NWB Project Description, 2013

Glacier-Climate Studies on the Prince of Wales Icefield, Ellesmere Island

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This is a research project that will take place on an outlet glacier of the Prince of Wales Icefield, Ellesmere Island. The outlet glacier here is unofficially named 'Humphrey Glacier', and access to the site will be via twin otter (on skis) from PCSP-Resolute, landing us directly on the icefield. We will be a party of two travelling by foot and ski for a 10-day visit from May 13-22, 2013.

Project Description

The proposed research is a continuation and completion of studies initiated in spring 2012. We are studying the icefield to measure the meteorological and energy balance processes that govern glacier melting, to advance understanding of glacier-climate processes and glacier response to climate change. We will also be taking snow and ice samples to understand the effects of widespread melting in summer 2012 on ice-core climate reconstructions. i.e. how does melting affect the snow chemistry and the ice-core stratigraphy?

Our work will be carried out on the glacier, and travel will be on skis from a base camp about 12 km from the glacier margin. We established this camp and several weather stations in spring 2012, and in 2013 we need to collect the data and extract all of our instruments. We will set up a temporary camp (2 sleeping tents, 1 gear tent, 1 kitchen tent). All equipment and gear will be removed on completion of the project (late May, 2013).

Methodology

Automatic weather stations have been deployed along a vertical transect on the icefield, from an elevation of 400 m (4 km from the glacier toe) to 1000 m, about 5 km above our camp. These instruments were installed in May 2012 and have been recording through the year. We will visit each site, download the data, and dismantle the equipment. All instruments and poles will be towed back to our glacier camp and will be removed. Snow and ice core samples will be collected from the upper icefield (southern Prince of Wales ice divide) using a Kovacs ice auger. All samples will be wrapped and shipped out for analysis at the University of Calgary.

Data

Meteorological and snow chemistry data collected will be available on request and publicly available through publication(s).

Reporting

Publications in scientific journals are anticipated (e.g., *Journal of Glaciology*). Reports will be provided to PCSP and NRI, and our group would be delighted to speak on Arctic climate change with any interested communities (e.g. Grise Fiord, Resolute).

Translation to Inuktitut available on request; this is a continuation of the 2012 project, with a simple field season requested in order to collect data and remove our stations