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14. ABSTRACT The principal research effort has been towards understanding the high-frequency tail of the surface gravity wave spectrum, lengths of 2 cm to 60 cm; these are principally responsible for wind drag on water. Analysis was based on a unique data set from geophones and hydrophones at 5 1/2 km depth midway between California and Hawaii. The measured spectral intensity around 10 Hz gives a more accurate measure of local winds than the standard satellite scatterometry. A spectral gap at the 30 Hz gravity to capillary transition offers new opportunities for spectral monitoring. We are making progress towards understanding the generation processes. A continuing effort towards the acoustic monitoring of ocean processes has been directed at the polar ocean cavities sandwiched between the floating ice sheet and the sea floor. We are exploring a possible tomography experiment in the Ross Sea with the goal of better predicting polar ice melting processes and the associated global rise in sea level.					
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Secretary of the Navy Professor of Oceanography

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The principal research effort has been towards understanding the high-frequency tail of the surface gravity wave spectrum, lengths of 2 cm to 60 cm; these are principally responsible for wind drag on water. Analysis was based on a unique data set from geophones and hydrophones at 5 1/2 km depth midway between California and Hawaii. The measured spectral intensity around 10 Hz gives a more accurate measure of local winds than the standard satellite scatterometry. A spectral gap at the 30 Hz gravity to capillary transition offers new opportunities for spectral monitoring. We are making progress towards understanding the generation processes.

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PUBLICATIONS

Farrell, W. and W. Munk, (2010). Booms and Busts in the Deep. *Journal of Physical Oceanography*, **40**, 2159-2169.

Munk, W. (2011) The Sound of Climate Change: Crafoord Prize Scientific Lecture, *Tellus*, 1-8.

Worcester, P.F., W.H. Munk, B.D. Cornuelle, M.A. Dzieciuch, and K.E. Wage (2011), Exploring an under-ice ocean cavity with sound, paper presented at XXV IUGG General Assembly, Melbourne, Australia, 28 June – 7 July 2011.

Munk, W. (2011) Nansen Center 1986-2011: A View from La Jolla. *Presentations from the Nansen Center's 25 Years Colloquium*, <http://www.nersc.no/news/presentations-nansen-center%C2%B4s-25-years-colloquium-available>.

- Worcester, P. F., and W. H. Munk (2012), Oceanography in 2030: The role of acoustics in observing the ocean, 2012 Ocean Sciences Meeting, Salt Lake City, Utah, 20–24 February 2012. (POSTER)
- Worcester, P. F., W. H. Munk, B. D. Cornuelle, M. A. Dzieciuch, and K. E. Wage (2012), Exploring an under-ice ocean cavity with sound, 2012 Ocean Sciences Meeting, Salt Lake City, Utah, 20–24 February 2012. (ORAL)
- Munk, W. and C. Pendarvis (2012) Where the Swell Begins. Groundswell Publication Annual Publication, 5, 242-257, in press.
- Dashen, R. and W. Munk (2013) A Model of Ocean Noise, JASA Special Issue, in press.
- Farrell, W. and W. Munk (2013) Surface gravity waves and their acoustic signatures, 1-30 Hz, on the mid-Pacific sea floor, JASA Special Issue, 134(4).
- Young, W.R., C.L. Wolfe, and W.H. Munk (2013) Generation of gravity-capillary waves by instability of shear flow, J. Fluid Mech., submitted.
- Munk, W. (2013) The perfect storm. Proceedings of the American Philosophical Society, in press.

Meetings and Invited Talks

Courant Institute of Mathematical Science, Center for Atmosphere Ocean Science Colloquium, **Invited Lecture:** *Exploring an under-ice ocean cavity with sound*, New York University, 04 November 2010

Attended: MEDEA Ocean Panel; Herndon, VA; 17-20 January 2011

Attended: American Philosophical Society Annual Meeting 28-30 April 2011

Invited Talk: *Scripps Then, Now, and in the Future*; Scripps Institution of Oceanography, La Jolla, CA; 12 May 2011

Attended: International Symposium on Interactions of Glaciers and Ice Sheets with the Ocean SIO, Scripps Institution of Oceanography, La Jolla, CA; 5-10 June 2011

Attended: Algae + Fish = Ocean Mixing? Conference, La Jolla, CA; 5-6 July 2011

Attended: JASON Summer Session; July 2011

Attended: Meeting of the Navy Chairs, ONR, Washington, D.C.; 18 August 2011

Attended: The Venice Conference: Improving the Capacity to Assess and to Adapt to Climate Change in Urban Coastal Regions, Venice Italy, 12-15 September 2011

Invited Talk: *Waves, long and short*, Fourteenth NPAL (North Pacific Acoustic Laboratory) Workshop; Fallbrook, CA; 20 October 2011

Keynote Address: *Waves, long and short*, Symposium to honour the scientific work of Klaus Hasselmann at the Max Planck Institute for Meteorology; Hamburg, Germany; 09 November 2011

Keynote Address: *Nansen Center 1986-2011: A View from La Jolla*, Nansen Center 25 Year Colloquium, In Honour of Fridtjof Nansens 150 Year Anniversary; Bergen, Norway; 18 November 2011

Invited Talk: *Waves, long and short*, National Oceanography Centre Lecture Series; NOC Southampton; 24 November 2011

Invited Talk: 2012 Distinguished Speakers Series, Riford Center; La Jolla, CA; 26 January 2012

Invited Talk: *Science and Technology on the Homefront*, 2012 Lecture Series, La Jolla Historical Society; La Jolla, CA; 07 April 2012

Attended: The American Philosophical Society Annual Meeting; Philadelphia, PA; 19-21 April 2012

Attended: JASON Spring Meeting; Arlington, VA; 27-29 April 2012

Attended: The National Academy of Sciences Annual Meeting; Washington, DC; 29 April – 01 May 2012

Invited Talk: *Wind drag and ultra-gravity waves*, IUGG Conference on Mathematical Geophysics; University of Edinburgh, 18-22 June 2012

Attended: Laying of the Keel of the Ocean Class Oceanographic Vessels AGOR 27 & AGOR 28; Anacortes, WA; 17 August 2012

Birch Aquarium at Scripps, University of California, San Diego (La Jolla, CA)
Distinguished Speakers Series: “*Where the Swell Begins*” (October 8, 2012)

Southern Ocean Observing System Workshop - Seeing Below the Ice (Hobart, Tasmania)
“*Where the Swell Begins*” (October 22-25, 2012)

CSIRO Student Symposium (Hobart, Tasmania)
“*Where the Swell Begins*” (October 26, 2012)

Symposium and Reception at Tokyo University
"A Discussion with Walter Munk" (November 7, 2012)

Kyoto Prize Presentation at the Atheneum (La Jolla, CA) "Reflections of a Past Laureate
on the 2012 Kyoto Prize Ceremony" (November 28, 2012)

Penn State University (State College, PA)
"Where the Swell Begins" (February 5, 2013)

Groundswell Society Annual Meeting (La Jolla, CA)
"Where the Swell Begins" (February 16, 2013)

Keck Theory Seminar at Scripps Institution of Oceanography, UCSD (La Jolla, CA)
"Where the Swell Begins" (March 30, 2013)

The American Philosophical Society Annual Meeting (Philadelphia, PA)
The Penrose Memorial Lecture: *"The Perfect Storm"* (April 24-26, 2013)