavier the isotopic composition of the sea water. The isotopic compositions of ice cores from Camp Century, Byrd Station, and the Vostok borehole, are examined. An upper limit of delta = -30 per mill has been estimated for the mean isotopic composition of continental excess ice during the latest glacial maximum. The isotopic balance between sea water and continental ice demonstrates that the increase of the mean O-18/O-16 of ocean water during the last glacial period was at least 1.2 per mill, in line with the benthic foraminifera and ice cap evidence.

33-2296
Heat balance of the Earth.
Budyko, M.I., Climatic changes, edited by J. Gribbin, London, Cambridge University Press, 1978, p.85-113, 48 refs.
DLC QC981.8.C5C55
Ice cover effect, Snow cover effect, Albedo, Heat balance.
This paper treats the heat balance of the Earth's surface, the Earth-atmosphere system and the atmosphere, as well as the water balance of the Earth. The effects of arctic and antarctic snow and ice cover on the albedo fo the Earth's surface and the Earth-atmosphere system are taken into account.

33-2297
Recent changes in snow and ice.
Kukla, G.J., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.114-129, 36 refs.
DLC QC981.8.C5C55
Snow cover, Ice conditions, Pack ice, Sea ice, Ice sheets, Insolation, Climatic changes.
Observations on the sensitivity of snow and ice fields in both hemispheres to the seasonal march of insolation are summarized. In the southern hemisphere, the extent of the antarctic pack-ice fields is especially sensitive to insolation in early Nov. Higher insolation to pack-ice fields at this time should result in shorter ice seasons and a smaller average extent of the pack. Minimum global extent of snow and ice and minimum radiation losses over snow and ice areas are reached in Aug. and Sep.

33-2298
Global influences of mankind on the climate.
Kellogg, W.W., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.205-227, Refs. p.223-227.
DLC QC981.8.C5C55
Ice conditions, Sea ice, Pack ice, Climate, Heat balance, Surface temperature, Human factors.
Studies of the global influences of mankind on climate lead to the conclusion that barring a major natural perturbation to the climate, mankind's activities will in all likelihood warm the Earth in the next few decades. It is expected that the rate will be appreciably larger than any change of mean surface temperature seen in the past 100 yr. The greatest changes will probably take place in the polar regions. Four regimes of arctic and antarctic ice and snow are considered: winter snow cover on the land that melts in summer; floating sea ice or pack ice; mountain glaciers; and the ice sheets of Greenland and the Antarctic. It is considered unlikely that the polar ice masses will be greatly affected by anthropogenic warming in the next century or so.

33-2299
Geographic based information management system for permafrost prediction in the Beaufort and Chukchi Seas. Part I: Submarine permafrost on the Alaskan Shelf. Part II: Submarine permafrost and the development of the Arctic Shelf of Eurasia in Pleistocene. Part III: Atlas of the computerized maps of the Alaskan Shelf.
Vigdorchik, M., Boulder, Colorado, Environmental Research Laboratories, 1978, 3 vols., Bibliography p.134-141.
Data processing, Computer applications, Permafrost forecasting, Submarine permafrost, Permafrost structure, Mapping, Petroleum industry, Permafrost distribution, Permafrost depth.

33-2300
Movement of snow-water through small plant-soil systems in the Medicine Bow Mountains, Wyoming.
Knight, D.H., et al, *Wyoming. University. Water Resources Research Institute. Report,* Apr. 1976, W77-01812, 71p. PB-261 252.
Harrison, A.T.
Snowmelt, Snow hydrology, Hydrologic cycle, Alpine vegetation, Evapotranspiration.

33-2301
Airborne linear-sweep FM radar system for measuring ice thickness.
Venier, G.O., et al, *Canada. Communications Research Centre. Report,* Dec. 1975, CRC-1269, 32p. N76-31379.
Cross, F.R.
Airborne equipment, Radar echoes, Ice cover thickness.

33-2302
L-band radar clutter statistics for terrain and ice. Volume 1. Technical discussion and results. Volume 2. Appendices.
Maffett, A., et al, *Environmental Research Institute of Michigan. Report,* Feb. 1978, ERIM-128900-9-F1 (1) (2), 2 vols., ADB-028 457L, ADB-028 458L, Distribution limited to U.S. Government agencies only.
Klimach, H., Liskow, A., Rawson, R., Heimiller, R.C.
Radar echoes, Terrain analysis, Pack ice, Tundra terrain, Statistical data.

33-2303
Ice-shedding paste for application to helicopter rotor blades.
Sewell, J.H., *United Kingdom. Royal Aircraft Establishment, Farnsborough. Technical report,* Nov. 1977, RAE-TR-77173, 26p., ADB-028 285, Distribution limited to DDC users.
Ice prevention, Protective coatings, Helicopters.

33-2304
Icephobic coatings for army rotary-wing aircraft.
Artis, D.R., Jr., *U.S. Army Air Mobility Research and Development Laboratory. Technical note,* May 1975, USAAMRDL-TN-19, 10p. ADB-004 715.
Ice prevention, Helicopters, Protective coatings, Chemical ice prevention.

33-2305
Selection of battery power supplies for cold temperature applications.
Winsor, W.D., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* Sep. 1978, No.78-13, 22p.
Butt, K.A.
Low temperature tests, Electric power generation.

33-2306
Field guide for portland cement concrete construction in Antarctica.
Keeton, J.R., *U.S. Naval Construction Batallion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical note,* Oct. 1969, NCEL-TN-1060, 18p., AD-861 520, 3 refs.
Cements, Concretes, Construction materials, Cold weather construction.
The guide was prepared for field use by military crews in producing, placing and curing portland cement concrete in Antarctica under summer temperatures down to 15F. Since the principal factors are mix control and mix temperature during production and exposed surface temperature control for 3 days following placement, these steps are discussed in considerable detail. The technical information presented in this document is based on field experiments at McMurdo Station, during *Deep Freeze* 69. (Auth. mod.)

33-2307
Icebreaker propulsion systems feasibility study. Vol.7. Mission sensitivity analyses.
NUS Corporation, Rockville, Md., Its report No.323, Feb. 1967, 51p. AD-861 585.
Icebreakers, Engines, Cost analysis.
The feasibility of polar icebreaker propulsion systems is studied. A ship with the characteristics of the reference design can accomplish approx 50% of individual antarctic scientific missions in the continuing mode, and 100% in the ramming mode. The results of the analysis appear to amply reinforce the validity of prior conclusions as to the superior cost effectiveness of nuclear propulsion systems for proposed polar icebreakers.

33-2308
New information on protective spruce strips. [Novoe o elovykh zashchitnykh zhivykh izgorodiakh],
Chirkov, V.A., *Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut zheleznodorozhnogo transporta. Vestnik,* 1978, No.7, p.47-52, In Russian. 7 refs.
Railroad tracks, Snowdrifts, Protective vegetation, Forest strips.

33-2309
Low temperature testing assembly based on IMASh-5S-65. [Ustanovka dlia nizkotemperaturnykh ispytanii na baze IMASh-5S-65],
Demchuk, I.S., et al, *Zavodskaia laboratoriia,* 1978, No.11, p.1371-1372, In Russian.
Baru, E.N., Krakhmalev, V.I.
Low temperature tests, Test equipment, Metals.

33-2310
Winterizing aircraft, a complicated problem. [Podgotovka aviatsionnoi tekhniki k zimnei ekspluatatsii—zadacha kompleksnaia],
Kovalev, P., *Vestnik protivovozdushnoi oborony,* 1978, No.9, p.70-73, In Russian.
Military transportation, Airplanes, Winter maintenance, Aircraft icing, Cold weather operation, Cold weather performance.

33-2311
Variations in the tidal regime due to hydraulic construction in border seas. [Izmeneniia rezhima prilivov v sviazi s gidrotekhnicheskim stroitel'stvom v okrainnykh moriakh],
Sezeman, N.A., *Vodnye resursy,* 1967, No.3, p.185-192, In Russian. 11 refs.
Hydroelectric power generation, Electric power plants, Tides, Tidal power plants, Okhotsk Sea.

33-2312
Experience in using pyramidal piles. [Opyt primeneniia piramidal'nykh svai],
Labazin, A.D., et al, *Zhilishchnoe stroitel'stvo,* Oct. 1978, No.10, p.23-25, In Russian.
Bazdyrev, IU.I., Dogadailo, A.I.
Pile foundations, Prefabrication, Concrete piles, Reinforced concrete, Clay soils, Peat.

33-2313
Structural peculiarities of residential buildings designed for Noril'sk. [Konstuktivnye osobennosti zhilykh zdanii dlia stroitel'stva v Noril'ske],
Pikhovkin, V.A., et al, *Zhilishchnoe stroitel'stvo,* Sep. 1978, No.9, p.4-6, In Russian.
Shkliarov, N.D.
Residential buildings, Permafrost beneath structures, Design, USSR—Noril'sk.

33-2314
Assembled plates of increased frost resistance. [Sbornye plity povyshennoi morozostoikosti],
Leshchinskii, M., *Stroitel'nye materialy i konstruktsii,* Oct.-Dec. 1977, No.4, p.24-25, In Russian.
Prefabrication, Plates, Reinforced concrete, Pavements, Frost resistance.

33-2315
Thermoinsulative cellular concrete for light roof structures. [Teploizoliatsionnyi iacheistyi beton dlia oblegchennykh krovel'nykh konstruktsii],
Merkin, A.P., et al, *Stroitel'nye materialy,* Nov. 1978, No.11, p.14-15, In Russian.
Prefabrication, Construction materials, Cellular concretes, Roofs, Thermal insulation.

33-2316
High strength concrete on a super-plasticizer base. [Vysokoprochnyi beton na osnove superplastifikatorov],
Bazhenov, IU.M., et al, *Stroitel'nye materialy,* Sep. 1978, No.9, p.18-19, In Russian. 4 refs.
Concrete structures, Reinforced concrete, Concrete hardening, Concrete strength, Frost resistance, Concrete admixtures, Cements, Low temperature tests, Freeze thaw cycles.

33-2317
Construction of short heat-treated earth piles. [Ustroistvo korotkikh termogruntovykh svai],
IUrdanov, A.P., *Promyshlennoe stroitel'stvo,* Oct. 1978, No.10, p.33-35, In Russian.
Pile foundations, Frozen fines, Ground ice, Frost heave, Loess, Boreholes, Electric heating, Piles.

33-2318
Safety of ice navigation. [Bezopasnost' plavaniia vo l'dakh],
Enin, N., *Rechnoi transport,* 1978, No.10, p.54-55, In Russian.
Ice conditions, Ice navigation, Icebreakers, USSR—Volga River.

33-2319
Soviet glaciological research in 1977. [Sovetskie gliatsiologicheskie issledovaniia v 1977 godu],
Kotliakov, V.M., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* Jan. 1978, No.32, p.5-13, In Russian.
Lapina, I.IA.
Glaciology, Research projects.
Activities and accomplishments of the Soviet antarctic research effort for 1977 are briefly reviewed. Taking part in the SAE for 1977 were the Moscow State University, the Arctic and Antarctic Institute and the Institute of Geography of the Academy of Sciences.

33-2320
Third meeting of the editorial board of the Atlas of World Snow and Ice Resources. [Tret'e zasedanie redkollegii atlasa snezhno-ledovykh resursov mira],
Dreier, N.N., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* Jan. 1978, No.32, p.13-17, In Russian.
Ice surveys, Snow surveys, Maps, Research projects.

33-2321
First Siberian glacioclimatological lectures. [Pervye sibirskie gliatsioklimaticheskie chteniia],
Rototaeva, O.V., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* Jan. 1978, No.32, p.17-19, In Russian.
Chernova, L.P.
Glaciology, Climate, Tundra climate, Subarctic climate, USSR—Siberia.

33-2322
Estimating and large-scale mapping of water balance in mountain glacier basins. [Opyt rascheta i krupnomasshtabnogo kartirovaniia vodnogo balansa gornolednikovykh basseinov],
Sosedov, I.S., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* Jan. 1978, No.32, p.21-26, In Russian with English summary. Discussion p.76. 9 refs.
Filatova, L.N., Kiktenko, O.V.
Water balance, Mapping, Mountain glaciers, Analysis (mathematics), USSR—Zailiyskiy Alatau.

33-2323
Linear models for calculating glacial runoff. [Primenenie lineinykh modelei dlia rascheta stoka s lednikov],
Glazyrina, E.L., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* Jan. 1978, No.32, p.27-34, In Russian with English summary. Discussion p.76. 13 refs.
Glazyrin, G.E.
Mathematical models, Glacier melting, Runoff forecasting, Subglacial drainage.

33-2324
Features of long-term runoff variations in relation to the water balance of glacier basins. [Osobennosti mnogoletnikh kolebanii stoka v sviazi s izucheniem vodnogo balansa lednikovogo basseina],
Mikhailova, V.I., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* Jan. 1978, No.32, p.34-37, In Russian with English summary. Discussion p.77. 3 refs.
Petriashova, E.V.
Water balance, Glacier melting, Runoff, Glacial hydrology.

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The purpose of this document is to record and present the information and concepts that have been compiled and developed during the preliminary design of a 20,000 shp diesel electric icebreaker. This report deals with 2nd cycle preliminary structural design of a polar icebreaker for use in arctic and antarctic regions. It includes the development of dynamic ice loads, a critique on the possibility of fatigue failure, elastic vs plastic plate design and those structural analyses required to determine preliminary hull scantlings. (Auth.)

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LeDrew, B.R., comp, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* Apr. 1977, 77-28, 187p.
Culshaw, S.T., comp.
Expeditions, Sea ice, Strains, Oceanography.

33-2498
Areas imaged during project SAR 77 using the ERIM four channel radar.
Larsen, R., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* June 10, 1977, 77-30, 59p.
Liskow, C., Rawson, R., Shuchman, R., Smith, F.
Sea ice, Icebergs, Radar echoes, Research projects, Aerial photography.

33-2499
Forecasting ice appearance dates for the Pechora River using the method of meteorological field expansion according to natural orthogonal components. [Primenenie metoda razlozheniia meteorologicheskikh polei po estestvennym ortogonal'nym sostavliiushchim pri prognoze poiavleniia l'da na r. Pechore],
Shanochkin, S.V., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Sbornik rabot po gidrologii,* 1977, No.12, p.18-23, In Russian. 10 refs.
Ice forecasting, Ice formation, Freezeup, Long range forecasting, USSR—Pechora River.

33-2500
Calculating snow melting intensity in the northwestern USSR. [K voprosu o raschete snegotaianiia na severo-zapade ETS],
Polishchuk, O.N., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Sbornik rabot po gidrologii,* 1977, No.12, p.34-39, In Russian. 11 refs.
Snow cover distribution, Forest canopy, Snow water equivalent, Snow melting, Forest land.

33-2501
Thermophysical properties of soils in Murmansk swamps and the formation of impervious layers. [Teplofizicheskie svoĭstva pochvo-gruntov zabolochennykh raĭonov v Amurskoĭ oblasti i usloviia obrazovaniia vodoneproniteaemogo sloia],
Kholoden, E.E., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Sbornik rabot po gidrologii,* 1977, No.12, p.47-53, In Russian. 10 refs.
Swamps, Unfrozen water content, Peat, Soil profiles, Clay soils, Frost penetration, Seasonal freeze thaw, Frozen ground, USSR—Amur River.

33-2502
Solar radiation diffusion in snow and ice. [O diffuzii solnechnogo izlucheniia v snezhnom i ledianom pokrove],
Kosachevskiĭ, V.A., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Sbornik rabot po gidrologii,* 1977, No.12, p.54-59, In Russian. 12 refs.
Snowmelt, Solar radiation, Radiation absorption, Snow water equivalent, Ice physics, Snow physics, Analysis (mathematics).

33-2503
Hydraulic and morphometric characteristics of slope runoff. [Issledovanie gidravlicheskikh i morfometricheskikh kharakteristik sklonovykh potokov],
Zubkova, K.M., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Sbornik rabot po gidrologii,* 1977, No.12, p.100-107, In Russian. 5 refs.
Slope processes, Soil freezing, Frost penetration, Frozen ground, Snow cover effect, Snowmelt, Runoff, Soil erosion.

33-2504
Agrotechnical activities resulting in decreased melt water runoff and erosion of light-brown soil. [Vliianie agrotekhnicheskikh priemov na umen'shenie stoka talykh vod i smyva svetlo-kashtanovoĭ pochvy],
Borets, V.P., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Sbornik rabot po gidrologii,* 1977, No.12, p.120-125, In Russian.
Soil moisture, Frost penetration, Soil freezing, Snow water equivalent, Snowmelt, Runoff, Soil erosion.

33-2505
Selection of interpretation indices for black-and-white aerial photographs of underlying surfaces obtained by the "Meteor" satellite during a winter-spring season. [Vybor deshifrovochnykh priznakov dlia cherno-belykh izobrazheniĭ podstilaiushcheĭ poverkhnosti po snimkam sputnika "Meteor" v zimne-vesennĭ period],
Pankratova, E.I., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Sbornik rabot po gidrologii,* 1977, No.12, p.147-155, In Russian. 3 refs.
Spaceborne photography, Snow cover distribution, Clouds (meteorology), Photointerpretation, Aerial photographs.

33-2506
Construction on the marine clays of Kola Peninsula. [Morskie glinistye grunty Kol'skogo poluostrova i stroitel'stvo na nikh],
Koff, G.L., Murmanskoe knizhnoe izd-vo, 1976, 125p., In Russian with English table of contents enclosed. 28 refs.
DLC TA705.K58
Clay soils, Soil mechanics, Soil moisture migration, Rheology, Buildings, Foundations, Cold weather performance, USSR—Kola Peninsula.

33-2507
Problems in regional hydrogeology. Regularities governing ground water formation and distribution. [Problemy regional'noĭ gidrogeologii. Zakonomernosti rasprostraneniia i formirovaniia podzemnykh vod],
Pinneker, E.V., Moscow, Nauka, 1977, 196p. (Pertinent pp.170-190), In Russian. 121 refs.
Ground water, Permafrost hydrology, Volcanoes, Water temperature, Thermodynamics, Ground ice, Suprapermafrost ground water, Subpermafrost ground water, Water chemistry, Water transport.

33-2508
Forecasting and preventing ground water rise on construction sites. [Prognoz i predotvrashchenie podtopleniia gruntovymi vodami territorii pri stroitel'stve],
Abramov, S.K., et al, Moscow, Strolizdat, 1978, 177p., In Russian with English table of contents enclosed. 93 ref.
Degtiarev, B.M., Dzektser, E.S., Donskoĭ, G.V., Muftakhov, A.Zh.
Drains, Flooding, Water level, Soil moisture migration, Earthwork, Buildings, Ground water, Flood control, Construction materials, Drainage, Foundations.

33-2509
Hydraulic concretes. [Gidrotekhnicheskie betony],
Goncharov, V.V., Kiev, Budivel'nik, 1978, 151p., In Russian with English table of contents enclosed. 32 refs.
Hydraulic structures, Dams, Foundations, Concrete structures, Concretes, Concrete admixtures, Frost resistance, Abrasion, Cavitation, Corrosion inhibitors, Protective coatings.

33-2510
Physical properties of fast ice near Twillingate, Newfoundland, February-March 1977.
Lau, G., et al, *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* Mar. 1978, 78-1, 95p., 22 refs.
Rossiter, J.
Sea ice, Fast ice, Ice cover thickness, Salinity, Crystal structure.

33-2511
Satellite ocean-related imagery applications program.
Wedler, E., et al, *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* June 1978, 78-7, 6p., Presented at Oceans '78, The Ocean Challenge, Washington, D.C., September 6-8, 1978.
Worsfield, R.D.
Remote sensing, Spaceborne photography, Sea ice distribution, Water temperature, Icebergs.

33-2512
Analogue data telemetry system for sea ice work.
Butt, K.A., *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* June 1978, 78-9, 39p., 7 refs.
Sea ice, Ice mechanics, Strain measuring instruments, Telemetering equipment.

33-2513
LANDSAT for the study of icebergs in the Baffin Bay-Labrador Sea area.
Dawe, B., et al, *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* Aug. 1978, 78-10, 16p., Prepared for Fifth Canadian Symposium on Remote Sensing, Victoria, B.C., August 28-31, 1978. 6 refs.
Gustajtis, K.A., Wedler, E., Worsfold, R.D.
Remote sensing, LANDSAT, Icebergs, Aerial reconnaissance, Radar echoes.

33-2514
Four channel synthetic aperture radar imagery results of freshwater ice and sea ice in Lake Melville.
Parashar, S.K., et al, *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* Aug. 1978, 78-11, 16p., Prepared for the Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-28, 1978. 24 refs.
Roche, C., Worsfold, R.D.
Radar echoes, Lake ice, Sea ice, Salinity, Ice structure, Ice physics.

33-2515
Detection and monitoring of oil pollution in the ice environment through microwave techniques.
Parashar, S.K., et al, *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* Aug. 1978, 78-12, 19p., Presented at the Fifth Canadian Symposium on Remote Sensing, Victoria, B.C., Aug. 28-31, 1978. 40 refs.
Dawe, B., Worsfold, R.D.
Oil spills, Oil pollution, Sea ice, Microwaves, Ice structure, Wind factors, Ocean currents, Brightness.

33-2516
Measurement of subsurface strain on Roche 0-43 artificially thickened sea ice drilling platform.
Butt, K., et al, *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* Oct. 1978, 78-16, 42p. + appends., 4 refs.
Allan, A., Ridings, T.
Artificial islands, Artificial ice, Offshore drilling, Strain measuring instruments.

33-2517
Surface strain of artificially thickened ice drilling platforms.
Allan, A., *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication,* Nov. 1978, 78-17, 7p. + 6 figs., 7 refs.
Artificial islands, Artificial ice, Strains, Offshore drilling.

33-2518
Are icicles single crystals.
Laudise, R.A., et al, *Journal of crystal growth,* Mar. 1979, 46(3), p.379-386, 11 refs.
Barns, R.L.
Ice crystal growth, Ice crystal structure, Crystallization.

33-2519
Icebergs for use as fresh water.
U.S. Environmental Data Service, Washington, D.C., 1978, 12p. PB-285 664.
Icebergs, Water supply.

33-2520
Selected bibliography of disturbance and restoration of soils and vegetation in permafrost regions of the USSR (1970-1977).
Andrews, M., *U.S. Army Cold Regions Research and Engineering Laboratory,* Oct. 1978, SR 78-19, 175p. ADA-062 339.
Bibliographies, Human factors, Environmental impact, Continuous permafrost, Discontinuous permafrost, Revegetation, Cryogenic soils, Damage.
This compilation of literature, published in Russian since 1970, comprises 1225 bibliographic citations relating to disturbance and restoration of soils and vegetation. Sixty-five percent of these were found by a manual search of CRREL Bibliography Vols. 25-32; the others were obtained through off-line searches from the relevant computerized data bases and personal files. Only one of these data bases, that of the National Agricultural Library, is shown to be of significance in providing a valuable checking source. The literature is discussed in chronological fashion, with general statements followed by highlights of each year's contributions. The years 1972 and 1973 produced the most publications, and by 1976 there was a noticeable lag in pickup of publications by the indexing services. A trend is apparent from a reconnaissance and description approach in earlier papers toward an integrated ecosystem approach in more recent publications. Increased consciousness of the effects of disturbance on the permafrost environment, and the importance of restoration and preservation of these environments, are reflected in the recent literature, particularly in symposium proceedings.

33-2521
Computer file for existing land application of wastewater systems: a user's guide.
Iskandar, I.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-22, 24p., ADA-062 658, 4 refs.
Robinson, D., Willcockson, W., Keefauver, E.
Waste disposal, Water treatment, Computer programs.
Two computer programs, both written in BASIC, have been developed to store and retrieve information on existing wastewater land treatment systems. The purpose of establishing these programs is to provide assistance to design engineers during the planning of new land treatment systems by making available the design criteria and performance characteristics of operating systems. The SEARCH program is designed to locate systems with specific design parameters, such as flow rate, waste type, application rate and mode, ground cover and length of operation. The printout from SEARCH includes a list of articles on similar systems in addition to the design parameters. The UPDATE program is used for the revision of information on file. Currently, there are about 350 domestic and 75 foreign systems on file.

33-2522
Engineering aspects of an experimental system for land renovation of secondary effluent.
Nylund, J.R., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-23, 26p. ADA-062 923.
Larson, R.E., Clapp, C.E., Linden, D.R., Larson, W.E.
Waste disposal, Water treatment, Waste treatment, Irrigation, Land reclamation.
A research system was designed and installed at the Apple Valley Wastewater Treatment Plant, two miles south of Rosemount, Minnesota, to develop agricultural management practices for removal of nitrogen from municipal wastewater effluent. A solid set irrigation system was designed and installed to apply wastewater effluent to 12 test blocks, each measuring 60 x 150 ft. A perforated plastic drainage tile was placed lengthwise in each block at a depth equivalent to the normal water table level and opening at one end of the block into a sampling station. Six blocks were planted to corn and six planted to eight species of forages. The effluent was applied at rates up to 15 ft/yr. This report presents the engineering considerations in the design of a solid set irrigation system and drain tile and monitoring system for evaluating the influence of the effluent application and agronomic practices on drainage waters.

33-2523
Increasing the effectiveness of soil compaction at below-freezing temperatures.
Haas, W.M., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-25, 58p., ADA-062 875, 57 refs.
Alkire, B.D., Kaderabek, T.J.
Soil compacting, Frozen ground compression, Compressive strength, Soil water, Chemical reactions.
This report presents data from an experimental program undertaken to determine the effect of low temperatures on the compaction characteristics of a silty sand. The effects of compactive effort and chemical additives were also investigated to determine possible methods of improving the densities of soils placed and compacted at low temperatures. A single soil type was used throughout the test program, and test results were obtained using Standard and Modified AASHO compactive efforts on an untreated soil prepared and tested at temperatures of 20C and -7C. Additional test series, using the same compactive efforts and temperatures, were performed on the soil after it had been treated with an additive. The amounts of additive used, based on the dry weight of soil, were 3, 2, 1, 0.5, and 0.25% of calcium chloride and 0.5% of sodium chloride. From the results of the experimental program, several important conclusions concerning the effect of low temperature compaction were drawn.

33-2524
Wastewater stabilization pond linings.
Middlebrooks, E.J., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, SR 78-28, 116p., ADA-062 903, Refs. p.63-66.
Perman, C.D., Dunn, I.S.
Waste disposal, Water treatment, Stabilization, Ponds, Linings, Sealing, Seepage.
A review of the literature on wastewater stabilization lagoon linings, covering the work during the past 20 years, is presented. Design, operating and maintenance experiences are presented for soil sealants, natural sealants, bentonite clays, chemical treatments, gunite, concrete, asphaltic compounds, plastics and elastomers. The characteristics of various materials, applicability to different wastes, construction techniques and details of installation techniques are presented. Installation costs for various materials and comparative costs are summarized. A summary of reported seepage rates for various types of lining materials is presented. A survey of the 50 states was conducted to determine the requirements for liners and allowable seepage rates. Requirements are varied and depend upon the local soil conditions and the experiences of the regulatory agencies with various materials. The trend is toward more stringent requirements. Accepted design and installation procedures are summarized, and detailed drawings of installation techniques are presented. Recommendations of the manufacturers and installers of liners are also presented.

33-2525
Summary of Corps of Engineers research on roof moisture detection and the thermal resistance of wet insulation.
Tobiasson, W., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Dec. 1978, SR 78-29, 6p., ADA-063 144, 12 refs.
Korhonen, C.
Roofs, Moisture transfer, Detection, Infrared spectroscopy.
Nuclear, infrared, capacitance, microwave and impulse radar methods for nondestructively detecting moisture in roofs were evaluated. No system was reliable enough by itself or by cross-checking with another system to eliminate the need for a few core samples of membrane and insulation to verify findings. Airborne infrared surveys are a cost-effective way of reconnoitering numerous roofs at a major installation. However, follow-up on-the-roof surveys are necessary. Of the several *grid* techniques examined, nuclear surveys were the most reliable. Hand-held infrared surveys are the most accurate on-the-roof method studied. Although an infrared camera costs significantly more than a nuclear meter ($27,000 vs $3,000), infrared surveys can be conducted more rapidly. Where numerous roofs are to be surveyed, infrared surveys appear to be the most cost-effective method. *In-situ* measurements have been made of the thermal resistance of wet and dry portions of roofs. A laboratory apparatus has been built to subject 12 in x 12 in specimens of roof insulation to combined thermal and moisture gradients. Thermal resistance and moisture content are periodically determined, and characteristic curves are being developed for various roof insulations.

33-2526
Ice fog suppression using reinforced thin chemical films.
McFadden, T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Nov. 1978, CR 78-26, 23p., ADA-063 107, 20 refs.
Collins, C.M.
Ice fog, Fog dispersal, Chemical ice prevention.
Ice fog suppression experiments on the Fort Wainwright Power Plant cooling pond were conducted during the winters of 1974-76. Baseline information studies occupied a sizable portion of the available ice fog weather in 1974-75. Then hexadecanol was added to the pond and dramatically improved visibility by reducing fog generated from water vapor released by the pond at -14C. Although this temperature was not low enough to create ice fog, the cold vapor fog created was equally as devastating to visibility in the vicinity of the pond. During the winter of 1975-76, suppression tests were continued, using films of hexadecanol, mixes of hexadecanol and octadecanol, and ethylene glycol monobutyl ether (EGME). Suppression effectiveness at colder temperatures was studied and limits to the techniques were probed. A reinforcing grid was constructed that prevented breakup of the film by wind and water currents. Lifetime tests indicated the EGME degrades much more slowly than either hexadecanol or the hexadecanol-octadecanol mix. The films were found to be very effective fog reducers at warmer temperatures but still allowed 20% to 40% of normal evaporation to occur. The vapor thus produced was sufficient to create some ice fog at lower temperatures, but this ice fog occurred less frequently and was more quickly dispersed than the thick fog that was present before application of the films.

33-2527
Bearing capacity of river ice for vehicles.
Nevel, D., *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1978, CR 78-3, 22p., ADA-055 244, 7 refs.
River ice, Ice bearing capacity, Vehicles, Floating ice.
The mathematical theory for the bearing capacity of river ice for vehicles is presented. The floating ice sheet is assumed to have simple supports at the shore line. Solutions are presented for loads uniformly distributed over circular end rectangular areas. Numerical evaluations are made for a number of vehicles and the results presented in graphical form.

33-2528
Peculiarities of drilling and blasting under permafrost conditions. [Osobennosti proizvodstva burovzryvnykh rabot v usloviiakh vechnoĭ merzloty],
Pechenin, IU.I., *Shakhtnoe stroitel'stvo,* Aug. 1978, No.8, p.12-14, In Russian.
Frozen rocks, Drilling, Blasting, Permafrost.

33-2529
Artificial freezing of rocks when sinking the shaft of the Yakovlevsk mine (Kursk magnetic anomaly). [O zamorazhivanii gornykh porod pri sooruzhenii stvola IAkovlevskogo rudnika KMA],
Nasonov, I.D., et al, *Shakhtnoe stroitel'stvo,* Sep. 1978, No.9, p.7-11, In Russian. 2 refs.
Dolgov, O.A., Varenyshev, V.M.
Mining, Shaft sinking, Artificial freezing, Frozen rocks.

33-2530
Distances between the tubes of artificial rock freezing assemblies. [O rasstoianiiakh mezhdu zamorazhivaiushchimi skvazhinami],
Shparber, P.A., *Shakhtnoe stroitel'stvo,* Nov. 1978, No.11, p.19-22, In Russian. 3 refs.
Shaft sinking, Frozen rocks, Artificial freezing, Mining.

33-2531
Melting of ice in sea water: a primitive model with application to the antarctic ice shelf and icebergs.
Gade, H.G., *Journal of physical oceanography,* Jan. 1979, 9(1), p.189-198, 17 refs.
Sea ice, Ice shelves, Icebergs, Ice melting, Sea water, Ice models.
Steady-state conditions are assumed to exist everywhere in the case of melting of the underside of an infinite slab of ice floating in sea water. Basic transfer equations for heat and salt are established, and solutions derived for the interior corresponding to given far field values of the temperature and salinity of the water. The solutions are discussed in the T-S diagram where the behavior is particularly simple. Determining parameters are the characteristic velocities ksd and Ksh, where ks and Ks are the molecular and turbulent diffusivities, respectively, of salt, d and h, the thicknesses of the corresponding laminar and turbulent layers. Also, the nonmelting/nonfreezing case is discussed and the determining parameter estabiished. Application of the theory to the Ross Ice Shelf (Little America V) gives acceptable results. Analysis of the static stability of the melt water mixtures reveals that with ambient temperatures approaching 17C, the stratification becomes unstable. Icebergs brought to tropical waters will cause melt water mixtures to intrude at subsurface levels. Finally, convection obtained in laboratory experiments with melting ice in sea water is reported to be in concordance with the theoretically derived stability criterion. (Auth.)

33-2532
Discovering the role of lichens in the nitrogen cycle in boreal-arctic ecosystems.
Crittenden, P.D., et al, *Bryologist,* Summer 1978, 81(2), p.258-267.
Kershaw, K.A.
Lichens, Nutrient cycle, Ecosystems.

33-2533
Role of lichens in antarctic ecosystems.
Lindsay, D.C., *Bryologist,* Summer 1978, 81(2), p.268-276, 49 refs.
Lichens, Ecosystems, Soil microbiology.
Antarctic terrestrial ecosystems can be divided into two main series: those of continental Antarctica and those of the maritime Antarctic. Within the former series, plant communities exist as isolated groupings of plants growing under a severe continental polar-desert climate and appear to be similar to communities of the High Arctic (e.g. the interior plateau of Devon Island). Communities in the maritime Antarctic region are more diverse, with less severe environmental conditions, and show affinities with lichen communities occupying similar habitats in boreal-Arctic zones of the northern hemisphere. Roles played by lichens in the two series of ecosystems are influenced considerably by environmental conditions and in continental Antarctica are often completely subordinated to physical processes. Weathering of substrata, for instance, in continental Antarctica, consists of the operation of several physical processes with lichens playing an insignificant role. It is only in the more suitable habitats found in the maritime Antarctic that lichens are able to play their full role in the development and functioning of ecosystems. (Auth.)

33-2534
Development of paluded, shrub-invaded saucer-shaped depressions. [Osvoenie pereuvlazhnennykh i zakustarennykh bliudtseobraznykh ponizhenii],
Afanas'ev, A.V., *Gidrotekhnika i melioratsiia*, Nov. 1978, No.11, p.59-62, In Russian.
Swamps, Drainage, Cold weather construction, Land reclamation.

33-2535
Winterizing radar stations. [Podgotovka RLS k zime],
Grishunin, V., *Tekhnika i vooruzhenie*, Nov. 1978, No.11, p.26-27, In Russian.
Military equipment, Radar, Cold weather operation, Icing.

33-2536
Conditions of low temperature. [V usloviiakh nizkikh temperatur],
Turchin, G., et al, *Tekhnika i vooruzhenie*, Nov. 1978, No.11, p.33, In Russian.
Pavlov, A.
Military engineering, Military transportation, Military equipment, Topographic surveys, Measuring instruments, Icing, Winter maintenance.

33-2537
Left shore Angara River swamps. [Bolotnye massivy levoberezh'ia reki Angary],
Bogdanovskaia-Gienef, I.D., *Sibirskii geograficheskii sbornik*, 1975, Vol.11, p.147-203, In Russian. 22 refs.
Permafrost distribution, Swamps, Landscape types, Vegetation, Ecosystems, Permafrost hydrology, Soil formation, Cryogenic soils, Peat, Suprapermafrost ground water, Ground ice, USSR—Angara River.

33-2538
Economic development of northern Transbaikal and economic reorganization of the Chita Region in connection with the Baykal Amur railroad construction. [Osvoenie Zabaikal'skogo Severa i voprosy preobrazovaniia khoziaistva Chitinskoi oblasti v sviazi so stroitel'stvom Baikalo-Amurskoi magistrali],
Nedeshev, A.A., et al, *Sibirskii geograficheskii sbornik*, 1977, Vol.13, p.38-79, In Russian. 45 refs.
Bybin, F.F., Kotel'nikov, A.M.
Economic development, Permafrost distribution, Cryogenic processes, Cryogenic soils, Earthquakes, Permafrost hydrology, Taliks, Taiga vegetation, Construction, Permafrost beneath structures, Baykal Amur railroad, USSR—Transbaikal.

33-2539
Economic-geographic analysis of geological surveys in the Baykal Amur railroad area. [Ekonomiko-geograficheskii analiz geologorazvedochnykh rabot (na primere odnogo iz raionov zony BAMa)],
Zadorozhnyi, V.F., *Sibirskii geograficheskii sbornik*, 1977, Vol13, p.80-125, In Russian. Refs. p.122-125.
Geological surveys, Baykal Amur railroad, Cost analysis, Economic development.

33-2540
Soils, landscapes and geochemical conditions of the shores of Lake Baykal and Northern Baykal region in the Baykal Amur railroad area. [Pochvy i landshaftno-geokhimicheskie usloviia poberezh'ia oz. Baikal i severnogo Pribaikal'ia v raione trassy BAMa],
Kuz'min, V.A., *Sibirskii geograficheskii sbornik*, 1977, Vol.13, p.126-183, In Russian. Refs. p.181-183.
Shores, Alpine tundra, Landscape types, Tundra vegetation, Mosses, Cryogenic soils, Lichens, Tundra soils, Classifications, Soil profiles, Soil chemistry, USSR—Baykal Lake, USSR—Barguzin Range.

33-2541
Geographic conditions and peculiarities of establishing supply bases in West Transbaikal along the Baykal Amur railroad. [Geograficheskie usloviia i osobennosti sozdaniia prodovol'stvennoi bazy v pritrassovykh raionakh Zapadno-Zabaikal'skogo uchastka BAMa],
Chernoi.rova, A.A., *Sibirskii geograficheskii sbornik*, 1977, Vol.13, p.185-220, In Russian. 52 refs.
Taiga soils, Construction, Logistics, Taiga vegetation, Storage, Permafrost beneath structures, Agriculture, Cryogenic soils, Baykal Amur railroad, USSR—Transbaikal.

33-2542
Economic-geographic peculiarities and main national economy problems in Eastern Transbaikal. [Ekonomiko-geograficheskie osobennosti i uzlovye narodnokhoziaistvennye problemy Vostochnogo Zabaikal'ia],
Nedeshev, A.A., et al, *Sibirskii geograficheskii sbornik*, 1976, Vol.12, p.33-74, In Russian. 37 refs.
Bybin, F.F., Lazhentsev, V.N.
Economic development, Mining, Natural resources, Transportation, Industrial buildings, Urban planning, Residential buildings, Permafrost beneath structures, Permafrost hydrology, Electric power generation, Baykal Amur railroad, USSR—Transbaikal.

33-2543
Compiling general maps of vegetation in the Ob' River floodplains. [Obzornoe kartografirovania rastitel'nosti poimy r. Obi],
Il'ina, I.S., *Sibirskii geograficheskii sbornik*, 1976, Vol.12, p.161-182, In Russian. 19 refs.
Taiga soils, Taiga vegetation, Plant ecology, Ecosystems, Mapping, Swamps, Peat, Landscape types, USSR—Ob' River.

33-2544
Experience of using claydite-concrete in hydraulic construction.
Dellos, K.P., et al, *Hydrotechnical construction*, May 1978, No.5, p.502-504, Translated from Gidrotekhnicheskoe stroitel'stvo.
Klad'ko, S.N.
Concretes, Hydraulic structures, Frost resistance, Concrete aggregates, Cements.

33-2545
Naleds of Siberia and the Far East. [Naledi Sibiri i Dal'nego Vostoka],
Alekseev, V.R., *Sibirskii geograficheskii sbornik*, 1974, Vol.8, p.5-68, 278, In Russian. English summary p.278. Refs. p.59-68.
Bibliographies, Naleds, Origin, Theories, Classifications, Charts, Permafrost hydrology.

33-2546
Crystal morphology and metamorphism of snow cover. [Kristallomorfologiia i metamorfizm snezhnoi tolshchi],
Kolomyts, E.G., *Sibirskii geograficheskii sbornik*, 1974, Vol.8, p.69-144, 278, In Russian. English summary p.278. Refs. p.140-144.
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Glacial till, Moraines, Sediments, Distribution, Soil mechanics, United Kingdom.

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Gordon, D.L., Higginbottom, I.E.
Glacial till, Glacial deposits, Landforms, Soil mechanics, Engineering geology, Models, Paleoclimatology.

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Glacial till, Glacial deposits, Engineering geology, Soil mechanics, Glacier flow, Grain size, Soil structure.

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Glacial deposits, Glacial till, Soil physics, Engineering geology, Geomorphology, Landforms, Grain size.

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Glacial till, Soil physics, Engineering geology, Soil strength, Permeability, Compressive properties, Sampling, Grain size, Tests.

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Butler, F.G.
Glacial deposits, Engineering geology, Penetration tests, Glacial till, Soil physics, Design.

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Siver, M.L.
Glacial till, Soil mechanics, Soil strength, Stress strain diagrams, Dynamic properties, Grain size, Tests.

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Glacial deposits, Clays, Soil physics, Shear strength, Soil strength, Loads (forces), Engineering geology, Tests.

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Glacial till, Deformation, Loads (forces), Engineering geology, Stress strain diagrams, Laboratory techniques, Tests.

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Glacial till, Soil tests, Cores, Loads (forces), Shear strength, Strain tests.

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Walbancke, H.J.
Glacial deposits, Soil strength, Shear strength, Clays, Slope stability, Soil structure, Permeability, Brittleness.

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Hight, D.W.
Glacial till, Glacial deposits, Engineering geology, Roads, Construction, Embankments, Foundations, Drainage, Trafficability.

33-2566
Problems of excavation in permeable drift.
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Glacial deposits, Excavation, Soil mechanics, Permeability, Drainage, Stability.

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Tunnelling in glacial materials in the British Isles.
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Glacial deposits, Tunneling (excavation), Soil mechanics.

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Glacial deposits, Cracks, Clays, Shear strength, Piles, Soil strength, Soil structure, Tests.

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Determination of time dependent heave characteristics of mixed glacial materials.
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Glacial deposits, Glacial till, Soil mechanics, Admixtures, Hydraulic structures, Earthwork, Time factor, Swelling, Sewage.

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Glacial deposits, Permeability, Engineering geology, Measuring instruments.

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Permafrost origin, Permafrost distribution, Permafrost structure, Permafrost thickness, Maps, Active layer, Soil air interface, Heat transfer, Heat balance, Ground ice, Ice formation, Permafrost hydrology, Naleds, Thermokarst.

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Permafrost origin, Permafrost distribution, Permafrost structure, Permafrost thickness, Active layer, Soil air interface, Heat transfer, USSR—Bol'shezemel'skaya Tundra, USSR—Malozemel'skaya Tundra.

33-2573
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Kuznetsova, I.L., Koreĭsha, M.M., Lakhtina, O.V.
Cryogenic relief, Thermokarst, Permafrost structure, Permafrost hydrology, Ground ice, Ice veins, Snow cover distribution, Vegetation factors, Wind factors, USSR—Kolyma River.

33-2574
Regional peculiarities of perennial freezing of rocks in Central Siberia during the Quaternary Period. [Regional'nye osobennosti mnogoletnego promerzaniia gornykh porod Srednei Sibiri na protiazhenii chetvertichnogo perioda],
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Quaternary deposits, Cryogenic processes, Permafrost distribution, Permafrost structure, Ice veins, Ice wedges, Permafrost thickness, USSR—Vilyuy River, USSR—Yakutia.

33-2575
Permafrost thickness in Pay-Khoy. [Moshchnost' merzloĭ zony Pai-Khoia],
Oberman, N.G., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.30-34, In Russian. 5 refs.
Permafrost distribution, Frozen rock temperature, Permafrost thickness, Temperature measuring instruments, Thermal regime, Boreholes, USSR—Bol'shezemel'skaya Tundra.

33-2576
History of permafrost formation in the Val'karay Plain. [Istoriia formirovaniia mnogoletnemerzlykh porod Val'karaĭskoĭ nizmennosti],
Arkhangelov, A.A., et al, Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.35-38, In Russian. 3 refs.
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Permafrost origin, Permafrost distribution, Permafrost structure, Arctic vegetation, Tundra, Forest tundra, USSR—Chukotskiy Peninsula.

33-2577
Regularities governing the process of recent permafrost formation in northern West Siberia. [Zakonomernosti protsessa sovremennogo obrazovaniia mnogoletnemerzlykh porod na severe Zapadnoĭ Sibiri],
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Discontinuous permafrost, Permafrost origin, Active layer, Climatic changes, Snow cover effect, Vegetation factors.

33-2578
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Frozen ground, Seasonal freeze thaw, Permafrost, Active layer, Classifications, Terminology.

33-2579
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Parmuzina, O.IU.
Frozen fines, Clay soils, Active layer, Frost penetration, Ice formation.

33-2580
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Frozen fines, Cryogenic structures, Classifications.

33-2581
Temperature regime as a factor in the formation of cryogenic structure of perennially frozen rocks. [Temperaturnyĭ rezhim kak faktor formirovaniia kriogennogo stroeniia merzlykh porod],
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Shpolianskaia, N.A.
Forest tundra, Permafrost structure, Cryogenic processes, Thermal regime, Frozen rock temperature, Heat balance, Tundra.

33-2582
Types of ice-bearing loess and fine-grained material in the permafrost zone. [O tipakh konstrativnogo alliuviia oblasti mnogoletnemerzlykh porod],
Kaplina, T.N., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.77-87, In Russian. 19 refs.
Alluvium, Loess, Frozen fines, Ground ice, Cryogenic processes, Permafrost structure, Ice veins, USSR—Yakutia.

33-2583
Cryogenic structure of mantle deposits in the Anabar-Olenek Plateau. [O kriogennom stroenii pokrovnykh obrazovaniĭ Anabaro-Olenekskogo plato],
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Alluvium, Glacial deposits, Frozen fines, Frozen gravel, Cryogenic structures.

33-2584
Studying microstructures of frozen rocks (methods, results, prospects). [Issledovanie mikrostroeniia merzlykh porod (metody, rezul'taty, perspektivy)],
Rogov, V.V., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.95-98, In Russian. 9 refs.
Frozen fines, Microstructure, Permafrost samplers, Microscope slides, Electronic equipment, Cold chambers, Laboratory techniques.

33-2585
Influence of the base-layer of ground on formation of the contacting bottom-layer of ice. [Vliianie gruntovogo osnovaniia na formirovanie prikontaktnogo sloia l'da],
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Kriuchkov, M.V., Kabanova, T.N.
Ground ice, Ice formation, Ice models, Soil freezing, Ice growth.

33-2586
Sheet ice as an indication of Pleistocene glaciation conditions in northern West Siberia. [Plastovye l'dy kak pokazatel' uslovii pleistotsenovykh oledenenii severa Zapadnoĭ Sibiri],
Solomatin, V.I., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.102-112, In Russian. 12 refs.
Permafrost structure, Ground ice, Ice sheets, Ice formation, Ice structure, Ice deformation, Ice composition, Ice crystal structure.

33-2587
Improving the techniques of drilling and sampling frozen rocks and ice. [Sovershenstvovanie tekhnologii bureniia i otbora prob v merzlykh porodakh i l'dakh],
Kudriashov, B.B., et al, Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.112-123, In Russian. 9 refs.
Chistiakov, V.K.
Permafrost structure, Ground ice, Drilling, Permafrost samplers, Boreholes, Ice sampling, Thermal regime.

33-2588
Thermokarst as a process in historical geology. [Termokarst kak istoriko-geologicheskiĭ protsess],
Katasonov, E.M., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.124-131, In Russian. 15 refs.
Thermokarst, Ground ice, Ice melting, Active layer, Cryogenic relief, Origin, Ice veins, Thermokarst lakes, Terminology.

33-2589
Systems approach to the study of thermokarst. [K izucheniiu termokarsta na osnove sistemnogo podkhoda],
Shur, IU.L., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.131-141, In Russian. 31 refs.
Thermokarst, Permafrost hydrology, Thermokarst lakes, Ice veins, Ice melting, Polygonal topography, Systems analysis.

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Post-cryogenic solifluction on inclines and shore slopes. [Postkriogennye splyvy gruntov na sklonakh i beregovykh otkosakh],
Zhigarev, L.A., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.141-151, In Russian. 13 refs.
Cryogenic processes, Slope processes, Solifluction, Mudflows, Soil moisture, Frozen fines, Ground thawing, Terminology.

33-2591
Naleds in the periglacial zone of East Siberian mountains. [Naledi prilednikovoĭ zony gor Vostochnoĭ Sibiri],
Shelnkman, V.S., et al, Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.151-156, In Russian. 10 refs.
Nekrasov, I.A.
Glacial hydrology, Naleds, Origin, Mountain glaciers, Glacier oscillation, Periglacial processes.

33-2592
Probability approach to frost fracturing. [Veroiatnostnyĭ podkhod k obrazovaniiu morozobolnykh treshchin],
Podbornyĭ, E.E., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.156-161, In Russian. 15 refs.
Soil freezing, Frost penetration, Frost shattering, Ground ice, Ice veins, Snow cover effect, Statistical analysis.

33-2593
Underground drainage in different cryohydrogeological structures of East Siberia. [Osobennosti podzemnogo stoka v razlichnykh kriogidrogeologicheskikh strukturakh Vostochnoĭ Sibiri],
Afanasenko, V.E., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.161-165, In Russian. 4 refs.
Permafrost distribution, Water supply, Water reserves, Permafrost hydrology, Water chemistry, Suprapermafrost ground water, Subpermafrost ground water, Taliks.

33-2594
Formation of ground water reserves in the cryolithosphere, related to vertical zonality of water balance elements in mountains. [O nekotorykh osobennostiakh formirovaniia zapasov podzemnykh vod kriolitosfery, obuslovlennykh vertikal'noĭ zonal'nost'iu elementov vodnogo balansa v usloviiakh gornogo rel'efa],
Zinchenko, A.I., et al, Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.165-170, In Russian. 6 refs.
Mel'nikova, T.V., Motrich, L.T., Papernov, I.M.
Permafrost hydrology, Water reserves, Suprapermafrost ground water, Subpermafrost ground water, Frozen rock temperature, Permafrost thermal properties, Water balance.

33-2595
Peculiarities of talik development beneath lakes in the West Siberian Plain. [Osobennosti razvitiia podozernykh talikov Zapadno-Sibirskoĭ nizmennosti],
Uvarkin, IU.T., et al, Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.171-175, In Russian. 3 refs.
Shamanova, I.I.
Permafrost hydrology, Taliks, Thermokarst, Permafrost structure, Ground ice, Forest tundra, Lakes, Permafrost beneath lakes.

33-2596
Experience in producing artificial taliks for water supply. [Opyt sozdaniia iskusstvennogo taliks dlia vodosnabzheniia],
Gol'dtman, V.G., et al, Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.175-186, In Russian. 5 refs.
Motrich, L.T.
Water supply, Permafrost hydrology, Taliks, Artificial melting, Ground ice.

33-2597
Applying systems analysis to permafrost forecasting in engineering and geological investigations. [Mnogoletnemerzlye skal'nye porody kak ob"ekt sistemnogo prognozirovaniia pri inzhenerno-geologicheskikh issledovanniakh],
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Krivonogova, N.F.
Engineering geology, Permafrost structure, Permafrost forecasting, Permafrost distribution, Permafrost hydrology, Frozen rock temperature, Ground ice, Ice formation, Systems analysis.

33-2598
Ecologic conditions of natural and disturbed land in the cryolithozone of West Siberia. [Ekologicheskie usloviia estestvennykh i narushennykh territoriĭ kriolitozony Zapadnoĭ Sibiri],
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Shur, IU.L.
Permafrost distribution, Tundra soils, Taiga soils, Taiga vegetation, Tundra vegetation, Plant ecology, Human factors, Forest tundra, Soil erosion, Permafrost degradation.

33-2599
Regularities governing variations in moisture-ice content of perennially frozen rocks in the Pur-Nadym interfluve. [Zakonomernosti izmenchivosti vlazhnosti-l'distosti mnogoletnemerzlykh porod Pur-Nadymskogo mezhdurech'ia],
Goral'chuk, M.I., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.205-210, In Russian. 5 refs.
Permafrost distribution, Ground ice, Taiga soils, Taiga vegetation, Soil moisture, USSR—Pur River, Ussr—Nadym River.

33-2600
Dynamics of temperature fields in seasonally and perennially frozen rocks in Central Yakutia when the surface covers are disturbed. [Dinamika temperaturnogo polia sezonno- i mnogoletnemerzlykh porod pri narushenii pokrovov v Tsentral'noĭ IAkutii],
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Permafrost thermal properties, Permafrost depth, Active layer thickness, Frozen ground temperature, Vegetation factors, Soil disturbance, USSR—Yakutia.

33-2601
Influence of short-range climatic variations on the mean annual temperature of perennially frozen rocks. [Vliianie korotkoperiodnykh kolebaniĭ klimata na sredniuiu godovuiu temperaturu mnogoletnemerzlykh porod],
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Climatic changes, Permafrost thermal cycles, Frozen rock temperature, Snow cover effect.

33-2602
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Shastkevich, IU.G., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.219-224, In Russian. 15 refs.
Permafrost thermal cycles, Permafrost thickness, Geothermy, Permafrost depth, Mathematical models.

33-2603
Geocryologic map of the USSR, scale 1:2 500 000 (compilation techniques). [Geokriologicheskaia karta SSSR masshtaba 1:2 500 000 (metodika sostavleniia)],
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Geocryology, Charts, Permafrost distribution, Permafrost structure, Permafrost hydrology, Mapping.

33-2604
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Trush, N.I., Kondrat'eva, K.A.
Engineering geology, Surveys, Mapping, Permafrost distribution, Active layer, Permafrost structure, Permafrost structure, Ground ice, Frozen ground mechanics, Permafrost thermal properties.

33-2605
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Permafrost structure, Mapping, Ground ice.

33-2606
Dynamics of the paleocryogenic zone in Europe during Late Pleistocene. [Dinamika paleokriogennoĭ zony Evropy v pozdnem pleĭstotsene],
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33-2607
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Gorbunov, E.IA.
Ice navigation, Icebreakers, Engines.

33-2608
Peat-sod-gley soils and the primitive residual-gley soils of cryogenic non-sorted circles. [Torfianisto-dernovo-gleevye i primitivnye ostatochno-gleevye pochvy merzlykh piaten],
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Sokhina, E.N.
DLC GB325.G4
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33-2609
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Residential buildings, Large panel buildings, Foundations, Large unit construction, Permafrost beneath buildings, Baykal Amur railroad, Design.

33-2610
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Walls, Panels, Concrete structures, Joints (junctions), Grouting, Winter concreting.

33-2611
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Tishkov, A.A., *Moscow. Obshchestvo ispytateleĭ prirody. Biulleten'. Otdel biologicheskiĭ*, Jan.-Feb. 1978, 83(1), p.111-117, In Russian with English summary. 17 refs.
Arctic vegetation, vegetation, Forest tundra, Mosses, Biomass.

33-2612
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Frozen fines, Permafrost, Loess, Ground ice, Cryogenic processes.

33-2613
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Valleys, Naleds, Alpine vegetation, Plant ecology, Ecosystems, Rivers.

33-2614
Thicknesses of glaciers and the cryolithozone of Novaya Zemlia as reflected on 1:2,500,000 scale maps. [O moshchnosti lednikov i kriolitozony Novoĭ Zemli pri ikh kartirovanii v masshtabe 1:2,500,000],
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Maps, Glacier thickness, Permafrost thickness, Mapping, Glacier ice, USSR—Novaya Zemlia.

33-2615
Expeditionary investigation of the mouths of northern rivers and recommendations for the improvement of navigation conditions (methods, problems, results). [Ekspeditsionnye issledovaniia ust'ev severnykh rek dlia obosnovaniia rekomendatsiĭ po uluchsheniiu usloviĭ sudokhodstva (metodika, zadachi, rezul'taty)],
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Rivers, Ice conditions, Ice navigation, Permafrost distribution, Arctic regions.

33-2616
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33-2617
Hailstone growth in super-cellular hail clouds. [O roste grada v superiacheĭkovykh gradovykh oblakakh],
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33-2618
Combined method of determining the mass of water in glaciers. [Kompleksnyĭ metod opredeleniia massy vody v lednikakh],
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Glacier ice, Glacier thickness, Ice (water storage), Ice volume, Analysis (mathematics).

33-2619
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Swamps, Drainage, Frost penetration, Freeze thaw cycles, Frozen ground temperature, Thickness, Peat.

33-2620
Studying models of an airborne generator of ice-forming liquid aerosols. [Issledovanie modeli samoletnogo zhidkostnogo generatora l'doobrazuiushchikh aerozoleĭ],
Beliaev, S.P., et al, *Meteorologiia i gidrologiia*, Nov. 1978, No.11, p.111-115, In Russian. 9 refs.
Kim, N.S., Matveev, IU.N.
Cloud seeding, Aerosols, Generators, Airborne equipment, Models.

33-2621
Electromagnetic sounding technique for determining bedrock depth in permafrost areas. [Opredelenie glubiny zaleganiia plotika v raĭonakh mnogoletneĭ merzloty metodom elektromagnitnykh zondirovaniĭ],
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Placer mining, Electromagnetic prospecting, Permafrost.

33-2622
Mapping separate relief forms of Arctic sea shelves. (Otobrazhenie na kartakh otdel'nykh form rel'efa shel'fa (na primere arkticheskikh morei)),
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Topographic features, Mapping, Submarine permafrost.

33-2623
Morphology of sod-podsolic forest soils developed on morainal loams in the central part of south taiga. (Morfologicheskie osobennosti dernovo-podzolistykh lesnykh pochv na morennykh suglinkakh tsentral'noĭ chasti iuzhnotaezhnoĭ podzony),
Dvornikova, L.L., *Leningrad. Universitet. Vestnik.*, Sep. 1978, 18(3), p.118-127, In Russian with English summary. 14 refs.
Taiga soils, Podsol, Taiga vegetation, Soil composition, Soil profiles, Moraines.

33-2624
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Arctic regions, Research projects.

33-2625
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Orvig, S., ed., World survey of climatology, Vol.14, edited by H.E. Landsberg, New York, Elsevier Publishing Co., 1970, 370p., Refs. passim. Includes references, geographical and subject indexes.
Arctic climate, Weather observations, Meteorological charts, Long range forecasting, Glacial meteorology, Ice air interface.

33-2626
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Mackay, D., *Arctic,* June 1977, 30(2), p.93-100, In English with French and Russian summaries. 15 refs.
Oil spills, Degradation, Dispersions.

33-2627
Water balance of a small pond in the High Arctic.
Marsh, P., et al, *Arctic,* June 1977, 30(2), p.109-117, In English with French and Russian summaries. 12 refs.
Wood, M.K.
Ponds, Water balance, Water supply, Ground water, Active layer, Tundra regions.

33-2628
Long hard winter. *Highways and public works,* Jan. 1979, 47(1826), p.24, 26.
Road maintenance, Winter maintenance, Snow removal.

33-2629
Trace metals in antarctic snows since 1914.
Boutron, C., et al, *Nature,* Feb. 15, 1979, 277(5697), p.551-554, 21 refs.
Lorius, C.
Snow composition, Aerosols, Atmospheric composition, Chemical composition.
The results of the variations of the concentrations of 12 elements, including Pb, Cd, Cu, Zn and Ag in snow deposited from 1914 to 1974 at an uncontaminated site in East Antarctica, are discussed here. As the composition of snow in central Antarctica is shown to be closely correlated to that in the lower atmosphere, this provides a valuable historical record of the composition of remote aerosols in the Southern Hemisphere. It is found that Pb, Cd, Cu, Zn and Ag were already strongly enriched 60 yr ago (with respect to the composition of reference crustal and marine sources), and that both the concentrations and the enrichment factors observed in 1914 for these five elements are comparable to the present ones. This suggests that the present background atmospheric concentrations of Pb, Cd, Cu, Zn and Ag in the Southern Hemisphere are not strongly influenced by global pollution, but are related to natural phenomena, possibly volcanism.

33-2630
Polar icebreaker cruise report, Operation *Deep Freeze* '79.
U.S. Coast Guard, Seattle, Washington, Mar. 8, 1979, Var. p.
Ice navigation, Ice breaking, Ships.
This cruise report presents details of operations aboard the USCGC icebreaker *Polar Star* in support of *Deep Freeze* '79. The main tasks of the cruise were to break open the channel to McMurdo Sound and provide science logistics support. Other tasks included conduct training and gathering engineering data. The following events are described: ship and air operations, navigation, communications and postal affairs, science activities, engineering aspects, administration, supply and logistics, medical practices, and public relations. Assigned personnel and recommendations for future cruises are listed.

33-2631
British Antarctic Survey. *Marine observer,* Oct. 1978, 48(262), p.188-195 + photos.
Research projects, Ice sheets, Glaciology, Radio echo soundings.
This paper traces the history of the British Antarctic Survey and describes its bases and support vessels, organization, administration, and scientific research activities. The Survey maintains permanent bases at South Georgia, Signy I., Argentine Is., Rothera Point, and Halley Bay. Another small base at Damoy Point, Wiencke I. serves as an air facility and transit point. Logistics and research support are provided by the vessels John Biscoe and Bransfield, and two ski-wheeled Twin-Otter aircraft. The Survey's staff numbers about 360. Research activities include programs in the atmospheric sciences, geology, geophysics, glaciology, biology, and physiology.

33-2632
Road winter service. (Strassen-Winterdienst),
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Winter maintenance, Snow removal equipment, Heating, Avalanche countermeasures, Deicers, Snow fences, Salting, Road maintenance, Ice removal, Road icing.

33-2633
Winter trafficability: International congress and fair at Dobbiaco, Italy. (Viabilité hivernale: le congrès international et le concours de matériels de Dobbiaco (Italie)), *Revue générale des routes et des aérodromes,* Apr. 1978, No.541, p.87-131, In French. For selected papers see 33-2634 through 33-2636.
Winter maintenance, Roads, Snow removal equipment, Ice removal, Deicers.

33-2634
Profitability of investments and technological and organizational improvement of winter services. (Rentabilité des investissements et amélioration des techniques et de l'organisation en matière de viabilité hivernale), *Revue générale des routes et des aérodromes,* Apr. 1978, No.541, p.88-94, 97-104, 109, In French.
Road maintenance, Salting, Winter maintenance, Deicing, Snow removal, Cost analysis, Accidents.

33-2635
Winter trafficability in France. (La viabilité hivernale en France),
Monot, J., et al, *Revue générale des routes et des aérodromes,* Apr. 1978, No.541, p.115, 117-119, In French.
Bachelard, G.
Winter maintenance, Road maintenance, Snow removal equipment, Trafficability, Economic analysis, France.

33-2636
Development, construction and operation of an icing warning system in the Netherlands. (Développement, construction et fonctionnement d'un projet d'alerte au verglas aux Pays-Bas),
Ten Cate, A.J., *Revue générale des routes et des aérodromes,* Apr. 1978, No.541, p.122-123, 125-127, In French.
Road icing, Ice forecasting, Warning systems, Surface temperature, Humidity.

33-2637
Studded tires; summary of experiments conducted in France, 1971-1977; support of the new regulations. (Les pneus à crampons; synthèse des essais effectués en France de 1971 à 1977; mise au point de la nouvelle réglementation),
Fève, M., *Revue générale des routes et des aérodromes,* Oct. 1978, No.546, p.51-63, In French. 20 refs.
Tires, Road maintenance, Damage, Winter maintenance, Tests.

33-2638
Cold weather concreting.
American Concrete Institute. Committee 306, *American Concrete Institute. Journal,* May 1978, 75(5), p.161-183, 26 refs.
Winter concreting, Cold weather construction, Concrete curing, Frost protection, Concrete heating, Concrete strength, Thermal insulation, Concrete hardening, Thermal properties, Reinforced concrete.

33-2639
Design of concrete bridges for temperature gradients.
Priestley, M.J.N., *American Concrete Institute. Journal,* May 1978, 75(5), p.209-217, 19 refs.
Bridges, Prestressed concrete, Reinforced concrete, Thermal stresses, Thermal regime, Cracking (fracturing), Heat transfer, Structural analysis, Trafficability, Design.

33-2640
On the origin of mineral impurities in ice.
Picciotto, E.E., *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 696, 21p., ADA-063 315, 6 refs. For French original see 33-3814.
Firn, Glacier ice, Ice composition, Isotopes, Impurities, Antarctica—Plateau Station.
Mineral impurities can originate from four main sources: the ocean, the lithosphere, extra-terrestrial space and man's activities. Whatever the particular objective envisaged, besides analytical problems, any research in this field faces a common general problem: determination of the relative contributions from each source. This paper discusses chemical and isotopic methods which will give a solution to this problem. The main difficulty lies in the large chemical fractionations which appear to take place at all stages of the passage between the source and the place of deposition. Two cases of definite identification of the origin are presented: evaluation of the extraterrestrial component in firn samples from Plateau Station (East Antarctica) based on the measurement of Mn-53, and the identification of a man-made component in the Pb found in an alpine glacier, based on the relative abundance of the stable isotopes of Pb. (Auth.)

33-2641
Physical characteristics of geophysical processes in polar oceans.
Bogorodskiĭ, V.V., ed, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, 82p., ADB-033 914, Distribution limited to U.S. Government agencies only. For Russian orignal see 33-716 through 33-719, 33-721, 33-724, 33-725, 33-731, 33-732, 33-1417, and 33-1418. For individual papers see 33-2642 through 33-2652.
Gusev, A.V., ed.
Sea ice, Drift, Physical properties, Ice composition, Ice optics, Ice temperature, Temperature variations.
These translated articles treat various aspects of the upper layers of arctic drift ice, including: chemical and physical characteristics; electrical parameters related to temperature and salinity; electrical microstructure; electromagnetic sounding; optical properties; temperature variations; acoustic emissions as a breakup indicator; cloud cover effects on sea ice; and icebergs in the Southern Ocean.

33-2642
Physical and chemical characteristics of upper layers of ice of varying age in the area of SP-22.
Khokhlov, G.P., *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.1-10, ADB-033 914, 1 ref. For Russian original see 33-716. Distribution limited to U.S. Government agencies only.
Sea ice, Ice physics, Ice composition, Ice salinity.

33-2643
Relationship between the electrical parameters of the upper layers of Arctic drift ice in the microwave range and temperature and salinity.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.11-18, ADB-033 914, 11 refs. For Russian original see 33-717. Distribution limited to U.S. Government agencies only.
Khokhlov, G.P.
Sea ice, Ice electrical properties, Ice salinity, Ice temperature, Microwaves.

33-2644
Fine electrical structure of the upper layers of drift ice.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.19-26, ADB-033 914, 4 refs. For Russian original see 37-318. Distribution limited to U.S. Government agencies only.
Khokhlov, G.P.
Sea ice, Ice electrical properties, Ice dielectrics, Ice salinity, Ice crystal structure.

33-2645
Principal characteristics of the vertical electrical structure of the upper layers of Arctic drift ice in the UHF range.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.27-35, ADB-033 914, 11 refs. For Russian original see 33-719. Distribution limited to U.S. Government agencies only.
Khokhlov, G.P.
Sea ice, Ice dielectrics, Ice electrical properties, Ice crystal structure.

33-2646
Side and normal waves in pulsed electromagnetic sounding of sea ice.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.36-39, ADB-033 914, 2 refs. For Russian original see 33-721. Distribution limited to U.S. Government agencies only.
Tripol'nikov, V.P.
Sea ice, Electromagnetic prospecting, Scattering.

33-2647
Experimental study of wave propagation in pulsed radio sounding of stratified media using considerable separation of the receiving and emitting points compared to the layer thickness.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.40-48, ADB-033 914, 5 refs. For Russian original see 33-724. Distribution limited to U.S. Government agencies only.
Trepov, G.V.
Radio echo soundings, Glacier ice, Ice dielectrics.

33-2648
Laser study of the optical properties of snow.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.49-54, ADB-033 914, 6 refs. For Russian original see 33-725. Distribution limited to U.S. Government agencies only.
Kropotkin, M.A.
Snow optics, Lasers.

33-2649
Space-time variability of the temperature of the upper layer of the Arctic Ocean.
Bogorodskiĭ, A.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.55-58, ADB-033 914, Distribution limited to U.S. Government agencies only.
Gavrilo, V.P., Gusev, A.V., Fedorinchik, L.F.
Water temperature, Temperature variations, Temperature gradients, Ice cover effect.

33-2650
Acoustic emission as an indicator of the process of deformation and break-up of ice.
Gavrilo, V.P., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.59-68, ADB-033 914, 13 refs. For Russian original see 33-731. Distribution limited to U.S. Government agencies only.
Gusev, A.V., Zaretskiĭ, IU.K., Fish, A.M.
Noise (sound), Ice acoustics, Ice breakup, Ice deformation.

33-2651
Infrared method of evaluating the effect of cloud cover on the surface temperature of sea ice.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.69-77, ADB-033 914, 2 refs. Distribution limited to U.S. Government agencies only.
Paramonov, A.I.
Sea ice, Ice temperature, Temperature variations, Cloud cover, Infrared radiation.

33-2652
Instrument studies of the submerged parts of icebergs in the Southern Ocean.
Bogorodskiĭ, A.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskiĭ and A.V. Gusev, p.78-82, ADB-033 914, 1 ref. For Russian original see 33-732 (F-20654). Distribution limited to U.S. Government agencies only.
Popov, I.K.
Icebergs, Underwater ice, Ice bottom surface, Side looking radar.
Side-looking radar is successfully used to study the underside of icebergs. Results of these investigations into the extent of immersion of medium sized icebergs are analyzed.

33-2653
Botanical observations in Alaska.
Andreev, V.N., *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 698, 29p., ADB-033 241, 14 refs. Translation of Botanicheskiĭ zhurnal 63(1): 115-128, 1978. Distribution limited to U.S. Government agencies only.
Research projects, Plants (botany), Tundra vegetation, Trees (plants).
A 15-day visit to Alaska by a Soviet botanist is reported. The 1975 visit was part of the US-USSR exchange on environmental protection and included stops at Palmer, Cantwell, and the University of Alaska in Fairbanks, McKinley Park, Barrow, Bettles, the Seward Peninsula, and several small villages. An account of the main vegetation types of Alaska and comparisons and contrasts with the Soviet tundra and taiga vegetation are given

33-2654
Experiment on estimating sea ice area from ice balance components (using the East Greenland ice zone as an example).
Lebedev, A.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 699, 20p., ADB-033 242, 19 refs. For Russian original see 31-1182. Distribution limited to U.S. Government agencies only.
Uralov, N.S.
Sea ice, Ice conditions, Drift.
With data available on the sea ice area at specific times and on the area of ice entering the sea, and removed from it in the interval between these moments, it is not hard to determine the dimensions of the area of ice formed or melted during the same period. Here the term "ice area" means the area of the sea occupied by ice with an undetermined density greater than one. If there are sufficiently great numbers of these estimated areas, then, having established the relationship between them and the hydrometeorological factors governing them, it is possible to estimate the sea ice area from its component elements. In this study this method of estimating ice area is applied to the entire region of East Greenland ice south of 80N.

33-2655
Thermal regime of reservoirs.
Rossinskiĭ, K.I., *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 700, 224p., ADB-034 526, 98 refs. For Russian original see 30-1829. Distribution limited to U.S. Government agencies only.
Reservoirs, Thermal regime, Flow rate, Water flow, Heat transfer, Ice temperature.
The present book considers laws governing the creation and variation of thermal conditions in large river storage basins at different seasons of the year. Heat exchange between the water masses and the surrounding space, as well as heat transport in an aquatic medium, are studied, and the effect of the size of the reservoirs and rate of water flow on water temperature is investigated. The theory of the thermal conditions of inland bodies of water is introduced, and methods and formulas for computing the water temperature in reservoirs is made. Many examples using material drawn from studies of the thermal conditions of reservoirs are presented.

33-2656
Interpreting the results of temperature gradient measurements in the bottom layer of water in Lake Bol'shoye Toko.
Efimov, A.V., *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 693, 15p., ADB-033 479, For Russian original see 32-343. 5 refs. Distribution limited to U.S. government agencies only.
Temperature gradients, Probes, Thermal measurements, Ocean bottom.
In view of the great labor consumption and high cost of drilling operations under sea conditions, a detailed study of the thermal regime of the shelf by the borehole methods appears to have low probability. The so-called marine geothermal studies can be used here. Their essence consists in measuring the temperature gradient by a thermal probe introduced into the first few meters of the bottom and separate determination of the coefficient of thermal conductivity of the ground. Thus it is possible to determine the surface thermal flux through the bottom of the body of water.

33-2657
Microrelief of the bottom surface of drifting sea ice.
Grishchenko, V.D., *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 694, 6p., ADB-033 100, For Russian original see 31-1197. 2 refs. Distribution limited to U.S. Government agencies only.
Ice bottom surface, Microrelief, Sea ice.
Scuba divers on one of the North Pole drifting ice stations examined the bottom surfaces of annual and multi-year sea ice. The bottom of young and annual ice is smooth in the early spring. During summer melting, depressions form and grow on the bottom because of inclusions in the ice, meltwater pools on the top surface, and phytoplankton accumulations, all of which allow increased penetration of radiation. By early fall depressions may be 2-12 cm or more in diameter and 5-10 cm deep. During winter new ice growth fills in the depressions and the bottom surface becomes smooth again, although large irregularities may retain their shapes.

33-2658
River boat guiding in ice navigation.
Tronin, V.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 695, 123p., ADB-033 240, 32 refs. For Russian original see 28-274. Distribution limited to U.S. Government agencies only.
Pushkarev, L.A.
River ice, Ice navigation, Ice conditions, Ice breaking.
This book summarizes experience operating river icebreakers and transports in ice. A classification of forms of river ice is given; and the behavior of ice in rivers and reservoirs is briefly described. The book describes river icebreakers and transports adapted to navigate in ice, reviews questions of preparation for ice navigation, and considers ways to guide icebreakers in different ice conditions and during the performance of certain icebreaking jobs. Recommendations are given for navigators sailing through ice on their own, and principles are set forth for the organization and execution of icebreaker pilotage.

33-2659
Observations on vertical profiles of the snow cover on roofs and melt at the bottom of the snow cover.
Nakamura, T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 697, 19p., ADA-063 109, 4 refs. For Japanese original see 33-548.
Abe, O.
Snow loads, Roofs, Snow melting.
Observations on vertical profiles of the snow cover on nearly flat roofs of three different buildings were made, and the observational results were compared with that of the snow cover on the ground. Comparison of these four results revealed that the layered structure of the snow cover on flat roofs is similar to the upper part of the snow cover on the ground, and a granular snow layer was observed at the bottom of each snow cover. This means that each snow cover melts at the bottom due to the heat flow either through the ceilings of the buildings or through the ground surface.

33-2660
Ust'-Oda-Kuytun physiographic province as an example of interaction between natural complexes and the industrial structure of territories. [Ust'-Ordynsko-Kuĭtunskaia fiziko-geograficheskaia provintsiia kak primer vzaimodeĭstviia prirodnogo kompleksa s proizvodstvenno-territorial'noĭ strukturoĭ],
Boiarkin, V.M., Geografiia iuga Vostochnoĭ Sibiri (Geography of the south of East Siberia), Irkutsk, 1973, p.5-29, In Russian. Refs. p.28-29.
DLC GB325.G383
Taiga soils, Landscape types, Taiga vegetation, Steppes, Permafrost distribution, Discontinuous permafrost, Seasonal freeze thaw, Plant ecology, Snow cover effect, USSR—Irkutsk.

33-2661
Formation of natural complexes in the central Angara River area. [Osobennosti formirovaniia prirodnykh kompleksov v raĭonakh srednego Priangar'ia],
Naumova, A.M., Geografiia iuga Vostochnoĭ Sibiri (Geography of the south of East Siberia), Irkutsk, 1973, p.30-33, In Russian. 1 ref.
DLC GB325.G383
Swamps, Permafrost distribution, Permafrost hydrology, Peat, Mosses, Active layer thickness, Permafrost depth, Plant ecology, Ecosystems, USSR—Angara River.

33-2662
Vertical differentiation and the zonal nature of sporadic forest-steppe landscapes in the Angara River area. [Vertikal'naia differentsiatsiia i zonal'naia priroda landshaftov ostrovnykh lesostepeĭ Priangar'ia],
Filippova, S.A., Geografiia iuga Vostochnoĭ Sibiri (Geography of the south of East Siberia), Irkutsk, 1973, p.34-42, In Russian. 8 refs.
DLC GB325.G383
Permafrost distribution, Sporadic permafrost, Landscape types, Taiga vegetation, Steppes, Cryogenic processes, Plant ecology, Ecosystems, Topographic factors, USSR—Angara River.

33-2663
Relationship between the cryolithozone and the radioactivity of surface crustal layers. [K voprosu vzaimosviazi kriolitozony s radioaktivnost'iu poverkhnostnykh sloev zemnoĭ kory],
Solopov, S.G., Geografiia iuga Vostochnoĭ Sibiri (Geography of the south of East Siberia), Irkutsk, 1973, p.131-132, In Russian. 3 refs.
DLC GB325.G383
Earth crust, Radioactivity, Permafrost distribution, Radiation measuring instruments, Gamma irradiation, Aerial surveys.

33-2664
Peculiarities of presenting basic landscape components of northern Transbaikal on large-scale topographic maps. ¡Osobennosti otobrazheniia osnovnykh komponentov prirodnykh landshaftov Severnogo Zabaĭkal'ia na krupnomasshtabnykh topograficheskikh kartakh¡
Plastinin, L.A., Geografiia iuga Vostochnoĭ Sibiri (Geography of the south of East Siberia), Irkutsk, 1973, p.133-138, In Russian.
DLC GB325.G383
Topographic maps, Alpine land forms, Glacial features, Landscape types, Taiga vegetation, Slope processes, Solifluction, Permafrost distribution, Cryogenic relief, Mapping, USSR—Transbaikal.

33-2665
Ground water characteristics in different geographic zones of West Siberia. ¡Osobennosti podzemnykh vod po geograficheskim zonam Zapadnoĭ Sibiri¡
Beĭrom, S.G., Geografiia Sibiri v usloviiakh nauchno-tekhnicheskogo progressa (Geography of Siberia in the light of scientific and technological progress) edited by V.M. Shirokov, Novosibirsk, Nauka, 1975, p.5-18, In Russian. 15 refs.
DLC GB325.G385
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33-2666
Changes in natural environment of the shore zone after construction of the Krashoyarsk and Novosibirsk reservoirs. ¡Izmeneniia prirodnykh usloviĭ v pribrezhnoĭ zone posle sozdaniia Krasnoyarskogo i Novosibirskogo vodokhranilishch¡
Kuskovskiĭ, V.S., et al, Geografiia Sibiri v usloviiakh nauchno-tekhnicheskogo progressa (Geography of Siberia in the light of scientific and technological progress) edited by V.M. Shirokov, Novosibirsk, Nauka, 1975, p.35-48, In Russian. 18 refs.
Podlipskiĭ, IU.I., Rybka, V.G., Savkin, V.M.
DLC GB325.G385
Hydroelectric power generation, Reservoirs, Ice conditions, Shoreline modification, Shore erosion, Slope processes, USSR—Yenisey River, USSR—Ob' River.

33-2667
Interaction between natural environment and Siberian reservoirs with regulated flow. ¡Vzaimodeĭstviia prirodnykh usloviĭ i zaregulirovannykh vod posle sozdaniia sibirskikh vodokhranilishch¡
Shirokov, V.M., Geografiia Sibiri v usloviiakh nauchno-tekhnicheskogo progressa (Geography of Siberia in the light of scientific and technological progress) edited by V.M. Shirokov, Novosibirsk, Nauka, 1975, p.82-96, In Russian. 20 refs.
DLC GB325.G385
Hydroelectric power generation, Reservoirs, Ice conditions, Icebound lakes, Ice jams, Taiga soils, Taiga vegetation.

33-2668
Raising the level of technical servicing and repair of machines at construction sites of the Baykal Amur railroad. ¡Vyshe uroven' tekhnicheskogo obsluzhivaniia i tekushchego remonta mashin na BAMe¡
Khaĭkis, L.B., *Mekhanizatsiia stroitel'stva,* Jan. 1978, No.1, p.12-15, In Russian.
Motor vehicles, Construction equipment, Winter maintenance, Earthwork, Excavating equipment, Baykal Amur railroad.

33-2669
Problems of construction companies concerning increased effectiveness of frozen ground excavation. ¡Zadachi stroitel'nykh organizatsiĭ po povysheniiu effektivnosti razrabotki merzlykh gruntov¡
Moiseev, P.I., *Mekhanizatsiia stroitel'stva,* July 1978, *No.7, p.3-6, In Russian.*
Earthwork, Frozen ground, Excavating equipment, Construction costs.

