



## **NIRB Application for Screening #125695**

### **Geology Research in Baffin Bay : REDUCING RISK TO COASTAL COMMUNITIES AND OFFSHORE INFRASTRUCTURES CAUSED BY MARINE GEOHAZARDS AND SEISMICITY**

**Application Type:** New

**Project Type:** Scientific Research

**Application Date:** 5/10/2022 11:07:14 AM

**Period of operation:** from 0001-01-01 to 0001-01-01

**Proposed Authorization:** from 0001-01-01 to 0001-01-01

**Project Proponent:** Alexandre Normandeau  
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Canada  
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## DETAILS

### Non-technical project proposal description

English: Project: Geology Research in Baffin Bay : REDUCING RISK TO COASTAL COMMUNITIES AND OFFSHORE INFRASTRUCTURES CAUSED BY MARINE GEOHAZARDS AND SEISMICITY Alexandre Normandeau, Natural Resources Canada The proposed expedition would take place in August or September 2022, depending on vessel availability. The expedition is part of the Geological Hazards in Baffin Bay Activity within the Public Safety Geoscience (PSG) Program of the Geological Survey of Canada, which began in 2012, and is partly funded by NRCan, CIRNAC and ArcticNet. To date, the activity has resulted in research expeditions in 2013 (NPC 148842, NIRB 13YN021) and 2018 (NPC 148842, NIRB 13YN021) and in 2019 (NPC 149732), as well as community engagement meetings in 2013, 2014, 2015, 2016, and 2019. Information collected during this project will help support community and government decisions on use of offshore areas and provide communities with better knowledge for improving public safety. The proposed research expedition would take place in and around the community of Grise Fiord. The major goals of this proposed research for 2022 would be: -To investigate the stability of the seabed in fjords near Grise Fiord. New imagery of the seabed shows that submarine landslides have occurred in several locations. Baffin Bay experiences a number of earthquakes and iceberg groundings which can trigger submarine landslides. Our research will help to determine the risk for a large submarine landslide happening in the future. -Coring and mapping of coastal environments would allow us to collect evidence of past tsunamis affecting the shoreline, similar to the 2017 Greenland tsunami. In addition, digging in coastal areas may take place using shovels to observe if tsunamis have occurred in the past near the villages. During this type of expedition, we typically collect seabed sediment samples (2 m long gravity cores), seafloor photographs and video, information about the shape of the seabed, and sub-bottom imaging. These instruments will be the same as those used during the 2013, 2018 and 2019 expeditions. The research would take place onboard the Government of Nunavut vessel Nulijuk. If this project is accepted, the research ship is available in August or September. Research results will be reported back during community visits after the conclusion of the field season or directly following the cruise and will be made publicly available. Results will also be presented at workshops in the North, at science conferences (ArcticNet) and will result in publications in various scientific journals, reports and plain language documents over the months and years following the project.

