



## **NIRB Application for Screening #125895**

### **Biogeochemical characterization of saline and glacial systems on Axel Heiberg Island**

**Application Type:** New

**Project Type:** Scientific Research

**Application Date:** 3/15/2024 3:20:07 AM

**Period of operation:** from 2024-03-27 to 2024-06-01

**Project Proponent:** Mark Skidmore  
Montana State University  
Department of Earth Sciences, 226 Traphagen Hall  
Bozeman Montana 59717  
United States  
Phone Number:: 406 994 7251, Fax Number::

### Non-technical project proposal description

French: Des chercheurs de la Montana State University, dont des étudiants en fin de cycle universitaire, proposent un projet pour caractériser les propriétés géochimiques et biologiques d'un réseau de saumure et d'un écoulement glaciaire sur l'île Axel Heiberg, au Nunavut. L'étude sur l'île Axel Heiberg impliquerait de prélever des échantillons d'eau, de glace, de neige, de saumure, de sel et de sédiments de l'intrusion diapirique de Stolz dans la baie de Whitsunday et d'un glacier qui alimente le fjord Skaare. Il est envisagé d'installer un camp temporaire sur le terrain pendant environ dix jours sur chacun des deux sites, pouvant accueillir jusqu'à cinq personnes. Le transport vers le camp se ferait via des avions Twin Otter depuis les installations du programme du plateau continental polaire, près de Resolute Bay. Le transport aux emplacements des camps sera assuré par motoneige et à pied. Les données chimiques et biologiques recueillies fourniront des informations permettant de mieux comprendre si ces environnements froids et salés constituent de bons habitats microbiologiques. Le projet se déroulerait de fin avril à fin mai 2024.

[illegible]

Operations Phase: from 2024-03-27 to 2024-06-01

# Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Fieldwork location - Whitsunday Bay	Scientific/International Polar Year Research	Crown	Previously visited for research by Wayne Pollard in 2012/2013	N/A	310 km from Grise Fiord and 525 km from Resolute Bay
Fieldwork location - Skaare Fiord	Scientific/International Polar Year Research	Crown	Previously visited for research by Wayne Pollard in 2004	N/A	310 km from Grise Fiord and 500 km from Resolute Bay

## Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Resolute Bay	Nancy Amarualik	Resolute Bay HTA	2024-03-15
Resolute Bay	Ian Dudla	Hamlet of Resolute Bay	2024-03-15
Grise Fiord	Marty Kuluguqtuq	Hamlet of Grise Fiord	2024-03-15
Grise Fiord	Jimmie Qaapik	Arctic College	2024-03-15
Grise Fiord	Grise Fiord HTA	Grise Fiord HTA	2024-03-15

# Authorizations

Indicate the areas in which the project is located:

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	Will be submitting an application to NRI shortly	Not Yet Applied		
Nunavut Water Board	Will be submitting an application to NWB shortly	Not Yet Applied		

## Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Twin Otter from Resolute Bay to each field site, Whitsunday Bay and Skaare Fiord	
Land	By foot or by snowmobile from the field camp to the field sampling site	

## Project accomodation types

Temporary Camp

## Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Snowmobile	2	300 cc	Transport at the field research site from the field camp to sampling sites
Twin Otter	1	Aircraft	Transfer from Polar Continental Shelf Program facility in Resolute Bay to fieldwork locations and return to Resolute Bay
Generator	2	2kW	To provide electrical power for the field camp

### Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Propane	fuel	6	20	120	Lbs	Cooking and heating in the field camp
Gasoline	fuel	5	20	100	Liters	Fuel for the snowmobiles and generators

### Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	Snowpack or glacier ice melt	Adjacent to the field camp locations in Whitsunday Bay and Skaare Fiord

# Waste

## Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Scientific/International Polar Year Research	Greywater	20 liters per day, 400 liters total	Greywater would be strained into a sump/pit and solids added to the non-combustible waste.	N/A
Scientific/International Polar Year Research	Non-Combustible wastes	2kg per day, 40 kg total	Non-combustible waste will be stored in (sealed) buckets and returned to PCSP in Resolute Bay for disposal.	N/A
Scientific/International Polar Year Research	Sewage (human waste)	3kg per day, 60kg total	Sewage will be stored in (sealed) buckets and returned to PCSP in Resolute Bay for disposal.	N/A

### Environmental Impacts:

The temporary field camps are small but may result in some localized minor compaction of the soil and possibly vegetation beneath tent sites. This impact would be limited due to the relatively short duration of the camps. We will have a fuel spill kit on site in case of any minor fuel spills from refueling snowmobiles or generators. All food will be stored in sealed containers to prevent access by wildlife. We will generate sewage, waste water from cooking, and a small amount of non-combustible waste. Sewage will be stored in (sealed) buckets and returned to PCSP in Resolute Bay for disposal. Cooking water will be strained, solids added to the non-combustible waste and strained water put into a sump. The non-combustible waste will be stored in sealed buckets and returned to PCSP in Resolute Bay for disposal.

# **Additional Information**

**SECTION A1: Project Info**

**SECTION A2: Allweather Road**

**SECTION A3: Winter Road**

**SECTION B1: Project Info**

**SECTION B2: Exploration Activity**

**SECTION B3: Geosciences**

**SECTION B4: Drilling**

**SECTION B5: Stripping**

**SECTION B6: Underground Activity**

**SECTION B7: Waste Rock**

**SECTION B8: Stockpiles**

**SECTION B9: Mine Development**

**SECTION B10: Geology**

**SECTION B11: Mine**

**SECTION B12: Mill**

**SECTION C1: Pits**

**SECTION D1: Facility**

**SECTION D2: Facility Construction**

**SECTION D3: Facility Operation**

**SECTION D4: Vessel Use**

**SECTION E1: Offshore Survey**

**SECTION E2: Nearshore Survey**

**SECTION E3: Vessel Use**

## **SECTION F1: Site Cleanup**

## **SECTION G1: Well Authorization**

## **SECTION G2: Onland Exploration**

## **SECTION G3: Offshore Exploration**

## **SECTION G4: Rig**

## **SECTION H1: Vessel Use**

## **SECTION H2: Disposal At Sea**

## **SECTION I1: Municipal Development**

### **Description of Existing Environment: Physical Environment**

Both field locations are in terrain that has been glaciated. However, there is currently no glacier at the Whitsunday Bay location.