33-2670
Experience and methods of frozen and hard rock excavation at the establishments of the Ministry of Construction of Heavy Industry, USSR. ¡Opyt i metody razrabotki merzlykh i skal'nykh gruntov na ob"ektakh Mintiazhstroiia SSSR¡
Barsov, I.P., *Mekhanizatsiia stroitel'stva,* July 1978, No.7, p.6-8, In Russian.
Earthwork, Excavating equipment, Frozen ground.

33-2671
Experience and methods of frozen and hard rock excavation in power engineering. ¡Opyt i metody razrabotki merzlykh i skal'nykh gruntov v energeticheskom stroitel'stve¡
Moroz, P.K., *Mekhanizatsiia stroitel'stva,* July 1978, No.7, p.8-9, In Russian.
Electric power plants, Earthwork, Excavating equipment, Frozen ground.

33-2672
Experience and methods of frozen and hard rock excavation in pipeline construction. ¡Opyt i metody razrabotki merzlykh i skal'nykh gruntov pri stroitel'stve magistral'nykh truboprovodov¡
Arendt, G.A., *Mekhanizatsiia stroitel'stva,* July 1978, No.7, p.9-11, In Russian.
Pipelines, Earthwork, Excavating equipment, Frozen ground.

33-2673
Machinery and equipment for frozen ground excavation. ¡Mashiny i oborudovanie dlia razrabotki merzlykh gruntov¡
Meshkov, V.M., *Mekhanizatsiia stroitel'stva,* July 1978, No.7, p.24-26, In Russian.
Earthwork, Excavating equipment, Frozen ground.

33-2674
Screw-drill scraper. ¡Vintovoĭ rykhlitel'¡
Gol'dberg, A.A., et al, *Mekhanizatsiia stroitel'stva,* Dec. 1978, No.12, p.21-22, In Russian.
Dalalian, T.G., Saksin, S.A., Chumakov, S.M.
Earthwork, Drills, Excavating equipment, Frozen ground.

33-2675
Snowstorms and drifting snow in the Altai Mountains. ¡Meteli i snegozanosimost v gornom Altae¡
Reviakin, V.S., et al, *Gliatsiologiia Altaia,* 1976, Vol.11, p.9-32, In Russian. 13 refs.
Tikhonova, L.L.
Avalanche engineering, Snow cover distribution, Snowstorms, Snow surveys, Snowdrifts, Snow accumulation, Charts, Wind factors, USSR—Altai Mountains.

33-2676
Types and characteristics of weather in the Aktru mountain-glacier basin. ¡O kharakteristike i tipizatsii pogody v gorno-lednikovom bassein Aktru¡
Tronov, M.V., et al, *Gliatsiologiia Altaia,* 1976, Vol.11, p.33-48, In Russian. 4 refs.
Lupina, N.Kh., Tronova, L.B.
Mountain glaciers, Snowfall, Alimentation, Ablation, Weather forecasting, Flood control, Glacial rivers, Microclimatology.

33-2677
Fresh snow avalanches in the Mul'ta River basin (western part of the Katun Range). ¡Laviny svezhevypavshego snega zapadnoĭ chasti Katunskogo Khrebta (na primere basseĭna r. Mul'ty)¡
Nochevalov, IU.V., et al, *Gliatsiologiia Altaia,* 1976, Vol.11, p.90-97, In Russian. 5 refs.
Chubenko, A.G.
Avalanches, Snow surveys, Avalanche formation, Avalanche triggering, Avalanche mechanics, USSR—Katun Range.

33-2678
Morphology of snow fields in the western part of the Katun Range. ¡Morfologiia snezhnikov zapadnoĭ chasti Katunskogo Khrebta¡
Tyryshkanov, V.P., *Gliatsiologiia Altaia,* 1976, Vol.11, p.98-102, In Russian. 3 refs.
Nivation, Snow accumulation, Topographic factors, USSR—Altai Mountains.

33-2679
Formation of chemical runoff from mountain glaciers of the Belaya Berel' River basin. ¡O formirovanii khimicheskogo stoka s lednikov basseĭna r. Belaia Berel'¡
Vilesov, E.N., et al, *Gliatsiologiia Altaia,* 1976, Vol.11, p.116-120, In Russian. 2 refs.
Tokmagambetov, G.A., Gel'dyeva, G.V., Bektenʻiarov, R.S.
Mountain glaciers, Glacial rivers, Glacier ablation, Meltwater, Water chemistry.

33-2680
Ice jams in the Altai Mountains. ¡Zatory i zazhory l'da na rekakh Altaia¡
Shurupa, E.P., et al, *Gliatsiologiia Altaia,* 1976, Vol.11, p.136-140, In Russian.
Proskurina, G.V.
Icebound rivers, Ice breakup, Slush, Ice jams, Flood control, USSR—Altai Mountains.

33-2681
Aerodynamic characteristics of blow-through snow fences. ¡Aerodinamicheskie kharakteristiki snegovyduvaiushchikh zaborov¡
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Likhanov, V.A., Marin, IU.A.
Roads, Snowdrifts, Snow fences, Design.

33-2682
Excavating equipment for frozen ground. ¡Mashiny dlia razrabotki merzlykh gruntov¡
Monastyrskiĭ, O.V., *Avtomobil'nye dorogi,* Sep. 1978, No.9, p.15-17, In Russian.
Earthwork, Excavating equipment, Frozen ground.

33-2683
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33-2684
Glacial compression in the outwash gravel of the Aadorfer Feld, with an explanation of the phenomenon. ¡Glaziale Stauchungen in den Niederterrassen-Schottern des Aadorfer Feldes und ihre Deutung¡
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Glacial deposits, Frozen gravel, Frozen sand, Deformation, Soil mechanics, Permafrost mass transfer, Ground ice, Shear stress, Glacier movement.

33-2685
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33-2686
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33-2687
Calculating three-layer pannels with elastic braces and their joints for temperature effects. ¡Raschet trekhsloĭnykh paneleĭ s gibkimi sviaziami i ikh stykov na deĭstvie temperatury¡
Emel'ianov, A.A., *Beton i zhelezobeton,* Nov. 1978, No.11, p.28-30, In Russian.
Large panel buildings, Concrete structures, Prefabrication, Panels, Thermal insulation, Joints (junctions), Grouting, Design, Temperature effects.

33-2688
Optimal technological schemes for preparing frozen dredging grounds. ¡Optimizatsiia tekhnologicheskikh skhem podgotovki merzlykh drazhnykh poligonov¡
Rashkin, A.V., *Gronyĭ zhurnal,* Nov. 1978, No.11, p.25-28, In Russian.
Earthwork, Dredging, Frozen ground, Artificial thawing, Frost protection.

33-2689
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Cold weather construction, Trenching, Earthwork, Drains, Excavating equipment, Frozen ground.

33-2690
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Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier surges.

33-2691
Pavement bases made of earth cemented with waste cinders. [Ustroĭstvo osnovaniĭ iz gruntov, ukreplennykh tsementom i zoloĭ unosa],
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Sirotiuk, V.V.
Roads, Pavements, Roadbeds, Soil stabilization, Cements, Waste disposal, Electric power plants, Waste cinders.

33-2692
Effectiveness and reliability of artificial structures on Siberian roads. [Ob effektivnosti i nadezhnosti iskusstvennykh sooruzheniĭ na dorogakh Sibiri],
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Roads, Permafrost beneath structures, Hydraulic structures, Culverts, Embankments, Pipes (tubes), Drains, Dams.

33-2693
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Korshunov, V.I.
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Fines, Water content, Models, Thixotropy, Mining, Quicksand.

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Pheno-rhythmo-types of mountain forest plants on the southern slope of the northwestern Caucasus. [Fenoritmotipy rasteniĭ gornykh lesov iuzhnogo sklona Severo-Zapadnogo Kavkaza],
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33-2698
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Vedernikov, V.I.
Algae, Plankton, Sea ice, Photosynthesis, Cryobiology, Arctic Ocean.
Microflora and conditions for photosynthesis in different layers of sea ice and undersea ice are described from the data in the literature. In spite of the sharp drop in light energy as the ice thickness increases, the upper layers are relatively poor in unicellular algae in comparison with the middle and lower layers. Ice flora are mainly pinnate and centric diatoms. Photosynthetic intensity is maximal in the upper and middle (solid) layers of ice. Primary production of solid sea ice in Antarctic coastal waters in the summer is comparable to the eutrophic and mesotrophic regions of the World Ocean. Algae in the lower (cellular) layer of ice and under sea ice phytoplankton, far removed from the edge of the ice, have a low light optimum of photosynthesis. Primary production of upper layers of undersea ice water depends greatly on the transparency and thickness of ice. (Auth.)

33-2702
Scraper for hard covers. [Rykhlitel' dlia tverdykh pokrytiĭ], *Promyshlennoe stroitel'stvo i inzhenernye sooruzheniia,* Oct.-Dec. 1978, No.4, p.44, In Russian.
Pavements, Earthwork, Excavating equipment, Frozen ground, Ice.

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Earthwork, Excavating equipment, Drilling, Baykal Amur railroad, Permafrost.

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Clay soils, Permeability, Measuring instruments, Clays.

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Railroad tracks, Winter maintenance, Snow removal equipment.

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Dobshits, L.N., Minaev, IU.N.
Cements, Pavements, Winter concreting, Reinforced concrete, Buildings, Concrete freezing, Concrete strength, Concrete hardening, Concrete admixtures.

33-2707
River bed control structures on the Yenisey. [Vypravitel'nye sooruzheniia na Enisee],
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Shore erosion, Ice loads, Hydraulic structures, Supports, Ice (construction material), Wooden structures, Ice aprons, Ice walls, USSR—Yenisey River.

33-2708
Guiding ships through ice. [Provodka sudov v ledovykh usloviiakh],
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Ships, Ice navigation, River ice, Icebreakers.

33-2709
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Transportation, Rivers, Lakes, Ice conditions, Ice navigation, Flood control.

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Icebound rivers, Ice breakup, Ice navigation.

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Icing, Mining, Electric heating, Materials handling equipment.

33-2712
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Loskutnikov, N.A., Gorbunov, V.F.
Swamps, Peat, Frost penetration, Drainage, Earthwork, Land reclamation, USSR—Tomsk.

33-2713
New land reclamation method for the far northeastern USSR. [Kraĭniĭ Severo-Vostok: novyĭ metod melioratsii],
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Skorodumov, I.N.
Land reclamation, Tundra soils, Tundra vegetation, Agriculture.

33-2714
Influence of natural and anthropogenic aerosols on geochemistry of polar snow. [Influence des aérosols naturels et anthropogéniques sur la géochimie des neiges polaires],
Boutron, C., France. Centre national de la recherche scientifique. Laboratoire de glaciologie. Publication No.254, 1978, 283p., In French. Ph.D. thesis. Refs. p.263-276.
Snow composition, Ice sheets, Glacier ice, Geochemistry, Pollution, Aerosols, Human factors.
Over 200 samples of snow from Antarctica, Greenland, and Devon Island have been analyzed for 12 elements. The methods of contamination-free sampling and analysis, developed after considerable experimentation, are described in detail. The background fallout rate for Central Antarctica and Greenland—assumed to be representative of the entire globe—does not appear to have been influenced significantly by human activity during the last century, except perhaps for Pb and Zn in the Northern Hemisphere. The origin of each element is determined by a statistical method refined by the introduction of space and time variables. Na, Mg, K, and Ca may be of both oceanic and continental origin; the other elements are always of continental origin, which is detritic in the case of Al, Fe, Mn, K, and Ca, and nondetritic for Pb, Cd, Cu, Zn, and Ag. Concentrations vary little with distance from the sea, except for Na, Mg, K, and Ca in Antarctica, which decrease rapidly for the first 100 km from the coast, then increase slightly toward the center of the continent. Concentrations show a fluctuation in time, but present values are comparable to those obtained at the beginning of this century.

33-2715
Hydrological atlas of Canada.
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Hydrology, Maps, Hydrologic cycle, Snow accumulation, Snowfall, Snow cover distribution, River ice, Runoff, Permafrost hydrology, Glacial hydrology, Meteorological data, Canada.

33-2716
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Pingos, Frozen ground, Ground ice, Seasonal freeze thaw, Ice melting.

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Ice pressure, Ice sheets, Shear stress, Frozen gravel, Deformation.

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Clarke, G.K.C.
Ice drills, Thermal drills, Glacier ice.

33-2720
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El-Tahan, H., et al, St. John's, Memorial University of Newfoundland, 51p., Refs. p.20-27. Manuscript prepared for the annual meeting of the American Society of Civil Engineers, Chicago, Oct. 16-20, 1978.
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Ice islands, Floating ice, Floating structures, Offshore drilling, Design.

33-2721
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Canada. Department of Indian Affairs and Northern Development, *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* Dec. 1973, No.73-29, c180p.
Merrett, J.S., Jarvis, P., MPS Associates Ltd.
Gas pipelines, Pipe laying, Construction costs, Route surveys, Environmental impact, Arctic regions, Canada—Northwest Territories—Mackenzie District.

33-2722
Regional impact of a northern gas pipeline. Vol.3. Impact of a pipeline on territorial transportation facilities, resource output and industrial development.
Canada. Department of Indian Affairs and Northern Development, *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* Dec. 1973, 73-30, c140p.
Pritchard, R.W., MPS Associates Ltd.
Gas pipelines, Pipe laying, Construction costs, Environmental impact, Route surveys, Transportation, Cost analysis, Canada—Northwest Territories—Mackenzie Valley.

33-2723
Regional impact of a northern gas pipeline. Vol.4. Impact of pipelines on selected territorial communities.
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Gas pipelines, Construction costs, Environmental impact, Route surveys, Cost analysis, Canada—Northwest Territories—Mackenzie Valley.

33-2724
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Gas pipelines, Construction costs, Route surveys, Economic analysis, Canada—Northwest Territories—Mackenzie Valley.

33-2725
Ice observations, 1970: Canadian Arctic.
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Ice conditions, Sea ice distribution, Ice forecasting, Observation, Arctic regions, Aerial reconnaissance, Maps, Canada.

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Winter concreting, Concrete strength, Concrete hardening, Admixtures, Chemical analysis, Research projects.

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Hydraulic transients: a seismic source in volcanoes and glaciers.
St. Lawrence, W., et al, *Science,* Feb. 16, 1979, 203(4381), MP 1181, p.654-656, 10 refs.
Qamar, A.
Wave propagation, Glaciers, Volcanoes, Earthquakes.
A source for certain low-frequency seismic waves is postulated in terms of the water hammer effect. The time-dependent displacement of a water-filled subglacial conduit is analyzed to demonstrate the nature of the source. Preliminary energy calculations and the observation of hydraulically generated seismic radiation from a dam indicate the plausibility of the proposed source.

33-2728
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Jacobs, K.M., *Maine. Department of Transportation. Materials and Research Division. Technical report,* Feb. 1978, No.78-4, 32p., 1 ref.
Soil chemistry, Saline soils, Ion diffusion, Water treatment.

33-2729
Terminal ballistics in cold regions materials.
Aitken, G.W., MP 1182, International Symposium on Ballistics, 4th. Proceedings, Monterey, California, U.S. Naval Postgraduate School, 1978, 6p., 11 refs.
Projectile penetration, Penetration tests, Frozen ground, Snow cover.
In a winter environment, snow and frozen soil may be the most readily available materials for use in field fortifications. Design of effective fortifications requires detailed knowledge of the response of these materials to impact from projectiles and projectile fragments. Data for small arms projectile and simulated projectile fragment penetration into snow and frozen soil are presented. Results of penetration predictions made using both closed form and empirical solutions are compared with test results, and the prediction techniques themselves are discussed. Basic agreement between predicted and measured penetrations was obtained for the simulated projectile fragments, which tended to remain stable in the target materials. Penetration of 7.62 mm small arms projectiles into frozen soil targets is also predictable at velocities below about 600 m/s, above which they tend to become unstable and tumble in the target. In the case of the empirical solution, the results presented serve to extend its range of applicability to projectiles weighing less than 0.9 kg.

33-2730
Climatic roles of ice: a contribution to the International Hydrological Programme (IHP).
Radok, U., *International Association of Hydrological Sciences. Bulletin,* Sep. 1978, 23(3), p.333-354, In English with French summary. Refs. p.351-354.
Ice sheets, Sea ice, Ice cover effect, Climatology, Climatic changes, Glacier oscillation, Models.
Terrestrial ice is featuring prominently in current speculations about consequences and causes of marked climatic anomalies. This review is an attempt to provide the climate debate with a cryospheric sense of proportion matching present glaciological knowledge and understanding. The more traditional cryospheric emphasis in climatology has been on the behavior of glaciers and ice sheets. Progress towards computer modelling of glaciers is appraised. Although at the opposite end of the time scales of climate, polar ice sheets are as important for its understanding as snow and sea ice. Cores from these ice sheets provide records of their history which has created their temperature and their distribution of stable and radioactive isotopes, trace chemicals, and dust. But the dynamics of these ice masses is also involved and needs to be modelled for an unambiguous interpretation of the core records in terms of past climate. This applies equally to any predictions of how the polar ice might respond to drastic short-term climatic trends. Various currently observed antarctic thickness profiles have suggested that an adequate model of the Antarctic ice sheet must allow for the possibility of large-scale surging. (Auth. mod.)

33-2731
Summary appraisals of the Nation's ground-water resources—Alaska.
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Anderson, G.S.
Water supply, Ground water, Water pollution, Ground ice, Permafrost, Meltwater, United States—Alaska.

33-2732
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Asphalts, Antiicing additives, Chemical ice prevention, Snow removal.

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Sea ice, Airborne radar, Radar echoes, Ice conditions.

33-2734
Northern Alaska hydrocarbon resources.
Kreitner, J.D., *Alaska. Federal-State Land Use Planning Commission. Study,* May 1978, No.34, 68p., 18 refs.
Natural resources, Hydrocarbons, Economic development.

33-2735
Results of the 1978 University of New Hampshire Athabasca Glacier Expedition.
Mayewski, P.A., et al, Durham, 1978, 56p., 25 refs.
Pregent, G.
Expeditions, Glacier ice, Ice temperature, Meteorological data, Glacier ablation, Stream flow.

33-2736
Predicting changes in the flow-stress state of a frozen core of a rock-earth dam during its thawing in the operational period.
Panov, S.I., *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 704, 10p., ADB-034 078, 2 refs. For Russian original see 33-1716. Distribution limited to U.S. Government agencies only.
Earth dams, Ground thawing, Soil freezing, Settlement (structural), Soil stabilization.
Calculation of the flow-stress state of a partially frozen rock-earth dam, performed using the finite element method, made it possible to estimate the degree of possible settling of the crest of the dam at two stages of its thawing, and also to determine the possibility, as a result of this thawing, of the formation of fracture cracks or leaky zones in the core of the dam. An analysis of the results of these calculations indicates that the partial freezing, which is permissible during construction of a rock-earth dam and affects primarily the core, does not produce conditions that could lead to the development of fracture cracks and leaky zones as it thaws, which could affect the operational reliability of the dam.

33-2737
Radar survey of thicknesses of floating ice covers.
Bogorodskiĭ, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 705, 4p., ADB-034 459, 4 refs. For Russian original see 27-990. Distribution limited to U.S. Government agencies only.
Tripol'nikov, V.P.
Sea ice, Floating ice, Airborne radar, Radar echoes, Ice cover thickness.
Radar parameters associated with profiling of sea ice thickness from aircraft are discussed. Based upon radar frequency and signal attenuation in the ice, an estimate of the radar system performance characteristics required for profiling sea ice vs ice thickness and flight altitude are given.

33-2738
Geophysical methods of study of permafrosts in USSR (brief summary of published works of Soviet researchers).
Akimov, A.T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 707, 30p., ADB-034 460, 130 refs. Translation of an unpublished communique, 1978. Distribution limited to U.S. Government agencies only.
Mel'nikov, V.P., Frolov, A.D.
Bibliographies, Permafrost, Geophysical surveys.
The translation is a brief summary of Soviet publications (1930's-1970's) on geophysical methods of studying permafrost. It covers electromagnetic methods (radar, radiothermal measurement, infrared photography, radio comparator and direction-finding, surface impedance, high frequency profiling, induced polarization), seismoacoustic and other methods. A bibliography of 130 items accompanies the summary.

33-2739
Tundra disturbances and recovery following the 1949 exploratory drilling, Fish Creek, Northern Alaska.
Lawson, D.E., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Dec. 1978, CR 78-28, 81p., ADA-065-192, 67 refs.
Brown, J., Evertee, K.R., Johnson, A.W., Komárková, V., Murray, D.F., Webber, P.J.
Human factors, Environmental impact, Oil spills, Damage, Exploration, Tundra vegetation, Revegetation.
A 1949 drill site in the Naval Petroleum Reserve Number 4, Alaska, the Fish Creek Test Well 1, was examined in August 1977 to determine the disturbance caused by drilling activities and to analyze the response and recovery of the vegetation, soils, permafrost, and surficial materials to that disturbance. Man-made disturbances include bladed and unbladed vehicular

trails, a winter runway, excavations, pilings, remains of camp structures, steel drums and other solid waste, and hydrocarbon spills. The most intense and lasting disturbance to the vegetation, soils, and permafrost resulted from bulldozing of surface materials, diesel fuel spills, and trails developed by multiple passes of vehicles. Thermokarst subsidence and thermal erosion, caused by increased thaw of permafrost due to disturbance, resulted in the development of a hummocky topography and water-filled depressions at the drill site. Some ice wedges disturbed in 1949 are still melting. Soil disturbance ranges from minor modification to complete destruction of the soil morphology. The effects of hydrocarbon spills are still detectable in the soils. Little of the original vegetation remains in the intensely disturbed area, such as around the drill pad where a grass-dominated community prevails. After 28 years, the vegetation cover is closed over most mesic sites, shallow wet sites are well vegetated, and xeric sites, areas of diesel fuel spills and areas of severe erosion remain mostly bare. Pioneering plant species on bare, disturbed areas are members of mature vegetation assemblages from the undisturbed tundra which have high reproductive and dispersal capacities. A hypothetical model of natural revegetation and vegetation recovery is proposed. Vascular plants, bryophytes, and lichens were collected from the Fish Creek site area for the first time. Recommendations on cleanup and restoration of sites are presented.

33-2740
Behavior of soils under flexible pavements—development of rapid frost susceptibility tests.
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Martin, R.T.
Frost action, Frost resistance, Soil freezing, Low temperature tests, Frost heave, Water pressure.

33-2741
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Snow accumulation, Mountains, Meteorology, Snowfall, Avalanches, Alpine land forms, Thermodynamics.

33-2742
Washout of aerosol particles in orographic clouds. [Auswaschung von Aerosolteilchen in Bergbewölkung],
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Aerosols, Ice crystal nucleation, Ice crystal growth, Supercooled clouds, Precipitation (meteorology), Ice sublimation, Experimentation.

33-2743
Calculations of the altitude level, where the precipitation changes from solid into liquid. [Zur Berechnung der Höhenlage des Überganges vom festen in flüssigen Niederschlag],
Grebner, D., *Vienna. Zentralanstalt für Meteorologie und Geodynamik. Publikation,* 1978, No.227, p.22/1-22/6, In German with French summary. 4 refs.
Precipitation (meteorology), Snowfall, Snow melting, Thermodynamics, Air temperature, Snowflakes.

33-2744
Direct influence of melting snowflakes on air temperature in mountains. [Der direkte Einfluss des Schmelzens der Schneeflocken auf die Lufttemperatur im Gebirge],
Ćurić, M., *Vienna. Zentralanstalt für Meteorologie und Geodynamik. Publikation,* 1978, No.227, p.24/1-24/6, In English with German summary. 6 refs.
Snow melting, Snowflakes, Thermodynamics, Air temperature, Cooling, Mountains.

33-2745
Specific influence of mudflow and avalanche dynamics on sedimentation in the high calcareous Alps of Salzburg. [Untersuchungen über den spezifischen Einfluss der Bewegungsdynamik von Muren und Lawinen auf die Sedimentation in den Kalkhochalpen von Salzburg],
Pippan, T., *Vienna. Zentralanstalt für Meteorologie und Geodynamik. Publikation,* 1978, No.227, p.27/1-27/5, In German with English summary. 9 refs
Sediment transport, Avalanche deposits, Sedimentation, Avalanche mechanics, Mudflows, Alpine land forms, Mountains.

33-2746
Snow load on overhead power lines. [Der Schneedruck auf Oberleitungsdrähten],
Plancher, C., *Vienna. Zentralanstalt für Meteorologie und Geodynamik. Publikation,* 1978, No.227, p.28/1-28/12, In French with German summary. 8 refs.
Snow accumulation, Power lines, Snow loads, Loads (forces), Air temperature, Wind factors.

33-2747
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Snow depth, Snow accumulation, Mountains, Alpine land forms, Poland—Tatra Mountains.

33-2748
Meteorological and nivological investigation of the reduction of snow cover thickness at Passo Rolle (April 17-19, 1975). [Eine meteorologische und nivologische Untersuchung der Abnahme der Dicke der Schneedecke am Rolle-Pass (17.-19. April 1975)],
Borghi, S., *Vienna. Zentralanstalt für Meteorologie und Geodynamik. Publikation,* 1978, No.227, p.30/1-30/3, In French with German and English summaries. 6 refs.
Snow depth, Snow melting, Snow evaporation, Thermodynamics, Heat balance, Meteorological factors.

33-2749
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Loup, J., *Vienna. Zentralanstalt für Meteorologie und Geodynamik. Publikation,* 1978, No.227, p.32/1-32/4, In French with German and English summaries. 2 refs.
Snowfall, Atmospheric circulation, Weather observations.

33-2750
Weather and avalanche disasters. [Wetter und Lawinenkatastrophen],
Bernot, F., *Vienna. Zentralanstalt für Meteorologie und Geodynamik. Publikation,* 1978, No.227, p.45/1-45/7, In German with English summary.
Avalanches, Damage, Snowfall, Rain, Weather observations, Meteorological charts, Mountains.

33-2751
Marine ecology—Mackenzie Delta and Tuktoyaktuk Peninsula. *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* Feb. 1974, No.74-22, 195p., In English with French summary. Refs. passim. For individual reports see 33-2752 through 33-2755.
Marine biology, Microbiology, Oil spills, Degradation, Countermeasures, Water pollution, Environmental impact, Canada—Northwest Territories—Mackenzie River Delta.

33-2752
Degradation of petroleum by a psychotolerant marine flora from the Eskimo Lakes. N.W.T.
Bunch, J.N., et al, *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* Feb. 1974, No.74-22, p.1-30, 10 refs.
Harland, R.C.
Marine biology, Microbiology, Countermeasures, Oil spills, Water pollution, Degradation.

33-2753
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Percy, J.A., *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* Feb. 1974, No.74-22, p.31-99, Refs. p.91-96.
Oil spills, Marine biology, Physiological effects, Environmental impact, Crude oil.

33-2754
Baseline study of the marine environment in the area of the Mackenzie Delta.
Grainger, E.H., *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* Feb. 1974, No.74-22, p.101-173, 24 refs.
Marine biology, Biomass, Environmental impact, Water temperature, Water chemistry, Salinity, Photosynthesis, Plankton, Canada—Northwest Territories—Mackenzie River Delta.

33-2755
Distribution and abundance of heterotrophic bacteria in the South Beaufort Sea.
Bunch, J.N., *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* Feb. 1974, No.74-22, p.175-195, 6 refs.
Marine biology, Biomass, Bacteria, Distribution, Oil spills, Microbiology, Beaufort Sea.

33-2756
Evaluation of excessive snow loads on roofs. [Evaluation des surcharges de neige sur les toits],
Schriever, W.R., *National Research Council, Canada. Division of Building Research. Canadian building digest,* July 1978, p.193F/1-193F/5, In French. 4 refs.
Roofs, Snow loads, Building codes.

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Changnon, D.
Snowstorms, Meteorological data, Ice storms, Snow depth, Air temperature, Wind factors, Cold weather survival, United States—Illinois.

33-2758
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Londagin, H.E., et al, Valdez, Alaska Dept. of Transportation and Public Facilities, Aug. 1977, 49p. PB-276 634.
Harding, F.H.
Glacial deposits, Sediments, Slope processes, Revegetation, Erosion control, Introduced plants, Slope protection, Cost analysis.

33-2759
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Research projects, Arctic regions, United States—Alaska.

33-2760
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Zuberbuhler, W.J., et al, *U.S. Navy. Naval Postgraduate School, Monterey, California. Report.,* Sep. 1976, NPS-58PA76091, 197p., ADA-032 056, M.Sc. thesis.
Roeder, J.A., Paquette, R.G., Bourke, R.H.
Ocean currents, Electrical resistivity, Sea ice, Salinity, Microstructure, Acoustic properties, Oceanographic surveys, Ice floes, Chukchi Sea.

33-2761
Wavy, blunt, smooth and pointed icicles. [Über wellige, stumpfe, glatte und spitze Eiszapfen],
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Impervious polymer screens and films in dams built of local materials. [Protivofil'tratsionnye polimernye ekrany i diafragmy v plotinakh iz mestnykh materialov],
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Pipelines, Permafrost beneath structures, Design.

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Swamps, Pipelines, Pipeline freezing, Thermal insulation, Design.

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Technologic peculiarities of hydraulic testing of pipelines in freezing weather. [Tekhnologicheskie osobennosti gidravlicheskikh ispytaniĭ truboprovodov v zimnikh usloviiakh],
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Cold weather construction, Pipelines, Tests.

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Pipelines, Thermal insulation, Permafrost beneath structures.

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Road to the Yakutian coal. [Doroga K IAkutskomu ugliu],
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Residential buildings, Large panel buildings, Panels, Lightweight concretes, Concrete aggregates, Permafrost beneath structures, Baykal Amur railroad.

33-2773
Improving the system of servicing construction machines at construction sites of the Baykal Amur railroad. [Sovershenstvovat' sistemu tekhnicheskogo obsluzhivaniia stroitel'nykh mashin na BAMe],
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Permafrost beneath structures, Construction equipment, Earthwork, Excavating equipment, Cold weather performance, Maintenance, Baykal Amur railroad.

33-2774
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Savkin, O.S.
Grouting, Permafrost beneath structures, Mortars, Concrete freezing, Bridges, Heat transfer, Concrete piles, Foundations.

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Tunnels, Reinforced concrete, Linings, Concrete placing, Concretes.

33-2776
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33-2777
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DLC QH541.3.P77
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DLC QH541.3.P77
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Vlasova, T.A., Godorozha, N.I.
DLC QH541.3.P77
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DLC QH541.3.P77
Lakes, Plankton, Plants (botany), Algae, Plant ecology, Biomass, USSR—Bol'shezemel'skaya Tundra.

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Content of phytoplankton pigments in the Kharbei lakes. [Soderzhanie pigmentov fitoplanktona v vodakh Kharbeĭskikh ozer],
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Pyrina, I.L., Getsen, M.V.
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33-2782
Primary phytoplankton production in lakes of the Kharbei sistem, Bol'shezemel'skaya Tundra. [Pervichnaia produktsiia fitoplanktona ozer Kharbeĭskoĭ sistemy Bol'shezemel'skoĭ tundry],
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Getsen, M.V., Vaĭnshteĭn, M.B.
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Lakes, Plankton, Biomass, Algae, Water chemistry, Photosynthesis, USSR—Bol'shezemel'skaya Tundra.

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Results of phytoplankton photosynthesis determination by the radioactive carbon technique and microbiological characteristics of the Kharbei lakes. [Rezul'taty opredeleniia fotosinteza fitoplanktona radiouglerodnym methdom i mikrobiologicheskaia kharakteristika Kharbeĭskikh ozer],
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DLC QH541.3.P77
Lakes, Plankton, Photosynthesis, Microbiology, Algae, Bacteria, USSR—Bol'shezemel'skaya Tundra.

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Macrophytes and their production in lakes of the Kharbei system. [Makrofity i ikh produktsiia v ozerakh Kharbeĭskoĭ sistemy],
Kochanova, E.I., Produktivnost' ozer vostochnoĭ chasti Bol'shezemel'skoĭ Tundry (Productivity of lakes in the east part of Bol'shezemel'skaya Tundra) edited by G.G. Vinberg and T.A. Vlasova, Leningrad, Nauka, 1976, p.79-89, In Russian.
DLC QH541.3.P77
Tundra soils, Tundra vegetation, Lakes, Algae, Plant ecology, Ecosystems, Biomass.

33-2785
Regularities governing production processes in tundra lakes. [Osnovnye zakonomernosti produktsionnykh protsessov v tundrovykh ozerakh],
Vlasova, T.A., et al, Produktivnost' ozer vostochnoĭ chasti Bol'shezemel'skoĭ Tundry (Productivity of lakes in the east part of Bol'shezemel'skaya Tundra) edited by G.G. Vinberg and T.A. Vlasova, Leningrad, Nauka, 1976, p.131-136, In Russian.
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DLC QH541.3.P77
Icebound lakes, Ice conditions, Lake water, Water chemistry, Tundra vegetation, Algae, Plankton, USSR—Bol'shezemel'skaya Tundra.

33-2786
Introduction to the Workshop on Ecological Effects of Hydrocarbon Spills in Alaska.
Atlas, R.M., et al, *Arctic,* Sep. 1978, 31(3), MP 1183, p.155-157.
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Meetings, Oil spills, Research projects.

33-2787
Crude oil degradation in Arctic tundra ponds.
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Oil spills, Tundra, Ponds, Degradation.

33-2788
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Jordan, M.J., et al, *Arctic,* Sep. 1978, 31(3), p.170-179, 18 refs.
Hobbie, J.E., Peterson, B.J.
Hydrocarbons, Oil spills, Lakes, Microbiology.

33-2789
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Horowitz, A., et al, *Arctic,* Sep. 1978, 31(3), p.180-191, In English with French summary. 6 refs.
Sexstone, A., Atlas, R.M.
Hydrocarbons, Water pollution, Lacustrine deposits, Microbiology.

33-2790
Effects of oil spills on phytoplankton in an Arctic lake and ponds.
Miller, M.C., et al, *Arctic,* Sep. 1978, 31(3), p.192-218, In English with French summary. 27 refs.
Alexander, V., Barsdate, R.J.
Oil spills, Lake water, Ponds, Plankton, Microbiology, Environmental impact.

33-2791
Toxicity of Prudhoe Bay crude oil to Alaskan Arctic zooplankton.
O'Brien, W.J., *Arctic,* Sep. 1978, 31(3), p.219-228, In English with French summary. 30 refs.
Crude oil, Oil spills, Microbiology, Plankton, Environmental impact.

33-2792
Effects of crude oil on aquatic insects of tundra ponds.
Mozley, S.C., et al, *Arctic,* Sep. 1978, 31(3), p.229-241, In French with English summary. 18 refs.
Butler, M.G.
Crude oil, Oil spills, Ponds, Ecology.

33-2793
Effects of crude and diesel oil spill on plant communities at Prudehoe Bay, Alaska, and the derivation of oil spill sensitivity maps.
Walker, D.A., et al, *Arctic,* Sep. 1978, 31(3), MP 1184, p.242-259, In English with French summary. 29 refs.
Webber, P.J., Everett, K.R., Brown, J.
Oil spills, Environmental impact, Tundra vegetation, Indexes (ratios), Maps.
Crude oil was spilled on six of the major Prudhoe Bay plant communities at an intensity of 12 liters/sq m. The communities occurred along a topographic-moisture gradient. The reaction of the major species of the various communities was recorded one year following the spills. Sedges and willows showed substantial recovery from crude oil spills. Mosses, lichens, and most dicotyledons showed little or no recovery. On a very wet plot with standing water, the vegetation showed very poor recovery. *Dryas integrifolia* M. Vahl, the most important vascular species on dry sites, was killed. Identical experiments using diesel oil rather than crude oil showed all species except an aquatic moss to be killed. A sensitivity index for the communities was calculated on the basis of the percentage cover of the resistant species divided by the original total plant cover of the community. With this information an oil spill sensitivity map for an area of Prudhoe Bay was constructed using a vegetation map as a base. Using the crude oil data from Prudhoe Bay together with some from the literature, a predictive sensitivity map was also constructed for an accidental crude oil spill at nearby Franklin Bluffs. In this example all the community types are considered to have moderate to excellent recovery potential.

33-2794
Some effects of oil on the physical and chemical characteristics of wet tundra soils.
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Tundra soils, Soil chemistry, Soil physics, Soil water, Oil spills.

33-2795
Effects of burning crude oil spilled onto six habitat types in Alaska.
McKendrick, J.D., et al, *Arctic,* Sep. 1978, 31(3), p.277-295, In English with French summary. 20 refs.
Mitchell, W.W.
Crude oil, Oil spills, Tundra soils, Soil freezing, Soil moisture, Vegetation patterns.

33-2796
Fertilizing and seeding oil-damaged Arctic tundra to effect vegetation recovery Prudhoe Bay, Alaska.
McKendrick, J.D., et al, *Arctic,* Sep. 1978, 31(3), p.296-304, In English with French summary. 6 refs.
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Tundra vegetation, Oil spills, Revegetation, Admixtures.

33-2797
Physical, chemical and biological effects of crude oil spills on black spruce forest, interior Alaska.
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Oil spills, Environmental impact, Forest tundra, Vegetation, Damage.

33-2798
Response of microorganisms to hot crude oil spills on a subarctic taiga soil.
Sparrow, E.B., et al, *Arctic,* Sep. 1978, 31(3), p.324-338, In English with French summary. 30 refs.
Davenport, C.V., Gordon, R.C.
Crude oil, Oil spills, Taiga soils, Microbiology, Bacteria.

33-2799
Fate of crude and refined oils in North Slope soils.
Sexstone, A., et al, *Arctic,* Sep. 1978, 31(3), p.339-347, In English with French summary. 6 refs.
Everett, K.R., Jenkins, T.F., Atlas, R.M.
Oil spills, Tundra soils, Hydrocarbons, Microbiology.
Prudhoe Bay crude oil and refined diesel fuel were applied to five topographically distinct tundra soils at Prudhoe Bay, Alaska. The penetration of hydrocarbons into the soil column depended on soil moisture and drainage characteristics. Biodegradation, shown by changes in the pristane to heptadecane and resolvable to total gas chromatographic area ratios, appeared to be greatly restricted in drier tundra soils during one year exposure. Some light hydrocarbons were recovered from soils one year after spillages. Hydrocarbons were still present in soils at Fish Creek, Alaska, contaminated by refined oil spillages 28 years earlier, attesting to the persistence of hydrocarbons in North Slope soils.

33-2800
Long term interactions of microorganisms and Prudhoe Bay crude oil in tundra soils at Barrow, Alaska.
Sexstone, A., et al, *Arctic,* Sep. 1978, 31(3), p.348-354, In English with French summary. 13 refs.
Gustin, P., Atlas, R.M.
Oil spills, Tundra soils, Microbiology.

33-2801
Effect of surface applied crude oil on soil and vascular plant root respiration, soil cellulase, and hydrocarbon hydroxylase at Barrow, Alaska.
Linkins, A.E., et al, *Arctic,* Sep. 1978, 31(3), p.355-365, In English with French summary. 34 refs.
Atlas, R.M., Gustin, P.
Crude oil, Oil spills, Bacteria, Soil chemistry, Tundra vegetation.

33-2802
Ectomycorrhizal fungi of *Salix rotundifolia* Trautv. I. Impact of surface applied Prudhoe Bay crude oil on mycorrhizal structure and composition.
Antibus, R.K., et al, *Arctic,* Sep. 1978, 31(3), p.366-380, In English with French summary. 38 refs.
Linkins, A.E.
Crude oil, Tundra vegetation, Plants (botany), Fungi, Roots.

33-2803
Ectomycorrhizal fungi of *Salix rotundifolia* Trautv. II. Impact of surface applied Prudhoe Bay crude oil on mycorrhizal root respiration and cold acclimation.
Linkins, A.E., et al, *Arctic,* Sep. 1978, 31(3), p.381-391, In English with French summary. 46 refs.
Antibus, R.K.
Crude oil, Tundra vegetation, Roots, Cold tolerance, Biomass.

33-2804
Fungal biomass responses to oil perturbated tundra at Barrow, Alaska.
Miller, O.K., Jr., et al, *Arctic,* Sep. 1978, 31(3), p.394-407, In English with French summary. 10 refs.
Linkins, A.E., Chmielewski, M.A.
Crude oil, Tundra vegetation, Environmental impact, Fungi, Biomass.

33-2805
Summary of the workshop on ecological effects of hydrocarbon spills in Alaska.
Costerton, J.W., et al, *Arctic,* Sep. 1978, 31(3), p.408-411.
Brunskill, G.J., Hutchinson, T., Widden, P.
Meetings, Oil spills, Hydrocarbons, Environmental impact.

33-2806
Genesis and classification of Arctic coastal plain soils, Prudhoe Bay, Alaska.
Parkinson, R.J., *Ohio. State University, Columbus. Institute of Polar Studies. Report,* Nov. 1978, No.68, 147p., Refs. p.63-66.
Soil surveys, Soil classification, Patterned ground, Soil chemistry.

33-2807
Glaciological field stations, Parts 1 and 2.
Vivian, R., comp, *Glaciological data,* Feb. 1978, No.4, 227p. (2 vols.), Numerous refs.
Research projects, Stations, Glaciology.
Data on nearly 70 field stations, world wide, is given in concise form. Basic information about each station includes: location, accessibility, and access point; research facilities and accommodations, major research interests and duration of programs; data generated and availability; name, address, and telephone number of sponsoring agency.

33-2808
Ice-coring project at Mizuho Station, East Antarctica, 1970-1975.
Kusunoki, K., ed, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, 172p., Refs. For individual papers see F-21298 through F-21313 or 33-2809 through 33-2824.
Suzuki, Y., ed.
Ice cores, Firn, Depth hoar, Ice crystals, Boreholes, Antarctica—Mizuho Station.
This volume is an outgrowth of a joint program of ice core drilling at Mizuho Station in East Antarctica by the Japanese Antarctic Research Expedition (JARE) in 1971-1975 and collaborative research on core analysis done at the drilling site and in home laboratories up to 1978. The volume contains 16 papers: one on drilling technology and operation, eight on the physical and chemical characteristics of retrieved cores, and 7 containing data from the core analysis and borehole logging. Core analysis is still in progress.

33-2809
Outline of the drilling operation at Mizuho Station.
Suzuki, Y., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.1-24, 10 refs.
Takizawa, T.
Ice coring drills, Thermal drills, Ice cores, Antarctica—Mizuho Station.
Ice drillings were carried out in 1971, 1972 and 1974-75 at Mizuho Station as part of the Glaciological Research Program in Mizuho Plateau of the Japanese Antarctic Research Expedition. Four holes, 41.0 m, 75.0 m, 147.5 m and 145.4 m deep, were drilled and 350 m of cores from them were sent to Japan. The operation is chronologically outlined from the embryo stage of its planning, with emphasis placed on its technical aspects. (Auth.)

33-2810
Stratigraphic analyses of firn and ice at Mizuho Station.
Watanabe, O., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.25-47, 21 refs.
Kato, K., Satow, K., Okuhira, F.
Firn stratification, Ice sheets, Ice cores, Snow accumulation, Ice composition, Oxygen isotopes, Snow density, Antarctica—Mizuho Station.
Stratigraphy of the 150-m core from Mizuho Station is studied by visual observations as well as by analysis of density and oxygen isotope profiles. Stratigraphic structures are well preserved to a depth of 70 m. Considerably deviated values of density from the average depth-density curve serve as good indicators of the texture of initially deposited snow. From stratigraphic interpretation, about 10.6 g/sq cm is estimated as the mean annual accumulation. With this value the age of the lowermost part of the 150-m core is estimated to be some 1100 years B.P. excluding the periods of hiatus of annual layers. In the delta O-18 profile to the depth of 60 m, the smallest peak indicating the coldest climate is seen at a depth of 32 m which is dated back to some 2000 years B.P. Comparison of the delta O-18 profile in the Mizuho core with that in the Camp Century core indicates that the period of hiatus of annual layers is about one-third of the real duration of the core formation and the mean annual accumulation is about two-thirds of 10.6 g/sq cm at Mizuho Station in the past 300 years. (Auth.)

33-2811
Structural characteristics of firn and ice cores drilled at Mizuho Station, East Antarctica.
Narita, H., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.48-61, 21 refs.
Maeno, N., Nakawo, M.
Firn, Ice cores, Ice crystal size, Ice structure, Structural analysis, Ice crystal structure, Antarctica—Mizuho Station.
Sizes, shapes and c-axis orientations of crystal grains as well as specific areas of grain boundaries and internal free surfaces were measured for firn and ice core samples of 147.5 m length obtained in 1971 and 1972 at Mizuho Station, East Antarctica. Five critical depths were found at which some structural changes occurred. They were 8 m, 30 m, 55 m, 70 m and 110 m. Their corresponding densities were 550, 730, 840, 855 and 882 kg/cu m, respectively. The densities of 550 and 840 kg/cu m correspond to frequently reported figures at which the densification mechanism changes from mechanical packing of air voids to plastic deformation of ice grains, and from the plastic deformation to shrinkage of closed-off air bubbles. The critical density of 730 kg/cu m (30 m) was first pointed out by Maeno in 1974, who concluded that the bonding between ice grains reached its maximum or optimum state for packing at this density. The present analyses showed that air voids were gathered only at intersections of grain boundaries in the core samples at the critical density. The remaining two critical densities, 855 kg/cu m (70 m) and 882 kg/cu m (110 m), are related to alterations of mechanical stress fields; samples below 70 m contained layers of small grains intermittently, and at depths deeper than 110 m crystal sizes decreased, suggesting the presence of shear components. (Auth.)

33-2812
Measurements of air permeability and elastic modulus of snow and firn drilled at Mizuho Station, East Antarctica.
Maeno, N., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.62-76, 18 refs.
Narita, H., Araoka, K.
Snow elasticity, Snow mechanics, Firn, Antarctica—Mizuho Station.
Air permeability and elastic modulus were measured for firn samples prepared from a 20-m pit and cores drilled to the depth of 147.5 m at Mizuho Station in East Antarctica. Air permeability decreased and elastic modulus increased with increasing depth or density. Two distinct changes were found to densities of 550 and 730 kg/cu m, i.e. at porosities of 0.40 and 0.20, in the plots of air permeability and elastic modulus against density or porosity. The former change is explained by the alteration of the densification mechanicism from mechanical packing to plastic deformation of ice particles, and the latter by the attainment of an optimum configuration of ice bounding for air permeation and mechanical strength. Observed results are compared with the theoretical air permeability of an ideal snow, to which all polar snows are considered to approach in a long aging

period under high hydrostatic pressure and high homologous temperature. It is suggested that the optimum state, which is reached at the density of 730 kg/cu m or the porosity of 0.20, is that of snow in which air channels are mainly located at intersections of grain boundaries and some 30 percent of them are unblocked. (Auth.)

33-2813
Electrical behaviors of antarctic ice drilled at Mizuho Station, East Antarctica.
Maeno, N., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.77-94, 25 refs.
Ice cores, Firn, Ice dielectrics, Ice electrical properties, Antarctica—Mizuho Station.
The electrical properties of Antarctic firn and ice cores drilled at Mizuho Station to the depth of 145 m were studied in a wide range of frequency (0.1 Hz to 1 Mz) and temperature (0 to -50C). Remarkable differences were found between the cores taken from depths shallower than 55 m and those from deeper parts. Dielectric properties of the cores above 55 m, corresponding to cores permeable to air flow and with densities less than 840 kg/cu m could be explained as those of heterogeneous mixture-dielectrics of ice and air, though the physical meaning of the activation energies for dielectric relaxation and high-frequency conduction were not clarified completely. Cores deeper than 55 m, corresponding to impermeable cores with densities higher than 840 kg/cu m, showed extremely large dielectric constants and conductivities. Based on the results of the present electrical measurements, the alteration of densification mechanisms was suggested to occur at a depth around 30 m corresponding to the density of 730 kg/cu m, where the bonding and compaction of composing ice particles were regarded to have reached their optimum mode, which was also confirmed by petrographic analyses of cores such as areas of internal free surfaces and grain boundaries.

33-2814
Stress-strain tests of ice core drilled at Mizuho Station, East Antarctica.
Shoji, H., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.95-101, 7 refs.
Ice cores, Ice mechanics, Strain tests, Stresses, Antarctica—Mizuho Station.
The mechanical properties of an ice sample (No. 143) taken from 100 m depth at Mizuho Station were investigated with stress-strain tests in uniaxial compression at temperatures of -6 and -16C. Strain rate employed in experiments ranged from 10,000,000 to 1,000,000/s. Stress-strain curves obtained are classified into two types: stress-yield type and stress-saturation type, according to the occurrence and non-occurrence of yield drop due to the internal cracking. The relationships between the maximum stress obtained from the curves and the strain rate (the stress dependence of the strain rate) thus obtained were compared with those for core samples taken at Byrd Station. It was found that the Mizuho core sample resembled Byrd core sample No.145 (300 m depth) in the mechanical property shown in the relationships stated above. Peculiarity in the property exhibited at -16C experiments is interpreted by the generation of cracks during deformation of high strain rate. (Auth.)

33-2815
Internal friction of antarctic Mizuho ice cores at low frequency.
Nakamura, T., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.102-113, 8 refs.
Abe, O.
Ice cores, Shear modulus, Internal friction, Ice mechanics, Antarctica—Mizuho Station.
Internal friction and shear modulus of Antarctic ice cores drilled at Mizuho Station were measured with an inverted torsion pendulum in a frequency range of 4 to 9 Hz and a temperature range of 96 to 272K. As a function of temperature, the measured internal friction of every core showed two peaks. One around 265K was considered due to the grain boundary and the other around 150K to the mechanical relaxation, because the internal friction of a single crystal has only one peak around 170K corresponding to the latter peak. The height of the former peak decreased with an increase in the density of the core. The shear modulus decreased very slowly with increase of temperature to around 253K, where internal friction begins to increase sharply. The decrease of shear modulus was rapid above that temperature. The shear modulus increased linearly with the density. (Auth.)

33-2816
Anisotropy of ultrasonic wave velocities in Mizuho cores.
Yamada, T., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.114-123, 13 refs.
Snow cover, Ice sheets, Depth hoar, Wave propagation, Anisotropy, Sound waves, Antarctica—Mizuho Station.
The snow cover at Mizuho Station is characterized by well-developed depth hoar. To clarify how the anisotropy of elastic wave velocities changes with the densification process of the depth hoar having an anisotropic texture, the P- and the S-wave velocities were measured directly as a function of depth for both the vertical and the horizontal direction using the ultrasonic pulse method applied to deep core samples drilled to the depth of 145 m at Mizuho Station. As for the P-wave velocity, the upper part of the ice sheet from the surface to the depth of 25-30 m (0.72-0.73 Mg/cu m density) was found to be anisotropic, while below that depth the ice sheet became isotropic. The curve of P-wave velocity versus density disclosed discontinuities at the densities of 0.65 and 0.84 Mg/cu m, which correspond to the depths of 10-16 and 55-60 m respectively. The facts indicate that the process of densification and metamorphism of snow and ice may change at these levels in the ice sheet at Mizuho Station. As for the S-wave velocity, the ice sheet was isotropic through all depths, whereas on the curve of S-wave velocity versus density only one discontinuity was clearly noticed, at the density of 0.65 Mg/cu m. (Auth. mod.)

33-2817
Extinction coefficient of light of cores drilled at Mizuho Station, East Antarctica.
Kamioka, S., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.124-130, 12 refs.
Kuroiwa, D.
Ice cores, Light scattering, Antarctica—Mizuho Station.
The extinction coefficient of light of shallow ice core samples obtained at Mizuho Station was measured and its dependence on depth from 10 m to 110 m, the density in the range of 550-880 kg/cu m, and specific surface area of grains were investigated. The value of extinction coefficient decreased and asymptoted to a definite value with the increase of depth. (Auth.)

33-2818
Compiled stratigraphic data from cores drilled at Mizuho Station.
Narita, H., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.132-135.
Watanabe, O., Satow, K., Okuhira, F.
Snow stratigraphy, Ice cores, Depth hoar, Grain size, Antarctica—Mizuho Station.
Stratigraphic analyses including layer features, grain sizes and depth hoar levels, were made under the transmitting fluorescent light for snow samples prepared from 20 m pit and drilled cores of JARE-12 and 13. The results of the stratigraphic analyses are given as well as the depths of measurements and names of observers.

33-2819
Compiled density data from cores drilled at Mizuho Station.
Narita, H., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.136-158.
Maeno, N.
Ice cores, Ice density, Firn, Antarctica—Mizuho Station.
Details of five separate series of measurements, amounting to a total of 3635 density measurements conducted on Mizuho cores during glaciological studies JARE-11, 12 and 13, are tabulated. The data include source of samples, depth range, remarks, series, average density, and cumulative mass per unit area for 0.5 m increments from the surface to 124 m.

33-2820
Petrographic data from cores drilled at Mizuho Station.
Narita, H., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.159-164.
Ice cores, Firn, Ice crystal size, Ice structure, Grain size, Antarctica—Mizuho Station.
For the purpose of studying changes in petrographic structures of firn and ice with depth, about 160 vertical thin sections were prepared from JARE-13 cores covering from 23.5 m to 145.5 m in depth, and microphotographs of them were taken under ordinary and polarized light. The photographs and petrographic structures, together with the frequency of size parameter and the fabric pattern are given.

33-2821
Oxygen isotopic composition in the cores from Mizuho Station.
Kato, K., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.165-166.
Ice cores, Ice composition, Oxygen isotopes, Antarctica—Mizuho Station.
The results of oxygen isotope determinations on the Mizuho cores are given in delta 0-18 notation. The 0-18/0-16 ratio of CO2 equilibrated isotopically with a water sample was measured with a double collector mass spectrometer.

33-2822
Compiled data of chemical compositions in ice cores drilled at Mizuho Station.
Murozumi, M., et al, *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.167-168.
Nakamura, S., Yoshida, Y.
Ice cores, Ice composition, Snow composition, Antarctica—Mizuho Station.
Data are presented on the concentrations of sodium, magnesium, and mercury in Mizuho cores.

33-2823
Temperature profile in the drilled hole.
Fujii, Y., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.169.
Boreholes, Snow temperature, Ice temperature.
Temperatures in a borehole drilled to a depth of 147.5 m by JARE-13 in 1972 are tabulated. Measurements were made with a thermistor, and the accuracy of the measurements was 0.02C.

33-2824
Inclination of the hole drilled by JARE-13.
Narita, H., *Tokyo. National Institute of Polar Research. Memoirs. Special issue,* Dec. 1978, No.10, p.170-172.
Boreholes, Borehole instruments, Snow depth.
The inclination of the hole drilled by JARE-13 was measured at every 5m down to 135m on Dec. 5, 1972, shortly after the termination of drilling at 147.5m below the snow surface. The measurements are tabulated, and the equipment is described and illustrated.

33-2825
Catastrophes and resilience of a zero-dimensional climate system with ice-albedo and greenhouse feedback.
Fraedrich, K., *Royal Meteorological Society. Quarterly journal,* Jan. 1979, 105(443), p.147-167, 16 refs.
Climate, Ice optics, Albedo, Mathematical models.

33-2826
Avalanches and snow safety.
Fraser, C., New York, Charles Scribner's Sons, 1978, 269p., Refs. p.255-261.
Accidents, Avalanche countermeasures, Safety, Avalanche formation, Avalanche triggering, Snow accumulation, Rescue operations, Explosion effects.

33-2827
Snow torrents: avalanche accidents in the United States 1967-71.
Williams, K., *U.S. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado. U.S. Forest Service general technical report,* Mar. 1975, RM-8, 190p.
Avalanche formation, Accidents, Rescue operations, Meteorological factors, Avalanches, Statistical data, United States.

33-2828
Thermal conductivity measurements on saturated rocks at permafrost temperatures.
King, M.S., *Canadian journal of earth sciences,* Jan. 1979, 16(1), p.73-79, In English with French summary. 9 refs.
Thermal conductivity, Frozen rocks, Permafrost thermal properties, Frozen ground thermodynamics, Thermal factors, Ice water interface, Soil composition, Saturation.

33-2829
Creep instability analysis of the Antarctic and Greenland ice sheets.
Cary, P.W., et al, *Canadian journal of earth sciences,* Jan. 1979, 16(1), p.182-188, In English with French summary. 21 refs.
Clarke, G.K.C., Peltier, W.R.
Ice sheets, Ice creep, Rheology, Shear stress, Heat flux, Heat transfer.
Creep instability, the runaway increase of temperature and deformation due to internal strain heating, is analyzed with a very simple model of one-dimensional heat transfer to estimate the stability of the antarctic and Greenland ice sheets. Derived stability maps indicate that for the assumed rheology both ice sheets are completely stable; however, the stability of the coastal region of Wilkes Land in Antarctica is only marginal and cannot be accurately determined because of uncertainties in the data, especially basal shear stress. (Auth.)

33-2830
Rock glacier types and their drainage systems, Grizzly Creek, Yukon Territory.
Johnson, P.G., *Canadian journal of earth sciences,* Sep. 1978, 15(9), p.1496-1507, In English with French summary. 10 refs.
Rock glaciers, Glacial hydrology, Drainage, Glacier movement, Glacier melting, Meltwater.

33-2831
Manual for construction foremen and workers laying and ballasting railroad tracks. [Posobie stroitel'nomu masteru i proizvoditeliu rabot po ukladke i ballastirovke puti],
Sessarevskii, A.N., et al, Moscow, Transport, 1978, 183p., In Russian with English table of contents enclosed. 14 refs.
Kostiukovich, A.R., Ulantsev, I.D.
Roadbeds, Embankments, Railroad tracks, Hydraulic structures, Permafrost beneath structures, Cold weather construction, Construction materials, Transportation, Baykal Amur railroad.

33-2832
Spring ice jams in stream channels (physical principles and quantitative analysis). [Vesennie zatory l'da v ruslovykh potokakh (fizicheskie osnovy i kolichestvennyĭ analiz)],
Deev, IU.A., et al, Leningrad, Gidrometeoizdat, 1978, 110p., In Russian with English table of contents enclosed. 91 refs.
Popov, A.F.
Icebound rivers, Ice breakup, Ice conditions, Ice floes, Ice jams, Experimentation, Analysis (mathematics).

33-2833
Coverings and roofs of industrial buildings in the North. [Pokrytiia i krovli promyshlennykh zdaniĭ na Severe],
Pikhovkin, V.A., Leningrad, Strolizdat, 1978, 135p., In Russian with English table of contents enclosed. 34 refs.
Industrial buildings, Linings, Walls, Roofs, Construction materials, Thermal insulation, Prefabrication, Panels.

33-2834
Manual for quality control in railroad construction. [Spravochnik po kontroliu kachestva zheleznodorozhnogo stroitel'stva],
Sokolov, F.G., et al, Moscow, Transport, 1977, 196p., In Russian with English table of contents enclosed. 6 refs.
Vicherevin, A.E.
Railroad tracks, Embankments, Hydraulic structures, Permafrost beneath structures, Dams, Swamps, Drainage, Soil stabilization, Bridges, Culverts, Drains, Baykal Amur railroad.

33-2835
Influence of the orientation of fillet welds on their strength at low temperatures. [Vliianie orientatsii uglovykh svarnykh shvov na ikh prochnost' pri nizkikh temperaturakh],
Sil'vestrov, A.V., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenĭ. Stroitel'stvo i arkhitektura,* 1978, No.8, p.11-16, In Russian. 6 refs.
Shagimardanov, R.M., Temnikov, V.G., Semenovich, M.D.
Steel structures, Welding, Joints (junctions), Cold weather tests.

33-2836
Bearing strength of cast-in-place pile clusters in swelling ground. [Nesushchaia sposobnost' svaĭnykh kustov iz buronabivnykh svaĭ v nabukhaiushchikh gruntakh],
Ekshteĭn, L.I., *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenĭ. Stroitel'stvo i arkhitektura,* 1978, No.8, p.32-33, In Russian. 1 ref.
Clays, Clay soils, Wettability, Pile foundations.

33-2837
Relation equations in problems of thermorheology of soils. [Ob uravneniiakh sviazi v zadachakh termoreologii gruntov],
Merzliakov, V.P., *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenĭ. Stroitel'stvo i arkhitektura,* 1978, No.8, p.52-57, In Russian. 6 refs.
Soil freezing, Frozen ground, Rheology, Analysis (mathematics).

33-2838
Draining urban waste water precipitate on silt in the North. [Obezvozhivanie osadkov gorodskikh stochnykh vod na ilovykh ploshchadkakh v usloviiakh Severa],
Blagorazumova, A.M., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenĭ. Stroitel'stvo i arkhitektura,* 1978, No.8, p.117-121, In Russian.
Marin, A.V.
Sewage treatment, Waste treatment, Desiccation, Waste disposal.

33-2839
Soil of the taiga zone of the Ural Mountains and the lands beyond. [Pochvy taezhnoĭ zony Urala i Zaural'ia],
Firsova, V.P., Moscow, Nauka, 1977, 176p., In Russian with English table of contents enclosed. Refs. p.165-175.
Taiga soils, Soil formation, Taiga vegetation, Soil chemistry, Soil profiles, Landscape types, Plant ecology, Mosses, Lichens, Soil microbiology, USSR—Ural Mountains.

33-2840
Photosynthesis and new growth of leaves in Arctic plants. [Fotosintez i novoobrazovanie listovogo apparata u rasteniĭ Arktiki],
Nazarov, S.K., *Ekologiia,* Nov.-Dec. 1978, No.6, p.76-79, In Russian. 8 refs.
Arctic vegetation, Plant physiology, Photosynthesis, Plant ecology.

33-2841
Thermomechanical drilling in frozen morainal deposits of Kola Peninsula. [Opyt termomekhanicheskogo bureniia pri razrabotke merzlykh morennykh gruntov Kol'skogo poluostrova],
Dorofeev, A.P., *Mekhanizatsiia stroitel'stva,* Jan. 1978, No.1, p.8-9, In Russian.
Earthwork, Moraines, Frozen ground, Thermal drills, Drilling, Excavating equipment, USSR—Kola Peninsula.

33-2842
Design, production and use of construction and assembling equipment in the Main Administration for Housing, Civil Engineering and Industrial Construction of Leningrad. [Opyt ispol'zovaniia, razrabotki i izgotovleniia sredstv mekhanizatsii stroitel'no-montazhnykh rabot v Glavleningradstroe],
Abramov, A.I., et al, *Mekhanizatsiia stroitel'stva,* Jan. 1979, No.1, p.13-16, In Russian.
Volkov, V.A., Kliuev, IU.D.
Construction equipment, Large panel buildings, Earthwork, Excavating equipment, Frozen ground.

33-2843
Improved cutting tools of excavators. [Usovershenstvovanie rabochikh organov rykhliteleĭ],
Vetrov, IU.A., et al, *Mekhanizatsiia stroitel'stva,* Jan. 1979, No.1, p.16-17, In Russian. 2 refs.
Earthwork, Excavating equipment, Frozen ground.

33-2844
DFM-230 cutter-disc excavator. [Diskofrezernaia mashina DFM-230],
Smolin, A.N., et al, *Mekhanizatsiia stroitel'stva,* Jan. 1979, No.1, p.17-18, In Russian.
Nepomniashchiĭ, V.M.
Earthwork, Excavating equipment, Frozen ground, Design.

33-2845
Highland (Subalpine) meadows of Uzbekistan. [Vysokogornye (ili subal'piĭskie) luga Uzbekistana],
Mallun, Z.A., *Uzbekskiĭ biologicheskiĭ zhurnal,* 1978, No.6, p.27-29, In Russian with Uzbek summary. 6 refs.
Alpine soils, Meadow soils, Alpine vegetation, Plant ecology, Ecosystems.

33-2846
Present state of soils in the Minusinsk Basin. [Sovremennoe sostoianie pochvennogo pokrova Minusinskoĭ kotloviny],
Kalep, L.L., *Akademiia nauk SSSR. Sibirskoe otdelenie. Institut geografii Sibiri i Dal'nego Vostoka. Doklady,* 1975, Vol.47, p.38-46, In Russian. 7 refs.
Taiga soils, Cryogenic soils, Snow cover distribution, Snow depth, Soil erosion, Taiga vegetation, Wind erosion, USSR—Krasnoyarsk.

33-2847
Applying some methods of forestry for studying topogeosystems. [Primenenie nekotorykh metodov lesovedeniia pri izuchenii topogeosistem],
Poliushkin, IU.V., *Akademiia nauk SSSR. Sibirskoe otdelenie. Institut geografii Sibiri i Dal'nego Vostoka. Doklady,* 1975, Vol.47, p.47-55, In Russian. 10 refs.
Taiga vegetation, Taiga soils, Plant ecology, Biomass, Topographic factors, Climatic factors, USSR—Irtysh River.

33-2848
Vegetation protection and long range forecasting of the development of vegetational resources of Central and Southern Siberia. [Okhrana rastitel'nosti i voprosy dolgosrochnogo prognozirovaniia osvoeniia rastitel'nykh resursov Srednei i IUzhnoĭ Sibiri],
Belov, A.V., *Akademiia nauk SSSR. Sibirskoe otdelenie. Institut geografii Sibiri i Dal'nego Vostoka. Doklady,* 1975, Vol.48, p.56-63. In Russian. 13 refs.
Taiga soils, Taiga vegetation, Plant ecology, Landscape types, Thermokarst, Swamps.

33-2849
Radiation properties of the atmosphere and the earth's surface. [Radiatsionnye kharakteristiki atmosfery i zemnoĭ poverkhnosti],
Kondrat'ev, K.IA., ed, Leningrad, Gidrometeoizdat, 1969, 564p. (Pertinent p.176-186), In Russian with English summary. 33 refs.
Albedo, Soils, Vegetation, Snow optics, Ice optics, Analysis (mathematics).

33-2850
Mathematical description of a melting snow cover. [Matematicheskoe opisanie taiushchego snezhnogo pokrova],
Trofimova, E.B., *Sredneaziatskiĭ regional'nyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.52, p.122-127, In Russian. 6 refs.
Snow stratigraphy, Snowmelt, Snow cover structure, Phase transformations, Mathematical models.

33-2851
Snow accumulation on slopes of different orientation in the Kyzylcha River experimental basin. [Snegonakoplenie na sklonakh raznoĭ ekspozitsii (na primere opytnogo basseĭna r. Kyzylcha)],
Gapishko, V.G., *Sredneaziatskiĭ regional'nyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1976, Vol.39, p.145-153, In Russian. 16 refs.
River basins, Slope processes, Slope orientation, Snow accumulation, Snow depth, Snow cover distribution, Snowmelt, USSR—Kyzylcha River.

33-2852
Evaluating the effect of avalanches on the formation of floods and mudflows. [K otsenke vliianiia lavin na formirovanie pavodkov i seleĭ],
Severskiĭ, I.V., *Sredneaziatskiĭ regional'nyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1976, Vol.39, p.154-165, In Russian. 24 refs.
Slope processes, Snow accumulation, Avalanche formation, Avalanche triggering, Snowmelt, Meltwater, Mudflows.

33-2853
Radioactive isotope techniques of studying soil moisture content in mudflow areas and forecasting mudflows. [Ispol'zovanie radioaktivnykh izotopov pri izuchenii vlazhnosti gruntov v seleopasnykh raionakh i prognozirovanii selevykh potokov],
Babinets, A.E., et al, *Problemy gidrogeologii i inzhenernogo gruntovedeniia,* 1975, No.4, p.121-123, In Russian. 6 refs.
Gudzenko, V.V.
Slope processes, Mudflows, Forecasting, Soil moisture, Measuring instruments, Radioactive isotopes, Telemetering equipment.

33-2854
Interrelationship between creep and sustained strength of clay soils. [O vzaimosviazi polzuchesti i dlitel'noĭ prochnosti glinistykh porod],
Mogilko, A.N., et al, *Problemy gidrogeologii i inzhenernogo gruntovedeniia,* 1975, No.4, p.139-142, In Russian. 6 refs.
Il'chenko, V.P.
Clays, Clay soils, Soil strength, Creep properties.

33-2855
Applying the geological similarity theory to forecasting the length of landslide cycles. [O primenenii teorii geologicheskogo podobiia dlia prognoza prodolzhitel'nosti opolznevykh tsiklov],
Rozovskiĭ, L.B., et al, *Problemy gidrogeologii i inzhenernogo gruntovedeniia,* 1975, No.4, p.143-147, In Russian. 4 refs.
Balandin, IU.G.
Slope processes, Mathematical models, Landslides.

33-2856
Finding the depth of the stable annual temperature layer and thermal properties of soils and ground at the *Feofaniia* hydrogeological research station. [Otsenka glubiny zaleganiia sloia postoiannykh godovykh temperatur i velichin termicheskikh svoĭstv pochvogruntov na gidrogeologicheskoĭ stantsii "Feofaniia"],
Rudenko, L.G., *Problemy gidrogeologii i inzhenernogo gruntovedeniia,* 1975, No.4, p.147-150, In Russian. 4 refs.
Soils, Thermal properties, Soil temperature, Temperature variations, Minerals, Thermal conductivity, Analysis (mathematics).

33-2857
Processes of natural heat transfer under permafrost conditions. ¡Protessy estestvennogo teploobmena v usloviiakh vechnoĭ merzloty¡,
Malevskiĭ-Malevich, S.P., ed, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, 128p., In Russian. For individual papers see 33-2858 through 33-2870. Refs. passim
Shur, IU.L., ed.
Permafrost thermal properties, Soil air interface, Heat transfer, Mass transfer, Phase transformations, Cryogenic soils, Heat balance, Tundra soils, Taiga soils, Forest tundra, Albedo, Aerial surveys.

33-2858
Field methods of studying heat balance. ¡Metodika polevykh teplobalansovykh issledovaniĭ¡,
Ivanova, I.I., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.4-15, In Russian.
Malevskiĭ-Malevich, S.P., Serova, N.V., Slavin-Borovskiĭ, V.B.
Cryogenic soils, Heat balance, Temperature measuring instruments, Design.

33-2859
Natural complexes of sea-shore plains in the Medvezh'e mine area. ¡Prirodnye kompleksy pribrezhnomorskikh ravnin v raĭone mestorozhdeniia Medvezh'e¡,
Moskalenko, N.G., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.16-21, In Russian. 4 refs.
Forest tundra, Mining, Human factors, Tundra soils, Continuous permafrost, Cryogenic soils, Tundra vegetation, Heat balance, Radiation balance.

33-2860
Climatic and synoptic characteristics of the field investigation area in 1975. ¡Klimaticheskaia i sinoptícheskaia kharakteristiki raĭona polevykh rabot 1975 g.¡,
Lazareva, N.A., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.22-28, In Russian. 2 refs.
Forest tundra, Arctic climate, Air temperature, Soil air interface, Heat transfer, Continuous permafrost, Heat balance.

33-2861
Calculating turbulent flow of heat and moisture from gradient measurement data. ¡O raschete turbulentnykh potokov tepla i vlagi po dannym gradientnykh izmereniĭ¡,
Legotina, S.I., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.29-39, In Russian. 29 refs.
Orlenko, L.R.
Soil air interface, Cryogenic soils, Heat transfer, Mass transfer, Analysis (mathematics).

33-2862
Calculating heat flux into soil during phase transformation. ¡O raschete potoka tepla v pochvu v usloviiakh fazovykh izmeneniĭ¡,
Serova, N.V., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.40-48, In Russian. 4 refs.
Tseĭtlin, G.Kh.
Cryogenic soils, Soil air interface, Heat transfer, Phase transformations, Active layer, Ground thawing, Analysis (mathematics).

33-2863
Results of calculating heat and moisture flow in the Nyda and Medvezh'e areas. ¡Rezul'taty rascheta turbulentnykh potokov tepla i vlagi (v raĭonakh Medvezh'ego i Nydy)¡,
Lazareva, N.A., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.49-56, In Russian. 4 refs.
Tundra soils, Soil air interface, Heat transfer, Mass transfer, Human factors, Analysis (mathematics).

33-2864
Determining thermophysical characteristics of some soil types in areas of economic development in northwestern Siberia. ¡Ob opredelenii teplofizicheskikh kbarakteristik nekotorykh tipov pochv raĭonov khoziaĭstvennogo osvoeniia severa Zapadnoĭ Sibiri¡,
Serova, N.V., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.57-68, In Russian. 3 refs.
Tundra soils, Swamps, Peat, Tundra vegetation, Soil temperature, Permafrost thermal properties.

33-2865
Methods and results of helicopter surveys of radiation characteristics of some underlying surfaces. ¡Metodika i rezul'taty vertoletnykh issledovaniĭ radiatsionnykh kharakteristik nekotorykh vidov podstilaiushcheĭ poverkhnostiĭ¡,
Malevskiĭ-Malevich, S.P., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.402, p.69-74, In Russian. 4 refs.
Slavin-Borovskiĭ, V.B.
Peat, Soil air interface, Albedo, Heat balance, Aerial surveys, Helicopters, Tundra, Forest tundra, Taiga.

33-2866
Thermal balance at some surfaces in areas of economic development of northwestern Siberia during the seasonal thawing of ground. ¡Teplovoĭ balans nekotorykh vidov poverkhnosti raĭonov osvoeniia severa Zapadnoĭ Sibiri v period sezonnogo protaivaniia gruntov¡,
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Malevskiĭ-Malevich, S.P., Serova, N.V.
Taiga soils, Tundra soils, Loams, Peat, Soil air interface, Albedo, Heat balance, Forest tundra.

33-2867
Influence of vegetation removal on changes in heat balance components of soil surfaces. ¡Vliianie udaleniia rastitei'nogo pokrova na izmenenie komponent teplovogo balansa¡,
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Malevskiĭ-Malevich, S.P., Shur, IU.L.
Tundra soils, Taiga soils, Tundra vegetation, Taiga vegetation, Heat balance, Albedo, Soil air interface, Environmental impact, Forest tundra.

33-2868
Detailed study of natural complexes in northwestern Siberia. ¡Opyt detal'nogo izucheniia prirodnykh kompleksov severa Zapadnoĭ Sibiri¡,
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Landscape types, Tundra vegetation, Patterned ground, Landscape development, Swamps, Peat, Soil formation, Soil temperature, Tundra soils, Vegetation factors.

33-2869
Heat transfer between soil and atmosphere under natural and disturbed tundra conditions. ¡Teploobmen pochvy s atmosferoĭ v estestvennykh i narushennykh tundrovykh usloviiakh¡,
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Tundra vegetation, Tundra soils, Soil air interface, Heat transfer, Soil temperature, Environmental impact.

33-2870
Calculating heat flow in thawing soils. ¡Raschet potoka tepla v protaivaiushcheĭ pochve¡,
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Palagin, E.G.
Thaw depth, Tundra soils, Active layer, Thawing rate, Ground thawing, Heat transfer, Phase transformations, Mass transfer, Ground ice, Vegetation factors, Analysis (mathematics).

33-2871
Cryogenic phenomena of highlands. ¡Kriogennye iavleniia vysokogoriĭ¡,
Gorbunov, A.P., ed, Novosibirsk, Nauka, 1978, 150p., In Russian. For individual papers see 33-2872 through 33-2882. Refs. passim.
Cryogenic processes, Permafrost distribution, Periglacial processes, Slope processes, Cryogenic formations, Pingos, Naleds, Ground ice, Permafrost structure, Rock glaciers, Glacier movement, Avalanches, Landslides, Mudflows, Glacial hydrology, USSR—Tien Shan.

33-2872
Cryogenic phenomena of the Pamir-Alai Mountains. ¡Kriogennye iavleniia Pamiro-Alaia¡,
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Cryogenic processes, Periglacial processes, Permafrost distribution, Ground ice, Pingos, Naleds, Frost heave, Permafrost structure, Permafrost beneath lakes, USSR—Pamirs.

33-2873
Formation and ablation of naleds in the medium altitude zone of the Altais. ¡K usloviiam formirovaniia i abliatsii naledeĭ v srednegornoĭ zone Altaia¡,
Krivonosov, B.M., Kriogennye iavleniia vysokogoriĭ (Cryogenic phenomena of highlands) edited by A.P. Gorbunov, Novosibirsk, Nauka, 1978, p.25-36, In Russian. 4 refs.
Naleds, Ice formation, Alimentation, Icing rate, Ice surveys, Ice structure, Impurities, Stratification, Ablation, Snow cover effect.

33-2874
Thufur in the Caucasus. ¡O tufurakh Kavkaza¡,
Bondyrev, I.V., Kriogennye iavleniia vysokogoriĭ (Cryogenic phenomena of highlands) edited by A.P. Gorbunov, Novosibirsk, Nauka, 1978, p.36-42, In Russian. 7 refs.
Periglacial processes, Pingos, Frost heave, Hummocks, Ground ice, Ice lenses.

33-2875
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Malsuradze, G.M.
Permafrost distribution, Periglacial processes, Cryogenic relief, Nivation, Slope processes, Solifluction, Patterned ground, USSR—Caucasus.

33-2876
Rock glaciers (state of the problem). ¡Kamennye gletchery (sostoianie problemy)¡,
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Rock glaciers, Glacier ice, Glacier movement, Glacier formation, Glacier melting.

33-2877
Vegetation effect on the nature of seasonal freeze thaw in the Zailiĭskiy Alatau Mountains. ¡Vliianie rastitel'nosti na kharakter sezonnogo promerzaniia i protaivaniia v gorakh Zailiĭskogo Alatau¡,
Severskiĭ, E.V., Kriogennye iavleniia vysokogoriĭ (Cryogenic phenomena of highlands) edited by A.P. Gorbunov, Novosibirsk, Nauka, 1978, p.73-85, In Russian. 16 refs.
Permafrost distribution, Cryogenic processes, Alpine vegetation, Landscape types, Frost penetration, Soil temperature, USSR—Zailiyskiy Alatau.

33-2878
Rock glaciers in the Bol'shaya Almatinka River Basin (Zailiyskiy Alatau). ¡Kamennye gletchery basseĭna r. Bol'shoĭ Almatinki (Zailiĭskiĭ Alatau)¡,
Glazovskiĭ, A.F., Kriogennye iavleniia vysokogoriĭ (Cryogenic phenomena of highlands) edited by A.P. Gorbunov, Novosibirsk, Nauka, 1978, p.85-92, In Russian. 10 refs.
Rock glaciers, Structures, Glacier ice, Glacier movement, Creep, Solifluction.

33-2879
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Nemov, A.E.
Permafrost distribution, Frozen rock temperature, Snow cover effect, Snow depth, Active layer, Permafrost structure, Permafrost thickness, Topographic factors, USSR—Tien Shan.

33-2880
Ground ice structures in the lacustrine deposits of the East Pamirs and Central Tien Shan. [K stroeniiu podzemnykh l'dov ozernykh tolshch Vostochnogo Pamira in Vnutrennego Tian' Shania],
Ermolin, N.D., Kriogennye iavleniia vysokogorii (Cryogenic phenomena of highlands) edited by A.P. Gorbunov, Novosibirsk, Nauka, 1978, p.99-111, In Russian. 9 refs.
Lacustrine deposits, Ground ice, Ice structure, Permafrost distribution, Permafrost structure, Classifications, USSR—Pamirs, USSR—Tien Shan.

33-2881
Conditions of permafrost formation in the Chatyrkel' Lake area. [Usloviia formirovaniia merzlykh otlozhenii oz. Chatyrkel'],
Ermolin, E.D., Kriogennye iavleniia vysokogorii (Cryogenic phenomena of highlands) edited by A.P. Gorbunov, Novosibirsk, Nauka, 1978, p.112-126, In Russian. 13 refs.
Permafrost origin, Permafrost distribution, Lacustrine deposits, Ground ice, Ice veins, Cryogenic formations, Thermokarst, Pingos, USSR—Tien Shan.

33-2882
Results of a study of temperature regime and seasonal soil-ground freezing in relation to avalanche formation conditions in Zailiyskiy Alatau. [Nekotorye rezul'taty issledovanii temperaturnogo rezhima i sezonnogo promerzaniia pochvogruntov v sviazi s otsenkoi uslovii lavinoobrazovaniia v Zailiiskom Alatau],
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Severskii, E.V., Kuzhbanov, A.B.
Slope processes, Avalanche formation, Soil freezing, Thermal regime, Mudflows, Landslides, Meltwater, Glacial hydrology, Alpine vegetation, Vegetation effect, Snow cover effect, USSR—Zailiyskiy Alatau.

33-2883
Basal sliding and conditions at the glacier bed as revealed by bore-hole photography.
Engelhardt, H.F., et al, *Journal of glaciology,* 1978, 20(84), p.469-508, In English with French and German summaries. 43 refs.
Harrison, W.D., Kamb, B.
Basal sliding, Glacier beds, Boreholes, Photography, Glacier flow.

