NIRB Application for Screening #126464

Responses of Permafrost Microbial Communities to Climate-Driven Thaw

Application Type: New

Project Type: Scientific Research

Application Date: Tuesday, June 16, 2026

Period of operation: from 2026-08-27 to 2026-09-28

Project Proponent:

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DETAILS

Non-technical project proposal description

English: Responses of Permafrost Microbial Communities to Climate-Driven ThawResearcher’s Names and Affiliations: Dr. Eric Bottos, Thompson Rivers University; Gwendolyn Freeze, Thompson Rivers University and Adventure CanadaProject Locations: Dundas Harbour, Powell Inlet, Port Leopold, Beechey Island, Prescott Island, Pasley Bay, Grise Fiord Inlet, Coutts Inlet, Maxwell Bay, Aston Bay, Strzelecki Harbour, Fort Ross, Wrottesley Inlet Timeframe: August 26 – September 27, 2026 Research Proposal: In our warming climate, the rate of permafrost thaw (ground that remains frozen for at least two consecutive years) is increasing in the Canadian Arctic. Permafrost stores vast amounts of carbon, which, upon thaw, is released as carbon dioxide and methane into the atmosphere, significantly contributing to rising global temperatures. The microbial communities (groups of microorganisms living together in an environment) within permafrost play a central role in this process, becoming more active as the ground thaws and accelerating the release of carbon. Interestingly, permafrost microbial communities are not all uniform. They can vary across Arctic landscapes, as shaped by local environmental conditions and the characteristics of the overlying soil layers. As permafrost thaws, it mixes with the microorganisms and nutrients from this overlying soil, which can alter its microbial community composition and, in turn, influence how much carbon is released. Despite their importance, the composition of permafrost microbial communities and its overlying soils across Arctic landscapes, as well as how these layers interact during thaw, remain largely understudied. The goal of this research is to study these factors, which could help us better predict the effects of permafrost thaw on future carbon emissions and global climate. This August, Gwen will join Adventure Canada and travel by ship throughout northern Nunavut. Permafrost cores and overlying soil samples will be collected from multiple sites representing different Arctic environments. The proposed research will investigate the following questions: 1) How do permafrost microbial communities and overlying soil characteristics vary across different Arctic landscapes? and 2) How do interactions between permafrost and its overlying soil influence microbial community responses to warming? Methodology:In 3x3 meter sampling plots, a small quantity of overlying soil will be collected at 10 cm below the soil surface using a trowel and shovel, while 30 cm permafrost cores will be collected using a portable auger. Small bryophyte samples will also be collected (≤5 grams). Samples will be stored at -20°C onboard until transported to Thompson Rivers University in Kamloops, BC. DNA sequencing technologies will be used to characterize microbial community compositions, and simulated thaw experiments will be carried out in lab to assess how overlying soils influence permafrost microbial communities during warming events. We expect environmental, wildlife, and community impacts to be minimal. Wildlife habitats and sensitive vegetation will be avoided during sampling, while any disturbance to soil and vegetation will be carefully restored. Soil layers will be kept separate during excavation to ensure accurate filling and restoration post-sampling. Research plans will remain flexible and be adjusted as needed in response to community member feedback and contextual considerations. Throughout the project, we are dedicated to ongoing collaboration with communities and organizations, and for their input to guide how data and findings are best managed and shared. Our goal is to ensure the most accessible and inclusive approach for all Nunavut residents.

French: Not provided. Please advise if required.