### **Description of Existing Environment: Biological Environment**

There is minimal vegetation at the two field locations, and any vegetation will be under snow cover/not growing given the timeframe of the fieldwork.

### **Description of Existing Environment: Socio-economic Environment**

The field locations are more than 300 km from Grise Fiord and 500 km from Resolute Bay.

### **Miscellaneous Project Information**

Not applicable

### **Identification of Impacts and Proposed Mitigation Measures**

The temporary field camps are small but may result in some localized minor compaction of the soil and possibly vegetation beneath tent sites. This impact would be limited due to the relatively short duration of the camps.

### **Cumulative Effects**

No cumulative effects are anticipated.



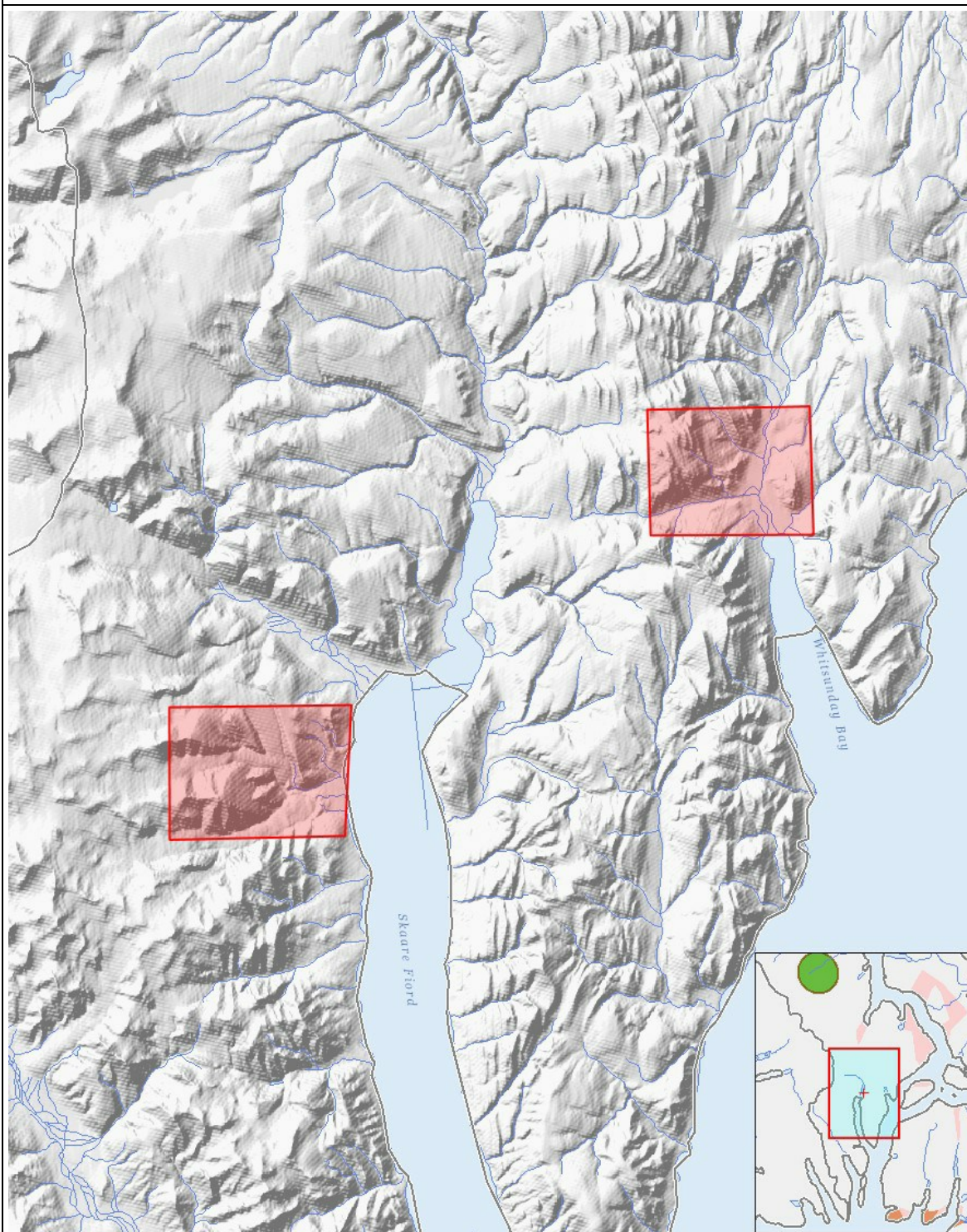
Impacts

Identification of Environmental Impacts

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Construction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operation																									
Scientific/International Polar Year Research		-	-	-	-	-	-	-	-	-	M	-	-	-	M	-	-	-	-	-	-	-	-	-	-
Decommissioning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

## Project Location



## List of Project Geometries

- |   |         |                                     |
|---|---------|-------------------------------------|
| 1 | polygon | Fieldwork location - Whitsunday Bay |
| 2 | polygon | Fieldwork location - Skaare Fiord   |