33-2884
Equilibrium state of the eastern half of the Ross Ice Shelf.
Thomas, R.H., et al, *Journal of glaciology,* 1978, 20(84), p.509-518, In English with French and German summaries. 19 refs.
Bentley, C.R.
Ice shelves, Mass balance, Ice volume, Ice cover thickness, Antarctica—Ross Ice Shelf.
Measurements of ice thickness, velocity, snow accumulation rates, and surface strain-rates are used to examine the state of equilibrium of three flow bands of the Ross Ice Shelf. The analysis gives the rate of thickening of the ice shelf in terms of the basal freezing rate, which is unknown. However, indirect evidence suggests that the basal flux ranges from a small value of freezing in the south to a melting rate of about one meter of ice per year at the ice front. If these values are correct, then the flow band in the south-east corner of the ice shelf appears to be thickening at an average value of (34) cm of ice per year. Persistent thickening at this rate must lead to grounding of large areas of the ice shelf. This would restrict drainage from west antarctic ice streams which feed this part of the ice shelf, and these would tend to thicken and advance their grounding lines into the ice shelf. Further north, near the RISP bore-hole site, the ice shelf is probably in equilibrium. The largest flow band is to the south and east of Roosevelt Island, and this also may be in equilibrium if there is significant bottom melting from ice shelf that is more than 100 km from the ice front. (Auth.)

33-2885
Study of several pressure ridges and ice islands in the Canadian Beaufort Sea.
Hnatiuk, J., et al, *Journal of glaciology,* 1978, 20(84), MP 1187, p.519-532, In English with French and German summaries. 3 refs.
Kovacs, A., Mellor, M.
Pressure ridges, Ice islands, Ice cover thickness, Profiles.
The environmental conditions in the southern Beaufort Sea are described, with special emphasis on pressure ridges and ice islands. Techniques for determining the geometric configurations and the physical and mechanical properties of sea-ice structures and ice islands are described. Profiles of pressure ridges were determined by surface surveys, drill-hole probes and side-looking sonar scanning. Multi-year pressure ridges with thicknesses up to 20 m and widths up to 120 m were examined in detail. The first-year ridge of 22 m thickness and 100 m width was studied. Results are given for several multi-year and the first-year ridges. Information obtained from dives under the ice is also given. Corresponding data are given for grounded ice islands, with emphasis on contact between the ice and sea bed. A 20 m thick ice-island fragment grounded in 15 m of water was one of several investigated. Measurements of temperature, salinity, tensile strength, and compressive strength are given for ice taken from old pressure ridges; and factors influencing the interpretation of test data are discussed.

33-2886
Numerical modelling of iceberg towing for water supplies—a case study.
Job, J.G., *Journal of glaciology,* 1978, 20(84), p.533-542, In English with French and German summaries. 13 refs.
Ice models, Ice melting, Ice deterioration, Ice (water storage), Water supply, Iceberg towing.
The towing of unprotected icebergs from the antarctic continent (66S) to latitude 38S, has been simulated using an explicit hydrodynamic model and an extended two-dimensional melting model. It was found that nominal towing accelerations in excess of .00002 m/sec sq were required to deliver ice over this route in most circumstances, and minimum energy consumptions were obtained at accelerations around .0001 m/sec sq. Unprotected icebergs could be delivered with about 50% yield to latitude 38S, but the rate of deterioration in the warm waters indicates that protection would be required for longer journeys. The towing simulation was most sensitive to north-south current components, the total towing distance, and the rate of iceberg deterioration. Efforts directed towards locating suitable icebergs in the region of 50S to 60S, and towards increasing knowledge of the changing current patterns in the Southern Ocean would be most valuable, as would a knowledge of the mechanisms and rates of deterioration of icebergs in warm seas. (Auth.)

33-2887
Direct determination of an upper limit for the electrical charge on dislocations in ice.
Joncich, D.M., et al, *Journal of glaciology,* 1978, 20(84), p.543-546, In English with French and German summaries. 11 refs.
Holder, J., Granato, A.V.
Electric charge, Ice electrical properties, Dislocations (materials).

33-2888
Fabric and origin of lateral moraines, Bethartoli Glacier, Garhwal Himalaya, India.
Osborn, G.D., *Journal of glaciology,* 1978, 20(84), p.547-553, In Englsih with French and German summaries. 4 refs.
Glacial till, Moraines, Structural analysis.

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Ice-wedge ice, Mackenzie Delta-Tuktoyaktuk Peninsula area, N.W.T., Canada.
Gell, W.A., *Journal of glaciology,* 1978, 20(84), p.555-562, In English with French and German summaries. 14 refs.
Ice wedges, Ground ice, Ice growth, Ice crystal structure.

33-2890
Fabrics of icing-mound and pingo ice in permafrost.
Gell, W.A., *Journal of glaciology,* 1978, 20(84), p.563-569, In English with French and German summaries. 23 refs.
Pingos, Ground ice, Ice structure, Soil structure.

33-2891
Disruption of bedrock by the growth and collapse of ice lenses.
Thom, G., *Journal of glaciology,* 1978, 20(84), p.571-575, In English with French and German summaries. 3 refs.
Ice lenses, Periglacial processes, South Shetland Islands.
Hummocks and hollows were found developed in bedrock in the South Shetland Islands, Antarctica. Excavation revealed an ice lens 60 cm thick beneath a hummock. A cycle for the formation of the hummocks and hollows by the growth and collapse of ice lenses is suggested. (Auth.)

33-2892
Inexpensive tensiometer for snow-melt research.
Wankiewicz, A., et al, *Journal of glaciology,* 1978, 20(84), p.577-584, In English with French nd German summaries. 5 refs.
DeVries, J.
Snow hydrology, Capillarity, Snow pressure, Measuring instruments.

33-2893
Determination of the water content of snow from the study of electromagnetic wave propagation in the snow cover.
Tobarias, J., et al, *Journal of glaciology,* 1978, 20(84), p.585-592, In English with French and German summaries. 4 refs.
Saguet, P., Chilo, J.
Snow water content, Electromagnetic prospecting, Wave propagation.

33-2894
Recent decline in available moisture in northern Victoria Land, Antarctica.
Mayewski, P.A., et al, *Journal of glaciology,* 1978, 20(84), p.593-594, In English with French and German summaries. 2 refs.
Attig, J.W., Jr.
Moisture, Glacier oscillation, Snow cover, Antarctica—Victoria Land.
Evidence from two areas in northern Victoria Land, Antarctica, demonstrate that available moisture has been declining since at least 1,265 B.P. The cause is not known. (Auth.)

33-2895
Petermann Gletscher: possible source of a tabular iceberg off the coast of Newfoundland.
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Icebergs, Drift.

33-2896
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Knighton, A.D., et al, *Journal of glaciology,* 1978, 20(84), p.598-599, 3 refs.
Theakstone, W.H.
Glaciers, Meltwater, Water flow, Flow rate.

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Adsorption, Temperature effects, Vapor pressure, Construction materials, Frost resistance, Cryobiology, Freeze thaw cycles.

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Liquids, Films, Ice solid interface, Mathematical models.

33-2899
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Worsfold, R.D., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* Nov. 1977, No.77-37, 57p., 4 refs.
Snow electrical properties, Ice electrical properties, Snow dielectrics, Ice dielectrics, Electric measuring instruments.

33-2900
Shoe Cove satellite data assistance to Canada's cold ocean resource development.
Wedler, E., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* May 1978, No.78-3, 17 leaves, 9 refs. Paper presented at the 92nd Annual EIC Conference, St. John's, Newfoundland, May 24-27, 1978.
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Remote sensing, Spaceborne photography, Data transmission, Sea ice.

33-2901
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Infrared radiation, Surface temperature, Airborne equipment, Sea ice, Data processing.

33-2902
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Strong, D., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* Feb. 1, 1978, No.77-35, 163p., 21 refs.
Radar echoes, Ice cover thickness, Snow depth, Ice cores, Snow cover structure, Sea ice, Physical properties.

33-2903
1977 drainage of the Austre Okstindbreen ice-dammed lake, its causes and consequences.
Theakstone, W.H., *Norsk geografisk tidsskrift,* 1978, 32(4), p.159-171, 35 refs.
Glacial lakes, Ice dams, Glacial rivers, Drainage, Water pressure.

33-2904
Full-depth pavement considerations in seasonal frost areas.
Eaton, R.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Feb. 1979, MP 1188, 24p., 8 refs. Paper presented at the annual meeting of the Association of Asphalt Paving Technologists, Denver, Colorado, Feb. 15-17, 1979.
Joubert, R.H.
Bituminous concretes, Seasonal freeze thaw, Frost resistance, Frost penetration, Subgrade preparation, Frost heave.
Two full-depth pavement sections were built on highly frost-susceptible subgrades that had been properly prepared. Suitable structural and service performances were achieved in spite of substantial, though uniform, frost heaves. A full-depth pavement built on a local municipal street has not approached structural failure. However, poor service performance caused by differential heaves and severe differences at surface castings has resulted. This paper reports on these studies and attempts to underscore the importance of proper design and construction of pavements on highly frost-susceptible soils. Particular emphasis is placed on the quality of subgrade preparation. Finally, the incorporation of transition sections at surface castings is considered necessary to diminish differential heave at the castings.

33-2905
Design of airfield pavements for seasonal frost and permafrost conditions.
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Johnson, T.C.
Airports, Bituminous concretes, Subgrade preparation, Seasonal freeze thaw, Frost penetration, Frost heave.

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Radar echoes, Sea ice, Photointerpretation, Ice cover thickness, Ice structure.

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Stickney, A.R.
Sewage treatment, Sludges, Desiccation, Freeze thaw cycles.

33-2908
Bogs in the tundra zone of Siberia.
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Swamps, Tundra terrain, Patterned ground, Ground ice, Tundra vegetation, Peat.

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Can paludification be stopped in the taiga.
Kriuchkov, V.V., *National Research Council, Canada. Technical translation,* 1978, TT-1922, 20p., 6 refs. For Russian original see 30-3144.
Taiga soils, Taiga vegetation, Forests, Swamps, Discontinuous permafrost.

33-2910
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Thermal insulation, Heat loss, Residential buildings.

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Meetings, Aircraft icing, Environmental tests, Test equipment, Meteorological factors.

33-2912
Some recent results on icing parameters.
Kleuters, W., et al, *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report,* Nov. 1978, No.127, AGARD Fluid Dynamics Panel Round-table Discussion on Aircraft Icing, Ottawa, Sep. 30, 1977. Proceedings, p.1/1-1/18, 6 refs.
Wölfer, G.
Aircraft icing, Meteorological factors, Mathematical models, Statistical analysis.

33-2913
Helicopter ice detection, icing severity and water content measurement.
Stallabrass, J.R., *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report,* Nov. 1978, No.127, AGARD Fluid Dynamics Panel Round-table Discussion on Aircraft Icing, Ottawa, Sep. 30, 1977. Proceedings, p.2/1-2/7, 2 refs.
Helicopters, Ice detection, Ice accretion, Cloud droplets, Humidity, Measuring instruments.

33-2914
Icing trials on the front fuselage and engine intakes of helicopters at conditions simulating forward flight.
Ashwood, P.F., et al, *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report,* Nov. 1978, No.127, AGARD Fluid Dynamics Panel Round-table Discussion on Aircraft Icing, Ottawa, Sep. 30, 1977. Proceedings, p.3/1-3/16, 2 refs.
Swift, R.D.
Helicopters, Ice accretion, Environment simulation, Environmental tests.

33-2915
Ice accertion and its effect on aerodynamics of unprotected aircraft components.
Laschka, B., et al, *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report,* Nov. 1978, No.127, AGARD Fluid Dynamics Panel Round-table Discussion on Aircraft Icing, Ottawa, Sep. 30, 1977. Proceedings, p.4/1-4/22, 16 refs.
Jesse, R.E.
Aircraft icing, Ice accretion, Countermeasures, Environment simulation.

33-2916
Theoretical and experimental means to predict ice accretion shapes for evaluating aircraft handling and performance characteristics.
Wilder, R.W., *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report,* Nov. 1978, No.127, AGARD Fluid Dynamics Panel Round-table Discussion on Aircraft Icing, Ottawa, Sep. 30, 1977. Proceedings, p.5/1-5/20, 7 refs.
Ice accretion, Ice forecasting, Aircraft icing, Performance.

33-2917
Icing test facilities and test techniques in Europe.
Pierre, M., et al, *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report* Nov. 1978, No.127, AGARD Fluid Dynamics Panel Round-table Discussion on Aircraft Icing, Ottawa, Sep. 30, 1977. Proceedings, p.6/1-6/11, 5 refs.
Vaucheret, X.
Aircraft icing, Test chambers, Environmental tests, Wind tunnels, Environment simulation.

33-2918
Techniques and facilities used at the ONERA Modane Centre for icing tests.
Armand, C., et al, *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report,* Nov. 1978, No.127, AGARD Fluid Dynamics Panel Round-table Discussion on Aircraft Icing, Ottawa, Sep. 30, 1977. Proceedings, p.A6/1-A6/23, In English with French and German summaries. 19 refs.
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equally as devastating to visibility in the vicinity of the pond. During the winter of 1975-76, suppression tests were continued using films of hexadecanol, mixes of hexadecanol and octadecanol, and ethylene glycol monobutyl ether (EGME). Suppression effectiveness at colder temperatures was studied and limits to the techniques were probed. A reinforcing grid was constructed that prevented breakup of the film by wind and water currents. Lifetime tests indicated that EGME degrades much more slowly than either hexadecanol or the hexadecanol-octadecanol mix. All the films were found to be very effective fog reducers at warmer temperatures but still allowed 20% to 40% of normal evaporation to occur. The vapor thus produced was sufficient to create some ice fog at lower temperatures, but this ice fog occurred less frequently and was more quickly dispersed than the thick fog that was present before application of the films.

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Ice conditions, Ice reporting, Aerial reconnaissance, Sea ice.

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Communication in the work place: an ecological perspective.
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Cold weather construction, Data transmission, Human factors, Environments.
Patterns of communication and social interaction within a work organization are significantly influenced by architecture. Nearly all work organizations are dependent upon information flow, both informal and formal, between coworkers. As a rule, the more open and informal the communication, the more productively and efficiently the organization operates. The architectural design concept of focal points is presented as a strategy for planning the work facility for improved informal communication. Examples of energy-efficient building design schemes for cold regions are presented. These prototype buildings combine design for improved worker efficiency with thermal efficiency.

33-2978
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Aerial photography, Glaciology.
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Ice detection, Roads, Measuring instruments, Microwaves, Radiometry, Bridges.

33-2980
Detection of preferential icing on bridges, using traffic and meteorological data.
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Ice detection, Bridges, Ice forecasting, Meteorological data.

33-2981
Climatonomical modeling of temperature response to dust contamination of antarctic snow surfaces.
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Climate, Mathematical models, Albedo, Snow surface temperature, Heat transfer, Snow air interface, Antarctica—South Pole.
Monthly averages of the surface energy balance are parameterized, resulting in a reduced solar forcing function and a nondimensional time scale for computing the thermal response at the air-snow interface by numerical forward integration. The climatonomic transform of the balance equation assesses surface-temperature perturbations resulting from parameter modifications that simulate effects of dust contamination of a snow surface. Three climatonomical model experiments permit these conclusions: 1) an albedo reduction increases primarily the summer temperatures; 2) an emissivity decrease raises the temperature of all months nearly uniformly; and 3) the thermally induced feedback on submedium structure (if summer melting is instigated) increases the storage capacity and reduces spring and summer temperatures with compensating rise in autumn and winter temperature. Quantitative results are exemplified by assumed modification of conditions that exist at the South Polar Plateau. (Auth.)

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Snow compaction, Snow mechanics, Firnification, Ice density, Salinity, Meltwater, Wet snow.

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33-2984
Pilot tests of satellite snowcover/runoff forecasting systems.
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Snow cover distribution, Runoff forecasting, Remote sensing, Spacecraft, Mapping, Landsat.

33-2985
Solid waste disposal by landspreading techniques.
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Waste disposal, Sludges, Land reclamation.
Landspreading is the disposal of solid waste by mixing compostable materials into the topsoil so that the decomposition process remains aerobic. Some of the advantages for landspreading include minimum settling of the land, no formation of undesirable odors or leachates, a potential for the support of vegetation, continued usefulness of the land, restoration in a minimum amount of time, and improvement in soil texture and water retention. Construction industry rototillers were selected as the most likely candidates for successfully homogenizing solid waste into the topsoil to depths up to 20 inches. Three types of these machines in two types of soil were studied, as well as the agricultural, chemical, and biological aspects of the process.

33-2986
Effects of sludge application on soil water and vegetation in a northern hardwood forest in New England.
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Hornbeck, J.W., Pierce, R.S.
Waste disposal, Vegetation, Forests, Sewage treatment, Sludges.

33-2987
Survey of icing conditions for marine gas turbines.
Swan, K.T., *U.S. Naval Air Propulsion Test Center. Report,* Sep. 1977, NAPTC-PE-114, 70p. ADA-045 558.
Ships, Icing, Turbines.

33-2988
Gravel removal studies in selected Arctic and subarctic streams in Alaska.
Woodward-Clyde Consultants, San Francisco, 1976, 134p. PB-272 991.
Streams, Gravel, Environmental impact, United States—Alaska.

33-2989
State-of-the-art survey and economic comparison of freezing processes.
Johnson, W.E., Dec. 1976, 75p., For another version see 33-745.
Desalting, Artificial freezing, Water supply, Economic analysis.

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Khan, A.R., Mulford, S.F.
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Corrosion, Antifreezes, Vehicles.

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33-2993
Final EIS/EIR Las Virgenes-Triunfo Malibu-Topanga area wide facilities plan.
U.S. Environmental Protection Agency. Region 9, San Francisco, Calif., 1977, 477p., PB-273 524, See also 33-2994.
Waste disposal, Waste treatment, Water treatment, Irrigation, Sewage treatment, Sewage disposal.

33-2994
Final EIS/EIR Las Virgenes-Triunfo Malibu-Topanga area wide facilities plan. Volume 2. Appendices.
U.S. Environmental Protection Agency. Region 9, San Francisco, Calif., 1976, 583p., PB-273 525, See also 33-2993.
Environmental impact, Sewage treatment, Sewage disposal, Irrigation.

33-2995
Ice fog (a bibliography with abstracts).
Brown, R.J., comp, Springfield, Va., National Technical Information Service, 1977, 62p., NTIS/PS-77/1014, Covers the period from 1974 through Oct. 1977.
Bibliographies, Ice fog.

33-2996
Some results from a joint Swedish-Finnish sea ice experiment, March 1977.
Omstedt, A., et al, *Sweden. Meteorlogiska och hydrologiska institutet. SMHI rapporter,* 1978, No.RMK 10, c50 leaves, In English with Swedish summary. 4 refs.
Sahlberg, J.
Sea ice, Drift, Wind velocity, Wind direction, Ocean currents, Models.

33-2997
Grain coarsening of ice particles immersed in pure water.
Tushima, K., *Seppyo,* Dec. 1978, 40(4), p.1-11, In Japanese with English summary. 16 refs.
Ice structure, Boundary value problems, Mass transfer.

33-2998
Measurement of falling velocity of snow using a laser Doppler velocimeter.
Abe, T., et al, *Seppyo,* Dec. 1978, 40(4), p.12-15, In Japanese with English summary. 4 refs.
Sasaki, O.
Snowfall, Velocity measurement, Measuring instruments.

33-2999
On the power required for driving the blower of a rotary type snow removal machine.
Kuriyama, H., et al, *Seppyo,* Dec. 1978, 40(4), p.16-23, In Japanese with English summary. 9 refs.
Shibuya, M.
Snow removal equipment, Engines.

33-3000
Cost evaluation study of snow removal by heating-system in a city in Japan.
Oshima, M., *Seppyo,* Dec. 1978, 40(4), p.24-36, In Japanese with English summary. 11 refs.
Snow removal, Heating, Water pipelines, Cost analysis.

33-3001
Roadside planting of snow break trees.
Saito, S., *Seppyo,* Dec. 1978, 40(4), p.37-43, In Japanese. 23 refs.
Trees (plants), Snowdrifts, Roads.

33-3002
Workshop and two tutorial seminars in Zvenigorod, February 1978. [Rabochee soveshchanie i dve shkoly-seminara v Zvenigorode v fevrale 1978 goda],
Voloshina, A.P., et al, *Adademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.5-28, In Russian.
Glaciology, Research projects, Meetings.
Comprehensive information is given on three seminars. Work done in the Arctic, the Antarctic and mountains of middle latitude is discussed seperately for each sponsoring institution.

33-3003
Resolutions of a Workshop of the Glaciological Section, Feb. 1978. [Rezoliutsiia Rabochego soveshchaniia Sektsii gliatsiologii, fevral' 1978 g.], *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.28-31, In Russian.
Glaciology, Research projects, Meetings.
Activities and accomplishments of institutions in glaciological research in the Arctic and Antarctic for 1977 are described. The workshop also developed the program for 1978, which includes plans to increase efforts in paleoglaciological studies in the Antarctic, as well as continued work on the new Antarctic atlas.

33-3004
All-Union conference on problems of naled formation. [Vsesoiuznoe soveshchanie po problemam naledoobrazovaniia],
Alekseev, V.P., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.31-38, In Russian.
Lugovskaia, E.A.
Naleds, Glaciology, Meetings, Research projects, Icing.

33-3005
Symposium on Physics and Chemistry of Ice and the meeting of the Council of the International Antarctic Glaciological Project. [Simpozium po fizike i khimii l'da i zasedanie soveta Mezhdunarodnogo antarkticheskogo gliatsiologicheskogo proekta],
Korotkevich, E.S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.38-41, In Russian.
Ice crystals, Ice composition, Ice physics, Meetings, Glaciology.
A total of 58 papers based on ice crystal studies in the Antarctic were presented at the Symposium on Physics and Chemistry of Ice at Cambridge, England, Sep. 10-24, 1977. Studies carried out by the Soviet Union, U.S.A., Australia, Japan and England were concerned with ice crystal structure and its deformation due to temperature variations and pressure. The IAGP meeting took place with the participation of Australia, England, the Soviet Union, the United States and France. Reports of work done in 1976/77 and plans for future research were presented; the latter concerned routes for radiosounding of ice, locations for deep drilling, and traverses for general glaciological and geophysical surveys. Summaries of the papers are given.

33-3006
Regional seminar on ice, snow and avalanches in India, March 1978. [Regional'nyĭ uchebnyĭ seminar po l'du, snegu i lavinam v Indii v marte 1978 g.],
Losev, K.S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.41-42, In Russian.
Ice surveys, Avalanches, Snow hydrology, Mountains.

33-3007
Detection of surging glaciers using aerial photography and LANDSAT imagery. [Obnaruzhenie pul'siruiushchikh lednikov s pomoshch'iu aerofotos"emki i snimkov so sputnika Landsat],
Krimmel, R.M., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.43-46, 141-133, In Russian and English. 3 refs. Discussion p.121,181.
Glacier surges, Remote sensing, Aerial photographs, LANDSAT.

33-3008
Identification of unstable glaciers intermediate between normal and surging glaciers. [Identifikatsiia neustoĭchivykh lednikov, promezhutochnykh mezhdu normal'nymi i pul'siruiushchimi lednikami],
Mayo, L.R., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.47-55, 133-135, In Russian and English. 5 refs. Discussion p. 121-122, 182-183.
Glacier oscillation, Remote sensing, LANDSAT, Aerial photographs, Classifications.

33-3009
Identification of surging glaciers by morphometric characteristics. [Identifikatsiia pul'siruiushchikh lednikov po morfometricheskim kharakteristikam],
Glazyrin, G.E., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.55-58, 136-138, In Russian and English. 10 refs. Discussion p.122-123, 183-184.
Glacier surges, Glacial features, Glacier surfaces.

33-3010
Summary of research on a surge-type glacier in Alaska. [Itogi issledovanĭ odnogo iz pul'siruiushchikh lednikov Aliaski],
Bindschadler, R., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.58-63, 138-142, In Russian and English. 31 refs.
Harrison, W., Raymond, C.
Glacier surges, Ice temperature, Glacier surfaces, Glacier flow, Glacier mass balance, Analysis (mathematics).

33-3011
Oscillations of the Obruchev Glacier (polar Urals) in 1953-1974. [Kolebaniia lednika Obrucheva (poliarnyĭ Ural) v 1953-1974 g.],
Shumskiĭ, P.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.64-70, 142-147, In Russian and English. 4 refs.
Krass, M.S.
Glacier oscillation, Observation, Analysis (mathematics).

33-3012
Study of the mechanism of mountain glacier oscillation. [Izuchenie mekhanizma kolebaniĭ gornykh lednikov],
Makarevich, K.G., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.70-74, 148-150, In Russian and English. 5 refs.
Makarevich, A.K.
Glacier oscillation, Glacier surfaces, Glacier flow, Mountain glaciers, Flow rate.

33-3013
Oscillation of the Shumskiy Glacier (Dzhungarskiy Alatau) in 1966-1974. [Kolebaniia lednika Shumskogo (Dzhungarskiĭ Alatau) v 1966-1974 gg.],
Shumskiĭ, P.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.33, p.75-76, 150-152, In Russian and English. 1 ref. Discussion p. 123, 184.
Krass, M.S., Cherkasov, P.A.
Glacier oscillation, Ice volume, Glacier mass balance.

33-3014
Readvance of the Allalin Glacier after the ice avalanche of 1965. (Vosstanovlenie lednika Alalin posle ego obvala v 1965 godu)
Röthlisberger, H., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.77-93, 142-164, In Russian and English. 14 refs. Discussion p.123-124, 184.
Kasser, P.
Glacier mass balance, Glacier oscillation.

33-3015
Role of self-oscillation in the dynamics of glacial systems. (Rol' avtokolebanii v dinamike lednikovykh sistem)
Rototaev, K.P., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.93-103, 164-168, In Russiah and English. Discussion p.124, 184.
Glacier oscillation, Glacial features, Dynamic properties, Climatic factors.

33-3016
Surges of Spitsbergen glaciers as features related to climate. (Podvizhki lednikov Shpitsbergena kak klimaticheski obuslovlennoe iavlenie)
Baranowski, S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.103-106, 168-170, In Russian and English. 18 refs. Discussion p.124, 184-185.
Glacier surges, Climatic changes, Glacier mass balance, Glacial features, Ice plasticity, Ice deformation.

33-3017
Thickening of the Khumbu Glacier flowing from Mt. Everest, East Nepal. (Utolshchenie lednika Kkhumbu, stekaiushchego s gory Everest (Vostochnyi Nepal))
Higuchi, K., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.107-112, 171-175, In Russian and English. 10 refs.
Mae, S., Kodama, H.
Glacier oscillation, Glacier mass balance, Glacier flow, Glacier tongues, Mountain glaciers, Seasonal variations, Climatic factors, Distribution.

33-3018
Observations of the meltwater permeation in the near-surface ice layers of the Mendenhall Glacier, southeast Alaska. (Nabliudeniia za prosachivaniem talof vody v pripoverkhnostnykh ledianykh sloiakh lednika Mendenkhol (IUzhnaia Aliaska))
Wakahama, G., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.112-116, 175-178, In Russian and English. 6 refs. Discussion p.124,185.
Glacier melting, Glacial hydrology, Meltwater, Subglacial drainage, Subsurface drainage, Glacier ablation, Time factor, Capillary ice.

33-3019
Effect of nocturnal precipitation on the mass balance of the Richa Samba Glacier, Hidden Valley, Nepal. (Vliianie nochnykh osadkov na balans massy lednika Rikkha Samba, dolina Khiden, Nepal)
Higuchi, K., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.117-121, 178-181, In Russian and English. 6 refs. Discussion p.125, 185.
Glacier mass balance, Glacier ablation, Precipitation (meteorology), Glacier oscillation, Temperature effects.

33-3020
Glaciological investigations along the Mirny-Pionerskaya-Dome C profile. (Gliatsiologicheskie issledovaniia v marshrute Mirnyi-Pionerskaia-Kupol C)
Korolev, P.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.191, In Russian.
Rudoi, A.N.
Snow accumulation, Snow density, Snow temperature, Ice temperature, Firn, Ice cover thickness, Antarctica—Pionerskaya Station.
Glacial and geomagnetic studies were carried out in Jan.-March 1978 during the Mirnyy-Pionerskaya-Dome C traverse. General data on the accumulation and density of snow, obtained from 335 stakes along the traverse, are indicated. The settling of the snow-firn layer, isotope content and snow and ice temperature were examined in three boreholes. N. Young, a scientist from the University of Melbourne, participated in gravimetric, magnetometric and barometric observations.

33-3021
Possible surges of glaciers in the Eurasian Arctic zone. (Vozmozhnye podvizhki lednikov evraziatskoi arkticheskoi zony)
Bozhinskii, A.N., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.192-196, In Russian with English summary. 9 refs.
Glacier surges, Glacier oscillation, Slope orientation, Climatic changes, Arctic regions.

33-3022
Rate of ice melting in water. (O skorosti taianiia l'da v vode)
Khodakov, V.G., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.196-200, In Russian with English summary. 11 refs. Includes discussion.
Godeichik, A.V., Moiseeva, G.P.
Iceberg towing, Marine transportation, Ice melting, Ice thermal properties, Water supply, Analysis (mathematics).
Theoretical aspects of ice melting in water are considered. Experimental data, obtained on the Bolshoye Khadatinskoye Lake (Polar Urals) and in the laboratory of the Institute of Geography (Moscow), along with available literature permitted to deduce a criterion equation and formula. Melting of an iceberg transported from Antarctica to Australia and Arabia was calculated on the basis of the formula. Calculations show that without special thermal protection the iceberg will be totally consumed by underwater melting.

33-3023
Dynamically unstable glaciers in the Central Pamirs. (Dinamicheski nestabil'nye ledniki Tsentral'nogo Pamira)
Rototaev, K.P., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.201-207, In Russian with English summary.
Glacier oscillation, Glacier movement, Glacier surges, Glacier surfaces, USSR—Pamirs.

33-3024
Water-ice balance of Spitsbergen glaciers in the 1975/1976 balance year. (Vodnoledovyi balans lednikov Shpitsbergena v 1975/76 balansovom godu)
Gus'kov, A.S., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.207-211, In Russian with English summary. 2 refs.
Gordeichik, A.V.
Glacial hydrology, Glacier mass balance, Snow accumulation, Snow surveys.

33-3025
Studies in the mountain-glacier basin of the Bolshaya Khadata River, Polar Urals, in the 1976/77 balance year. (Issledovaniia v gorno-lednikovom basseine r. Bol. Khadata na Poliarnom Urale v 1976/77 balansovom godu)
Gokhman, V.V., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.212-215, In Russian with English summary. 5 refs.
Glacier mass balance, Snow accumulation, Glacial hydrology, Air temperature, Alpine glaciation.

33-3026
Cement ice of Siberia and the Far East. (Gol'tsovyi led Sibiri i iuga Dal'nego Vostoka)
Tarakanov, A.G., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.215-219, In Russian with English summary. 14 refs.
Ground ice, Ice formation, Meltwater, Freezing, Alpine glaciation.

33-3027
Application of granulometric and thermal analyses to paleoglaciological reconstructions. (Opyt primeneniia granulometricheskogo i termicheskogo analizov pri paleogliatsiologicheskikh rekonstruktsiiakh)
Sevast'ianov, D.V., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.220-224, In Russian with English summary. 7 refs.
Tarnovskii, A.A.
Glacial deposits, Moraines, Thermal analysis, Paleoclimatology.

33-3028
Annual velocity field variations of the isochronous surface of Karabatkak Glacier in 1974-1976. (Kolebaniia polia godovoi skorosti izokhronnoi poverkhnosti lednika Karabatkak v 1974-1976 gg.)
Bakov, E.K., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.225-226, In Russian with English summary. 1 ref.
Glacier oscillation, Glacier surfaces, Glacier mass balance, Glacier flow, Velocity measurement, Seasonal variations.

33-3029
Annotated list of Soviet literature on glaciology for 1975. (Annotirovannyi spisok sovetskoi literatury po gliatsiologii za 1975 god)
Kotliakov, V.M., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia,* 1978, No.33, p.227-280, In Russian with English summary. 441 refs.
Lapina, I.IA., Chernova, L.P.
Glaciology, Ice physics, Ice composition, Sea ice, River ice, Ground ice, Avalanches, Snow surveys, Mudflows, Bibliographies.
The list contains Soviet publications on glaciology, published in Russian (or having summaries in Russian) in periodicals, proceedings and transactions of conferences for 1975. Some publications of previous years omitted from earlier bibliographies are included. The annotations are grouped into the following sections: Organization of studies, Scientific meetings, Methods of studies, General problems of glaciology, Physics and chemistry of ice, Sea and river ice, Underground ice and aufeis, Paleoglaciology, The Arctic and Antarctic, The Caucasus, Central Asia and Kazakhstan, Siberia and the Far East, Avalanches and mudflows, Studies of snow cover, and Seasonal snow cover outside the areas of present-day glaciers.

33-3030
Fate and effects of oil pollutants in extremely cold marine environments. Annual report no. 5, 1 Jan-31 Dec 77.
Atlas, R.M., University of Louisville, 1977, 53p. ADA-048 334.
Crude oil, Oil spills, Pollution, Environmental impact, Bacteria, Degradation.

33-3031
Oil persistence in tundra and its impact on the belowground ecosystem. Progress report, June 1, 1975-March 1, 1976.
Miller, O.K., Jr., Blackstone, Virginia Polytechnic Institute and State University, 1976, 146p. ORO/4940-1.
Oil spills, Tundra vegetation, Damage, Environmental impact.

33-3032
Arctic under-ice roughness.
LeSchack, L.A., et al, Dec. 1977, 19p. ADA-048 690.
Chang, D.C.
Sea ice, Ice cover thickness, Ice bottom surface, Underwater acoustics.

33-3033
Oil persistence in tundra and its impact on the belowground ecosystem. Progress report, June 1, 1976-March 1, 1977.
Miller, O.K., Jr., Blackstone, Virginia Polytechnic Institute and State University, 1977, 153p. ORO/4940-2.
Oil spills, Tundra vegetation, Damage, Environmental impact.

33-3034
Frost degree day and related theoretical ice thickness curves for selected Russian Arctic Stations.
Potocsky, G.T., et al, *U.S. Naval Oceanographic Office. Technical note,* Oct. 1972, NOO-TN-7700-8-72, 39p. ADA-048 735.
Mitchell, P.A.
Sea ice, Ice growth, Ice cover thickness, Degree days.

33-3035
Report of the International Ice Patrol Service in the North Atlantic Ocean, season of 1976.
Ketchen, H.G., et al, *U.S. Coast Guard. Bulletin,* Apr. 15, 1978, No.62, 82p.
Jennings, C.W.
Sea ice, Ice conditions, Icebergs, Aerial reconnaissance, Oceanography.

33-3036
Air deployed oceanographic mooring (ADOM). Final report, Mar. 1, 1978-Feb. 28, 1979.
New Hampshire. University. Marine Systems Engineering Laboratory, Durham, New Hampshire, 1979, c100 leaves, Numerous refs.
Sea ice, Ice coring drills, Impact tests, Penetration tests, Airborne equipment.

In this report, the technology involved in the design and aerial delivery of an unmanned ice drilling system for Arctic pack ice is presented and discussed.

33-3037
Effects of ice covers on alluvial channel flow and sediment transport processes.
Sayre, W.W., et al, *Iowa. University. Institute of Hydraulic Research. Report,* Feb. 1979, No.218, 96p., 26 refs.
Song, G.B.
River ice, Ice cover effect, River flow, Velocity measurement, Sediment transport, Shear stress.

33-3038
Joint studies on physical and biological environments in permafrost, Alaska and North Canada, July to August 1977.
Kinoshita, S., ed, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, 149p., In English with Japanese summaries. Refs. passim. For individual reports see 33-3039 through 33-3047.
Active layer, Permafrost hydrology, Tundra soils, Environments, Pingos, Patterned ground, Tundra vegetation, Arctic regions, United States—Alaska—Barrow, Canada—Northwest Territories—Tuktoyaktuk.

33-3039
Outline of research project.
Kinoshita, S., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.1-16, In English with Japanese summary. 20 refs.
Permafrost hydrology, Active layer, Tundra soils, Thermal regime, Landforms, Research projects, Aerial photographs, Arctic regions.

33-3040
Core samplings of the uppermost layer in a tundra area.
Kinoshita, S., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.17-44, In English with Japanese summary. 15 refs.
Fujino, K., Horiguchi, K., Fukuda, M., Inoue, M.
Permafrost samplers, Tundra soils, Core samplers, Drill core analysis, Patterned ground, Ground ice, Pingos.

33-3041
Thermal regime of the uppermost layer in a tundra area in summertime.
Inoue, M., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.45-56, In English with Japanese summary. 9 refs.
Kinoshita, S.
Active layer thickness, Thermal regime, Tundra, Permafrost thermal properties, Thermal conductivity, Soil temperature, Freeze thaw cycles.

33-3042
Acidity of the uppermost layer of permafrost—its relationship to the thickness of the active layer.
Horiguchi, K., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.57-69, In English with Japanese summary. 10 refs.
Active layer thickness, Soil chemistry, Acidity, Permafrost.

33-3043
Water-permeability inside the uppermost layer of a tundra area.
Fujino, K., Joint studies on physical and biological enviror ments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.71-76, In English with Japanese summary. 6 refs.
Active layer thickness, Ground water, Permeability, Tundra soils, Patterned ground, Permafrost.

33-3044
Determination of oxygen isotopic concentration in the ground ice of a tundra area.
Fujino, K., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.77-83, In English with Japanese summary. 9 refs.
Kato, K.
Ice composition, Deuterium oxide ice, Ground ice, Oxygen isotopes, Tundra, Permafrost.

33-3045
Diversity in Collembola and topographic features of tundra.
Tanno, K., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.85-92, In English with Japanese summary. 5 refs.
Shimada, K.
Tundra vegetation, Topographic features, Pingos, Patterned ground, Animals.

33-3046
Zooplankton surveys in arctic temporary ponds at Barrow and Tuktoyaktuk.
Shimada, K., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.93-103, In English with Japanese summary. 14 refs.
Ponds, Continuous permafrost, Plankton, Distribution, Environments, United States—Alaska—Barrow, Canada—Northwest Territories—Tuktoyaktuk.

33-3047
Plant communities in permafrost.
Ito, K., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.105-147, In English with Japanese summary. 8 refs.
Tundra vegetation, Arctic vegetation, Plants (botany), Permafrost, Classifications.

33-3048
Airport pavement design and evaluation. *U.S. Federal Aviation Administration. Advisory circular,* Dec. 7, 1978, AC 150/5320-6C, 15p. + 4 appends., 24 refs.
Airports, Aircraft landing areas, Concrete pavements, Soil strength, Subgrades, Permafrost beneath roads, Design, Soil classification, Pavements.

33-3049
Some problems of photogrammetry in Antarctica.
Dressler, K., *Jena review,* 1975, No.2, p.88-92, back cover, 10 refs.
Photogrammetry, Stereophotography, Topographic features, Geodetic surveys, Glacier surfaces, Meteorological data, Measuring instruments.
An aerophotogrammetric method used during the 17th Soviet Antarctic Expedition to determine topographic features of a traverse of 100 km length with side lengths of 3 to 5 km is described. Difficulties encountered because of frequent snowstorms, low air temperature, poor visibility and excessive albedo are discussed. About 140 stereomodels and 36 single photographs were taken from 25 bases in 76 directions, using a 19/1318 Phototheodolite. To reduce errors in aerophotogrammetry the following suggestion is made: the tracks of sledges are distinctly recognizable in the aerial photograph. If the caterpillar tractor moves around the geodetic fixed points in a circle, the tracks can serve as ground control points of maximum accuracy visible from the air. The photographic flight should be carried out as soon as possible after having finished this marking work.

33-3050
Ground water quality summary for Alaska. A termination report.
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Johnson, P.R., Murphy, R.S.
Ground water, Water supply, Economic analysis, United States—Alaska.

33-3051
Application of artificial recharge technology for managing the water resources—Anchorage, Alaska.
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Water supply, Ground water, Water table, Fluid infiltration, Water reserves, United States—Alaska—Anchorage.

33-3052
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Water supply, Ground water, Urban planning, Cold weather operation, Subarctic regions, Cost analysis, Floods.

33-3053
Light attenuation in falling snow.
Mason, J.B., *U.S. Army. Electronics Research and Development Command. Atmospheric Sciences Laboratory. Research and development technical report,* Aug: 1978, ASL-TR-0013, 15p., ADA-061 604, 17 refs.
Snow optics, Snowfall, Light scattering, Optical phenomena, Visibility, Atmospheric attenuation.

33-3054
Improving the operability of diesel vehicles at low temperature.
Vanič, M., et al, *U.S. Army Foreign Science and Technology Center. Technical translation,* Dec. 1978, HT-6555-78, 13p., Translation from Goriva i maziva, 1976, 15(5), p.3-10. 3 refs.
Simik, V.
Cold weather operation, Vehicles, Diesel engines, Engine starters, Temperature variations.

33-3055
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Chance, R.L., *National Association of Corrosion Engineers. Publication,* Apr. 1974, No.3N175, p.9-15, 67 refs.
Snow removal, Ice removal, Salting, Economic analysis, Corrosion.

33-3056
Preliminary report on the coal resources of the National Petroleum Reserve in Alaska.
Martin, G.C., et al, *U.S. Geological Survey. Open-file report,* 1978, No.78-1033, 23p. + 2 maps, 33 refs.
Callahan, J.E.
Natural resources, Frozen coal, Geologic structures, Permafrost.

33-3057
Proceedings.
Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978, MP 1193, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, 209p., For selected papers see 33-3058 through 33-3080. Abstracts of many of the papers in this volume have been previously accessioned from the preliminary publication of this colloquium, Collection of Abstracts, and may be found as 33-1984 through 33-2001. Texts of question and answer sessions which followed presentations have been added to most of the abstracts duplicated in the Proceedings volume.
Meetings, Mars (planet), Planetary environments, Permafrost hydrology, Geologic structures, Water.

33-3058
Studies on terrestrial ice cores.
Langway, C.C., Jr., Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.11-27., Refs. p.24-27.
Ice sheets, Ice cores, Isotope analysis, Age determination.
The author reviews the progress achieved since about 1965 in retrieving and analyzing polar ice cores. Most of the studies concern Greenland cores but many of the citations include work done in Antarctica. Significant advances are recorded in the technology of retrieval as well as in the scope and detail of the analyses which include: chemistry, stratigraphy, physical properties, microparticles, and stable and radioactive isotopes Results of the investigations over the years have had significant bearing on a substantial number of scientific disciplines.

33-3059
Development of a simplified method for field monitoring of soil moisture.
Walsh, J.E., et al, MP 1194, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.40-44, Includes comments. 3 refs.
McQueeney, D., Layman, R.W., McKim, H.L.
Soil moisture, Measuring instruments, Electric equipment.

33-3060
Viking GCMS analysis of water in the Martian regolith.
Anderson, D.M., et al, MP 1195, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.55-61, Includes comments. 7 refs.
Tice, A.R.
Ground water, Mars (planet), Soil tests, Gas inclusions.

33-3061
Mars: chemical reduction of the regolith by frost.
Huguenin, R.L., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.83-99, Includes comments. 27 refs.
Miller, K.J., Harwood, W.S.
Soil chemistry, Chemical reactions, Frost action, Weathering.

33-3062
Mars: remote spectral identification of H2O frost and mineral hydrate.
Huguenin, R.L., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.100-108, Includes comments. 19 refs.
Clark, R.N., McCord, T.B.
Spectrometers, Reflectance, Hydrates, Frost, Soil moisture.

33-3063
Mars permafrost sampling requirements.
Stephens, J., Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.111-114, Includes comments.
Mars (planet), Permafrost samplers.

33-3064
Episodic channeling and layered terrain on Mars: implications for ground ice.
Theilig, E., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.151-157, Includes comments. 9 refs.
Greeley, R.
Mars (planet), Soil structure, Ground ice, Topographic features.

33-3065
Martian polar layered deposits: the geological consequences of dust storms.
Blasius, K.R., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.173-178, Includes comments. 1 ref.
Cutts, J.A., Roberts, W.J.
Mars (planet), Extraterrestrial ice, Cosmic dust, Topographic features.

33-3066
Solar activity records planetary ice caps.
Zeller, E.J., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.186-192, Includes comments. 2 refs.
Parker, B.C.
Ice sheets, Ice cores, Ion density (concentration), Antarctica—Amundsen-Scott Station.
The authors describe the results of chemical analyses made on an ice core from South Pole Station. Nitrate and ammonium ion levels are identified and traced from the 10th century to the early part of the 20th. The fluctuations in ionic level are related to solar activity and climatology during this 1000 yr period. Extending this type of sequential analysis to other planets or satellites having ice caps must take into account the composition and structure of their atmospheres.

33-3067
Local snow distribution on Axel Heiberg Island, N.W.T. Empirical methods for extrapolating snow course data on White Glacier. [Lokale Schneeverteilung auf Axel Heiberg Island, N.W.T. Empirische Methode zur Extrapolation von Schneekursdaten auf dem White Glacier],
Steffen, K., et al, *Geographica helvetica,* 1977, 32(4), p.195-202, In German. 10 refs.
Müller, F.
Snow cover distribution, Snow courses, Tundra regions.

33-3068
On the mass budget of Baby Glacier, Axel Heiberg Island, Canadian High Arctic. [Zum Massenhaushalt des Baby Glacier, Axel Heiberg Island, kanadische Hocharktis],
Alean, J., et al, *Geographica helvetica,* 1977, 32(4), p.203-208, In German. 9 refs.
Müller, F.
Glacier mass balance, Seasonal variations.

33-3069
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Glacier mass balance, Glacier ablation.

33-3070
On climate and plants on Coburg Island, N.W.T., Canada. [Über Pflanzen und Klima auf Coburg Island, N.W.T., Kanada],
Müller, F., *Geographica helvetica,* 1977, 32(4), p.213-218, In German. 6 refs.
Climatology, Plants (botany), Water supply, Wind factors, Ecosystems.

33-3071
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Waste disposal, Sludges, Irrigation.

33-3072
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Flavelle, P.A.
Measuring instruments, Spectrophotometers, Solar radiation, Floating ice, Research projects.

33-3073
Geotechnic evaluation of the proposed ALCAN gas pipeline in Alaska.
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Gas pipelines, Cold weather construction, Environmental impact, Frost heave, River crossings, Frozen ground mechanics, Frozen ground thermodynamics.

33-3074
Proceedings.
Arctic Environmental Workshop, 7th, April 1978, *Toronto. University. Institute for Environmental Studies. Publication,* 1978, EE8, 161p., For selected papers see 33-3075 through 33-3080.
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Meetings, Offshore drilling, Artificial islands, Oil spills, Environments.

33-3075
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Franklin, L.J., *Toronto. University. Institute for Environmental Studies. Publication,* 1978, EE8, Arctic Environmental Workshop, 7th, April 1978. Proceedings, edited by S. Jones and D. Mackay, p.19-24 + 2 figs.
Pipe laying, Offshore drilling, Ice scoring, Oil wells, Protective coatings, Ice cover, Artificial islands.

33-3076
Technology update—artificial islands in the Beaufort Sea.
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Offshore drilling, Artificial islands, Sea ice, Ocean waves, Ice pressure, Wind factors.

33-3077
Drilling vessel types.
Plé, C., *Toronto. University. Institute for Environmental Studies. Publication,* 1978, EE8, Arctic Environmental Workshop, 7th, April 1978. Proceedings, edited by S. Jones and D. Mackay, p.39-46 + 2 figs.
Offshore drilling, Ships, Icebergs.

33-3078
Beaufort Sea drilling.
Todd, M.B., *Toronto. University. Institute for Environmental Studies. Publication,* 1978, EE8, Arctic Environmental Workshop, 7th, April 1978. Proceedings, edited by S. Jones and D. Mackay, p.47-66.
Offshore drilling, Sea ice, Ships, Logistics.

33-3079
Biologist looks at oil in the sea.
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Oil spills, Marine biology.

33-3080
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Snow loads, Roofs, Snow surveys, Snow depth, Wind factors, Snow water equivalent.

33-3082
Proceedings, Pts. 1,2. [15. Internationale Tagung für Alpine Meteorologie, Grindelwald, 19-23 Sept. 1978. Tagungsbericht, Teil 1,2],
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Snowfall, Snow accumulation, Snow cover distribution, Ice accretion, Freezeup, Firn, Meteorological factors, Mountains.

33-3083
Quantitative assessment of the short wave radiation balance of a glacier. [Quantitative Erfassung der kurzwelligen Strahlungsbilanz eines Gletschers],
Escher-Vetter, H., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen,* 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.247-250, In German with English summary. 3 refs.
Radiation balance, Glacial meteorology, Albedo, Solar radiation, Wave propagation, Aerial photographs.

33-3084
Study of the water table on the Kesselwandferner, Oetztal Alps, in a firn pit 30 m deep. Summary. [Untersuchungen der Wassertafel am Kesselwandferner (Ötztaler Alpen) an einem 30 m tiefen Firnschacht. Kurzfassung],
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Water table, Firn, Glacier surfaces, Drilling.

33-3085
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Föhn, P.M.B., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen,* 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.288-292, In German with English summary. 7 refs.
Snowfall, Snow accumulation, Statistical data, Snow depth, Design criteria, Switzerland—Davos.

33-3086
Relationships of days with snow cover to days with snowfall in mountain areas of Serbia, Yugoslavia. [Verhältnis der Tage mit Schneedecke zu den Tagen mit Schneefall in den Gebirgsgebieten Serbiens in Jugoslawien],
Milosavljević, K., et al, *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen,* 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.293-296, In German with English summary. 2 refs.
Todorović, N.
Snow cover distribution, Snowfall, Snow cover stability, Time factor.

33-3087
Geographic distribution of icing in Liguria. [La distribuzione geografica delle formazioni di ghiaccio in Liguria],
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Palau, C., Tessore, E.
Icing, Alpine vegetation, Damage, Distribution, Topographic factors, Mountains, Italy—Liguria.

33-3088
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Zanella, G., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen,* 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.301-304, In Italian with English summary. 9 refs.
Snow accumulation, Snow cover distribution, Snow depth, Mountains, Altitude, Italy—Po Valley.

33-3089
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Snowfall, Snow cover distribution, Time factor, Weather forecasting, France—Alps.

33-3090
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Tepes, E., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen,* 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.308-312, 3 refs.
Ice accretion, Icing, Structures, Mountains.

33-3091
Numerical simulation of river freezeup in relation to meteorological parameters as exemplified by the Loisach River, Bavaria. [Numerische Simulation von Flussvereisungen in Abhängigkeit meteorologischer Parameter am Beispiel der Loisach/Oberbayern],
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Freezeup, River ice, Mathematical models, Meteorological factors.

33-3092
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Research projects, Sea ice, Oil pollution, Water chemistry, Submarine permafrost, Sediment transport, Earthquakes.

33-3093
Oil spill vulnerability, coastal morphology and sedimentation of Kodiak Island, Kotzebue Sound and the Beaufort Coast.
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Nummedal, D., Ruby, C.
Coastal topographic features, Shoreline modification.

33-3094
Field observations of medium and small scale features of the Bering Sea ice edge in February 1978.
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Sea ice, Ice edge, Interfaces.

33-3095
Dynamics of near-shore ice.
Kovacs, A., et al, Environmental assessment of the Alaskan continental shelf, Vol.2 Principal investigators' reports July-Sep. 1978, Boulder, Colorado, Environmental Research Laboratories, 1978, p.230-233.
Weeks, W.F.
Sea ice, Fast ice.
The authors report briefly on a new ice pile-up southeast of Pt. Barrow and the status of various reports connected with their current studies.

33-3096
Dynamics of near shore ice.
Colony, R., Environmental assessment of the Alaskan continental shelf, Vol.2 Principal investigators' reports July-Sep. 1978, Boulder, Colorado, Environmental Research Laboratories, 1978, p.234-240.
Sea ice, Drift, Ice pressure, Measuring instruments.

33-3097
Bottom sediment dynamics and winter sediment transport.
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Drake, D.E.
Bottom sediment, Sediment transport, Pack ice.

33-3098
Study of climatic effects on ice extent and its seasonal decay along the Beaufort Sea and Chukchi Sea coasts.
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Sea ice, Ice deterioration, Seasonal variations, Climate.

33-3099
Characterization of the nearshore hydrodynamics of an Arctic barrier island-lagoon system.
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Hydrodynamics, Measuring instruments, Ocean currents.

33-3100
Sediment characteristics, stability, and origin of the barrier island-lagoon complex, north Arctic, Alaska.
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Hydrodynamics, Sediments, Offshore land forms.

33-3101
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Whitaker, R.E.
Ocean currents, Salinity, Measuring instruments, Mathematical models.

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Christianson, C.D., et al, *U.S. Environmental Protection Agency. Report,* Jan. 1979, EPA-600/3-79-003, 175p., Refs. p.171-175.
Coutts, H.J.
Ponds, Ice cover effect, Bubbling, Waste treatment, Aeration, Cold weather performance, Sludges, Alage.

33-3103
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Maps, Sea ice distribution, Ice conditions.

33-3104
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Environmental impact, Ecology, Hydrocarbons, Metals, Tidal currents, Marine biology, Earthquakes, United States—Alaska—Kodiak Island.

33-3105
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Offshore drilling, Petroleum industry, Oil wells, Icebreakers, Tanker ships.

33-3106
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Ice navigation, Electric equipment, Loran.

33-3107
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Portable equipment, Houses, Cold weather operation, Logistics.

33-3108
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Smee, B.W., et al, *Canadian mining and metallurgical bulletin,* Apr. 1979, 72(804), p.67-82, 96 refs.
Sinha, A.K.
Glacial deposits, Geologic structures, Geophysical surveys, Geochemistry, Glacial lakes, Minerals, Electromagnetic prospecting, Ground ice.

33-3109
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Larsen, G., et al, *Denmark. Geologiske undersögelse. Report,* 1977, Series II, No.111, 36p., 31 refs.
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Glacial geology, Age determination, Glacial deposits, Stratigraphy.

33-3110
Estimation of the critical degree of saturation of autoclaved aerated concretes subjected to freezing. [Estimation du degré critique de saturation des bétons cellulaires autoclavés soumis au gel], *Matériaux et constructions,* July/Aug. 1978, No.64, p.283-294, In French and English.
Freeze thaw tests, Cellular concretes, Saturation, Laboratory techniques, Moisture content, Freeze thaw cycles.

33-3111
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Lehmuskoski, P., et al, *Suomen geodeetinen laitos. Tiedonantoja,* 1978, No.86, 27p., 28 refs.
Mäkinen, J.
Gravimetric prospecting, Measuring instruments, Sea ice.

33-3112
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Purves, F., *Canada. Environmental Protection Service. Report,* July 1978, EPS 4-EC-78-9, 18p., In English with French summary. 5 refs.
Crude oil, Natural gas, Oil spills, Ice cover effect, Laboratory techniques.

33-3113
Ice blockage of water intakes.
Carey, K.L., *U.S. Nuclear Regulatory Commission. Contractor report,* Mar. 1979, NUREG/CR-0548, MP 1197, 27p., 19 refs.
Water intakes, Frazil ice, Bottom ice, Ice cover.
Ice blockage of water intake structures can pose serious threats to the availability of cooling water at thermal power plants. Ice blockage difficulties are described as they may occur in rivers, lakes, reservoirs, and estuaries, and as they may affect intakes either at the surface or submerged. Characteristics of both surface sheet ice and frazil ice are examined: formational processes, sizes, thicknesses, movement or mobility, and modes of blockage or adhesion. Case histories of incidents of ice blockage of intakes are given. Solving ice blockage problems, either through original design, post-construction modification, or revised operational techniques is discussed.

33-3114
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Infrared spectroscopy, Reflectance, Clouds (meteorology), Snow cover.

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Ocean currents, Tidal currents, Models, Bering Sea.

33-3116
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Oceanography, Ocean currents, Hydrography, Water temperature.

33-3117
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DLC TA410.M39
Freeze thaw tests, Chemicals, Laboratory techniques, Concrete durability, Frost resistance.

33-3118
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33-3119
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Freeze thaw tests, Laboratory techniques, Concretes.

33-3120
Critical degree of saturation method of assessing freeze/thaw resistance of concrete.
Fagerlund, G., *Matériaux et constructions,* July/Aug. 1977, No.58, p.217-229.
DLC TA410.M39
Concrete strength, Frost resistance, Freeze thaw tests, Laboratory techniques, Soil moisture, Capillarity.

33-3121
International cooperative test of the critical degree of saturation method of assessing the freeze/thaw resistance of concrete.
Fagerlund, G., *Matériaux et constructions,* July/Aug. 1977, No.58, p.231-253, In English with French summary. 26 refs.
DLC TA410.M39
Freeze thaw tests, Frost resistance, Concerete durability, Laboratory techniques.

33-3122
Reports of glaciological surveys of 1977. (Relazioni della campagna glaciologica 1977),
Lesca, C., et al, *Comitato glaciologico italiano. Bollettino. Ser.3,* 1978, 1(1), p.74-107, In Italian.
Saibene, C., Zanon, G.
Glaciology, Mountain glaciers, Glacier oscillation, Glacier tongues, Italy.

33-3123
Geography of the northern regions—strategic aspects. (Nordområdenes geografi—strategiske aspekter),
Sollie, F., Lysaker, Norway, Fridtjof Nansen-Stiftelsen på Polhögda, 1978, 12p., In Norwegian.
Northwest Passage, Military operation, Arctic regions.

33-3124
Role of meteorology in helicopter icing problems.
Ryder, P., *Meteorological magazine,* May 1978, 107(1270), p.140-147, 9 refs.
Aircraft icing, Ice accretion, Helicopters, Meteorological factors, Analysis (mathematics), Ice formation.

33-3125
Nineteenth Soviet Antarctic Expedition. Winter research 1973-75. (Deviatnadtsataia sovetskaia antarkticheskaia ekspeditsiia. Zimovochnye issledovaniia 1973-1975 gg.),
Sovetskaia antarkticheskaia ekspeditsiia, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.69, 144p., In Russian. Numerous refs. passim. For individual papers see A-21454, B-21464, B-21465, C-21463, H-21457, H-21458, H-21466, I-21455, I-21456, K-21459, K-21461, K-21462 and L-21460, or 33-3126 and 33-3127.
Ignatov, V.S., ed.
Research projects, Antarctica.
This volume reports on the winter activities of the 19th SAE. The first half includes a description of the expedition's program, short reports on the activities of each working group's accomplishments, and a summary of engineering and construction work carried out during the period. The second half is composed of articles written by expedition members to report on their work in geophysics, atmospheric physics, oceanography, zoology, medicine and other disciplines.

33-3126
Winter activities of the 19th SAE. (Zimovochnye raboty deviatnadtsatoĭ sovetskoĭ antarkticheskoĭ ekspeditsii),
Ignatov, V.S., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.69, p.9-48, In Russian.
Research projects, Antarctica.
This overall description of the wintering over activities of the 19th SAE is divided into two sections. The first outlines the organization and methods of the scientific activities—observational program, surface and upper-air meteorological research, geophysical studies, glaciological investigations, oceanographic research, and medical research. The second portion covers the engineering and construction work accomplished by the group. Appended is a list of expedition participants by station and specialty.

33-3127
Geodetic and meteorological investigations of ground refraction over antarctic continental ice. (Geodezicheskie i meteorologicheskie issledovaniia zemnoĭ refraktsii nad poverkhnost'iu antarkticheskogo materikovogo l'da),
Dittrich, G., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1978, Vol.69, p.100-119, In Russian. 10 refs.
Helwig, A.
Glacial meteorology, Refraction.
Preliminary results of investigations into the effect of ground refraction on accuracy of vertical angles and distance measurement in Antarctica are given. Studies were done by a group of meteorologists and geodesists by means of simultaneous geodetic and meteorological observations at three fixed points under various weather conditions. The coefficient of refraction was computed from vertical gradient air temperature data, then compared with the refraction coefficient from geodetic readings. Thus can the effect of ground refraction on accuracy in high southern latitudes be assessed.

33-3128
Influence of freezing and thawing on the resilient properties of a silt soil beneath an asphalt concrete pavement.
Johnson, T.C., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, CR 78-23, 59p., See also 32-3761.
Cole, D.M., Chamberlain, E.J.
Bituminous concretes, Subgrade soils, Soil freezing, Ground thawing, Elastic properties.
Stress-deformation data for silt subgrade soil were obtained from in-situ and laboratory tests, for use in mechanistic models for design of pavements affected by frost action. Plate-bearing tests were run on bituminous concrete pavements constructed directly on a silt subgrade, applying repeated loads to the pavement surface while the silt was frozen, thawing, thawed, and fully recovered. Repeated-load laboratory triaxial tests were performed on the silt in the same conditions. Analysis of deflection data from the in-situ tests showed resilient moduli of the silt as low as 2000 kPa for the critical thawing period, and 100,000 kPa or higher when silt was fully recovered. Analysis of the laboratory tests, which gave moduli comparable to the latter values, showed that resilient modulus during recovery from the thaw-weakened condition can be modeled as a function of the changing moisture content.

33-3129
Wastewater treatment and reuse by the soil-plant systems.
Gilley, J.R., Lincoln, University of Nebraska, 1977, 25p. PB-275 595.
Water treatment, Waste disposal, Irrigation, Soil chemistry.

33-3130
Scientific plan for the proposed Nansen drift station.
Untersteiner, N., et al, Washington, D.C., National Research Council, 1976, 256p. ADA-047 621.
Aagaard, K., Alexander, V., Anderson, J., Barnett, D.
Research projects, Drift stations, Icebreakers, Pack ice, Logistics.

33-3131
Significance of frost action and surface soil characteristics to wind erosion at Rocky Flats, Colorado. Third progress report, October 1, 1976-June 30, 1977.
Caine, N., et al, Boulder, Institute of Arctic and Alpine Research, 1977, 65p. COO-2517-3.
Morin, P., Nicholas, R.M.
Frost action, Soil freezing, Ground thawing, Wind erosion, Soil structure.

33-3132
Naval Oceanographic Office numerical ice forecasting system operations manual.
Owens, L.B., Jr., et al, *U.S. Naval Oceanographic Office. Technical note,* Nov 1974, NOO-TN-6150-33-74, 27p. ADA-049 019.
Gerson, D.J.
Manuals, Ice forecasting, Mathematical models, Computer applications.

33-3133
Rolling resistance of aircraft wheels in dry snow.
Kinigren, B., *National Swedish Road and Traffic Research Institute. Report,* 1977, VTI-128, 36p., N78-14041, In Swedish with English summary.
Airplanes, Vehicle wheels, Friction, Snow cover effect.

33-3134
Photosynthetically active radiation transmission through ice. *U.S. National Oceanic and Atmospheric Administration. Technical memorandum,* July 1978, NOAA-TM-ERL-GLERL-18, 57p. PB-288 463.
Lake ice, Ice cover effect, Solar radiation, Photosynthesis.

33-3135
Studies of snowpack properties by passive microwave radiometry.
Chang, A.T.C., et al, *U.S. National Aeronautics and Space Administration. Technical memorandum,* Nov. 1978, NASA-TM-79671, 17p. N79-16479.
Hall, D.K., Foster, J.L., Rango, A., Schmugge, T.J.
Snow physics, Snow mechanics, Microwaves, Radiometry, Snow temperature, Snow water content.

33-3136
Snowpack ground truth: radar test site, Steamboat Springs, Colorado, 8-16 April 1976.
Howell, S., et al, *U.S. National Aeronautics and Space Administration. Contractor report,* Apr. 1976, NASA-CR-144773, 30p. N76-28633.
Jones, E.B., Leaf, C.F.
Snow density, Snow depth, Soil moisture, Temperature measurement.

33-3137
Performance of frost heave modifying chemical additives at the CN Dorval test site.
Sheeran, D.E., et al, *McGill University, Montreal. Geotechnical Research Centre. Technical report,* Oct. 1978, TDC/TP-1814, 94p. PB-289 708.
[illegible]g, R.N.
Frost heave, Countermeasures, Chemical ice prevention, Railroads, Roadbeds.

33-3138
Glacier and ice sheet sliding; priorities for research.
National Research Council. Ad Hoc Study Group on Glacier and Ice Sheet Sliding, Washington, D.C., National Research Council, 1976, 10p., PB-288 573, 21 refs.
Research projects, Ice sheets, Glacier movement.

33-3139
Carbon and nitrogen transformations in soils amended with sewage sludge.
Terry, R.E., Lafayette, Indiana, Purdue University, 1976, 183p., PB-288 945, Ph.D. thesis.
Soil chemistry, Waste treatment, Sludges, Sewage treatment.

33-3140
U.S. contribution to the Polar Experiment (POLEX). Part 1. POLEX-GARP (North). Part 2. POLEX-GARP (South).
Joint U.S. Polex Panel, Washington, D.C., 1974, 173p.
Research projects, Sea ice, Ice cover effect, Weather forecasting, Heat balance.
This publication reviews the national research effort in both polar regions to determine the physical basis for climates; defines the national contribution to polar research; explores the means for international collaboration; and continues review of the scientific merits of the Arctic Ice Dynamics Joint Experiment (AIDJEX). Both parts outline general and specific recommendations, background information and considerations affecting the U.S. contribution, a summary of program elements, and a time schedule for execution of the program. In addition, Part 1 contains appendices A through F which are devoted to the following respective topics: meteorological observations in support of weather forecasting, processes at and above the ice, heat balance of the polar oceans, numerical modeling experiments, climate record, and abbreviations (Auth.)

33-3141
Transport of shore stones by ice in the Airisto area, southwest Finland, winter 1975/76. (Jään aiheuttama rantakivien kulkeutuminen talvella 1975/76 airiston alueella),
Pyökäri, M., *Turku, Finland. Yliopisto. Maantieteen laitos. Julkaisuja,* 1978, No.84, 18p., In Finnish with English summary. 27 refs.
Ice rafting, Beaches, Rocks, Finland.

33-3142
Arctic oil spill countermeasures logistics study: summary report.
De Leuw Cather, Canada Ltd., et al, *Canada. Environmental Protection Service. Report,* Dec. 1978, EPS 3-EC-78-8, 59p., In English with French summary.
Oil spills, Countermeasures, Logistics, Marine transportation, Airplanes, Motor vehicles, Railroads.

33-3143
Review of ice movement buoys for tracking oil spills.
Goodman, R.H., *Canada. Environmental Protection Service. Report,* Dec. 1978, EPS 3-EC-78-7, 38p., In English with French summary. 15 refs.
Pack ice, Drift, Ice navigation, Remote sensing, Oil spills.

33-3144
Surface and bedrock contour maps at DYE-3.
Overgaard, S., et al, *Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk felteori. Report,* July 1978, No.199, 9 leaves, 6 refs.
Gudmandsen, P.
Mapping, Radio echo soundings, Ice cover thickness, Land ice, Greenland.

33-3145
Theory, development and testing of an ice-oil boom.
Tsang, G., *Canada. Enviornmental Protection Service. Report,* Mar. 1979, EPS 4-EC-79-2, 61p., In English with French summary. 8 refs.
Oil spills, Floating ice, Ice booms.

33-3146
CEL building and experimental subgrade cooling system, Barrow, Alaska—construction history and performance characteristics.
Barthelemy, J.L., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical report,* Mar. 1979, R870, 56p., 14 refs.
Permafrost preservation, Cooling, Buildings, Subgrades, Heat transfer.
During the summer of 1976, personnel from the Civil Engineering Laboratory erected a building on the ice-rich permafrost near Barrow, Alaska. The structure, placed on just 1 foot of gravel, has been used as a test bed to evaluate an experimental subgrade cooling system. The cooling system consists of 15 loop-configured heat exchangers called convection cells. During the winter months, heat losses from the building into the permafrost are redirected via these convection cells to the cold environment outside, thus preventing progressive degradation from thaw. To date, data collected from some 150 thermocouples located in the subgrade and heat-exchange systems have shown that the rate of winter heat removal is even greater than originally anticipated. Although a small cyclical displacement of the floor and foundation resulting from seasonal summer thaw and winter freezeback has been apparent, this movement is minimal compared to settlement which would have occurred had the massive ice present in the subgrade been allowed to thaw unchecked.

33-3147
Environmental assessment of the Alaskan continental shelf. Executive summary, Apr. 1977-Mar. 1978.
Boulder, Colorado, Environmental Research Laboratories, 1978, 64p.
Research projects, Data processing, Logistics.

33-3148
Study of ice adhesion to construction materials, anticorrosion and anticing coatings. [Issledovanie adgezii l'da k konstruktsionnym materialam, antikorrozionnym i antiobledenitel'nym pokrytiiam],
Ivkachev, A.G., et al, *Kholodil'naia tekhnika,* 1976, No.8, p.15-18, In Russian. 8 refs.
Malyshev, V.P., Bogomolov, V.A.
Ice adhesion, Protective coatings, Adhesive strength, Surface roughness, Construction materials, Thermal factors, Corrosion prevention, Ice prevention.

33-3149
Flood characteristics of Alaskan streams.
Lamke, R.D., *U.S. Geological Survey. Water resources investigations,* 1979, No.78-129, 61p., 5 refs.
Floods, Streams, Drainage, Climatic factors, Precipitation gages, Analysis (mathematics), Arctic regions, United States—Alaska.

33-3150
Quantitative dynamic mathematical models for Great Lakes research.
Quinn, F.H., Ann Arbor, University of Michigan, 1971, 141p., University Microfilms order No.71-23,852, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1971, p.1591-1592.
Hydrodynamics, Hydrology, Lake ice, Ice conditions, Mathematical models, Great Lakes.

33-3151
Glacial geomorphology of the Hastings Quadrangle, Michigan.
Folsom, M.M., East Lansing, Michigan State University, 1971, 189p., University Microfilms order No. 71-23,183, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1971, p.1651-1652.
Glacial geology, Geomorphology, Glacial till, Sediments, Moraines, Glacier ablation, Subglacial observations, Landforms, Topographic features.

33-3152
Hall effect in ice.
Rose, D.N., College Station, Texas A. and M. University, 1971, 61p., University Microfilms order No.71-24,706, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1971, p.1794.
Ice crystals, Ice physics, Proton transport, Accuracy.

33-3153
Wind tunnel study on the growth of graupel.
Pflaum, J.C., Los Angeles, University of California, 1978, 126p., University Microfilms order No.7823395, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Dec. 1978, p.2857.
Snow pellets, Snow crystal growth, Wind tunnels, Hydrodynamics, Ice accretion, Hoarfrost, Cloud chambers.

33-3154
Copepod distributional ecology in a glacial run-off fjord.
Stone, D.P., Vancouver, University of British Columbia, Canada, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, March 1979, p.4248. Microfilm from the National Library of Canada.
Glacial hydrology, Runoff, Plankton, Marine biology, Water temperature, Salinity, Hydrography, Canada—British Columbia—Knight Inlet.

33-3155
Ecological aspects of energy capture and utilization in four Arctic and alpine rosette species of *Saxifraga.*
Masters, M.A., Durham, N.C., Duke University, 1978, 355p., University Microfilms order No.7905364, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, March 1979, p.4175.
Alpine vegetation, Tundra vegetation, Plant ecology, Plant physiology, Arctic vegetation, Environments, Air temperature, Solar radiation.

33-3156
Ice ablation measured by stakes and by terrestrial photogrammetry—a comparison on the lower part of the White Glacier, Axel Heiberg Island, Canada.
Arnold, K.C., Montreal, P.Q., McGill University, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, March 1979, p.4244. Microfilm from the National Library of Canada.
Glacier ablation, Markers, Photogrammetry, Aerial photographs, Measuring instruments.

33-3157
***Correlation* between the pore-size distributions and freeze-thaw durability of coarse aggregates in concrete.**
Kaneulji, M., Lafayette, Ind., Purdue University, 1978, 157p., University Microfilms order No.7905731, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Mar.1979, p.4492.
Concrete durability, Concrete freezing, Freeze thaw tests, Concrete aggregates.

33-3158
Influence of climate on glaciers and permafrost.
Thompson, R.D., Geographical papers, No.57, Reading, England, University, 1977, 44p., 26 refs.
Glacier mass balance, Permafrost distribution, Climatic factors, Snow accumulation, Ice thermal properties, Tundra, Ground thawing, Heat flux, Active layer thickness, Topographic effects, Human factors.

33-3159
Geobotanical and ecological observations at two locations in the west-central Siberian Arctic.
Webber, P.J., et al, *Arctic and alpine research,* 1977, 9(3), p.305-315, 10 refs.
Klein, D.R.
Tundra vegetation, Ecology, Ecosystems, Landforms, Arctic regions, Animals, USSR—Siberia.

33-3160
Dielectric properties of ice microcrystal dispersions: some comments on a discussion. [Propriétés diélectriques des dispersions de microcristaux de glace: commentaires sur une "mise au point"],
Lagourette, B., et al, *Journal de physique,* June 1978, 39(6), p.718-721, In French. 75 refs. Comments on 32-1683.
Boned, C., Babin, L.
Ice dielectrics, Dispersions, Microstructure, Ice temperature, Ice relaxation, Temperature effects.

33-3161
Selected papers from: Third International Conference on Port and Ocean Engineering Under Arctic Conditions.
McCormick, M.E., ed, *Ocean engineering,* Oct. 1976, 3(5), p.263-373, For other versions of these selected papers see: 31-1934, 31-1937, 32-2205, 32-2215, 32-2216, 32-2233, 32-2239, 32-2240, 32-2252. Cited items in Vol. 32 are the conference versions of the papers edited to greater or lesser extent for inclusion in this collection. The two items from Vol. 31 were based on a symposium held in conjunction with the conference but do not appear in the conference proceedings. They were published separately in Occasional Publication No. 4 of the Institute of Marine Science at the University of Alaska.
Meetings, Sea ice, Ice pressure, Offshore structures, Wind (meteorology), Ocean currents.

33-3162
Remote sensing as an aid for navigation in ice-covered areas.
Thoren, R., Freiburg, West German, 1978, 54p., N79-16836, Presented at the Symposium on Remote Sensing, International Society for Photogrammetry, Freiburg, July 2-8, 1978.
Remote sensing, Ice navigation, Photointerpretation, Sea ice.

33-3163
Temperature measurements on the Vickers Viscount stabilizer in flight under icing conditions.
Bertelrud, A., Stockholm, Aeronautical Res. Inst. of Sweden, Aug. 1977, 35p. N79-16845.
Temperature measurement, Aircraft icing, Heat loss.

33-3164
Helicopter icing research.
Adams, R.I., Workshop on Meteorolgical and Environmental Inputs to Aviation Systems, 2nd. Proceedings, Knoxville, University of Tennessee Space Institute, 1978, p.139-152. N79-17421 (N79-17413).
Research projects, Protective coatings, Aircraft icing, Helicopters.

33-3165
Aircraft icing.
Perkins, P.J., Workshop on Meteorological and Environmental Inputs to Aviation Systems, 2nd. Proceedings, Knoxville, University of Tennessee Space Institute, 1978, p.85-99. N79-17418 (N79-17413).
Aircraft icing, Meteorological data, Measurement.

33-3166
Blank corrections for ultratrace atomic absorption analysis.
Cragin, J.H., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, CR 79-3, 5p., ADA-066 979, 2 refs.
Quarry, S.T.
Water chemistry, Chemical analysis, Metals, Atomic absorption.
Both flame and flameless atomic absorption(AA) measurements require a distilled water blank correction. This correction is due to the analyte contained in the distilled water used to prepare the standards and not, as commonly thought, to the reference "blank" used to zero the instrument. Flameless AA analyses of acidified heavy metal samples generally require additional corrections for the furnace deflection blank and for an acid blank. To prevent adsorption losses, the acid blank should be determined by extrapolation of a series of acid dilutions in distilled water.

33-3167
Topologic characteristics of heat, moisture and matter in geosystems. [Topologicheskie oscbennosti tepla, vlagi, veshchestva v geosistemakh],
Bachurin, G.V., ed, Irkutsk, 1970, 168p., In Russian. For selected papers see 33-3168 through 33-3179. Refs. passim. Prepared for a seminar, March 1970.
Nechaeva, E.G., ed, Snytko, V.A., ed.
DLC GB325.A475
Taiga soils, Landscape types, Taiga vegetation, Soil moisture, Cryogenic soils, Snow cover structure, Snow crystals, Crystal growth, Soil temperature, Radiation balance.

33-3168
Air and soil temperature in some taiga facies of the Angara River area. [Temperatura vozdukha i pochvy v nekotorykh taezhnykh fatsiiakh Priangar'ia],
Kremer, L.K., et al, Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.4-8, In Russian.
Krauklis, A.A.
DLC GB325.A475
Taiga soils, Soil temperature, Air temperature, Taiga vegetation, Plant ecology, Ecosystems, USSR—Angara River.

33-3169
Radiation regime and heat transfer in the central taiga of the Kondo-Sos'va area near the Ob' River. [Nekotorye osobennosti radiatsionnogo rezhima i teploobmena srednetaezhnykh fatsiĭ Kondo-Sos'vinskogo Priob'ia],
Trofimova, I.E., Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.17-21, In Russian.
DLC GB325.A475
Taiga vegetation, Radiation balance, Heat balance, Taiga soils, Landscape types, Swamps, Albedo, Peat, Soil temperature, Forest canopy, Heat transfer.

33-3170
Radiation regime and atmospheric temperature and humidity in different layers of dark conifer forests. [Radiatsionnyĭ rezhim, temperatura i vlazhnost' vozdukha v raznykh iarusakh temnokhvoĭnogo lesa],
Grigor'ev, G.N., Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.22-26, In Russian.
DLC GB325.A475
Soil temperature, Air temperature, Humidity, Radiation balance, Forest canopy, Radiation absorption, Taiga vegetation, Taiga soils.

33-3171
Temperature regime of southern taiga soils in West Siberia. [Temperaturnyĭ rezhim pochv iuzhnoĭ taĭgi Zapadnoĭ Sibiri],
Nasulich, L.F., Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.27-28, In Russian.
DLC GB325.A475
Taiga soils, Soil temperature, Thermal regime, Taiga vegetation.

33-3172
Hydrothermal conditions of soils in the Sos'va area near the Ob' River. [Gidrotermicheskie usloviia pochv na territorii Sos'vinskogo Priob'ia],
Fedorova, N.M., Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.32-34.
DLC GB325.A475
Taiga soils, Soil temperature, Soil moisture migration, Taiga vegetation, Landscape types.

33-3173
Dynamics of moisture reserves in the southern taiga facies of West Siberia. [Dinamika zapasov vlagi v iuzhnotaezhnykh fatsiiakh Zapadnoĭ Sibiri],
Nechaeva, E.G., et al, Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.35-39, In Russian.
Laĭvin'sh, M.IA., Polushkin, IU.V.
DLC GB325.A475
Ground ice, Taiga soils, Podsol, Seasonal freeze thaw, Soil moisture migration, Taiga vegetation, Landscape types, Plant ecology.

33-3174
Moisture regime of southern taiga soils near the lower course of the Angara River. [Rezhim vlazhnosti pochv iuzhnoĭ taĭgi nizhnego Priangar'ia],
Khismatullin, Sh.D., Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.44-49, In Russian.
DLC GB325.A475
Podsol, Taiga soils, Seasonal freeze thaw, Soil moisture migration, Soil temperature, Frost penetration, Taiga vegetation, USSR—Angara River.

33-3175
Methods of determining moisture content of taiga soils under semi-experimental station conditions. [O metodike opredeleniia vlazhnosti pochv v polustatsionarnykh taezhnykh usloviiakh],
Khismatullin, Sh.D., Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.47-49, In Russian.
DLC GB325.A475
Taiga soils, Soil moisture, Moisture content, Samplers, Sampling, Laboratory techniques.

33-3176
Peculiarities of soil regimes in the Tugrski research station. [Osobennosti pochvennykh rezhimov v fatsiiakh Tugrskogo statsionara],
Sazonov, A.G., et al, Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.50-52, In Russian.
Sokolov, N.A.
DLC GB325.A475
Taiga soils, Taiga vegetation, Lichens, Mosses, Soil temperature, Heat transfer, Mass transfer, Research projects.

33-3177
Crystal growth and mass transfer in snow cover of the West Siberian taiga. [Rost kristallov i massoobmen v snezhnoĭ tolshche Zapadnosibirskoĭ taĭgi],
Kolomyts, E.G., Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.73-76, In Russian.
DLC GB325.A475
Snow cover distribution, Metamorphism (snow), Snow crystal growth, Snow stratigraphy, Taiga terrain, Landscape types, Mass transfer, Sublimation.

33-3178
Enzyme activity of microbes and its role in organic matter transformation in the steppe and taiga geosystems. [Enzimaticheskaia aktivnost' mikrobnoĭ massy i ee rol' v transformatsii organicheskogo veshchestva v stepnykh i taezhnykh geosistemakh],
Mikhallova, E.N., et al, Topologicheskie osobennosti tepla, vlagi, veshchestva v geosistemakh (Topologic characteristics of heat, moisture and matter in geosystems) edited by G.V. Bachurin, et al, Irkutsk, 1970, p.120-123, In Russian.
Nikitina, Z.I.
DLC GB325.A475
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Visibility, Trafficability, Wind velocity, Particles, Blowing snow, Boundary layer.
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Alpine vegetation, Snowdrifts, Snow fences, Snow depth, Soil moisture, Growth, Animals, Cold weather survival.

