

LMG 0701
Situation Report
21-28 January, 2007

During the third week of the LTER cruise, we completed all but the final few stations on the main sampling grid. During the grid operations we successfully deployed a physical oceanography mooring of conductivity and temperature sensors and current meters at Station 300.100. The goal of this mooring is to detect intrusions of warm, nutrient-rich Upper Circumpolar Deep Water (UCDW). It will be in place until next January and samples every 20 minutes. The mooring was designed and built by Doug Martinson and Rich Iannuzzi (Lamont-Doherty) and it was deployed by our RPSC support group (Andy Nunn, Greg Buikema, Meghan King, Kevin Pedigo and Fred Stuart) with additional help from Clayton Jones.



Figure 1. Scene on Avian Island, site of a large (50,000 breeding pairs) Adelie penguin rookery and of the birder group's field camp during 20-25 January, 2007. (Photo credit: Kristen Gorman). .

At the end of the week, we made our annual visit to Rothera Base. About 15 LMG personnel spent the day touring the base and visiting friends and colleagues, while an equal number from the base spent the day on the vessel, conducting an instrument intercalibration exercise. The visit concluded with a party in the evening.

Individual science group reports follow.

B-013. Seabird Component (Bill Fraser, PI).

Field Team Members: Eric Erdmann and Kristen Gorman

Our work this week primarily included the Avian Island Field Camp, 20 Jan - 25 Jan 2007. The Avian Island work consisted of Adelie penguin colony surveys, deployment of PTT satellite transmitters on breeding Adelie penguins, Adelie penguin diet sampling, weighing Adelie penguin chicks, surveying marine mammals, breeding Southern Giant Petrels and Blue-eyed Shags.

We observed a Macaroni penguin on Avian Island this year. Several Minke whales were observed near the island during our field camp, as well as 2 attacks on penguins by Leopard seals. The weather was mostly overcast with some occasional snow and rain. The week ended with better weather, just before returning to the L. M. Gould early Friday morning.

We finished the week off with seabird surveys from the bridge of the L.M.G. along the 200 line.

B-016: Phytoplankton Ecology and Marine Optics (Maria Vernet, PI).

Field Team members: Wendy Kozlowski (field team leader), Ryan Burner, Diane Chakos, Mary Engels, Julie Schram, Tyler Thigpen and Tristan Wohlford.

During week three sampling at 23 stations completed work on the 300 and nearly all of the 200 line stations. In addition to the core suite of samples taken at these stations, water was collected and processed at eight locations for size fractionated chlorophylls and at four locations for microzooplankton grazing experiments. During the collaborative science day with the British Antarctic Survey, two stations in the Rothera/Adelaide vicinity were sampled for fluorometer cross-calibration purposes. High primary production (PP) and chlorophyll was seen at the inside of the 300 line, and fluorometry at stations inside Marguerite Bay indicate similar increased levels of both PP and biomass might be expected there.

B-028 Zooplankton and Micronekton. (Langdon B. Quetin and Robin M. Ross (co-PIs), **Field Team Members:** Kelly Moore, Sam Hammond, Dana Nakase, Shannon Rich

During week 3 of the cruise we completed the standard net tows and acoustic transects on the 300 transect line and most of the 200 line. Catches continued to show the presence of ice krill, the cold-water species of euphausiid, out to the middle shelf. In addition we started to catch larval Antarctic silverfish, a species of fish also associated with cold continental shelf water, at the inner shelf stations. Other years these larval silverfish have been confined to the coastal stations. Growth and spawning experiments with Antarctic krill were initiated with krill from stations on the outer and inner shelf. Spawning frequency was higher on these southern lines compared to the northern lines, with up to 10% of the females releasing eggs per day. Based on these experiments the reproductive

cycle was slightly delayed this year in comparison to that of 2006, but on-going spawning both north and south suggests that good conditions for reproduction were/are present in both the 2005-2006 and 2006-2007 seasons.

B-045: Microbial Ecology and Biogeochemistry. (Hugh Ducklow, PI).

Field Team members: Matthew Erickson, David Kirchman, Kristen Myers, Julian Ma, Noelle Yochum. Helping from Palmer Station: Nicole Middaugh.

Like the other groups, we completed full sampling at all stations occupied. In general, bacterial production rates appear higher inshore, with more uniformly high rates spread across the shelf in the south. We also conducted MicroFISH assays at the inner, midshelf and outer slope stations on all 5 transect lines, with accompanying community DNA samples for genomic analysis of bacterial and archaeal populations. We deployed current drifters at the same stations. The latest drifter reports indicate energetic transport to the northeast from the outer northern stations, and cross-shelf transport at the shelf stations.

Webb-Slocum Rutgers Glider Mission (Doug Martinson and Oscar Schofield, PIs).

Field Team member: Clayton Jones.

The Slocum glider is nearing the end of its journey having flown from near Palmer Station out to the 600.100 point on the LTER grid and then turning southerly bisecting the grid hitting the 500.100, 400.100, 300.100 and 200.100 stations before heading inshore to the 200.000 station where it will be recovered on 31-January. During this transit the glider has been reporting in every three hours to update position and transmit a data set to Rutgers University in New Jersey via Iridium satellite communications. Position updates are automatically emailed to the ship's account at every surfacing and Rutgers provides a daily update of data plots for science and engineering review. On this close to 600 km journey, the glider has returned over 1200 CTD, fluorometer, and backscatter down cast profiles. After recovery, the glider will be redeployed the next day in a process study site near Avian Island. A summary report next week will include graphics of the glider data.