

*Project Number: 070340*

*Project Title: Long-term oceanographic monitoring of the Gulf of Alaska Ecosystem*

*PI Name: Thomas Weingartner.....*

*Time period covered by report: 10/1/06 – 8/31/07*

*Date of Report: 8/28/07*

*Report prepared by: Thomas Weingartner...*

*Project website address (if applicable): <http://www.ims.uaf.edu/gak1/>.*

**Work Performed:**

We have:

1. conducted the monthly CTD sampling at station GAK 1
2. are archiving and quality controlling Middleton and Prince William Sound weather buoy and we are generating air-sea heat flux time series from these data.
3. Recovered and re-deployed the GAK 1 mooring. However, the mooring was re-deployed without the ISUS nitrate sensors provided by the Alaska Ocean Observing System. These were not deployed because the batteries for these instruments were bad. New batteries would have required a long delay (2.5 months) in the deployment.
4. The instruments from the GAK 1 mooring are at Seabird undergoing post-calibration.

We have detected anomalously cold conditions at station GAK 1 with these beginning in the winter of 2006-07. Deep (>150 m depth) temperatures are the coldest observed since the early 1970s. The deep shelf waters have remained cold through the summer, which suggests that deep temperatures may be even colder this winter. The cooling is accompanied by anomalous freshening which has also persisted through the summer. The reasons for these changes are not completely clear at this writing. However, we find that while the air-sea heat fluxes of winter of 2006-07 were anomalous and enhanced cooling, these anomalies were not exceedingly large. Similar statements can be made for downwelling wind stress and wind mixing. While we do not yet have estimates of coastal discharge for this period, the oceanographic data suggests that discharge was anomalously low and that upper ocean salinities were anomalously large. This suggests that the water column was only weakly stratified through early winter so that winter cooling and mixing were efficiently distributed over the whole water column. We are continuing to pursue this scenario and will report on this event at the 2008 Alaska Marine Science Symposium. Figures describing our results and those generated by subsequent analyses can be found on our website (<http://www.ims.uaf.edu/gak1/>).

**Future Work:** We will continue the monthly CTD sampling and recover the GAK 1 mooring in March 2008. At that time we will re-deploy it along with the ISUS nitrate sensor provided by AOOS. We will continue our analyses of the unusual cooling observed in the winter of 2006-07 and report on this in detail at the Alaska Marine Science Symposium,

**Coordination/Collaboration:** We collaborate with T. Royer and C. Grolsch (Old Dominion University) on the analyses of these data.

**Community Involvement/TEK & Resource Management Applications:** NOT APPLICABLE TO THIS PROJECT

**Information Transfer:**

Aagaard, K., T.J. Weingartner, S.L. Danielson, R.A. Woodgate, G.C. Johnson, and T.E. Whitledge, Some controls on flow and salinity in Bering Strait, *Geophys. Res. Lett.*, 33, L19602, doi:10.1029/2006GL026612, 2006.

Markus A. Janout, M. A., T. J. Weingartner, D. L. Musgrave, S. R. Okkonen, and T. E. Whitledge, Some characteristics of Yakutat eddies propagating along the continental slope of the northern Gulf of Alaska, (in review *Deep-Sea Research*).

Markus A. Janout, M. A., T. J. Weingartner, D. L. Musgrave, S. R. Okkonen, and T. E. Whitledge, Some characteristics of Yakutat eddies propagating along the continental slope of the northern Gulf of Alaska (poster presented at the Alaska Marine Science Symposium, January 2007, Anchorage Alaska).

**Budget:** NO CHANGE