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33-3304
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Ice physics, Ice mechanics, Ice pressure, Stresses, Measuring instruments, Design, Analysis (mathematics).

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Evaluation of improved track structural components under sub-arctic conditions.
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Railroad tracks, Subgrades, Frost heave, Countermeasures, Prestressed concrete, Anchors.

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Hydraulic structures, Pipelines, Tidal currents, Trenching, United States—Alaska—Cook Inlet.

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Submarine permafrost, Permafrost distribution, Seismic reflection, Seismic velocity, Temperature measurement, Beaufort Sea.

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Computer programs, Forecasting, Environment simulation, Offshore drilling.

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Hall, D.K., *U.S. National Aeronautics and Space Administration. Technical memorandum,* Sep. 1978, NASA-TM-79642, 6p., 8 refs.
Naleds, Chemical reactions, Frost weathering, Minerals.

33-3314
Army experience with synthetic engine oils in mixed fleet Arctic service.
Lestz, S.J., et al, Warrendale, Pa., Society of Automotive Engineers, 1975, 23p., Presented at the SAE Fuels and Lubricants Meeting, June 3-5, 1975, Houston, Texas. 32 refs.
Bowen, T.C.
Engines, Military research, Lubricants, Cold weather performance, Synthetic oils.

33-3315
Microwave brightness of polar firn as measured by Nimbus 5 and 6 ESMR.
Chang, A.T.C., et al, *U.S. National Aeronautics and Space Administration. Technical memorandum,* Oct. 1978, NASA-TM-79662, 20p., N79-13476, 20 refs.
Choudhury, B.J., Gloerson, P.
Microwaves, Brightness, Firn, Temperature measurement.
The microwave emission from a half-space medium, characterized by coordinate dependent scattering and absorbing centers, was calculated by numerically solving the radiative transfer equation by the method of invariant imbedding. A Mie scattering phase function and surface polarization was included in the calculation. Also included are the physical temperature profile and the temperature variation of the index of refraction for ice. Using published values of grain size and temperature profile data of polar firn, the brightness temperature was calculated for the 1.55 cm and 0.8 cm wavelengths. For selected regions in Greenland and Antarctica, the results are in reasonable agreement with the observed Nimbus-5 and Nimbus-6 ESMR data. (Auth.)

33-3316
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33-3318
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Oil pollution, Water pollution, Marine biology, Environmental impact, Research projects, Animals, Economic development.

33-3319
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Research projects, Economic development, Oil pollution, Water pollution, Marine biology, Environmental impact.

33-3321
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Water pollution, Environmental impact, Ocean currents, Sediments, Climate, Sea ice distribution, Submarine permafrost, Models, Mapping.

33-3322
Study of climate effects on ice extent and its seasonal decay along the Beaufort Sea and Chukchi Sea coasts.
Barry, R.G., Environmental assessment of the Alaskan continental shelf, Vol.3. Principal investigators' quarterly reports for the period July-September 1977, Boulder, Colorado, Environmental Research Laboratories, 1977, p.104-299, PB-279 913, 8 refs.
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33-3323
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Kovacs, A., et al, MP 1200, Environmental assessment of the Alaskan continental shelf, Vol.3. Principal investigators' quarterly reports for the period July-September 1977, Boulder, Colorado, Environmental Research Laboratories, 1977, p.503-510. PB-279 913.
Weeks, W.F.
Pack ice, Drift, Radar echoes, Ice cover thickness, Ice deformation, Data processing.

33-3324
Delineation and engineering characteristics of permafrost beneath the Beaufort Sea.
Sellman, P.V., et al, MP 1201, Environmental assessment of the Alaskan continental shelf, Vol.3. Principal investigators' quarterly reports for the period July-September 1977, Boulder, Colorado, Environmental Research Laboratories, 1977, p.518-521. PB-279 913.
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Submarine permafrost, Drill core analysis.

33-3325
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Hartz, R.W., Smith, P.A.
Submarine permafrost, Forecasting, Shoreline modification, Coastal topographic features.

33-3326
Environmental assessment of the Alaskan continental shelf, Vol.3. Biological studies. Boulder, Colorado, Environmental Research Laboratoratories, 1978, 623p., PB-289 156, Principal investigators' final reports. Numerous refs.
Research projects, Oil pollution, Water pollution, Marine biology, Animals, Environmental impact, Economic development.

33-3327
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Research projects, Economic development, Oil pollution, Water pollution, Environmental impact.

33-3328
Detachable drilling equipment for the EO-2621A excavator. [Smennoe burovoe oborudovanie k ekskavatoru EO-2621A],
Bugaev, V.G., et al, *Mekhanizatsiia stroitel'stva,* Feb. 1979, No.2, p.9-10, In Russian.
Earthwork, Drills, Excavating equipment, Permafrost.

33-3329
Improved performance of earthhwork equipment for freezing weather. [Rezervy povysheniia effektivnosti primeneniia zemleroĭnykh mashin v zimnee vremia],
Vartanov, S.Kh., *Mekhanizatsiia stroitel'stva,* Feb. 1979, No.2, p.10-12, In Russian. 2 refs.
Excavating equipment, Cold weather construction, Earthwork, Frozen ground.

33-3330
Testing a modernized cutting tool for the ETTs-202A excavator designed for frozen ground. [Rezul'taty ispytaniĭ modernizirovannogo rabochego organa ekskavatora ETTs-202A pri razrabotke merzlykh gruntov],
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Grin'ko, A.F., Suurpere, A.O.-I.
Excavating equipment, Earthwork, Frozen ground, Design.

33-3331
Experience in using a new type of rippers in the Trust "Mosinzhstroĭmekhanizatsiia" No.1. [Opyt primeneniia novogo ekskavatornogo rykhlitelia v treste "Mosinzhstroĭmekhanizatsiia" No.1],
Gusman, M.E., et al, *Mekhanizatsiia stroitel'stva,* Feb. 1979, No.2, p.14, In Russian.
Zviagintsev, A.N., Isaev, O.K., Nedorezov, I.A.
Excavating equipment, Earthwork, Frozen ground.

33-3332
Intensifying the process of wedge penetration into ground. [Intensifikatsiia protsessa vnedreniia klina v grunt],
Khmara, L.A., et al, *Mekhanizatsiia stroitel'stva,* Feb. 1979, No.2, p.15, In Russian. 1 ref.
Shatov, S.V., Balovnev, V.I.
Earthwork, Excavating equipment, Frozen ground.

33-3333
Weak limestones as a main stone material in the north European USSR. [Maloprochnye izvestniaki—glavnyĭ rezerv kamennykh materialov na evropeĭskom Severe SSSR],
Beĭsher, R.V., et al, *Avtomobil'nye dorogi,* Dec.1978, No.12, p.8-9, In Russian. 2 refs.
Bondarevskiĭ, V.I.
Roads, Airports, Pavements, Construction materials.

33-3334
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Levchenko, A.V., et al, *Avtomobil'nye dorogi,* Dec. 1978, No.12, p.10-11, In Russian.
Putilin, E.I.
Roads, Airports, Pavements, Soil stabilization, Cements.

33-3335
Winter maintenance of roads in the Moscow area. [Zimnee soderzhanie dorog v Moskovskoĭ oblasti],
Fedorov, G.V., *Avtomobil'nye dorogi,* Dec. 1978, No.12, p.17-18, In Russian.
Roads, Winter maintenance, Snow removal equipment, Deicing.

33-3336
Improved method of designing road pavements for frost resistance under Siberian conditions. [Utochnenie metoda rascheta dorozhnykh odezhd na morozoustoĭchivost' v usloviiakh Sibiri],
Shelopaev, E.I., et al, *Avtomobil'nye dorogi,* Dec. 1978, No.12, p.23, In Russian. 2 refs.
Tulaev, A.IA.
Roads, Pavements, Frost resistance, Frost heave, Roadbeds, Design.

33-3337
Thermal insulation layer of foam polystyrene in embankments built on permafrost. [Teploizoliruiushchaia prosloĭka iz penopolistirola v nasypiakh na vechnomerzlykh gruntakh],
Ivanov, V.N., *Avtomobil'nye dorogi,* Dec. 1978, No.12, p.24-25, In Russian. 2 refs.
Roadbeds, Embankments, Permafrost beneath structures, Thermal insulation, Roads.

33-3338
Short range forecasting of spring flood hydrographs for rivers of the Central Siberian Plateau, using the genetic calculations techaique. [O vozmozhnosti kratkosrochnogo prognozirovaniia gidrografa vesennego polovod'ia na rekakh Sredne-Sibirskogo ploskogor'ia metodom geneticheskogo rascheta],
Krivosheeva, V.P., *Zapadno-sibirskiĭ regional'nyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1978, Vol.37, p.18-25, In Russian. 3 refs.
Floods, Forecasting, Runoff, Snow depth, Snow water equivalent, Analysis (mathematics).

33-3339
Computer calculation of river ice weakening in spring (the layer-by-layer technique). [Raschet vesennego oslableniia rechnogo l'da na EVM (posloĭnaia skhema)],
Liser, I.IA., *Zapadno-sibirskiĭ regional'nyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1978, Vol.37, p.37-47, In Russian. 3 refs.
Ice breakup, Ice strength, Ice air interface, Snow air interface, Heat transfer, River ice, Analysis (mathematics), Computer applications.

33-3340
Influence of ice cover structure and thickness on its radiation properties. [Vliianie stroeniia i tolshchiny ledianogo pokrova na ego radiatsionnye svoĭstva],
Ergin, V.P., *Zapadno-sibirskiĭ regional'nyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1978, Vol.37, p.48-53, In Russian. 15 refs.
Albedo, Ice cover thickness, Ice structure, Ice cover strength, Ice deterioration, Lake ice, Sea ice.

33-3341
Tebelery village in the Chuysk steppe. [Tebelery v Chuĭskoĭ stepi],
Krivonosov, B.M., *Zapadno-sibirskiĭ regional'nyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1978, Vol.37, p.87-90, In Russian.
Cryogenic processes, Pingos, Naleds, Frost heave, USSR—Altai Mountains.

33-3342
Project for the organization of industrial construction in the northern USSR. [Proekt organizatsii stroitel'stva promyshlennogo predpriiatiia v severnoĭ zone strany],
Dodin, V.A., et al, Moscow, Stroĭizdat, 1978, 56p., In Russian with English table of contents enclosed. 6 refs.
Industrial buildings, Earthwork, Concrete structures, Reinforced concrete, Construction materials, Transportation, Construction equipment, Construction costs.

33-3343
Effect of formation of the west antarctic ice sheet shallow-water marine faunas of Chile.
Zinsmeister, W.J., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.25-26, 3 refs.
Ice sheets, Ice formation, Ocean currents, Plankton, Climatic changes.
The biological and geological processes along the west coast of South America are dependent on the Humboldt Current, and any variation in the marine and polar climate in the southern Circum-Pacific should be reflected by corresponding changes in the Humboldt Current. The history of past climatic events in this area is examined. Recent work on the shallow-water molluscan faunas of central Chile indicates that subtropical conditions existed during the Middle and Upper Miocene when temperatures would have been expected to be much colder. These faunas abruptly disappear at the end of the Miocene and are replaced by cool temperate faunas similar to those existing today along the coast of Chile. This sudden faunal change appears to be related to the formation of the west antarctic ice sheet during the latest Miocene and Lower Pliocene and the subsequent introduction of colder subantarctic waters into the Humboldt Current.

33-3344
Soil weathering sequences in Wright Valley.
Bockheim, J.G., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.36-39, 7 refs.
Weathering, Soils, Alpine glaciation, Alpine soils, Moraines, Antarctica—Wright Valley.
Soils in Wright Valley were examined during the 1977-78 field season to establish their relationship to Wright Lower, Wright Upper, and alpine glaciations, and to compare them with soils previously investigated in Taylor Valley. Detailed descriptions were made for 55 profiles. A total of 295 soil samples were collected, and surface weathering features were recorded at 28 localities. A map of Wright Valley gives the location of soil profiles and landforms, and tabular data reflect the soil morphology, surface weathering characteristics, the effects of advances of the Wright Lower Glacier, and correlation of Wright and Taylor Valley soils.

33-3345
Antarctic search for meteorites during the 1977-78 field season.
Cassidy, W.A., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.39, 4 refs.
Glacier flow, Ablation.
Of 310 samples recovered from major bare ice patches along the western side of Allan Hills, 307 were identified as meteorites. One meteorite was found on ice at a field camp located between the eastern and western arms of Allan Hills. It is believed that the collection represents 20 to 50 new finds. The specimens were found for the most part on the upper and lower limbs of an ice monocline, which may reflect the existence of a near-surface ridge across which which the ice is flowing. Data on ice-flow regimes could help in the search for meteorite concentrations. On the other hand knowledge of meteorite concentrations should help to interpret ice-flow regimes and to infer past climate.

33-3346
Ross Sea glaciations: events in Lower Victoria Valley.
Borns, H.W., Jr., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.43-44, 3 refs.
Glacial geology, Glaciation, Glacial deposits, Antarctica—Victoria Valley.
The glacial geology of the Lower Victoria Valley was studied in order to determine whether, and to what extent, lower Victoria Valley had been invaded from the seaward side by ice of the Ross Sea glaciations. The broad distribution of volcanic clasts and apparent lack of in-place young volcanics in the lower Victoria Valley area suggest that a Ross Sea source is the most

reasonable explanation. Preliminary field work suggests that Victoria Lower Glacier has expanded several times and out of phase with at least many of the alpine glaciers that drain into the valley. This evidence, coupled with the elevation of the bedrock beneath the Victoria Lower Glacier and with the presence of scoreaceous basalt clasts in the drift, suggests the possibility that ice of the Ross Sea glaciations moved into Lower Victoria Valley several times. An 18-kg iron meteorite, thought to be the largest yet found in Antarctica, was discovered embedded in the till surface on the north side of the valley floor approx 1 km in front of the Victoria Lower Glacier.

33-3347

Glacial geologic studies in the McMurdo Sound region.

Stuiver, M., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.44-45, 7 refs.

Denton, G.H., Kellogg, T.B., Kellogg, D.E.

Glacial geology, Moraines, Glacial deposits, Drift, Antarctica—McMurdo Sound.

Glacial geologic studies during the 1977-78 field season included the following projects: mapping surficial deposits in Wright Valley between Wright Lower Glacier and Lake Vanda; collecting additional algae C-14 samples from deltas deposited in Glacial Lake Washburn in Taylor Valley; obtaining a chronology for young, ice-cored moraine ridges that border most glaciers in the McMurdo Sound Region; collecting shells and obtaining initial C-14 dates from the McMurdo Ice Shelf; and examining the glacial geology of the Ruppert and Hobbs Coasts.

33-3348

Reconnaissance of the glacial geology of Hobbs Coast and Ruppert Coast, Marie Byrd Land.

Karlén, W., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.46-47, 7 refs.

Melander, O.

Glacial geology, Striations, Weathering, Glacier oscillation, Antarctica—Marie Byrd Land.

Examples of striations, weathering, and glacial polish observed during reconnaissance of the glacial geology of Hobbs Coast and Ruppert Coast are discussed. In the Ruppert Coast area striations shown an ice movement mainly toward north and northwest (essentially the same as the present). At a few places striations indicate that an ice movement toward northeast occurred at some time. Directions of the striations in the Hobbs Coast area were also basically the same as the direction of ice movement that now occurs (north and, locally, west). Striations dated at 13 m.y. old have been reported from Boyer Butte. Field observations indicate that glaciers in direct contact with the sea have retreated through calving, while glaciers not in direct contact with the sea show no evidence of a retreat in recent time.

33-3349

Fixed nitrogen in antarctic ice and snow.

Parker, B.C., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.47-48, 4 refs.

Zeller, E.J., Harrower, K., Thompson, W.J.

Ice composition, Snow composition, Firn, Chemical analysis, Ice cores, Antarctica—South Pole.

Using portions of a 100-m South Pole firn core and snow pit samples, both a short term and long term cyclicity have been identified in the concentrations of nitrate (NO_3^-) and ammonium (NH_4^+) ions. The presence of significant NH_4^+ and absence of detectable nitrite (NO_2^-) in clean antarctic firn, ice, and snow had not been previously reported. Several climatic minimums apparently correspond to low NO_3^- and NH_4^+ levels generally. A Vostok ice core sample approx 10,000 yr old revealed the highest NO_3^- concentration of 525 microg of NO_3-N per liter. Potential sources of these substances in antarctic snow and ice are being tested.

33-3350

Ultrasonic measurements on deep ice cores from Antarctica.

Gow, A.J., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), MP 1202, p.48-50, 3 refs.

Kohnen, H.

Ice cores, Ultrasonic tests, Ice crystal structure, Antarctica—Byrd Station.

This report discusses some results of recent measurements of ultrasonic velocities performed on ice cores collected in 1968 at Byrd Station. The analytical technique is described. It is concluded that measurement of ultrasonic velocities of cores from deep drill holes enables monitoring of the relation characteristics of the cores and determination of the gross trends of c-axis orientation in the ice sheet. Supplemented by optical thin section, studies can verify the exact nature of the fabric at any given depth and any inclination of the fabric symmetry axis with respect to the direction of propagation of P-wave velocity.

33-3351

905-meter deep core drilling at dome C (East Antarctica) and related surface programs.

Lorius, C., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.50-51, 8 refs.

Donnou, D.

Ice cores, Ice composition, Drilling, Ice mechanics, Snow surveys, Antarctica—East Antarctica.

Using a newly developed electromechanical corer a 905-m core was recovered after drilling at dome C for 42 days. Several operations were carried out along with the drilling: logging and sampling for further laboratory studies, total gas content determinations, crystal size measurements, tests for mechanical properties of the ice, and filtration of the collected meltwater. *In situ* measurements consisted of diameter and temperature profiles. A surface program was also carried out. It included meteorological observations and atmospheric sulfur dioxide sampling. Snow surface and accumulation studies were conducted, and the 5-m-deep pit was extended down to 8 m for stratigraphy and snow sampling. Shallow coring and temperature measurements were also performed.

33-3352

Radio echo sounding of the antarctic ice sheet, 1977-78.

Drewry, D.J., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.52-53, 11 refs.

Meldrum, D.T.

Radio echo soundings, Ice sheets, Ice shelves, Subglacial observations.

A total of 141 flight hours were flown during 13 radio echo sounding missions in Antarctica between Jan. 13 and 23, 1978. Sounding was achieved along 25,000 km. Investigations were carried out in the International Antarctic Glaciological Project area, in West Antarctica, and in the Ross Ice Shelf Project area. The first large sub-ice lake in West Antarctica was detected along the western flank of the Ellsworth Mountains. The water body is at least 13 km in extent occupying a bedrock hollow beneath 3,500 m of ice. Several smaller lakes were also identified. Other investigations include studies of layering in East Antarctica; studies of birefringence and thus anisotropy of the dielectric constant of radar wave propagation in ice sheets; sounding behind the McMurdo dry valley area indicating the presence of sub-ice water, moraines, and a local ice surface dome; estimation of the heat flux through the base of an ice sheet; and study of the relative chronology between formation of ice sheets in East and West Antarctica.

33-3353

Glaciology near Byrd Station.

Whillans, I.M., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.53-54, 6 refs.

Ice sheets, Glacier flow, Glacier oscillation, Boreholes, Snow accumulation, Antarctica—Byrd Station.

The dynamics of ice flow along the Byrd Station strain network, and the interpretation of the Byrd Station core results are discussed. It is found that the ice sheet near Byrd Station has been flowing in a simple, nearly steady-state fashion for some tens of thousands of year. Although the ice sheet is close to steady-state, it is thinning slowly, at a rate of little more than 0.03 m/yr. This is attributed to a warming effect of about 8C which took place 14,000 yr ago. Because the tilting of the Byrd Station core hold has been measured, it is now possible to model the ice flow and to calculate the depth-age relationship for the core with some reliability. Variations in snow accumulation on the ice sheet near Byrd Station have been analyzed statistically.

33-3354

Ross Ice Shelf Project 1977-78.

Clough, J.W., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.54.

Ice shelves, Research projects, Antarctica—Ross Ice Shelf.

The 1977-78 Ross Ice Shelf Project (RISP) field season was marked by two major achievements: penetration of the ice shelf at the RISP drill camp J-9 and completion of the Ross Ice Shelf Geophysical and Glaciological Survey (RIGGS).

33-3355

Access hole drilling through the Ross Ice Shelf.

Browning, J.A., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.55.

Somerville, D.A.

Ice shelves, Ice drills, Boreholes, Drilling, Antarctica—Ross Ice Shelf.

Two access holes were drilled through the 1,380-ft ice thickness of the Ross Ice Shelf, using a flame-jet drill powered by an internal burner whose reactants are compressed air and fuel oil provided at high pressure. The drilling equipment and procedures used are described. The diameter of one of the holes showed large irregularities over the entire hole length. Reasons for the formation of these irregularities are not understood. It is considered doubtful that flame drilling beyond 3,000 ft in solid ice is practical.

33-3356

Glaciological measurements on the Ross Ice Shelf.

Thomas, R.H., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.55-56, 6 refs.

MacAyeal, D.R.

Ice shelves, Strains, Antarctica—Ross Ice Shelf.

Field work to complete the Ross Ice Shelf Geophysical and Glaciological Survey (RIGGS) was to involve remeasurement of 82 Kehle-type strain rosettes planted the previous season in a grid pattern on the ice shelf. It was further planned to remeasure detailed strain networks along two 40-km lines near camp C-6 and along a 35-km line on Crary Ice Rise. Precise position fixes were to be made at grid stations using a Geoceiver. Most of the work was accomplished following major delays.

33-3357

Ross Ice Shelf Geophysical survey, 1977-1978.

Greischar, L.L., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.56-59, 11 refs.

Shabtaie, S., Albert, D.G., Bentley, C.R.

Ice shelves, Geophysical surveys, Sounding, Radar echoes, Electrical resistivity, Antarctica—Ross Ice Shelf.

The geophysical program on the ice shelf began with gravity and radar sounding profiles and a seismic-surface-wave experiment at station Q-13. During the last week of Dec., five remote field sites were occupied with support of the Twin Otter airplane. Gravity measurements, radar sounding of ice thickness, and seismic sounding of water depth beneath the ice were made at all sites. In addition, studies of seismic and radio-wave velocities within the ice shelf were made at two of these sites and an electrical resistivity profile was completed at one. Early in Jan. airborne radar sounding was made along 1,800 kilometers of flight lines. The measurements are described.

33-3358

Antarctic ice core recovery.

Chiang, E., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.59-61, 9 refs.

Langway, C.C., Jr.

Ice cores, Ice composition, Ice density, Ice temperature, Ice shelves, Aerosols.

As part of the Polar Ice Core Analysis Program ice cores were obtained from sites Q-13, C-16, J-9, on the Ross Ice Shelf, and South Pole. These cores and other samples were collected to permit further investigation of the seasonal variation in sea salt concentrations, delineation of aerosol sources by chemical analysis, and assessment of the factors influencing the variations in the physical characteristics of the ice at these and other selected sites. In addition to the ice cores, snow and ice samples were collected from the ice towers near the summit of Mt. Erebus and also on the Ross Ice Shelf for preliminary investigations of the dispersion of aerosols emitted in the Mt. Erebus plume toward the shelf. Surface-to-core tie-in studies were conducted in the vicinity of each site, and measurements were made of core density, stratigraphy, and corehole temperature.

33-3359

Erebus glacier tongue movement.

Holdsworth, G., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.61-63, 3 refs.

Holdsworth, R.

Glacier tongues, Glacier oscillation, Ice deformation, Ice mechanics, Stresses, Antarctica—Erebus Glacier Tongue.

Ice deformation measurements were made on the Erebus Glacier Tongue, McMurdo Sound, in an attempt to support the hypothesis that, as a result of ocean wave excitation, a floating glacier may oscillate at a frequency that corresponds to one of its higher modes. Under storm conditions with open water, the amplitude and duration of vertical oscillations may be caused by the bending stresses in the resonant-like motion that cause fatigue failure in the ice. Other measurements included density, temperature, ice thickness, and water depth.

33-3360

Green iceberg samples in the Weddell Sea.

Amos, A.F., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.63-64, 2 refs.

Icebergs, Ice composition, Weddell Sea.

A green and white iceberg was observed and sampled in the eastern Weddell Sea from ARA Islas Orcadas cruise 15 in Feb. 1978. The bulk of the iceberg was comprised of bluish-white, opaque ice that was horizontally stratified but had a rougher top surface than a typical tabular iceberg. The "abnormal" portion of the iceberg was a deep green color, appearing almost black in certain light. The iceberg was estimated to be about 20 m high, 100 m long, and 40 m wide and was tilted at an angle of approximately 35 deg. The green "outcrop" stretched along the entire side that was tilted downward and extended beneath the sea surface. The maximum height of green ice above the surface was approximately 14 m. Results of analyses of the iceberg sample are presented. None of the results so far can be used to postulate an origin for the green iceberg.

33-3361

Numerical model of antarctic sea ice.

Parkinson, C.L., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.65-67, 4 refs.

Rayner, J.N.

Sea ice distribution, Mathematical models, Ice cover thickness.

A large scale numerical model, developed to simulate the annual cycle of sea ice in the Southern Ocean, is described. The model employs a 41 by 41 rectangular grid with 200-km horizontal resolution, an 8-hr timestep, and four vertical layers: ice, snow, ocean, and atmosphere. Both thermodynamic and dynamic processes are incorporated and there is an allowance for leads. The model is run for a 4-yr simulation period, allowing sufficient time for the yearly cycle to reach an approximate equilibrium. Although the model produces some satisfactory results on a large scale, smaller scale features such as the observed tendency for thicker ice at the northern reaches of the Weddell Sea than at the Weddell Sea coast are generally not reproduced. The results, however, demonstrate the feasibility of including sea ice in global models of the atmosphere and/or oceans.

33-3362

Continuous surface strain measurements on sea ice and on Erebus Glacier Tongue, McMurdo Sound, Antarctica.

Goodman, D.J., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.67-70, 12 refs.

Holdsworth, R.

Sea ice, Glacier tongues, Ice runways, Strains, Ice mechanics, Antarctica—Erebus Glacier Tongue.

These investigations included measurement of the flexural wave energy on the sea ice close to the Erebus Glacier Tongue, monitoring of the surface strain changes on the glacier itself, and measurement of continuous surface strain (in a frequency range

between 1 hertz and d c.) close to the annual runway on the sea ice close to McMurdo Station as LC-130 transport planes landed and vehicles passed along the ice road to the runway. Strains were measured continuously to an accuracy of 1 in 100,000,000 strain, over a 5-m gage length with a geophysical wire strainmeter. Typical examples of the data obtained are presented and discussed.

33-3363
Sea ice and ice algae relationships in the Weddell Sea.
Ackley, S.F., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), MP 1203, p.70-71, 7 refs.
Taguchi, S., Buck, K.R.
Sea ice, Pack ice, Algae, Cryobiology, Ice breakup, Chemical composition, Weddell Sea.
Analysis of data obtained during a 1977 cruise in the Weddell Sea indicates that the ice algal community found during that cruise is distinct from others that have been described (for example, the bottom epontic community in the land-fast ice in McMurdo Sound, the surface communities off East Antarctica, and the bottom communities in Arctic Pack ice.) Unlike these other communities, the Weddell pack algae is dominantly an interior one, existing not at the surface or bottom but at mid-depth (.65 to 2.15 m) within the ice. The formation of this community is dependent on the unique thermal and physical setting for Weddell sea pack ice. Brine drainage processes are initiated by summer warming, but are not carried through to completion as in the Arctic. This process causes a redistribution of salinity, maximizing in the mid-depth regions of the ice and apparently leading to algae production because of the relatively higher nutrient levels at these mid-depths. A qualitative model indicating the relationship between the thermally induced brine migration and subsequent algae growth is given.

33-3364
Tritium and carbon-14 distributions in McMurdo Sound, 1977.
Jackson, T.L., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.71-73, 7 refs.
Linick, T.W., Michel, R.L., Williams, P.M.
Ice composition, Radioactive isotopes, Ice cores, Fallout, Sea ice, Pack ice.
Sea waters from McMurdo Sound sampled for tritium and C-14 concentrations, and ice cores of 1-yr-old pack ice from the McMurdo Station sampling site were analyzed for tritium. Data for the samples are tabulated. Biological studies have indicated that water flows northward from under the Ross Ice Shelf on the west side of McMurdo Sound. The highest microbial activity was found at McMurdo Station, and the lowest activity, on the west of the Sound. These investigations indicate that the seawater on the east side of McMurdo may have undergone a more recent interaction with the atmosphere than the west side, causing higher concentrations of bomb-produced radionuclides such as tritium and C-14. Higher concentrations of both radioisotopes were found at the McMurdo sampling site. However tritium concentration closer to values found in the west side of McMurdo were found in the open Ross Sea. Thus, other factors, such as snow melt, may influence concentrations at McMurdo. The average tritium concentration for the ice cores was 1.01 tritium units, slightly higher than that found in the McMurdo seawater.

33-3365
Melting snow in the dry valleys is a source of water for endolithic microorganisms.
Friedmann, E.I., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.162-163, 10 refs.
Snow melting, Microbiology, Meltwater, Deserts, Cryobiology.
The role played by melting snow on endolithic microbial growth on rocks in the antarctic dry valleys has been investigated. Observations suggest that melting snow is a major, or perhaps exclusive, source of water for endolithic microorganisms in the antarctic desert. Like dew in hot deserts, meltwater is available only intermittently: endolithic microorganisms that rely on these water sources periodically undergo stages of desiccation. It appears likely that endolithic microorganisms of the antarctic cold desert are being moistened less frequently than those in hot deserts.

33-3366
Airborne particles and electric fields near the ground in Antarctica.
Benninghoff, W.S., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.163-164.
Benninghoff, A.S.
Aerosols, Particles, Snow composition, Electric fields.
The kinds, numbers, and deposition of airborne particles within 2 m of the ground were investigated at several antarctic sites. The airborne organic particles, derived from indigenous organisms, were relatively few at Arrival Heights and Lake Vanda, still fewer at McMurdo, and absent at South Pole station. Two categories of introduced organic particles greatly outweighed the numbers of native particles: cells and tissue fragments of conifer wood, and clothing fibers, both natural and synthetic. Snow samples collected at South Pole station contained incompletely burned diesel fuel residue and small quantities of mineral grains as well as conifer wood cells and clothing fibers, all presumably introduced by station activity. Electric field studies suggest that during periods of blowing snow and/or dust, greater numbers of airborne particles would tend to be deposited on wet soil or rock surfaces. This principle may be of basic significance in processes of diaspore lodgment and germination.

33-3367
Ecosystem comparisons of oasis lakes and soils.
Parker, B.C., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.168-169, 8 refs.
Simmons, G.M., Jr.
Lakes, Ecosystems, Meltwater, Limnology, Soils, Antarctica—Victoria Land.
The objective of this research was to gain an understanding of the interaction between dry valley (oasis) lakes and their associated soil and glacial meltstream ecosystem, and to assess the importance and magnitude of biotic processes influencing the development and evolution of these arheic antarctic lakes. Ten lakes in southern Victoria Land were surveyed during the 1977-78 austral summer. Most of the lakes had a benthic (attached) algal mat community. Wherever foam was collected, it was very high in chlorophyll, ATP, and cell numbers. In deeper arheic and nonmixing lakes such as Bonney, Vanda, Fryxell, and Chad, much of the fluorescence near the saline bottom was phaeophytin, suggesting a long history of productivity. In contrast, Miers, Joyce, and Hoare, with relatively fresh bottom water, had little phaeophytin. Phosphate in all lakes was scarce relative to certain potential nutrients. Phosphorus-33 uptake data suggest that phosphorus may be the major nutrient limiting productivity in these lakes. The high diversity of algal and microfaunal species from the lakes was unexpected. The first psychrophilic freshwater algae from Antarctica have been obtained. Despite the high concentrations of NO3 and NH4 ions in glacial ice and lake water, acetylene reduction studies showed that nitrogen fixation by benthic algal mats takes place.

33-3368
Atmospheric ice crystals at the South Pole in summer.
Ohtake, T., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.174-175, 6 refs.
Ice crystal formation, Precipitation (meteorology), Ice crystal nuclei, Clouds (meteorology), Antarctica—Amundsen-Scott Station.
The formation mechanisms of atmospheric ice crystals at the South Pole have been studied. The ice crystals formed in three different layers. High clouds (cirrus or cirrostratus) formed 1 mm or larger assembled-bullet ice crystals. Middle clouds (altostratus or altocumulus) created combined ice crystals in the form of side planes, bullets, and columns about 1 mm in size. Ice crystals from both high and middle clouds form and grown in the clouds, then fall out over long distances. The lowest 1,000 m, without visible cloud layer, but sometimes accompanied by fractostratus clouds, created ice crystals in the form of thin hexagonal plates and columns smaller than 0.2 mm. This last kind of ice crystal is the most complicated and forms by water vapor deposition directly onto nuclei under sub-ice saturation conditions. The stepped column ice crystals at South Pole station may result from the freezing of low-level stratus cloud droplets.

33-3369
Spectroscopic studies at McMurdo, South Pole, and Siple stations during the austral summer 1977-78.
Kuhn, M., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.178-179, 4 refs.
Siogas, L.
Albedo, Solar radiation, Reflectivity, Snow surface, Sea ice, Ice surface, Sastrugi, Antarctica—McMurdo Station, Antarctica—Amundsen-Scott Station, Antarctica—Siple Station.
This project concentrated on the radiative properties of different types of surfaces. Measurements were made of spectral albedo, anisotropic reflectance, and spectral extinction in snow and ice. Typical spectra are shown for albedo measurements taken at McMurdo, South Pole, and Siple stations, and at Canada Glacier of fresh water ice, sea ice, and aged and fresh snow.

33-3370
Trace elements in the antarctic atmosphere.
Zoller, W.H., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.187-188, 6 refs.
Cunningham, W.C., McGregor, C., Duce, R.A.
Snow composition, Aerosols, Ice composition, Atmospheric composition.
The project described in this article is designed to ascertain the composition of antarctic aerosols and to determine their source. The results will be used to evaluate the relationship of atmospheric aerosol burdens and the composition of snow. Efforts at South Pole Station are concentrating on the collection of particle samples for trace metal analysis and on both particulate and gaseous halogen samples. Radon-222 measurements are also being made daily. The results of chemical analysis of snow samples from the surface and from a 5-m pit will be compared with the atmospheric concentrations of elements measured. A plot of the chemical compositions of the atmosphere and snow from earlier measurements shows agreement within a factor of 3 or 4 for 13 elements determined. These results may indicate that the concentrations of these elements in snow are closely related to atmospheric burdens. Samples of ice were also collected from the summit of Mt. Erebus for analysis of halogens and other trace species.

33-3371
Gamma ray activity from radioactive fallout at the South Pole.
Dreschhoff, G., et al, *Antarctic journal of the United States,* Oct. 1978, 13(4), p.193-194, 4 refs.
Zeller, E.
Fallout, Radioactivity, Snow impurities, Antarctica—South Pole.
Significant variations in the gamma ray activity at specific levels below the surface were detected in a 4-m-deep pit on the Ross Ice Shelf at Williams Field and in a 5-m-deep pit in Marie Byrd Land. A much more successful test conducted in a 10-m-deep glaciological pit near South Pole Station revealed three individual zones of fallout concentration at depths of 1.4 m, 3.1 m, and 4.4 m. The increased gamma ray activity at these levels is very distinct and amounts to a 5 to 10% increase over the level of the background radiation. Beta activity peaks have been found at the same three locations by laboratory measurements. Each fallout zone can be correlated with a nuclear weapons test series.

33-3372
Ship operations, *Deep Freeze* 78.
Eckman, J.F., *Antarctic journal of the United States,* Oct. 1978, 13(4), p.227-229.
Icebreakers.
The itineraries and operations of the icebreakers *Glacier, Burton Island,* and *Polar Star,* the cargo ship *Bland,* and the tankship *Maumee* in support of the U.S. Antarctic Research Program are described. The *Glacier* and *Burton Island* furnished support for scientific activities. The channel break into Winter Quarters Bay was accomplished by the *Polar Star.* The *Bland* and *Maumee* provided resupply support. Icebreaker helicopters flew 169 flights in support of science and operations. The *Burton Island* was decommissioned after her return to Oakland, Calif.

33-3373
Annotated bibliography of "glaciel" studies; morpho-sedimentological aspects. [Bibliographie annotée du glaciel; aspects morpho-sédimentologiques],
Dionne, J.C., *Revue de géographie de Montréal,* 1969, 23(3), p.339-349, In French. Refs. p.340-349.
Glaciology, Bibliographies, Sediments, Glacial geology, Glacial till, Ice physics, Geomorphology.

33-3374
Late-glacial ice-wedge casts north of Québec City. [Fentes de cryoturbation terdiglaciares dans la région de Québec],
Dionne, J.C., *Revue de géographie de Montréal,* 1971, 25(3), p.245-264, In French with English and German summaries. 59 refs.
Ice wedges, Paleoclimatology, Cryogenic formations, Tundra, Moraines.

33-3375
Characteristics of erratic boulders along the shores of the St. Lawrence estuary. [Caractéristiques des blocs erratiques des rives de l'estuaire du Saint-Laurent],
Dionne, J.C., *Revue de géographie de Montréal,* 1972, 24(2), p.125-152, In French with English and Russian summaries. 39 refs.
Glacial deposits, Rock mechanics, Glacial till, Paleoclimatology, Shores, Glacial geology, Estuaries.

33-3376
Eastward transport of erratics in James Bay area, Québec.
Dionne, J.C., *Revue de géographie de Montréal,* 1974, 28(4), p.453-457, In English with French summary. 12 refs.
Rock mechanics, Glacial deposits, Glacier flow, Glaciation, Paleoclimatology, Ice age theory.

33-3377
Levels of ammonium, sulfate, chloride, calcium, and sodium in snow and ice from southern Greenland.
Busenberg, E., et al, *Journal of geophysical research,* Apr. 20, 1979, 84(C4), p.1705-1709, 28 refs.
Langway, C.C., Jr.
Snow composition, Ice composition, Chemical analysis, Ion density (concentration), Precipitation (meteorology), Acidity, Pollution, Greenland.

33-3378
Deformation of pack ice by ridging.
Bugden, G.L., *Journal of geophysical research,* Apr. 20, 1979, 84(C4), p.1793-1796, 7 refs.
Ice deformation, Pressure ridges, Pack ice, Ice mechanics, Ice pressure, Sea ice distribution, Analysis (mathematics), Mathematical models.

33-3379
Mapping of sea ice and measurement of its drift using aircraft synthetic aperture radar images.
Leberl, F., et al, *Journal of geophysical research,* Apr 20, 1979, 84(C4), p.1827-1835, 26 refs.
Bryan, M.L., Elachi, C., Farr, T., Campbell, W.
Sea ice distribution, Drift, Side looking radar, Radar echoes, Airborne radar, Remote sensing, Sensor mapping.

33-3380
Temperature fine structure near the sea-ice margin of the Chukchi Sea.
Paquette, R.G., et al, *Journal of geophysical research,* Mar. 20, 1979, 84(C3), p.1155-1164, 24 refs.
Bourke, R.H.
Ice edge, Salinity, Ice conditions, Water temperature, Temperature distribution, Sea water, Oceanography, Chukchi Sea.

33-3381
Experimental study of brine drainage and convection in young sea ice.
Niedrauer, T.M., et al, *Journal of geophysical research,* Mar. 20, 1979, 84(C3), p.1176-1186, 14 refs.
Martin, S.
Brines, Sea ice, Ice growth, Ice temperature, Convection, Heat flux, Experimental data, Laboratory techniques.

33-3382
On heat and mass flux through dry snow.
Palm, E., et al, *Journal of geophysical research,* Feb. 20, 1979, 84(C2), p.745-749, 11 refs.
Tveitereid, M.
Snow heat flux, Mass transfer, Snow physics, Snow permeability, Thermal properties, Convection, Diffusion, Analysis (mathematics), Snow water content.

33-3383
Ice-scour tracks on the Beaufort Sea continental shelf —their form and interpretation of the processes creating them.
Wahlgren, R.V., Ottawa, Ont., Carleton University, Department of Geography, Jan. 1979, 183p. + 5 appends. + maps, M.A. thesis. 13p. of refs. No microfiche available.
Ice scoring, Drift, Geomorphology, Shore erosion, Coastal topographic features, Slope processes, Buoyancy, Echo sounding, Acoustic measuring instruments, Ice floes, Computer applications, Measuring instruments, Beaufort Sea.

33-3384
Breeding cycle and behavior of the semipalmated sandpiper at Barrow, Alaska.
Ashkenazie, S., et al, *Auk,* Jan. 1979, Vol.96, p.56-67, 35 refs.
Safriel, U.N.
Ecology, Animals, Breeding, Behavior, United States —Alaska—Barrow.

33-3385
Report of polar meteorology workshop, Reno, Nevada, 1975.
Warburton, J.A., ed, *Nevada. University. Desert Research Institute. Technical report.,* [1976], Ser. P, No.18, 117p., Numerous refs. passim. For selected papers see F-21672, I-21661 through I-21663, I-21665 through I-21671, I-21673, and K-21664, or 33-3386.
DLC GB611.N4
Meteorology.
This report contains the formal papers presented at the Polar Meteorology Workshop, held in Reno, Nevada, 6-8 May 1975. The discussion and planning which occurred at the workshop are presented under four principal headings: Climatology and Synoptic Meteorology; The Chemistry of Atmospheric Particulates and Gases and Their Roles in Precipitation Processes; Energy Transfer and Atmospheric Structure; and Facilities and Techniques. The three day workshop was attended by 46 scientists engaged in meteorological research in both north and south polar regions. Critical issues were identified, as were new areas of research need. Recommendations for future research in polar areas are presented, together with explanations and justifications for the provision of specific facilities for the conduct of this research in the Arctic and Antarctic. (Auth.)

33-3386
Role of precipitation processes in chemistry of polar snows.
Warburton, J.A., et al, *Nevada. University. Desert Research Institute. Technical report,* [1976], Ser. P, No.18, Report on polar meteorology workshop, Reno, Nevada, 1975, edited by J.A. Warburton, p.104-107, 2 refs.
Linkletter, G.O., Owens, M.S.
DLC GB611.N4
Snow crystals, Snow impurities, Snow composition, Precipitation (meteorology), Antarctica—Ross Ice Shelf.
Preliminary study of replicated snow crystals in Antarctica indicates that the relative proportions of diffusional and accretional growth change with distance from the ocean, with diffusional processes becoming dominant in the more inland regions. It was proposed that variations in the chemistry of antarctic snow and ice may in part be accounted for by the temporal and spatial distribution of the atmospheric growth mechanisms of snow. These phenomena were investigated at two camps on the Ross Ice Shelf. The first results of analysis comparing relationships between precipitation processes and snow chemistry in time and space are presented in tables. The ratios shown are indicative of normal sea water values for the coastal stations. Further inland the ratios show evidence of enrichment in K and Mg. Apparently significant enrichment is occurring in specific precipitation types and depends on the type, *e.g.*, water droplets, accreted ice crystals, and diffusional growth crystals.

33-3387
Structure and functions of biogeocenoses in the Taymyr tundra. [Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry],
Tikhomirov, B.A., ed, Leningrad, Nauka, 1978, 303p., *In Russian. For individual papers see 33-3388* through 33-3402. Refs. passim.
Tomilin, B.A., ed.
Microclimatology, Tundra soils, Tundra vegetation, Forest tundra, Swamps, Plant ecology, Ecosystems, Plant physiology, Landscape types, Soil profiles, Phenology, Soil microbiology, Algae, Lakes, Bibliographies, USSR—Taymyr Peninsula.

33-3388
Micro- and mesoclimates of Taymyr. [Mikro- i mezoklimaty Taĭmyra],
Romanova, E.N., Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.5-29, In Russian. 15 refs.
Microclimatology, Air temperature, Cryogenic soils, Tundra soils, Solar radiation, Soil temperature, Tundra vegetation, Forest tundra, Swamps, USSR—Taymyr Peninsula.

33-3389
Variations in the composition of soil solutions and some soil properties in the "Tareya" research station during the vegetation period. [Izmenenie sostava pochvennykh rastvorov i nekotorykh svoĭstv pochv statsionara "Tareia" v techenie vegetatsionnogo perioda],
Vasil'evskaia, V.D., et al, Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.30-57, In Russian. 15 refs.
Kolpashchikova, G.A.
Cryogenic soils, Tundra soils, Swamps, Peat, Tundra vegetation, Soil moisture, Soil composition, Soil chemistry.

33-3390
Seasonal dynamics of Arctic plant increments in the western Taymyr. [Sezonnaia dinamika prirosta arkticheskikh rasteniĭ po nabliudeniiam na Zapadnom Taĭmyre],
Vital', A.D., Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.58-71, In Russian. 14 refs.
Tundra soils, Tundra vegetation, Plant ecology, Ecosystems, USSR—Taymyr Peninsula.

33-3391
Vegetation in the vicinity of the Taymyr Biogeocenological Research Station. [Rastitel'nost' okrestnostei Taĭmyrskogo biogeotsenologicheskogo statsionara],
Matveeva, N.V., Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.72-113, In Russian. 19 refs.
Tundra vegetation, Plant ecology, Ecosystems, Tundra soils, Landscape types, USSR—Taymyr Peninsula.

33-3392
Life forms of vascular plants in the Taymyr Research Station. [Zhiznennye formy sosudistykh rasteniĭ Taĭmyrskogo statsionara],
Polozova, T.G., Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.114-143, In Russian. 20 refs.
Arctic vegetation, Tundra soils, Tundra vegetation, Plant ecology, Plant physiology, Ecosystems, Bibliographies, USSR—Taymyr Peninsula.

33-3393
Phenologic observations in the basic plant associations of the Taymyr Biogeocenological Research Station. [Fenologicheskie nabliudeniia v osnovnykh rastitel'nykh soobshchestvakh Taĭmyrskogo biogeotsenologicheskogo statsionara],
Polozova, T.G., et al, Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.144-165, In Russian. 5 refs.
Deeva, N.M.
Tundra vegetation, Ecosystems, Plant physiology, Tundra soils, Phenology, Air temperature, Wind factors, USSR—Taymyr Peninsula.

33-3394
Seed productivity of western Taymyr plants. [Semennaia produktivnost' rasteniĭ Zapadnogo Taĭmyra],
Khodachek, E.A., Struktura i funktsii biogeotsenozov Taĭmyrskoĭ tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.166-167, In Russian. 40 refs.
Tundra soils, Tundra vegetation, Plant physiology, Swamps, Ecosystems, Bibliographies, USSR—Taymyr Peninsula.

33-3395
Fine structure of two rare species of the genus Nitzschia Hass. from western Taymyr water-bodies. [Tonkaia struktura dvukh redkikh vidov roda Nitzschia Hass. iz vodoemov Zapadnogo Taĭmyra],
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Underground facilities, Heat transfer, Waste disposal, Heat recovery, Heat sinks.
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Data processing, Remote sensing, Photointerpretation, Aerial photography, Spaceborne photography.

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Research projects, Marine biology, Animals, Oil pollution, Microbiology, Hydrocarbons, Environmental impact.

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Water pollution, Hydrocarbons, Sediment transport, Suspended sediments.

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Ocean currents, Oceanography, Fast ice, Pressure ridges, Ice mechanics.

33-3496
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Tidal currents, Radar echoes, Water flow, Mapping.

33-3497
Current measurements in possible dispersal areas of the Beaufort Sea.
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Ocean currents, Periodic variations, Flow rate.

33-3498
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Ocean currents, Tidal currents, Water flow, Oceanography, United States—Alaska—Gulf of Alaska.

33-3499
Alaska numerical modeling.
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Oceanography, Meteorology, Mathematical models.

33-3500
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Coachman, L.K., et al, Environmental assessment of the Alaskan continental shelf, Vol.10, Transport. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, Oct. 1978, p.327-574, Includes as appendices: On lateral water mass interaction—a case study, Bristol Bay, Alaska, by L.K. Coachman et al; Structural front over the continental shelf of the eastern Bering Sea, by J.D. Schumacher et al; Evolution of the hydrographic structure over the continental shelf near Bristol Bay, Alaska during summer 1976, by T.H. Kinder et al; and Front overlying the continental slope in the eastern Bering Sea, by T.H. Kinder et al (see 33-2964). Numerous refs.
Kinder, T.H., Schumacher, J.D., Charnell, R.L.
Oceanography, Ocean currents, Tidal currents, Water structure, Temperature variations, Salinity, Thermal conductivity.

33-3501
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Oceanography, Water temperature, Salinity, Beaufort Sea.

33-3502
Lagrangian surface current measurements on the outer continental shelf.
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Ocean currents, Remote sensing.

33-3503
Study of climatic effects on fast ice extent and its seasonal decay along the Beaufort-Chukchi coasts.
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Climatic factors, Fast ice, Ice breakup, Sea ice distribution, Ice forecasting, Seasonal variations.

33-3504
Mechanics of origin of pressure ridges, shear ridges and hummock fields in landfast ice.
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Sea ice, Pressure ridges, Hummocks, Ice mechanics, Fast ice.

33-3505
Propagation of long period waves in floating sea ice.
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Shapiro, L.H.
Sea ice, Floating ice, Wave propagation, Ice mechanics, Vibration, Mathematical models.

33-3506
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Sea ice, Floating ice, Wave propagation, Ice mechanics, Mathematical models.

33-3507
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Fast ice, Ice mechanics, Stresses, Shores, Pressure ridges.

33-3508
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Data processing, Computer programs.

33-3509
Assembly for studying growth and melting of hailstones and the results obtained in preliminary testing. [Ustanovka dlia issledovaniia rosta i taianiia gradin i nekotorye predvaritel'nye rezul'taty opytov, provedennykh v nei],
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Okudzhava, A.M., Chikhladze, V.A.
Hailstone growth, Ice melting, Test equipment, Hailstones, Laboratory techniques.

33-3510
Growth of ice crystals. [K voprosu rosta kristalla l'da],
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Balakhvantseva, T.N., Basilashvili, M.I.
Ice crystals, Crystal growth, Mathematical models.

33-3511
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Pruidze, V.P., Bibiluri, L.Sh.
Supercooled fog, Artificial nucleation, Freezing nuclei, Ice nuclei, Fog dispersal, Cold chambers, Aerosols, Test equipment.

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33-3575
Prospects of using satellite surveying methods in geocryology. ¡Perspektivy ispol'zovaniia aerokosmicheskikh metodov v geokriologii¡
Nekrasov, I.A., Aerokosmicheskie issledovaniia Zemli (Satellite surveys of the Earth), Moscow, Nauka, 1979, p.224-234, In Russian. Refs. p.232-234.
Geocryology, Remote sensing, Measuring instruments, Infrared photography, Spaceborne photography, Photointerpretation, Permafrost distribution, Permafrost hydrology, Cryogenic processes, Cryogenic formations.

33-3576
Journeys down the line: building the Trans-Alaskan pipeline.
Mead, R.D., Garden City, N.Y., Doubleday, 1978, 609p.
DLC TN879.5.M36
History, Pipelines, Cold weather construction.

33-3577
Environmental assessment of the Alaskan continental shelf, Vol.2. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, 542p., Principal investigators' reports October-December 1978. For selected individual reports see 33-3578 through 33-3587.
Research projects, Ocean currents, Tidal currents, Sea ice, Climate, Shoreline modification, Sediments, Submarine permafrost, Oil spills, Data processing.

33-3578
Study of climatic effects on fast ice extent and its seasonal decay along the Beaufort-Chukchi coasts.
Barry, R.G., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.33-45.
Sea ice distribution, Fast ice, Climatic factors.

33-3579
Three-dimensional model for estuaries and coastal seas: Volume 6, Bristol Bay simulations.
Liu, S.K., et al, Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.63-183, 11 refs.
Leendertse, J.J.
Estuaries, Wind factors, Oil pollution, Wind factors, Water flow, Computerized simulation, Mathematical models.

33-3580
Coastal meteorology of the Alaskan Arctic coast.
Kozo, T., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.184-192.
Wind velocity, Wind direction, Models.

33-3581
Characterization of the nearshore hydrodynamics of an Arctic barrier island-lagoon system.
Matthews, J.B., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.193-201.
Sea ice, Water flow, Ocean currents, Measuring instruments, Water temperature, Salinity.

33-3582
Sediment characteristics, stability, and origin of the barrier island-lagoon system.
Naidu, A.S., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.202-215, 2 refs.
Offshore land forms, Sediment transport, Chemical analysis, Minerals.

33-3583
Environmental geology and geomorphology of the barrier island-lagoon system along the Beaufort Sea coastal plain from Prudhoe Bay to the Colville River.
Cannon, P.J., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.216-223, 2 refs.
Offshore land forms, Shore erosion, Aerial photography, Photointerpretation, Coastal topographic features.

33-3584
Oceanographic processes in a Beaufort Sea barrier island-lagoon system: numerical modeling and current measurements.
Mungall, J.C.H., et al, Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.224-235.
Whitaker, R.E.
Oceanography, Offshore land forms, Ocean currents, Mathematical models.

33-3585
Offshore permafrost studies and shoreline history of Chukchi and Beaufort Seas as an aid to predicting offshore permafrost conditions.
Hopkins, D.M., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.280-296, Includes Record of a pre-historic storm surge in the Wainwright Inlet-Kuk River area by Hopkins, R.W. Hartz, and S.W. Robinson as appendix A. 12 refs.
Submarine permafrost, Shoreline modification, Geologic structures, Radioactive age determination.

33-3586
Subsea permafrost probing, thermal regime and data analysis.
Osterkamp, T.E., et al, Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.319-399.
Harrison, W.D.
Submarine permafrost, Drill core analysis, Thermal regime.

33-3587
Beaufort seacoast permafrost studies.
Rogers, J.E., et al, Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.400-408.
Morack, J.L.
Submarine permafrost, Seismic refraction, Permafrost indicators, Permafrost depth.

33-3588
Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, 688p., Principal investigators' annual reports for the year ending March 1978. Numerous refs. For selected individual reports see 33-3589 through 33-3603.
Research projects, Sea ice, Oil spills, Submarine permafrost, Shoreline modification, Shore erosion, Earthquakes, Water chemistry, Seismology.

33-3589
Oil spill vulnerability of the Beaufort Sea coast.
Nummedal, D., et al, Environmental assessment of the Alaskan continental Shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.1-7, 7 refs.
Fischer, I.A., Knoth, J.S.
Ocean waves, Shore erosion, Sediment transport.

33-3590
Interaction of oil with sea ice in the Arctic Ocean.
Martin, S., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.8-10.
Sea ice, Oil spills, Viscous flow.

33-3591
Dynamics of near-shore ice.
Kovacs, A., et al, MP 1205, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.11-22.
Weeks, W.F.
Sea ice, Drift, Ice cover thickness, Radar echoes, Ice structure, Pressure ridges.

33-3592
Dynamics of near shore ice.
Pritchard, R.S., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.39-49.
Sea ice, Dynamic properties, Drift, Measuring instruments, Ice mechanics, Ice models.

33-3593
Delineation and engineering characteristics of permafrost beneath the Beaufort Sea.
Sellmann, P.V., et al, MP 1206, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.50-74.
Chamberlain, E.
Submarine permafrost, Bottom sediment, Boreholes, Temperature measurement.
Observations include determinations of subsea sediment temperature, type, ice content, and chemical composition. These data, coupled with geophysical studies and results from other Beaufort Sea geological studies, are being used jointly to ascertain subsea permafrost distribution. This report includes a summary of the spring 1977 field program and a general summation of the results from two years of field study in the Prudhoe Bay area. The 1977 field study produced six additional drilled and sampled holes plus 27 probe sites which yielded both material property and temperature data. The field observations and the results of laboratory analyses of the samples help to demonstrate the complex nature of subsea permafrost.

33-3594
Offshore permafrost studies, Beaufort Sea.
Hopkins, D.M., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.75-146, Includes as appendixes: Microfossils—benthic foraminifera by K. McDougall; Ostracodes by E. Compton et al; Final report on pollen from borehole PB-2 and Modern pollen rain on the Chukchi and Beaufort Sea coasts, Alaska both by R.E. Nelson.
Hartz, R.W.
Submarine permafrost, Boreholes, Temperature measurement, Thermokarst, Marine biology, Fossils, Pollen, Radioactive age determination.

33-3595
Marine environmental problems in the ice covered Beaufort Sea shelf and coastal regions.
Barnes, P., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.148-299, For attachments to this report see 33-3596 through 33-3599. 8 refs.
Reimnitz, E.
Sea ice, Offshore land forms, Ice scoring, Ocean currents, Tidal currents, Bottom topography, Sediment transport.

33-3596
Storm surges in the Alaskan Beaufort Sea.
Reimnitz, E., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.166-192, 24 refs.
Maurer, D.K.
Storms, Wind (meteorology), Sea ice, Wood, Shoreline modification, Ice scoring, Sea level.

33-3597
Ice gouging characteristics; their changing patterns from 1975-1977, Beaufort Sea, Alaska.
Barnes, P., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.193-229, 16 refs.
McDowell, D., Reimnitz, E.
Sea ice, Ice scoring, Bottom sediment.

33-3598
Ice-gouged microrelief on the floor of the eastern Chukchi Sea Alaska: a reconnaissance survey.
Toimil, L.J., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.230-276, 50 refs.
Ice scoring, Sea ice, Bottom topography, Acoustic measuring instruments, Bottom sediment.

33-3599
Stamukhi shoals of the Arctic—some observations from the Beaufort Sea.
Reimnitz, E., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.277-299, 8 refs.
Maurer, D.K.
Sea ice, Ice deformation, Hummocks, Pressure ridges.

33-3600
Distributions of grain size, total carbon, heavy and light minerals, clay mineralogy, and inorganic geochemistry, outer continental shelf, southern Bering Sea.
Gardner, J.V., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.300-383, 1 ref.
Vallier, T.L., Dean, W.E., Kvenvolden, K.A., Redden, G.D.
Sea water, Water chemistry, Minerals, Particle size distribution, Sediments.

33-3601
Yukon delta coastal processes study.
Dupré, W.R., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.384-446, 44 refs.
Geologic structures, Tides, Permafrost distribution, Shoreline modification, Coastal topographic features, Sea ice.

33-3602
Subsea permafrost: probing, thermal regime and data analysis.
Osterkamp, T.E., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.570-650, 23 refs.
Harrison, W.D.
Submarine permafrost, Boreholes, Thermal regime, Salinity, Pile driving, Ground thawing, Settlement (structural).

33-3603
Beaufort seacoast permafrost studies.
Rogers, J.C., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.651-688, 19 refs.
Morack, J.L.
Submarine permafrost, Permafrost depth, Permafrost thickness, Seismic refraction.

33-3604
Environmental assessment of the Alaskan continental shelf, Vol.12. Hazards. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, 619p., Principal investigators' annual reports for the year ending March 1978. For selected individual reports see 33-3605 through 33-3618.
Research projects, Bottom sediment, Sediment transport, Shoreline modification, Submarine permafrost, Seismology.

33-3605
Faulting, sediment instability, erosion, and deposition hazards of the Norton Basin seafloor.
Nelson, H., Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.187-307, Includes six separate papers, q.v., 33-3606 through 33-3611. Numerous refs.
Geologic structures, Bottom sediment, Ice scoring, Gas inclusions, Bottom topography, Ocean currents.

33-3606
Report on surface and subsurface faulting in Norton Sound and Chirikov Basin.
Johnson, J.L., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.203-227, 25 refs.
Holmes, M.L.
Acoustic measuring instruments, Seismic reflection, Bottom topography, Geologic structures.

33-3607
Identification of thermogenic gas-charged sediment in Norton Basin and potential hazards.
Nelson, H., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.228-245, 17 refs.
Kvenvolden, K.A., Clukey, E.C.
Bottom sediment, Gas inclusions, Acoustic measuring instruments, Drill core analysis.

33-3608
Modern biogenic gas-generated craters (sea floor "pockmarks") on the Bering Shelf, Alaska.
Nelson, H., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.246-261, 27 refs.
Thor, D.R., Sandstrom, M.W.
Bottom sediment, Bottom topography, Gas inclusions, Geochemistry.

33-3609
Potential hazards of ice gouging over the Norton Basin sea floor.
Thor, D.R., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.262-278, 22 refs.
Nelson, H., Williams, R.O.
Sea ice, Ice scoring, Drift, Wind factors.

33-3610
Scour depressions and zones in Norton Sound.
Larsen, M.C., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.279-290, 24 refs.
Nelson, H., Thor, D.R.
Ice scoring, Bottom topography.

33-3611
Areas of active, large scale sand wave and ripple fields with scour potential on the Norton Basin sea floor.
Nelson, H., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.291-307, 8 refs.
Field, M.E., Cacchione, D.A., Drake, D.E.
Bottom topography, Ice scoring, Sands.

33-3612
Sediment transport in Norton Sound, northern Bering Sea, Alaska.
Cacchione, D.A., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.308-450, Includes the paper New instrument system to investigate sediment dynamics on continental shelves by Cacchione and Drake. 26 refs.
Drake, D.E.
Suspended sediments, Bottom sediment, Sediment transport, Ice cover effect, Ocean currents, Wind factors, Storms.

33-3613
Coastal processes and morphology of the Bering Sea coast of Alaska.
Sallenger, A.H., Jr., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.451-502, 11 refs.
Ocean waves, Shoreline modification, Shore erosion, Ice scoring, Storms, Geomorphology.

33-3614
Shoreline history of Chukchi and Beaufort Seas as an aid to predicting offshore permafrost conditions.
Hopkins, D.M., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.503-573, Includes 5 papers as appendices. For three of these see 33-3615 through 33-3617.
Hartz, R.W.
Shores, History, Submarine permafrost, Permafrost forecasting.

33-3615
Coastal morphology, coastal erosion, and barrier islands.
Hopkins, D.M., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.508-543, 23 refs.
Hartz, R.W.
Shoreline modification, Shore erosion, Geomorphology, Ice cover effect, Sediment transport, Wind factors, Storms.

33-3616
Modern pollen rain on the Chukchi and Beaufort Sea coasts, Alaska.
Nelson, R.E., Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.550-558, 6 refs.
Pollen, Tundra vegetation, Trees (plants).

33-3617
Erosional hazards map of the Arctic coast of the National Petroleum Reserve-Alaska.
Hartz, R.W., Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.566-573, 12 refs.
Shore erosion, Shoreline modification, Water waves, Storms, Ground thawing.

33-3618
Seismotectonic studies of northeast and western Alaska.
Biswas, N.N., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.575-619, 19 refs.
Gedney, L.
Seismic surveys, Earthquakes.

33-3619
Antarctic; Commission reports, Vol.17. [Antarktika; doklady komissii, vypusk 17],
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izuchenliu Antarktiki, Moscow, Nauka, 1978, 275p., In Russian. Numerous refs. passim. For individual papers see A-21686, A-21687, A-21705, B-21706, C-21702, E-21697 through E-21701, E-21704, F-21695, F-21696, H-21707, H-21708, I-21691, J-21693, K-21688 through K-21690, K-21692, K-21694, K-21709 and L-21703, or 33-3620 through 33-3622.
DLC G576.A65
Meetings, Research projects, Antarctica.
This volume comprises papers read at the 2nd All-Union Conference on Antarctic Research, commemorating the 20th year of Soviet activity and international cooperation in the Antarctic. The papers review the most significant findings in the last 20 years, their practical application in exploiting the polar areas, and the direction research should take in the future.

33-3620
Soviet research in the Southern Ocean. [Itogi sovetskikh issledovanii i IUzhnom okeane],
Treshnikov, A.F., *Antarktika; doklady komissii,* 1978, No.17, p.82-95, In Russian. 32 refs.
Sea ice distribution, Icebergs.
A history of Soviet Antarctic Expedition work in the Southern Ocean in the last 20 years is given. Over this period 1,500 oceanographical sampling points were used, hundreds of thousands of miles covered by echo sounding, characteristics of surface circulation studied over 35,000 miles, and deep circulation investigated at 26 stations. Bottom sediments were sampled at more than 500 stations and more than 200 measurements taken of sediment depth. Biological studies include more than 4,000 plankton and 400 benthic probes. These data allowed the geographical limits of the Southern Ocean to be established, the frontal zones and bordering seas defined, water masses identified, icebergs classified, sea ice masses located and tracked, and both surface and deep water circulation more completely charted.

33-3621
Glaciology in Antarctica on the eve of the 1980's. [Gliatsiologiia Antarktidy na rubezhe 80-kh godov XX v.],
Kotliakov, V.M., *Antarktika; doklady komissii,* 1978, No.17, p.111-124, In Russian. 14 refs.
Ice sheets, Glaciology, Antarctica.
Antarctic glaciology in the last 10 years is reviewed. During this time there has been a shift from complex studies carried out by individual countries to international projects. The article discusses the major one: International Antarctic Glaciological Project—its aims, the area under study, methodology, the Soviet role, and main results to date. The disposal of radioactive waste by burying it in Antarctica is considered but rejected. Antarctic mass balance is estimated and some problems affecting precision of such estimates are discussed. The possibilities either of catastrophic collapse of the West Antarctic ice sheet or of massive surges are touched upon. Suggestions for further glaciological research in Antarctica are offered.

33-3622
Paleoglaciology in Antarctica. [O probleme paleogliatsiologii Antarktidy],
Bardin, V.I., *Antarktika; doklady komissii,* 1978, No.17, p.125-131, In Russian. 28 refs.
Paleoclimatology, Glaciation.

The results of paleoglaciological research in Antarctica are reviewed. Studies of the complex of moraines of various ages in Victoria Land, Dronning Maud Land and Mac. Robertson Land have shown definite similarities in main glacial events among these regions and have proved that the East Antarctic ice sheet, at least after it reached its fullest extent, developed as one entity and underwent three great cyclical oscillations. Comparative lithological and morphological descriptions of moraines and glacial sediment dating have led to a correlation of the glacial events in various parts of Antarctica and to an understanding of the general course of East Antarctic Cenozoic glaciation.

33-3623
Methods and instruments for regional seismic surveys in inaccessible areas and their application in Siberia.
[Metodika i apparatura dlia regional'nykh seismicheskikh issledovanii v trudnodostupnoi mestnosti i ikh primenenie v Sibiri],
Fedynskii, V.V., ed, *Akademiia nauk SSSR. Sibirskoe otdelenie. Institut geologii i geofiziki. Trudy,* 1978, Vol.389, 205p., In Russian with English table of contents enclosed. 149 refs.
Kosminskaia, I.P., ed.
Seismic surveys, Permafrost physics, Seismic refraction, Telemetering equipment, Radio communication, Taiga terrain, Seismic prospecting.

33-3624
Winter stratification in a lake dominated by throughflow.
Bengtsson, L., *Luleå, Sweden. University. Research report,* 1978, TULEA 1978:01, p.24-45, 2 refs.
Water temperature, Temperature distribution, Heat flux, Heat transfer, Bottom sediment, Winter.

33-3625
Devices for collecting statistical data of maximum ice-overloads on overhead lines.
Paris, L., [Italy, 1970], 8 leaves, Unpublished manuscript. C.I.G.R.E. Study Committee, No.22, W.G. No.6—Safety factors.
Power line icing, Ice loads, Ice formation, Ice accretion, Measuring instruments, Statistical data, Wind factors.

33-3626
Origins and ecology of the Sierran alpine flora and vegetation.
Chabot, B.F., Durham, N.C., Duke University, 1971, 160p., University Microfilms order No.72-11,076, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p 6862-6863.
Alpine vegetation, Plant ecology, Environments.

33-3627
Moisture migration and heat transfer in wet sand during freezing.
Gupta, J.P., Philadelphia, University of Pennsylvania, 1971, 162p., University Microfilms order No.72-17,364, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p.7006.
Soil freezing, Soil moisture migration, Frozen sand, Heat transfer, Heat flux, Temperature effects, Water content.

33-3628
Processes and rate of development of talus slopes and protalus rock glaciers in the Ogilvie and Wernecke Mountains, Yukon Territory.
Gray, J.T., Montreal, P.Q., McGill University, 1971, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p.7107. Microfilm from the National Library of Canada.
Talus, Rock glaciers, Slope processes, Erosion, Avalanche deposits.

33-3629
Investigation of the low-temperature dynamic-mechanical response of hardened cement paste.
Helmuth, R.A., Stanford, Calif., University, 1972, 144p., University Microfilms order No.72-16,726, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p.7153.
Cements, Low temperature tests, Elastic properties, Ice formation, Viscosity, Thermal expansion, Amorphous ice, Temperature variations, Dynamic properties, Hardness tests.

33-3630
Statistical analysis of the liquid water distribution in a high altitude snowpack.
Carroll, T.R., Boulder, Colorado University, 1977, 86p., University Microfilms order No.77-29,901, N78-17421, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Jan. 1978, p.3103.
Snow water content, Snow hydrology, Snowmelt, Meltwater, Liquid phases, Statistical analysis, Models, Mountains.

33-3631
Influence of ice-crystal size and dispersed-solid inclusions on the creep of polycrystalline ice.
Baker, R.W., Minneapolis, Minnesota University, 1977, 111p., University Microfilms order No.7802631, N78-22431, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Apr. 1978, p.4688.
Ice creep, Ice crystal structure, Ice crystal size, Ice growth, Strain tests, Rheology, Thermal factors.

33-3632
Vegetation organization and fire frequency in the western subarctic.
Johnson, E.A., Saskatoon, Canada, University of Saskatchewan, 1977, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2109-2110. Microfilm from the National Library of Canada.
Subarctic vegetation, Forest fires, Revegetation, Mathematical models.

33-3633
Glacial drift characteristics of Minnesota as revealed on Landsat imagery.
Goebel, J.E., Lubbock, Texas Technological University, 1978, 147p., University Microfilms order No.7819890, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2186.
Glacier movement, Glacial till, Glacial geology, Remote sensing, LANDSAT, Photointerpretation.

33-3634
Physical adsorption, contact angle and ice adhesion studies on plastics.
Tse, J.T., Los Angeles, University of Southern California, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2327. Copies available from Micrographics Dept., Doheny Library, USC, Los Angeles, CA (90007).
Ice adhesion, Ice solid interface, Plastics, Adsorption, Wettability.

33-3635
Velocity of sound in supercooled and superheated water.
Trinh, E.H.C., New Haven, Conn., Yale University, 1978, 227p., University Microfilms order No.7820807, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2353.
Supercooled water, Sound transmission, Acoustic properties, Models, Experimental data.

33-3636
Heat and mass transfer in freezing unstaurated soil.
Jame, Y.-W., Saskatoon, Canada, University of Saskatchewan, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2401. Microfilm from the National Library of Canada.
Soil freezing, Heat transfer, Mass transfer, Soil moisture migration, Moisture content, Frost heave, Soil temperature, Measuring instruments.

33-3637
Effects of Prudhoe crude oil fractions on the Arctic amphipods *Boeckosimus affinis* and *Gammarus zaddachi*.
Busdosh, M., Louisville, Kentucky, University of Louisville, 1978, 124p., University Microfilms order No.7909723, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, May 1979, p.5210.
Crude oil, Marine biology, Oil spills, Environmental impact, Limnology, Damage, Animals, Sediments, Arctic regions.

33-3638
Buoy systems for acquiring data in marine environment.
Hall, J.M., et al, Offshore Technology Conference, 7th, Houston, Texas, May 5-8, 1975. Proceedings, Vol.2, 1975, p.493-502.
Kerut, E.G., Irico, J.
Meteorological instruments, Ice conditions, Buoyancy, Drift, Telemetering equipment, Moorings, Marine meteorology.

33-3639
Unique strategy for obtaining wave and wind data in the Gulf of Alaska.
McLeod, W.R., et al, Offshore Technology Conference, 7th, Houston, Texas, May 5-8, 1975. Proceedings, Vol.2, 1975, p.503-517.
Adamo, L.C., Hamilton, R.C.
Meteorological data, Measuring instruments, Water waves, Wind (meteorology), United States—Alaska—Gulf of Alaska.

33-3640
Prediction of the severity of iceberg season in northwest Atlantic Ocean.
Murty, T.S., et al, Offshore Technology Conference, 7th, Houston, Texas, May 5-8, 1975. Proceedings, Vol.3, 1975, p.785-794, 12 refs.
Bolduc, P.A.
Icebergs, Sea ice distribution, Ice conditions, Ice forecasting, Air temperature, Atmospheric pressure, Water temperature, Mathematical models.

33-3641
Soil morphologic and hydraulic changes associated with wastewater irrigation.
Simpson, T.W., et al, *Pennsylvania State University. Institute for Research on Land and Water Resources. Research project technical completion report,* Nov. 1978, 212p. PB-291 399.
Cunningham, R.L.
Water treatment, Waste disposal, Irrigation, Research projects.

33-3642
Modeling and simulation of wastewater reuse systems.
Smith, C.L., *Louisiana State University. Department of Chemical Engineering. Report,* Aug. 1978, LSU-WR-AR01, 22p., ADA-062 710, Available in microfiche copies only.
Waste disposal, Water treatment, Models, Simulation.

33-3643
Summary of Great Lakes weather and ice conditions, Winter 1976-77.
Quinn, F.H., et al, *U.S. National Oceanic and Atmospheric Administration. Technical memorandum,* Oct. 1978, NOAA-TM-ERL-GLERL-20, 155p. PB-292 613.
Assel, R.A., Boyce, D.E., Leshkevich, G.A., Snider, C.R.
Weather observations, Lake ice, Ice conditions, Spaceborne photography, Icebreakers, Ice cover thickness, Great Lakes.

33-3644
Present state and problems of the investigation of permafrost shores of reservoirs.
Are, F.E., *U.S. Army Cold Regions Research and Engineering Laboratory,* Mar. 1979, TL 714, 13p., ADB-036 864L, 21 refs. Distribution limited to U.S. Government agencies only. For Russian original see 32-440.
Reservoirs, Permafrost hydrology, Shore erosion, Shoreline modification, Thermokarst.
With increasing development in Siberia has come increased use of natural lakes and construction of artificial lakes in permafrost terrain. The reworking of the shores of these water bodies through thawing of ice in the ground has become a significant engineering factor in their construction and utilization. The basic processes of shoreline reworking are thermoabrasion (erosion of the underwater part of the shoreline through the thermal and mechanical energy of moving water), thermokarst (subsidence of the lake bottom as a result of thawing), and the thermodenudation (action of thermal energy of the air and solar radiation on the abovewater part of the shoreline). The degree of reworking of shorelines depends greatly on the ice content of the soil, and determining this is difficult. Prediction of the reworking of frozen shorelines suffers from a lack of factual data on 1) the nature and rate of reworking, 2) the morphometry of the shore zone, and 3) the erodability of the permafrost material in different hydrological and geological conditions.

33-3645
Consolidation of cohesionless soils by blasting.
Ivanov, P.L., *U.S. Army Cold Regions Research and Engineering Laboratory,* Mar. 1979, TL 713, 171p., ADB-036 863L, 68 refs. Distribution limited to U.S. Government agencies only. Translation of Izdatel'stvo literatury po stroitel'stvu, Leningrad, 1967, p.1-170.
Soil stabilization, Soil compacting, Explosion effects, Blasting.
This book gives the basic precepts of the effects of an explosion on water-saturated soil and the processes which occur when cohesionless soil is consolidated, and it gives necessary data concerning the technology of blasting. It examines in detail the methods of consolidating cohesionless water-saturated soil by means of subsurface, surface and underwater blasting. Examples are given of the application of the method for consolidating aggraded sandy soil, the rock beds of harbor facilities, the foundations of hydraulic engineering works, the bases of power lines, and civil-engineering works. An evaluation is given of the area of application of the blasting method of consolidation, its efficiency and technical effectiveness as well as the methods for monitoring consolidation.

33-3646
Calculating the pattern of talik zones and steady temperature fields of rocks beneath water bodies of arbitrary form.
Balobaev, V.T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Mar. 1979, TL 712, 15p., ADB-036 862L, 10 refs. Distribution limited to U.S. Government agencies only. For Russian original see 29-1395.
Shastkevich, IU.G.
Frozen rocks, Permafrost beneath lakes, Temperature effects, Taliks beneath lakes.
In areas where perennially frozen rock is present beneath a lake basin, talik zones are formed in the frozen strata. The talik zones have different depths and configurations and can be either enclosed or open. Their configuration depends on the surface temperature at the bottom of the lake, and other factors Since the talik zones are often used as water supplies, for grounding power installations and other industrial purposes, it is necessary to be able to calculate their configuration. This paper presents a method for calculating the stationary temperature field of rock beneath a lake basin of any shape, which can serve as a basis for determing the configuration of the talik zones.

33-3647
Characteristics of the reshaping of shorelines of thermokarst lakes in central Yakutia.
Are, F.E., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Mar. 1979, TL 711, 23p., ADB-036 861L, 8 refs. Distribution limited to U.S. Government agencies only. For Russian original see 29-1388.
Balobaev, V.T., Bosikov, N.P.
Thermokarst lakes, Shoreline modification, Shore erosion, Ice cover effect.
The reshaping of the shorelines of thermokarst lakes in Yakutia takes place primarily under the influence of the mechanical energy of waves. Thermal reconstruction of the shorelines is a function of the ice content of the shoreline rock and the water level in the lake. The shorelines of lakes in which the shore runs along the bottom of an alas are stable and can grow. Shorelines running along the slope of the edge of the alas, composed of an ice complex, undergo thermal restructuring leading to shoreline retreat. The intensity of this process does not exceed 1 meter annually.

33-3648
Thermophysical processes in the "frozen soil-water" system during the construction of dams from local materials.
Kuznetsov, A.L., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 701, 17p., ADB-036 860L, 7 refs. Distribution limited to U.S. Government agencies only. For Russian original see 33-1715.
Pekhovich, A.I., Razgovorova, E.L.
Earth dams, Frozen ground thermodynamics, Ice temperature, Soil freezing, Ground thawing.
In permafrost regions, characterized by harsh climatic conditions and difficult geological conditions with frozen ground, especially when earth which settles when warmed is involved, dams are constructed from local materials of the frozen type. The goal of this paper is to promote the development of a new technique for erecting dams under the conditions which exist in the Far North, using frozen soil without preliminary thawing.

33-3649
Landsat data collection platform at Devil Canyon site, upper Susitna Basin, Alaska—Performance and analysis of data.
Haugen, R.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Feb. 1979, SR 79-2, 17 refs., ADA-068 508, 7 refs.
Tuinstra, R.L., Slaughter, C.W.
Data transmission, Remote sensing, LANDSAT.
In October 1974, a Landsat Data Collection Platform was installed near the prospective Devil Canyon damsite on the Susitna River, south central Alaska. The development of sensor interfaces and characteristics of transmitted data for air and ground surface temperature, windspeed and wind run, water equivalent snow accumulation, and battery voltage are discussed. Temperature data are analyzed statistically and compared with data from surrounding National Weather Service stations. Although some difficulties were encountered in operation during the winter of 1974-75, it was demonstrated that the Landsat data collection system could provide useful environmental data from a remote, subarctic location in the winter on a near-real-time basis.

33-3650
Effect of water content on the compressibility of snow-water mixtures.
Abele, G., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, CR 79-2, 26p., ADA-066 936, 6 refs.
Haynes, F.D.
Snow water content, Snow compression, Snow density, Snow deformation.
The stress-density relationships of snow-water mixtures were investigated and are shown as functions of water content, initial snow density, initial snow-water mixture density and rate of deformation. An increase in water content in snow at a particular density or a decrease in the rate of deformation (or strain rate) decreases the stress, but apparently not the specific energy required to reach a specific mixture density.

33-3651
Computer modeling of atmospheric ice accretion.
Ackley, S.F., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Mar. 1979, CR 79-4, 36p., ADA-068 582, 25 refs.
Templeton, M.K.
Ice accretion, Meteorological factors, Ice physics, Helicopters.
A computer model is described to compute the amount of ice accretion on an object under a variety of initial conditions. Numerical techniques are best applied to these problems because of time dependent effects governing the amount of ice collected and the variety of initial conditions that can lead to ice accumulation. The helicopter rotor icing problem adds an additional complexity since the velocity along the rotor blade varies over a wide range, strongly affecting the amounts of ice collected at different blade positions. The physics of ice accretion is reviewed, and the accounting for the time-dependence in the computer model is described. Some model results are presented and indicate the dependence of ice accretion on velocity, droplet sizes, cloud liquid water content, and temperature for a cylindrical object of constant size.