Inuktitut: ᑭᐅᔭᐅᓂᖓ ᓄᓇᐅᑉ ᐃᑭᐊᖓᓂ ᖁᐊᖑᐃᓐᓇᖅᑐᒥᑦ ᓄᓇᓕᖕᓂᑦ ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᖓᓄᑦᖃᐅᔨᓴᖅᑎᐅᑉ ᐊᑎᖏᑦ ᐊᒻᒪ ᐱᓕᕆᕝᕕᒋᔭᖏᑦ: ᓘᒃᑖᖅ ᐃᐅᕆᒃ ᕚᑐᔅ, ᑖᒻᓴᓐ ᑰᑦ ᓯᓚᑦᑐᖅᓴᕐᕕᖕᒦᙶᖅᑐᖅ; ᒍᐃᓐᑐᓕᓐ ᕗᕇᔅ, ᑖᒻᓴᓐ ᕆᕗ ᓯᓚᑦᑐᖅᓴᕐᕕᖕᒦᙶᖅᑐᖅ ᐊᒻᒪ ᐳᓚᕋᑦᑐᓕᕆᔨᒃᑯᓐᓂᑦ ᑲᓇᑕᒥ ᐱᓕᕆᐊᒃᓴᐅᑉ ᓇᓃᓐᓂᖓ: ᑕᓪᓕᕈᑎ, ᐃᖃᓗᐃᑦ, ᓯᕿᓂᖅ, ᐃᓗᕕᐊᓗᐃᑦ, ᐊᑎᔪᖅ ᓴᒻ, ᑯᓖᕈᒃ, ᐊᐅᓱᐃᑦᑐᖅ, ᑲᖏᖅᑐᐊᓗᒃ, ᒫᒃᔅᕙᐅᓪ ᐃᒪᖓ, ᐋᔅᑕᓐ ᐃᒪᖓ ᔅᑐᔨᓕᑭ ᑐᓚᑦᑕᕐᕕᒃ, ᕗᐊᑦ ᕌᔅ, ᕋᑎᔅᓕ ᖃᖏᖅᓗᖓᖃᖓᒃᑰᓂᖓ: ᐋᒡᒌᓯ 26 - ᓰᑎᐱᓇ 27, 2026 ᖃᐅᔨᓴᕈᒪᓂᕐᒧᑦ ᑐᒃᓯᕋᐅᑎ: ᐅᖅᑰᓯᕙᓪᓕᐊᓂᑦᑎᓐᓂ, ᓄᓇᐅᑉ ᖁᐊᖑᓂᖓᑕ ᐊᐅᑉᐸᓪᓕᐊᓂᖓ (ᒪᓂᕋᖅ ᖁᐊᖑᐃᓐᓇᖅᑐᖅ ᐊᕐᕌᒍᓄᑦ ᒪᕐᕉᖕᓄᑦ ᑭᖑᓕᓃᖕᓄᑦ) ᐊᖏᓪᓕᕙᓪᓕᐊᔪᖅ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ. ᖁᐊᖑᐃᓐᓇᖅᑐᖅ ᐊᖏᔫᒻᒪᑦ, ᑖᓐᓇ ᐊᐅᒃᐸᓪᓕᐊᓕᖅᑎᓪᓗᒍ, ᐊᓂᕐᓂᖃᕐᓇᖅᑐᖅᑕᖃᖅᑎᓪᓗᒍ ᐳᔪᕐᓗᒥᑦ, ᐊᓯᔾᔩᖕᒪᑦ ᓄᓇᕐᔪᐊᑉ ᐅᖅᑰᓯᕙᓪᓕᐊᓂᖓᓄᑦ. ᓄᓇᓕᖃᓖᑦ (ᑲᑎᙵᐅᖅᑐᑦ ᐊᕙᑎᒥᑦ) ᓄᓇᐅᑉ ᐃᑭᐊᖓᓂ ᖁᐊᖑᐃᓐᓇᖅᑐᒥ ᐊᒃᑐᐃᓂᖃᖅᐳᖅ ᑕᒪᑐᒥᖓ ᐱᓕᕆᕙᓪᓕᐊᓂᕐᒥ, ᐆᒻᒪᓇᒃᓯᕙᓪᓕᐊᑎᓪᓗᒍ ᒪᓂᕋᖅ ᐊᐅᒃᐸᓪᓕᐊᓪᓗᓂ ᓴᒃᑲᓂᖅᓴᐅᑎᑦᑎᖕᒪᑦ ᐳᔪᕐᓗᖕᒥᒃ. ᑐᓴᕈᒥᓇᖅᑐᖅ, ᖁᐊᖑᐃᓐᓇᖅᑐᑦ ᓄᓇᓕᖕᓂ ᐊᔾᔩᙱᓐᓇᖏᒻᒪᑕ. ᐊᔾᔩᒃᐸᙱᒻᒪᑕ ᐅᑭᐅᖅᑕᖅᑐᒥ ᓄᓇᓂᑦ, ᐋᖅᑭᒃᓯᒪᓂᖓ ᓄᓇᓕᐃᓂᑦ ᐊᕙᑎᐅᑉ ᖃᓄᐃᙱᓂᖓᓄᑦ ᐊᒻᒪ ᖃᓄᐃᑦᑑᓂᕆᔭᖏᑦ ᓄᓇᐅᑉ ᖄᖓᑕ. ᓄᓇᐅᑉ ᖁᐊᖑᐃᓐᓇᖅᑑᑉ ᐊᐅᒃᐸᓪᓕᐊᓂᖓᓄᑦ, ᑲᑎᖃᑦᑕᕐᒪᑕ ᐆᒪᔪᖃᓖᓂᑦ ᐊᒻᒪ ᐆᒻᒪᑦᑎᐊᕆᖕᓇᖅᑐᓂᑦ ᑖᒃᑯᓇᙵᑦ ᐃᔾᔪᕐᒥᑦ, ᐊᓯᔾᔩᔪᓐᓇᕐᒪᑕ ᒥᑭᑦᑐᒥᒃ ᓄᓇᓕᖕᓂ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᐊᒻᒪ, ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᐊᒃᑐᐃᔪᓐᓇᕐᒪᑦ ᐳᔪᕐᓗᒃᑕᖃᖅᑎᓪᓗᒍ. ᐱᒻᒪᕆᐅᓗᐊᖅᑎᓪᓗᒍ,

