Non-technical Project Proposal Description

Northern Ellesmere Ice Shelves, Epishelf Lakes and Climate Impacts

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This research program will continue work on the current characteristics and stability of the northern Ellesmere Island ice shelves and adjacent multiyear landfast sea ice. Fieldwork started at this location in 2008, and will continue for the foreseeable future. Almost all of the ice shelves in this region have experienced dramatic break-ups over the last eight years, so this project aims to improve understanding of the causes of these events and the fate of the remaining ice shelves and related ice features.

Measurements will focus on the determination of ice shelf thickness and internal structure using ground penetrating radar and shallow ice cores. Surface melt rates and patterns of surface motion will be determined from stakes drilled into the ice shelf surface and measurements from GPS units and Radarsat-2 satellite imagery. Water current and salinity measurements will be taken in the fiords and bays along the coastline and behind the ice shelves to measure how changes in the water are influencing ice shelf melt. We will continue servicing of a semi-permanent automated weather station that is providing data in the vicinity of Milne Ice Shelf. This data is uploaded daily via a satellite connection, and made publicly available at http://tinyurl.com/milnewx..

This project will contribute to the ArcticNet project ‘Freshwater Resources of the Eastern Canadian Arctic’. We will continue to publicize our project findings through the popular media (e.g., CBC North, Nunatsiaq News), talks in local communities (e.g., Qarmartalik School, Resolute Bay) and outreach activities coordinated by ArcticNet (e.g., icebreaker visits to communities). At least three graduate students will work on this project, so we expect several theses and scientific papers to be produced. These will be published in international journals such as the Journal of Glaciology, with copies provided to the Nunavut Research Institute.