33-3652
New land reclamation equipment. [Novaia meliorativnaia tekhnika]
Kamyshentsev, L.A., et al, Moscow, Rossel'khozizdat, 1977, 183p., In Russian with English table of contents enclosed.
Kazakov, V.S., Sokolov, IU.A.
Land reclamation, Swamps, Drainage, Trenching, Earthwork, Excavating equipment, Frozen ground.

33-3653
High-water structures and regional forecasts of river discharge in the non-chernozem zone of the European USSR. [Struktura polovod'ia i territorial'nye prognozy vesennego stoka rek v nechernozemnoĭ zone evropeĭskoĭ territorii SSSR]
Subbotin, A.I., Leningrad, Gidrometeoizdat, 1978, 98p., In Russian with English table of contents enclosed. 53 refs.
Floods, Flood forecasting, Rivers, Runoff, Ground water, Snowmelt, Snow water equivalent, Mapping, Charts.

33-3654
Fundamentals of deep roadbed stabilization. [Osnovy glubinnogo zakrepleniia gruntov zemlianogo polotna avtomobil'nykh dorog]
Volotskiĭ, D.V., Moscow, Transport, 1978, 119p., In Russian with English table of contents enclosed. 49 refs.
Roadbeds, Soil stabilization, Frost heave, Slope stability, Cements, Roads.

33-3655
Fundamentals of sagging ground mechanics. [Osnovy mekhaniki prosadochnykh gruntov]
Mustafaev, A.A., Moscow, Strofizdat, 1978, 263p., In Russian with English table of contents enclosed. 220 refs.
Fines, Loess, Soil moisture migration, Soil mechanics, Rheology, Foundations, Settlement (structural), Buildings, Deformation, Design.

33-3656
Summary reports prepared by principal investigators for the Bering Sea-Gulf of Alaska Geological Studies Review Meeting Jan. 31-Feb. 3, 1978, Menlo Park, California. *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3, c65 leaves, These reports, a part of OCSEAP, are included as Appendix 1 to the Newsletter. For selected report summaries see 33-3657 through 33-3663.
Research projects, Oil spills, Coastal topographic features, Geology, Sediments, Sea ice, Volcanoes, Earthquakes, Meetings.

33-3657
Coastal morphology, sedimentation and oil spill vulnerability—Gulf of Alaska project summary.
Hayes, M.O., et al, *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3 (Appendix 1), Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 5 leaves.
Ruby, C.H.
Coastal topographic features, Oil spills, Logistics, Countermeasures.

33-3658
Faults, unstable sediment masses, sediment distribution, and geochemistry of sediments, outer continental shelf, southern Bering Sea.
Vallier, T.L., et al, *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3 (Appendix 1), Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 8 leaves, 3 refs.
Gardner, J.V., Kvenvolden, K.A., Dean, W.E.
Marine geology, Sedimentation, Seismology, Chemical analysis.

33-3659
Yukon delta coastal processes study.
Dupré, W.R., *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3 (Appendix 1), Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 4 leaves.
Estuaries, Permafrost distribution, Fast ice, Coastal topographic features, Marine geology.

33-3660
Summary of the eastern Gulf of Alaska environmental program.
Molnia, B.F., et al, *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3 (Appendix 1), Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 9 leaves, Includes bibliography of project papers as of Jan. 29, 1978.
Carlson, P.R.
Bottom sediment, Marine geology, Geologic processes.

33-3661
Environmental geologic studies in northern Bering Sea.
Nelson, H., et al, *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3 (Appendix 1), Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 3 leaves, 7 refs.
Thor, D.R.
Marine geology, Sea ice, Ice scoring, Ocean currents, Bottom sediment.

33-3662
Sediment transport in Norton Sound, Alaska.
Cacchione, D.A., et al, *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3 (Appendix 1), Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 6 leaves, 2 refs.
Drake, D.E.
Sediment transport, Tidal currents.

33-3663
Coastal processes of the Bering Sea coast of Alaska.
Sallenger, A.H., et al, *Bering Sea-Gulf of Alaska newsletter,* May 1978, Vol.3 (Appendix 1), Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 3 leaves.
Dingler, J., Hunter, R.E.
Marine geology, Shoreline modification, Ocean waves, Shore erosion.

33-3664
USA/USSR Symposium on recycling water supply systems and reuse of treated water at industrial plants, 5th, Moscow, Sep. 1977. Washington, D.C., U.S. Environmental Protection Agency, 1978, 64p., PB-289 865, English reprints of the 14 papers presented at the symposium.
Water treatment, Waste disposal, Sewage treatment, Meetings.

33-3665
Thermal conductivity of ice, water and steam.
Engineering Sciences Data Unit, London, England, 1978, 18p. ESDU-78039.
Thermal conductivity, Ice, Water, Steam.

33-3666
Risk assessment and health effects of land application of municipal wastewater and sludges. Proceedings of a conference held in San Antonio, Tex., Dec. 12-14, 1977.
Sagik, B.P., ed, San Antonio, University of Texas, 1977, 344p., PB-289 675, Numerous refs.
Sorber, C.A., ed.
Waste disposal, Water treatment, Waste treatment, Sludges, Irrigation, Health, Meetings.

33-3667
Evaporation of ice in planetary atmospheres: ice covered rivers on Mars.
Wallace, D., et al, *U.S. National Aeronautics and Space Administration. Contractor report,* Oct. 1978. NASA-CR-157999, 44p., N79-13980, Presented at the 9th Annual meeting of the Division for Planetary Sciences of the American Astronomical Society, Boston, Oct. 29, 1977.
Sagan, C.
Planetary environments, Mars (planet), Ice sublimation, Extraterrestrial ice.

33-3668
Ecology and pathology of wildlife in response to spray irrigation of chlorinated effluent. Phase 1.
Anthony, R.G., et al, *Pennsylvania State University. Institute for Research on Land and Water Resources Research publication,* Aug. 1978, No.189, 187p. PB-289 366.
Waste disposal, Water treatment, Irrigation, Environmental impact, Animals, Vegetation.

33-3669
On the absorption of solar radiation in a layer of oil beneath a layer of snow.
Larsen, J.C., et al, *U.S. National Aeronautics and Space Administration. Conference papers,* 1976, NASA-CP-2001-Vol-3, National Aeronautics and Space Administration. Langley Research center. Advances in engineering science, Vol.3, p.1105-1114. N77-10330 (N77-10305).
Barkstrom B.R.
Oil spills, Snow cover, Radiation absorption, Models, Solar radiation.

33-3670
Radioglaciology: surface soundings near DYE-3.
Söndergaard, F., *Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report,* Feb. 1975, TUD-D-258, 32p. N76-33603.
Radio echo soundings, Ice cover thickness, Strain measuring instruments, Greenland.

33-3671
Radioglaciology: soundings near Isua, southwest Greenland.
Gudmandsen, P., et al, *Copenhagen. Polyteknisk laercanstalt. Laboratoriet for elektromagnetisk feltteori. Report,* Oct. 1974, TUD-D-224, 31p. N76-33601.
Skou, N., Söndergaard, F.
Radio echo soundings, Ice cover thickness, Seismic velocity, Greenland.

33-3672
Simulation of heat transfer from a warm pipeline buried in permafrost.
Wheeler, J.A., [1974], 44 leaves, Manuscript prepared for the 74th national meeting of the American Institute of Chemical Engineers, New Orleans, Louisiana, Mar. 11-15, 1973. 31 refs.
Permafrost heat transfer, Permafrost preservation, Pipeline insulation, Ground thawing, Refrigerating, Permafrost thermal properties, Hot oil lines, Air temperature, Stefan problem, Snow cover effect, Analysis (mathemtatics).

33-3673
Geophysical studies in Antarctic waters with the *M.S. Explora.* [Geophysikalische Untersuchungen in antarktischen Gewässern mit "M.S. Explora"],
Hinz, K., *Meerestechnik,* June 1978, 9(3), p.83-87, In German and English.
Ice shelves, Ice conditions, Seismic surveys, Ice cover thickness, Bottom sediment, Measuring instruments, Weddell Sea.
Combined geophysical studies were carried out on board the *Explora* in the Weddell Sea and on the eastern Antarctic continental margin between 67S and 74.2S, 30W and 20E in Jan.-Feb. 1978. Preliminary results are reported on shelf ice conditions, profiles of continental shelf and coastline, using seismic exploration. Magnetic and gravimetric measurements, as well as seismic refraction soundings were performed. Sediments of the Princess Martha coast are briefly discussed.

33-3674
Research and development work in the Division of Mechanical Engineering, 1978.
National Research Council, Canada. Division of Mechanical Engineering, Ottawa, Ont., [1979], 88p.
Engineering, Research projects, Railroads, Roads, Marine transportation, Air cushion vehicles, Thermal properties, Oceanography, Ships, Pipelines, Ice cutting, Hydraulic jets, Low temperature research, Aircraft icing.

33-3675
Snow crystals photographed *in situ* in winter storms.
Carrera, N.J., *Chicago. University. Cloud Physics Laboratory. Technical note,* Sep. 1976, No.49, p.3.1-3.6, 17 refs. Reprint from preprint volume of the International Conference on Cloud Physics, Boulder, Colo., July 26-30, 1976, p.85-90. Publ. by American Meteorological Society, Boston, Mass.
Snow crystal structure, Snow crystal growth, Photointerpretation, Photographic techniques.

33-3676
Coordinated Doppler radar and aircraft observations of riming and drop breakup in stratiform precipitation.
Passarelli, R.E., Jr., *Chicago. University. Cloud Physics Laboratory. Technical note,* Sep. 1976, No.49, p.6.1-6.6, 10 refs. Reprint from preprint volume of the International Conference on Cloud Physics, Boulder, Colo., July 26-30, 1976, p.500-505. Publ. by American Meteorological Society, Boston, Mass.
Cloud physics, Ice crystal growth, Microstructure, Hoarfrost, Snow optics, Cloud droplets, Airborne radar, Melting points, Precipitation (meteorology), Spectroscopy.

33-3677
Annual report Number 10; interim report 1 Oct. 77-30 Sep. 78.
Untersteiner, N., et al, Seattle, University of Washington, 1978, 39p. ADA-063 023, Contract N00014-76-C-0234.
Maykut, G., Martin, S., Grenfell, T., Kauffman, P., Washington (State). University. Department of Atmospheric Sciences.
Research projects, Sea ice, Ice conditions, Ice cover thickness, Ice optics.

33-3678
Significance of frost action and surface soil characteristics to wind erosion at Rocky Flats, Colorado. Final report.
Caine, N., Boulder, Colorado, Institute of Arctic and Alpine Research, 1978, 100p., COO-2517-4, See also 33-2113 and 33-3131.
Frozen ground mechanics, Frost action, Frost heave, Soil physics, Wind erosion.

33-3679
Gases in the sea ice; annual report Oct. 10, 1977-Sep. 30, 1978.
Gosink, T.A., et al, Fairbanks, University of Alaska, 1978, 98p. ADA-062 096.
Kelley, J.J.
Sea ice, Gas inclusions.

33-3680
Two-stream theory of spectral reflectance of snow.
Choudhury, B.J., et al, *U.S. National Aeronautics and Space Administration. Technical memorandum,* Sep. 1978, NASA-TM-79639, 21p. N79-18721.
Chang, A.T.C.
Snow optics, Reflectance, Light scattering.

33-3681
Drifting snow similitude.
Iversen, J.D., *American Society of Civil Engineers. Hydraulics Division. Journal,* June 1979, 105(HY6), p.737-753, 31 refs.
Snowdrifts, Wind tunnels, Laboratory techniques, Environment simulation, Analysis (mathematics).

33-3682
Trickle irrigation using treated wastewater.
Oron, G., et al, *American Society of Civil Engineers. Irrigation and Drainage Division. Journal,* June 1979, (IR2), p.175-186, 21 refs.
Shelef, G., Turzynski, B.
Waste disposal, Water treatment, Irrigation, Soil chemistry, Agriculture.

33-3683
Periodic surging of the Antarctic ice sheet—an assessment by modelling.
Budd, W.F., et al, *Hydrological sciences bulletin,* Mar. 1979, 24(1), p.95-114, In English with French summary. 16 refs.
McInnes, B.J.
Ice sheets, Ice cover thickness, Ice volume, Glacier surges,
A numerical model has been developed which simulates surging in certain glaciers and ice sheets in an apparently realistic manner. This model has been found to give close representations to a number of existing real surging temperate ice masses from small mountain glaciers to large sectors of ice caps. The model reproduces realistically many features of these ice masses such as the period of the surge, the duration, the velocity of advance, the magnitude of the advance, and the changes in ice thickness. The application of the model to the Antarctic ice sheet is made more difficult by the problem caused by the temperature dependence of the flow properties of ice. This means that for a complete study the interaction with the environment needs to be considered. However, preliminary calculations indicate a number of features that are relevant to the effect of Antarctic ice surges on the global climate. These include the period between surges, the duration of the surge, the amount of ice advanced and the changes in thickness of the ice sheet.

33-3684
Water and salt movement in unsaturated frozen soil: principles and field observations.
Cary, J.W., et al, *Soil Science Society of America, Journal,* Jan.-Feb. 1979, 43(1), p.3-8, 18 refs.
Papendick, R.I., Campbell, G.S.
Frozen ground hydrology, Soil moisture migration, Electrical resistivity, Frost heave, Temperature effects.

33-3685
Seismotectonics of the Beaufort Sea.
Hasegawa, H.S., et al, *Canadian journal of earth sciences,* Apr. 1979, 16(4), p.816-830, In English with French summary. 46 refs.
Chou, C.W., Basham, P.W.
Seismology, Tectonics, Earthquakes, Gravity anomalies.

33-3686
Effluent irrigation at different frequencies.
Overman, A.R., *American Society of Civil Engineers. Environmental Engineering Division. Journal,* June 1979, 105(EE3), p.535-545, 18 refs.
Waste disposal, Water treatment, Irrigation, Agriculture.

33-3687
Glacio-climatological study on the Kai-gata Glacieret, Mt. Chokai. Pt.2. Instrumental surveys of shape and size and movement measurements.
Tsuchiya, I., *Seppyo,* Mar. 1978, 40(1), p.1-9, In Japanese with English summary. 8 refs.
Glacier mass balance, Glacier movement, Glacier ablation, Glacial features, Photogrammetric surveys.

33-3688
Glacio-climatological study on the Kai-gata Glacieret, Mt. Chokai. Pt. 3. Thermal analysis in combination with remote sensing and some features as glacier.
Tsuchiya, I., *Seppyo,* Mar. 1978, 40(1), p.10-21, In Japanese with English summary. 19 refs.
Glacier heat balance, Glacier mass balance, Thermal regime, Remote sensing, Ice thermal properties.

33-3689
Consideration on mechanism of formation of transverse snow-waves.
Kobayashi, S., *Seppyo,* Mar. 1978, 40(1), p.22-30, In Japanese with English summary. 27 refs.
Snow surface, Snowdrifts, Surface roughness, Snow cover structure, Wind direction, Wind factors.

33-3690
Apparatus named "Shimo-bako" to produce a lot of frost.
Nakamura, H., *Seppyo,* Mar. 1978, 40(1), p.31-36, In Japanese with English summary. 1 ref.
Artificial snow, Ice formation, Frost, Equipment.

33-3691
Shape of the snow bank formed under eaves by the fall of snow on roofs.
Nakamura, H., *Seppyo,* Mar. 1978, 40(1), p.37-41, In Japanese with English summary. 2 refs.
Roofs, Snow accumulation, Snow cover distribution, Snow depth, Analysis (mathematics).

33-3692
New snow-disaster-population index and snow-disaster expenditures.
Nakatao, T., et al, *Seppyo,* Mar. 1978, 40(1), p.42-46, In Japanese with English summary. 6 refs.
Mizukoshi, M.
Snow removal, Cost analysis, Indexes (ratios).

33-3693
Effect of heat from the ground upon the subsidence force of snow.
Ishikawa, M., et al, *Seppyo,* Mar. 1978, 40(1), p.47-49, In Japanese. 4 refs.
Ono, S., Kawaguchi, T.
Snow compaction, Subsidence, Snow cover effect, Soil temperature, Heat transfer, Heat loss.

33-3694
Natural associations of lower plants in West Siberia. [Prirodnye kompleksy nizshikh rasteniĭ Zapadnoĭ Sibiri],
Popova, T.G., ed, Novosibirsk, Nauka, 1977, 214p., In Russian. For selected papers see 33-3695 through 33-3700. Refs. passim.
Rivers, Ecosystems, Lakes, Taiga, Swamps, Plankton, Shores, Algae, Permafrost, Plant ecology.

33-3695
Phytoplankton and algal discharge in the upper course of the Yenisey River and its tributaries. [Fitoplankton i stok vodoroslei verkhnego Eniseia i ego pritokov],
Chaĭkovskaia, T.S., Prirodnye kompleksy nizshikh rastenīĭ Zapadnoĭ Sibiri (Natural associations of lower plants in West Siberia) edited by T.G. Popova, Novosibirsk, Nauka, 1977, p.3-20, In Russian. 13 refs.
Rivers, Algae, Plankton.

33-3696
Phytobenthos in the central and lower course of the Yenisey River. [Fitobentos srednego i nizhnego Eniseia],
Levadnaia, G.D., Prirodnye kompleksy nizshikh rastenīĭ Zapadnoĭ Sibiri (Natural associations of lower plants in West Siberia) edited by T.G. Popova, Novosibirsk, Nauka, 1977, p.21-43, In Russian. 35 refs.
Algae, Plant ecology, Bibliographies, USSR—Yenisey River.

33-3697
Formation of algal associations on coal mine tailings in the Kuznetsk Basin. [Formirovanie vodoroslevykh gruppirovok na otvalakh ugol'nykh razrabotok v Kuzbasse],
Shushueva, M.G., Prirodnye kompleksy nizshikh rastenīĭ Zapadnoĭ Sibiri (Natural associations of lower plants in West Siberia) edited by T.G. Popova, Novosibirsk, Nauka, 1977, p.57-85, In Russian. 21 refs.
Taiga, Algae, Coal, Mining, Tailings, Vegetation, Plant ecology, Ecosystems.

33-3698
Algae in small water bodies of the southeastern Vasyugan'ye. [Vodorosli malykh vodoemov iugo-vostochnogo Vasiugan'ia],
Safonova, T.A., Prirodnye kompleksy nizshikh rastenīĭ Zapadnoĭ Sibiri (Natural associations of lower plants in West Siberia) edited by T.G. Popova, Novosibirsk, Nauka, 1977, p.86-105, In Russian. 13 refs.
Taiga soils, Taiga vegetation, Swamps, Algae, Soil microbiology, Plant ecology.

33-3699
Classification and biology of diatoms in Omsk region lakes. [K sistematike i biologii diatomovykh vodoroslei iz ozer Omskoĭ oblasti],
Zeniuk, T.I., Prirodnye kompleksy nizshikh rastenīĭ Zapadnoĭ Sibiri (Natural associations of lower plants in West Siberia) edited by T.G. Popova, Novosibirsk, Nauka, 1977, p.133-135, In Russian. 10 refs.
Lakes, Algae, Plant ecology, USSR—Omsk.

33-3700
Lichen flora in Gornaya Shoriya. [Flora lishaĭnikov Gornoĭ Shorii],
Sedel'nikova, N.V., Prirodnye kompleksy nizshikh rastenīĭ Zapadnoĭ Sibiri (Natural associations of lower plants in West Siberia) edited by T.G. Popova, Novosibirsk, Nauka, 1977, p.194-208, In Russian. 30 refs.
Alpine vegetation, Arctic vegetation, Lichens, Plant ecology, Alpine landforms, Ecosystems, Alpine soils.

33-3701
Increasing the effectiveness of using cement and asphalt concretes in Siberia. [Povyshenie effektivnosti primenenia tsementnykh i asfal'tovykh betonov v Sibiri],
Tarashchanskiĭ, E.G., ed, Novosibirsk, 1977, 130p., In Russian. For selected papers see 33-3702 through 33-3709. Refs. passim.
DLC TH153.P646
Winter concreting, Concretes, Cements, Bituminous concretes, Asphalts, Frost resistance, Buildings, Roads, Pavements, Concrete durability, Concrete curing, Concrete aggregates.

33-3702
Present state and future trends in the development of the theory of thermoviscoelasticity of asphalt concretes. [Sostoianie i perspektivy razvitiia teorii termoviazkouprugosti asfal'tobetona],
Gubach, L.S., Povyshenie effektivnosti primeneniia tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p.16-35, In Russian. 25 refs.
DLC TH153.P646
Bituminous concretes, Rheology, Frost resistance, Models, Asphalts, Concretes.

33-3703
Calculating thicknesses of asphalt concrete pavements for cracking resistance. [Raschet tolshchiny asfal'tobetonnogo pokrytiia iz usloviĭ treshchinostoĭkosti],
Boguslavskiĭ, A.M., Povyshenie effektivnosti primeneniia tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p.36-39, In Russian. 3 refs.
DLC TH153.P646
Bituminous concretes, Frost resistance, Cracking (fracturing), Asphalts, Concretes.

33-3704
Relation between temperature and the dynamic elastoviscoplastic properties of sandy asphalt concretes. [O zavisimosti dinamicheskikh uprugoviazkoplastichnykh svoĭstv peschanogo asfal'tobetona ot temperatury],
Vil'msen, I.I., Povyshenie effektivnosti primeneniia tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p.40-45, In Russian. 3 refs.
DLC TH153.P646
Bituminous concretes, Acoustic properties, Frost resistance, Tests, Asphalts, Concretes.

33-3705
Influence of repeated freezing-thawing of sandy asphalt concrete on its linear thermal expansion coefficient. [Vliianie mnogokratnogo zamorazhivaniia-ottaivaniia peschanogo asfal'tobetona na ego koeffitsient lineĭnogo temperaturnogo rasshireniia],
Zykov, V.A., Povyshenie effektivnosti primeneniia tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p.46-49, In Russian. 4 refs.
DLC TH153.P646
Asphalts, Concretes, Bituminous concretes, Frost resistance, Freeze thaw cycles, Deformation.

33-3706
Deformation of asphalt concrete pavements containing bitumens obtained from West Siberian oil. [Issledovanie deformativnoĭ sposobnosti asfal'tobetonnykh pokrytiĭ s ispol'zovaniem bitumov, poluchennykh iz zapadnosibirskoĭ nefti],
Dukhovnyĭ, G.S., et al, Povyshenie effektivnosti primeneniia tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p.56-59, In Russian. 5 refs.
Zatolokin, I.N., Ragozin, V.N.
DLC TH153.P646
Bituminous concretes, Frost resistance, Cracking (fracturing), Low temperature tests.

33-3707
Preparation and hardening of hot sand concrete used in road construction. [Issledovaniia po tekhnologii prigotovleniia i tverdeniia goriachego dorozhnogo peskobetona],
Moroz, S.A., et al, Povyshenie effektivnosti primeneniia tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p.77-86, In Russian. 3 refs.
Vostrikov, IU.S.
DLC TH153.P646
Frost resistance, Winter concreting, Concrete admixtures, Roads, Concrete aggregates, Pavements, Concretes, Concrete placing.

33-3708
Influence of the hardening moment on frost resistance of thermohydrated cement stone. [Vliianie momenta uplotneniia na morozostoĭkost' tsementnogo kamnia iz termogidratirovannogo tsementa],
Vostrikov, IU S., Povyshenie effektivnosti primeneniia tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p 87-92, In Russian.
DLC TH153.P646
Concrete aggregates, Cements, Concrete hardening, Frost resistance, Concrete strength, Concretes.

33-3709
Influence of preliminary curing on the properties of concretes in road pavement foundations in freezing weather. [Vliianie predvaritel'nogo vyderzhivaniia na svoĭstva betona osnovaniĭ dorozhnykh odezhd v zimnikh usloviiakh],
Tarashchanskiĭ, E.G., et al, Povyshenie effektivnosti primenenna tsementnykh i asfal'tovykh betonov v Sibiri (Increasing the effectiveness of using cement and asphalt concretes in Siberia) edited by E.G. Tarashchanskiĭ, Novosibirsk, 1977, p.93-99, In Russian. 6 refs.
Shkurenko, V.I., Selivanova, V.I.
DLC TH153.P646
Roads, Concrete freezing, Pavements, Concrete curing, Concrete strength, Foundations, Concretes.

33-3710
Economic justification of replacements in an icebreaking fleet. [Metody ekonomicheskogo obosnovaniia popolneniia ledokol'nogo flota],
Khristoliubov, V.V., *Leningrad. Tsentral'nyĭ nauchno-issledovatel'skiĭ institut morskogo flota. Trudy,* 1978, Vol.230, p.8-18, In Russian.
Icebreakers, Ice navigation, Transportation, Cost analysis, Ships.

33-3711
Evaluation of the possibility of measuring the thickness of the snow-covered Arctic sea ice by IR radiometry.
Bogorodskiĭ, V.V., et al, *Doklady. Earth science sections,* May-June 1977, Vol.234, p.4-7, Translated from Doklady Akademii nauk SSSR, vol.234, No.3. 5 refs.
Martynova, E.A.
Ice cover thickness, Snow cover distribution, Infrared radiation, Radiometry, Arctic Ocean.

33-3712
Determining parameters of lightning protective cables for ice melting circuit diagrams. [Opredelenie parametrov grozozashchitnykh trosov dlia skhem plavki gololeda],
Rudakova, R.M., et al, *Elektricheskie stantsii,* Apr. 1979, No.4, p.56-58, In Russian.
Guzairov, M.B., Ovchinnikov, M.F.
Power line icing, Deicing, Design.

33-3713
Soil mechanics, bases and foundations. [Mekhanika gruntov, osnovaniia i fundamenty],
Dalmatov, B.I., ed, Leningrad, 1968, 48p., In Russian. Extended summaries of papers presented at the 26th Nauchnaia konferentsiia Leningradskogo Inzhenerno-Stroitel'nogo Instituta, Leningrad, Jan.30-Feb. 9, 1968. For selected papers see 33-3714 through 33-3722. Refs. passim.
DLC TA710.A1L44
Foundations, Clay soils, Thixotropy, Swamps, Pile foundations, Peat, Frost penetration, Bearing strength, Frost heave, Ground ice.

33-3714
Determining the characteristics of clay soil deformation in time. [Opredelenie kharakteristik deformativnosti glinistogo grunta vo vremeni],
Dalmatov, B.I., et al, Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.8-10, In Russian. 1 ref.
Do Bang.
DLC TA710.A1L44
Clay soils, Soil moisture migration, Soil strength, Soil compacting, Creep properties, Thixotropy, Settlement (structural), Foundations, Analysis (mathematics).

33-3715
Thixotropic soils of Leningrad as bearing ground. [Ob ispol'zovanii tiksotropnykh gruntov Leningrada v kachestve osnovaniĭ],
Sotnikov, S.N., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.11-13, In Russian.
DLC TA710.A1L44
Foundations, Glacial deposits, Fines, Thixotropy, Bearing strength.

33-3716
Horizontal pressure of peat on piles. [O gorizontal'nom davlenii torfa na svai],
Morareskul, N.N., et al, Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.18-20, In Russian.
Shvetsov, V.M., Kovalenko, N.P., Khudiakov, A.D.
DLC TA710.A1L44
Swamps, Peat, Pile foundations, Shear strength, Drainage, Deformation.

33-3717
Pile foundations for power line supports in swamps. ¡Svaĭnye fundamenty opor LEP na bolotakh¡,
Morareskul, N.N., et al, Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.20-23, In Russian.
Shvetsov, V.M.
DLC TA710.A1L44
Swamps, Power line supports, Foundations, Peat, Bearing strength.

33-3718
Laboratory investigation of linear deformations in frozen ground with temperature changes. ¡Laboratornye issledovaniia lineĭnykh deformatsiĭ merzlykh gruntov pri izmenenii temperatury¡,
Simagin, V.G., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.25-28, In Russian.
DLC TA710.A1L44
Frozen ground temperature, Frost penetration, Cracking (fracturing), Tests, Laboratory techniques.

33-3719
Effectiveness of some means of preventing foundation frost heave. ¡Effektivnost' primeneniia nekotorykh mer protiv moroznogo vypuchivaniia fundamenta¡,
Ulitskiĭ, V.M., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.28-31, In Russian. 1 ref.
DLC TA710.A1L44
Foundations, Footings, Frost heave, Design.

33-3720
Ground ice effect on sagging of frozen ground during thawing. ¡Vliianie ledianykh vkliucheniĭ na prosadochnost' merzlogo grunta pri ottaivanii¡,
Churkina, Z.A., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.31-34, In Russian. 1 ref.
DLC TA710.A1L44
Frozen fines, Ground ice, Ground thawing, Soil moisture migration, Settlement (structural).

33-3721
Influence of freezing on the stability of embankments with smelting slag interlayers. ¡Vliianie promerzaniia na ustoĭchivost' nasypeĭ s prosloĭkami metallurgicheskogo shlaka¡,
Karlov, V.D., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.34-37, In Russian.
DLC TA710.A1L44
Embankments, Frost penetration, Frost heave, Snow cover effect.

33-3722
Freezing and frost heave of peat. ¡Promerzanie, puchenie i smerzanie torfa¡,
Morareskul, N.N., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1968, p.37-39, In Russian.
DLC TA710.A1L44
Swamps, Peat, Frost penetration, Ground ice, Frost heave.

33-3723
Soil mechanics, bases and foundations. ¡Mekhanika gruntov, osnovaniia i fundamenty¡,
Dalmatov, B.I., ed, Leningrad, 1969, 47p., In Russian.
Extended summaries of papers presented at the 28th Nauchnaia-konferentsiia Leningradskogo Inzhenerno-Stroitel'nogo Instituta, Leningrad, Feb.2-7, 1970. For selected papers see 33-3724 through 33-3727. Refs. passim.
DLC TA710.A1L45
Soil mechanics, Foundations, Concrete structures, Winter concreting, Pile foundations, Frost heave, Frost penetration, Frozen rock temperature.

33-3724
Winter concreting of large foundation plates. ¡Ustroĭstvo fundamentnykh plit bol'shikh razmerov v zimnee vremia¡,
Dalmatov, B.I., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1969, p.5-7, In Russian.
DLC TA710.A1L45
Industrial buildings, Foundations, Concrete structures, Winter concreting, Seasonal freeze thaw, Settlement (structural).

33-3725
Sagging of thawing ground on the Volga automobile plant construction site. ¡Issledovanie osadok grunta pri ottaivanii na ploshchadke stroitel'stva Volzhskogo avtomobil'nogo zavoda¡,
Lastochkin, V.S., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1969, p.8-11, In Russian.
DLC TA710.A1L45
Industrial buildings, Foundations, Concrete structures, Reinforced concrete, Winter concreting, Seasonal freeze thaw, Settlement (structural).

33-3726
Industrial and storage buildings on frost susceptible soils. ¡Rezul'taty obsledovaniĭ proizvodstvennykh i skladskikh zdaniĭ, vozvedennykh na puchinistykh gruntakh¡,
Ulitskiĭ, V.M., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1969, p.11-14, In Russian.
DLC TA710.A1L45
Industrial buildings, Foundations, Frost heave, Frozen fines, Frost penetration, Footings, Concrete structures, Deformation.

33-3727
Temperature of the beginning of freezing of silts. ¡Temperatura nachala zamerzaniia alevrolitov¡,
Simagin, V.G., Mekhanika gruntov, osnovaniia i fundamenty (Soil mechanics, bases and foundations) edited by B.I. Dalmatov, Leningrad, 1969, p.14-16, In Russian.
DLC TA710.A1L45
Frozen fines, Frost penetration, Soil moisture migration, Phase transformations, Ground ice, Ice formation, Low temperature tests, Laboratory techniques.

33-3728
Tunnel soft spot fixed by freezing. *World construction,* Sep. 1978, 31(9), p.47, 50.
Tunneling (excavation), Artificial freezing, Finland.

33-3729
Bridge blight: the search for a remedy continues. *World construction,* July 1978, 31(7), p.78-81.
Bridges, Corrosion inhibitors, Concrete pavements, Concrete admixtures, Ice prevention, Deicing, Freeze thaw cycles.

33-3730
How to detect concrete deck corrosion earlier.
Clemena, G.G., et al, *World construction,* July 1978, 31(7), p.81-83, Condensed version of a paper prepared for presentation to the Bridge Engineering Conference, St. Louis, Mo., 1978.
McKeel, W.T., Jr.
Bridges, Corrosion, Infrared photography, Detection.

33-3731
U.S.S.R.'s Baykal-Amur railway rolls eastward.
Mytarev, V., *World construction,* July 1978, 31(7), p.92-93.
Railroads, Construction, Baykal Amur railroad, Permafrost preservation, Tunneling.

33-3732
Dipolar correlation factor and dipole moment of a water molecule in ice III.
Johari, G.P., *Philosophical magazine,* Mar. 1979, 39(3), p.219-228, 23 refs.
High pressure ice, Ice composition, Ice structure.

33-3733
Experimental folding in ice and the resultant c-axis fabrics.
Wilson, C.J.L., et al, *Nature,* May 3, 1979, 279(5708), p.49-51, 14 refs.
Russell-Head, D.S.
Ice deformation, Ice structure, Anisotropy.

33-3734
Wind tunnel investigation of the growth of graupel initiated from frozen drops.
Pflaum, J.C., et al, *Journal of the atmospheric sciences,* Apr. 1979, 36(4), p.680-689, 42 refs.
Pruppacher, H.R.
Ice growth, Snow pellets, Wind tunnels, Laboratory techniques, Cloud physics.

33-3735
Comparative testing system of the applicability for various thermal scanning systems for detecting heat losses in buildings.
Grot, R.A., et al, MP 1212, Infrared Information Exchange, 4th. Proceedings, St. Louis, Missouri, 1978, p.B71-B90, 18 refs.
Munis, R.H., Marshall, S.J., Greatorex, A.
Buildings, Heat loss, Thermal measuring instruments, Tests.
A two-stage program for determining the applicability of various remote thermal scanning systems for detecting heat losses in buildings is described. The types of instruments tested are high resolution thermal imaging systems, low resolution thermal imaging systems, thermal line scanners and point radiometers. The first phase of this project consisted of inserting known building defects into a specially designed room at the USA Cold Regions Research and Engineering Laboratory and having a representative of the manufacturer of each type of equipment inspect the room at three temperature differences across the room envelope. The second phase of this project will consist of a field evaluation of these same instruments in approximately 10 cities, in cooperation with a weatherization program for low-income housing sponsored by the Community Services Administration and directed by the National Bureau of Standards. The goal of the second phase is to determine the cost effectiveness of various remote thermal scanning services.

33-3736
Detecting wet roof insulation with a hand-held infrared camera.
Korhonen, C., et al, MP 1213, Infrared Information Exchange, 4th. Proceedings, St. Louis, Missouri, 1978, p.A9-A15, 5 refs.
Tobiasson, W.
Infrared photography, Roofs, Moisture content, Detection.
Since 1975, CRREL has used hand-held infrared scanners for detecting wet insulation under built-up roof membranes. Thermocouples installed on roofs have shown that temperature differences between areas of wet and dry insulation may exist during both the day and night. The optimum time to detect these differences with an infrared camera is at night when solar interference is eliminated. Surveys have been conducted successfully in many locations from Alabama to Alaska during both warm and cold weather. Three-inch diameter core samples of the roof membrane and insulation have been obtained to verify infrared findings. This paper briefly overviews the technique used to survey roofs for moisture and then presents results of a controlled experiment at Pease AFB, New Hampshire, to show the correlation between thermal images and temperature differences observed thermoelectrically in wet and dry portions of a roof. Measurements of the thermal resistance of the wet and dry areas complete the physical picture.

33-3737
Origin, distribution, and depositional history of gravel deposits on the Beaufort Sea continental shelf, Alaska.
Rodeick, C.A., *U.S. Geological Survey. Open-file report,* 1979, 79-234, 87p., M.Sc. thesis, 1975. 37 refs.
Bottom sediment, Gravel, Marine geology, Ice rafting, Radioactive age determination.

33-3738
Studies on the ice sheet flow and local mass budget in Mizuho Plateau, Antarctica.
Naruse, R., *Hokkaido Daigaku, Sapporo, Japan. Teion Kagaku Kenkyujo (Hokkaido. University. Institute of Low Temperature Science. Contributions) Ser.A,* 1978, No.28, p.1-54, Refs. p.50-54.
Ice sheets, Mass balance, Mass flow, Antarctica—Mizuho Plateau.
Surveys of a triangulation chain 250 km in length were carried out in 1969 and 1973-1974 along the parallel of 72S in Mizuho Plateau, East Antarctica. Obtained from them were horizontal and vertical components of surface velocities of the ice sheet at 140 stations and parameters of surface strains at 140 triangles of the chain. Local mass budgets at the triangulation stations were deduced from vertical velocities and accumulation rates. General dynamic conditions over Mizuho Plateau were also discussed. Horizontal velocities were small near the Yamato Mountains, while they had a maximum of more than 20 m/a around 39E. The direction of the flow vector was, in general, identical approximately with that of the large-scale maximum slope of the ice surface. Tensile strains predominated mostly over compressive strains, and the direction of the maximum extension was rather close to that of the ice flow. Submergence velocities indicated large values, such as -0.7 to -1 m/a, in the region from 39E eastward. The amount of snow accumulation was not enough in this region to compensate for the deficit of the ice mass caused by the submergence flow. It followed that the local mass budget was negative there. It is suggested from this study that the ice sheet of Mizuho Plateau is in an unsteady state as a whole. (Auth.)

33-3739
Studies on the behavior of unfrozen interlamellar water in frozen soil.
Horiguchi, K., *Hokkaido Daigaku, Sapporo, Japan. Teion Kagaku Kenkyujo (Hokkaido. University. Institute of Low Temperature Science. Contributions) Ser A.* 1978, No.28, p.55-78, 16 refs.
Frozen ground, Clays, Bentonite, Water, Phase transformations, Water content, Clay minerals.

33-3740
Sealing concrete joints with electric heating of concrete mixtures. ¡Effektivnaia tekhnologiia zamonolichivaniia stykov s elektroprogrevom betona¡,
Gendin, V.IA., et al, *Beton i zhelezobeton,* Feb. 1979, No.2, p.25-26, In Russian.
Miagkov, A.D., Kuznetsov, A.P.
Concrete structures, Joints (junctions), Sealing, Mortars.

33-3741
Roadbed construction in freezing weather. ¡Vozvedenie zemlianogo polotna zimoĭ¡,
Bronitskiĭ, E.I., *Avtomobil'nye dorogi,* Jan. 1979, No.1, p.8-9, In Russian.
Roadbeds, Embankments, Earthwork, Excavating equipment, Roads, Frozen ground.

33-3742
Flora of the Kolyma River delta. ¡K flore del'ty reki Kolymy¡,
Petrovskiĭ, V.V., et al, *Botanicheskiĭ zhurnal,* Jan. 1979, 64(1), p.19-31, In Russian with English summary. 5 refs.
Koroleva, T.M.
Arctic soils, Arctic vegetation, Ecosystems, Deltas, USSR—Kolyma River.

33-3743
Field testing of frozen ground. ¡Polevye ispytaniia merzlykh gruntov¡,
Staritsyn, A.P., *Biulleten' stroitel'noĭ tekhniki,* Jan. 1979, No.1, p.15-16, In Russian.
Standards, Frozen ground mechanics, Bearing strength, Tests.

33-3744
Technical and economic effectiveness of melting ice-hoarfrost deposits on power lines. ¡Tekhniko-ekonomicheskaia tselesoobraznost' primeneniia plavki gololedno-izmorozevykh otlozheniĭ na provodakh liniĭ elektroperedachi¡,
Sinel'nikov, V.IA., et al, *Energetika i elektrifikatsiia,* Oct.-Dec. 1978, 4(98), p.22-24, In Russian. 5 refs.
Kryzhov, G.P.
Power line icing, Hoarfrost, Ice loads, Deicers.

33-3745
Mechanical properties of titanium alloys and their welded joints at low temperature. ¡Mekhanicheskie svoĭstva titanovykh splavov i ikh svarnykh soedineniĭ pri nizkoĭ temperature¡,
Blashchuk, V.E., et al, *Avtomaticheskaia svarka,* Jan. 1979, No.1, p.59-60, In Russian.
IAdchenko, IU.G., Gurevich, S.M.
Welding, Metals, Brittleness, Low temperature tests.

33-3746
Impact load resistance of built-up details at subzero temperature. ¡Soprotivliaemost' udarnym nagruzkam naplavlennykh detaleĭ pri otritsatel'noĭ temperature¡,
Grinberg, N.A., et al, *Avtomaticheskaia svarka,* Oct. 1978, No.10, p.15-17, In Russian. 4 refs.
Belikova, N.A.
Excavating equipment, Winter maintenance, Welding.

33-3747
Bored situ-cast foundations with enlarged bases. ¡Buronabivnye fundamenty s opornym ushirieniem¡,
Vershinin, V.P., et al, Leningrad, Stroĭizdat, 1978, 87p., In Russian with English table of contents enclosed. 10 refs.
Kovalev, I.V., Chelnokov, E.L.
Foundations, Footings, Concrete piles, Reinforced concrete, Winter concreting, Frozen fines, Clays, Loams, Frost penetration, Bearing strength.

33-3748
Winter concreting of transportation structures without heating. ¡Bezobogrevnoe betonirovanie transportnykh sooruzheniĭ zimoĭ¡,
Kostiaev, P.S., Moscow, Transport, 1978, 208p., In Russian with English table of contents enclosed. 77 refs.
DLC TA682.43.K67
Winter concreting, Concrete admixtures, Antifreezes, Concrete structures, Pavements, Concrete curing, Roads, Concrete heating, Bridges, Culverts, Reinforced concrete, Frost resistance.

33-3749
Monitoring salt-water and freshwater wedges in an arctic delta.
Walker, H.J., *Louisiana State University, Baton Rouge. Coastal Studies Institute. Technical report,* Dec. 1977, No.268, 7p., ADA-055 458, 6 refs. Reprint from Geoscience and man, Dec. 1977, Vol.18:147-153.
Ice wedges, River flow, Hydrology, Ice water interface, Ice drills, Deltas, Ice breakup, Salt water, Sea ice, River ice, United States—Alaska—Colville Delta.

33-3750
Arctic alternatives.
Pimlott, D.H., ed, Ottawa, Ont., Canadian Arctic Resources Committee, 1977, 391p., A National Workshop on People, Resources and the Environment North of 60 at Carleton University, Ottawa, May 24-26, 1972 in cooperation with the Arctic Institute of North America. Refs. passim. For selected papers see 33-3751 through 33-3754.
Vincent, K.M., ed, McKnight, C.E., ed.
Environmental impact, Marine biology, Permafrost beneath structures, Pollution, Environmental protection, Canada.

33-3751
Aquatic resources in the Canadian North: knowledge, dangers and research needs.
Sprague, J.B., Arctic alternatives. Edited by H.P. Pimlott, K.M. Vincent and C.E. McKnight, Ottawa, Ont., Canadian Arctic Resources Committee, 1977, p.168-189, 14 refs.
Environmental protection, Environmental impact, Ecosystems, Marine biology, Pollution, Erosion, Oil spills, Climatic factors, Waste disposal, Legislation, Canada.

33-3752
Atmospheric environment of the Canadian North.
Hare, F.K., Arctic alternatives. Edited by H.P. Pimlott, K.M. Vincent and C.E. McKnight, Ottawa, Ont., Canadian Arctic Resources Committee, 1977, p.249-283, 14 refs.
Ice conditions, Environmental impact, Human factors, Climatic changes, Air pollution.

33-3753
Arctic and Subarctic marine environment.
Dunbar, M., Arctic alternatives. Edited by H.P. Pimlott, K.M. Vincent and C.E. McKnight, Ottawa, Ont., Canadian Arctic Resources Committee, 1977, p.284-288, 11 refs.
Marine biology, Sea water, Environmental impact, Climatic changes, Seasonal freeze thaw, Runoff.

33-3754
Terrestrial environments: vegetation and permafrost.
Lambert, J.D.H., Arctic alternatives. Edited by H.P. Pimlott, K.M. Vincent and C.E. McKnight, Ottawa, Ont., Canadian Arctic Resources Committee, 1977, p.297-308, 10 refs.
Permafrost beneath structures, Arctic vegetation, Environmental impact, Permafrost preservation, Pipelines.

33-3755
Seventeenth Soviet Antarctic Expedition. Seasonal research 1971/72. ¡Semnadtsataia sovetskaia antarkticheskaia ekspeditsiia. Sezonnye issledovaniia 1971/72 g.¡,
Sovetskaia antarkticheskaia ekspeditsiia, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1979, Vol.71, 150p., In Russian. Numerous refs. passim. For individual papers see B-21765, B-21766, E-21763, E-21764, F-21759, F-21767, G-21760, J-21761 and L-21762, or 33-3756 through 33-3759.
Korotkevich, E.S., ed.
Research projects, Antarctica.
This volume contains reports on research done by the Soviet Antarctic Expedition in 1971/2. In the first section there is a general description of the organization and execution of the expedition including an overview of research vessel activity, research flights, the Mirnyy-Vostok glaciological field trip and marine biology and botany. The second section presents some individual papers in oceanology, geology, aerial photography, glaciology, biology, and botany.

33-3756
Ice conditions encountered by the *Ob'* in antarctic waters in 1971/72. ¡Ledovye usloviia plavaniia d/e *Ob'* v antarkticheskikh vodakh v 1971/72 g.¡,
Botnikov, V.N., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1979, Vol.71, p.80-98, In Russian. 2 refs.
Korotkevich, E.S., Leont'ev, E.B.
Drift, Ice conditions, Icebreakers, Sea ice, Antarctica—Balleny Islands.
Ice conditions encountered by the *Ob'* in antarctic waters from Dec. 1971 to June 1972 are discussed. Information on ice conditions along the heretofore little known Marie Byrd Land coast is given and the effectiveness of icebreakers in this area assessed. Ice features in the Balleny ice field are described. Ice drift data for the Molodezhnaya Station area are presented and several characteristics of the antarctic ice regime in the fall-winter navigation season considered.

33-3757
Pack ice conditions and unloading of supply ships at Mirnyy and Leningradskaya Stations in 1971/72. ¡Sostoianie pripaia i usloviia razgruzki ekspeditsionnykh sudov v raĭonakh observatorii Mirnyĭ i stantsii Leningradskoĭ v navigatsiiu 1971/72 g.¡,
Botnikov, V.N., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1979, Vol.71, p.99-104, In Russian. 2 refs.
Korotkevich, E.S., Leont'ev, E.B.
Pack ice, Ice conditions, Ships, Cargo, Antarctica—Leningradskaya Station, Antarctica—Mirnyy Station.
Prevailing ice conditions during cargo operations at Mirnyy and Leningradskaya Station are reviewed. Pack ice parameters such as thickness, snow cover thickness and presence or absence of crevasses are described. Various approaches used by the ships and different routes for the cargo operation to the bases are discussed.

33-3758
Radio echo survey and glacier movement. ¡Radiolokatsionnaia ploshchadnaia sĕmka i dvizhenie lednika¡,
Fedorov, B.A., et al, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1979, Vol.71, p.129-132, In Russian. 1 ref.
Shalygin, A.M., Fedorinchik, L.A.
Glacier movement, Radio echo soundings, Antarctica—Mirnyy Station.
Radio echo surveys were made in two polygons on the Mirnyy—171 km traverse. Maps showing subglacial relief within both areas are given. Radio echo attenuation data are used to estimate absorption temperature of the glacier, which was -11 C for Polygon 1 and -16C for polygon 2.

33-3759
Temperature of the snow-firn layer. ¡Temperatura snezhno-firnovoĭ tolshchi¡,
Khmelevskiĭ, I.F., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy,* 1979, Vol.71, p.144-148, In Russian.
Snow temperature, Firn, Antarctica—Queen Mary Coast.
Temperature measurements were taken of the snow-firn layer down to 50 m in three cores drilled at points 49, 57, and 153 km from Mirnyy on a Vostok-Mirnyy profile. Temperature at the level below which seasonal temperature changes are not reflected (15 m) was -18.8, -19.3 and -27.7 C respectively. A negative temperature gradient—0.02, 0.03 and 0.015 C/m—was noted. The temperature regime reestablished itself within 5 or 6 days after drilling. Snow-firn layer temperatures drop about 0.8 C per 10 km distance from the coast and 0.9 C per 100 m of absolute altitude.

33-3760
Some ecological and taxonomic observations on the colored snow algae found in Rumpa and Skarvsnes, Antarctica.
Akiyama, M., *Tokyo. National Institute of Polar Research. Memoirs,* 1979, No.11, Special issue, p.27-34, Refs. p.33-34.
Colored snow, Algae, Antarctica—Skarvsnes Foreland.
Some ecological and taxonomic observations were made on the algae of colored snow found in Rumpa and Skarvsnes, Antarctica. The redcolored snow resulted from the accumulation of a red pigment in algae which was identified as an astaxanthin-like substance. The biomass of colored snow algae was in the range of 160,000-530,000 cells per ml of the melted water. The main components of colored snow algal flora were *Scotiella polyptera, Cryocystis brevispina, Chlamydomonas* sp. and *Stichococcus bacillaris.* Cells of *Scotiella* were frequently coated with thin membrane resembling the primary membrane in some Volvocalean zygospores. (Auth. mod.)

33-3761
Proceedings, Pt.3.
IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978, International Association for Hydraulic Research, 1978, 284p., Part 3 of this three-part proceedings contains invited and continuing papers and discussions of papers published in Parts 1 and 2. For full papers of Part 3, see 33-3762 through 33-3768; for full papers pertaining to the discussions see 33-361 through 33-432.
Meetings, River ice, Ice pressure, Hydraulic structures, Heat transfer, Frazil ice, Thermal regime, Models.

33-3762
Whence and whither ice engineering.
Kennedy, J.F., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 3, International Association for Hydraulic Research, 1978, p.21-43, 13 refs.
Sea ice, River ice, Ice physics, Ice mechanics.

33-3763
Ice in estuaries and harbours.
Carstens, T., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 3, International Association for Hydraulic Research, 1978, p.47-81, 18 refs.
Sea ice, River ice, Ports, Estuaries, Water flow, Heat transfer, Models, Ice prevention, Air entrainment.

33-3764
Some problems of ice accretion on hydraulic structures.
Korzhavin, K.N., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 3, International Association for Hydraulic Research, 1978, p.85-92.
Hydraulic structures, Ice pressure, Ice loads, Research projects, Models.

33-3765
Thermal regime of ice covered waters.
Larsen, P., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 3, International Association for Hydraulic Research, 1978, p.95-117, 36 refs.
Ice formation, Ice temperature, Frazil ice, Ice breakup, Thermal regime.

33-3766
Physical simulation of ice behaviour at an Arctic ship terminal.
Noble, P., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 3, International Association for Hydraulic Research, 1978, p.129-157.
Abdelnour, R., Miller, D.
Ports, Ice cover effect, Petroleum industry, Ice cover thickness, Ice navigation, Ships, Logistics.

33-3767
Ice hydraulic modeling: a design tool for ice control structures.
Nelka, J., et al, IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 3, International Association for Hydraulic Research, 1978, p.225-241, 5 refs.
Kotras, T.
Ice cover effect, Hydraulic structures, Ice control, Models.

33-3768
Simplified heat transfer model to explain the formation of frazil ice.
Desmond, R.M., IAHR Symposium on Ice Problems, Luleå, Sweden, Aug. 7-9, 1978. Proceedings, Part 3, International Association for Hydraulic Research, 1978, p.255-265, 6 refs.
Ice formation, Frazil ice, Heat transfer, Models.

33-3769
Geobotanical studies on the Taku Glacier anomaly.
Heusser, C.J., et al, *Geographical review,* Apr. 1954, 44(2), MP 1215, p.224-239, AD-030 651, 21 refs. Same as SIP-10697. Also issued as Report No.7, Contract n9onr83001.
Schuster, R.L., Gilkey, A.K.
DLC G1.G35 Vol.44
Glacier movement, Vegetation patterns, Geobotanical interpretation, United States—Alaska—Taku Glacier.

33-3770
Freeze-up, break-up and ice thickness in Canada. [Embâcle, debâcle, et épaisseur de la glace au Canada], Allen, W.T.R., Downsview, Ontario, Canada, Atmospheric Environment Service, 1977, 185p., In English and French. 3 refs.
Ice breakup, Ice cover thickness, Freezeup, Statistical data, Canada.

33-3771
Coastal erosion rates along the Chukchi Sea coast near Barrow, Alaska.
Harper, J.R., *Arctic,* Dec. 1978, 31(4), p.428-433, 14 refs.
Coastal topographic features, Shore erosion, Submarine permafrost, Ground ice.

33-3772
Seasonal variations in sea ice extent in the Davis Strait-Labrador Sea area and relationships with synoptic-scale atmospheric circulation.
Crane, R.G., *Arctic,* Dec 1978, 31(4), p.434-447, 13 refs.
Sea ice distribution, Ice formation, Ice breakup, Atmospheric circulation, Meteorological factors, Seasonal variations.

33-3773
Remote detection of water under ice-covered lakes on the North Slope of Alaska.
Kovacs, A., *Arctic,* Dec. 1978, 31(4), MP 1214, p.448-458, 9 refs.
Remote sensing, Lake water, Lake ice, Radar echoes, Ice cover thickness, Water supply.
Results from using an impulse radar sounding system on the North Slope of Alaska to detect the existence of water under lake ice are presented. It was found that both lake ice thickness and depth of water under the ice could be determined when the radar antenna was either on the ice surface or airborne in a helicopter. The findings also revealed that the impulse radar sounding system could detect where lake ice was bottom-fast and where water existed under the ice cover.

33-3774
Organization of technical servicing and machine repairs under northern conditions. [Organizatsiia tekhnicheskogo obsluzhivaniia i remonta mashin v usloviiakh Severa],
Karakulev, A.V., et al, Leningrad, Stroĭizdat, 1978, 168p., In Russian. 27 refs.
Kirillov, G.N.
DLC TH900.K33
Construction equipment, Winter maintenance, Construction costs.

33-3775
Process equipment in northern cities (review). [Inzhenernoe oborudovanie gorodov Severa (obzor)],
Chesnova, L.M., et al, Moscow, 1975, 42p., In Russian with English table of contents enclosed. 5 refs.
Nikulenkov, G.A.
DLC TD86.R87C49
Utilities, Pipelines, Pipe laying, Water supply, Construction materials, Thermal insulation, Water pipes, Frost protection, Sewage treatment.

33-3776
Natural thermal emissivity of snow-ice covers in Arctic seas. [Sobstvennoe teplovoe izluchenie snezhnoledianogo pokrova arkticheskikh morei],
Bogorodskiĭ, V.V., et al, Leningrad, Gidrometeoizdat, 1978, 39p., In Russian with English summary. English table of contents enclosed 30 refs.
Martynova, E.A.
Snow cover, Ice physics, Ice cover, Snow physics, Thermal radiation, Infrared radiation, Infrared mapping, Infrared photography, Arctic Ocean.

33-3777
Interaction between the oceans and the atmosphere. [Vzaimodeĭstvie okeana i atmosfery],
Plakhotnik, A.F., Moscow, Nauka, 1978, 203p., In Russian with English table of contents enclosed. Refs. p.180-201.
Sea ice, Water temperature, Ocean currents, Air water interactions, Atmospheric circulation, Atmospheric disturbances, Air temperature, Bibliographies.
The first attempt is presented to generalize on the atmosphere-ocean interaction to improve long-range weather forecasting and contribute to the development of a general theory of climate. Histories of traditional scientific trends in the discipline (such as studies of boundary layers, interaction mechanisms, thermal and dynamic interactions and their scale) and of new geographic approaches—general, region and typologic—are discussed.

33-3778
Changes in ice condition dates on streams in the Votkin reservoir basin during years of anomalous atmospheric circulation. [Izmenenie srokov ledovykh iavleniĭ na rekakh vodosbora Votkinskogo vodokhranilishcha v gody anomal'nogo razvitiia form atmosfernoĭ tsirkuliatsii],
Kalinin, G.S., *Gidrologiia i meteorologiia,* 1974, Vol.7, p.44-46, In Russian. 2 refs.
Icebound rivers, Ice formation, Ice breakup, Atmospheric circulation.

33-3779
Influence of atmospheric circulation on snow cover in the central and southern Ural Mountains. [Vliianie tsirkuliatsii atmosfery na snezhnyĭ pokrov na Srednem i IUzhnom Urale],
Kulikova, S.Kh., *Gidrologiia i meteorologiia,* 1974, Vol.7, p.139-151, In Russian. 19 refs.
Snow cover distribution, Snow accumulation, Synoptic meteorology, Wind factors, Meteorological charts, USSR—Ural Mountains.

33-3780
Glaze in Bashkirskaya ASSR. [O gololede na territorii Bashkirskoĭ ASSR],
Pospelova, V.F., et al, *Gidrologiia i meteorologiia,* 1974, Vol.7, p.171-176, In Russian. 5 refs.
Varganova, L.A.
Hoarfrost, Glaze, Icing rate, Meteorological factors.

33-3781
Space-time regularities of glaze distribution in the Perm' area. [Prostranstvenno-vremennye zakonomernosti raspredeleniia gololeda v Permskoĭ oblasti],
Pospelova, V.F., *Gidrologiia i meteorologiia,* 1974, Vol.7, p.248-253, In Russian. 4 refs.
Hoarfrost, Glaze, Wind velocity, Meteorological factors.

33-3782
Soil freezing in the Ukraine. [O promerzanii pochvy na Ukraine],
Golub, E.V., *Meteorologiia, klimatologiia i gidrologiia,* 1975, Vol.11, p.27-32, In Russian with English summary. 6 refs.
Soil freezing, Frost penetration, Snow cover effect, Meteorological charts, Meteorological data.

33-3783
Distribution of glaze and hoarfrost deposits over the Ukraine during anomalous winters. [Osobennosti raspredeleniia gololedno-izmorozevykh otlozheniĭ na territorii Ukrainy v anomal'nye zimy],
Prokhorenko, M.M., et al, *Meteorologiia, klimatologiia i gidrologiia,* 1975, Vol.11, p.33-37, In Russian with English summary. 7 refs.
Raevskiĭ, A.N.
Glaze, Hoarfrost, Ice formation, Meteorological data, Meteorological charts.

33-3784
Device for glaze detection on flat surfaces. [Ustroĭstvo dlia indikatsii gololeda na ploskoĭ poverkhnosti],
Soldatov, B.I., et al, *Meteorologiia, klimatologiia i gidrologiia,* 1975, Vol.11, p.76-81, In Russian with English summary. 8 refs.
Penchev, E.A., Smirnov, V.V.
Glaze, Icing, Measuring instruments.

33-3785
Electric exploration data on permafrost thickness in the Nizhnyaya Tunguska Basin. [Elektrorazvedochnye dannye o moshchnosti mnogoletneĭ merzloty v basseĭne r. Nizhneĭ Tunguski],
Bubnov, V.M., et al, *Sibirskiĭ nauchno-issledovatel'skiĭ institut geologii, geofiziki i mineral'nogo syr'ia. Trudy,* 1977, Vol.254, p.80-84, In Russian. 4 refs.
Pokrovskiĭ, N.S., Skobelin, E.A.
Permafrost thickness, Permafrost beneath rivers, Electrical prospecting, Topographic factors.

33-3786
Relation between the depth of seasonal thawing of perennially frozen soils and their moisture content. [Zavisimost' glubiny sezonnogo protaivaniia mnogoletnemerzlykh pochvogruntov ot ikh vlazhnosti],
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Seasonal freeze thaw, Permafrost depth, Frozen ground analysis, Moisture content.

33-3787
Peculiarities of slush accumulation in small high mountain water reservoirs. [Osobennosti akkumulirovaniia shugi v vysokogornykh vodokhranilishchakh maloĭ emkosti],
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Hydroelectric power generation, Lakes, Ice conditions, Slush, Ice jams.

33-3788
Formation of chemical composition of surface waters at low and subzero temperatures. [O nekotorykh faktorakh formirovaniia khimicheskogo sostava poverkhnostnykh vod v usloviiakh nizkikh i otritsatel'nykh temperatur],
Ivanik, V.M., *Gidrokhimicheskie materialy,* 1978, Vol.71, p.8-14, In Russian. 14 refs.
Rivers, Permafrost beneath rivers, Permafrost hydrology, Ground water, Water chemistry, Cryogenic soils, Soil moisture migration.

33-3789
Cryogenic system with adjustable temperature.
Demishev, A.G., et al, *Instruments and experimental techniques,* July-Aug. 1978(Publ. Feb. 79), 21(4), Pt.2, p.1152, Translated from Pribory i tekhnika eksperimenta.
Ratmanskiĭ, D.S., Shirkov, A.K., Pelykh, D.P.
Low temperature tests, Cryostats.

33-3790
Hillside waste and snow avalanche processes resulting in accumulative relief forms. [Osypnye i lavinnye protsessy i sozdavaemye imi akkumuliativnye formy rel'efa],
Miagkov, S.M., et al, *Geomorfologiia,* Jan.-Mar. 1979, No.1, p.67-72, In Russian with English summary. 11 refs.
Troshkina, E.S., Salova, T.A.
Slope processes, Talus, Landslides, Avalanches, Avalanche erosion, Avalanche deposits.

33-3791
Peculiarities of slope formation in the low-mountain Amur River area. [Osobennosti formirovaniia sklonov nizkogorii nizhnego Priamur'ia],
Paniushkin, A.I., et al, *Geomorfologiia,* Jan.-Mar. 1979, No.1, p.77-82, In Russian with English summary. 6 refs.
Borunov, A.K.
Cryogenic slope processes, Slope orientation, Slope stability, Microrelief, Snow cover effect, Vegetation factors, USSR—Amur River.

33-3792
Types of landscapes in the non-chernozem zone of European Russia. [Tipy landshaftov nechernozem'ia evropeiskoi Rossii],
Isachenko, A.G., et al, *Geograficheskoe obshchestvo SSSR. Izvestiia,* Jan.-Feb. 1979, 111(1), p.3-10, In Russian. 7 refs.
Shliapnikov, A.A.
Tundra soils, Taiga soils, Soil formation, Podsol, Landscape development, Landscape types.

33-3793
Oscillations of high-mountain glaciers during historic time in the Caucasus according to lichens and radiocarbon data. [Kolebaniia lednikov vysokogornogo Kavkaza v istoricheskoe vremia (po likhenometricheskim i radiouglerodnym dannym)],
Serebriannyi, L.R., et al, *Geograficheskoe obshchestvo SSSR. Izvestiia,* Jan.-Feb. 1979, 111(1), p.11-18, In Russian. 19 refs.
Golodkovskaia, N.A., Il'ves, E.O.
Glacier tongues, Glacier surveys, Glacier oscillation, Lichens, Moraines, Radioactive age determination.

33-3794
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Lovelius, N.V.
Lakes, Alassy, Water level, Thermokarst, Permafrost hydrology, Trees (plants), Age determination, USSR—Yakutia.

33-3795
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Bashkuev, E.B.
Earthwork, Excavation, Blasting, Explosion effects, Frozen ground.

33-3796
Methods of assigning frost resistance of concrete. [Metodika naznacheniia morozostoikosti betona],
Dvorkin, L.I., et al, *Gidrotekhnika i melioratsiia,* Feb. 1979, No.2, p.27-30, In Russian. 5 refs.
Mironenko, A.V.
Concrete structures, Frost resistance, Concrete freezing, Freeze thaw cycles, Concrete strength.

33-3797
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Zelinger, F.F., et al, *Gidrotekhnika i melioratsiia,* Feb. 1979, No.2, p.30-33, In Russian. 2 refs.
Loskutnikov, N.A., Sennikov, S.I., Keller, V.F.
Soil freezing, Peat, Frost penetration, Freeze thaw cycles, Snow cover effect, Climatic factors.

33-3798
New reclamation equipment for winter use. [Novaia meliorativnaia tekhnika dlia raboty v zimnikh usloviiakh],
El'kis, S.IA., *Gidrotekhnika i melioratsiia,* Feb. 1979, No.2, p.36-40, In Russian.
Land reclamation, Earthwork, Excavating equipment, Frozen ground.

33-3799
Formation of ice plugs in drains. [Obrazovanie ledianykh probok v drenakh],
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Swamps, Drains, Ice formation, Land reclamation, Frost penetration, Soil moisture migration, Phase transformations, Capillarity, Drainage.

33-3800
Allowing for temperature deformations and settlement of buildings. [Uchet temperaturnykh i usadochnykh deformatsii zdanii],
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Foundations, Settlement (structural), Thermal regime, Deformation, Freeze thaw cycles, Concrete structures, Buildings, Cold weather construction.

33-3801
Electrochemical protection of northern gas pipelines from corrosion. [Osobennosti elektrokhimzashchity severnykh gazoprovodov ot korrozii],
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Gas pipelines, Corrosion prevention, Pipeline insulation.

33-3802
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Sonninskii, A.V., *Gazovaia promyshlennost',* Dec. 1978, No.12, p.22-25, In Russian.
Petroleum transportation, Hot oil lines, Electric heating.

33-3803
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Well casings, Cements, Cement additives, Permafrost, USSR—Yakutia.

33-3804
Preventing damage resulting from salt defrosting of mobile railroad tracks in quarries. [Preduprezhdenie otritsatel'nykh rezul'tatov pri razmorazhivanii soliami peredvizhnykh zheleznodorozhnykh putei na kar'erakh],
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Mountain soils, Cryogenic slope processes, Sporadic permafrost, Solifluction, Tailings, Slope stability, Landslides.

33-3806
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33-3807
Methods of compiling and using combined maps of mineral and raw material resources of the BAM area. [K metodike sostavleniia i ispol'zovaniia kompleksnoi karty mineral'no-syr'evykh resursov BAM],
Malikov, D.N., *Geodeziia i kartografiia,* Feb. 1979, No.2, p.49-52, In Russian.
Maps, Permafrost distribution, Economic development, Natural resources, Mapping, Baykal Amur railroad.

33-3808
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Conference on the Mackenzie Delta: Priorities and Alternatives, Ottawa, Ont., Dec. 3-4, 1975, Ottawa, Ont., Canadian Arctic Resources Committee, 1977, 193p., Refs. passim. For selected papers see 33-3809 through 33-3811.
Estuaries, Environmental impact, Oil spills, Offshore drilling, Pollution, Legislation, Canada—Northwest Territories—Mackenzie River Delta.

33-3809
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Aircraft icing, Cloud physics, Weather modification, Equipment.

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Data on oceanographic studies in the South Atlantic Ocean were used from the scientific literature in relation to the krill industry. The following topics are discussed in this article: structure and circulation of the water masses, water temperature distribution, chemical composition of sea water; seasonal sea ice distribution; and locations of the Antarctic Convergence and Antarctic Divergence. A list of Antarctic expeditions from different countries from 1839 to 1969 is included.

33-3827
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Sea ice, Ice cover thickness, Radar echoes.

33-3830
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Grave, N.A.
Permafrost preservation, Thermal stresses, Human factors, Permafrost distribution, Damage.
This report is based on a review paper presented at the Third International Conference on Permafrost held in July 1978 at Edmonton, Canada. It reviews the literature covering 1974-1978 and covers subjects related to natural and human induced disturbance of terrain underlain by pprmafrost. Subjects include investigations undertaken in conjunction with oil and gas pipelines, terrain mapping, methods for estimating terrain sensitivity, methods of protecting terrain, and the thermal effects of off road transportation, oil spills, fire, removal of the surface soil layers, snow conditions, mining and other construction practicees. Methods of protecting and restoring permafrost in the USSR are presented in tabular form. An appendix summarizes results of modeling and microclimatic investigation, and the distribution and properties of subsea, land-based, and alpine permafrost.

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Ultrasonic tests, Low temperature tests, Acoustic scattering, Polymers.

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Rumer, R.R.
Lake ice Ice melting, Meltwater, Heat transfer, Albedo.

33-3834
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33-3835
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Howarth, D.A.
Sea ice distribution, Pack ice, Spacecraft, Mapping.
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33-3836
Iceberg utilization.
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Icebergs, Economic development, Water supply, Iceberg towing.
The prospect of transporting icebergs to south Australia for use as a fresh water source is examined. It is speculated that a large iceberg of some 5 sq km in top surface could be towed from the Amery Ice Shelf area to the southern coast of Australia in about 2 mo, with about half of its original mass remaining for conversion to water. Such an iceberg would contain enough water to supply a city of the size of Adelaide or Perth for 2 yr. The chief requirement for this task would be an appropriate towing force. A comparison of the energy requirements of iceberg towing and seawater desalination indicates that icebergs promise to be a much more economic source of water than desalination. The water would be suitable for domestic and industrial supplies, and perhaps for garden food crops. Feasible methods for protecting and towing the icebergs, and for converting them into water in storage are as yet undeveloped.

33-3837
Wind-drift model of open and very open pack ice. {Model' vetrovogo dreifa redkikh i razrezhennykh l'dov},
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Ice models, Pack ice, Drift, Wind (meteorology), Mathematical models.

33-3838
Calculation of ice edge movement in antarctic polynyas. {Raschet velichiny peremeshcheniia kromki l'dov v antarkticheskikh polyn'iakh},
Maslovskiĭ, M.I., *Problemy Arktiki i Antarktiki,* 1978, No.53, p.18-20, In Russian. 3 refs.
Mathematical models, Computerized simulation, Drift, Ice edge, Polynyas, Antarctica.
The feasibility of calculating ice edge movement in polynyas is examined. A viscoelastic model of ice cover and additional integral models for atmospheric and oceanic boundary layers are formulated. For the estimated velocities of air and water, ice edge movement is determined; a combined Eulerian-Langrangian system of coordinates was used.

33-3839
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33-3840
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Shushlebin, A.I., *Problemy Arktiki i Antarktiki,* 1978, No.53, p.50-54, In Russian. 5 refs.
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33-3841
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Kliueva, N.V., *Problemy Arktiki i Antarktiki,* 1978, No.53, p.66-70, In Russian. 13 refs.
Snow optics, Ice optics, River ice, Solar radiation, Radiation absorption.

33-3842
Application of the conditional ergodicity theory to snow cover studies in the Central and South Ural Mountains. {Primenenie teorii uslovnoĭ ergodichnosti k izucheniiu snezhnogo pokrova srednego i iuzhnogo Urala},
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Snow water content, Snow hydrology, Rain, Snow depth, Snow temperature, Snow density, Runoff, Experimentation.

33-3845
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Tundra vegetation, Organic soils, Ecosystems, Chemical analysis, Nutrient cycle, Environmental impact, Decomposition, Thaw depth, Damage.

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Bitumens, Bottom sediment, Geochemistry, Microbiology, Organic matter, Arctic Ocean.

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33-3850
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33-3851
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Waste disposal, Water treatment, Sludges, Agriculture, Manuals.

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33-3857
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33-3859
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Sea ice, Gas inclusions, Sound transmission, Carbon dioxide, Boundary value problems.

33-3860
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Sea ice, Ice conditions, Remote sensing, Radar echoes.

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Applications of HCMM data to soil moisture, snow, and estuarine current studies. Quarterly report no.3.
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Thermal measuring instruments, Snow cover, Soil moisture, Estuaries.

33-3862
Spray application of wastewater effluent in West Dover, Vermont: an initial assessment.
Cassell, E.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1979, SR 79-6, 38p., ADA-068 534, 26 refs.
Meals, D.W., Bouzoun, J.R.
Waste disposal, Water treatment, Soil chemistry, Water chemistry.
Runoff from spray application of secondary wastewater effluent on a forested hillside in West Dover, Vermont, was monitored for a six-week period (11 July-19 August 1977). Both quantity and quality of applied effluent and site drainage were monitored. On-site groundwater and two adjacent streams were sampled for water quality. Drainage flows were relatively constant during the study period in spite of highly variable inputs to the site. There is evidence that substantial quantities of water may be leaving the spray site by moving through the subsurface fragipan layer. On a mass basis, 95% of the total nitrogen, 96% of the ammonia nitrogen, 92% of the nitrate-nitrogen, 98% of the organic nitrogen, 99% of the total phosphorus, and 79% of the BOD5 were removed by spray application. Heavy precipitation was observed to flush most nutrient forms, especially nitrate-nitrogen, from the spray site. Groundwater on the spray field contained lower concentrations of nutrients than did the applied effluent, but higher concentrations than those found in site drainage. No hazardous nitrate levels were detected in groundwater. No elevations of nutrient concentrations in the Deerfield River on Ellis Brook were detected during the study period. However, there was some evidence of increased chloride concentrations in Ellis Brook.

33-3863
Phase composition measurements on soils at very high water contents by pulsed nuclear magnetic resonance technique.
Tice, A.R., et al, *Transportation research record,* 1978, No.675, MP 1210, p.11-14, 22 refs.
Burrous, C.M., Anderson, D.M.
DLC TE7.H5 no.675
Frozen ground physics, Unfrozen water content, Nuclear magnetic resonance, Soil chemistry, Saline soils.
A simple, rapid method of determining the unfrozen water content of frozen soils is described in detail. The method uses the first pulse amplitude of a pulsed nuclear magnetic resonance analyzer. Phase composition curves were obtained for four soils at very high total water contents. Three of the soils (Manchester fine sand, Fairbanks silt, and Goodrich clay) had been previously examined by another method (isothermal calorimeter). The fourth (Kotzebue silt) is a naturally saline soil found in low-lying coastal regions of Alaska. This soil was tested both in its natural state and with the soluble salts removed. The phase composition curves obtained by the nuclear magnetic resonance method are consistent with those obtained by using the isothermal calorimeter, but the nuclear magnetic resonance method saved time, requiring only 48h. It also provides a high degree of reproducibility and can be used over a wide range of temperatures. As expected, the unfrozen water content of the saline soil was much higher in its natural state than after removal of the soluble salts. In addition, the unfrozen water content of all four soils appears to increase somewhat as the total water content of the sample is increased.

33-3864
Permafrost beneath the Beaufort Sea, near Prudhoe Bay, Alaska.
Sellmann, P.V., et al, MP 1211, Offshore Technology Conference, 11th. Proceedings, Houston, Texas, 1979, p.1481-1493, 34 refs.
Chamberlain, E.J.
Submarine permafrost, Drill core analysis, Penetration tests, Permafrost depth.
The occurrence and properties of subsea permafrost near Prudhoe Bay, Alaska, were investigated by drilling and probing. Nine holes were drilled and 27 sites were probed with a cone penetrometer. The deepest drill hole was 65.1m below the seabed, while a depth of 14.1 m was reached with the cone penetrometer. Engineering and chemical properties were determined from core samples and point penetration resistance data were obtained with the penetrometer. Thermal profiles were acquired at both the drill and probe sites.

33-3865
Projected thermal and load-associated distress in pavements incorporating different grades of asphalt cement.
Johnson, T.C., et al, MP 1209, Hanover, New Hampshire, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, 53p., Submitted for presentation at the Association of Asphalt Paving Technologists' annual meeting. 35 refs.
Shahin, M.Y., Dempsey, B.J., Ingersoll, J.
Bituminous concretes, Asphalts, Low temperature tests, Frost heave, Cracking (fracturing), Thermal stresses, Temperature effects.

33-3866
Soil mechanics for off-road vehicle engineering.
Karafiath, L.L., et al, Series on rock and soil mechanics, Vol.2, No.5, Clausthal, Germany, Trans Tech Publications, 1977, 515p., Numerous refs.
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Soil mechanics, All terrain vehicles, Tracked vehicles, Soil classification, Soil trafficability, Plastic properties, Vehicle wheels.

33-3867
Grouting silt and sand at low temperatures—a laboratory investigation.
Johnson, R., *U.S. Army Cold Regions Research and Engineering Laboratory,* Mar 1979, CR 79-5, 33p., ADA-068 741, 4 refs.
Low temperature tests, Grouting, Chemical reactions, Compressive strength.
This report presents data from an experimental program undertaken to develop information on proposed and existing chemical grout solutions to provide engineering properties in connection with grouting of soils in ambient temperatures of 39 F and below. Twelve grout solutions were investigated, including organic chemicals, sodium silicates, cements, and clay (bentonite).

33-3868
Report of pit-wall observations of snow cover in Sapporo, 1977-1978.
Endo, Y., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1978, No.36-37, p.1-6, In Japanese. 4 refs.
Snow cover, Snow physics.

33-3869
Regional characteristics of the snow cover in the western part of Hokkaido.
Endo, Y., et al, *Low temperature science (Teion kagaku). Series A Physical sciences. Data report,* 1978, No.36-37, p.7-10, In Japanese. 3 refs.
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Snow cover, Snow physics.

33-3870
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Wind (meteorology), Air temperature.

33-3871
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Snow cover, Snow physics.

33-3872
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33-3873
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Snow mechanics, Stresses, Strains.

33-3874
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Aota, M.
Ocean currents, Measuring instruments.

33-3876
Frost heave in Tomakomai (1977-1978).
Kinoshita, S., et al, *Seppyo,* Mar. 1979, 41(1), p.107-112, In Japanese. 1 ref.
Suzuki, Y., Horiguchi, K., Inoue, M., Takeda, K., Ishizaki, T.
Soil mechanics, Frost heave, Soil moisture.

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Alekseeva, A.K.
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Petroleum industry, Swamps, Seasonal freeze thaw, Frost penetration, Peat, Roads, Pipelines, Embankments, Drilling.

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Swamps, Frost penetration, Pipelines, Design.

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Bredikhina, L.M., Keĭder, N.IA.
DLC TN863.P75
Swamps, Discontinuous permafrost, Urban planning, Peat, Seasonal freeze thaw, Permafrost hydrology.

33-3951
Geobotanical interpretation of aerial photographs for construction in the Agan oil field area in Western Siberia. (Primenenie metoda geobotanicheskogo aerofotodeshifrirovaniia dlia inzhenernykh tseleĭ v usloviiakh Zapadnoĭ Sibiri na primere Aganskogo mestorozhdeniia nefti),
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Abramov, V.IA.
DLC TN863.P75
Swamps, Aerial photographs, Geobotanical interpretation.

33-3952
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Golovnin, V.P., et al, Proektirovanie obustroĭstva neftianykh mestorozhdeniĭ Zapadnoĭ Sibiri (Planning the development and technology of oil fields in West Siberia) edited by Mezhlumov, O.A., Tiumen', 1969, p.155-158, In Russian. 4 refs.
Abdullaev, N.A.
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Urban planning, Buildings, Foundations, Permafrost beneath structures, Construction equipment, Construction materials.

33-3962
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Glacier mass balance, Glacier movement, Velocity measurement, Ice temperature, Sediments, Antarctica—Taylor Glacier.
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33-3963
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Ice cores, Ice composition, Ice dating, Chemical composition.
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Glacier melting, Icebergs, Ice shelves, Upwelling, Surface waters, Meltwater, Chemical composition.

33-3970
Late Quaternary extent of the West Antarctic ice sheet: new evidence from Ross Sea cores.
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Ice sheets, Drill core analysis, Marine biology, Glacial geology, Marine geology, Antarctica—Ross Sea.
Ross Sea cores contain diatom floras and have sediment characteristics which suggest that grounded ice filled the Ross Sea embayment to the continental shelf margin during the last, and previous, glacial advances. Each successive advance reworked sediments from the previous interglacial period with older material and compressed them into a firm deposit with reworked (mixed and fractured) microfossils. As the grounding line retreated past each core location, subglacial meltwater, tidal pumping, and marine bottom-water flow winnowed light, less heavily silicified diatoms, leaving a lag of *Eucampia balaustium* in well-sorted, sandy sediment. Warm-water, open-marine conditions initially prevailed after deglaciation on the northern part of the continental shelf during summers. Open-marine conditions were gradually replaced by the pack-ice cover that today characterizes the Ross Sea continental shelf region. (Auth.)

33-3971
Results and prospects of studying large-scale interaction between the ocean and the atmosphere. ¡Nekotorye itogi i perspektivy issledovaniĭ krupnomasshtabnogo vzaimodeĭstviia okeana i atmosfery¡
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33-3975
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Sokolov, B.L., *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Trudy,* 1978, Vol.253, p.60-73, In Russian. 10 refs.
Permafrost hydrology, Naleds, Alimentation, Ice growth, Ice volume, Aerial photographs.

33-3976
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Soil stabilization, Sands, Cements, Heating, Soil strength, Frost resistance.

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River ice, Lake ice, Ice cover thickness, Acoustic measurement, Echo sounding.

33-3978
Hydrology of the Baykal Amur railroad area. {Voprosy gidrologii BAMa},
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33-3979
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33-3986
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33-3987
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Active layer, Podsol, Cryogenic soils, Soil freezing, Frost penetration, Soil moisture migration, Phase transformations, Unfrozen water content, Taiga soils, Frozen fines.

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Frozen ground, Permeability, Soil temperature, Soil moisture migration, Ground ice, Seasonal freeze thaw, Frost penetration, Meltwater, Drainage.

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Surface drainage, Frozen ground, Ground thawing, Permeability, Soil moisture migration, Flow rate.

33-3991
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Floods, Meltwater, Runoff, Frozen ground, Soil moisture migration, Permeability, Heat transfer.

