cANIMIDA – Arctic Summer 2006

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Summer 2006 concludes our scheduled field efforts for the ANIMIDA and cANIMIDA programs that started in 1999. We are all very proud of our success this summer and throughout the project. Our monitoring of oil and gas development in the offshore waters of the North Slope has been valuable and well received. We also greatly enhanced our understanding of the natural biogeochemistry of the coastal Beaufort Sea.

We began operations this summer on July 24 and will finish up within the next few days. During the first few days of the trip, caged mussels were deployed at eight locations to investigate the short-term uptake of potential contaminants. Samples of fish, clams and amphipods also were collected throughout the study area. We had a great year for fish and amphipod collection.

The MMS 1273 wends its way through the summer ice, 10 miles north of Cross Island

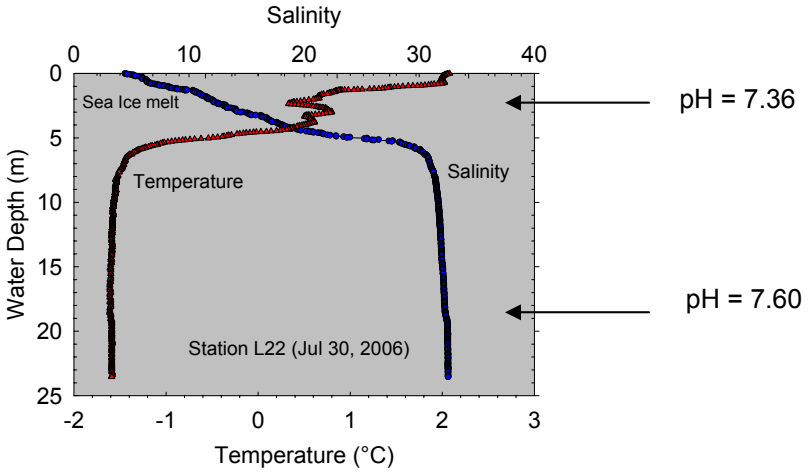
Gravity coring in Harrison Bay

Still pumping water.

Fish abound in fyke net at Point Brower.

Amphipods!!!

One highlight of this year's trip was collection of water samples and a sediment core from a site about 10 miles north of the barrier islands. The return trip back through the ice would put any expert in mazes to a good test. The salinity and temperature profiles for the water column at this northern site (shown below) highlight the importance of sea ice melt to the formation of the Arctic halocline. We look forward to matching our trace metal data with the hydrography.



Vertical profiles of salinity and temperature for station located 10 miles north of Cross Island. Low salinity and pH in the surface water are from sea ice melt. Nearer to shore, in ice-free water, the surface salinity was ~16 and the pH was 7.55.

This summer, we extended the sediment coring effort to Harrison Bay, about 70 miles to the west of Northstar Island. We collected some particularly interesting cores in Harrison Bay with organic-and clay-rich sediment and no obvious sulfate reduction. The cores will be age dated and analyzed for the history of hydrocarbon and metal input. We also had the opportunity to see the new exploration island as part of the Oooguruk unit. We have many special memories of the Northstar development that was at the center of the ANIMIDA and cANIMIDA programs and it was interesting to see the new island.

Under construction, Northstar Island from the south, April 2000

Northstar Island from the north, August 2006

Northstar's new sister island at the Oooguruk unit in Harrison Bay, August 2006.

We are very excited about the success of the 1999-2006 field efforts and feel very fortunate to have been able to work in this beautiful Arctic setting. We thank Minerals Management Service (MMS), U.S. Department of Interior, for funding this study and especially Dick Prentki and Cleve Cowles of MMS for such strong support throughout the project. We thank BP Exploration Alaska, Inc., for logistical support and accommodations on the North Slope and the staff of the Seawater Treatment Plant at West Dock for their interest in our work and use of their laboratory facilities.

We are very pleased that many FIT students (Rob Rember, Michelle McElvaine, Debra Woodall, Matt Alkire, Greg Delfosse and Carrie Semmler), as well as many other colleagues, had an opportunity to part of the 13 Arctic trips since 1999.

The coastal Beaufort Sea that we have enjoyed is beautiful in its solitude and ice sculptures and vibrant with its bird life, seals and more. We are still amazed by the spring floods and the movement of river water many miles offshore under the ice. Equally exciting are the pools of fresher water that form during summer many miles offshore due to melting sea ice. What a wonderful place to work!

We have published numerous papers and reports to date with many more to come in the next two years that have been set aside for continued laboratory analysis, data analysis, writing and meetings. Some selected project publications to date are listed below.

Trefry, J.H., Rember, R.D., Trocine, R.P. and Brown, J.S. (2003) Trace metals in sediments near offshore oil exploration and production sites in the Alaskan Arctic. ***Environmental Geology*** 45:149-160.

Rember, R.D. and Trefry, J.H. (2004) Increased concentrations of dissolved trace metals and organic carbon during snowmelt in rivers of the Alaskan Arctic. ***Geochimica et Cosmochimica Acta*** 68:477-489.

Brown, J.S., Boehm, P., Cook, L., Trefry, J.H. and Smith, W. (2004) Hydrocarbon and metal characterization of sediments, bivalves and amphipods in the ANIMIDA study area. ***Outer Continental Shelf Study MMS 2004-024***, U.S. Department of Interior, Anchorage, AK. Available at http://www.mms.gov/alaska/reports/2004Reports/akpubs04.HTM

Trefry, J.H., Rember, R.D., Trocine, R.P. and Brown, J.S. (2004) Partitioning of potential contaminants between dissolved and particulate phases in waters of the coastal Beaufort Sea. ***Outer Continental Shelf Study MMS 2004-031***, U.S. Department of Interior, Anchorage, AK. Available at http://www.mms.gov/alaska/reports/2004Reports/akpubs04.HTM

Trefry, J.H., Rember, R.D., Trocine, R.P. and Savoie, M. (2004) Sources, Concentrations and Dispersion Pathways for Suspended sediment in the Coastal Beaufort Sea. ***Outer Continental Shelf Study MMS 2004-32***, U.S. Department of Interior, Anchorage, AK. Available at http://www.mms.gov/alaska/reports/2004Reports/akpubs04.HTM

Alkire, M.B. and Trefry, J.H. (2006) Transport of spring floodwater from rivers under ice to the Alaskan Beaufort Sea. **Journal of Geophysical Research-Oceans** (in press).