ᖃᓄᐃᓕᓐᓄᓐᓚ ᖁᐊᖏᔨᐃᓐᓇᖅᑐᖅ ᓄᓇ ᓄᓇᓕᖏᓂ ᐊᓚᒪᓗ ᓄᓇᐅᕐ ᖃᖏᓚᓂᑦᑐᑦ ᐃᔪᐃᐸᑦ ᐅᑭᐅᖅᑕᖅᑐᓕᒻ ᓄᓇᖏᓂ, ᐊᓚᒪᓗᑦᑕᐅᖅ ᖃᓄᖅ ᑕᑦᑯᓇᑦ ᖃᓕᓴᑦ ᐊᐅᑐᐊᓂᖏᓐᓂᑦ ᐊᐅᐅᕐᓕᐊᑎᓕᓗᔪ, ᖃᐅᔨᓴᖅᑕᐅᖏᓐᓗᐊᖏᒪᑦ. ᖃᐅᔨᓴᓂᐅᕐᐸ ᑐᕋᓖᓐᓚ ᑕᒪᐃᓂᕐᓂᐊᕐᓂᖅ ᖃᐅᔨᓴᕐᒪᓕᕐᓂᑐᐃᓂ ᓄᓇᐅᕐᐸ ᐃᑭᐊᖏᓂ ᖁᔨᓂᖅᑕᐅᕐᕕᒃᓂᐅᖅ ᓄᓇᐅᕐᐸ ᐃᑭᐊᖏᓂ ᐊᐅᐅᕐᐸᑦᑕᐅᓕᐊᑎᓕᓗᔪ