33-3992
Experimental study of water permeability of soils. {Eksperimental'nye issledovaniia vlagoprovodnosti pochv},
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Ground thawing, Podsol, Chernozem, Soil moisture migration, Permeability, Capillarity, Analysis (mathematics).

33-3993
Thermal regime of the ground-surface-atmosphere system in Vyatka and Kama river basins. {Termicheskiĭ rezhim sistemy "deiatel'naia poverkhnost' - atmosfera" v basseĭnakh rek Viatki i Kamy},
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River basins, Snowmelt, Surface drainage, Flood forecasting, Ground thawing, Soil air interface, Heat balance.

33-3994
Thermoelectric pyranometers for meteorologic and hydrologic investigations. {Termoelektricheskie priemniki dlia meteorologicheskikh i gidrologicheskikh issledovaniĭ},
Vasilevskiĭ, A.M., et al, *Leningrad. Gosudarstvennyĭ gidrologicheskiĭ institut. Trudy,* 1978, Vol.250, p.99-106, In Russian. 11 refs.
Gul'kov, V.N., Sozina, N.N.
Actinometry, Measuring instruments, Subglacial observations, Solar radiation, Snow cover.

33-3995
Calculation of the stability of fresh-fallen snow on slopes. {K raschetu ustoĭchivosti svezhevypavshego snega na sklone},
Khalkechev, V.A., *Meteorologiia i gidrologiia.* Jan. 1979, No.1, p.92-96, In Russian with English summary. 1 ref.
Avalanches, Snow density, Snow cover stability, Snow cover structure, Analysis (mathematics).

33-3996
Vertical and horizontal structure of tussocks formed by cotton grass in the lower course of the Netteveem River (Chukotskiy Peninsula). {Vertikal'naia i gorizontal'naia struktura pushitsevykh kochkarnikov nizhnego techeniia r. Netteveem (Chukotskiĭ p-ov)},
Kononova, M.IU., *Leningrad. Universitet. Vestnik,* Dec. 1978, 24(4), p.125-131, In Russian with English summary. 6 refs.
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Biriukov, V.N., et al, *Lesovedenie,* Mar.-Apr. 1979, No.2, p.3-12, In Russian with English summary. 16 refs.
Malan'in, A.N., Biriukova, Z.P., Solov'ev, A.M.
Forest soils, Soil composition, Soil chemistry, Soil moisture, Cryogenic soils, Plant physiology, Forest strips, Forest fires.

33-3998
Dynamics of linear annual increment of shoots and needles of pine regrowth in the lichen forests of the Pechora polar areas. {Dinamika godichnogo lineĭnogo prirosta pobegov i khvoi u podrosta sosny v lishaĭnikovykh borakh Pecherskogo Zapoliar'ia},
Listov, A.A., *Lesovedenie,* Mar.-Apr. 1979, No.2, p.23-33, In Russian with English summary. 29 refs.
Tundra soils, Tundra vegetation, Forest tundra, Plant physiology, Plant ecology.

33-3999
Influence of rheological rock properties on the selection of the method of coal removal from permafrost areas. {Vliianie reologicheskikh svoĭstv porod na vybor tekhnologii vyemki ugol'nykh plastov mnogoletnemerzloĭ zony},
Sever'ianov, A.N., *Moscow. Institut gornogo dela. Nauchnye soobshcheniia,* 1977, No.148, p.65-68, In Russian. 2 refs.
Mining, Frozen coal, Permafrost, Rheology, Excavation.

33-4000
Load on the working face at a narrow-bite removal of gently sloping, medium thickness permafrost layers. {O nagruzkakh na ochistnoĭ zaboĭ pri uzkozakhvatnoĭ vyemke pologikh plastov sredneĭ moshchnosti mnogoletnemerzloĭ zony},
Petrov, V.V., *Moscow. Institut gornogo dela. Nauchnye soobshcheniia,* 1977, No.148, p.68-71, In Russian. 4 refs.
Mining, Permafrost, Rock excavation, Timbering (supporting).

33-4001
Calculating the performance of air conditioning pipes in permafrost. {Sposob rascheta teplovoĭ truby i otsenka ee rabotosposobnosti primenitel'no k usloviiam mnogoletneĭ merzloty},
Manichev, E.V., *Moscow. Institut gornogo dela. Nauchnye soobshcheniia,* 1977, No.148, p.76-82, In Russian. 2 refs.
Mining, Air conditioning, Pipelines, Permafrost, Design.

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Machine for snow clearing and removal. {Nuzhny mashiny dlia ochistki i uborki snega},
Netusov, V.P., *Promyshlennyĭ transport,* 1978, No.3, p.11, In Russian.
Railroad tracks, Snow removal equipment.

33-4003
Climatic consequences of the southward displacement of the polar boundary of forests. {Klimaticheskie posledstviia smeshcheniia poliarnoĭ granitsy lesa k iugu}, Tyrtikov, A.P., *Moskovskoe obshchestvo ispytateleĭ priirody. Biulleten'. Otdel biologicheskiĭ,* Sep.-Oct. 1978, 83(5), p.60-64, In Russian with English summary. 17 refs.
Forest tundra, Tundra vegetation, Forest lines, Climatic factors.

33-4004
Geological surveys in the BAM zone. {Geologorazvedochnye raboty v zone BAM}, *Razvedka i okhrana nedr,* Dec. 1978, No.12, p.3-7, In Russian.
Geological surveys, Permafrost distribution, Mining, Baykal Amur railroad.

33-4005
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Veĭsman, L.I., et al, *Razvedka i okhrana nedr,* Mar. 1979, No.3, p.41-44, In Russian.
Gel'man, R.N., Chasova, T.T.
Aerial photography, Permafrost distribution, Cryogenic processes, Thermokarst, Swamps, Pingos.

33-4006
Large block foundations for large panel buildings. {Fundamenty iz ukrupnennykh blokov dlia krupnopanel'nykh domov},
Simorot, K., *Na stroĭkakh Rossii,* Feb. 1979, No.2, p.50-52, In Russian.
Large panel buildings, Foundations, Prefabrication.

33-4007
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Moshkov, A., *Na stroĭkakh Rossii,* Mar. 1979, No.3, p.10-13, In Russian.
Urban planning, Residential buildings, Permafrost beneath structures, Roads.

33-4008
Use of spaceborne photography in design. {Ispol'zovanie kosmicheskikh snimkov v proektirovaniĭ},
Melua, A., *Na stroĭkakh Rossii,* Apr. 1979, No.4, p.44-46, In Russian.
Spaceborne photography, Permafrost distribution, Arctic terrain, Urban planning, Baykal Amur railroad.

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Soil formation under meadow and forest vegetation in the Alpine region of the Central Caucasus (Elbrus region).
Gennadiev, A.N., *Soviet soil science,* Mar.-Apr. 1978, No.2, p.142-150, Translated from Pochvovedenie. 19 refs.
Alpine soils, Meadow soils, Alpine vegetation, Forests, Soil formation, USSR—Caucasus.

33-4010
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Shpynova, L.G., et al, *Akademiia nauk SSSR. Doklady,* 1979, 245(4), p.892-895, In Russian. 10 refs.
Belov, N.V., Sobol', Kh.S., Sanitskiĭ, M.A.
Winter concreting, Cements, Concrete hardening, Concrete freezing, Concrete strength.

33-4011
Gold scattering aureoles in snow cover on the surface of ore manifestation. {Oreoly rasseianiia zolota v snezhnom pokrove na poverkhnosti rudoproiavleniia},
Pogrebniak, IU.F., et al, *Akademiia nauk SSSR. Doklady,* 1979, 245(4), p.953-955, In Russian. 7 refs.
Tat'iankina, E.M., Tolochko, V.V.
Mining, Geochemistry, Exploration, Snow impurities, Metals.

33-4012
Landscape-geochemical subdivision of the nonchernozem zone according to decomposition and scattering of organic contaminating substances. {Landshaftno-geokhimicheskoe raĭonirovanie nechernozemnoĭ zony po usloviiam razlozheniia i rasseianiia organicheskikh zagriazniaiushchikh veshchestv},
Glazovskaia, M.A., *Moscow. Universitet. Vestnik. Seriia 5 Geografiia,* Mar.-Apr. 1979, No.2, p.10-19, In Russian with English summary. 7 refs.
Shores, Cryogenic soils, Tundra soils, Taiga soils, Swamps, Soil pollution.

33-4013
Some aspects of the geological role of cryogenesis. {Nekotorye aspekty geologicheskoĭ roli kriogeneza},
Chizhov, A.B., *Moscow. Universitet. Vestnik. Seriia 4 Geologiia,* Jan.-Feb. 1979, No.1, p.53-63, In Russian. 24 refs.
Cryogenic processes, Permafrost distribution, Permafrost structure, Permafrost hydrology, Glaciation.

33-4014
Natural reforestation of drained high bogs. {Estestvennoe vozobnovlenie lesa na osushennom verkhovom bolote},
Korepanov, A.A., et al, *Lesnoe khoziaĭstvo,* 1979, No.3, p.24-27, In Russian. 9 refs.
Druzhinin, N.A.
Swamps, Drainage, Revegetation, Forestry.

33-4015
Peculiarities of winter soil fires in forests. {Osobennosti zimnikh pochvennykh pozharov},
Filippov, A.V., *Lesnoe khoziaĭstvo,* 1979, No.3, p.54, In Russian.
Forest fires, Forest soils, Peat, Snow cover distribution, Soil moisture.

33-4016
Gyroscope drift in ice. {Volchok dreĭfuet vo l'dakh},
Pikul', V., *Izobretatel' i ratsionalizator,* 1978, No.9, p.20-21, In Russian.
Sea ice, Drift, Drift stations, Design.

33-4017
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Belousov, N.A., et al, *Lesnaia promyshlennost',* 1978, No.12, p.6, In Russian.
Slodkevich, IA.V.
Motor vehicles, Tracked vehicles, Cold weather performance.

33-4018
Improving the technology of mountain tunnel construction. {Sovershenstvovanie tekhnologii sooruzheniia gornykh tonneleĭ},
Vlasov, S., et al, *Metrostroĭ,* 1978, No.8, p.1-3, In Russian.
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Tunnels, Linings, Anchors, Drills, Baykal Amur railroad, Permafrost.

33-4019
Tunnels of the Baykal Amur railroad. {Tonneli BAMa},
Salopekin, I., *Metrostroĭ,* 1978, No.8, p.3-6.
Construction equipment, Tunnels, Baykal Amur railroad, Permafrost.

33-4020
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Construction equipment, Construction materials, Tunneling (excavation), Baykal Amur railroad, Permafrost.

33-4021
High speed tunneling. {Dlia skorostnoĭ prokhodki},
Tarasiugin, A., *Metrostroĭ,* 1978, No.8, p.10-11, In Russian.
Tunnels, Construction equipment, Baykal Amur railroad, Permafrost.

33-4022
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Priakhin, P., *Metrostroĭ,* 1978, No.8, p.11-13, In Russian.
Tunnels, Traverses, Lasers, Baykal Amur railroad, Measuring instruments, Permafrost.

33-4023
Effectiveness of dredging equipment. {Effektivnost' gruntozabornykh ustroĭstv},
Bekriashev, A., *Rechnoĭ transport,* 1979, No.4, p.39, In Russian.
Earthwork, Dredging, Excavating equipment, Design.

33-4024
Equipment for cars used in the North. {Oborudovanie avtomobileĭ dlia raboty na Severe},
Selivanov, I.I., *Promyshlennyĭ transport,* Jan. 1979, No.1, p.27-28, In Russian.
Motor vehicles, Thermal insulation, Engine starters, Heating, Design.

33-4025
Winter performance of ferries. {Rabota perepravy zimoĭ},
Sadovenko, V., *Rechnoĭ transport,* 1979, No.1, p.10-11, In Russian.
Lakes, Ice navigation, Ships.

33-4026
Attending to ice conditions in the North. {Obsluzhivanie obstanovki na Severe},
Kovrigin, I., et al, *Rechnoĭ transport,* 1979, No.1, p.34, In Russian.
Znikin, E.
River ice, Ice conditions, Ice navigation, Traffic control.

33-4027
Reliability of hydraulic conveyors in the Far North. {Nadezhnost' gidrotransportnykh sistem na Kraĭnem Severe},
Dzhvarsheishvili, A.G., et al, *Promyshlennyĭ transport,* Nov. 1978, No.11, p.20-21, In Russian.
Kochetkova, I.V.
Pipeline freezing, Ice formation, Hydraulic conveyors.

33-4028
Calculation of pressure of fluids freezing in cavities on well casings. {Raschet davleniia na obsadnuiu kolonnu pri zamerzanii zhidkosti v kaverne},
Bulatov, A.I., et al, *Neftianoe khoziaĭstvo,* Mar. 1979, No.3, p.25-27, In Russian. 4 refs.
Pustil'nik, S.IA., Vidovskiĭ, A.L.
Oil wells, Well casings, Soil pressure, Soil moisture, Frost penetration, Ice formation.

33-4029
Optimal parameters of hot pipeline performance. {Optimal'nye parametry raboty goriachikh truboprovodov},
Abramzon, L.S., *Neftianoe khoziaĭstvo,* Feb. 1979, No.2, p.53-54, In Russian. 7 refs.
Petroleum transportation, Hot oil lines, Thermal insulation, Heat transfer, Analysis (mathematics).

33-4030
Glaciology of the highest glaciers in Pamirs. {Gliatsiologiia vysochaĭshikh lednikov Pamira},
Diurgerov, M.B., et al, *Priroda,* 1978, No.9, p.72-79, In Russian.
Urumbaev, N.A.
Glaciers, Snow cover distribution, Snow stratigraphy, Glacier ice, Alimentation, Glacier surfaces, Glacier surveys, Ice cracks, USSR—Pamirs.

33-4031
Forage resources in taiga areas of the nonchernozem zone. {Kormovye resursy taezhnykh raĭonov nechernozem'ia},
Dmitrieva, S.I., *Rastitel'nye resursy,* 1979, 15(1), p.3-10, In Russian. 3 refs.
Taiga soils, Taiga vegetation, Podsol, Swamps, Peat.

33-4032
Icebergs in the North Atlantic Ocean. {Aĭsbergi severnoĭ Atlantiki},
IAkovlev, D., *Morskoĭ sbornik,* Jan. 1979, No.1, p.61-64, In Russian.
Icebergs, Ice navigation, Ice reporting, Fog, Radar tracking.

33-4033
In northern latitudes. {Severnymi shirotami},
Maĭnagashev, B., *Morskoĭ flot,* 1979, No.3, p.24-26, In Russian.
Sea ice, Ice navigation, Icebreakers, Ships, Drift stations.

33-4034
Report of decommissioning of the PM-3A Nuclear Power Plant, McMurdo Station, Antarctica.
Foster, M.E., et al, Port Hueneme, California, Naval Nuclear Power Unit, Feb. 1979, var. p., Unpublished manuscript. Refs.
Jordan, N.M.
Nuclear reactors, Soil pollution, Radiation, Radioactive wastes, Ice composition, Impurities, Waste disposal, Antarctica—McMurdo Station.
The PM-3A Nuclear Power Plant, operated from 1962 to 1972 by the Navy under a Memorandum of Understanding between the Atomic Energy Commission and the Department of Defense, has been dismantled and removed from Antarctica, and the site has been decontaminated to levels as low as reasonably achievable. Removal of the plant components and surrounding low-level contaminated rock from the continent was considered prudent in view of the provision in Article V of the Antarctic Treaty that states "... the disposal there of radioactive waste material shall be prohibited". This report shows that the concentrations of man-made radionuclides remaining on the site would result in a radiation dose less than 15 millirems per year as an upper limit or 6 millirems per year as a most probable value. These low doses are the result of the extremely low levels of radionuclides (averaging 8 picocuries per gram of crushed rock for cesium-137, and even less for the other nuclides—cesium-134, cobalt-60, and strontium-90) and the lack of any significant pathway to man in the antarctic environment. The report concludes that the PM-3A decommissioning is complete, and the site may be released for unrestricted use in accordance with United States standards. For individual abstracts see G-14738, G-20496, and G-21855 through G-21857, or 33-4035 and 33-4036. (Auth.)

33-4035
Radiological survey of the PM-3A site: Volume 1. Final report.
Jentz, T.L., Rockville, Maryland, NUS Corp., June 1978, 165p., Unpublished manuscript.
Nuclear reactors, Soil pollution, Radiation, Ice composition, Radioactive wastes, Impurities, Waste disposal, Antarctica—McMurdo Station.
A complete radiological survey was performed at the PM-3A site at McMurdo Station. This survey included the measurement of soil contamination levels, radiation levels, contamination levels and airborne radioactivity levels. Samples of soil, water and crud were collected for laboratory analysis. The results are presented in charts and graphs. All the TLD environmental packets recorded an equivalent exposure of less than 500 mrem per yr due to reactor produced by-product material. All removable contamination levels in and on the buildings were less than 1000 dpm/100 sq cm. Airborne radioactivity levels in and around the facility were well below the acceptable concentrations in air above natural background for unrestricted areas. Water and ice samples were collected at five locations. Highest tritium levels were found in ice samples collected in the area where liquid radioactive waste was discharged during plant operation.

33-4036
Radiological survey of the PM-3A site: Volume 2. Final report: Appendix. Rockville, Maryland, NUS Corp., June 1978, 85p., Unpublished manuscript.
Nuclear reactors, Soil pollution, Radiation, Ice composition, Impurities, Waste disposal, Antarctica—McMurdo Station.
This appendix to the radiological survey of the site on which the McMurdo Station nuclear reactor once stood sets forth the procedures for analysis of soil, air particulates, water and crud. A procedure for routine acquisition and processing of gamma-ray spectra using the Ge(Li) detector system is also described. The correct method for reporting results and for checking performance of counting equipment is outlined. Specifications and calibration for the following types of survey equipment are given: PRM-7, Micro-R Meter; PRM-5-3 with SPA-3; PRM-4A or PRM-6 with HP-210 pancake detector; BC-4, beta counter; SAC-4, alpha scaler; and RAS-1, air sampler.

33-4037
Ocean-atmosphere system.
Perry, A.H., et al, New York, Longman, Nov. 1977, 160p., Refs.
Walker, J.M.
DLC GC190.2.P47
Sea ice, Pack ice, Ice shelves, Ice conditions, Air water interactions.
This book is concerned with interactions between the atmosphere and the oceans and with the interdependence of atmospheric and oceanic circulation. It is intended as a text for second and third year undergraduates in the fields of geography, geophysics, environmental science, marine biology, and nautical studies. The book contains six chapters covering the following topics: the principal features of the ocean-atmosphere system, oceanic macro-circulations, the action of wind on the sea, ocean-atmosphere heat exchange, the thermal behavior of the ocean-atmosphere system and climatic responses, and various international projects and numerical models. The chapter on ocean macro circulations contains discussions on ice conditions, the formation of bottom water, and the significance of deep-water circulations in the Southern Ocean.

33-4038
Past and present day tropospheric fallout fluxes of Pb, Cd, Cu, Zn and Ag in Antarctica and Greenland.
Boutron, C., *Geophysical research letters,* Mar. 1979, 6(3), p.159-162, 24 refs.
Fallout, Aerosols, Snow composition, Ice composition, Chemical composition.
Estimates of the present day tropospheric fallout fluxes of Pb, Cd, Cu, Zn and Ag in the central areas of Antarctica and Greenland are calculated from the measured concentrations of these elements in the deposited snow. The fluxes obtained are higher by one to two orders of magnitude in Greenland, probably largely because of the different geographical locations and meteorological regimes of Greenland and Antarctica. The variations of these fluxes during the last century suggest that the present day enrichments of these five metals in tropospheric aerosols in remote areas are not influenced significantly by human activity, but may be for a small part for Pb and Zn in the Northern Hemisphere, and are therefore linked to natural processes. (Auth.)

33-4039
Snow transport by katabatic winds in Mizuho Camp area, East Antarctica.
Kobayashi, S., *Meteorological Society of Japan. Journal,* Apr. 28, 1978, 56(2), p.130-139., 26 refs.
Snow gages, Wind factors, Wind velocity, Snowdrifts, Antarctica—Mizuho Station.
This paper describes the results of snow drift measurements made on a slope near Mizuho Camp where katabatic winds prevail. A handy collector, a chest with ten drawers, was devised, to measure the amount of drifting snow under severe conditions in Antarctica. Called a drawer-type collector, it has a collection efficiency of about 0.23 and measures mass fluxes at ten levels up to 1 m above the snow surface at one time. A maximum total drift transport was obtained at each place by integrating the measured and extrapolated mass fluxes from the lowest level to the height of 10 m, as given by an empirical formula. Using the distribution of wind speed and the relative frequencies of occurrence of drifting and blowing snow at Mizuho Camp and its vicinity, the actual amount of snow transported across a cross-slope line of 1 km in width was obtained, which was about 1 billion kg/km/yr.

33-4040
Study on ice faulting and icequake activity in Lake Suwa. 2. Temporal variation of m-value.
Hamaguchi, H., et al, *Tohoku University. Scientific reports. Series V Geophysics,* 1978, 25(1), p.25-38, 18 refs.
Goto, K.
Ice mechanics, Lake ice, Ice cracks, Ice breakup, Ice cover strength, Ice deformation, Stresses, Fracturing, Japan—Suwa Lake.

33-4041
Geotechnical aspects of iceberg scours on ocean floors.
Chari, T.R., *Canadian geotechnical journal,* May 1979, 16(2), p.379-390.
Icebergs, Ice scoring, Ocean bottom.

33-4042
Undrained strength of some thawed permafrost soils.
Nixon, J.F., et al, *Canadian geotechnical journal,* May 1979, 16(2), p.420-427, 5 refs.
Hanna, A.J.
Permafrost physics, Shear strength, Density (mass/volume), Soil mechanics, Soil tests, Canada—Northwest Territories—Mackenzie River Delta.

33-4043
Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost. [Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu],
Mel'nikov, P.I., ed, Novosibirsk, Nauka, 1979, 300p., In Russian. For individual papers see 33-4044 through 33-4087. Refs. passim.
Buildings, Foundations, Permafrost bases, Piles, Footings, Supports, Reinforced concrete, Pipelines, Permafrost beneath structures, Permafrost control, Permafrost forecasting, Bridges, Hydraulic structures.

33-4044
Interaction of buildings with thawing bearing ground. [Sovmestnaia rabota zdaniia i ottaivaiushchego osnovaniia],
Pozovskaia, V.G., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.5-16, In Russian. 5 refs.
Neĭmark, L.I., Vialov, S.S.
Buildings, Foundations, Ground thawing, Permafrost bases, Settlement (structural), Design.

33-4045
Peculiarities of pipeline performance in permafrost in earthquake areas. [Osobennosti raboty truboprovodov v mnogoletnemerzlykh gruntakh v seĭsmoaktivnykh raĭonakh],
Spiridonov, V.V., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.16-23, In Russian.
Gekhman, A.S., Figarov, N.G.
Pipelines, Embankments, Permafrost beneath structures, Earthquakes, Design.

33-4046
Methods of calculating centrally loaded pile foundations in frozen ground. [Metodika rascheta tsentral'no nagruzhennykh svaĭnykh fundamentov v merzlykh gruntakh],
Khafizov, R.M., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.23-29, In Russian. 4 refs.
Spiridonov, V.V.
Pile foundations, Permafrost beneath structures, Bearing strength, Design.

33-4047
Seasonal variations of electrical resistivities and temperature of frozen rocks and some concepts concerning the mechanism of electrical conductivity in frozen media. [Sezonnye izmeneniia elektricheskikh soprotivleniĭ i temperatury merzlykh porod i nekotorye predstavleniia o mekhanizme elektroprovodnosti v merzlykh sredakh],
Akimov, A.T., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.29-33, In Russian. 7 refs.
Kirillov, V.A.
Permafrost physics, Permafrost thermal properties, Electrical properties.

33-4048
Bridge foundations and piers of reinforced concrete piles driven into perennially frozen ground. [Fundamenty i opory mostov iz zhelezobetonnykh svaĭ-stolbov zaglubliaemykh v vechnomerzlye grunty],
Silin, K.S., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.34-38, In Russian. 4 refs.
Glotov, N.M.
Bridges, Piers, Concrete piles, Reinforced concrete, Permafrost beneath structures.

33-4049
Role of cryogenic conditions in the design of hydraulic structures. [Rol' merzlotnykh usloviĭ v praktike proektirovaniia gidrotekhnicheskikh sooruzheniĭ],
Krivonogova, N.F., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoĭ konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.38-49, In Russian. 14 refs.
Ziskovich, V.E., Kuznetsov, A.L.
Hydraulic structures, Permafrost beneath structures, Ground ice, Permafrost structure, Frozen fines, Design.

33-4050
Calculating temperature fields in the foundations of structures of arbitrary forms. [Raschet temperaturnykh poleĭ v osnovaniiakh sooruzheniĭ proizvol'noĭ formy],
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Mirenburg, IU.S.
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Pile foundations, Permafrost beneath structures, Pile driving, Frozen ground temperature, Ground thawing, Heat transfer.

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Ice strength, Loads (forces), Creep properties, Ice crystal structure, Ice crystal size.

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Pingos, Ice veins, Ice formation, Soil formation, Soil pressure, Naleds, Ice pressure, Ice growth.

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Thermokarst lakes, Origin, Development.

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Natural gas, Gas pipelines, Liquefied gases, Soil freezing, Frost penetration, Thermal insulation, Heat transfer.

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Natural gas, Gas pipelines, Liquefied gases, Soil freezing, Frost penetration.

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Avalanches, Snow surveys, Snow cover structure, Mapping.

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Avalanche forecasting, Avalanche formation, Avalanche triggering, Meteorological data, Computer applications.

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Avalanche forecasting, Avalanche mechanics, Avalanche velocities, Statistical analysis.

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Avalanches, Snow cover distribution, Snow cover structure, Snow temperature, Avalanche formation, Avalanche triggering.

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Avalanches, Paleoclimatology, Snowfall, Climatic changes, Trees (plants), Age determination, Mathematical analysis.

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Avalanches, Metamorphism (snow), Snow creep, Snow compaction, Snow crystals, Plastic deformation.

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Avalanche engineering, Avalanche countermeasures, Snow retention, Steel structures, Snow creep, Snow loads.

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DLC TP882.3.F58
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Concrete freezing, Frost penetration, Moisture, Phase transformations, Ice formation, Freeze thaw cycles, Frost resistance.

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Concrete strength, Frost resistance, Measuring instruments, Concrete freezing, Ice formation, Cements, Test equipment.

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Ultrasonic velocity investigations of crystal anisotropy in deep ice cores from Antarctica.
Kohnen, H., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, CR 79-10, 16p., ADA-071 451, 23 refs.
Gow, A.J.
Ice sheets, Glacier flow, Ice cores, Ice crystal structure, Ice acoustics, Anisotropy, Wave propagation, Ultrasonic tests, Ice crystal size, Shear properties, Antarctica—Byrd Station, Antarctica—Little America Station.
Ice cores from Byrd Station and Little America V have been used to test an ultrasonic technique for evaluating crystal anisotropy in the Antarctic Ice Sheet. P-wave velocities measured parallel and perpendicular to the vertical axes of cores from the 2164-m-thick ice sheet at Byrd Station have yielded results in excellent agreement with the observed c-axis fabric profile and with the in-situ P-wave velocity profile measured parallel to the bore hole axis. Velocity differences in excess of 140 m/s for core samples from deeper than 1300 m attest to the strong single pole clustering of crystallographic c-axes about the vertical, especialy in the zone from 1300-1800 m. Such oriented structure is compatible only with strong horizontal shearing in the zone. The existence in an ice sheet of widespread shearing several hundred meters above its bed raises serious questions as to the validity of current concepts of the flow of large ice masses that tend to gloss over or ignore crystal alignments of this magnitude. The ultrasonic technique has proven to be a fast and powerful tool for determining crystal fabrics in ice sheets. Results from Byrd Station and Little America V, together with fabric data from several other locations in East Antarctica, suggest that crystal orientations within the Antarctic Ice Sheet tend to be characterized by either single or multi-pole clustering of c-axes about a vertical symmetry axis.

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Mikhalev, G.
Military equipment, Military transportation, Cold weather performance, Winter maintenance.

33-4207
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Sedin, V.A.
Mining, Shaft sinking, Ground thawing, Timbering (supporting), Design.

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Mining, Shaft sinking, Artificial freezing.

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Supporting walls and slopes of baked cohesive earth. (Podpornye steny i otkosy iz obozhzhennykh sviaznykh gruntov),
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Slopes, Soil compacting, Heating, Soil stabilization, Retaining walls.

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Niogrin prevents freezing of coal cargo. (Niogrin prepiatstvuet smerzaniiu energeticheskikh ugleĭ),
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Frozen cargo, Coal, Frost protection, Antifreezes.

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Subgrades, Embankments, Permafrost beneath structures, Permafrost control, Baykal Amur railroad.

33-4213
Determining ultimate strength of frozen ground. (Opredelenie predela prochnosti merzlykh gruntov),
Valiakhmetov, D.G., et al, *Stroitel'nye i dorozhnye mashiny*, Jan. 1979, No.1, p.20-21, In Russian. 4 refs.
Pavlov, V.N.
Earthwork, Excavating equipment, Frozen ground strength.

33-4214
Experimental-industrial tests of a chemical method of sand-clay rock cementation. (Opytno-promyshlennaia proverka khimicheskogo metoda zakrepleniia peschano-glinistykh porod),
Basinskiĭ, V.G., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedeniĭ. Geologiia i razvedka*, Feb. 1979, No.2, p.144-146, In Russian.
Orlov, A.V.
Mining, Sands, Clays, Rock excavation, Cements, Silication.

33-4215
Digging trenches in freezing weather. (Otryvka okopov zimoĭ),
Gusev, V., *Voennyĭ vestnik*, Dec. 1978, No.12, p.100-101, In Russian.
Military engineering, Trenching, Frozen ground, Military operation.

33-4216
Application of the active optical location method to snow melting control. (O vozmozhnosti primeneniia metoda aktivnoĭ opticheskoĭ lokatsii dlia kontrolia za protsessom taianiia snega),
Kropotkin, M.A., et al, *Vodnye resursy*, 1979, No.3, p.184-187, In Russian. 4 refs.
Dmitriev, G.A., Sheveleva, T.IU.
Snow surface, Albedo, Snow melting, Snow water equivalent, Artificial thawing, Lasers, Telemetering equipment.

33-4217
Model experimentation with water seepage through polymer structurized fills and foam plastic filters. [Model'nye opyty po izucheniiu fil'tratsii ostrukturennykh polimerami drenazhnykh zasypok i fil'trov iz penomaterialov],
Utkaeva, V.F., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Nauchnye doklady vysshei shkoly. Biologicheskie nauki,* 1979, 181(1), p.90-94, In Russian. 11 refs.
Barbashev, G.P., Masolova, A.I.
Land reclamation, Swamps, Peat, Drains, Rock fills, Filters, Polymers.

33-4218
High altitude vegetational zoning of the eastern Pamirs. [K vysotnoĭ poiasnosti rastitel'nosti Vostochnogo Pamira],
Ukhacheva, V.N., *Russia. Ministerstvo vysshego i srednge spetsial'nogo obrazovaniia. Nauchnye doklady vysshei shkoly. Biologicheskie nauki,* 1978, 180(12), p.95-102, In Russian. 26 refs.
Alpine land forms, Alpine soils, Alpine vegetation, Bibliographies.

33-4219
Calculating road pavements for frost resistance and drying. [Raschet dorozhnykh odezhd na morozoustoĭchivost' i osusheniej],
Shelopaev, E.I., *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenii. Lesnoĭ zhurnal,* 1979, No.1, p.36-40, In Russian. 2 refs.
Forestry, Pavements, Soil moisture migration, Frost penetration, Freezing rate, Frozen fines, Roads, Subgrades.

33-4220
Calculating heat loss of underground pipelines allowing for insulation. [K raschetu teplopoter' podzemnykh truboprovodov s uchetom izoliatsii],
Diachuk, R.P., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenii. Neft' i gaz,* 1978, No.9, p.65-69, In Russian. 10 refs.
Furman, A.V.
Pipeline insulation, Heat loss, Mathematical models, Underground pipelines.

33-4221
Attachment for microscopes used at low temperatures. [Prisposoblenie k svetovomu mikroskopu dlia raboty pri nizkikh temperaturakh],
Berkovich, M.A., et al, *Zavodskaia laboratoriia,* 1979, 45(1), p.40, In Russian.
Tkachenko, G.T.
Frost protection, Low temperature research, Deicing, Microscopes.

33-4222
Measuring unit for small tangential values of dielectric loss angles at low temperatures. [Achelka dlia izmereniia malykh znachenii tangensa ugla dielektricheskikh poter' pri nizkikh temperaturakh],
Posadskiĭ, A.A., et al, *Zavodskaia laboratoriia,* 1979, 45(1), p.41-43, In Russian.
Kolodiev, B.N.
Low temperature research, Test equipment, Measuring instruments.

33-4223
Sea ice ridging over the Alaskan continental shelf.
Tucker, W.B., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, CR 79-8, 24p., ADA-070 572, 24 refs.
Weeks, W.F., Frank, M.D.
Sea ice distribution, Pressure ridges, Ice deformation, Surface roughness, Profiles, Lasers, Mathematical models, Statistical analysis, Remote sensing, Forecasting.
Sea ice ridging statistics obtained from a series of laser surface roughness profiles are examined. Each set of profiles consists of six 200-km-long flight tracks oriented approximately perpendicular to the coastline of the Chukchi and Beaufort Seas. The flights were made in February, April, August, and December 1976, and one additional profile was obtained north of Cross Island during March 1978. It was found that although there is a systematic variation in mean ridge height (h) with season (with the highest values occurring in late winter), there is no systematic spatial variation in h at a given time. The number of ridges/km is also high during the late winter, with the highest values occurring in the Barter and Cross Island profiles. In most profiles, the ice 20 to 60 km from the coast is more highly deformed than the ice either nearer the coast or farther seaward. The Wadhams model for the distribution of ridge heights gives better agreement with observed values in the higher ridge categories than does the Hibler model. Estimates of the spatial recurrence frequency of large pressure ridges are made by using the Wadhams model and also by using an extreme value approach. In the latter, the distribution of the largest ridges per 20 km of laser track was found to be essentially normal. Wadhams' distribution consistently predicts slightly larger ridge sails than does the extreme value approach.

33-4224
Point source bubbler systems to suppress ice.
Ashton, G.D., *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, CR 79-12, 12p., ADA-071 038, 8 refs.
Mechanical ice prevention, Bubbles, Ice melting, Heat transfer, Water flow, Air temperature, Piles, Offshore structures, Computerized simulation.
An analysis of a point source bubbler system used to induce local melting of an ice cover is presented. The analysis leads to a numerical simulation programmed in FORTRAN which may be used to predict the effectiveness of such systems. An example application is presented using a typical record of average daily air temperatures. The FORTRAN program for the point source simulation as well as a FORTRAN program for line source systems are included in the Appendix.

33-4225
Energy requirements for small flow wastewater treatment systems.
Middlebrooks, E.J., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1979, SR 79-7, 82p., ADA-070 676, 16 refs.
Middlebrooks, C.H.
Waste disposal, Waste treatment, Ponds, Fluid infiltration, Seepage, Cost analysis.
This report summarizes energy requirements for small wastewater treatment systems (0.05 - 5 million gallons per day) applicable to military installations. It compares various treatment combinations, and presents the energy requirements for the most viable alternatives in tabular form. It also presents energy requirements for various components of wastewater treatment systems in a format making it convenient to calculate the energy requirements for many combinations of the components. In addition, it summarizes briefly energy estimates made by others. The report compares typical combinations of unit operations and processes used to produce various quality effluents on the basis of energy consumption. It concludes that land application systems are the most energy-efficient wastewater treatment systems and that they are capable of producing an equivalent or higher quality effluent than any other treatment system.

33-4226
Seeking low ice adhesion.
Sayward, J.M., *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1979, SR 79-11, 83p., ADA-071 040, 54 refs.
Ice adhesion, Adhesive strength, Ice prevention, Ice solid interface, Wettability, Cohesion, Polymers, Deicers, Surface properties, Surface energy.
Icing impairs operation of helicopters and other aircraft, antennae, power and communication lines, shipping and superstructures, canal locks, etc. Prevention or easier removal of icing requires reduction of its adhesion strength. Literature study shows that adhesion results from secondary (van der Waals) forces yet exceeds normal cohesive strengths. It depends on free surface energy, low contact angle, good contact and wetting, cleanliness, and texture. Modes of adhesion testing are briefly discussed. Poor adhesion occurs with low energy surfaces or contaminants, e.g. hydrocarbons, fluorocarbons, waxes, oils, etc., particularly when textured or porous. The resulting low contact angle, poor wetting and occlusion of air at the interface weaken the bond or provide stress loci which can initiate cracks and failure. Coefficient of expansion differences may help in release of ice. Further ideas appear among the 100 abstracts presented. A survey of over 300 manufacturers produced over 100 replies. Half of them offered some 100 products deemed worth testing. These are listed with addresses and contacts. Besides simple resins and other release agents, they include composites which combine low surface energy and stronger materials as micro-mixture, interpenetrating-network, "plastic-alloy," or filler-matrix systems. About 15 to 20 products appear of special interest. Samples of liquid coating or supplier-prepared panels of many are available for the testing phase to follow.

33-4227
Electromagnetic geophysical survey at an interior Alaska permafrost exposure.
Sellmann, P.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, SR 79-14, 7p., ADA-071 065, 5 refs.
Delaney, A.J., Arcone, S.A.
Permafrost physics, Permafrost structure, Ground ice, Ice wedges, Soil strength, Electromagnetic prospecting, Geophysical surveys, Seasonal freeze thaw.
Road construction activity near Fairbanks, Alaska, in the late fall of 1977, revealed a large exposure of Fairbanks silt containing numerous massive ice features. These exposures are typical of those found in this region. Thaw, during the summer of 1978, caused the upper ice-rich sections to retreat several meters. Geophysical techniques were utilized over these exposures to determine if resistive anomalies of ice wedge dimension could be detected. Magnetic induction measurements at three intercoil spacings and low-frequency surface impedance measurements were made about 6 m from the edge of each exposure in April 1978 before thaw commenced. The results agree well with observations of the layering, but most individual anomalies are difficult to interpret because the lateral extent of the ice is unknown.

33-4228
Improved drainage and frost action criteria for New Jersey pavement design. Phase 2 (Data analysis).
Berg, R.L., *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, SR 79-15, 51p., ADA-071 041, 7 refs.
Frost penetration, Subsurface drainage, Moisture content, Freezing indexes, Pavements.
Before constructing actual highway pavements with open-graded drainage layers, frost penetration depths and moisture content profiles were measured beneath several pavements in New Jersey. Air and surface freezing indexes were measured at three locations during the 1975-1976 and 1976-1977 winters. All freezing indexes were considerably greater during the 1976-1977 winter. The modified Berggren equation was used to compute the maximum frost depth at 30 test sites. Measured maximum frost depths ranged from 20.5 in. to 52.0 in., while computed maximum values ranged from 14.0 in to 61.0 in. The mean difference between observed and computed maximum frost penetration depths was 3.8 in. Maximum frost penetration depths were computed for hypothetical pavements with open-graded drainage at four of the test sites. It was concluded that open-graded drainage layers would not significantly change the frost penetration beneath highway pavements in New Jersey. It was recommended that test pavements be installed to verify the computations.

33-4229
Roof moisture survey—U.S. Military Academy.
Korhonen, C., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, SR 79-16, 8 refs.
Tobiasson, W.
Roofs, Walls, Leakage, Insulation, Moisture content, Infrared equipment, Measuring instruments.
The roofs and upper story walls of buildings 745E, 752, and 756 at the U.S. Military Academy, West Point, New York, were surveyed with a hand-held infrared camera to locate sources of reported wall leaks. An electrical resistance probe was used to determine the relative level of moisture in wall components. Several 3-in.-diam core samples of each roof were obtained to verify suspected moisture conditions and to examine the roof membrane in cross section. Wet areas on each roof were outlined with white spray paint. Wall leaks are believed to becaused by wind-driven rain entering the parapet walls in locations where the decorative glaze-coat has spalled off. Recommendations for maintenance of these buildings are based on information derived from the infrared survey, electric resistance readings, core samples and visual examinations.

33-4230
Evaluation of nitrification inhibitors in cold regions land treatment of wastewater: Part 1. Nitrapyrin.
Elgawhary, S.M., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, SR 79-18, 25p., ADA-071 077, 21 refs.
Iskandar, I.K., Blake, B.J.
Waste treatment, Water treatment, Soil microbiology, Land reclamation, Arctic regions.
A series of laboratory and field tests was conducted to investigate the possibility that nitrapyrin could be useful as a nitrification inhibitor in land treatment of wastewater. Laboratory tests included soil incubation and soil column studies. Variables were soil type, temperature, nitrapyrin concentration and method of application to the soil. Experimental designs included two soils, three temperatures (0, 10 and 20C) and three *levels of inhibitors in a complete factorial.* Forage grasses were present in all treatments, and wastewater containing NH4+ was utilized. Weekly application of wastewater was 5 cm. Soil solution at depth and leachate at 160 cm were collected and analyzed weekly for NH4N and NO3N. That data indicate that nitrapyrin was not effective in inhibiting nitrification when applied to the soil surface in soil columns simulating land treatment slow infiltration. The ineffectiveness of the compound under a mode of application where it is mixed and sprayed with wastewater is thought to be due to its volatility, sorption by organic matter, low water solubility and its immobility in soils. Other chemicals such as carbon disulfide and thiocarbonates, which have different characteristics than the nitrapyrin, showed promising results. Research is under way to obtain conclusive data.

33-4231
Review of electrical resistivity of frozen ground and some electromagnetic methods for its measurement.
Arcone, S.A., *Materials performance,* 1979, 18(5), MP 1215, p.32-37, 16 refs.
Frozen ground physics, Electrical resistivity, Electromagnetic prospecting, Geophysical surveys, Radio waves, Soil moisture content, Soil temperature, Grain size, Airborne radar, Measuring instruments.
Results of extensive studies of earth resistivities of low temperature soils are presented. Ground measurements of the electromagnetic field components of radio waves propagated at low frequencies from distant transmitters and of the inductive coupling between two loop antennas are described. Results of measurements by these methods are compared with each other and with actual findings from excavations and borings at permafrost sites. The measurements are shown to provide data on locations of lens ice, indicate zones of thawing, give indications which permit estimating resistivities of layers and permit construction of a map of Alaska identifying major resistivity zones. Airborne evaluation of remotely propagated waves permits con-

struction of resistivity contour maps. Reasons for variations in resistivity among various categories of frozen soils are discussed.

33-4232
Recommended environmental code of good practice for gas pipeline development. *Canada. Environmental Protection Service. Report,* Jan. 1977, 1-EC-77-1, 56p., In English with French summary. 18 refs.
Gas pipelines, Environmental protection, Arctic regions.

33-4233
Ice dissipation in eastern Lake Erie.
Yu, P.M.-T., Buffalo, State University of New York, Sep. 1977, 157 leaves, M.S. thesis. 47 refs.
Lake ice, Ice breakup, Ice mechanics, Ice melting, Ice conditions, Heat transfer, Ice air interface, Solar radiation, Ice cover thickness, Meteorological data, Mathematical models, Computer applications.

33-4234
Calculating heating rate of frozen rocks in the field of a traveling electromagnetic wave, allowing for temperature. (Raschet nagreva merzlykh porod v pole begushchei elektromagnitnoĭ volny s uchetom temperatury),
Misnik, IU.M., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenĭ. Gornyĭ zhurnal,* 1979, No.2, p.6-11, In Russian. 10 refs.
Rikenglaz, L.E., Khominskiĭ, V.A.
Mining, Excavating equipment, Artificial thawing, Unfrozen water content, Electric heating, Frozen rock temperature, Permafrost heat transfer.

33-4235
Petroleum exploration and environmental protection in the Alaskan Arctic.
Britton, M.E., *U.S. Geological Survey. Yearbook,* 1978, p.27-39.
Aircraft landing areas, Environmental protection, Tundra soils, Soil trafficability, Motor vehicles, Tundra vegetation, Ice roads, Roads, Arctic regions, United States—Alaska.

33-4236
Determining subsea permafrost characteristics with a cone penetrometer—Prudhoe Bay, Alaska.
Blouin, S.E., et al, *Cold regions science and technology,* June 1979, 1(1), MP 1217, p.3-16, 10 refs.
Chamberlain, E.J., Sellmann, P.V., Garfield, D.E.
Submarine permafrost, Penetration tests, Permafrost distribution, Penetrometers, United States—Alaska—Prudhoe Bay.

33-4237
Relationships between January temperatures and the winter regime in Germany.
Bilello, M.A., et al, *Cold regions science and technology,* June 1979, 1(1), MP 1218, p.17-27, 12 refs.
Appel, G.C.
Weather forecasting, Frost forecasting, Snow accumulation, Seasonal freeze thaw, Meteorological data, Meteorological charts.

33-4238
Application of the Andrade equation to creep data for ice and frozen soil.
Ting, J.M., et al, *Cold regions science and technology,* June 1979, 1(1), p.29-36, 10 refs.
Martin, R.T.
Ice strength, Frozen ground mechanics, Strains, Creep.

33-4239
Water flow through heterogeneous snow.
Colbeck, S.C., *Cold regions science and technology,* June 1979, 1(1), MP 1219, p.37-45, 19 refs.
Meltwater, Snow cover structure, Water flow, Snow stratigraphy, Capillarity, Surface waters.
An earlier gravity flow theory (Colbeck 1971) treated snow as a homogeneous and uniform medium. The theory is expanded here to include the effects of ice layers and flow channels. Two examples are constructed and compared with observed runoff. In this particular situation, the results suggest that most of the water moves down flow channels.

33-4240
Snowpack albedo and snow density.
Bohren, C.F., et al, *Cold regions science and technology,* June 1979, 1(1), p.47-50, 9 refs.
Beschta, R.L.
Snow surface, Snow density, Snow compaction, Albedo.

33-4241
Freezing and thawing tests of liquid deicing chemicals on selected pavement materials.
Minsk, L.D., *Cold regions science and technology,* June 1979, 1(1), MP 1220, p.51-58, 8 refs.
Concrete pavements, Deicing, Antifreezes, Tests.
The extent of deterioration of portland cement concrete and several types of asphaltic concrete subjected to organic deicing chemicals was determined over 60 freezing-thawing cycles. Proprietary solutions containing urea, ethylene glycol, and formamide affected the surface of old air-entrained concrete only slightly (rating of 1 on a scale of 0 to 5 of increasing degradation). Asphaltic concrete specimens were not significantly affected. Abrasion tests were made on air-entrained concrete specimens exposed to ethylene glycol solution during freezing and thawing; material loss was very low, nearly the same as with a distilled water control.

33-4242
On icebergs and their uses. A report to the Australian Academy of Science.
Schwerdtfeger, P., *Cold regions science and technology,* June 1979, 1(1), p.59-79, 38 refs.
Water supply, Water reserves, Icebergs, Transportation, Sea water, Water temperature, Ice melting, Antarctica.
Various properties of icebergs are reviewed in the light of water requirements, both existing and potential, in sub-tropical lands. Most of the specific economic and environmental information provided is based on Australian examples. Some aspects of iceberg dynamics and thermodynamics are discussed and the concept of icebergs being valuable sources (or rather sinks) or energy in addition to their being reservoirs of fresh water is put forward.

33-4243
First International Symposium on Ground Freezing.
Diekmann, N., *Cold regions science and technology,* June 1979, 1(1), p.81-82.
Meetings, Soil freezing, Soil moisture migration, Phase transformations, Artificial freezing, Frozen ground mechanics.

33-4244
Seismic surface wave observations in West Antarctica.
Dewart, G., *Ohio. State University, Columbus. Institute of Polar Studies. Report,* 1978, No.70, 21p., 14 refs.
Ice sheets, Anisotropy, Seismic velocity, Seismic surveys, Antarctica—West Antarctica.
Explosion-produced seismic surface waves recorded along the Byrd Station Strain Network in West Antarctica were investigated. Amplitudes were much greater for Rayleigh waves than for Love waves. Higher modes of both wave types were registered. Group velocity dispersion analysis revealed significant lateral inhomogeneity in near-surface structure of the ice sheet throughout the study area. Velocity anisotropy was indicated at one site. (Auth.)

33-4245
Dynamics of large ice masses.
Koerner, R.M., *Geoscience Canada,* June 1979, 6(2), p.97-98.
Meetings, Ice sheets, Ice shelves, Sea ice, Glacier mass balance, Ice mechanics, Spacecraft, Surveys.
A report on the August 1978 meeting of the International Glaciology Society in Ottawa is presented. Brief critical remarks are made of each session; much valuable work was devoted to the West Antarctic ice sheet. The proceedings will be published as one issue of the *Journal of glaciology.*

33-4246
Some features of the turbulent transfer on the bare ice field near the Yamato Mountains, East Antarctica.
Kobayashi, S., *Tokyo. National Institute of Polar Research. Memoirs,* Mar. 1979, Special issue No.12, p.9-18, 15 refs.
Glacier ablation, Turbulent flow, Wind factors, Ice air interface, Antarctica—Shirase Glacier, Antarctica—Yamato Mountains.
Measurements were made of profiles of wind speed and air temperature on the bare ice surface on the lee of the Yamato Mountains from Dec. 1-7, 1973. The vertical profile of air temperature was found unstable in the daytime when the wind speed decreased, as the bare ice surface was heated by solar radiation. Consequently, a mean eddy heat flux transported from the surface was 50 ly/day. As for an energy budget, estimated latent heat flux was about 150 ly/day, which indicates the evaporation of 0.25 cm/day in the summer. The observations of wind turbulence by the use of sonic anemometer showed a strong turbulence generated by nunataks. This strong turbulence contributes to the surface ablation of bare ice in the summer. (Auth.)

33-4247
Dynamical features of the Meteorite Ice Field, Antarctica.
Naruse, R., *Tokyo. National Institute of Polar Research. Memoirs,* Mar. 1979, Special issue No.12, p.19-24, 14 refs.
Glacier ablation, Glacier flow, Glacier heat balance, Antarctica—Yamato Mountains.
Results of the glaciological work done in 1969 and 1973-1974 near the Yamato Mountains showed that the dynamic features of the southern Meteorite Ice Field (bare ice) were quite different from those of the ice sheet in the Shirase drainage, East Antarctica. In the ice field ice flowed toward the Yamato Mountains with the small horizontal velocity of less than 2 m/year; the vertical movement of ice indicated the emergence velocity of 5 cm/year on the average, and the mean ablation rate amounted to 5 cm/year in water equivalent. Whether the concentration of meteorites within a limited area is possible, in terms of a mass budget study in the present drainage system, is also discussed. The result revealed that, if a number of meteorites had once fallen uniformly over the hinterland of the drainages of the Shirase Glacier and of the Meteorite Ice Field, more than 95% of the meteorites were drained off through the coast of the ice sheet, and only a few percent of them were conveyed to and exposed on the bare ice field around the Yamato Mountains. (Auth.)

33-4248
Temperature profile in the bare ice area near the Yamato Mountains, Antarctica.
Nishio, F., et al, *Tokyo. National Institute of Polar Research. Memoirs,* Mar. 1979, Special issue No.12, p.25-37, 22 refs.
Mae, S.
Glacier ablation, Ice temperature, Ablation, Ice sheets, Antarctica—Yamato Mountains.
The temperature profile of the ice sheet in the bare ice area (Meteorite Ice Field) near the Yamato Mountains (72S, 36E) was calculated on the basis of the heat conduction theory under steady state conditions. The effect of geothermal heat flux, vertical velocity of ice mass and ice thickness on temperature profile was examined. Analysis of the profile in past stages of ice sheet fluctuation showed that before the Fukushima ice stage (about 10,000 years B.P.) upward velocity and ablation rate were approx zero, or the downward motion of ice mass and accumulation might have occurred. This result is completely different from the present state (upward velocity 5 cm/year and ablation rate 5 cm/year), which suggests that most of the Yamato meteorites collected in 1969-1975 were exposed on the surface of the area after the Fukushima stage. (Auth.)

33-4249
Antarctic journal of the United States, Vol.14, No.1.
U.S. National Science Foundation, Washington, D.C., Mar. 1979, 11p.
Ice shelves, Drilling, Thermal drills.
This issue contains articles on the new Siple Station, drilling through the Ross Ice Shelf, airborne research, the 1978 U.S. antarctic population, NSF funds awards for Oct. 1 to Dec. 31, 1978, a monthly climate summary, and special news announcements. The new Siple Station will house eight men during the coming austral winter and is expected to function as a year-round U.S. research platform until the late 1980's before needing replacement. Three holes were melted through the Ross Ice Shelf at Site J-9 during the final drilling season, using the Browning hot water drill. The operations and observations are described. Ice core obtained at the site by Soviet drillers, using thermal drills, is also described. The 1978 U.S. antarctic population varied from 112 to 1,064. The numbers and trends are plotted.

33-4250
Antarctic journal of the United States, Vol.14, No.2.
U.S. National Science Foundation, Washington, D.C., June 1979, 23p.
Glacier ice, Ice sheets, Ice shelves, Glacier flow.
This issue contains regulations to implement the Antarctic Conservation Act of 1978, a report of geologic and glaciological investigations out of a major field camp on Darwin Glacier, an article on the recovery of 309 meteorites from the antarctic ice sheet in the Allan Hills and Darwin Glacier areas last season, NSF funds awards for Jan. 1 to Mar. 31, 1979, the monthly climate summary, and other special announcements. The regulations establish a permit system for various activities in Antarctica and designate certain mammals and birds and certain geographic areas as requiring special protection, as well as sites of special scientific interest. The regulations are effective as of July 1, 1979. The Darwin Glacier studies focused on sites along and between the Darwin and Byrd Glaciers, which flow from East Antarctica to the Ross Ice Shelf, in an attempt to chart the geologic history of the region and to describe the current glaciological interactions between the ice streams and the Ross Ice Shelf.

33-4251
Introduction of new techniques of controlling construction processes under northern conditions. (Vnedrenie novoĭ tekhniki kontrolia stroitel'nogo proizvodstva v usloviiakh Severa),
Kudashov, E.A., et al, Leningrad, Strolizdat, 1978, 96p., In Russian. 36 refs.
Tenenbaum, P.S.
Construction materials, Construction equipment, Concrete structures, Standards, Concretes, Measuring instruments.

33-4252
Biologic activity of forest soils in Tuva. (Biologicheskaia aktivnost' lesnykh pochv Tuvy),
Nekrasova, V.D., et al, Novosibirsk, Nauka, 1978, 78p. In Russian. Refs. p.67-77.
Gukasian, A.B.
DLC QH161.N46
Taiga soils, Plant ecology, Podsol, Soil profiles, Soil microbiology, Soil chemistry, Peat, Taiga vegetation.

33-4253
Construction of artificial islands as Beaufort Sea drilling platforms.
Garratt, D.H., et al, *Journal of Canadian petroleum technology,* Apr.-June 1978, 17(2), p.1-8, 9 refs.
Kry, P.R.
Artificial islands, Sands, Offshore drilling, Ice loads, Water waves, Sea ice, Wave propagation, Beaufort Sea.

33-4254
Thermal regime modelled for drilling and producing in permafrost.
Taylor, A.E., *Journal of Canadian petroleum technology,* Apr.-June 1979, 18(2), p.59-66, 26 refs.
Phase transformations, Permafrost thermal properties, Boreholes, Thermal insulation, Drilling, Thermal regime, Mathematical models, Petroleum industry, Latent heat.

33-4255
Arctic Pilot Project. *Shipbuilding and marine engineering international,* May 1979, 102(1228), p.179, 181, 183.
Icebreakers, Tanker ships, Natural gas, Fuel transport, Marine transportation, Design.

33-4256
Inerta 160—a bottom coating system for super heavy duty. *Shipbuilding and marine engineering international,* May 1979, 102(1228), p.184, 186-187.
Icebreakers, Protective coatings, Polymers, Ice loads, Impact strength, Ice friction.

33-4257
Hydrodynamic reduction gears for ice-breaking vessels. *Shipbuilding and marine engineering international,* May 1979, 102(1228), p.191-192.
Icebreakers, Hydrodynamics.

33-4258
ICEREM—an integrated computer programme by Mitsui for optimising the hull form of icebreaking ships. *Shipbuilding and marine engineering international,* May 1979, 102(1228), p.193.
Icebreakers, Engineering, Ice resistivity, Computer applications.

33-4259
Almirante Irizar–most powerful icebreaker in the South. *Shipbuilding and marine engineering international,* May 1979, 102(1228), p.186, 194, 197-198.
Icebreakers, Ice navigation, Marine transportation, Bubbling.
The antarctic icebreaker *Almirante Irizar,* ordered by the Argentine Government in 1975, was delivered on Dec. 15, 1978, by Wärtsilä's Helsinki Shipyard. The icebreaker is of a completely new type, designed for supplying the Argentinian research stations in Antarctica It is capable of wintering in Antarctica with more than 200 persons on board Different parts of the ship, including machinery, are briefly described. An air bubble system aids the icebreaker to navigate in ice conditions

33-4260
Behaviour of crude oil under fresh-water ice.
Chen, E.C., et al, *Journal of Canadian petroleum technology,* Apr.-June 1976, 15(2), p.79-83, 12 refs.
Keevil, B.E., Ramseier, R.O.
Crude oil, Ice bottom surface, Drops (liquids), Coalescing, Ice water interface, Thermal regime, Laboratory techniques.

33-4261
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Waste disposal, Drilling fluids, Offshore drilling, Impurities, Environmental impact, Waste treatment, Petroleum industry, Beaufort Sea.

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33-4264
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Liou, K.-N.
Ice crystal optics, Light scattering, Supercooled clouds, Ice crystal structure, Cloud droplets, Polarization (waves), Lasers, Laboratory techniques.

33-4265
Scattering of polarized laser light by water droplet, mixed-phase and ice crystal clouds. Pt.2. Angular depolarizing and multi-scattering behavior.
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Ice crystal optics, Artificial ice crystals, Ice crystal structure, Light scattering, Polarization (waves), Supercooled clouds, Lasers, Laboratory techniques.

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Snow crystal growth, Ice accretion, Cloud droplets, Hoarfrost, Ice crystal size, Cloud physics.

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Knight, C.A., Nagamoto, C.T., Morgan, G.M., Knight, N.C.
Hailstones, Particle size distribution, Solubility, X-ray analysis, Ice crystal nuclei.

33-4268
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Pipelines, Leakage, Cold weather operation, Ice lenses, Hot oil lines, United States—Alaska.

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Oxygen, Metals, Interfaces, Chemical reactions, Temperature effects, Temperature gradients, Corrosion, Dispersions, Pressure.

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Mauger, A.
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Offshore drilling, Submarine permafrost, Drift, Ocean currents, Environmental impact, Icebergs, Petroleum industry, Ice scoring, Marine biology, Oil spills, Canada—Northwest Territories—Lancaster Sound.

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Icequakes, Ice sheets, Seismology, Antarctica—Showa Station.
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Avalanche formation, Avalanche deposits, Roads, Safety, Meteorological factors.

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Soil freezing, Artificial freezing, Frozen ground mechanics, Frozen ground thermodynamics, Frozen ground strength, Excavation, Earthwork, Soil stabilization, Freeze thaw cycles, Meetings.

33-4280
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Walton, T.
Frost heave, Temperature effects, Soil pressure, Frost action, Frost penetration, Soil freezing, Clay soils, Ice lenses.

33-4281
Strain rate effect on the compressive strength of frozen sand.
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Artificial freezing, Frozen sand, Strain tests, Compressive strength, Moisture content.

33-4282
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Eckardt, H., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.81-93, 6 refs.
Frozen ground mechanics, Creep properties, Rheology, Compressive properties, Static loads, Temperature effects, Stresses.

33-4283
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Sanger, F.J., et al, MP 1216, International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.95-117, 32 refs.
Sayles, F.H.
Soil freezing, Thermal properties, Artificial freezing, Frozen ground mechanics, Frozen ground thermodynamics, Creep properties, Rheology, Construction, Analysis (mathematics), Frost heave.

33-4284
Soil freezing method for large tunnel constructions.
Wind, H., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.119-126.
Artificial freezing, Soil freezing, Frozen ground mechanics, Tunneling (excavation), Drilling, Construction.

33-4285
Construction of a sewer in artificially frozen ground.
Bösch, H.-J., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.127-131.
Artificial freezing, Tunneling (excavation), Soil freezing, Subsurface structures, Pipe laying, Sewage, Construction, Sanitary engineering, Drilling.

33-4286
Subway construction in Stuttgart under protection of a frozen soil roof.
Jonuscheit, J.P., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.133-135.
Artificial freezing, Tunneling (excavation), Soil freezing, Frozen ground mechanics, Subsurface structures, Settlement (structural), Construction.

33-4287
Ground freezing for support of open excavations.
Braun, B., et al, International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.137-155, 27 refs.
Shuster, J.A., Burnham, E.W.
Artificial freezing, Soil freezing, Excavation, Subsurface structures, Frozen ground mechanics, Pipe laying, Cost analysis.

33-4288
Ninth meeting of the Coordinating Council of the International Antarctic Glaciological Project. [Deviatoe soveshchanie koordinatsionnogo soveta mezhdunarodnogo antarkticheskogo gliatsiologicheskogo soveta (MAGP)],
Kotliakov, V.K., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.5-8, In Russian.
Meetings, Ice sheets, Ice cover thickness, Radar echoes, Ice composition, Impurities, Ice structure.
The meeting was held at Chamonix, France, on May 13-16, 1978. Reports were presented by delegates of France, Great Britain, the USA, Australia, the USSR and Japan. Main topics discussed included radar echo sounding of the Antarctic ice cover, ice core drilling and thermal drills, geophysical surveying techniques on land, snow surveys and glaciological studies. Recommendations are offered concerning technical improvement of measuring instruments, research trends in their design, modernization of reconnaissance aircraft, and data processing and interpretation.

33-4289
Studies of the Greenland ice sheet in the Geophysical Isotope Laboratory of Copenhagen University. [Izuchenie grenlandskogo lednikovogo pokrova v geofizicheskoĭ izotopnoĭ laboratorii Kopengagenskogo universiteta],
Bazhev, A.B., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.8-13, In Russian.
Gordienko, F.G.
Glacier ice, Ice sampling, Snow physics, Snow composition, Isotope analysis, Spectrometers, Ice sheets, Laboratory techniques, Test equipment.

33-4290
Cold Regions Research and Engineering Laboratory in the USA. [Laboratoriia po izucheniiu i osvoeniiu kholodnykh raĭonov v SShA],
Frolov, A.D., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.14-16, In Russian.
Ice physics, Snow physics, Permafrost physics, Permafrost hydrology, Research projects, Cold weather construction, Ice roads, Snow roads, Geophysical surveys, Infrared reconnaissance, Environmental protection, U.S. Army CRREL.

33-4291
Work of Soviet glaciologists in the USA and Antarctica for the Ross Ice Shelf Project in 1977/78. [Rabota sovetskikh gliatsiologov v SShA i Antarktide po proektu issledovaniia shel'fovogo lednika Rossa v 1977/78 g.],
Zotikov, I.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.16-20, In Russian.
Zagorodnov, V.S.
Ice shelves, Ice drills, Thermal drills, Sea ice, Ice formation, Ice melting, Ice bottom surface, Acoustic measuring instruments, Bottom sediment, Drill core analysis, Marine biology, Antarctica—Ross Ice Shelf.
Activities of Soviet glaciologists working for the Ross Ice Shelf Project included the studies of thermal regime and water movement beneath the ice, the processes of ice accretion and melting at the bottom surface monitored by a special acoustic device, thermal drilling of large diameter (60 cm) holes through the ice shelf, core drilling and sampling bottom sediments, and biological studies at the ocean bottom. In the USA, the scientists have visited organizations associated with antarctic research: the National Science Foundation in Washington, D.C., the U.S. Army Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire, some state universities and the U.S. National Oceanic and Atmospheric Administration in Colorado.

33-4292
Regimes of West Caucasus glaciers depicted on maps of the World Atlas of Snow and Ice Resources. [Rezhim lednikov Zapadnogo Kavkaza na kartakh atlasa snezhno-ledovykh resursov mira],
Zverkova, N.M., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.21-34, In Russian with English summary. 32 refs.
Krenke, A.N., Tareeva, A.M.
Glaciation, Mountain glaciers, Maps, Snow cover distribution, Snow accumulation, Slope processes.

33-4293
Generalization of mountain glacier contours depicted on small scale maps. [Generalizatsiia izobrazheniia konturov gornogo oledeneniia na melkomasshtabnykh kartakh],
Kravtsova, V.I., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.34-41, In Russian with English summary. 4 refs.
Loseva, V.G.
Mountain glaciers, Mapping, Aerial reconnaissance, Spaceborne photography.

33-4294
Generalization principles followed in the World Atlas of Snow and Ice Resources in conformance with the adopted series of scales. [Nekotorye printsipy generalizatsii na kartakh atlasa snezhno-ledovykh resursov mira v sootvetstvii s priniatym masshtabnym riadom],
Timofeeva, N.A., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.41-46, In Russian with English summary. 7 refs.
Mapping, Glaciation, Snow cover distribution.

33-4295
Problems and contents of small scale snow avalanche maps. [O zadachakh i soderzhanii melkomasshtabnykh lavinnykh kart],
Glazovskaia, T.G., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.46-50, In Russian with English summary. 6 refs.
Miagkov, S.M.
Snow surveys, Mapping, Avalanche forecasting.

33-4296
Methods of compiling avalanche danger maps of foreign territories in the World Atlas of Snow and Ice Resources. [Vozmozhnaia metodika sostavleniia kart lavinnoĭ opasnosti v atlase snezhno-ledovykh resursov mira na zarubezhnye territorii],
Glazovskaia, T.G., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.50-57, In Russian with English summary. 1 ref.
Miagkov, S.M., Okolov, V.F.
Avalanches, Mapping, Snow cover distribution, Snow depth, Snow density, Air temperature, Avalanche forecasting, Charts.

33-4297
Avalanche map of the Altai-Sayan Mountains. [Karta lavin Altae-Saianskoĭ gornoĭ strany],
Kravtsova, V.I., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.58-64, In Russian with English summary. 5 refs.
Kuz'mina, I.S., Reviakin, V.S.
Mountains, Snow cover distribution, Snow surveys, Mapping, Avalanche forecasting, Charts.

33-4298
Calculating accumulation fields at the alimentation-boundary elevation of Caucasus glaciers. [Raschet polia akkumuliatsii na vysote granitsy pitaniia lednikov Kavkaza],
Tareeva, A.M., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.64-68, In Russian with English summary. 9 refs.
Glaciers, Alimentation, Snow accumulation, Snow melting, Mass balance.

33-4299
Separation of water in subisothermal glaciers. [Vydelenie vody v subizotermicheskikh lednikakh],
Krass, M.S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.69-75, In Russian with English summary. 4 refs.
Glacier ice, Ice melting, Unfrozen water content, Heat transfer, Analysis (mathemtatics).

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Interactions and densities of glacier-snow field systems. [Vzaimodeĭstvie v sistemakh lednikov i snezhnikov i mera ikh kompaktnosti],
Mazo, V.L., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.75-79, In Russian with English summary.
Glaciers, Firn fields, Distribution, Heat transfer, Moisture transfer.

33-4301
Snow cover equilibrium on mountain slopes. [O ravnovesii snezhnogo pokrova na sklonakh gor],
Bozhinskiĭ, A.N., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.101-107, In Russian with English summary. 8 refs.
Grigorian, S.S.
Mountains, Slope processes, Snow cover stability, Avalanches, Slope orientation.

33-4302
Determining solar radiation penetration into snow for studying the formation of insolation avalanches in the Khibiny Mountains. [Opredelenie pronikaiushcheĭ v sneg solnechnoĭ radiatsii s tsel'iu izucheniia uslovĭi obrazovaniia insoliatsionnykh lavin v Khibinskikh gorakh],
Okolov, V.F., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.107-112, In Russian with English summary. 2 refs.
Solar radiation, Snow depth, Avalanche formation.

33-4303
Possible changes in ice conditions in the Arctic Basin and in heat exchange with the atmosphere due to variations in interoceanic ice and water transfer. [Vozmozhnye izmeneniia ledovitosti i teploobmena s atmosferoĭ Arkticheskogo basseĭna pri izmeneniiakh mezhokeanicheskogo obmena vodami i l'dom],
Faĭko, L.I., *Akademiia nauk SSSR. Institut geografii Materialy gliatsiologicheskikh issledovanĭ. Khronika obsuzhdeniia,* 1978, No.34, p.112-116, In Russian with English summary. 9 refs.
Arctic Ocean, Water transport, Ice conditions, Air water interactions, Heat transfer.

33-4304
Monitoring glacial phenomena in the central Caucasus. (K probleme monitoringa gliatsial'nykh iavleniĭ na primere Tsentral'nogo Kavkaza),
Tishchenko, A.P., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.116-119, In Russian with English summary. 3 refs.
Troshkina, E.S., Ushakova, L.A.
Spaceborne photography, Snow cover distribution, Alpine land forms, Glaciation, USSR—Caucasus.

33-4305
Snow accumulation under different winter conditions in the mountain taiga landscapes of southern Sikhote Alin. (Osobennosti snegonakopleniia v raznye tipy zim v gorno-taezhnykh landshaftakh IUzhnogo Sikhote-Alinia),
Maliugin, IU.F., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.119-123, In Russian with English summary. 14 refs.
Taiga vegetation, Forest canopy, Mountains, Snow cover distribution, Snow accumulation, Snow surveys.

33-4306
Developing a scheme for glaciological regionalization of the Earth. (Opyt razrabotki skhemy gliatsiologicheskogo raionirovaniia Zemli),
Kruchinin, IU.A., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.134-142, In Russian with English summary. 32 refs.
Glaciation, Mapping, Glaciers, Permafrost, Nivation, Landscape types, Maps.

33-4307
Natural systems of naleds and mountain glaciers. (O prirodnykh sistemakh naledeĭ i gornykh lednikov),
Koreĭsha, M.M., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.142-146, In Russian with English summary. 7 refs.
Romanovskiĭ, N.N.
Mountain glaciers, Glacial hydrology, Periglacial processes, Naleds, Ice accretion, Recrystallization.

33-4308
Dynamic classification and mathematical models of glaciers. (Dinamicheskaia klassifikatsiia i matematicheskie modeli lednikov),
Grigorian, S.S., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.146-152, In Russian with English summary.
Krass, M.S., Shumskiĭ, P.A.
Glaciers, Mathematical models, Glacier movement, Glacier ice, Ice structure, Ice strength, Ice deformation.

33-4309
Quasistationary characteristics of glacier dynamics according to surface observations. (Kvazistatsionarnaia kharakteristika dinamiki lednikov po nabliudeniiam na poverkhnosti),
Shumskiĭ, P.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.152-163, In Russian with English summary. 7 refs.
Krass, M.S., Mikhalev, V.I., Cherkasov, P.A.
Glacier movement, Glacier surfaces, Alimentation, Glacier ablation, Mass balance, Ice deformation, Strains, Analysis (mathematics), Antarctica.
Quasistationary dynamics of the Obruchev glacier (Polar Ural Mountains) and the marginal part of the Antarctic Ice Sheet is analyzed. The stress-strain state of ice, its rotation rate and velocity are calculated from surface observations. Formulas derived are recommended for estimating three-dimensional dynamics of glaciers and their bottom conditions.

33-4310
Shifting of snow and ice belts in mountains due to gravity factors. (O smeshchenii poiasa snega i l'da v gorakh pod vliianiem gravitatsionnogo faktora),
Tronov, M.V., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978 No.34, p.163-167, In Russian with English summary 11 refs.
Mountains, Snow line, Slope orientation, Snow cover distribution, Mountain glaciers, Glacier oscillation.

33-4311
Using the elevation of glacier alimentation boundaries in hydrometeorological calculations. (Ispol'zovanie vysoty granitsy pitaniia na lednikakh v gidrometeorologicheskikh raschetakh),
Krenke, A.N., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.167-178, In Russian with English summary. 44 refs.
Shantykova, L.N.
Mountain glaciers, Glacier mass balance, Alimentation, Ablation, Glacier ice, Glacial hydrology.

33-4312
Time variations of meteorological parameters in different glaciation areas of the USSR. (Vremennaia izmenchivost' meteorologicheskikh parametrov v raznykh lednikovykh raionakh SSSR),
Voloshina, A.P., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.178-185, In Russian with English summary. 7 refs.
Glacier ice, Alimentation, Glacier ablation, Air temperature, Solar radiation, Meteorological data, Meteorological factors.

33-4313
Influence of underlying surfaces on alimentation and ablation of glaciers. (Vliianie podstilaiushcheĭ poverkhnosti na pitanie i abliatsiiu lednikov),
Shumskiĭ, P.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.185-192, In Russian with English summary.
Krass, M.S.
Glacier oscillation, Glacier surfaces, Alimentation, Glacier ablation, Heat transfer.

33-4314
Glacier as an object of studying dynamics of atmospheric pollution. (Lednik kak ob"ekt izucheniia dinamiki zagriazneniia atmosfery),
Anokhin, IU.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.192-197, In Russian with English summary. 9 refs.
Glacier ice, Ice coring drills, Thermal drills, Ice cores, Drill core analysis, Air pollution.

33-4315
Glacial washout and air temperature at glacier surfaces. (Gliatsial'nyĭ smyv i temperatura vozdukha na poverkhnosti lednikov),
Shcheglova, O.P., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.197-204, In Russian with English summary. 18 refs.
Lebedeva, N.G.
Glacier surfaces, Air temperature, Ablation, Glacial hydrology, Meltwater, Suspended sediments, Glacial rivers.

33-4316
Role of Antarctic shelf ice in frazil ice formation. (Rol' shel'fovykh lednikov Antarktidy v obrazovanii vnutrivodnogo l'da),
Chikovskiĭ, S.S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.205-210, In Russian with English summary. 15 refs.
Sea ice, Ice formation, Frazil ice, Ice structure, Sea water freezing, Supercooled water, Antarctica.
Frazil ice formation and its effect on ice conditions and polar seas hydrology are discussed. Its development begins with ice appearance on sea surface and continues through the whole winter season, the growth rate fluctuating and reaching its maximum during periods of most intensive tidal currents. Frazil ice thickness was measured up to 4 m beneath fast ice and not exceeding 0.5 m at the ice edge. It is believed that supercooled water areas formed near antarctic shores are responsible for frazil ice development.

33-4317
Calculating the depth of dynamic crevasses in naturally deforming ice covers. (Raschet glubiny dinamicheskikh treshchin v estestvenno deformiruiushchemsia lednikovom pokrove),
Klokov, V.D., *Akademiia nauk SSSR. Institut geografii. Materialy glistsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.210-214, In Russian with English summary. 11 refs.
Glacier ice, Ice surface, Ice cracks, Crevasses, Ice deformation, Glacial hydrology, Antarctica.
Depths of crevasses at the periphery of the Antarctic Ice Sheet are calculated by solving the D.P. Nye ice flow equation for three glacier groups: ice cascades and outlet glaciers with frontal widths smaller and greater than 10 km. In all three groups crevasse depths increased with widths amounting to 50-70, 55-85, and 60-100 m, respectively. Nomograms for crevasse depth determination are presented and applications of the results to glacial hydrology discussed.

33-4318
Kinetic theory of ice deformation. (Kineticheskaia teoriia deformirovaniia l'da),
Vialov, S.S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.214-226, In Russian with English summary. 10 refs.
Ice deformation, Flow rate, Ice structure, Ice temperature, Strains.

33-4319
Automated data processing used in compiling the avalanche inventory of the USSR. (Avtomatizatsiia obrabotki dannykh pri sostavlenii kadastra lavin SSSR),
Grakovich, V.F., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.227-235, In Russian with English summary. 4 refs.
Kanaev, L.A.
Snow surveys, Avalanche forecasting, Computer applications, Data transmission, Data processing.

33-4320
Methods of estimating and large-scale mapping of avalanche areas. (Metodika otsenki i krupnomasshtabnoe kartografirovanie lavinnoĭ opasnosti territoriĭ),
Zolotarev, E.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.235-241, In Russian with English summary. 29 refs.
Akif'eva, K.V., Urumbaev, N.A.
Snow surveys, Mapping, Snow cover distribution, Avalanche forecasting, Avalanche formation, Aerial photography.

33-4321
Physico-chemical methods of glacier stratification. (Fiziko-khimicheskie metody stratifitsirovaniia lednikov),
Punning, IA.-M.K., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.241-245, In Russian with English summary. 13 refs.
Glacier ice, Stratigraphy, Paleoclimatology, Firn stratification.

33-4322
Methods of studying ice deformation in the Obruchev glacier tunnel. (Sposoby issledovaniĭ deformatsionnykh svoĭstv massiva l'da v tonnele lednika Obruchev),
Tiulina, T.IU., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.245-254, In Russian with English summary. 9 refs.
Glacier ice, Ice structure, Ice deformation, Ice creep, Stratification, Stresses, Ice strength.

33-4323
Mathematical dependencies used for calculating snow densities. (Zavisimosti dlia raschetnogo opredeleniia plotnosti snezhnogo pokrova),
Rozenberg, L.S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.254-259, In Russian with English summary. 10 refs.
Snow density, Snow depth, Air temperature, Wind velocity, Snow compaction, Analysis (mathematics).

33-4324
Chemical composition of glaciers and processes of its formation. (Khimicheskiĭ sostav lednikov i protsessy ego formirovaniia),
Korkina, N.M., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia,* 1978, No.34, p.260-278, In Russian. 70 refs.
Glacier ice, Ice composition, Alimentation, Snow composition, Water chemistry, Glaciers.

33-4325
Iceberg coneth?: international law relating to antarctic iceberg exploitation.
Lundquist, T.R., *Natural resources journal,* Jan. 1977, 17(1), p.1-41, 207 refs.
DLC K14.A868
Water supply, Ice (water storage), Iceberg towing.
Recent studies have suggested the technological capability, economic feasibility, and environmental acceptability of transporting icebergs to arid regions in both the Southern and Northern Hemispheres. This article seeks to complement these iceberg exploitation proposals by examining the international legal interface with iceberg harvesting and transit. It is suggested that the unresolved legal status of Antarctica casts the largest cloud over entitlement certainty, since different antarctic regimes

would entail differences in the extent of ocean zones and conditions for harvesting icebergs. Other property rights uncertainty springs from the Antarctic Treaty, baseline demarcation, the breadth of the territorial sea (if one applies at all), the custom doctrine, the status of condominia and trusteeships, and problems with the Law of the Sea and the Negotiating Text.

33-4326
Water and ice balance of recent and ancient glaciation areas of the USSR. [Vodno-ledovyĭ balans raĭonov sovremennogo i drevnego oledeneniia SSSR],
Khodakov, V.G., Moscow, Nauka, 1978, 194p., In Russian with English abstract and table of contents. 326 refs.
Mountain glaciers, Ice sheets, Glacier ice, Water balance, Alimentation, Ablation, Snow cover distribution, Snowstorms, Avalanches, Snowdrifts, Glacial hydrology, Charts.

33-4327
Ice cover effect on the distribution of velocities in a stream produced by a hydraulic actuator. [Vliianie ledianogo pokrova na raspredelenie skorosteĭ v potoke, sozdannom gidrouskoritelem],
Soboleva, M.I., Gidrotekhnicheskoe stroitel'stvo i sooruzheniia (Hydraulic construction and structures), Leningrad, 1975, p.101-113, In Russian. 3 refs.
DLC TC155.G47
Subglacial drainage, Mathematical models, Stream flow, Ice friction, Flow rate, Analysis (mathematics).

33-4328
Calculating heat transfer at the ocean-air interface. [Raschet potoka tepla na granitse razdela okean-atmosfera],
Kalatskiĭ, V.I., et al, *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1978, Vol.194, p.10-17, In Russian. 12 refs.
Nesterov, E.S.
Surface temperature, Air water interactions, Oceans, Heat transfer.

33-4329
Mathematical model of wind driven ice in the Caspian Sea. [Chislennaia model' vetrovogo dreĭfa l'da v Kaspiĭskom more],
Ovsienko, S.N., *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1978, Vol.194, p.53-58, In Russian. 5 refs.
Sea ice, Drift, Mathematical models, Ice conditions, Ice forecasting.

33-4330
Calculating the nonmonotone variations of ice cover thickness in non-arctic seas. [Skhema rascheta nemonotonnogo izmeneniia tolshchiny l'da v nearkticheskikh moriakh],
Efroimson, V.O., *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1978, Vol.194, p.59-66, In Russian. 6 refs.
Sea ice, Ice cover thickness, Ice formation, Ice growth, Ice melting, Ice air interface, Ice water interface, Heat transfer.

