



Antarctic News



Newsletter for Participants of a U.S. Undergraduate Antarctic Program

August 2009

Cruise LMG 09 03

From March to April of 2009 the cruise LMG 09 03 took place. Mason Fried '10 and his advisor, Professor *Eugene Domack* were able to go on this cruise which deployed 4 GPS units to measure total isostatic rebound on the Antarctic Peninsula since the Last Glacial Maximum (LGM). The scientific goals were to establish three bedrock Global Positioning Systems (GPS) which will be interfaced with satellite telemetry. These stations are part of a network of GPS systems to be deployed around the Antarctic and the northern Antarctic Peninsula. The measurements obtained from the instrumentation will be used to evaluate the past loading of the earth's crust from ice sheets that once flowed across the region and to measure the year to

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Looking North at Duthiers Point, with the Antarctic Peninsula highlands off to the right. GPS antenna with Gentoo penguins in the foreground. This outcrop was spotted by Gene some years ago and was both a beautiful sight and a perfect hold for the equipment.

Photo by Bjorn Johns from UNAVCO.

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Success in South Korea

Eugene Domack and *Amy Leventer* attended the 16th International Symposium on Polar Sciences, June 10-12, 2009, Incheon, Korea. One focus of the symposium was the development of collaborative research programs on the new Korean icebreaker, R/V Araon. Our attendance at this workshop was instrumental in strengthening our research links with our Korean colleagues, specifically with Dr. Ho Il Yoon from the Korea Polar Research Institute (KOPRI) and the two Korean scientists who will be participating on cruise NBP10-01, Sun Mi Jeong and Ku Chul Yu. In addition, we developed a preliminary plan for a Korean (Drs. Ho Il Yoon, W.S. Lee and M. Park, KOPRI) – US (LARISSA team members and Drs. R. Dziak and J. Haxel, PMEL NOAA) collaboration for acoustic monitoring of ice calving and quaking.

-Amy Leventer and Gene Domack



Amy Leventer, Eugene Domack, and Dr. Ho Il Yoon in South Korea.

Photo courtesy of Eugene Domack

Symposium website:

<http://symposium.kopri.re.kr/2009/invitation.htm>





A small calving event located at the tide water terminus of the glacier at Palmer Station, Anvers Island. Photo by Mason Fried.

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year gain or loss of water to the ice masses currently encapsulating the mountains of the Antarctic Peninsula. At present very little information is available on the contribution of these glacial systems to global sea level rise. They remain a large unknown in estimates of future sea level rise as the region continues to warm.

The last great ice sheet to cover the region may have done so in ways that have influenced the behavior of current ice shelves, which are just now disintegrating as climate changes.

<http://www.hamilton.edu/news/exp/Antarctica/2009/>

<http://facility.unavco.org/data/>

Antarctic Student Projects at Hamilton College

Kimberly Roe '08 - Kimberly studied the transport of particulate organic matter in sub-ice shelf environments for her senior thesis. Her project evaluated the organic carbon content and stable isotopic composition of 34 surface sediment samples and one kasten core collected in areas formerly occupied by the Larsen A and B Ice Shelves. The study suggests that particulate organic matter transport in the sub-ice shelf environment is related to sea ice extent in the Weddell Sea.

Taylor Burt '08 - The results of radiocarbon analyses on inorganic and organic carbon from Antarctic marine fossils are notoriously difficult to interpret due to reworking and the prominent carbon reservoir effect in the Southern Ocean. Studies have shown significant



Santa Claus Rock installation off Hugo Island. Metal frame with solar panels, battery, transmission case and weather monitor with Mason Fried (left) and Eugene Domack (right) and the Lawrence M. Gould in the background. Photo by Bjorn Johns from UNAVCO.

geographic variability in the magnitude of the later effect (Gordon and Harkness, 1992) and therefore region specific corrections for the carbon reservoir effect are essential for accurate dating of marine fossils. During cruise NBP 01 07, a 9cm long *Errina asperateridae* coral species specimen (dredged from the Adare Basin off the NW Ross Sea) with a modern growth tip was pieced together from the fragments and analyzed for radiocarbon activity at six points along its length. Extrapolating a constant growth rate from the base to the tip allowed us to determine the magnitude of the carbon reservoir effect to be 1020 ± 40 years for the study area, which agrees within the bounds of global ocean ventilation age models, but provides a more precise correction for future studies.

