

## 2008 Annual Report: Ocean & Climate Change Institute

In 2008, the Ocean and Climate Change Institute (OCCI) concentrated most of its research activities and resources on changes in North Atlantic and Arctic Ocean climate. The institute distributed about \$1.3M for the Arctic Research Initiative (ARI), our five-year focused research program, supported by the Sealark Foundation, to study changes in Arctic climate and their impacts on the marine and surrounding terrestrial ecosystems.

Combined with our research activities funded by the Comer Science and Education Foundation, the two year funding total for the Arctic Research Initiative is now about \$5M, supporting more than 30 research projects and significantly enhancing WHOI participation in International Polar Year research. ARI supports diverse research activities, including studies of the transport and fate of terrestrial carbon to the Arctic Ocean, the effects of changing sea ice cover on marine ecosystems and organisms, and the effects of changing ocean circulation on sea ice extent.

OCCI also supported research in other areas and regions, including several studies of the ocean's biological pump and the possibility of ocean iron fertilization to enhance ocean productivity and uptake of atmospheric CO<sub>2</sub>.

Katherine Silverthorne (Joint Program student in Physical Oceanography) was supported by OCCI and her research was highlighted in an article in the January 2009 OCCI report. Katie studies the development of the "18 degree water" in the North Atlantic, a persistent water layer of consistent temperature and salinity characteristics that may play a role in climate).

Jong Jin Park (PO) was the 2008 OCCI Postdoctoral Fellow, working with Ray Schmitt, examining global drifter and float-collected measurements of ocean properties, to study inertial oscillations in the mixed layers of the oceans. Delia Oppo (G&G) and Ruth Curry (PO) finished three-year OCCI fellowships in 2008. Delia works on the past history of earth's climate. Ruth studies the modern ocean circulation and climate-driven changes in ocean properties such as salinity and temperature.

Last year OCCI also participated in notable outreach to individuals from industry and government. In February, we participated in CERA Week 2008, an important annual meeting of the energy industry, at the invitation of WHOI Corporation Member James Rosenfield. At this meeting we had the opportunity to showcase WHOI research and under-ice technology for the Arctic, a region of much interest to energy companies because of its future resource potential.

In July, OCCI participated in a "Climate War Game" hosted by The Center for a New American Security, an independent and nonpartisan defense think tank, which is headed by WHOI Corporation Member Kurt Campbell. The "war game" was a simulation of future international negotiations to reduce greenhouse gas emissions and stabilize climate. Individuals played the roles of future government leaders participating in the negotiations. Our role was to help produce a future climate scenario that would be both realistic and also severe enough to prompt cooperative action by future world leaders. Several of the participants in this war game are now serving in the new administration, including Kurt Campbell, the new Assistant Secretary of State for East Asian Affairs.

With the help of Mary Louise Timmermans (Assistant Scientist in Physical Oceanography), OCCI hosted the International Symposium on Arctic Sea Ice and Climate at WHOI in November. This symposium convened a group of leading Arctic researchers to discuss the recent, rapid melting in the Arctic and to present preliminary observations from the 2008 field season.

As part of OCCI's outreach efforts, one of the Symposium participants, Jean Claude Gascard, an oceanographer at the Université Pierre et Marie Curie in Paris, France, presented a public lecture at Redfield Auditorium in Woods Hole. The lecture, entitled "Arctic Changes, Global Warming, Global Warning", was well attended and stimulated much discussion.

—[William Curry](#), *Institute Director*



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(from left) Joint Program student Camilo Ponton, Tim Eglinton (MCG department chair), Liviu Giosan (G&G), and Daniel Montlucon (MCG) load the helicopter to return from sampling remote lakes in the Canadian Arctic. Supported by the Arctic Research Initiative, the team took lake-bottom sediment cores in the Mackenzie River delta to analyze for baseline data on river flow and transport of organic matter from soils, from pre-industrial times to the present. (Photo courtesy of Liviu Giosan, Woods Hole Oceanographic Institution)



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Bringing up the days' catch—mud from the bottom of a frozen lake near the town of Inuvik in the Canadian Arctic—Joint Program student Camilo Ponton holds the 2.5-meter piston corer used for sampling, flanked by WHOI researchers Liviu Giosan (right) and Daniel Montlucon. The lakefloor sediment layers hold clues to past climate and river flows in the Mackenzie River Delta. (Photo courtesy of Liviu Giosan, Woods Hole Oceanographic Institution)

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