33-4331
Spatial distribution of the dates of first ice appearance on water bodies of the European USSR. [Issledovanie prostranstvennogo raspredeleniia srokov pervogo poiavleniia l'da na vodnykh ob'ektakh evropeĭskoĭ territorii SSSR],
Sheremetevskaia, O.I., *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1978, Vol.194, p.67-74, In Russian. 9 refs.
Ice conditions, Ice forecasting, Sea ice, River ice, Lake ice.

33-4332
Forecasting ice conditions on the Sea of Azov. [Prognoz ledovykh uslovīĭ na Azovskom more],
Kruglov, A.A., *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1978, Vol.194, p.75-85, In Russian. 9 refs.
Ice conditions, Ice forecasting, Meteorological data, Statistical analysis.

33-4333
Calculating the length of ice navigation routes in the Gulf of Finland. [Raschet protiazhennosti ledovykh trass v Finskom zalive],
Nikolaev, S.G., *Leningrad. Gidrometeorologicheskiĭ nauchno-issledovatel'skiĭ tsentr. Trudy,* 1978, Vol.194, p.86-91, In Russian. 3 refs.
Ice navigation, Icebreakers, Ice conditions.

33-4334
Meteorological loads on structures. [Meteorologicheskie nagruzki na sooruzheniia],
Zavarina, M.V., ed, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, 104p., In Russian. For individual papers see 33-4335 through 33-4349. Refs. passim.
Kopanev, I.D., ed.
Buildings, Towers, Snow loads, Hoarfrost, Ice loads, Wind pressure, Power line icing, Icing detection, Mathematical models.

33-4335
Accuracy of climatic probability indices. [O tochnosti veroiatnostnykh klimaticheskikh pokazateleĭ],
Zavarina, M.V., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.3-10, In Russian. 7 refs.
Ice loads, Snow lords, Wind pressure, Wind velocity, Statistical data, Meteorological data, Accuracy.

33-4336
Prevailing types of ice-hoarfrost deposits in the European USSR. [Preobladaiushchiĭ vid gololedno-izmorozevykh otlozheniĭ na ETS],
Zavarina, M.V., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.11-14, In Russian. 5 refs.
Mytarev, M.N., Sokolova, S.N.
Icing, Hoarfrost, Ice cover thickness, Ice structure, Ice loads, Meteorological data, Meteorological charts.

33-4337
Annual maxima of ice loads in the Asiatic USSR. [Godovye maksimumy gololednykh nagruzok na ATS],
Mytarev, M.N., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.15-18, In Russian. 2 refs.
Icing, Hoarfrost, Ice loads, Ice cover thickness, Ice structure, Meteorological data.

33-4338
Evaluating an indirect method of calculating ice loads on tall structures. [K otsenke kosvennogo metoda rascheta gololednykh nagruzok na vysotnye sooruzheniia],
Bolkov, V.P., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.19-26, In Russian. 11 refs.
Towers, Icing, Hoarfrost, Ice loads, Icing rate, Design.

33-4339
Improving indirect calculation of the plane surface icing rate. [K utocheniiu kosvennogo metoda rascheta intensivnosti obledeneniia ploskoĭ poverkhnosti],
Glukhov, V.G., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.27-37, In Russian. 11 refs.
Zakharov, A.G.
Icing, Glaze, Hoarfrost, Ice loads, Ice growth, Icing rate.

33-4340
Perfecting the icing intensity chart of Pamir-Alai according to power line breakdown data. [Utochnenie karty gololednogo raĭonirovaniia Pamiro-Alaia po svedeniiam ob avariĭnosti vozdushnykh liniĭ elektroperedachi i sviazi],
Popova, A.P., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.38-43, In Russian. 4 refs.
Pershin, I.I.
Power line icing, Ice loads, Hoarfrost, Mapping, Meteorological charts.

33-4341
Accuracy of hoarfrost-icing observations. [K voprosu o tochnosti gololedno-izmorozevykh nabliudeniĭ],
Popov, N.I., et al, *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.44-48, In Russian. 8 refs.
Kholodov, V.V.
Power line icing, Hoarfrost, Ice density, Ice volume, Ice detection, Measuring instruments.

33-4342
Distribution and density of ice-hoarfrost deposits on plane surfaces. [Osobennosti raspredeleniia i plotnost' gololedno-izmorozevykh otlozheniĭ na ploskoĭ poverkhnosti],
Zakharov, A.G., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.49-54, In Russian. 2 refs.
Icing, Hoarfrost, Ice loads, Buildings, Roofs, Walls.

33-4343
Duration of especially dangerous icing periods on Sakhalin Island. [Prodolzhitel'nost' osobo opasnykh obledeneniĭ na Sakhaline],
Berngardt, R.P., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.55-57, In Russian. 5 refs.
Ice forecasting, Power line icing, Ice loads, Meteorological data, USSR—Sakhalin Island.

33-4344
Wind loads on iced power lines in lowlands of the European USSR. [Raspredelenie vetrovykh nagruzok na provoda vozdushnykh liniĭ pri gololede na ravninnoĭ chasti evropeĭskoĭ territorii SSSR],
Golikova, T.N., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.58-61, In Russian. 5 refs.
Power line icing, Wind pressure, Ice loads, Ice forecasting, Meteorological charts.

33-4345
Compiling a regional map of wind loads during icing. [Opyt razrabotki i postroeniia regional'noĭ karty vetrovykh nagruzok pri gololede],
Golikova, T.N., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.62-69, In Russian. 7 refs.
Power line icing, Ice forecasting, Ice loads, Wind pressure, Wind velocity, Mapping, Meteorological charts.

33-4346
Some wind characteristics used in determining loads on tall structures. [Nekotorye kharakteristiki vetra dlia opredeleniia nagruzok na vysokie sooruzheniia],
Borisenko, M.M., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.70-79, In Russian. 18 refs.
Buildings, Wind pressure, Wind velocity, Design.

33-4347
Snow loads on objects of the *Apatit* industrial complex named after S.M. Kirov. [O snegovykh nagruzkakh v raĭone ob'ektov proizvodstvennogo ob'edineniia "Apatit" im. S.M. Kirova],
Belen'kiĭ, B.M., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.80-86, In Russian. 12 refs.
Mining, Buildings, Snow loads, Design.

33-4348
Natural illumination intensity on vertical surfaces in the USSR. [Osveshchennost' vertikal'nykh poverkhnosteĭ na territorii SSSR],
Khaĭrullin, K.Sh., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.87-95, In Russian. 11 refs.
Windows, Walls, Insolation, Design, Buildings.

33-4349
Allowing for moistening of vertical surfaces in Tashkent. [Uchet uvlazhneniia vertikal'nykh poverkhnosteĭ v g. Tashkente],
Aminov, E.Kh., *Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy,* 1978, Vol.408, p.96-103, In Russian. 7 refs.
Walls, Precipitation (meteorology), Moisture content, Wind velocity, Buildings, Analysis (mathematics).

33-4350
Calculating the information content of the landscape-indication and the geophysical electric profiling methods from data of engineering-geocryological surveys in northwestern Siberia. [Raschet informativnosti landshaftno-indikatsionnogo i geofizicheskogo metoda EP po materialam inzhenerno-geokriologicheskoĭ s"emki territorii severa Zapadnoĭ Sibiri],
Goral'chuk, M.I., et al, Sovremennye metody izucheniia svoĭstv i sostoianiia gornykh porod (Modern methods of studying the state and properties of rocks), Moscow, 1976, p.30-38, In Russian. 3 refs.
Chekrygina, S.N., IAkimova, A.S.
DLC TA706.S68
Geophysical surveys, Engineering geology, Geocryology, Electrical prospecting, Peat, Permafrost structure, Frozen rock temperature.

33-4351
Bridge on drilled situ-cast supports. [Most na buronabivnykh oporakh],
Sokolov, O.L., et al, *Transportnoe stroitel'stvo,* June 1979, No.6, p.11, In Russian.
Pakhomova, L.N.
Bridges, Permafrost beneath structures, Piers, Foundations, Permafrost temperature, Permafrost control.

33-4352
Cooling devices for strengthening and control of perennially frozen bases. [Sokhranenie i ukreplenie merzlykh osnovaniĭ okhlazhdaiushchimi ustanovkami],
Gapeev, S.I., *Transportnoe stroitel'stvo,* June 1979, No.6, p.20-22, In Russian.
Permafrost bases, Permafrost control, Buildings, Foundations.

33-4353
Selecting the structure of nonburied fill foundations. [Vybor konstruktsii podsypki dlia nezaglublennykh fundamentov],
Tishin, V.G., *Transportnoe stroitel'stvo,* June 1979, No.6, p.49-51, In Russian. 3 refs.
Buildings, Foundations, Rock fills, Permafrost beneath structures, Frost heave.

33-4354
Criteria for evaluating sectional thermoinsulative structures. [Kriterii otsenki polnosbornykh teploizoliatsionnykh konstruktsiĭ],
Zvonarev, M.G., et al, *Energeticheskoe stroitel'stvo,* May 1979, No.5, p.16-18, In Russian. 5 refs.
Popov, V.G., Chebotarev, V.D.
Prefabrication, Pipeline insulation, Thermal insulation, Construction materials.

33-4355
Effective electric methods of pre-construction thawing of permafrost. [Ratsional'nye sposoby predpostroechnogo elektroottaivaniia vechnomerzlykh gruntov],
Maksimenko, E.S., *Energeticheskoe stroitel'stvo,* May 1979, No.5, p.28-29, In Russian. 2 refs.
Cold weather construction, Earthwork, Ground thawing, Artificial thawing, Permafrost.

33-4356
Fundamentals of design and construction on macroporous sagging ground. [Osnovy proektirovaniia i stroitel'stva na prosadochnykh makroporistykh gruntakh],
Abelev, IU.M., et al, Moscow, Strolizdat, 1979, 271p., In Russian with English table of contents enclosed. 80 refs.
Abelev, M.IU.
Clay soils, Loess, Soil moisture migration, Thixotropy, Buildings, Foundations, Settlement (structural), Soil stabilization, Piles, Cements.

33-4357
Effect of fluid flow on freezing and thawing of saturated porous media.
Goldstein, M.E., et al, *Royal Society of London. Proceedings. Series A,* 1978, No.364, p.45-73, 7 refs.
Reid, R.L.
Freeze thaw tests, Porous materials, Permafrost heat transfer, Fluid flow, Seepage, Soil stabilization, Heat transfer, Saturation, Analysis (mathematics).

33-4358
Workshop on snow cover and sea ice data.
World Data Center A for Glaciology, *Glaciological data,* May 1979, GD-5, 117p., Refs. passim. For individual papers see 33-4359 through 33-4370.
Snow cover distribution, Sea ice distribution, Ice conditions, Ice forecasting, Remote sensing, Data processing, Mapping.

33-4359
Snow and ice data sets for climate and water resources studies with particular reference to North America.
Jenne, R.L., et al, *Glaciological data,* May 1979, GD-5, p.7-23, Refs. p.18-21.
Crane, R.G.
Snow cover distribution, Sea ice distribution, Ice conditions, Snow hydrology, Meteorological data, Water reserves, Mapping, Models.

33-4360
Data sources and sea ice products of Fleet Weather Facility/Joint Ice Center, Suitland.
Godin, R.H., *Glaciological data,* May 1979, GD-5, p.29-35, 8 refs.
Sea ice distribution, Ice forecasting, Remote sensing, Maps.
Since 1973, the U.S. Navy Fleet Weather Facility, Suitland, has produced global sea ice analyses for purposes ranging from guiding ships through ice infested waters to numerical heat budget model inputs. The weekly Antarctic Sea Ice Chart is produced almost exclusively from satellite information. Other data sources and analysis tools are mentioned.

33-4361
Mapping and archiving of Canadian sea ice data.
Markham, W E , *Glaciological data,* May 1979, GD-5, p.37-39, 8 refs.
Sea ice distribution, Ice cover thickness, Ice conditions, Ice surveys, Mapping.

33-4362
DMSP near IR sensor for cloud/snow discrimination.
Kimball, A.W., Jr., *Glaciological data,* May 1979, GD-5, p.43-47, 4 refs.
Snow cover distribution, Remote sensing, Infrared radiation, Cloud cover, Measuring instruments, Design.

33-4363
United States environmental satellite data archives.
Hoppe, E.R., *Glaciological data,* May 1979, GD-5, p.49-56, 5 refs.
Ice conditions, Remote sensing, Data processing, Meteorological data, LANDSAT.

33-4364
Satellite-derived river basin snow-cover percentages: a new data base for hydrologists.
Schneider, S.R., *Glaciological data,* May 1979, GD-5, p.57-60, 3 refs.
Snow cover distribution, Snow hydrology, River basins, Remote sensing, Data processing, Mapping.

33-4365
LANDSAT-derived snow cover as a forecast tool in the Rio Grande basin in Colorado.
Shafer, B.A., *Glaciological data,* May 1979, GD-5, p.61-69, 5 refs.
LANDSAT, Remote sensing, Snow cover distribution, Snow hydrology, Flood forecasting, Aerial photographs, Snowmelt, Forecasting, Seasonal variations, Runoff, River basins.

33-4366
Archiving and mapping of Canadian snow cover data.
Findlay, B.F., *Glaciological data,* May 1979, GD-5, p.71-87, 20 refs.
Snow cover distribution, Snow accumulation, Snowfall, Data processing, Vegetation factors, Mapping, Canada.

33-4367
Accuracy of snow and ice monitoring.
Kukla, G., *Glaciological data,* May 1979, GD-5, p.91-97, 8 refs.
Snow cover distribution, Ice conditions, Snow depth, Heat balance, Albedo, Mapping, Accuracy.

33-4368
Arctic sea ice data set, 1901-1956.
Kelly, P.M., *Glaciological data,* May 1979, GD-5, p.101-106, 25 refs.
Sea ice distribution, Ice forecasting, Data processing, Meteorological data.

33-4369
Inadequacies in archived sea ice data.
Dehn, W.S., *Glaciological data,* May 1979, GD-5, p.107-108.
Sea ice distribution, Ice conditions, Data processing, Ice forecasting, Ice navigation, Offshore drilling.

33-4370
NASA mapping projects (summary).
Zwally, H.J., *Glaciological data,* May 1979, GD-5, p.109-111, 2 refs.
Sea ice distribution, Ice conditions, Meteorological data, Mapping, Remote sensing, Spacecraft.
A mapped brightness temperature data set for the Southern Hemisphere is being converted into a set of sea ice concentration maps. The antarctic maps for sea ice concentration from 1973-76 will be completed during 1979. A preliminary analysis of the variation of the antarctic sea ice limits and open water within the pack for 1973, 1974 and 1975 is presented. Ice extent was less in 1975, but there also appears to have been less open water within the pack ice.

33-4371
Oil spills in a river: a one-dimensional model.
Voznesenskiĭ, G.T., *International Association of Hydrological Sciences. Bulletin,* June 1979, 24(2), p.213-223, In English with French summary. 7 refs.
Rivers, Oil spills, Water pollution, Ice cover effect, Drift, Mathematical models.

33-4372
Beneath the ice.
Thompson, T., *TRW systems and energy magazine,* Summer 1979, 3(2), p.1-3.
Gas pipelines, Offshore structures, Equipment, Arctic regions.

33-4373
Parameter effects on dynamic properties of frozen soils—discussion.
Chae, Y.S., *American Society of Civil Engineers. Geotechnical Engineering Division. Journal,* July 1979, 105(GT7), p.907-908, For the article by T.S. Vinson being discussed, see 33-646. 1 ref.
Frozen ground mechanics, Dynamic properties, Viscoelasticity.

33-4374
Modeling ice regime of Lake Erie.
Wake, A., et al, *American Society of Civil Engineers. Hydraulics Division. Journal,* July 1979, 105(HY7), p.827-844, 30 refs.
Rumer, R.R., Jr.
Lake ice, Heat balance, Heat transfer, Water temperature, Ice cover thickness.

33-4375
Ice studies: visit to the Radio Physics Laboratory of the Arctic and Antarctic Research Institute in Leningrad.
Bentley, C.R., *American Geophysical Union. Transactions,* Mar. 6, 1979, 60(10), p.151.
Research projects, Radio echo soundings, Ice cover thickness.
Summarized here in some detail are discussions of Russian research efforts regarding radio echo soundings of various ice masses in the Arctic and Antarctic. Discussions were held in June 1977.

33-4376
On the use of the electro-optical distance meter in geomorphological research. [Elektro-optisen etäisyysmittarin käytöstä geomorfologisessa tutkimuksessa],
Seppälä, M., *Terra,* 1979, 91(1), p.21-25, In Finnish with English summary. 6 refs.
Measuring instruments, Mass movements (geology), Lasers, Glacier movement.

33-4377
Mass growth measurements of freely falling ice crystals produced by two different seeding methods.
Michaeli, G., et al, *Journal of crystal growth,* Aug. 1979, 47(2), p.291-298, 21 refs.
Gallily, I.
Cloud physics, Ice crystal growth, Cloud seeding, Nucleating agents.

33-4378
Local temperature measurements over ice-water interface and convective flow patterns.
Azouni, M.A., *Journal of crystal growth,* July 1979, 47(1), p.109-114, 13 refs.
Ice water interface, Temperature measurement, Temperature variations, Convection.

33-4379
Norwegian Committee on Permafrost, activities in 1976-78. [NTNF's Utvalg for Permafrost. Virksomhet i årene 1976-78],
Gregersen, O., *Frost i jord,* May 1979, No.20, p.3-8, In Norwegian with English summary. 11 refs.
Permafrost beneath buildings, Cold weather construction, Organizations.

33-4380
General discussion on utilities delivery in permafrost regions. [En generell omtale av vann- og avlöpssystemer i permafrostområder],
Moen, T.I., *Frost i jord,* May 1979, No.20, p.9-16, In Norwegian with English summary. 11 refs.
Permafrost beneath buildings, Utilities, Subsurface structures, Pipe laying, Heat loss, Water pipes, Freezing, Countermeasures, Thermal insulation, Hot water, Cost analysis.

33-4381
Influence of the heat extraction rate on the ice segregation rate of soils.
Loch, J.P.G., *Frost i jord,* May 1979, No.20, p.19-30, 12 refs.
Frost heave, Heat flux, Heat loss, Soil freezing, Soil temperature, Ice lenses, Soil moisture migration, Experimentation.

33-4382
Suggestions for an improved standard laboratory test for frost heave susceptibility of soils.
Loch, J.P.G., *Frost i jord,* May 1979, No.20, p.33-38, 12 refs.
Frost heave, Soil freezing, Heat flux, Heat loss, Experimentation.

33-4383
Calculated risk for exceeding design load during the service life of structures. [Risiko for lastoverskridelse i bygningers funksjonstid],
Heiersted, R.S., *Frost i jord,* May 1979, No.20, p.39-43, In Norwegian with English summary. 4 refs.
Structures, Loads (forces), Climatic factors, Time factor, Analysis (mathematics), Design, Snow loads.

33-4384
Influence of the addition of water vapor diffusion on the numerical simulation of the process of ice segregation.
Outcalt, S., *Frost i jord,* May 1979, No.20, p.45-57, 22 refs.
Frozen ground analysis, Ice needles, Vapor diffusion, Soil freezing, Soil moisture migration, Frost heave, Unfrozen water content, Thermal regime, Ice sublimation, Phase transformations, Mathematical models.

33-4385
Reinforcement of frozen foundations by cooling.
Gapeev, S.I., *U.S. Army Foreign Science and Technology Center. Translation,* Feb. 1979, FSTC-895-77, 130p., ADB-038 383, For Russian original see 24-3584. 30 refs.
Buildings, Permafrost depth, Permafrost distribution, Pile foundations, Artificial freezing, Frost heave.

33-4386
Efficient numerical technique for one-dimensional thermal problems with phase change.
Goodrich, L.E., *International journal of heat and mass transfer,* May 1978, 21(5), p.615-621, In English with French, German and Russian summaries. 17 refs.
Frost penetration, Soil freezing, Phase transformations, Heat transfer, Thermal conductivity, Freeze thaw tests, Boundary layer, Cold weather construction, Accuracy, Mathematical models.

33-4387
Soil stabilization with cement in Switzerland compared with German construction methods. [Bodenstabilisierung mit Zement in der Schweiz—Vergleich mit deutschen Bauweisen],
Schmidt, M., *Strassen- und Tiefbau,* July 1979, 33(7), p.18-22, 24, In German. 13 refs.
Soil stabilization, Cement additives, Soil cement, Soil moisture, Water content, Alpine land forms.

33-4388
Methods of oceanological investigations. [Metodika okeanologicheskikh issledovaniĭ],
Dvorkin, E.N., ed, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, 131p., In Russian. For selected papers see 33-4389 through 33-4396. Refs. passim.
Kochetov, S.V., ed.
Drift, Ice conditions, Mathematical models, Ice water interface, Heat transfer, Air water interactions, Ocean currents, Fast ice, Polynyas, Ice cover, Arctic Ocean.

33-4389
Mathematical balance model of large hydrologic anomalies in the Arctic Ocean. [Balansovaia model' formirovaniia krupnykh anomaliĭ gidrologicheskogo rezhima Severnogo Ledovitogo okeana],
Nikiforov, E.G., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.6-15, In Russian. 9 refs.
Kochetov, S.V.
Drift, Ice conditions, Mathematical models, Ice water interface, Ice cover, Heat transfer, Arctic Ocean.

33-4390
Annual variations in hydrologic regime of the Siberian shelf seas. [Mezhdugodichnaia izmenchivost' gidrologicheskogo rezhima moreĭ sibirskogo shel'fa],
Shpaĭkher, A.O., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.16-25, In Russian. 10 refs.
Fedorova, Z.P.
Sea water, Air water interactions, Heat transfer, Ice conditions, Arctic regions.

33-4391
Changes in thermal conditons of the Arctic Ocean. [K izmeneniiu teplovogo sostoianiia Severnogo Ledovitogo okeana],
Bulatov, L.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.26-33, In Russian. 17 refs.
Zakharov, V.F.
Thermal regime, Air water interactions, Ocean currents, Water temperature, Ice conditions, Arctic Ocean.

33-4392
Seasonal and annual variations of heat inflow from the Atlantic into the Arctic basin. [O sezonnykh i mezhgodovykh kolebaniiakh postupleniia tepla atlanticheskikh vod v Arkticheskiĭ basseĭn],
Mandel', S.Z., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.50-54, In Russian. 7 refs.
Ocean currents, Water transport, Heat transfer, Water temperature, Ice edge, Arctic Ocean.

33-4393
Relations among atmospheric processes and transport of water, heat and salts in the Kara Sea. [O sviazi atmosfernykh protsessov s perenosami vody, tepla i soleĭ v Karskom more],
Stepanov, S.I., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.55-59, In Russian. 6 refs.
Water transport, Air water interactions, Heat transfer, Ocean currents, Wind factors, Ice conditions, Ice forecasting, Kara Sea.

33-4394
Heat accumulation by polynyas beyond the fast ice. [Akkumuliatsiia tepla zapripaĭnymi polyn'iami],
Bulatov, L.V., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.96-97, In Russian. 4 refs.
Zakharov, V.F.
Fast ice, Polynyas, Air water interactions, Ice formation, Arctic Ocean.

33-4395
Influence of young ice on winter heat exchange between ocean and atmosphere in the Arctic Basin. [Vliianie molodogo l'da na teploobmen mezhdu okeanom i atmosferoĭ v Arkticheskom basseĭne zimoĭ],
Blinov, N.I., et al, *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.98-103, In Russian. 5 refs.
Kochetov, S.V.
Air water interactions, Ice water interface, Heat transfer, Solar radiation, Ice heat flux, Arctic Ocean.

33-4396
Studying interrelations between numerical and synoptic typification of atmospheric processes in the Arctic. [Issledovanie vzaimosviazi chislennykh i sinopticheskikh tipizatsiĭ atmosfernykh protsessov v Arktike],
Vanda, IU.A., *Leningrad. Arkticheskiĭ i antarkticheskiĭ nauchno-issledovatel'skiĭ institut. Trudy,* 1978, Vol.349, p.124-131, In Russian. 12 refs.
Arctic climate, Synoptic meteorology, Long range forecasting, Computer application.

33-4397
Hydrologic forecasts and calculations. [Gidrologicheskie prognozy i raschety],
Fedoreĭ, V.G., ed, *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, 101p., In Russian. For selected papers see 33-4398 through 33-4404. Refs. passim.
Lobanov, S.A., ed.
Ice breakup, River crossings, Ice forecasting, Flood forecasting, Ice jams, Icebound rivers, Flood control, Permafrost hydrology, Subsurface drainage, Runoff, Baykal Amur railroad, Ice deterioration.

33-4398
Long range forecasts of dates for the autumn ice flow on the Amur Basin rivers. [O dolgosrochnom prognoze dat nachala osennego ledokhoda na rekakh basseĭna Amura],
Teteriatnikova, E.P., et al, *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, p.3-15, In Russian. 16 refs.
Sokolova, G.V.
Ice forecasting, Long range forecasting, River basins, USSR—Amur River.

33-4399
Long range forecasting of ice breakup in the lower course of the Amur River. [Dolgosrochnyĭ prognoz srokov vskrytiia nizhnego Amura],
Lobovikova, Z.P., *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, p.22-26, In Russian. 3 refs.
Ice breakup, Ice forecasting, Flood control, Long range forecasting, Icebound rivers.

33-4400
Forecasting flood water levels for mountain rivers of the BAM zone. [Prognoz pavodochnykh urovneĭ vody gornykh rek v zone BAM],
Mel'nikova, Z.D., *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, p.30-37, In Russian. 7 refs.
River crossings, Flood control, Permafrost hydrology, Baykal Amur railroad.

33-4401
River ice properties in the eastern BAM area in the spring. [O svoĭstvakh ledianogo pokrova na rekakh vostochnoĭ zony BAM v vesenniĭ period],
Timchenko, V.M., et al, *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, p.38-45, In Russian. 9 refs.
Shilina, L.I.
Icebound rivers, Ice strength, Ice cover thickness, Ice breakup, Ice jams, Ice forecasting, Flood control.

33-4402
Forecasting ice breakup on Sakhalin rivers, allowing for ice cover strength during the deterioration period. [Prognoz vskrytiia rek Sakhalina na osnove ucheta prochnostnykh svoĭstv ledianogo pokrova v period razrusheniia],
Viatskikh, V.I., *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, p.46-51, In Russian. 6 refs.
Icebound rivers, Ice forecasting, Ice deterioration, Ice breakup, Ice cover strength.

33-4403
Maximum runoff coefficients and soil moisture content before flooding in the eastern BAM area. [Koeffitsienty maksimal'nogo stoka i predpavodochnaia uvlazhnennost' v zone vostochnogo uchastka trassy BAM],
Lobanova, N.I., *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, p.65-72, In Russian. 5 refs.
Cryogenic soils, Permafrost hydrology, Runoff, Streams, Drainage, Soil moisture, Flood control, River crossings, Baykal Amur railroad.

33-4404
Calculating maximum runoff in the eastern BAM area. [O raschetakh maksimal'nogo stoka v zone vostochnogo uchastka trassy BAM],
Lobanova, N.I., *Vladivostok. Dal'nevostochnyĭ nauchno-issledovatel'skiĭ gidrometeorologicheskiĭ institut. Trudy,* 1977, Vol.69, p.80-84, In Russian. 4 refs.
River crossings, Flood forecasting, Permafrost hydrology, Runoff, Subsurface drainage, Baykal Amur railroad.

33-4405
Thermal and physical aspects of landscapes. [Teplofizika landshaftov],
Pavlov, A.V., Novosibirsk, Nauka, 1979, 285p., In Russian with English table of contents enclosed. Refs. p.237-251.
Landscape development, Landscape types, Snow cover distribution, Snow morphology, Snow thermal properties, Soil moisture, Soil air interface, Heat transfer, Radiant heating, Heat balance, Vegetation patterns, Air water interactions, Soil temperature, Vegetation factors.

33-4406
Cold climate utilities delivery design manual.
Smith, D.W., et al, *Canada. Environmental Protection Service. Report,* 1979, EPS 3-WP-79-2, c300 leaves, Numerous refs. passim.
Manuals, Utilities, Natural resources, Water supply, Waste disposal, Water treatment, Water pipelines, Pipeline freezing, Thermal insulation.

33-4407
Predictions of ice-cover development in streams and its effect on dissolved oxygen modelling.
McBean, E., et al, *Canadian journal of civil engineering,* June 1979, 6(2), p.197-207, In English with French summary. 43 refs.
Farquhar, G., Kouwen, N., Dubek, O.
Oxygen, Streams, Mathematical models, Ice cover effect.

33-4408
Performance evaluation of an arctic sewage lagoon.
Miyamoto, H.K., et al, *Canadian journal of civil engineering,* June 1979, 6(2), p.324-328, In English with French summary. 6 refs.
Heinke, G.W.
Sewage disposal, Waste disposal, Ponds, Cold weather performance, Sewage treatment.

33-4409
Satellite ocean-related imagery applications program—final report. *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* June 1979, No.79-6, 487p., Refs. p.317-320.
Spaceborne photography, Aerial reconnaissance, Sea ice distribution, Icebergs, Ice conditions, Mapping, Data processing, Water temperature.

33-4410
Subsurface ice and heavily icy ground as bases for structures.
Vialov, S.S., et al, *U.S. Army Foreign Science and Technology Center. Translation,* Apr. 1979, FSTC-HT-1295-78, 274p., ADB-038 016, For Russian original see 32-1655. 48 refs.
Dokuchaev, V.V., Shelnkman, D.R.
Ice physics, Ground ice, Permafrost bases, Ice strength, Ice creep, Foundations.

33-4411
Test report on engineering test instruction no. 71033-T002 airblast assisted snowplow.
Andersen, J L., *Canada. Land Engineering Test Establishment. Report,* Feb. 1975, No 11/75, 35 leaves
Snow removal equipment, Blowers.

33-4412
Data record of current observations, Vol.16, Beaufort Sea, 1974 to 1976.
Huggett, W.S., et al, Sidney, B.C., Institute of Ocean Sciences, Patricia Bay, 1977, 139p.
Woodward, M.J., Douglas, A.N.
Oceanography, Ocean currents, Measurement.

33-4413
Electrical ground impedance measurements in the United States between 200 and 415 kHz.
Arcone, S.A., et al, *U.S. Federal Aviation Agency. Research and development report,* Dec. 1978, FAA-RD-78-103, MP 1221, 92p, ADA-068 088.
Delaney, A.J.
Radio waves, Electrical resistivity, Mapping.
The objectives of the work described in this report were to use and evaluate new radiowave methods of measuring earth resistivity in the LF and VLF bands and to develop estimated effective ground resistivity maps in this same band for the United States, including Alaska. Both airborne and ground methods were investigated by using the wavetilt and surface impedance techniques. It is concluded from the VLF study that over much of the central United States VLF airborne resistivity might well approximate LF ground resistivity. The ground methods discussion concerns the surface impedance method in the LF band. It is concluded from the LF studies that the present conductivity map is fairly accurate for BCB purposes but inapplicable to LF purposes.

33-4414
Effect of temperature on the strength of snow-ice.
Haynes, F.D., *U.S. Army Cold Regions Research and Engineering Laboratory,* Dec 1978, CR 78-27, 25p. ADA-067 583.
Snow strength, Ice strength, Temperature effects, Tensile strength, Compressive strength.
Uniaxial compression and tension tests were conducted on polycrystalline snow-ice to determine the effect of temperature on its strength Test temperatures ranged from -0 1C to 54C Two machine speeds, 0 847 mm/s and 84.7 mm/s were used for the constant displacement rate tests. The compressive strength at 54C was about one order of magnitude higher than at -0.1C. The tensile strength at 18C was about 20% higher than at -0 1C The initial tangent and 50% strength moduli are given for the compression tests, while the secant modulus to failure is given for the tension tests. The mode of fracture is discussed and the test results are compared with data from other investigations.

33-4415
Analysis of the midwinter temperature regime and snow occurrence in Germany.
Bilello, M.A , et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Sep. 1978, CR 78-21, 56p. ADA-066 934.
Appel, G.C.
Air temperature, Snowfall, Meteorological data, Weather forecasting, Statistical analysis.
This study investigates the possibility of providing estimates of the time of occurrence and length of the freezing season for any location in East and West Germany by using the average January air temperature (AJAT) as an index. The results indicate that reliable values of the mean freezing index can be obtained from the AJAT relationships which are developed for Germany. This association is further verified using data from the northeastern part of the U.S. and the AJAT is then used to determine the average starting and ending dates (and hence the probable length) of the freezing season for stations in Germany The AJAT and the average dates of snowfall occurrence for numerous locations in the U.S. and Germany are also correlated Interrelationships between these parameters and the average number of days with snow on the ground for stations up to 3000 m in elevation in Germany are examined.

33-4416
Relationships between static and dynamic characteristics of deformability of frozen and thawed rock in rock samples and undisturbed rock masses.
Voronkov, O.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Jan. 1979, TL 703, 15p., ADB-033 625L, 7 refs. For Russian original see 33-1717. Distribution limited to U.S. Government agencies only.
Nozdrin, G.I., Mikhallovskiĭ, G.V.
Frozen rocks, Foundations, Frozen ground settling.
In conjunction with the exploitation of the natural resources of the Far North and permafrost regions, as well as the construction of large engineering projects on rock foundations under these conditions, the study of the relationship between static and dynamic characteristics of deformability has become an important and timely problem. The results given here permit a number of practical conclusions to be drawn which will be of value in locating and studying rock foundations in permafrost areas.

33-4417
Terrain sensitivity, Mackenzie Valley and northern Yukon. *Task Force on Northern Oil Development. Environmental-Social Committee. Report,* 1974, No.74-44, 2 maps, 10 refs. In French and English. No microfiche available.
Terrain analysis, Surface properties, Soil strength, Glacial deposits, Glacial till, Environmental impact, Canada—Mackenzie Valley, Canada—Yukon River.

33-4418
Report of Operation *Deep Freeze* 79, 1978-1979.
U.S. Naval Support Force, Antarctica, San Francisco, Calif., July 9, 1979, var.p.
Military operation, Cold weather operation, Logistics.
This report summarizes *Deep Freeze* 79 operations in support of the U.S. antarctic research program. Information is provided on air, ship, meteorological, photographical, crash/fire, Byrd surface camp, and terminal operations, public works, logistics, communications and electronics, medical and dental procedures, administration, and executive staff activities Highlights and noteworthy aspects of the support season are listed chronologically.

33-4419
Global pollution: is the Arctic haze actually industrial smog.
Kerr, R.A., *Science,* July 20, 1979, 205(4403), p.290-293.
Air pollution, Aerosols, Rain.
It is suggested that the pollution that produces acid rain, known to travel hundreds of kilometers from its source, may continue its travels into the pristine Arctic. It is noted that in contrast to the Arctic where air masses follow short, direct paths from pollution sources into low-lying arctic areas, the sources of pollution for the Antarctic, which is one of the cleanest places on earth, are farther away and the winds between them and the 3000-m-high interior follow long, rising spirals.

33-4420
Global surface albedo model.
Hummel, J.R., et al, *Journal of applied meteorology,* Mar. 1979, 18(3), p.239-253, 39 refs.
Reck, R.A.
Albedo, Pack ice, Land ice, Snow cover, Tundra regions.
A model has been used to determine the average surface albedo of the earth's surface in latitudinal bands for the four seasons of the year. In addition, global maps of surface albedo for elements 10 deg latitude by 10 deg longitude are provided. The model involves assigning one of 49 different types of surface to each of 77,040 areas for each of the four seasons. Each type of surface is assigned a different albedo for each season The average surface albedo for a given latitudinal band is obtained by averaging the albedos for the areas in the desired latitudinal band. The average surface albedos are intended to be used for input data in our radiative-convective energy balance model of the earth's atmosphere in order to compute the atmospheric temperature profile The average annual albedo values for 18 different latitudinal bands are compared with the predictions of three other studies The values in this work tend to be slightly lower than the others from 30N-30S, and slightly higher from 90-50N and 50-90S. The annual global average albedo is calculated to be 15 40 as compared to 13 0 for the previous predictions The arctic and antarctic regions are discussed

33-4421
Environmental assessment of the Alaskan continental shelf, Vol.4. Biological studies. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, Mar. 1979, 804p., Principal investigators' final reports. Numerous refs.
Marine biology, Natural resources, Ecology, Fish, Populations.

33-4422
Environmental assessment of the Alaskan continental shelf, Vol.5. Biological studies. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, Mar. 1979, 710p., Principal investigators' final reports. Numerous refs.
Animals, Ecology, Environmental impact, Oil pollution, Marine biology, Metals, Sea water.

33-4423
Detection of Arctic water supplies with geophysical techniques.
Arcone, S.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* June 1979, CR 79-15, 30p., ADA-072 157, 38 refs.
Delaney, A.J., Sellmann, P.V.
Water supply, Detection, Ground water, Magnetic properties, Radio waves.
This report discusses the application of several modern geophysical techniques to groundwater exploration in areas of permafrost. These methods utilize the principles of magnetic induction and radiowave surface impedance in the 10- to 400 kHz band, the techniques of impulse and side-looking radar in the 50- to 10,000 MHz band, and also some optical techniques using imagery obtained from a satellite, all for detecting free water under an ice cover in shallow, almost completely frozen lake basins, and thaw zones within lake beds, stream channels, and in permafrost in general. The radar studies demonstrate the use of these techniques for determining depth of free water and ice cover thickness on lakes and rivers.

33-4424
Photoelastic instrumentation—principles and techniques.
Roberts, A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, SR 79-13, 153p., ADA-072 011, 83 refs.
Hawkes, I.
Measuring instruments, Optical properties, Stresses, Elastic properties, Indicating instruments, Photoelasticity.
This report contains a detailed review of the theory and design of photoelastic transducers for measuring loads, strains, stresses and pressures. The measurement of engineering parameters under the adverse conditions normally encountered in the mining and civil engineering industries presents great problems, particularly where such measurements are to be made over long periods of time. Photoelastic transducers have distinct advantages over competing equipment in this respect in that the parameters to be measured are revealed as light interference fringes, and the measuring gage itself often need consist of nothing more than simple steel and glass components. Examples of such gages are given in the report. The majority of the work reported here was carried out by the staff and students of the Postgraduate School of Mining, Sheffield University.

33-4425
Rapid detection of water sources in cold regions—a selected bibliography of potential techniques.
Smith, D.W., comp, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, SR 79-10, 75p. ADA-070 030.
Smith, G.A., comp, Brown, J.M., comp, Schraeder, R.L., comp, Kosikowski, L., comp.
Bibliographies, Ground water, Water supply, Detection, Electrical resistivity.
A review of current literature on existing techniques that could be utilized in the rapid location of water sources for field camp use in permafrost regions resulted in the selection of three nonground contact methods of electrical resistivity and two radar methods as being the most effective techniques. The search included thousands of references; 77 of these were chosen to be included in the annotated bibliography. The interest level or pertinence of each entry to the study is indicated, and keywords are provided. The keyword index contains all keywords for all entries listed in alphabetical order.

33-4426
NaNO2-Na2SO4 combined additive in cold concrete.
People's Republic of China. Institute of Low Temperature Building Sciences, Heilongjiang, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, TL 717, 55p., ADA-071 504, Translated from unidentified source.
Concrete admixtures, Antifreezes, Concrete strength, Corrosion prevention, Winter concreting.
Experiments were conducted in which NaNO2, Na2SO4 and N(C2H4OH)3 were added to cold concrete to prevent freezing and promote strengthening. NaNO2 was added in an amount equal to 13.3% of the water content of the concrete, and Na2SO4 and N(C2H4OH)3 in amounts equal to 3% and 0 03%, respectively, of the cement content. The concrete was kept from freezing at -10C and the strength increased to over 60% of the design strength after 28 days and 80%-90% of the design strength after three months. This type of additive used at higher temperatures (+10 to +15C) results in an early strengthening effect, good concrete density, resistance to infiltration of up to 28-30 kg/sq cm, strength in the later stages 5 to 10% greater than that of ordinary concrete, and physical properties superior to those of ordinary concrete. Because of the rust-preventing action of NaNO2, the cold concrete additives do not have any rusting or corroding effects on the steel

bars. The facts that cold concrete is convenient to work with, additives are obtained easily and costs are comparatively low make this an excellent method for winter construction.

33-4427

Oceanographic data report d'Iberville Fiord Ellesmere Island, N.W.T.

Frozen Sea Research Group, Pacific Marine Science report 77-23, Sidney, B.C., Environment Canada, Institute of Ocean Sciences, Patricia Bay, 1977, 101p., 15 refs.

Oceanographic surveys.

33-4428

Atmospheric physics. {Fizika atmosfery},

Khrgian, A.Kh., Leningrad, Gidrometeoizdat, 1978, 2 vols., In Russian with English summary. 281 refs. 2nd edition. For first ed. see SIP 10003.

Atmospheric physics, Meteorology, Solar radiation, Clouds (meteorology), Precipitation (meteorology), Snow, Hail, Glaze, Sea ice, Aircraft icing, Permafrost.

33-4429

Flora and vegetaion of Kuznetskiy Alatau highlands. {Flora i rastitel'nost' vysokogorii Kuznetskogo Alatau},

Sedel'nikov, V.P., Novosibirsk, Nauka, 1979, 168p., In Russian with English table of contents enclosed. Refs. p.162-167.

Alpine vegetation, Alpine tundra, Tundra vegetation, Swamps, Alpine land forms, Alpine soils.

33-4430

Underground mining technology for deep-seated placers in the Northeastern USSR. {Tekhnologiia podzemnoĭ razrabotki glubokozalegaiushchikh rossypeĭ Severo-Vostoka SSSR},

Lubil', K.I., Novosibirsk, Nauka, 1978, 49p., In Russian with English table of contents enclosed.

Placer mining, Excavating equipment, Mine shafts, Supports, Frozen coal, Ground ice, Drilling, Blasting, Permafrost.

33-4431

Manual for highway engineers (Highway design and research). {Spravochnik inzhenera-dorozhnika (Izyskaniia i proektirovanie avtomobil'nykh dorog)},

Andreev, O.V., ed, Moscow, Transport, 1977, 559p. (Pertinent p.344-506), In Russian with abridged English table of contents enclosed.

Roads, Roadbeds, Permafrost beneath roads, Frost heave, Embankments, Slope stability, Settlement (structural), Pavements, Culverts, Drainage, Bridges.

33-4432

Hydrochemistry of rivers in the Baykal Amur railroad area. {Gidrokhimiia rek trassy BAM},

Tarasov, M.N., et al, Leningrad, Gidrometeoizdat, 1978, 76p., In Russian with English table of contents enclosed.

Lapshina, T.P., Bashmakova, O.I.

Cryogenic soils, Taiga soils, Taiga vegetation, Permafrost hydrology, Rivers, Ice composition, Water chemistry, Charts, Baykal Amur railroad.

33-4433

Structural geomorphology of West Siberia. {Strukturnaia geomorfologiia Zapadnoĭ Sibiri},

Ziat'kova, L.K., Novosibirsk, Nauka, 1979, 200p., In Russian with English table of contents enclosed. Refs. p.148-164.

Geomorphology, Cryogenic relief, Permafrost weathering, Cryogenic processes, Solifluction, Mountain glaciers, Glacial erosion, Spaceborne photography, Photointerpretation.

33-4434

Hydrography of Pamirs and Pamir-Alai (water resources). {Gidrografiia Pamira i Pamiro-Alaia (vodnye resursy)},

Kemmerikh, A.O., Moscow, Mysl', 1978, 246p., In Russian with English table of contents enclosed. Refs. p.255-263.

Glacial hydrology, Glacier ice, Alimentation, Glacier ablation, Glacial rivers, Snow cover distribution, Slope processes, Mudflows, Glaciology, USSR—Pamir-Alai Mountains.

33-4435

Small-scale testing of soils for frost action and water migration.

Sayward, J.M., *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, SR 79-17, 17 p., ADA-071 989, 25 refs.

Soil tests, Frost action, Soil moisture migration, Frost heave, Ice needles.

A method is described by which frost action (soil heaving and and needle ice) and the use of soil additives for its control can be studied. The apparatus and procedure are simple and convenient, requiring no extensive space or services and using only small quantities of materials. The procedure could be useful in developing a standard test for such purposes where small scale and convenience are requisite. Also described are two simple, small-scale accessory tests that likewise relate to permeability of soils. These evaporation and wetting tests might also have similar use, particularly in the study of water migration-inhibiting additives.

33-4436

Determination of frost penetration by soil resistivity measurements.

Atkins, R.T., *U.S. Army Cold Regions Research and Engineering Laboratory,* July 1979, SR 79-22, 24p. ADA-071 990.

Measuring instruments, Frost penetration, Electrical resistivity, Frozen ground physics.

Two sensors that depend on changes in soil resistivity were tested. Tests were conducted under a parking area with an asphalt-concrete surface where salt was periodically applied as part of snow removal operations. For comparison, data were obtained from a resistivity probe, a thermocouple probe and a thermistor probe. Results indicated that measuring temperature to determine frost penetration can lead to large errors under some conditions, for instance when salt has been applied or when frost is coming out of the ground in spring. The resistivity probe performed reliably during the entire measurement program. It was concluded that resistivity probes have definite advantages which should be considered when future frost penetration measurement programs are designed.

33-4437

Penetration tests in subsea permafrost, Prudhoe Bay, Alaska.

Blouin, S.E., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, CR 79-7, 45p., ADA-071 999, 9 refs.

Chamberlain, E.J., Sellmann, P.V., Garfield, D.E.

Submarine permafrost, Bottom sediment, Penetration tests, Penetrometers, Offshore drilling.

Sediments beneath the Beaufort Sea near Prudhoe Bay, Alaska, were probed at 27 sites using a static cone penetrometer to determine engineering properties and distribution of material types, including ice-bonded sediments. The probe provided both point and casing resistance data and thermal profiles. At five sites these data were correlated with information from adjacent drilled and sampled holes. These control data and the quality of the probe information permitted profiles of sediment type and occurrence of ice-bonded material to be developed along three lines that included various geological features and depositional environments. Material properties were quite variable in the upper 14 m of sediments probed. In general, softer, finer-grained sediments occurred in the upper layers, while penetration refusal was met in stiff gravels 10 to 12 m below the seabed. Seabed temperatures during the study were all below 0C. However, because of uncertainties in freezing point values caused by brines, evaluation of the penetration resistance data was required to identify the occurrence of ice-bonded sediments. The coupling of thermal and penetration resistance data revealed that seasonally ice-bonded sediments occurred where the sea ice froze back to or near the seabed. Deeper, perennially frozen sediments also appeared to be present at several probe sites. The penetration data obtained can be used to aid in the design of shallow and deep foundations in both ice-bonded and unfrozen subsea sediments.

33-4438

Sedimentological analysis of the western terminus region of the Matanuska Glacier, Alaska.

Lawson, D.E., *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1979, CR 79-9, 112p., ADA-072 000, Refs. p.109-112.

Glacial deposits, Glacial geology, Sediment transport, Glacial till.

Sedimentation at the terminus of the Matanuska Glacier has been found to be primarily subaerial in a 100- to 300-m wide, ice-cored zone paralleling the edge of the active ice. Certain physical and chemical characteristics of the ice and debris of the superglacial, englacial and basal zones of the glacier indicate the debris of the basal zone, the primary source of sediment, is entrained during freeze-on of meltwater to the glacier sole. Till formation results from the melting of buried ice of the basal zone. Melt-out till inherits the texture and particle orientations of basal ice debris; other properties are not as well preserved. Most deposits result from resedimentation of till and debris by sediment gravity flows, meltwater sheet and rill flow, slump, spall, and ice ablation. Depositional processes are interrelated in the process of backwasting of ice-cored slopes. Sediment flows are the primary process of resedimentation. Their physical characteristics, multiple mechanisms of flow and deposition, and characteristics of their deposits vary with the water content of the flow mass. Deposits of each process are distinguished from one another by detailed analysis of their internal organization, geometry and dimensions, and the presence of other internal and related external features. Genetic facies are defined by these characteristics.

33-4439

Subsea cryolithozone of the Arctic Ocean.

Are, F.E., *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1978, TL 686, 26p., ADA-069 856, For Russian original see 32-322. Refs. p.16-26.

Frozen rocks, Subsurface investigations, Shores, Sea level, Submarine permafrost.

The cryolithic zone is the designation for a zone of the Earth's crust having a sub-freezing point temperature, the frozen rocks are rocks which contain ice, the cold (frost) rocks are rocks whose temperature is below zero but which do not contain ice. It is reliably known that a cryolithic zone is extensively developed below the bottom of the Arctic Ocean and its fringe seas. However, the geocryological study of the sea bottom is extremely deficient. Reports about the distribution, properties and developmental principles of rocks of the sea bottom cryolithic zone have already long been necessary to support navigation through the northern maritime routes and for the construction of ports. Their requirement has sharply increased in connection with the initiated recovery of natural resources of the arctic shelf. The enormous practical significance, poorly studied nature of and poor access to the subsea cryolithic zone render its investigation one of the most interesting and pressing problems of modern cold research.

33-4440

Distribution of snow depth in the USSR.

Kopanev, I.D., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1978, TL 687, 15p., ADA-069 855, For Russian original see 32-616. 16 refs.

Lipovskaia, V.I.

Snow surveys, Snow depth, Seasonal variations.

33-4441

Algolization of wastewater with subsequent use for irrigation. *U.S. Army Cold Regions Research and Engineering Laboratory,* May 1978, TL 689, 4p., ADA-069 854, Translation of Al'golizatsiia stochnykh vod posleduiushchim ispol'zovaniem na oroshenie, Kupavna, All Union Scientific Research Institute for Utilization of Wastewater in Agriculture, 1975, 7p.

Waste treatment, Water treatment, Irrigation, Algae.

The need for the treatment (decontamination) of residential and urban wastewater for irrigation purposes is dictated by the need to protect the environment from pollution and insure the rational utilization of water resources. This report discusses the purification of wastewater prior to use in irrigation.

33-4442

Collection of articles on wastewater and its uses for irrigation in the Soviet Union. *U.S. Army Cold Regions Research and Engineering Laboratory,* July 1978, TL 692, 59p., ADA-069 857, Translation of Russian articles from unidentified sources.

Waste treatment, Water treatment, Irrigation, Health.

This collection deals with various aspects of wastewater irrigation (wwi), including: irrigating with untreated and treated wastewaters; the usefulness of wwi; how much of waste substances should be removed prior to irrigating feed crops; effect of wwi on grass crop yield; effectiveness of fertilizers during wwi; construction of treatment ponds; effect of wwi on boggy land; and effect on animals (rabbits) of forage from lands using wwi.

33-4443

Proceedings, Vol.2.

Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978, New York, American Society of Civil Engineers, 1979, p.631-1167, Refs. passim. For selected papers see 33-4444 through 33-4465. For Vol.1 see 32-3596 through 32-3643.

Cold weather construction, Permafrost beneath structures, Pipelines, Pile foundations, Ice conditions, Frozen ground mechanics, Permafrost hydrology, Meetings.

33-4444

Model studies of ocean floor scouring by icebergs.

Chari, T.R., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.828-839, 14 refs.

Muthukrishnaiah, K.

Icebergs, Bottom sediment, Offshore structures, Ice scoring, Damage, Ice loads, Soil strength, Impact strength, Mathematical models.

33-4445

Slope stability studies in a cold environment.

Donovan, N.C., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.840-851, 6 refs.

Krzewinski, T.G.

Slope stability, Soil strength, Landslide control, Solifluction, Permafrost preservation, Rock glaciers, Hot oil lines, Environmental impact.

33-4446

Design and construction of river training structures.

Veldman, W.M., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.852-863, 3 refs.

Yaremko, E.K.

Channel stabilization, Bank protection (waterways), River basins, Water erosion, Floods, Runoff, Ice melting, River flow, Design.

33-4447
Seepage-induced erosion along buried pipelines.
Vita, C.L., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.864-874, 3 refs.
Rooney, J.W.
Pipelines, Subsurface structures, Seepage, Flow rate, Frost penetration, Soil erosion, Seasonal freeze thaw, Frozen ground mechanics.

33-4448
Port of Anchorage marine terminal design.
Perdichizzi, P., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.875-886, 15 refs.
Yasuda, T.
Ports, Ice loads, Wharves, Pile foundations, Tidal currents, Ice conditions, Sea ice distribution, Floating ice, Ice navigation, Docks, United States—Alaska—Anchorage.

33-4449
Cold region considerations relative to development of the Susitna hydroelectric project.
Yould, E.P., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.887-895.
Osterkamp, T.
Dams, Electric power plants, Ice conditions, Environmental protection, Glacial till, Frazil ice, Ice loads, Arctic climate, Cost analysis, Subarctic climate.

33-4450
Corps of Engineers experience with concrete construction in Alaska.
Anderson, F.A., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.903-914, 2 refs.
Cold weather construction, Concrete structures, Concrete strength, Thermal factors, Winter concreting, Air entrainment, Precast concrete.

33-4451
Advances in Arctic construction methods and equipment.
Eliason, K.E., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.915-921.
Permafrost beneath structures, Pipe laying, Suspended pipelines, River crossings, Pipeline supports, Construction equipment, Permafrost hydrology, Drilling, Hot oil lines, Water supply, Cost analysis, Design.

33-4452
Grouting silt and sand at low temperatures.
Johnson, R., MP 1078, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.937-950, 2 refs.
Grouting, Viscosity, Soil stabilization, Frozen ground mechanics, Sands, Stress strain diagrams, Compressive strength, Temperature effects, Cold weather operation, Resins, Tests.

33-4453
Predicting feasibility of cold weather earthwork.
Roberts, W.S., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.960-972, 35 refs.
Lovell, C.W., West, T.R.
Earthwork, Cold weather construction, Permafrost structure, Soil texture, Forecasting, Seasonal variations, Climatic factors, Meteorological data, Maps, Cost analysis.

33-4454
Permafrost foundation designs.
Long, E.L., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978 Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.973-987, 16 refs.
Permafrost beneath structures, Pile foundations, Soil creep, Frozen ground mechanics, Shear strength, Soil stabilization, Active layer, Foundations, Design.

33-4455
Exterior walls of the North (a design consideration).
Odsather, R.L., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.988-1002.
Walls, Thermal insulation, Cold weather construction, Buildings, Design.

33-4456
Self-refrigerated gravel pad foundations.
Phukan, A., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1003-1016, 12 refs.
Abbott, R.D., Cronin, J.E.
Frozen gravel, Refrigerating, Thermal insulation, Foundations, Heat transfer, Frozen ground settling, Frozen ground mechanics, Frozen ground thermodynamics, Ground thawing, Pile foundations, Design.

33-4457
Pipelines in intermittent muskeg terrain.
Walker, G., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1017-1028, 6 refs.
Schulz, D.G., Theriault, R.J.
Pipelines, Permafrost beneath structures, Muskeg, Shear stress, Stresses, Discontinuous permafrost, Seasonal freeze thaw, Models.

33-4458
Case study: fresh water supply for Point Hope, Alaska.
McFadden, T., et al, MP 1222, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1029-1040, 10 refs.
Collins, C.
Water supply, Permafrost hydrology, Snowmelt, Ice melting, Lake water, United States—Alaska—Point Hope.

33-4459
Thermal analysis of water distribution systems.
Srouji, G.A., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1041-1052, 2 refs.
Frozen ground analysis, Thermal analysis, Pipeline freezing, Water pipes, Cold weather operation, Heat loss, Hydraulics, Computer applications, Analysis (mathematics).

33-4460
Pitorifice service loop calibration testing.
Johnson, G.V., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1053-1062, 2 refs.
Water pipes, Pipeline freezing, Countermeasures, Water transport, Velocity, Permafrost, Tests.

33-4461
Snow and ice roads in the Arctic.
Johnson, P.R., MP 1223, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1063-1071, 6 refs.
Snow roads, Ice roads, Airports, Cold weather construction, Environmental protection, Arctic vegetation, Construction materials.

33-4462
Airport design and construction techniques in Western Alaska Lowlands.
Kuranel, R.Y., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1072-1084, 2 refs.
Airports, Discontinuous permafrost, Tundra vegetation, Freeze thaw cycles, Environmental impact, Cold weather construction, Design.

33-4463
Water wastage problem in Alaska.
Martin, B., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1085-1092, 7 refs.
Leakage, Water supply, Pipe flow, Water pipes, Pipeline freezing, Cold weather operation, Countermeasures, Economic analysis, Seepage.

33-4464
Effect of low temperature on flow through pipes.
Quraishi, A.A., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1093-1100, 5 refs.
Pipelines, Pipe flow, Friction, Roughness coefficient, Viscosity, Low temperature tests.

33-4465
Solar energy potential in Alaska.
Seifert, R., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1101-1112, 6 refs.
Zarling, J.
Solar radiation, Heating, Heat capacity, Computerized simulation, Arctic regions, Cost analysis.

33-4466
Characteristics of durable asphalt pavements. [Egenskaper ved slitesterke bituminøse vegdekker]
Keyser, J.H., et al, *Norway. Veglaboratoriet. Meddelelser,* Jan. 1973, No.44, p.5-14, In Norwegian. 26 refs.
Thurmann-Moe, T.
Bituminous concretes, Concrete pavements, Concrete durability, Concrete strength, Tires, Damage.

33-4467
Vehicle corrosion due to the use of chemicals in winter maintenance and the effect of corrosion inhibitors. [Snesmeltningskjemikaliers bidrag til rustdannelse på biler og virkning av rusthindrende tilsetninger]
Thurmann-Moe, T., et al, *Norway. Veglaboratoriet. Meddelelser,* Jan. 1973, No.44, p.15-29, In Norwegian with English summary. 10 refs.
Ruud, O.E.
Vehicles, Corrosion inhibitors, Antiicing additives, Deicers, Winter maintenance, Corrosion.

33-4468
Saltpeter and urea as alternative chemicals for winter maintenance. [Kalksalpeter og urea som alternative kjemikalier i vintervedlikeholdet]
Thurmann-Moe, T., et al, *Norway. Veglaboratoriet. Meddelelser,* Jan. 1973, No.44, p.31-32, In Norwegian.
Ruud, O.E.
Winter maintenance, Deicers, Urea, Antiicing additives.

33-4469
Undersealing of vehicles with various sealants. [Understellsbehandling av biler med antikorrosjonsmidler]
Ruud, O.E., et al, *Norway. Veglaboratoriet. Meddelelser,* Jan. 1973, No.44, p.33-38, In Norwegian. 1 ref.
Saether, B.E., Angermo, F.
Protective coatings, Corrosion prevention, Vehicles, Winter maintenance.

33-4470
Isotherms under ice.
Stewart, K.M., International Association of Theoretical and Applied Limnology, 18th, Leningrad, 1971. Proceedings, Pt.1, Stuttgart, Nägele und Obermiller, 1972, p.303-311, In English with Russian summary. 9 refs.
Subglacial observations, Frozen lakes, Water temperature, Isotherms, Density (mass/volume), Thermal regime.

33-4471
Nutrients in ice. Some data from a highmountain lake.
Grötterud, O., International Association of Theoretical and Applied Limnology, 18th, Leningrad, 1971. Proceedings, Pt.1, Stuttgart, Nägele und Obermiller, 1972, p.327-333, 3 refs.
Lake ice, Ice analysis, Limnology, Nutrient cycle, Organic nuclei, Mountains, Spectrophotometers, Laboratory techniques.

33-4472
Design and construction of ice sounding antennas for LC-130 Bureau No. 159131.
Skou, N., et al, *Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report,* Aug. 1978, R 200, 149p., 1 ref.
Teilgaard, J.
Antennas, Radio echo soundings, Airborne equipment, Airborne radar.

33-4473
Evaluation of pumps and separators for Arctic oil spill cleanup.
Western Canada Hydraulic Laboratories Ltd, *Canada. Environmental-Protection Service. Report,* Apr. 1979, EPS 4-EC-79-3, 57p., In English with French summary. 2 refs.
Oil spills, Pumps, Cold weather performance.

33-4474
Snow blowing and snow fall on the North Slope, Alaska.
Wendler, G., *Alaska. University. Geophysical Institute. Report,* July 1978, UAG R-259, 22p., 15 refs.
Blowing snow, Snowfall, Wind direction, Wind velocity, Meteorological data.

33-4475
Preliminary wind tunnel simulation study of snow collection gauges.
Haasz, A.A., et al, *Toronto. University. Institute for Aerospace Studies. Technical note,* May 1979, No.29, 8p. + appends., 13 refs.
Raimond, S.
Snow gages, Environment simulation, Measuring instruments, Wind tunnels.

33-4476
Great Lakes winter navigation. Technical and economic analyses. Vols. 1-5 and Annex.
Nowacki, H., et al, *Michigan. University. Department of Naval Architecture and Marine Engineering. Report,* Dec. 1973-Sep. 1975, Nos.151-156, 6 Vols., PB-270 983 through PB-270 988, Also available in a paper copy unit as PB-270 982-SET.
Ships, Ice navigation, Economic analysis, Computer programs, Great Lakes.
The six volumes present analyses and details of computer programs (Vol.2) which predict the feasibility of Great Lakes winter navigation under a variety of ice conditions and ship hull reinforcement configurations (Vols. 4 and 5) and power plant upgradings (Vol.3). The economic ramifications (Vol.3) of these variations form a major consideration of the programs. Since delays en route or in port represent a critical factor in Great Lakes shipping, a number of these are included in the programs to determine specific economic impacts.

33-4477
Influence of asymmetrical ice melting regimes on high-frequency and wire communication. ⟨Vliianie nesimmetrichnykh rezhimov plavki gololeda na vysokochastotnuiu i provodnuiu sviaz'⟩,
Rudakova, R.M., et al, *Elektricheskie stantsii,* May 1979, No.5, p.61-62, In Russian.
Guzairov, M.B., Ovchinnikov, M.F.
Power line icing, Deicers.

33-4478
Investigation of a reinforced concrete cistern for liquefied gases. ⟨Issledovanie zhelezobetonnogo rezervuara dlia szhizhennogo gaza⟩,
Samollenko, V.N., et al, *Beton i zhelezobeton,* Mar. 1979, No.3, p.7-8, In Russian.
Chepiga, E.V., Zaĭpol'd, V.V.
Concrete structures, Tanks (containers), Reinforced concrete, Thermal regime, Design.

33-4479
Role of motor vehicle industry in the development of natural resources of Siberia, the Far East and the Far North. ⟨Rol' avtomobil'noĭ tekhniki v osvoenii prirodnykh bogatstv Sibiri, Dal'nego Vostoka i Kraĭnego Severa⟩,
Titkov, A.I., et al, *Avtomobil'naia promyshlennost',* Apr. 1979, No.4, p.1-2, In Russian.
Kuzin, V.A., Ustinov, E.A.
Motor vehicles, Mining, Transportation, Cold weather operation, Cold weather construction, Cold weather performance.

33-4480
Assembling derricks in West Siberia. ⟨Opyt montazha burovykh v Zapadnoĭ Sibiri⟩,
Rekhviashvili, V.V., *Burenie,* 1978, No.2, p.31-33, In Russian.
Drilling, Foundations, Swamps, Permafrost beneath structures, Derricks, Petroleum industry.

33-4481
Studying low temperature stresses in casing heads and casings. ⟨Issledovanie nizkotemperaturnykh napriazheniĭ v kolonnoĭ golovke i obsadnykh trubakh⟩,
Kerimov, Z.G., et al, *Burenie,* 1978, No.4, p.16-18, In Russian. 5 refs.
Mirzadzhanov, D.B., Abdullaev, T.B.
Well casings, Thermal stresses, Petroleum industry, Freeze thaw cycles, Wells.

33-4482
Repairing pipelines built in swamps and paluded areas. ⟨K voprosu avariĭno-vosstanovitel'nogo remonta truboprovodov na zabolochennykh i obvodnennykh uchastkakh trassy⟩,
Dvorkin, V.IU., et al, *Transport i khranenie neft i nefteproduktov,* 1979, No.2, p.14-15, In Russian. 2 refs.
Garshin, V.V.
Swamps, Peat, Pipe laying, Construction equipment, Maintenance.

33-4483
Operating partially loaded hot pipelines. ⟨Upravlenie "goriachim" nefteprovodom pri nepolnoĭ zagruzke⟩,
Dizenko, E.I., et al, *Transport i khranenie nefti i nefteproduktov,* 1979, No.1, p.8-9, In Russian.
Novoselov, V.F., Khazankin, V.G.
Pipeline heating, Hot oil lines, Cold weather operation, Petroleum transportation.

33-4484
Calculating the hydraulic resistance coefficient of electrically heated pipelines. ⟨Metodika rascheta koeffitsienta gidravlicheskogo soprotivleniia truboprovodov s putevym elektropodogrevom⟩,
Eremin, I.I., *Transport i khranenie nefti i nefteproduktov,* 1979, No.1, p.27-29, In Russian. 3 refs.
Petroleum transportation, Pipeline heating, Hot oil lines, Design.

33-4485
Approximate estimation of thermal regimes of land-based storage tanks for brine. ⟨Priblizhennyĭ prognoz temperaturnogo rezhima nazemnogo rassolokhranilishcha⟩,
Dobrianskiĭ, IU.P., et al, *Transport i khranenie nefti i nefteproduktov,* 1979, No.1, p.33-36, In Russian. 5 refs.
Bykorez, E.I., Borisov, V.V.
Petroleum products, Storage tanks, Brines, Freeze thaw cycles, Thermal regime, Phase transformations, Ice thermal properties, Latent heat, Design.

33-4486
Attendant heating of oil pipelines. ⟨Soputstvuiushchiĭ obogrev truboprovodov⟩,
Panarin, V.V., *Transport i khranenie nefti i nefteproduktov,* 1979, No.3, p.22-24, In Russian. 3 refs.
Hot oil lines, Pipeline heating, Design.

33-4487
Snow loads on roofs of vertical cylindrical cisterns. ⟨Opredelenie snegovoĭ nagruzki na pokrytiia vertikal'nykh tsilindricheskikh rezervuarov⟩,
Otstavnov, V.A., et al, *Transport i khranenie nefti i nefteproduktov,* 1979, No.3, p.25-27, In Russian. 3 refs.
Rozenberg, L.S.
Petroleum industry, Steel structures, Storage tanks, Snow loads, Design.

33-4488
Allowing for winter conditions. ⟨Uchityvaia zimnie usloviia⟩,
Klochkov, V.I., *Vestnik protivovozdushnoĭ oborony,* Jan. 1979, No.1, p.62-64, In Russian.
Military equipment, Winter maintenance, Cold weather operation, Military engineering.

33-4489
Deicing airports. ⟨Bor'ba s gololedom na aerodrome⟩,
Siniaev, I., *Tyl i snabzhenie sovetskikh vooruzhennykh sil,* Feb. 1979, No.2, p.62-64, In Russian.
Military transportation, Airports, Winter maintenance, Deicing.

33-4490
Control of roof collapse due to drillhole blasting from the surface, in mines of permafrost areas. ⟨Upravlenie obrusheniem osnovnoĭ krovli vzryvaniem skvazhinnykh zariadov s poverkhnosti na shakhtakh oblasti mnogoletneĭ merzloty⟩,
Sleptsov, A.E., *Fiziko-tekhnicheskie problemy razrabotki poleznykh iskopaemykh,* Mar.-Apr. 1979, No.2, p.115-119, In Russian. 4 refs.
Mining, Permafrost, Ground ice, Drilling, Blasting.

33-4491
Tanker ships for liquefied gases. ⟨Transport szhizhennogo gaza tankerami⟩,
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Martychan, IA.S., Tregubov, I.A.
Liquefied gases, Tanker ships, Thermal insulation, Gas production, Transportation.

33-4492
Patents in the field of pipe production for the North. ⟨Patentnye razrabotki v oblasti proizvodstva trub dlia severnykh raĭonov⟩,
Pasternak, V.I., *Gazovaia promyshlennost',* Mar. 1979, No.3, p.42-44, In Russian.
Pipes (tubes), Construction materials, Steels, Frost resistance, Pipelines.

33-4493
Ice movement at the exit from embankments. ⟨Dvizhenie l'da na uchastkakh vykhoda potoka iz damb obvalovaniia⟩,
Kliavin', E.R., *Gidrotekhnika i melioratsiia,* Mar. 1979, No.3, p.35-37, In Russian.
Icebound rivers, Ice breakup, Shores, Embankments, Ice jams.

33-4494
Deformation of subsurface irrigation networks in deeply frozen soil. ⟨Deformatsii zakrytoĭ orositel'noĭ seti pri glubokom promerzanii gruntov⟩,
Alekseev, S.I., *Gidrotekhnika i melioratsiia,* Mar. 1979, No.3, p.39-41, In Russian.
Soil freezing, Subsurface structures, Irrigation, Pipelines, Deformation.

33-4495
Reclamation of tundra lowlands on Chukotskiy Peninsula. ⟨Melioratsiia tundrovykh nizmennosteĭ na Chukotke⟩,
Skorodumov, I.N., *Gidrotekhnika i melioratsiia,* Apr. 1979, No.4, p.68-71, In Russian.
Lakes, Tundra terrain, Land reclamation, Permafrost beneath lakes, Swamps, Tundra soils, Tundra vegetation.

33-4496
Portable shock-wave densimeter, designed by the Dnepropetrovsk Institute of Railroad Transportation Engineers (DIIT), for quality control of earth structures along the Baykal Amur railroad. ⟨Portativnyĭ udarno-volnovoĭ plotnomer DIITa dlia kontrolia kachestva stroitel'stva zemlianykh sooruzheniĭ na BAMe⟩,
Gol'dshteĭn, M.N., et al, *Dnepropetrovsk. Institut inzhenerov zheleznodorozhnogo transporta. Trudy,* 1977, No.26, Voprosy geotekhniki (Problems in geotechnics), p.13-16, In Russian.
Berman, M.A., Babitskaia, S.S.
Roadbeds, Embankments, Soil compacting, Gravel, Sands, Compactibility, Measuring instruments, Shock waves, Seismic velocity, Baykal Amur railroad, Impact tests.

33-4497
Determining ice and unfrozen water content in frozen ground samples. ⟨Opredelenie kolichestva nezamerzsheĭ vody i l'da v obraztse merzlogo grunta⟩,
Babitskaia, S.S., et al, *Dnepropetrovsk. Institut inzhenerov zheleznodorozhnogo transporta. Trudy,* 1977, No.26, Voprosy geotekhniki (Problems in geotechnics), p.17-20, In Russian. 1 ref.
Prilma, N.G.
Ground ice, Frozen ground, Unfrozen water content, Laboratory techniques, Test equipment.

33-4498
Sedimentation in the terminus region of the Matanuska Glacier, Alaska.
Lawson, D.E., Urbana, University of Illinois, 1977, 287p., University microfilms order No.78-4062., Ph.D. thesis. Refs. p.275-285. No microfiche available.
Glacial deposits, Glacial till, Glacial erosion, Sedimentation, Sediment transport, Meltwater, Ice water interface, Ice solid interface, Liquid solid interfaces, Ablation.

33-4499
Permafrost monitoring program at Alert, N.W.T.—project description and preliminary results. *Canada. Earth Physics Branch. Open file,* 1979, No.79-5, 48p., 17 refs. For individual articles see 33-4500 through 33-4502.
Permafrost thickness, Permafrost thermal properties, Drill core analysis, Canada—Northwest Territories—Alert.

33-4500
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Brown, R.J.E., *Canada. Earth Physics Branch. Open file,* 1979, No.79-5, p.3-8.
Permafrost thermal properties, Frozen ground temperature, Drill core analysis, Thermistors.

33-4501
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Judge, A.S.
Permafrost thermal properties, Permafrost thickness, Topographic features, Drill core analysis, Frozen ground temperature, Thermistors, Air temperature.

33-4502
Description of cores from boreholes at Alert, N.W.T.
Gratton-Bellew, P.E., *Canada. Earth Physics Branch. Open file,* 1979, No.79-5, p.39-48, 17 refs.
Drill core analysis, Frozen rocks, Geologic structures.

33-4503
Exploratory corrosion tests in the Canadian Arctic.
Bieler, G.J., *Canada. Centre for Mineral and Energy Technology. CANMET report,* Mar. 1977, No.77-45, 30p., In English with French summary. 8 refs.
Steels, Corrosion, Sea water, Temperature effects.

33-4504
Plate loading tests and frost depth in the Danish STINA test fields. (Pladebelastningsforsög og frostnedtraengning pä de danske STINA-prövefelter),
Nielsen, S., *Denmark. Statens vejlaboratorium. Interne notater,* Apr. 1978, No.81, 4p. + 10 figs., In Danish.
Roads, Frost penetration, Thermal insulation, Stresses, Analysis (mathematics).

33-4505
Observations of the morphology of melting snow.
Knight, C.A., *Journal of the atmospheric sciences,* June 1979, 36(6), p.1123-1130, 17 refs.
Snowfall, Snow morphology, Snow melting, Snow crystal structure.

33-4506
High Arctic action heating up as exploration regains momentum. *Oilweek,* July 2, 1979, 30(21), p.20-23.
Petroleum industry, Offshore drilling, Natural gas, Canadian Archipelago.

33-4507
Offshore report. *Oilweek,* July 2, 1979, 30(21), 28p. + map.
Research projects, Petroleum industry, Oil recovery, Ice navigation, Offshore drilling, Environmental impact, Sea ice, Iceberg towing.

33-4508
Thick sea-ice floes.
Walker, E.R., et al, *Arctic,* June 1979, 32(2), p.140-147, In English with French summary. 11 refs.
Wadhams, P.
Ice floes, Sea ice, Ice growth, Ice cover thickness.

33-4509
Changes in permafrost distribution produced by a migrating river meander in northern Yukon, Canada.
Crampton, C.B., *Arctic,* June 1979, 32(2), p.148-151, In English with French summary. 3 refs.
Permafrost distribution, Rivers, Subpermafrost ground water, Taliks.

33-4510
Geomorphology of Teshekpuk Lake in relation to coastline configuration of Alaska's coastal plain.
Weller, M.W., et al, *Arctic,* June, 1979, 32(2), p.152-160, 11 refs.
Derksen, D.V.
Lakes, Shore erosion, Shoreline modification, Surface drainage.

33-4511
Remote detection of a freshwater pool off the Sagavanirktok River delta, Alaska.
Kovacs, A., et al, *Arctic,* June 1979, 32(2), MP 1224, p.161-164, 4 refs.
Morey, R.M.
Radar echoes, Ground ice, Ground water.

33-4512
Status of gravimetric studies in the Antarctic and nature of the anomalies.
Grushinskiĭ, N.P., et al, St. Louis, Mo., U.S. Defense Mapping Agency, Sep. 1978, 19p., ADB-032 601L, Distribution limited to U.S. government agencies only. 10 refs.
Sazhina, N.B.
Gravity anomalies, Antarctica.
Data used to draw up a gravimetric map (1:5,000,000) of Antarctica are discussed. The state of art, the nature of the antarctic gravimetric field and its connection with geomorphology are discussed.

33-4513
Thawing may cause re-laying of part of Alyeska line.
Oil and gas journal, July 23, 1979, 77(30), p.24-26.
Pipelines, Ground ice, Ground thawing, Pipe flow, Ice melting, Pipeline pigs.

33-4514
Direct measurement of stress at the base of a glacier.
Boulton, G.S., et al, *Journal of glaciology,* 1979, 22(86), p.3-24, In English with French and German summaries. 14 refs.
Morris, E.M., Armstrong, A.A., Thomas, A.
Glacial geology, Stresses, Measuring instruments, Ice pressure, Glacier flow.

33-4515
Accumulation, ablation, and oxygen isotope variations on the Queen Elizabeth Islands ice caps, Canada.
Koerner, R.M., *Journal of glaciology,* 1979, 22(86), p.25-41, In English with French and German summaries. 35 refs.
Ice sheets, Ice accretion, Ablation, Oxygen isotopes, Isotope analysis, Seasonal variations.

33-4516
Formation of medial moraines on alpine glaciers.
Small, R.J., et al, *Journal of glaciology,* 1979, 22(86), p.43-52, In English with French and German summaries. 14 refs.
Clark, M.J., Cawse, T.J.P.
Moraines, Glacial till, Glacial deposits, Geologic structures.

33-4517
Pattern of ice surface lowering for Rennick Glacier, northern Victoria Land, Antarctica.
Mayewski, P.A., et al, *Journal of glaciology,* 1979, 22(86), p.53-65, In English with French and German summaries. 11 refs.
Attig, J.W., Jr., Drewry, D.J.
Glacier ablation, Glacier flow, Antarctica—Rennick Glacier.
Unlike glaciers farther south along the Transantarctic Mountains, Rennick Glacier does not drain into the Ross Ice Shelf but flows directly into a seasonally ice-covered ocean. The primary controls on the activity of this glacier and others in this region are mass balance and sea-level. Two major glacial events are recorded in the upper Rennick Glacier region. The location of erratics and glacially scoured features suggest that during the oldest or Evans glaciation ice covered all but the highest peaks in the region. Following this glaciation a readvance produced the Rennick glaciation. Drift produced during this glaciation has a surface cover of unweathered clasts and is commonly found in the form of recessional moraines with associated ice-marginal lakes. Rennick Glacier is currently in a recessional phase of the Rennick Glaciation. The phase is characterized by physical re-adjustment of local ice masses including progressive inland migration of the Rennick Glacier grounding line. To date the grounding line has migrated up the mid-point of the glacier. This trend may be expected to continue. (Auth.)

33-4518
Formation and composition of the gas content of sea ice.
Tsurikov, V.L., *Journal of glaciology,* 1979, 22(86), p.67-81, In English with French and German summaries. 18 refs.
Sea ice, Gas inclusions, Ice composition, Ice cover strength.

33-4519
Grain coarsening of water-saturated snow.
Raymond, C.F., et al, *Journal of glaciology,* 1979, 22(86), p.83-105, In English with French and German summaries. 17 refs.
Tusima, K.
Snow water content, Snow cover structure, Particle size distribution, Snow melting, Regelation.

33-4520
Applications of numerical transient fluid dynamics to snow avalanche flow. Part 1. Development of computer program AVALNCH.
Lang, T.E., et al, *Journal of glaciology,* 1979, 22(86), p.107-115, In English with French and German summaries. 6 refs.
Dawson, K.L., Martinelli, M., Jr.
Snow physics, Snow mechanics, Fluid mechanics, Avalanche mechanics, Computer programs.

33-4521
Application of numerical transient fluid dynamics to snow avalanche flow. Part 2. Avalanche modeling and parameter error evaluation.
Lang, T.E., et al, *Journal of glaciology,* 1979, 22(86), p.117-126, In English with French and German summaries. 2 refs.
Martinelli, M., Jr.
Friction, Avalanche mechanics, Viscosity, Computer programs, Mathematical models, Snow cover.

33-4522
Using linear discriminant analysis to classify snowfall situations into avalanching and non-avalanching ones.
Drozdovskaia, N.F., *Journal of glaciology,* 1979, 22(80), p.127-133, In English with French and German summaries. 7 refs.
Avalanche forecasting, Classifications, Mathematical models, Geomorphology, Meteorological data.

33-4523
Fracture toughness of fresh-water ice.
Liu, H.W., et al, *Journal of glaciology,* 1979, 22(86), p.135-143, In English with French and German summaries. 19 refs.
Miller, K.J.
Fracture zones, Ice cover strength, Loads (forces), Cracking (fracturing), Unfrozen water content, Temperature effects.

33-4524
Dielectric behaviour of ice microcrystals: a study versus temperature.
Boned, C., et al, *Journal of glaciology,* 1979, 22(86), p.145-154, In English with French and German summaries. 43 refs.
Lagourette, B., Clausse, M.
Ice dielectrics, Ice crystal structure, Ice microstructure, Dispersions, Temperature effects.

33-4525
Enthalpy relaxation phenomenon of heavy ice.
Haida, O., et al, *Journal of glaciology,* 1979, 22(86), p.155-160, In English with French and German summaries. 25 refs.
Suga, H., Seki, S.
Enthalpy, Ice relaxation, Heavy ice.

33-4526
Determination of *a*-axis orientations of polycrystalline ice.
Matsuda, M., *Journal of glaciology,* 1979, 22(86), p.165-169, In English with French and German summaries. 5 refs.
Ice crystal structure, Ice microstructure, Measurement, Lattice models.

33-4527
Flexural wave studies on the basis of single-sensor recordings.
Taylor, R.W., *Journal of glaciology,* 1979, 22(86), p.171-175, In English with French and German summaries. 10 refs.
Ice sheets, Floating ice, Water waves, Wave propagation, Underwater acoustics.

33-4528
Cryoconite holes on Sermikavsak, West Greenland.
Gribbon, P.W.F., *Journal of glaciology,* 1979, 22(86), p.177-181, In English with French and German summaries. 18 refs.
Ice sheets, Surface structure, Radiation balance, Heat transfer.

