

LMG 0701
Situation Report
14-21 January, 2007

In the past week, we continued to survey the LTER Grid of hydrographic stations, completing the 500 and 400 lines. The bird group conducted a one-day field survey of the penguin rookery just south of Renaud Island, and deployed to Avian Island, south of Adelaide Island to start their 5 annual; 5-day field camp as the week ended. During the week we also conducted the high-density survey of bird foraging and krill distribution observations near Anvers Island. The Webb-Slocum Glider continued on its route along the xxx.100 line in the grid, collecting and reporting data on water column structure in the upper 100 meters. There were minor delays for weather and equipment repair but operations were mostly smooth, efficient and successful.



Figure 1. MT Greg Buikema recovers the CTD-Rosette through the Baltic Room door at Station 300.060 on 21 January.

Special thanks to Capt. Galster and MPC Andy Nunn for prompt decisions to conduct the Renaud Island deployment and High-density grid just ahead of potentially disrupting storms.

Individual science group reports follow.

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

Field Team Members: Eric Erdmann and Kristen Gorman

This week started with our field excursion to Renaud Island / Armstrong Reef to conducted work at Adelie Penguin breeding colonies. The trip was successful; in large part due to the support we received by the LMG Captain, MPC, MTs, and ETs. We deployed satellite transmitters and obtained data on dietary items, as well as population status of Adelies.

We conducted the High Density Grid off of Anvers Island. Penguins were scarce; however, we did observe several whales in the area. There was a large abundance of krill in the area that likely explains the presence of whales. Given the increased food availability for penguins this season, it's possible that the penguins may be foraging closer to their breeding colonies around Anvers Island, as oppose to more offshore locations where we conducted the High Density Grid.

We continued the week with at-sea bird observations along the 400 line. We departed for our field camp at Avian Island at the end of the week.

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.

Sampling during week two completed the 500 and 400 cardinal grid lines; three CTD's and underway surface sampling were also done during the Palmer area high density foraging grid. The complete suite of standard measurements was taken at all stations sampled, and one microzooplankton grazing experiment was also completed at station 400.180. The 500 line production continues to be lower than in January 2006, with slightly higher production rates and chl a biomass seen during the high density grid and along the inside of the 500 line.

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 2 of the cruise, our primary activities were the Anvers High-Density Grid and standard stations on the 400 transect line. The Anvers High-Density Grid is a fine-scale survey, 10 km by 20 km grid with 2.5 km horizontal spacing, of the foraging region of the Adelie penguins nesting near Palmer Station. During the high density grid we conduct two types of operation – (1) the along-track observations of seabird and marine mammal activities, zooplankton biomass from a scientific echosounder towed from the ship, and phytoplankton biomass, and (2) target tows of the zooplankton in the foraging grid and diet samples of the Adelie penguins in the nearby colonies. Many of the seabirds and marine mammals are dependent on Antarctic krill, an abundant member of

the zooplankton community, as their primary food source. The biomass of Antarctic krill within the Anvers High-Density Grid was much higher this year than last, with nearly continuous layers of krill in the upper 50 m. The target tows from the trawling zodiac showed that the biomass of Antarctic krill was dominated by young-of-the-year (yoy), i.e. those krill spawned the austral summer of 2006. The dominance of yoy indicates a very successful year class from 2006, the first in this region since the year class of 2002. The presence of ice krill further seaward than the long-term average persisted on the 400 line, again with no salps on the shelf.

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.

We collected surface to bottom samples at all stations occupied on the 500 and 400 lines during the week. Bacterial production rates were estimated in the upper 100 meters at all stations. On this year's cruise, guest investigator Dr. David Kirchman (Univ of Delaware) is assaying selected surface water samples using the MicroFISH technique, with which specific bacterial phylotypes ("species") can be identified using molecular probes. Microautoradiography using selected organic substrates (amino acids, glucose, protein) is done simultaneously, allowing us to assign specific biochemical activities to specific members of the bacterial community. To our knowledge, this is the first time this technique has been applied in Antarctic waters.