Proposed amendment to 2016 Nunavut Research Licence No. 02 023 16R-M: Wayne Pollard

Project Title: An investigation of the sensitivity of high Arctic permafrost to climate change
Principal investigator: Dr. Wayne Pollard, Professor, Department of Geography, McGill University, 805 Sherbrooke St. W. Montreal, Quebec. H3A 0B9

Updated Project Overview:
This is an ongoing project that examines how global warming, in particular warm summer temperatures, is affecting the stability of high Arctic permafrost conditions, landscapes and infrastructure. The 4 main aims are: (1) to identify and measure changes in different landscapes (e.g. tundra, polar desert, wet lands, shorelines), (2) to assess local climate variability, (3) to evaluate the nature and extent of ground ice in permafrost and its vulnerability to climate change, (4) to determine the amount and rate of landscape change caused by warming and melting permafrost (thermokarst). A secondary aim is to assess the degree to which these changes impact fuel contaminated soils. The information collected in this study will improve our general understanding of how climate and permafrost interact which will allow for the better prediction of future changes. In addition to the locations listed on my initial licence (Eureka and Expedition Fiord) I wish to add Resolute Bay where I will begin a preliminary assessment of terrain conditions. Resolute has a well-documented history of development as well as an excellent climate record. Work in the Resolute area will include a series of terrain surveys to identify sites where the permafrost is stable as well as sites where changes in the landscape related to warming permafrost is beginning. Areas of ice wedge polygons, patterned ground and slopes will be surveyed. Measurements will include surveying with gps and ground penetrating radar as well as probing active layer depths and mapping vegetation. The main area of study will be to the west of the community. As stated in my initial licence renewal this research also has a significant training component involving students on several levels. In this regard I wish to expand the training component to include 5 additional undergraduate students who will be involved in all of the survey and mapping activities around Resolute. A key component of their instruction will be the understanding of how permafrost systems function and the role of climate in maintaining and modifying permafrost conditions. The Resolute activities will be carried out during August and will be based at the Polar Continental Shelf Program facility.

2016 Research Team:
Wayne Pollard (PI), Chris Omelon, Dale Andersen, Hans Larsson (replaces Denis Lacelle), Michael Templeton (M.Sc.), Melissa Ward (Ph.D.) and the undergraduate field assistant from McGill will be Claire Bernard. Since this is a university-based research project we would like to include 6 additional undergraduate students as part of a field methods training program.

2016 Fieldwork Schedule:
This is unchanged - planned fieldwork is from July 15- August 30.

2016 Field sites:
In addition tothe Eureka area on the Fosheim Peninsula, Ellesmere Island (80º00'N 85º95'W), and Expedition Fiord area, Axel Heiberg Island (79º25'N; 90º45'W). I wish to include the Resolute Bay area, mainly west of the community (74 °45'N; 94°59"W)

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