NPC 150949: Assessing changing cryohydrogeologic conditions with locally-relevant landscape indicators in Nunavut, Canada

Close

Proposal Status: Conformity Determination Issued

Overview Documents Questionnaire

Project Overview

Type of application: New

Proponent name:

Michelle Blade

Proponent company:

McGill University

Project Description:

This research project pairs Inuit Qaujimajatuqangit with permafrost and groundwater science to identify and assess locally-relevant landscape indicators of winter groundwater movement along overland travel routes. Winter overland travel by Nunavut community members primarily consists of snowmobiling and dog sledding. Encountering overflow water is a locally-relevant winter overland travel hazard. Community-member known overflow areas have been selected to collect field data during the Winter of 2025/2026 and if need be the Winter of 2026/2027. Water samples (less than 4L) are collected from the overflow water and nearby lake(s) twice a year in the Fall and Spring. Trail cameras are set up on 4ft wooden stakes to take daily photos of the overflow water area and resulting icing formation. Small sensors (8.5x1 inch or smaller) are installed in the overflow water and nearby lake(s) to record daily water temperature, electrical conductivity, and water level. Researcher personnel stay in community accommodations and access the field locations by snowmobile, ATV, or truck utilizing the community's overland travel routes. All trail cameras, sensors, and wooden stakes will be removed at the end of the research project. Environmental impacts are negligible. Combined, these results improve understanding of why these winter overflow areas are already occurring where they are - and enhance predictions for local decision makers of where additional winter overflow areas may begin occurring and become future hazards along winter overland travel routes as a result of climate change. Currently, Arctic climate change prediction models rarely account for near-surface groundwater processes nor its effects on locally-relevant landscape processes such as winter overland travel hazards.

Project Schedule

Start Date:

2025-10-27

End Date:

2027-12-31

Project Map

List of project geometries:

Id

Geometry

Location Name

19047

polygon

Arviat - Itiguarjuit (rolling hills) overflow area

19051

polygon

Arviat - Amaruqtalik (wolf esker) overflow area

19071

polygon

Rankin Inlet - overflow area #1

19073

polygon

Rankin Inlet - overflow area #2

19079

polygon

Coral Harbour - Mamittuittuq overflow area

19081

polygon

Iqaluit - overflow area #1

19086

polygon

Whale Cove - overflow area

NPC Planning regions:

No Approved Plan

Keewatin

Project Land Use and Authorizations

Project Land Use:

Scientific Research

Licensing Agencies:

Nunavut Research Institute

Nunavut Water Board

Nunavut Impact Review Board

Material Use

Equipment:

Type

Quantity

Type

Use

snowmobile + qamutiik

2

3x8ft

Up to two snowmobiles with qamutiik (wooden sleds) to transport researchers and field gear

ATV

2

5x5ft

Up to two all-terrain vehicles will be utilized to transport researcher personnel and field gear to and from field data collection areas.

Trail cameras

14

6x4inches

Trail cameras installed one metre above ground level on wooden stakes to take daily photos of overflow water and icing formation

sensors - solinst levelogger

14

8.5x1inch

Solinst leveloggers to install in nearby lake(s) and overflow water areas to record daily water temperature, electrical conductivity, and water level

sensors - ibutton

14

1inch

ibutton sensors to install in nearby lake(s) and overflow water areas to record daily water temperature

truck

1

7x19ft

Up to one truck will be utilized to transport researcher personnel and field gear to and from field data collection areas.

Fuel Use:

Type

Container

Capacity

Use

No data found

Hazardous Material and Chemical Use:

Type

Container

Capacity

Use

No data found

Water Consumption:

Daily Amount (m^2)

Retrieval Method

Retrieval Location

0

Waste and Impacts

Environmental Impacts:

Environmental impacts are negligible. Research personnel will stay in community accommodations and do day trips to the field data collection locations in the Fall and Spring traveling by snowmobile, ATV, or truck along regularly utilized community overland routes. No fuel drums/containers nor supply caches will be established on the land at anytime. No research is conducted in the marine environment. All trail cameras, wooden stakes, and sensors will be removed at the end of the research project.

Waste Management:

Waste Type

Quantity Generated

Treatement Method

Disposal Method

No data found