MMS ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

Region: Alaska

Planning Area(s): Beaufort Sea

Title: Mapping Sea Ice Overflood Using Remote Sensing from Smith Bay to Camden Bay (AK-06-06)

MMS Information Need(s) to be Addressed: This information is important to identify and characterize potential hazards, such as from strudel scour along the Beaufort Sea coast. In addition this information could be used to assist in the development of ice models and their performance during breakup in the landfast ice zone. The results will be used in NEPA analysis and documentation for Beaufort Sea Lease Sales, EPs, and DPPs.

Total Cost: $475,000 **Period of Performance:** FY 2006-2009

Conducting Organization: D.F. Dickins Assoc., Ltd

MMS Contact: Chief, Alaska Environmental Studies Section

Description:

Background: MMS has limited spatial and temporal information on rivers overflooding the nearshore sea ice in spring. The most recent work in 1999 focuses on overflood of the Sagavanirktok River in the vicinity of the proposed Liberty prospect. There are also 3 years of overflood data for the Kuparuk River in the vicinity of Northstar. Landsat imagery from projects in 1988 and 1993 has been collected and archived at the University of Alaska Geophysical Institute for the Beaufort Sea. With the advent of development in the Beaufort Sea this type of information is needed to address issues regarding pipeline routing and facility siting. Analysis of overflood and its implications for exploration and development requires information on both the temporal and spatial distribution of ice overflood from the breakup of North Slope rivers in the spring. This study would provide baseline data and improve the accuracy of information for environmental assessment and hazard mitigation. These observations would also be of value to the offshore industry for planning operations on the OCS.

Objectives:

- Compare the helicopter survey of the zone of overflooding for the Colville river delta against satellite imagery collected for the same time period.
- Utilizing satellite imagery, map the overflooded areas for the major North Slope river systems from 1997-2007
- Compare overflood areas of the landfast ice to strudel scour locations

Methods: This study will: 1)collect and synthesize existing Landsat/Radarsat/MODIS and other available remote sensing imagery; 2) quantify the spatial and temporal distribution of river overflood of the moderate size rivers on the North Slope of Alaska from Smith Bay to Camden

Bay with a focus on mapping the maximum overflood extent; 3) compile Beaufort Sea stream gauge data; 4) fly an aerial survey along the Colville River delta for one season to ground truth remote sensing data and quantify uncertainties of estimating the overflood from remotely sensed data; 5) collect hydrographic data for the Sagavanirktok and Kuparuk rivers and quantify any relationship between river runoff and aerial extent of overflood; 6) compile available spatial data on the location of strudel scours from existing surveys along the Beaufort Sea coast; 7) compile all of the overflood limits and available strudel scour data into a Geographic Information System (GIS) database; 8) provide a report that summarizes the spatial distribution of river overflood by year along the Beaufort Sea Coast, including individual years as well as minimum and maximum historical overflood extents from 1996-2007; 9) compare overflood extent to the location of strudel scours and other environmental variables.

Current Status: Ongoing

Final Report Due: March 2009

Publications Completed: None

Affiliated WWW Sites: http://www.mms.gov/alaska/

Revised Date: January 2009