French: **Projet : Recherche géologique dans la baie de Baffin : RÉDUIRE LES RISQUES POUR LES COMMUNAUTÉS CÔTIÈRES ET LES INFRASTRUCTURES OFFSHORE CAUSÉS PAR LES RISQUES GÉOLOGIQUES MARINS ET LA SÉISMICITÉ** Alexandre Normandeau, Ressources naturelles Canada L'expédition proposée aurait lieu en août 2022, selon la disponibilité des navires. L'expédition fait partie de l'activité Risques géologiques dans la baie de Baffin du programme Géosciences de sécurité publique (PSG) de la Commission géologique du Canada, qui a débuté en 2012 et est en partie financée par RNCAN, RCAANC et ArcticNet. À ce jour, l'activité a donné lieu à des expéditions de recherche en 2013 (NPC 148842, NIRB 13YN021) et 2018 (NPC 148842, NIRB 13YN021) et en 2019 (NPC 149732), ainsi qu'à des réunions d'engagement communautaire en 2013, 2014, 2015, 2016, et 2019. Les informations recueillies au cours de ce projet aideront à appuyer les décisions communautaires et gouvernementales sur l'utilisation des zones extracôtières et fourniront aux communautés de meilleures connaissances pour améliorer la sécurité publique. L'expédition de recherche proposée aurait lieu dans et autour de la communauté de Grise Fiord. Les principaux objectifs de cette recherche proposée pour 2022 seraient : - D'étudier la stabilité du fond marin dans les fjords près de Grise Fiord. De nouvelles images du fond marin montrent que des glissements de terrain sous-marins se sont produits à plusieurs endroits. La baie de Baffin connaît un certain nombre de tremblements de terre et d'échouements d'icebergs qui peuvent déclencher des glissements de terrain sous-marins. Nos recherches aideront à déterminer le risque qu'un grand glissement de terrain sous-marin se produise à l'avenir. -Le carottage et la cartographie des environnements côtiers nous permettraient de recueillir des preuves de tsunamis passés affectant le littoral, similaires au tsunami du Groenland de 2017. De plus, des fouilles dans les zones côtières peuvent avoir lieu à l'aide de pelles pour observer si des tsunamis se sont produits dans le passé près des villages. Au cours de ce type d'expédition, nous recueillons généralement des échantillons de sédiments du fond marin (carottes gravitaires de 2 m de long), des photographies et des vidéos du fond marin, informations sur la forme du fond marin et imagerie du sous-fond. Ces instruments seront les mêmes que ceux utilisés lors des expéditions 2013, 2018 et 2019. La recherche se déroulerait à bord du navire Nulijuk du gouvernement du Nunavut. Si ce projet est accepté, le navire de recherche est disponible en août ou septembre. Les résultats de la recherche seront rapportés lors des visites communautaires après la fin de la saison sur le terrain ou directement après la croisière et seront rendus publics. Les résultats seront également présentés lors d'ateliers dans le Nord, lors de conférences scientifiques (ArcticNet) et donneront lieu à des publications dans diverses revues scientifiques, des rapports et des documents en langage simple au cours des mois et des années suivant le projet.

[illegible]

Operations Phase: from 2019-08-05 to 2019-08-20

## Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Grise Fiord	Scientific/International Polar Year Research	Marine	N/A	N/A	Grise Fiord
Grise Fiord	Marine Based Activities	Marine	N/A	N/A	Grise Fiord

## Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Grise Fiord	Terry Noah	Ausuittuq Adventures	2022-05-09

# Authorizations

Indicate the areas in which the project is located:

North Baffin

## Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	N/A	Applied, Decision Pending		

## Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Canadian North or First Air flights	

## Project accomodation types

Community

Other,

## Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Gravity corer	1	6' X 4"	Collect sediment samples
R/V Nuliajuk	1	62'	Research Vessel
Multibeam echosounder	1	attached to ship	Seabed imaging
3.5 kHz echosounder	1	attached to ship	Seabed imaging

### Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Hydraulic oil	hazardous	1	3	3	Liters	for ship operations
Diesel	fuel	1	0	0	Liters	Fuel for ship (self-contained on vessel)

### Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
14	Desalinization by reverse-osmosis onboard ship	Offshore

# Waste

## Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Marine Based Activities	Sewage (human waste)	N/A	Not disposed of in Nunavut waters. Contained on RV Nuliajuk	All waste stored on board

## Environmental Impacts:

No anticipated environmental impacts

# **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**

The vessel is a 20m vessel that will conduct seabed survey operations and sediment coring operations in Grise Fiord. The vessel will operate on a 24h schedule, with sediment coring during daytime and seabed surveys during night time. There will be 2 scientist on board and 6 crew members. Members of the Grise Fiord community will be invited to come on board during the scientific cruise to exchange on science objectives and results. All other vessel requirements will follow the requirement from the Government of Nunavut as it is a GN research vessel.

