

MEETINGS

Scientific Drilling for Climate-Related Objectives on Arctic Ocean Margins

Catching Climate Change in Progress: Drilling on Circum-Arctic Shelves and Upper Continental Slopes; San Francisco, California, 10–11 December 2011

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Fifty scientists and program managers met to discuss plans for scientific drilling on the margins of the Arctic Ocean. The workshop was coconvened by T. Collett (U.S. Geological Survey), S. Dallimore (Geological Survey of Canada), J. Mienert (Tromsø, Norway), C. Paull (Monterey Bay Aquarium Research Institute), and V. Romanovsky (University of Alaska Fairbanks) and was sponsored by the U.S. Science Support Program for the Integrated Ocean Drilling Program (IODP).

The Arctic Ocean remains the most poorly studied of the world's oceans, and some scientists have expressed strong interest in making the Arctic a high priority during the post-2013 phase of IODP. The 45-year-long history of scientific ocean drilling has included only one program in the high Arctic (Arctic Coring Expedition (ACEX), IODP Expedition 302) and several expeditions to study Arctic Ocean gateways, particularly in the Norwegian-Greenland seas. To date, there

has been no targeted planning to pursue the unique records of Pleistocene (~2.6 million to 11,700 years ago) to contemporary sea level fluctuations, glacial and erosional history, sea ice dynamics, and oceanographic and climate change that can be accessed on Arctic Ocean margins. These margins are also the only places to document the impact of Late Pleistocene to contemporary climate change on subsea permafrost and associated methane hydrates. With the trend of decreasing summer sea ice cover in the Arctic Ocean, access to sites where these scientific problems can be studied by seafloor drilling may require only minimal icebreaker support in the future.

The workshop featured presentations on existing and planned IODP proposals; the outcomes of other Arctic Ocean IODP workshops; the challenges of high-latitude and shallow-water drilling; potential industry linkages; and new, more capable platforms for site survey, scientific drilling, and icebreaking in the Arctic Ocean. Many attendees contributed brief presentations to inform planning

of scientific drilling activities. These presentations reviewed a just-completed site survey in the Chukchi Sea; outlined opportunities for IODP interaction with the International Continental Drilling Project (ICDP); made the case for deep biosphere sampling in the Arctic Ocean subseafloor; and described novel logging, observatory, and geophysical tools. Participants also learned about a multiyear drilling activity being conducted in the Laptev Sea from fast ice, the only active scientific drilling in the circum-Arctic Ocean. Breakout groups focused on the use of drilling as a tool to elucidate regional sea level histories, methane dynamics, degradation of subsea permafrost, and paleoclimate and paleoceanography.

Several full proposals and preproposals are pending at IODP for the geographic areas discussed at the workshop. These proposals focus on sea level reconstructions in the Beringia-Chukchi area, abrupt climate change recorded in the Mackenzie Trough, Arctic Ocean gateway paleoceanography, and the opal CT transition in the Norwegian Sea. Partially as a result of this workshop, new proposals are being formulated to study the degradation of permafrost and methane hydrates on the Beaufort Sea margin and methane hydrate degassing on the Svalbard margin. A full report will be posted on the workshop's Web site (<http://iodp-ussp.org/workshop/catching-climate-change/>) in the future.

—CAROLYN RUPPEL, U.S. Geological Survey, Woods Hole, Mass.; E-mail: cruppel@usgs.gov