33-4529
Gravitational stresses in floating ice sheets.
Evans, R.J., et al, *Journal of glaciology,* 1979, 22(86), p.182-185, In English with French and German summaries. 3 refs.
Parmerter, R.R.
Floating ice, Water pressure, Gravity, Ice cracks.

33-4530
Acoustic emission as an indication of stability decrease in fracture zones of avalanches.
Gubler, H., *Journal of glaciology,* 1979, 22(86), p.186-188, In English with French and German summaries. 3 refs.
Fracture zones, Slope stability, Snow cover stability, Snow acoustics.

33-4531
Deviation of a bore hole during drilling.
Sanderson, T.J.O., *Journal of glaciology,* 1979, 22(86), p.195-197, 2 refs.
Ice cores, Drilling, Models.
The author presents a problem in which ice core drills, during the drilling process, come substantially off plumb and are horizontally well displaced from the point of entry by the time they reach their lowest drill level. He suggests a mechanism which causes the deviations and presents calculations for predicting, and thus, avoiding them. The calculations agree well in form but grossly disagree in magnitude. The author seeks help in solving this dilemma.

33-4532
Year-round use of scrapers. (Kruglogodichnoe ispol'zovanie skreperov),
Goncharenko, V.T., *Mekhanizatsiia stroitel'stva,* June 1979, No.6, p.7-8, In Russian.
Cold weather construction, Earthwork, Excavating equipment, Frozen ground.

33-4533
Machines for the Baykal Amur railroad. [Mashiny dlia BAMa],
Meshkov, V.M., *Mekhhanizatsiia stroitel'stva,* June 1979, No.6, p.26-28, In Russian.
Construction equipment, Transportation, Drilling, Earthwork, Excavating equipment, Cranes, Baykal Amur railroad, Frozen ground.

33-4534
Impact of cohesive mudflow on transverse obstacles. [Nekotorye voprosy udarnogo vozdeĭstviia strukturnogo (sviaznogo) selevogo potoka na poperechnye sooruzheniia],
Iordanishvili, Z.S., et al, *Tiflis. Gruzinskiĭ politekhnicheskiĭ institut. Nauchnye trudy,* 1975, No.175, p.104-109, In Russian with English summary. 2 refs.
Sokhadze, L.D.
Flow control, Slope processes, Mudflows, Impact tests, Flow rate.

33-4535
Snow protection on the Frunze-Osh road. [Zashchita ot snezhnykh zanosov uchastkov dorogi Frunze-Osh],
Fortuna, IU.A., *Frunze. Politekhnicheskiĭ institut. Trudy,* 1971, Vol.31, p.85-87, In Russian.
Roads, Winter maintenance, Wind factors.

33-4536
Bases and foundations on settling ground in earthquake areas. [K probleme osnovaniĭ i fundamentov na prosadochnykh gruntakh v seĭsmicheskikh raĭonakh],
Atsenko, D.V., *Frunze. Politekhnicheskiĭ institut. Trudy,* 1973, Vol.75, p.12-16, In Russian. 5 refs.
Pile foundations, Loess, Earthquakes, Settlement (structural).

33-4537
Improving the operation and organization of pipeline construction in West Siberia. [Sovershenstvovanie upravleniia i organizatsii stroitel'stva truboprovodov v Zapadnoĭ Sibiri],
Postnikov, V.V., et al, *Stroitel'stvo truboprovodov,* May 1979, No.5, p.12-15, In Russian.
Paramonov, A.A.
Petroleum transportation, Pipelines, Cold weather operation, Construction costs.

33-4538
Non-buried foundations for construction in the Tyumen' region. [Nezagliublennye prostranstvennye fundamenty dlia stroitel'stva v Tiumenskoĭ oblasti],
Dashkov, A.G., et al, *Stroitel'stvo truboprovodov,* May 1979, No.5, p.15-16, In Russian.
Strubtsov, IU.A., Belen'kiĭ, P.M., Moskovtsev, A.G.
Buildings, Rock fills, Foundations, Permafrost beneath structures, Design.

33-4539
Pipeline construction in swamps in summer using pipe-laying platforms. [Sooruzhenie truboprovodov na bolotakh v letnee vremia s pomoshch'iu montazhno-ukladochnykh platform],
Kovalev, E.P., et al, *Stroitel'stvo truboprovodov,* May 1979, No.5, p.17-18, In Russian.
Girshovich, I I.
Swamps, Pipe laying, Construction equipment.

33-4540
Road construction and operation. [Stroitel'stvo i ekspluatatsiia avtomobil'nykh dorog],
Chumakov, IU.L., et al, Moscow, Transport, 1976, 424p. (Pertinent p.48-101, 117-199, 311-327), In Russian with abridged English table of contents enclosed. 40 refs.
Kubasov, A.U., Tarabarko, N.S.
Roads, Cold weather construction, Earthwork, Permafrost beneath roads, Embankments, Swamps, Drainage, Soil stabilization, Pavements, Winter maintenance.

33-4541
Construction on water-saturated loess. [Osobennosti stroitel'stva na vodonasyshchennykh lessovykh gruntakh],
Krutov, V.I., *Stroitel'nye konstruktsii,* 1977, No.30, p.18-22, In Russian.
Buildings, Foundations, Loess, Meltwater, Soil moisture migration, Settlement (structural), Pile foundations, Concrete piles.

33-4542
New structures of cast-in-place piles for special construction conditions. [Novaia konstruktsiia nabivnoĭ svai dlia stroitel'stva v osobykh usloviiakh],
Shishko, G.F., et al, *Stroitel'nye konstruktsii,* 1977, No.30, p.84-86, In Russian.
Fil', IU.A.
Pile foundations, Settlement (structural), Clay soils, Concrete piles, Buildings.

33-4543
Sagging loess in the upper Ob' River area and its mechanical properties. [Lessovye prosadochnye grunty verkhnego Priob'ia i ikh mekhanicheskie kharakteristiki],
Shvetsov, G.I., et al, *Altaĭskiĭ politekhnicheskiĭ institut. Trudy,* 1975, Vyp.52, p.3-11, In Russian. 8 refs.
Aref'ev, V.S., Shvetsova, N.A.
Residential buildings, Industrial buildings, Foundations, Loess, Settlement (structural).

33-4544
Building engineering structures on Altai grounds. [Osobennosti stroitel'stva inzhenernykh sooruzheniĭ na gruntakh Altaĭskogo kraia],
Aref'ev, V.S., et al, *Altaĭskiĭ politekhnicheskiĭ institut. Trudy,* 1975, Vol.52, p.18-24, In Russian. 4 refs.
Shvetsov, G.I.
Residential buildings, Pile foundations, Permafrost beneath structures, Concrete structures, Reinforced concrete, Concrete piles, Clay soils, Frozen fines, Permafrost control.

33-4545
Determining bearing capacity of piles in sandy grounds from pile driving data. [K voprosu opredeleniia nesushcheĭ sposobnosti svaĭ v peschanykh gruntakh po dannym ikh pogruzheniia],
Varnakov, B.V., *Altaĭskiĭ politekhnicheskiĭ institut. Trudy,* 1975, Vol.52, p.55-60, In Russian.
Pile foundations, Industrial buildings, Sands, Thixotropy, Clay soils, Soil moisture migration, Pile driving.

33-4546
Porosity of the cement part of concrete containing SSB, GHKh and Sa additives. [Strukturnaia poristost' rastvornoĭ chasti betona s dobavkami SSB, GKZh i Sa],
Stupachenko, P.P., *Vladivostok. Dal'nevostochnyĭ politekhnicheskiĭ institut. Trudy,* 1971, 72(2), p.52-60, In Russian. 2 refs.
Concretes, Frost resistance, Cement additives, Antifreezes, Concrete strength.

33-4547
Snow accumulation, distribution, melt, and runoff.
Colbeck, S.C., et al, *American Geophysical Union. Transactions,* May 22, 1979, 60(21), MP-1233, p.465-468, 29 refs.
Snow accumulation, Snow cover distribution, Snowmelt, Runoff, Heat transfer, Snow surveys, Remote sensing, Hydrology.

33-4548
Effect of freezing and thawing on the permeability and structure of soil.
Chamberlain, E.J., et al, *Engineering geology,* 1979, Vol.13, MP 1225, p.73-92, For another version and abstract see 32-3469. 11 refs.
Gow, A.J.
Freeze thaw cycles, Soil moisture migration, Permeability, Soil structure, Soil physics, Soil texture, Particle size distribution, Fines.

33-4549
Effect of freeze-thaw cycles on resilient properties of fine-grained soils.
Johnson, T.C., et al, *Engineering geology,* 1979, Vol.13, MP 1226, p.247-276, For another version and abstract see 32-3502. 20 refs.
Cole, D.M., Chamberlain, E.J.
Frozen ground mechanics, Freeze thaw cycles, Pavement bases, Bearing tests, Shear stress, Subgrade soils, Loads (forces), Soil temperature, Models.

33-4550
Thermal and rheological computations for artificially frozen ground construction.
Sanger, F.J., et al, *Engineering geology,* 1979, Vol.13, MP 1227, p.311-337, 32 refs. For another version and abstract see 33-4283.
Sayles, F.H.
Soil freezing, Artificial freezing, Frozen ground mechanics, Frozen ground thermodynamics, Creep properties, Rheology, Thermal properties, Frost heave, Analysis (mathematics), Construction.

33-4551
Long-term studies of the global climate system.
Scientific Committee on Antarctic Research, *Polar record,* 1979, 19(121), SCAR bulletin No.61, Jan. 1979, p.407-418.
Climate, Meteorological factors, Sea ice, Ice sheets, Snow cover, Oceanography.
This report, by the SCAR Working Group on Meteorology, assesses the role of Antarctica in long-term studies of the global climate system, the topic of a joint meeting of meteorologists, glaciologists, oceanographers, and upper atmosphere physicists during XV SCAR (1978). The discussions include examination of the basis for a SCAR program in support of global climatic studies, general comments, recommendations concerning antarctic research, and consideration of the relevance of antarctic glaciology, physical oceanography, and upper atmosphere studies to a SCAR program on climate. The glaciological studies fall into three groups, which are each considered in turn—snow and sea ice, the surface layer of the ice sheet down to a depth of 200 m, and the older ice inside of the ice sheet. A primary concern of the oceanographic investigations is the need to know how and why the ocean surface temperature varies. The use of satellite techniques as well as long-term measurements is stressed for oceanographic studies. The special geographic advantages which Antarctica offers for identifying and studying meteorological phenomena are discussed.

33-4552
Operation *Deep Freeze* '79 end of season report.
U.S. Naval Support Force, Antarctica, San Francisco, May 9, 1979, var. p.
Logistics, Military operation, Cold weather operation.
This report summarizes the operations of Antarctic Development Squadron Six in support of *Deep freeze* '79 for the periods Aug. 23 to Sep. 1978 and Oct. 9, 1978 to Feb. 28, 1979. The following aspects of the operations are described: significant events, air operations, maintenance, logistics, administration, communications, photography, public affairs, medical/dental, detachments, training, safety, and recommendations.

33-4553
Potential of tree rings for reconstruction of past climate variations in the Southern Hemisphere.
LaMarche, V.C., Jr., *World Meteorological Organization. Publication,* 1975, WMO No.421, WMO/IAMAP Symposium on Long-Term Climatic Fluctuations, Norwich, Aug. 18-23, 1975, Proceedings, p.21-30, 20 refs.
Ice cores, Climatic changes, Paleoclimatology.
The importance of tree-ring data from the Southern Hemisphere as a source of paleoclimatic information is assessed. Tree-ring properties of potential worth for paleoclimatic inference include variations in ring width, density, and isotopic composition. It is probable that paleo-climatic information analogous to that found by isotopic analysis of ice cores from Greenland and Antarctica can be obtained from hydrogen isotope determinations of dated wood samples from trees. South America, with its temperate forests extending from Tierra del Fuego to central Chile, offers the greatest immediate potential for application of tree-ring data to paleoclimatic problems in the Southern Hemisphere. Previous studies citing evidence for the correlation of precipitation in Santiago, Chile with snow accumulation at Byrd Station, and the role of the circum-Antarctic ice pack in regulating the position of the circumpolar vortex are noted.

33-4554
Effect of volcanic activity on climate.
Pollack, J.B., et al, *World Meteorological Organization. Publication,* 1975, WMO No.421, WMO/IAMAP Symposium on Long-Term Climatic Fluctuations, Norwich, Aug. 18-23, 1975, Proceedings, p.279-285, 25 refs.
Toon, O.B., Sagan, C.
Ice cores, Volcanic ash, Paleoclimatology, Snow cover.
Radiative transfer calculations of the global energy balance have been carried out to estimate the change in mean surface temperature that results from the addition of volcanic aerosols to the stratosphere. The results are consistent with the stratospheric warming observed in the first several months following the eruption of Mt. Agung and the average surface temperature decrease found for the two year period following major volcanic explosions. Changes in the level of volcanic activity appear to be an important factor for the temperature changes that have occurred over the last hundred years and may have contributed to some parts of the last major ice age. Some assessment of the importance of volcanic activity in causing or enhancing the ice ages has been obtained from studies of Greenland and antarctic ice cores.

33-4555
Annual report.
Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori, 1978, 22p., Refs.
Radio echo soundings, Sea ice, Ice cover thickness, Airborne radar.
This report summarizes the research projects being conducted by the Electromagnetic Inst., lists personnel, teaching activities, publications, and participation in councils, etc., and briefly notes activities in the radio anechoic chamber. One of the projects in remote sensing is concerned with radio echo sounding of antarctic inland ice.

33-4556
Vegetation and production ecology of Alaskan Arctic tundra.
Tieszen, L.L., ed, Ecological studies, No.29, New York, Springer, 1978, 686p., Refs. passim. For individual articles see 33-4557 through 33-4581.
DLC QK146.V43
Arctic vegetation, Tundra vegetation, Plant ecology, Biomass, Grasses, Photosynthesis, Plant physiology, Nutrient cycle, Meteorological factors, United States—Alaska—Barrow.

33-4557
Vegetation, floristics, and phytogeography of northern Alaska.
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Knox, A.D., Morelli, F.A.
Algae, Biomass, Tundra vegetation, Lakes, Ponds, Mosses, Classifications.

33-4564
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Fungi, Arctic vegetation, Tundra vegetation, Distribution, Nutrient cycle.

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33-4571
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33-4572
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33-4581
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Sea ice, Ice bottom surface, Underwater acoustics, Pressure ridges, Ice cover thickness.

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33-4588
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Snow cover structure, Snow cover stability.

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Raymond, C.F.
Snow impurities, Snow water content, Snow crystal structure.

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Snow gages, Corpuscular radiation, Snow water equivalent, Neutrons.

33-4591
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Snow gages, Corpuscular radiation, Snow water equivalent.

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Snow gages, Corpuscular radiation, Indicating instruments.

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Ice physics, Ice melting, Melting points, Channels (waterways).

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Snow slides, Avalanches, Avalanche countermeasures, Damage.

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Snow cover structure, Snow cover distribution.

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Economic development, Petroleum industry, Natural gas, Transportation, Pipelines, Roads, Buildings, Permafrost beneath structures, Construction costs.

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Economic development, Petroleum industry, Construction, Industrial buildings, Construction materials, Manufacturing, Construction costs.

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33-4601
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33-4602
Proceedings, Vols. 1 and 2.
International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979, Trondheim, University, 1979, 1414p., For selected papers see 33-4603 through 33-4667.
Meetings, Sea ice, Shores, Remote sensing, Environmental impact, Oceanography, Meteorology, Ocean waves, Ice mechanics, Soil mechanics, Offshore structures, Oil spills, Ports.

33-4603
Morphology and hazards related to nearshore ice in coastal areas.
Stringer, W.J., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.1-22.
Sea ice, Ice structure, Coastal topographic features, Mapping, Ice conditions, Classifications, Petroleum industry.

33-4604
Landfast ice motion observed in the MacKenzie Delta region in the southern Beaufort Sea in the 1972/73 winter.
Spedding, L.G., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.23-37, 9 refs.
Fast ice, Drift, Remote sensing, Thermal expansion, Ice cover thickness.

33-4605
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Artificial islands, Ice cover strength, Ice mechanics, Drift, Sea ice, Ice (construction material).

33-4606
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Nelson, R.D.
Ice pressure, Offshore structures, Stresses, Ice cover strength, Sea ice.

33-4607
Measurement of sea ice pressures.
Templeton, J.S., III, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.73-87, 15 refs.
Ice pressure, Measuring instruments, Sea ice.

33-4608
Model tests of ice rubble strength.
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Ice strength, Ice structure, Ice mechanics, Sea ice.

33-4609
Multi year pressure ridges in the Canadian Beaufort Sea.
Wright, B., et al, MP 1229, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.107-126, 17 refs.
Hnatiuk, J., Kovacs, A.
Sea ice, Pressure ridges, Ice structure, Models.
The findings of a field study designed to generate fundamental data on multi-year pressure ridges in the near shore zone of the Canadian Beaufort Sea are presented. The study investigated the geometry of eleven floating multi-year ridges or ridge fragments and the sail height and keel depth of four additional multi-year ridge fragments. The cross-sections of multi-year ridges with total thicknesses varying between 9.6 and 41.8 m were examined, and the results suggest that they can be adequately represented by one ridge model with a constant sail to keel ratio and geometry. It is also shown that the ice comprising multi-year ridges is solid with the interblock voids existing at the time of their formation being completely filled with ice. The data obtained from this study are being used in the engineering design of exploration and production systems for the Beaufort Sea. In the shallow waters of this area, exploratory drilling from artificial islands has been carried out since 1973, and since 1976, the exploration effort has extended into the deeper waters of the Beaufort Sea, using drillships.

33-4610
Ice pile-up and ride-up on Arctic and subarctic beaches.
Kovacs, A., et al, MP 1230, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.127-146, 22 refs.
Sodhi, D.S.
Sea ice, Shores, Pressure ridges, Ice push.
Information on shore ice pile-up and ride-up in arctic and subarctic waters is presented. Cross-sectional profiles of several ice pile-ups and ride-ups are presented from which models and theoretical analyses were made. The expressions derived give the force required to overcome gravitational potential and friction occurring during ice-piling and ride-up. It was estimated that the distributed force required during ice-piling or ride-up was of the order of 10 to 350 kPa (about 1.5 to 50 psi). Field observations revealed that shore ice pile-up or ride-up appears to occur within a period of less than 30 minutes at any time of year, but most often in the spring and fall. Pile-up seldom occurs more than 10 m inland from the sea, but ride-up frequently extends 50 m or more inland, regardless of ice thickness. While steeply sloping shores do not favor ice ride-up, sea ice has mounted the steep, 9-m-high bluff at Barrow, Alaska, destroying structures and taking lives.

33-4611
Artificial ice islands for exploratory drilling.
Cox, G.F.N., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.147-162, 12 refs.
Artificial islands, Ice islands, Flooding, Offshore structures.

33-4612
On the sea ice conditions in the Greenland and Barents Seas.
Loeng, H., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.163-176, 22 refs.
Vinje, T.E.
Sea ice, Ice conditions, Seasonal variations, Greenland Sea, Barents Sea.

33-4613
Correlation of storms and major ice movements in the nearshore Alaskan Beaufort Sea.
Agerton, D.G., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.177-189, 7 refs.
Kreider, J.R.
Pack ice, Ice conditions, Meteorological data, Storms, Beaufort Sea.

33-4614
Five-year sea ice climatology of the Bering Sea derived from satellite observations.
Barnes, J.C., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.191-205, 7 refs.
Bowley, C.J.
Sea ice, Ice conditions, Spaceborne photography, Climatology, Bering Sea.

33-4615
Aerial reconnaissance and subsea profiling of sea ice in the Bering Sea.
Deily, F.H., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.207-219.
Sea ice, Aerial reconnaissance, Subglacial observations, Acoustic measuring instruments.

33-4616
Iceberg investigation along the west coast of Greenland.
Dietrich, J., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.221-239.
Zorn, R., Nielsen, A.H.
Icebergs, Drift, Ocean currents, Wind factors.

33-4617
Another hypothesis about iceberg draft.
Brooks, L.D., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.241-252, 14 refs.
Icebergs, Measurement, Ice density.

33-4618
Probable ice thickness of the Arctic Ocean.
Blidberg, D.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.253-267, 24 refs.
Corell, R.W., Westneat, A.S.
Sea ice, Ice cover thickness, Acoustic measurement.

33-4619
Remote surveillance of the terrestrial environment by electromagnetic waves, a review.
Gjessing, D.T., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.269-287, 21 refs.
Remote sensing, Electromagnetic prospecting, Surface structure, Radar, Radio waves.

33-4620
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Rossiter, J.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.289-305, Also designated C-CORE Publication No.79-10. 12 refs.
Narod, B.B., Clarke, G.K.C.
Icebergs, Airborne radar, Profiles.

33-4621
Tromsö telemetry station—services and applications.
Övergård, A., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.307-312.
Telemetering equipment, Stations, Spacecraft.

33-4622
Sea-ice observations by satellite in the Bering, Chukchi, and Beaufort Seas.
Ahlnäs, K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.313-329, 12 refs.
Wendler, G.
Ice conditions, Ice edge, Spaceborne photography, Sea ice.

33-4623
ADOM ice drilling systems review.
Blidberg, D.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.345-358.
Corell, R.W., Westneat, A.S.
Ice drills, Sea ice, Aerial delivery, Automatic control.

33-4624
Remote acoustic sensing of Arctic Ocean properties.
Dyer, I., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.359-367, 9 refs.
Remote sensing, Acoustic measuring instruments, Bottom topography, Seismic refraction, Backscattering.

33-4625
Some possible effects of Arctic industrial developments on the marine environment.
Lewis, E.L., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.369-392, 37 refs.
Economic development, Oil recovery, Environmental impact, Oil pollution, Mining, Marine biology.

33-4626
Oil pollution in ice-covered Arctic waters.
Weller, G., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.393-406, 9 refs.
Oil pollution, Sea ice, Environmental impact, Submarine permafrost, Ice scoring.

33-4627
Ice effects on oceanographic conditions in Rupert Bay.
Michel, B., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.515-529, 8 refs.
Purves, W., Soucy, A.
Ice cover thickness, Tidal currents, Water temperature, Salinity, Ice cover effect.

33-4628
Spectra of inertial waves for an ice covered mixed layer.
Colony, R., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.531-546, 13 refs.
Ocean currents, Ice cover effect, Drift, Water waves, Boundary value problems, Mathematical models.

33-4629
Flexural and uniaxial compression strength of sea ice in Danish waters.
Tryde, P., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.633-641, 6 refs.
Sea ice, Ice strength, Compressive strength.

33-4630
Existence of oriented sea ice by the Mackenzie Delta.
Vittoratos, E.S., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.643-650, 6 refs.
Sea ice, Ice crystal structure, Compressive strength, Ice islands, Crystal orientation.

33-4631
Crystallographic studies and strength tests of field ice in the Alaskan Beaufort Sea.
Wang, Y.-S., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.651-665, 6 refs.
Sea ice, Ice crystal structure, Crystal orientation, Ice cover strength, Compressive strength.

33-4632
Temperature effect on the uniaxial strength of ice.
Haynes, F.D., MP 1231, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.667-681, 17 refs.
Ice strength, Compressive strength, Tensile strength.
The effect of temperature on the uniaxial strength of fine-grained, polycrystalline ice was investigated. Dumbbell-shaped specimens were loaded in uniaxial compression and uniaxial tension. Two machine speeds, 0.847 mm/s and 84.7 mm/s, were used for the tests, and the test temperatures ranged from -0.1 to -54C. The uniaxial compressive strength is very sensitive to temperature, generally increasing as the temperature decreased from -0.1C to -54C, with the greatest increase between -0.1C and -3C. The tensile strength is not very sensitive to temperature, but did continue to increase with decreasing temperature. Tensile strength also increased the most between -0.1C and -3C. An initial tangent modulus and a 50% stress modulus were found for each compression test. The initial tangent modulus increased about two times as the temperature decreased from -0.1C to -54C. The 50% stress modulus also increased with decreasing temperature. A secant modulus was found for the tensile tests and it tended to decrease with decreasing temperature. The specific energy required to cause failure was also found for the compression and tension tests.

33-4633
Comparison of *in-situ* and laboratory uniaxial fresh water ice strength.
Vittoratos, E.S., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.683-695, 7 refs.
Kry, P.R.
Ice strength, Compressive strength, Strain measuring instruments, Temperature effects.

33-4634
Plane strain fracture toughness (K1c) of fresh water ice.
Hamza, H., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.697-707, 11 refs.
Muggeridge, D.B.
Ice mechanics, Ice strength, Dynamic loads, Temperature effects.

33-4635
Effect of test system stiffness on strength of ice.
Sinha, N.K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.708-717, 6 refs.
Frederking, R.M.W.
Ice strength, Test equipment.

33-4636
Mechanical and morphological properties of doped ice: a search for a better structurally simulated ice for model test basins.
Timco, G.W., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.719-739, 17 refs.
Artificial ice, Ice mechanics, Ice structure, Doped ice, Test chambers, Ice strength, Water chemistry.

33-4637
Friction measurements of sea ice on flat plates of metals, plastics and coatings.
Tushima, K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.741-755, 9 refs.
Tabata, T.
Sea ice, Metal ice friction, Surface roughness.

33-4638
Borehole relaxation test as a means for determining the creep properties of ice covers.
Ladanyi, B., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.757-770, 10 refs.
Ice creep, Boreholes, Relaxation (mechanics), Analysis (mathematics).

33-4639
Interfacial tension and contact angle of crude oil under ice.
Malcom, J.D., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.771-778, 16 refs.
Dutton, C.R.
Crude oil, Ice cover, Liquid solid interfaces, Water films.

33-4640
Creep of floating sea-ice sheets—a finite element formulation.
Tinawi, R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.779-795, 22 refs.
Murat, J.R.
Sea ice, Floating ice, Ice creep, Ice mechanics, Dynamic loads, Mathematical models.

33-4641
Buckling analysis of wedge-shaped floating ice sheets.
Sodhi, D.S., MP 1232, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.797-810, 7 refs.
Sea ice, Floating ice, Ice loads, Ice pressure.
A buckling analysis for semi-infinite wedge-shaped floating ice sheets is presented, considering a radial stress field for the in-plane stresses. The buckling load and buckling pressure are computed for varying ice sheet geometry and boundary conditions. The results of this analysis are close to those of earlier analyses for semi-infinite ice sheets and tapered beams.

33-4642
Decade of North Sea Foundations.
De Ruiter, J., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.811-831, 18 refs.
Offshore structures, Pile foundations, Pile driving, Construction equipment, Concrete structures, North Sea.

33-4643
Geotechnical survey of the seafloor with a free fall penetrometer.
Chari, T.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.833-843, 15 refs.
Abdel-Gawad, S.M., Chaudhuri, S.N.
Bottom sediment, Penetration tests, Impact tests, Sands.

33-4644
Coarse grained sediment dynamics, Beaufort Sea, Alaska.
Nummedal, D., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.845-858, 20 refs.
Sediment transport, Ice push, Storms, Water waves.

33-4645
Shallow geology of the continental shelf off north Norway.
Rokoengen, K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.859-875, 13 refs.
Marine geology, Geologic structures, Ice scoring, Bottom sediment.

33-4646
Seabed roughness characterization by broadband acoustic echosounding.
Cochrane, N.A., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim. University, 1979, p.877-898, 9 refs.
Dunsiger, A.D.
Remote sensing, Bottom sediment, Surface roughness, Seismic surveys.

33-4647
Geological considerations for engineering activities on the Kodiak shelf and upper slope.
Hampton, M.A., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.935-949, 21 refs.
Bottom sediment, Geologic structures, Marine geology, Sediment transport.

33-4648
Geotechnical engineering characteristics of the outer continental shelf lease areas in Alaska.
Sangrey, D.A., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.963-976, 32 refs.
Marine geology, Geologic structures, Bottom sediment, Engineering geology, Ice cover effect, Natural gas.

33-4649
Ship-ice interaction.
Enkvist, E., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol 2, Trondheim, University, 1979, p.977-1002, 58 refs.
Varsta, P., Riska, K.
Ice breaking, Icebreakers, Ice navigation, Ships, Ice loads, Propellers, Ship icing.

33-4650
Ice forces and accelerations on a Polar Class icebreaker.
Noble, P.G., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1003-1022, 5 refs.
Tam, W.K., Menon, B., Bayly, I.M.
Ice navigation, Icebreakers, Ice pressure, Dynamic loads, Mathematical models.

33-4651
Ice model tests and computer simulation of propeller-ice impacts of a polar research ship.
DeBord, F.W., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1023-1040, 5 refs.
Lewis, J.W., Voelker, R.P.
Ice models, Ice navigation, Ships, Propellers, Icebreakers.

33-4652
Ice impact loads on steering system components of Arctic class ships.
Menon, B., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1041-1068, 13 refs.
Noble, P.G.
Ice floes, Icebreakers, Ice loads, Impact tests, Mathematical models.

33-4653
Ice-breaking mechanisms for ice-breakers and offshore structures.
Vinogradov, O.G., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1069-1079, 7 refs.
Kentfield, J.A.C., Vermeulen, P.J.
Ice breaking, Icebreakers, Offshore structures, Ice removal equipment.

33-4654
Experimental study on ice forces on a cone-shaped and an inclined pile structure.
Saeki, H., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1081-1095, 6 refs.
Ono, T., Ozaki, A.
Offshore structures, Ice breaking, Ice pressure, Pile structures.

33-4655
Laboratory tests on downdrag loads developed by floating ice covers on vertical piles.
Frederking, R.M.W., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1097-1110, 10 refs.
Floating ice, Ice cover thickness, Ice pressure, Pile structures, Ice mechanics.

33-4656
Probabilistic force calculations for structures in ice-covered seas.
Wheeler, J.D., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1111-1126, 14 refs.
Offshore structures, Ice pressure, Ice mechanics, Mathematical models, Probability theory.

33-4657
Generation of smoothed spectrum-compatible ice force records.
Arockiasamy, M., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p 1127-1138, 10 refs.
Reddy, D.V., Bobby, W., Cheema, P.S.
Ice pressure, Statistical data, Data processing, Computer programs.

33-4658
Laboratory tests for dynamic ice-structure interaction.
Määttänen, M., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1139-1153, 5 refs.
Ice solid interface, Pile structures, Ice pressure, Dynamic loads.
For bottom-founded structure simulation, a test pile was designed so that its stiffness, natural frequencies and modes and damping could be varied. The ice movement against the pile was arranged to have constant acceleration in order to excite different modes with different ice velocities. The flexibility of the drive system caused jerking ice movement with low velocities. Analysis of the recorded ice forces and acceleration include the refinement at measured ice forces by eliminating the response of the measuring system itself, using dynamic equilibrium or transfer function approach. The frequency contents and the damping of vibrations are analyzed using Fourier signal analyzer. Results thus far show similitude with in-field ice force histograms: both random and saw-tooth like repetitious ice force fluctuations appear. The change from one interaction mode to the other with increasing drive velocities occurs. With high velocities relatively smooth random ice crushing occurs, and in some cases natural modes are stable. The greatest energy content of ice force does not always appear with the natural frequencies of structures.

33-4659
Non-stationary response of offshore towers to ice forces.
Reddy, D.V., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1155-1171, 16 refs.
Arockiasamy, M., Cheema, P.S.
Offshore structures, Loads (forces), Ice pressure, Analysis (mathematics).

33-4660
Conceptual design of floating drilling production and storage caisson for Arctic waters.
Gerwick, B.C., Jr., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1173-1189, 7 refs.
Jahns, H.O.
Caissons, Offshore structures, Ice pressure, Offshore drilling, Sea ice.

33-4661
Preliminary design of the Arctic mobile drilling structure.
Hancock, J.A., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1191-1204, 4 refs.
Hudson, T.A., Van Scherpe, P.H., Steridum, R.E.
Ice pressure, Offshore drilling, Offshore structures, Sea ice.

33-4662
Fast ice thickness and snow depth relationships related to oil entrapment potential, Prudhoe Bay, Alaska.
Barnes, P.W., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1205-1225, 14 refs.
Reimnitz, E., Toimil, L.J., Hill, H.R.
Fast ice, Ice cover thickness, Ice bottom surface, Snow depth, Oil pollution.

33-4663
Oil spill on the shore of an ice-covered fjord in Spitsbergen.
Carstens, T., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1227-1242, 21 refs.
Sendstad, E.
Oil spills, Ice cover effect, Environmental impact.

33-4664
Development of winter navigation in the St. Lawrence River below Montreal.
Danys, J.V., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1243-1256, 6 refs.
Rivers, Ice navigation, Icebreakers, Ice control.

33-4665
Concepts for ice management at Arctic LNG terminal.
Cammaert, A.B., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1257-1268, 4 refs.
Miller, D.R., Gill, R.J.
Natural gas, Storage, Ports, Ice formation, Ice control, Heat recovery.

33-4666
Design of harbor structures for boats.
Wortley, C.A., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1283-1300, 9 refs.
Ports, Ice pressure, Ice control, Docks, Design criteria, Great Lakes.

33-4667
Wave mechanics principles on the design of rubble-mound breakwaters.
Gunbak, A.R., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1301-1318, 29 refs.
Ports, Protection, Wave propagation, Mechanical properties.

33-4668
Physiological adaptation to the environment.
Symposium on Physiological Adaptation to the Environment, Amherst, University of Massachusetts, June 20-22, 1973, New York, Intext Educational Publishers, 1975, 576p., Refs. passim. For selected papers see 32-628, 32-671 and 33-4669 through 33-4672.
Vernberg, F.J., ed.
Ecology, Tundra, Cold tolerance, Plant physiology, Animals, Birds, Insects.

33-4669
Physiological ecology of Arctic and alpine photosynthesis and respiration.
Tieszen, L.L., et al, Physiological adaptation to the environment. Edited by F.J. Vernberg, New York, Intext Educational Publishers, 1975, p.157-200, Refs. p.194-200.
Wieland, N.K.
Arctic vegetation, Alpine vegetation, Tundra vegetation, Plant physiology, Plant ecology, Photosynthesis.

33-4670
Arctic and alpine plant water relations.
Courtin, G.M., et al, Physiological adaptation to the environment. Edited by F.J. Vernberg, New York, Intext Educational Publishers, 1975, p.201-224, Refs. p.220-224.
Mayo, J.M.
Arctic vegetation, Alpine vegetation, Tundra vegetation, Plant physiology, Plant ecology, Cold tolerance, Climatic factors, Environments.

33-4671
Some aspects of nutritional adaptations of Arctic herbivorous mammals.
White, R.G., Physiological adaptation to the environment. Edited by F.J. Vernberg, New York, Intext Educational Publishers, 1975, p.239-268, Refs. p.261-268.
Animals, Arctic vegetation, Tundra vegetation, Nutrient cycle, Seasonal variations, Physiology.

33-4672
Metabolic adaptations of tundra birds.
West, G.C., et al, Psysiological adaptation to the environment. Edited by F.J. Vernberg, New York, Intext Educational Publishers, 1975, p.301-329, Refs. p.325-329.
Norton, D.W.
Ecology, Tundra, Acclimatization, Birds.

33-4673
Estimated snow, ice, and rain load prior to the collapse of the Hartford Civic Center arena roof.
Redfield, R.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory,* Apr. 1979, SR 79-9, 32p., ADA-069 323, 19 refs.
Tobiasson, W.N., Colbeck, S.C.
Roofs, Loads (forces), Snow loads, Ice loads, Rain.
The roof of the Hartford, Connecticut, Civic Center Arena collapsed under an unknown load of snow, ice and rain early in the morning on Jan. 18, 1978. Based on available meteorological and snow load measurements, estimates for the amount of load present at the time of failure are made using a number of techniques. In addition, previous maximum loads due to snow, ice or rain since the building was constructed are also estimated.

33-4674
Standing crop of algae in the sea ice of the Weddell Sea region.
Ackley, S.F., et al, *Deep-sea research,* Mar. 1979, 26(3A), MP 1242, p.269-281, c.
Buck, K.R., Taguchi, S.
Sea ice, Algae, Cryobiology, Weddell Sea.
Physical and biological measurements were made of sea ice cores taken from 69 to 78 S in the Weddell Sea. Fluorescence measurements indicated an algal community that was strongly associated with salinity maxima within the ice. Maximum concentrations of chlorophyll *a* ranged from 0.31 to 4.54 mg cu m. Comparisons with standing crops in the water column indicate that the standing crop within the ice can represent a minor but significant fraction of the total standing crop for the region. The sea ice algal community is apparently distinct from others that have been described for land-fast ice in McMurdo Sound, sea ice in the Arctic, and pack ice off East Antarctica. The highest concentrations of biological material are found in the bottom or top samples from those regions, whereas the Weddell Sea maxima are concentrated at intermediate depths (0.65 to 2.15m) within the ice. A qualitative model indicating the relationship between thermally induced brine migration and subsequent algal growth is presented. (Auth. mod.)

33-4675
In vitro* digestibility of forages utilized by *Rangifer tarandus.
Person, S.J., et al, Alaska. University. Biological papers. Special report No.1, International Reindeer and Caribou Symposium, 1st, Fairbanks, Alaska, Aug. 9-11, 1972. Proceedings. Edited by J.R. Luick, et al., Sep. 1975, p.251-256, 15 refs.
White, R.G., Luick, J.R.
Animals, Lichens, Grasses, Ecology, Laboratory techniques, Physiology.

33-4676
Volatile fatty acid (VFA) production in the rumen and cecum of reindeer.
White, R.G., et al, International Reindeer and Caribou Symposium, 1st, Fairbanks, Alaska, Aug. 9-11, 1972. Proceedings. Edited by J.R. Luick, et al, Alaska. University. Biological papers. Special report No.1, Sep. 1975, p.284-289, 8 refs.
Gau, A.M.
Animals, Lichens, Grasses, Ecology, Physiology.

33-4677
Ecology of tundra invertebrates at Prudhoe Bay, Alaska.
MacLean, S.F., Jr., Alaska. University. Biological papers. Special report No.2, Oct. 1975, p.114-123, 7 refs.
Ecology, Tundra, Biomass, Insects.

33-4678
Physiological aspects of the ecology of *Dicranum fuscescens* in the Subarctic. I. Acclimation and acclimation potential of CO2 exchange in relation to habitat, light, and temperature.
Hicklenton, P.R., et al, *Canadian journal of botany,* May 15, 1976, 54(10), p.1104-1119, 46 refs.
Oechel, W.C.
Subarctic vegetation, Mosses, Plant ecology, Photosynthesis, Carbon dioxide, Light effects, Temperature effects.

33-4679
Comparative Co2 exchange patterns in mosses from two tundra habitats at Barrow, Alaska.
Oechel, W.C., et al, *Canadian journal of botany,* June 15, 1976, 54(12), p.1355-1369, In English with French summary. 38 refs.
Collins, N.J.
Tundra vegetation, Arctic vegetation, Mosses, Plant physiology, Photosynthesis, Carbon dioxide, Light effects, Temperature effects, Water content, United States—Alaska—Barrow.

33-4680
Two Soviet recoveries of Dunlins banded at Point Barrow, Alaska.
Norton, D.W., *Auk,* Oct. 1971, 88(4), p.927.
Ecology, Biogeography, Migration, Animals, Polar regions.

33-4681
Methods of determining astronomical coordinates and land navigation in Antarctica. [Metody opredeleniia astronomicheskikh koordinat i voprosy nazemnoĭ navigatsii v Antarktide],
Lazarev, G.E., Moscow, Nauka, 1977, 146p., In Russian with English table of contents enclosed. Refs. p.143-145.
Navigation, Mapping, Geodesy, Geodetic surveys, Indicating instruments, Instruments, Antarctica.
Aspects of working with high-precision astronomical and geodetic instruments and of receiving exact-time signals in Antarctica are discussed. By analyzing physical and geographical conditions, the author is able to make recommendations about methods of determining latitude, longitude and azimuth. Techniques for coordinate determination on traverse, the feasi-

bility of maintaining course direction and distance measurement and the use of navigational devices for land transport are considered.

33-4682
Leveling under unfavorable conditions during artificial settlement of a house foundation. [Opyt nivelirovaniia v neblagopriiatnykh usloviiakh pri iskusstvennoĭ posadke doma],
Kamnev, A.V., et al, *Altaĭskiĭ politekhnicheskiĭ institut. Trudy,* 1973, Vol.27, p.66-69, In Russian.
Guliaev, IU.P.
Cold weather construction, Clay soils, Soil compacting, Foundations, Settlement (structural), Leveling.

33-4683
Policy of the B.E. Vedeneev Hydraulics Institute in studies of hydraulic structure foundations and earth dams. [Osnovnye zadachi issledovaniĭ VNIIG im. B.E. Vedeneeva v oblasti osnovaniĭ gidrotekhnicheskikh sooruzheniĭ i gruntovykh plotin],
Skladnev, M.F., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1978, Vol.122, p.3-11, In Russian.
Evdokimov, P.D., Sapegin, D.D.
Hydraulic structures, Concrete structures, Earth dams, Ice (construction material), Permafrost beneath structures, Research projects.

33-4684
Calculating consolidation of rock-filled dam cores allowing for soil creep (two-dimensional problem). [Raschet konsolidatsii iader plotin s uchetom polzuchesti skeleta grunta (ploskaia zadacha)],
Kotochigov, A.M., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1978, Vol.122, p.65-68, In Russian. 3 refs.
Lykova, N.I.
Hydraulic structures, Earth dams, Rock fills, Soil compacting, Creep properties, Design.

33-4685
Calculating nonsteady seepage in earth dams. [Raschet neustanovivsheĭsia fil'tratsii v gruntovykh plotinakh],
Mozhevitinov, A.L., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1978, Vol.122, p.69-75, In Russian.
Suleĭmanov, I.A.-G.
Hydraulic structures, Earth dams, Rock fills, Slope stability, Seepage, Analysis (mathematics).

33-4686
Constructing grout curtains in calcareous rocks. [Opyt sozdaniia protivofil'tratsionnoĭ zavesy v karbonatnykh porodakh],
Demin, V.F., et al, *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1978, Vol.122, p.81-85, In Russian. 5 refs.
Popov, IU.D., Allas, E.E.
Hydraulic structures, Soil stabilization, Waterproofing, Cements, Resins, Grouting.

33-4687
Calculating horizontal shift of rigid hydraulic structures allowing for foundation creep. [K voprosu rascheta gorizontal'nykh smeshcheniĭ zhestkikh napornykh gidrosooruzheniĭ uchetom svoĭstv polzuchesti grunta osnovaniia],
Aptekar', L.D., *Leningrad. Vsesoiuznyĭ nauchno-issledovatel'skiĭ institut gidrotekhniki. Izvestiia,* 1978, Vol.122, p.86-91, In Russian. 7 refs.
Hydraulic structures, Foundations, Clays, Creep properties, Water pressure, Design.

33-4688
Proceedings, Vol.2.
International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977, *Desalination,* Apr.-May 1979, 29(1/2), 231p., Refs. For selected papers see 33-4689 through 33-4700 or F-22080 through F-22087.
Ice (water storage), Water supply, Transportation, Weather modification, Economic development, Iceberg towing.
This volume of 17 papers and abstracts, together with the first volume of the proceedings (F-20448 or 32-4707) presents various aspects of iceberg technology and its potential applications. The aim of the work included in this volume is to gain more understanding of tabular icebergs, their sources, properties and behavior, and to exchange views on plausible efficient ways of employing icebergs as a water resource. Other uses for icebergs which might be contemplated are for power generation, weather modification, mitigation of thermal effects, provision of suitable environment for mariculture, and recreation purposes (floating islands).

33-4689
Water supply and weather modifications from transferred iceberg from Antarctica to countries of the world's "thirst belt".
Victor, P.-E., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.7-15.
Ice (water storage), Water supply, Transportation, Weather modification, Economic development, Iceberg towing.
The use of antarctic icebergs as a source of fresh water and as a microclimate modifier is proposed. The production of fresh water from icebergs is believed to have only beneficial aspects. Only tabular icebergs are suitable for transport. The annual production of such icebergs is probably more than 10,000 (which melt away). Towing of such masses (100 million m m as a first step) is possible with existing tugs. Protection against excessive melting during transfer (6 to 8 months) is given, theoretically, by a "shell" maintaining a pool of cold water under and around the "foot" of the iceberg. Economically, the cost of iceberg produced water is competitive with the cost of water delivered by desalinization. Study of the proposed operation and all of its phases leads to the conclusion that it is technically feasible and economically sound. (Auth. mod.)

33-4690
Terradynamics as applied to ice.
Pope, A., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.17-23.
Icebergs, Sea ice, Glacier ice, Dynamic properties, Ice cover thickness, Penetration tests, Impact tests.

33-4691
Icebergs used and theory with suggestions for the future.
Day, J.M., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol 2, p.25-40, 10 refs.
Icebergs, Ice (water storage), Economic development, Iceberg towing.
The use of icebergs as a refrigerant and a water source is reviewed, together with the sequence of events leading up to the present. The methodology of each iceberg theorist is presented and compared. The events and opinions emerging from the first iceberg meeting at Rensselaerville, N. Y., in 1974 are stated. Suggestions are made which could solve some of the problems facing this technology and a new approach to processing and delivery is outlined. (Auth. mod)

33-4692
Eighth voyage aboard *Al Hammal*. A study of the transport of a large tabular iceberg from the Antarctic to the Arabian Peninsula.
Coillet, D.W., et al, *Desalination,* Apr. May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.47-78, Refs. p.73-78.
Dunlap, R.M.
Icebergs, Ice mechanics, Ice (water storage), Transportation, Iceberg towing.
This paper examines the critical parameters in the design of an iceberg-moving tugboat. The projected tow course is outlined and an engineering analysis is presented.

33-4693
Towage of an iceberg.
Montfort, L., et al, *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.79-95, 7 refs.
Oudendijk, C.
Meteorological factors, Iceberg towing.
This paper discusses the following aspects of iceberg towing: existing towboats and practical experience applicable to iceberg projects, necessary equipment for the transfer, sea and weather conditions, technical considerations, and human problems and safety. It is speculated that an iceberg, towed from the Weddell Sea vicinity to the Gulf of Aden, a voyage of roughly 9000 naut. mi, say, at the speed of one knot, would take approximately one year. Important considerations for such a venture include refueling at sea, tug maintenance, support vessels, equipment to be placed on the berg, etc. These matters are discussed.

33-4694
Determination of iceberg underwater shape with impulse radar.
Rossiter, J.R., et al, *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.99-107, 14 refs.
Gustajtis, K.A.
Icebergs, Radar echoes, Ice cover thickness, Sounding, Ice dielectrics.
The measurement of iceberg underwater dimensions and features will be essential for safe and effective choice, preparation, and transportation of icebergs. An iceberg's subsurface shape affects its deterioration, its form drag, and its strength. Short-pulse radar echo-sounding methods can be used to sound icebergs since polar fresh-water ice is highly transparent to radio signals. Available radar equipment can be used either from an aircraft or from the iceberg surface, and can provide reliable, easily-interpreted, real-time results. These systems can measure iceberg thickness and can provide information about inhomogeneities, such as crevasses, but further work is required to be able to estimate subsurface shape. This paper reviews the available literature on radio echo sounding of icebergs, including antarctic icebergs.

33-4695
Capability of SAR systems for iceberg detection and characterization.
Rawson, R., et al, *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.109-133, 16 refs.
Larson, R., Shuchman, R., Worsfold, R.
Airborne radar, Icebergs, Radar tracking, Ice detection.

33-4696
Geophysical aspects of a large iceberg tow.
David, D.C., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.135-152, 8 refs.
Ice melting, Ice (water storage), Water supply, Economic development, Iceberg towing.
This paper describes the hypothetical transport of an antarctic iceberg to Saudi Arabia to illustrate the problems inherent in any tow across tropical waters. The towing route is from the Weddell Sea through the Pacific Ocean and the Arabian Sea to the Gulf of Aden. The following aspects of iceberg utilization are discussed: locating and harnessing, melting, transit, a course and timetable for the tow, and technological problems involved in utilizing water from the iceberg. The approximate cost for the delivery of water from an iceberg of the size chosen for this treatment to Saudi Arabia would be 53.7 cents per cu m, as compared with 80 cents per cu m for fresh water from desalinization. Intensive field study is needed on the effects of currents and waves on motion and breakup, and the cost and feasibility of insulating. A trial tow would also be desirable.

33-4697
Ice cooled ocean thermal energy conversion plants.
DeMarle, D.J., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.153-163, 11 refs.
Icebergs, Electric power plants, Thermal factors, Cooling systems.

33-4698
Role of liquid oxygen explosive in iceberg utilization and development.
Tate, G.L., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.167-172, 3 refs.
Icebergs, Water supply, Oxygen, Ice (water storage), Explosives.

33-4699
Iceberg utilization and alternative systems related to fresh water transport—recycling and supplementary desalinization.
Looyen, C.D., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.173-189.
Water supply, Water treatment, Ice (water storage), Economic development, Transportation, Iceberg towing.
The author examines the subject of polar iceberg utilization and considers various plans for treating and transporting iceberg

waters to Saudi Arabia. It is suggested that an iceberg ready for transport could be wrapped in a plastic diaper-like bag which would hold the melting fresh water, allowing it to subsequently be pumped away to shore reservoirs. Techniques of water recycling and desalinization using solar power are examined and illustrated. The modes of transport considered include a submerged sea train and tankers. A system based on the conversion of in-use and new tankers for loading water and/or oil is described. It is further suggested that possible alternate solutions to Saudi Arabia's water problems may be found in close-by regions, i.e., the Nile River and under Egypt's desert.

33-4700
Integrated ice-water system.
Coillet, D.W., *Desalination,* Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.191-196.
Icebergs, Water supply, Ice (water storage), Cost analysis.
A study is made of the possible impact on the Arabian Peninsula of implementing, to a scale growing over 20 years to 3,000 million metric tons annually, the transportation to coastal ports of antarctic icebergs and the reticulation of water harvested from this source. Issues discussed include data collection, preparation of the load, and its navigation at sea and in confined channels. One version of staging, embayment, and harvesting was adopted for the study. The operation of onshore impoundment and pipelines was analyzed in detail, especially with respect to conjunctive seasonal supplies from all sources, and their use patterns. (Auth. mod.)

33-4701
Underwater profiling of icebergs using submersibles.
Sukhov, B.P., Oceans '78, The Ocean Challenge, Washington, D.C., Marine Technology Society, 1978, p.225-230, 9 refs.
Icebergs, Underwater ice, Underwater acoustics, Measurement.

33-4702
SAR imaging of waves in ice.
Dawe, B.R., et al, Oceans '78, The Ocean Challenge, Washington, D.C., Marine Technology Society, 1978, p.379-384, 8 refs.
Parashar, S.K.
Sea ice, Radar echoes, Ocean waves.

33-4703
Influence of subgrade properties on frost heave.
Jones, R.H., et al, *Highways and public works,* July 1979, 47(1832), p.17-22, 15 refs.
Berry, A.N.
Frort heave, Soil moisture, Low temperature tests, Subgrade soils, Frost resistance.

33-4704
Mathematical model for Lake Bonney, Antarctica.
Howell, L.W., Jr., Blacksburg, Virginia Polytechnic Institute and State University, 1977, 326p., University Microfilms order No.78-01587, Ph.D. thesis. Refs. p.110-113.
Limnology, Frozen lakes, Biomass, Computer applications, Mathematical models, Antarctica—Bonney, Lake.
During limnological study in 1971-1976, numerous aspects of Lake Bonney's chemical, physical, and biological features from November through January were studied. The project goals consisted of characterizing the Lake's chemical, physical and biological features and the development of a mathematical model of the Lake ecosystem. The present work is the mathematical model, which consists of 21 simultaneous differential equations, 21 parametric equations, and 180 coefficients. A computer program has been written which numerically approximates the solutions to the differential equations, the results appearing as graphs or in tabular form. In addition, graphs of many of the parametric equations are available. The model may be adapted to similar lakes by changing the appropriate coefficients and parametric equations.

33-4705
Glaciers of the Alps. [Gletscher der Alpen],
Bachmann, R.C., Bern, Hallwag, 1978, 304p., In German. c150 refs.
Mountain glaciers, Alpine glaciation, Glacier movement, Glacial deposits, Glacier tongues, Alpine vegetation, Moraines.

33-4706
Additional ground truth activities and aids to SAR imagery interpretation, Hopedale, Labrador, Winter 1977.
Strong, D.C., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication,* Apr. 1978, 77-36, 68p., 12 refs.
Worsfold, R.D.
Radar echoes, Sea ice distribution, Ice sheets, Ice physics, Snow cover distribution, Snow physics, LANDSAT, Photography.

33-4707
Is Antarctica really the last treasury of mankind. [Ist die Antarktis wirklich die letzte Schatzkammer der Menschheit?],
Tessensohn, F., *Umschau,* Apr. 15, 1979, 79(8), p.248-253, In German with English summary. 6 refs.
Natural resources, Minerals, Exploration, Engineering geology.
Many articles appearing in the press during the last months gave the impression of Antarctica being the last source on earth for all kinds of natural resources, the "last treasury of mankind". These statements are critically tested in this article by summing up the facts on the so far known occurrences of mineral resources in Antarctica and the difficulties which a possible commercial exploitation of a mineral deposit would encounter. It is concluded, that mineral exploitation in Antarctica is unlikely in the near future, but research carried out now might well pay off for coming generations. (Auth.)

33-4708
Experimental measurements of sea ice failure stresses near grounded structures.
Sackinger, W.M., et al, Fairbanks, University of Alaska, 1978, 85p., 18 refs. This report also included in Environmental assessment of the Alaskan continental shelf, Vol.1. Physical science studies. Principal investigators' final reports, March 1979, p.31-121.
Nelson, R.D.
Sea ice, Ice strength, Stresses, Measuring instruments, Pack ice, Remote sensing, Telemetering equipment.

33-4709
Waste heat capture study.
Robert W. Retherford Associates, Anchorage, Alaska, 1978, 115p. + 72p. appends, Numerous refs.
DLC TJ260.R6 1978
Heat recovery, Heat sources, United States—Alaska.

33-4710
Intramolecular potential of water molecules engaged in hydrogen bonding from analysis of the overtone spectrum of ice I.
Sceats, M.G., et al, *Journal of chemical physics,* July 15, 1979, 71(2), p.973-982, 37 refs.
Rice, S.A.
Ice formation, Water chemistry, Hydrogen bonds.

33-4711
On the role of Fermi resonance in the spectrum of water in its condensed phases.
Sceats, M.G., et al, *Journal of chemical physics,* July 15, 1979, 71(2), p.983-990, 38 refs.
Stavola, M., Rice, S.A.
High pressure ice, Amorphous ice, Spectra, Resonance.

33-4712
Simulation of inertial oscillation in drifting pack ice.
McPhee, M.G., *Dynamics of atmospheres and oceans,* May 1978, 2(2), p.107-122, 14 refs.
Pack ice, Drift, Ocean currents, Mathematical models, Mass transfer, Wind pressure.

33-4713
Engineering geology of the USSR. Vol.7, Central Asia. [Inzhenernaia geologiia SSSR. Tom sed'moĭ. Sredniaia Aziia],
Tuliaganov, Kh.T., ed, Moscow, Universitet, 1978, 351p., In Russian with English table of contents enclosed. Refs. p.346-349.
Teush, R.P., ed, Khodzhibaev, N.N., ed.
DLC TA705.4.R9I59
Alpine land forms, Engineering geology, Mountain glaciers, Rock streams, Solifluction, Roads, Railroads, Buildings, Avalanches, Firn fields, Environmental protection, USSR—Central Asia.

33-4714
Determining effective technological schemes for cutter-bar excavators working in frozen ground. [Metodika opredeleniia ratsional'nykh tekhnologicheskikh skhem razrabotki merzlogo grunta s primeneniem barovykh zemlereznykh mashin],
Basov, I.G., *Tomsk. Politekhnicheskiĭ institut. Izvestiia,* 1968, Vol.158, p.44-48, In Russian.
Earthwork, Excavating equipment, Frozen ground.

33-4715
Ultimate working regimes of cutter-bar excavators for frozen ground. [O predel'nykh rezhimakh raboty barovogo ispolnitel'nogo organa pri rezanii merzlogo grunta],
Basov, I.G., *Tomsk. Politekhnicheskiĭ institut. Izvestiia,* 1968, Vol.158, p.55-58, In Russian. 2 refs.
Earthwork, Excavating equipment, Frozen ground.

33-4716
Cratering and ditching in frozen soils.
Riddoch, R.G., Kingston, Ont., Royal Military College of Canada, June 1979, 213p., M.E. thesis. Refs. p.191-195.
Frozen ground strength, Blasting, Excavation, Drilling, Fracturing, Earthwork, Compressive strength, Cold weather construction, Permafrost beneath structures, Explosion effects, Design.

33-4717
Introduction to the rheology of snow. [Introduction à la rhéologie de la neige],
Montmollin, V. de, Grenoble, Université scientifique et médicale, 1978, 285p., Ph.D. thesis. In French with English summary. 35 refs.
Snow surveys, Snow creep, Rheology, Snow mechanics, Metamorphism (snow), Shear properties, Wave propagation.

33-4718
Sixth Conference-Seminar on the Exchange of Experience in Construction under Severe Climatic Conditions. Proceedings. Vol.4, No.1.
Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970, Krasnoyarsk, 1970, 115p., In Russian. For individual papers see 33-4719 through 33-4731. Refs. passim.
DLC TH5.S69
Construction materials, Steel structures, Welding, Cold weather construction, Buildings, Walls, Panels, Aluminum, Thermal insulation, Rubber, Roofs, Wood, Wooden structures, Prefabrication, Wind pressure.

33-4719
New low-alloy nitrogen-vanadium semi-killed steel for welded structures designed for the Far North. [Novaia nizkolegirovannaia azotistovanadievaia poluspokoĭnaia stal' dlia svarnykh stroitel'nykh konstruktsiĭ, prednaznachennykh dlia raboty v usloviiakh Severa],
Pavlov, V.V., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.5-15, In Russian. 4 refs.
Zhemchuzhnikov, G.V.
DLC TH5.S69
Steels, Welding, Steel structures, Cold weather performance.

33-4720
Effect of technological defects on static strength of welded joints at low temperatures. [Vliianie tekhnologicheskikh defektov na staticheskuiu prochnost' svarnykh soedineniĭ, rabotaiushchikh v usloviiakh nizkikh temperatur],
Kotenko, E.V., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.16-27, In Russian. 8 refs.
Zhemchuzhnikov, G.V., Girenko, V.S.
DLC TH5.S69
Steel structures, Welding, Frost resistance, Joints (junctions), Defects, Cold weather construction.

33-4721
Fatigue life of the seam zone near welded joints of thermally strengthened construction steels at low temperatures (bibliographic review). [Rabotosposobnost' okoloshovnoĭ zony svarnykh soedineniĭ termouprochnennykh stroitel'nykh staleĭ pri nizkotemperaturnoĭ ekspluatatsii (obzor literatury)],
Volovik, A.IA., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.28-34, In Russian. 8 refs.
DLC TH5.S69
Steel structures, Welding, Joints (junctions), Frost resistance.

33-4722
Ways of improving steel structures at low air temperatures. (Puti povysheniia nadezhnosti stal'nykh konstruktsiĭ, ekspluatiruiushchikhsia pri nizkikh temperaturakh vozdukha)
Sil'vestrov, A.V., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.35-43, In Russian. 8 refs.
DLC TH5.S69
Brittleness, Steel structures, Welding, Defects, Cold weather performance.

33-4723
Prestressed aluminum wall panels. (Stenovoe ograzhdenie iz predvaritel'no napriazhennykh aliuminievykh panelei)
Dukarskiĭ, IU.M., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.44-54, In Russian.
Belov, S.V.
DLC TH5.S69
Walls, Panels, Aluminum, Thermal insulation, Buildings.

33-4724
Three-layer panels with corrugated sheeting and polymer thermal insulation. (Trekhsloĭnye paneli s primeneniem metallicheskogo gofrirovannogo nastila i polimernogo uteplitelia)
Tamplon, F.F., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.55-62, In Russian. 1 ref.
Krokhalev, V.G.
DLC TH5.S69
Roofs, Panels, Metals, Thermal insulation.

33-4725
Sectional structures in the construction of settlements in northern Canada. (Sbornye konstruktsii v poselkovom stroitel'stve na severe Kanady)
Krupitsa, K.K., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.63-74, In Russian.
Lazhintsev, V.I
DLC TH5.S69
Buildings, Prefabrication, Walls, Roofs, Panels, Thermal insulation, Joints (junctions).

33-4726
Low temperature performance of synthetic rubber roofing materials. (Krovlia zavodskogo izgotovleniia iz sinteticheskikh kauchukov i ee ekspluatatsionnye svoĭstva pri nizkikh temperaturakh)
Folomin, A.I., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.75-79, In Russian.
Safonov, A.M.
DLC TH5.S69
Roofs, Construction materials, Rubber, Frost resistance.

33-4727
No-roll polymer roofing of increased chemical and frost resistance. (Bezrulonnaia polimernaia krovlia povyshennoĭ morozostoĭkosti i khimstoĭkosti)
Shul'zhenko, IU.P., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.80-83, In Russian. 3 refs.
DLC TH5.S69
Roofs, Construction materials, Polymers, Frost resistance.

33-4728
New methods of improving the strength of Arbolit. (Novye metody povysheniia prochnosti arbolita)
Van'kov, P.I., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.84-89, In Russian. 4 refs.
Klar, G.V.
DLC TH5.S69
Construction materials, Wood, Admixtures, Plastics, Frost resistance.

33-4729
Technology and properties of Arbolit used in the Tyumen' Region. (Osobennosti tekhnologii i svoĭstv arbolita, vnedrennogo v Tiumenskoĭ oblasti)
Buzhevich, G.A., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.90-99, In Russian.
Shcherbakov, A.S., Gusev, B.P., Babkin, V.I.
DLC TH5.S69
Construction materials, Plastics, Admixtures, Wood, Wastes, Strength, Frost resistance.

33-4730
Calculating frameless buildings for moisture and thermal stresses. (Voprosy rascheta beskarkasnykh zdaniĭ na temperaturno-vlazhnostnye vozdeĭstviia)
Sid'ko, I.N., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.100-107, In Russian. 2 refs.
DLC TH5.S69
Buildings, Humidity, Thermal stresses, Design.

33-4731
Wind loads on building walls. (O vozdeĭstvii vetra na ograzhdaiushchie konstruktsii zdaniĭ)
Dobrynin, E.N., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(1), p.108-114, In Russian. 5 refs.
Plaksina, T.M., Andreev, I.D.
DLC TH5.S69
Wind pressure, Walls, Design, Buildings.

33-4732
Sixth Conference-Seminar on the Exchange of Experience in Construction under Severe Climatic Conditions. Proceedings. Vol.4, No.2.
Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970, Krasnoyarsk, 1970, 140p., In Russian. For individual papers see 33-4733 through 33-4751. Refs. passim.
DLC TH5.D69
Climate, Buildings, Walls, Humidity, Air temperature, Concete structures, Thermal insulation, Prefabrication, Panels, Metals.

33-4733
Calculations and field studies of the moisture regime of walls in the Arctic. (Raschety i naturnye issledovaniia vlazhnostnogo rezhima sten zdaniĭ v Arktike)
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Shkliarov, N.D.
Walls, Humidity, Vapor transfer, Design, Buildings, Air temperature, Freeze thaw cycles.

33-4734
Selecting rational structures of exterior walls for residential buildings in Yakutia. (O vybore ratsional'noĭ konstruktsii naruzhnykh sten zhilykh zdaniĭ v usloviiakh IAkusткoĭ ASSR)
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Joints (junctions), Residential buildings, Walls, Air leakage (buildings), Heat loss, Thermal insulation, Permafrost beneath structures, Design.

33-4735
Promising cellular concrete structures for industrial and residential construction in the North. (Perspektivnye konstruktsii iz iacheistykh betonov v promyshlennom i zhilishchnom stroitel'stve na Severe)
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Concrete structures, Industrial buildings, Walls, Cellular concretes, Panels, Thermal insulation, Design.

33-4736
Structures of exterior walls of two-layer panels with light concrete thermal insulation. (Konstruktsii naruzhnykh sten iz dvukhsloĭnykh paneleĭ s uteplitelem iz legkogo betona)
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Oganian, K.M., Shliapin, B.B.
Buildings, Walls, Panels, Cellular concretes, Thermal insulation, Desing.

33-4737
Structural design of the thermal regime of ground floor framing in buildings on permafrost. (Inzhenernyĭ raschet teplovogo rezhima tsokol'nykh perekrytiĭ zdaniĭ na vechnomerzlykh gruntakh)
Vas'kovskiĭ, A.P., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.38-48, In Russian. 8 refs.
Shkliarov, N.D.
Permafrost beneath structures, Floors, Thermal regime, Buildings.

33-4738
Use of ash concrete in exterior walls of buildings in Noril'sk. (K voprosu primeneniia gazozolobetona v naruzhnykh stenakh proizvodstvennykh zdaniĭ Noril'ska)
Alilueva, S.T., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.49-57, In Russian. 3 refs.
Walls, Concrete structures, Panels, Cellular concretes, Thermal insulation, Buildings, Permafrost beneath structures.

33-4739
Effective enclosures for few-story industrial buildings in the Central Ob' River area. (Effektivnye ograzhdaiushchie konstruktsii dlia industrial'nogo maloetazhnogo stroitel'stva v Srednem Priob'e)
Savoĭskiĭ, V.M., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.58-63, In Russian. 7 refs.
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Industrial buildings, Walls, Permafrost beneath structures, Construction materials, Prefabrication, Panels.

33-4740
Field studies of enclosures built of three-layer metal panels. (Naturnye obsledovaniia ograzhdaiushchikh konstruktsiĭ iz metallicheskikh trekhsloĭnykh paneleĭ)
Tamplon, F.F., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.64-70, In Russian.
Nikolashkin, G.A.
Walls, Panels, Aluminum, Thermal insulation, Roofs, Buildings.

33-4741
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Zheleznyĭ, V.I., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.71-76, In Russian. 7 refs.
Walls, Panels, Aluminum, Thermal insulation, Roofs, Joints (junctions), Thermal regime, Humidity.

33-4742
State of enclosures of the Baykal Cellulose Plant. [Sostoianie ograzhdaiushchikh konstruktsiĭ Baĭkal'skogo tselliuloznogo zavoda],
Alilueva, S.T., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.77-82, In Russian.
Pikhovkin, V.A.
Walls, Roofs, Panels, Cellular concretes, Joints (junctions), Humidity, Industrial buildings, Freeze thaw cycles.

33-4743
Structures of curtain panel joints of exterior walls. [Konstruktsiia stykov navesnykh paneleĭ naruzhnykh sten],
Stanov, V.I., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.83-89, In Russian.
Walls, Panels, Large panel buildings, Joints (junctions), Grouting, Permafrost beneath buildings.

33-4744
Using glass-reinforced concrete panels in plants with high humidity at ambient air temperature of -36C. [Opyt primeneniia steklozhelezobetonnykh paneleĭ v tsekhakh s vysokoĭ vlazhnost'iu pri raschetnoĭ temperature naruzhnogo vozdukha -36 C],
Pavlova, A.G., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.90-94, In Russian. 5 refs.
Industrial buildings, Walls, Roofs, Panels, Reinforced concrete, Wind pressure, Thermal stresses, Design, Light transmission.

33-4745
Thermotechnical qualities of enclosures of dismountable assembled structures allowing for air leakage. [Teplotekhnicheskie kachestva ograzhdaiushchikh konstruktsiĭ sborno-razbornykh sooruzheniĭ s uchetom infil'tratsii],
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Walls, Heat loss, Panels, Air leakage (buildings), Design, Buildings.

33-4746
Influence of heating devices on the thermal stress state of one-layer building panels. [Vliianie otopitel'nykh priborov na teplovoe i termonapriazhennoe sostoianie odnosloĭnykh paneleĭ zdaniĭ],
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Walls, Heating, Thermal stresses, Panels, Buildings.

33-4747
Plastic window sashes. [Okonnye pereplety iz plastmass],
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Nikolaev, A.N., Bokorev, S.P., Aleksandrova, Z.G.
Plastics, Frost resistance, Air leakage (buildings), Window sashes.

33-4748
Studying moisture regime of combined wall panels for industrial buildings under severe climatic conditions. [K issledovaniiam vlazhnostnogo rezhima sovmeshchennykh plit pokrytiĭ promyshlennykh zdaniĭ v surovykh usloviiakh],
Boĭko, G.V., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.115-118, In Russian.
Walls, Panels, Moisture, Thermal regime, Permafrost beneath structures, Industrial buildings.

33-4749
Glued plywood panels for residential buildings in the Far North. [Kleefanernye paneli dlia zhilykh domov na Kraĭnem Severe],
Levinson, V.D., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.119-124, In Russian.
Svetozarova, E.I., Terent'ev, V.IA.
Residential buildings, Walls, Panels, Wooden structures, Permafrost beneath structures.

33-4750
Carbamide foam plastics for thermal insulation of attics in the Far North. [Karbamidnye penoplasty dlia teploizoliatsii cherdachnykh perekrytiĭ v usloviiakh Kraĭnego Severa],
Krasheninnikov, A.N., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1979, 4(2), p.125-133, In Russian. 7 refs.
Shplet, N.G.
DLC TH5.S69
Roofs, Attics, Thermal insulation, Residential buildings.

33-4751
Thermal regime of aluminum panel houses. [Temperaturnyĭ rezhim doma iz aliuminievykh paneleĭ],
Pchelintsev, V.T., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(2), p.134-138, In Russian.
Residential buildings, Panels, Aluminum, Thermal regime, Thermal insulation, Permafrost beneath structures.

33-4752
Sixth Conference-Seminar on the Exchange of Experience in Construction under Severe Climatic Conditions. Proceedings. Vol.4, No.3.
Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970, Krasnoyarsk, 1970, 156p., In Russian. For individual papers see 33-4753 through 33-4766. Refs. passim.
DLC TH5.S69
Concrete structures, Concretes, Reinforced concrete, Concrete strength, Frost resistance, Concrete freezing, Concrete retarders, Prestressed concrete, Concrete placing, Settlement (structural), Cellular concretes, Cements, Concrete aggregates.

33-4753
Service life and strength of concrete at low temperatures. [Dolgovechnost' i prochnostnye svoĭstva betona v usloviiakh nizkikh temperatur],
Moskvin, V.M., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.5-26, In Russian. 10 refs.
Kapkin, M.M., IArmakovskiĭ, V.N.
DLC TH5.S69
Concretes, Freeze thaw cycles, Concrete strength, Frost resistance, Low temperature tests, Laboratory techniques.

33-4754
Structural defects of freezing concrete. [Strukturnye defekty v betone pri vozdeĭstvii na nego otritsatel'nykh temperatur],
Ivanova, O.S., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.27-41, In Russian. 9 refs.
Krylov, B.A.
DLC TH5.S69
Winter concreting, Concrete freezing, Concrete strength, Concrete structures, Concrete placing.

33-4755
Influence of structural characteristics on frost resistance of concretes. [Vliianie strukturnykh kharakteristik na morozostoĭkost' betonov],
Alimov, L.A., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.42-47, In Russian. 1 ref.
Voronin, V.V., Gorchakov, G.I.
DLC TH5.S69
Lightweight concretes, Concrete aggregates, Concrete structures, Frost resistance, Cements.

33-4756
Combined dilatometer-calorimeter for studying concrete structure and durability. [Issledovanie struktury i dolgovechnosti betonov s pomoshch'iu kompleksnogo pribora dilatometra-kalorimetra],
Ivanov, V.I., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.48-59, In Russian. 8 refs.
Lifanov, I.I., Gorchakov, G.I.
DLC TH5.S69
Concrete strength, Concrete aggregates, Concrete freezing, Concrete structures.

33-4757
Formation of prestressed concrete structure at subzero temperatures. [Osobennost' strukturoobrazovaniia betona v usloviiakh predvaritel'no napriazhennogo elementa pri otritsatel'nykh temperaturakh],
Kosolapov, A.V., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.60-69, In Russian. 7 refs.
Kichigina, G.I.
DLC TH5.S69
Prestressed concrete, Reinforced concrete, Concrete hardening, Concrete structures, Concrete freezing, Winter concreting.

33-4758
Evaluating shrinkage and thermal deformations of concrete at subzero temperature. [Otsenka temperaturnykh i usadochnykh deformatsiĭ betona pri otritsatel'noĭ temperature],
Kichigina, G.I., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.70-77, In Russian. 6 refs.
Kosolapov, A.V.
DLC TH5.S69
Prestressed concrete, Reinforced concrete, Concrete freezing, Concrete hardening, Deformation.

33-4759
Electric heating effect on changes in phase composition, hydration and structure of cement stones. [Vliianie elektrorazogreva na izmenenie fazovogo sostava, stepeni gidratatsii i struktury tsementnogo kamnia],
IArlushkina. S.Kh., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.78-91, In Russian. 2 refs.
Volkov, O.S., Larionova, Z.M., Krylov, B.A.
DLC TH5.S69
Cements, Chemical composition, Electric heating, Phase transformations, Structures, Hardness.

33-4760
Elastic heating units for thermal treatment of concretes. [Opyt primeneniia gibkikh elektronagrevateleĭ pri teplovoĭ obrabotke betona],
Mironov, S.A., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.92-98, In Russian.
Krylov, B.A., Pizhov, A.I., Babaev, A.A.
DLC TH5.S69
Concrete heating, Electric heating, Concrete admixtures, Winter concreting, Concrete hardening, Prefabrication.

33-4761
Durability of reinforced concrete piles under severe climatic conditions. [K voprosu o dolgovechnosti zhelezobetonnykh svaĭ v surovykh klimaticheskikh usloviiakh],
Snezhko, Z.P., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.99-106, In Russian. 2 refs.
DLC TH5.S69
Concrete piles, Reinforced concrete, Pile foundations, Concrete freezing, Concrete strength.

33-4762
Thermal deformations and frost resistance of lightweight concretes with porous aggregates in the Far North. [Temperaturnye deformatsii i morozostoĭkost' legkikh betonov na poristykh zapolniteliakh v usloviiakh Kraĭnego Severa],
Abramova, P.S., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.107-113, In Russian. 2 refs.
IUrchenko, E.N.
DLC TH5.S69
Lightweight concretes, Concrete aggregates, Frost resistance, Freeze thaw cycles, Concrete strength.

33-4763
Studying properties of aerated haydite concrete for construction in the Yakut ASSR. [Rezul'taty izucheniia svoĭstv porizovannogo keramzitobetona dlia stroitel'stva v IAkutskoĭ ASSR],
Zaslavskaia, A.S., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.114-123, In Russian. 2 refs.
DLC TH5.S69
Cellular concretes, Cements, Lightweight concretes, Frost resistance.

33-4764
Experimentation with using aerated concretes with dense aggregates instead of coarsely porous concretes in the Far North. [Opyt issledovaniia i vnedreniia na Kraĭnem Severe porizovannogo betona na plotnykh zapolniteliak vzamen krupnoporistogo betona],
Buzhevich, G.A., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.124-134, In Russian.
Rumiantseva, L.A., Romanov, IU.M.
DLC TH5.S69
Lightweight concretes, Concrete structures, Concrete aggregates, Frost resistance.

33-4765
Durability of cellular concrete structures. [O dolgovechnosti konstruktsiĭ iz iacheistykh betonov],
Baranov, A.T., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.135-139, In Russian.
DLC TH5.S69
Cellular concretes, Lightweight concretes, Concrete aggregates, Wastes, Prefabrication, Frost resistance, Concrete strength.

33-4766
Ultimate water content in plastically flowing mixtures for frost resistant concretes. [Predel'noe vodosoderzhanie plastichnolitoĭ betonnoĭ smesi dlia morozostoĭkogo betona],
Akhmylovskiĭ, B.A., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovykh klimaticheskikh usloviiakh, 6, Krasnoiarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970),* 1970, 4(3), p.140-154, In Russian. 8 refs.
DLC TH5.S69
Concrete freezing, Concrete aggregates, Frost resistance, Tests, Concretes, Water content.

33-4767
Deposition and accumulation of plutonium isotopes in Antarctica.
Cutter, G.A., et al, *Nature,* June 14, 1979, 279(5715), p.628-629, 17 refs.
Bruland, K.W., Risebrough, R.W.
Snow composition, Snow impurities, Radioactive isotopes, Fallout.
Data are presented on the deposition of plutonium isotopes from the atmosphere at Dome C on the high antarctic plateau. The activities of Pu-239+240 and Pu-238 versus snow depth are plotted and discussed. The period of peak fallout of Pu-239+240 occurred during 1955-59 and appears to be representative of weapons tests at Bikini and Eniwetok. The Apr. 1964 burnup of a satellite (SNAP-9A) containing 17 kCi of Pu-238 in the southern stratosphere is recorded as a rapid activity in the 1965-66 stratum in the snow reecord of Pu-238 at Dome C. The profiles suggest that almost all of the plutonium isotopes injected into the atmosphere have now been removed. The activities of both Pu-239+240 and Pu-238 deposited during 1976 at Dome C were only 1.4% of the activities deposited during the respective periods of maximum fallout.

33-4768
Ice cores and climatic change.
Robin, G. de Q., *Royal Society of London. Philosophical transactions. Series B,* 1977, Vol.280, p.143-168, 44 refs.
Ice sheets, Ice cores, Climatic changes, Ice dating, Glacial geology, Paleoclimatology, Antarctica—Byrd Station, Antarctica—Vostok Station.
The paper deals primarily with the use of stable isotopic ratios to determine the former climate of ice sheets. Studies of temperature profiles throughout ice sheets have shown that for at least several thousand years, changes of isotopic delta ratios have been proportional to changes of surface temperatures; this relationship is discussed in terms of the physical processes involved. It is considered reasonable to use a similar relation for earlier periods in Antarctica, but in Greenland the relation may have varied with time. When determining past climates from the isotopic record, allowances have to be made for changes in the flow and thickness of ice sheets during major glacial periods. These factors are considered in relation to major ice cores from Vostok and Byrd stations in Antarctica and from Camp Century in Greenland. Vostok is the simplest case glaciologically, Camp Century the most complex. On purely glaciological grounds it appears that the ice age gave way to present-day climates some 1000 a B.P., the coldest period being 2000 a B.P., when the climate in Antarctica was 6-8C colder than at present. Glaciological data suggest a duration of 50,000 to 100,000 years for the last ice age. Before this period, climates in Greenland and Antarctica appear to have been around 2-3C warmer than at present. (Auth)

33-4769
World's biggest moving job—icebergs.
Fales, E.D., Jr., *Popular mechanics,* Jan. 1978, 149(1), p.47-51.
Water supply, Ice (water storage), Iceberg towing.
This article describes methods of towing icebergs devised at Memorial University in Newfoundland and tested in the North Atlantic. The original impetus for the project came from the need to protect offshore oil platforms from iceberg flows but such technology would be applicable for towing icebergs to arid regions for use as drinking water, "floating freezers," and weather control devices.

33-4770
Relationship between mean stresses and local values of internal forces in a drifting ice cover.
Khelsin, D.E., *Oceanology,* Dec. 1978, 18(3), p.285-286, Translated from Okeanologiia. 4 refs.
Ice cover, Drift, Ice floes, Ice pressure, Ships, Ice navigation, Mathematical models.

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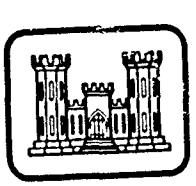
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NOTE

This is a companion issue to CRREL Report 12, Vol. 33, Pt.1. The latter contains the full bibliographic citations referred to in the author and subject indexes included in this issue. In the author index principal and joint personal and corporate authors are listed along with the title, date, pagination, and language of the document and the accession number. The subject index is composed of three basic elements: 1) terms taken from a controlled vocabulary based on the *Thesaurus of Engineering and Scientific Terms* (LEX-EJC), 2) free terms added as needed, 3) geographic names, generally entered under countries. The terms are listed in a single alphabetical arrangement, along with title (original, translated, abridged, expanded, or supplied), principal author, date, pagination, and language of pertinent documents, and their accession numbers.

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See also Airborne equipment; Balloons; Brakes (motion arresters); Buoys; Cables (ropes); Caissons; Construction equipment, Cranes; Deicers, Drills; Electric equipment; Electronic equipment; Excavating equipment; Front end loaders; Hydraulic conveyors; Ice drills; Ice removal equipment; Infrared equipment, Materials handling equipment, Military equipment, Portable equipment, Railroad equipment; Rescue equipment, Samplers; Skis; Snow removal equipment, Telemetering equipment, Test equipment, Turbines

Erosion

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See: National parks

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See: Ice crystal collision

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See: Frost heave

Pavement icing

See: Road icing

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See: Soil formation

Pellets
See: Snow pellets

Penetration
See: Projectile penetration

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