

Beaufort Gyre Exploration Project: Dispatch 5: Measurements of opportunity

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During an unplanned stop anchored in the shallow waters off Tuktoyaktuk (around 70 N, 133 W) scientists took the opportunity to collect water samples and make measurements. Chief Scientist Bill Williams lowered a hand-held CTD into the 14 meters of water to examine the temperature and salinity structure here. The relatively warm and fresh top layer (about 2 meters thick) is influenced by the MacKenzie River that flows into the Beaufort Sea just west of Tuktoyaktuk.

Peter Lavrentyev (U. Akron) used a bucket to collect water from the surface. Peter and Jennifer Putland filtered the water for Chlorophyll-a (which gives an indication of phytoplankton abundance) and preserved some water to take back to the lab for analysis under a microscope. They froze some in the ship's freezer (-80 C) to store for DNA analysis of the plankton community structure (the samples need to be frozen to prevent degradation of the DNA), and are storing some at even cooler temperatures (in liquid nitrogen) to preserve bacteria and other tiny plankton. Their combined analysis will provide information on the entire microbial food web. Traditionally Arctic food webs have been associated with large algae (diatoms), but recent data have indicated that much smaller plankton are playing an important role in the carbon cycle here. Their significance is predicted to increase further as ice melts and ocean temperatures rise.

The quiet day also provided a chance to prepare for upcoming experiments. Linda White (IOS) did a full system calibration of her nutrient auto-analyzer in preparation for running samples to measure the concentration and composition of nutrients through the Arctic water column. Carlton Rauschenberg (CRREL) and Wes Halfacre (Purdue University, Indiana) took time to begin assembly of the O-Buoy, which is a system that they will mount in the permanent ice cover to autonomously measure greenhouse gases in the Arctic atmosphere. Steve Lambert (WHOI) and I tested buoys that will be deployed in the sea ice to measure the temperature and salinity in the Arctic Ocean surface layer.

We're now steaming west in ice-free water to begin a line of CTD/Rosette stations that runs south to north along 140 W. To see our current position go to: <http://www.sailwx.info/shiptrack/researchships.phtml> (and click on *CCGS Louis S. St-Laurent*).

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