Mapping and Characterization of Recurring Spring Leads and Landfast Ice in the Chukchi and Beaufort Seas, Coastal Marine Institute Project (NOFA MMS09HQPA0004T)

Monthly progress report, August 2010

1) *Summary of work performed and progress made during preceding month*

A. *Analysis of ice distribution and lead patterns*

No significant progress to report.

B. *Analysis of landfast ice extent*

Ordering and processing of SAR data has continued but no new whole seasons have been completed. We are currently trying to obtain secure FTP access to the content management system so that A. Gaylord and R. Gens can post their completed files.

C. *Assessing potential alternative approaches at deriving landfast ice edge locations and landfast ice stability*

Work is continuing on the manuscript for the paper we plan to submit to the Canadian Journal of Geoscience, as discussed in the July report. We are currently confirming results from a comparison between the InSAR derived seaward landfast ice edges (SLIEs) and SLIEs obtained using the primary technique used in this project and the previous MMS study (AK-03-06, MMS-71707).

D. *Literature review pertaining to icebreaker impacts upon sea ice in the Beaufort and Chukchi Seas*

We completed and submitted the literature review on August 31. We found very little material specifically addressing the physical impacts of icebreaking upon sea ice this, largely due to the apparently prevailing opinion there is no physical impact to address. However, we found a number of articles addressing related aspects of sea ice behavior. In summary, wintertime icebreaking will lead to thicker rougher ice in the path of the icebreaker. In drifting pack ice, this effect is probably almost negligible compare to natural ice dynamics, though it is conceivable that a large ice management operation could leave a detectable mark on the sea ice. This is a question that could probably be answered reasonably easily via a remote sensing study of the ice surround the ACEX drilling site in 2004.

Summertime icebreaking would be expected to lead enhanced melt in the region of broken ice, but we were able to find no literature on this specific topic. Icebreaking in landfast ice will leave the most long-lived effect on the sea ice and greatest potential for impacts outside the immediate path of the ship. Observations on break-up following two short ice breaker journeys into landfast ice in Lancaster Sound led to the conclusion that icebreaking activities will have no impact on landfast ice break-up. However, more recent satellite from the Baltic Sea has shown destabilization is possible between pairs of icebreaker channels. With a lack of data to the contrary, it is possible to conceive a scenario involving extensive icebreaking in landfast ice leading to early break-up.

E. Miscellaneous activities

n/a

2) Summary of significant technical, schedule or cost problems encountered during preceding month

n/a

3) Summary of resolutions agreed to between Contractor and MMS re item (2)

n/a

4) Significant meetings held or other contacts made in connection with project during preceding month

n/a

5) Action items, open questions etc.

n/a