Peter Gerrity '09 - Peter's senior project involved a geochemical analysis of Kasten Core 44 from the cruise NBP 01-07. The core was taken from the southern side of James Ross Island, near the outlet of the Swift Glacier. The purpose of his project was to investigate the changes in total percent carbon and stable isotope ratios of carbon as they relate to the retreat of the Larsen A ice shelf. Using his geochemical data as well as gray scale analysis of x-rays and sediment size analysis that was performed by Cyrus Read, He was able to show both the breakup of the ice sheet and transition to an open ocean environment as they were recorded in the chemical and physical changes in the sediment deposited at the core site.

Mason Fried '10 - Mason has been working on Antarctic Research with Gene for the past year and a half and recently he went on the cruise NBP 09 03. Starting in the

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LARISSA Team

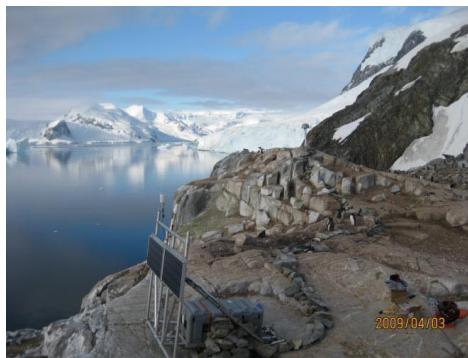
Here is the newest list of Principle Investigators and Collaborators for the LARISSA project. If you would like their full contact information please check out the LARISSA website at this link:

<http://www.hamilton.edu/news/exp/larissa/principleinvestigatorsandcollaborators.html>

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fall of 2009, he will begin work on his thesis which will relate to interannual changes in the cGPS records at Palmer Station.

Alexander DeMoor '10 - Alex spent the spring semester studying abroad in Tasmania and when he returns in the fall, he will be completing a thesis on Snowball Earth analogs in the Antarctic marine sediment records.



Photograph of the entire cGPS station on Duthier's point. Perspective is looking southeast, toward the head of Andvord Bay and Bruce Plateau, in background.
Photo was taken from the LMG 09 03 Cruise Report

The LARISSA team met at National Science Foundation for a Principal Investigators meeting on May 5 and 6. LARISSA is a National Science Foundation-funded initiative that joins



an international, interdisciplinary team together to address a significant regional problem with global change implications, the abrupt environmental change in Antarctica's Larsen Ice Shelf System.

Lead Principal Investigator (PI) and Project Director Eugene Domack, the J. W. Johnson Family Professor of Environmental Studies, and Principal Investigator and Associate Professor of Biology Michael McCormick attended along with several representatives from *National Geographic Magazine*. The publication plans to write about LARISSA's next expedition in 2010 to Antarctica. Other attendees included representatives from national and international colleges and universities, the National Science Foundation's Office of Polar Programs and the National Snow and Ice Data Center. Pictured in the photograph (above) are meeting attendees.

Note as of July 30th: Megan Crocker, the Lab Manager/Research Assistant for Antarctic Research at Hamilton College will finish her contract at the end of July 2009. She will miss working at Hamilton College very much but it is time for her to attend graduate school. In August, she will be pursuing a master's at the University of Utah in Salt Lake City. Megan's email address, mcrocker@hamilton.edu, will still be able to receive emails until the end of October so if anyone has questions or needs concerning her work during the time of her stay at Hamilton College, please feel free to email her.