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

N/A

## **SECTION I1: Municipal Development**

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

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

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

### **Miscellaneous Project Information**

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

### **Cumulative Effects**

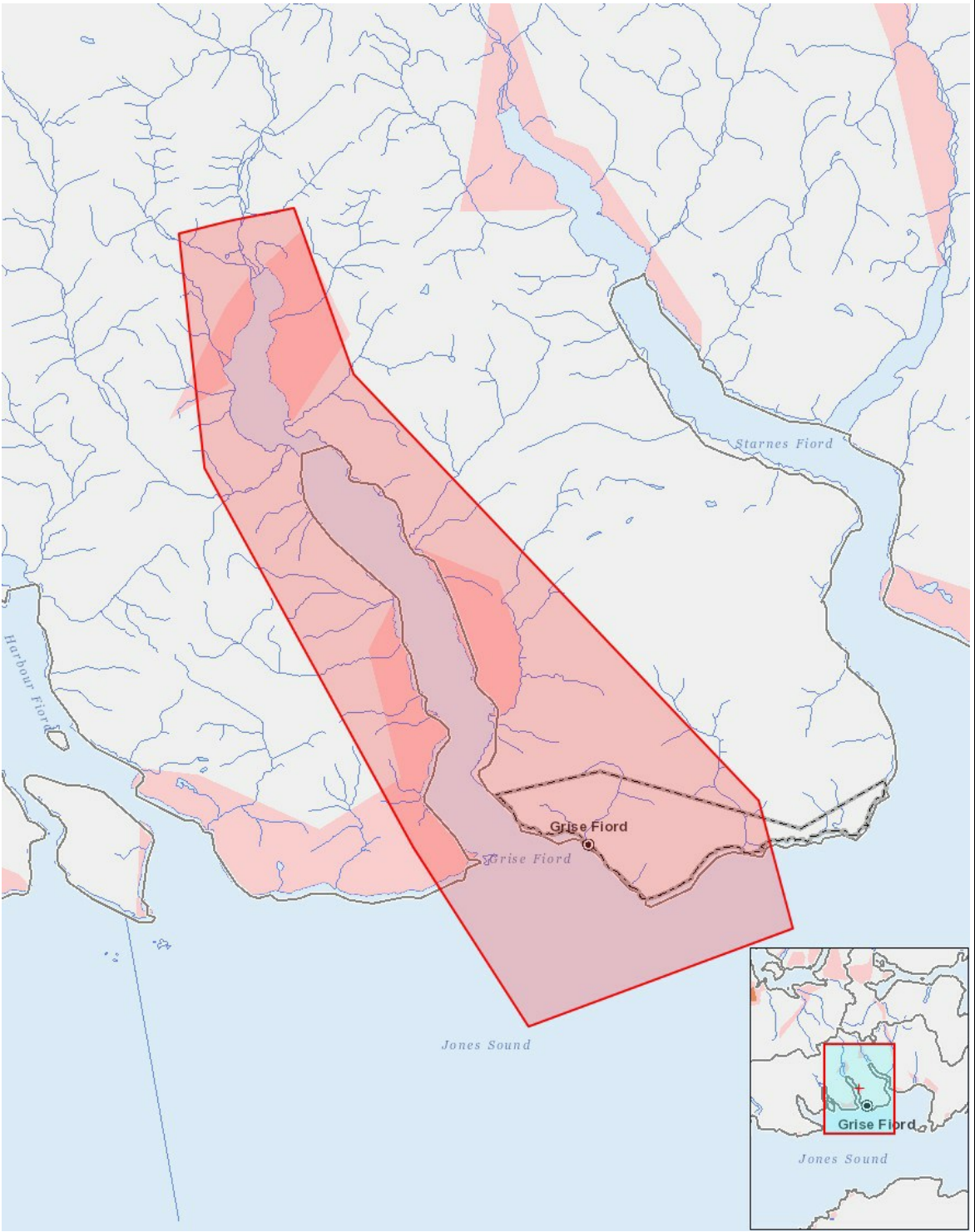
# Impacts

## 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
<b>Construction</b>																										
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<b>Operation</b>																										
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<b>Decommissioning</b>																										
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(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

1	polygon	Grise Fiord
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