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Port Leopold	Researching	Inuit Owned Surface Lands	Wilderness site and abandoned trading post. To the extent of our knowledge, there is no history of research within our proposed sampling area.	Archeological significance includes an abandoned Hudson Bay Company trading post. Sampling will not occur near or disturb any archaeological or paleontological sites.	Approximately 150 km southeast of Resolute. Prince Leopold Island is a Migratory Bird Sanctuary, located approximately 15 km north of Port Leopold. Sampling will not affect this area.
Dundas Harbour	Researching	Crown	Wilderness site and abandoned settlement. To the extent of our knowledge, there is no history of research within our proposed sampling area.	Archeological history includes long-standing Inuit land use, as well as a Hudson Bay Company trading post, an RCMP detachment and a small graveyard. Sampling will not occur near or disturb any archaeological or paleontological sites.	Approximately 200 km south of Grise Fiord and 200 km north of Arctic Bay.
Pasley Bay	Researching	Inuit Owned Surface Lands	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	None to the extent of our knowledge, recognizing that people have likely crossed and utilized these lands prior to our visit. In the event that sites exist, they will remain undisturbed.	Approximately 150 km northwest of Taloyoak.
Prescott Island	Researching	Crown	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	None to the extent of our knowledge, recognizing that people have likely crossed and utilized these lands prior to our visit. In the event that sites exist, they will remain undisturbed.	Approximately 200 km south of Resolute.
Beechey Island	Researching	Crown	Wilderness site and National Historic Site of Canada (1993). To the extent of our knowledge, there is no	This broader site contains the graves of three of Sir John Franklin's expedition members during the Northwest passage expedition, as well	Beechey Island is a National Historic Site of Canada, and is located approximately 80 km east of Resolute.

			history of research within our proposed sampling area.	as a fourth grave of a later search party member. It also contains the Northumberland House, which was a shelter used for later search parties, among other archeological aspects (cairns, building ruins). Sampling will not occur near or disturb any archaeological or paleontological sites.	
Powell Inlet	Researching	Crown	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	None to the extent of our knowledge, recognizing that people have likely crossed and utilized these lands prior to our visit. In the event that sites exist, they will remain undisturbed.	Approximately 200 km south of Grise Fiord and 200 km north of Arctic Bay.
Grise Fiord Inlet	Researching	Crown	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	None to the extent of our knowledge, recognizing that people have likely crossed and utilized these lands prior to our visit. In the event that sites exist, they will remain undisturbed.	Approximately 20 km northwest of Grise Fiord.
Coutts Inlet	Researching	Crown	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	In the greater Coutts Inlet area, archaeological significance includes the presence of Inuit, Thule and potentially Dorset peoples, including remnants of sod houses and tent rings. Sampling will not occur near or disturb any archaeological or paleontological sites.	Approximately 115 km southeast of Pond Inlet.
Maxwell Bay	Researching	Crown	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	None to the extent of our knowledge, recognizing that people have likely crossed and utilized these lands prior to our visit. In the event that sites exist, they	Approximately 180 km east of Resolute.

				will remain undisturbed.	
Aston Bay	Researching	Crown	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	Archaeological significance includes evidence of Thule and Arctic Small Tool Tradition sites in the greater Aston Bay area. Sampling will not occur near or disturb any archaeological or paleontological sites.	Approximately 80 km south of Resolute.
Fort Ross	Researching	Crown	Wilderness site and abandoned trading post. To the extent of our knowledge, there is no history of research within our proposed sampling area.	Archaeological significance includes an abandoned Hudson Bay Company trading post established in 1937, for which four buildings were built, as well as homes of Inuit families established at that same time. Some of these buildings remain standing today. Sampling will not occur near or disturb any archaeological or paleontological sites.	Approximately 275 km north of Taloyoak and 300 km south of Resolute.
Wrottesley Inlet	Researching	Inuit Owned Surface Lands	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	None to the extent of our knowledge, recognizing that people have likely crossed and utilized these lands prior to our visit. In the event that sites exist, they will remain undisturbed.	Approximately 230 km north of Taloyoak.
Strzelecki Harbour	Researching	Crown	Wilderness site. To the extent of our knowledge, there is no history of research within our proposed sampling area.	None to the extent of our knowledge, recognizing that people have likely crossed and utilized these lands prior to our visit. In the event that sites exist, they will remain undisturbed.	Approximately 275 km southwest of Resolute.

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Resolute Bay	This year only sampling at remote sites will be possible and therefore we will be unable to hire	Data generated from this work will be accessible to Nunavut residents and results are to be	2026-06-16

	local community members at our research sites to aid in sampling, as we had hoped to do last year.	published in open-access journals. Findings will be shared directly with nearby communities and territorial organizations, both as plain-language summaries and a technical report, should there be interest.	

Authorizations

Indicate the areas in which the project is located:

Kitikmeot
North Baffin

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Planning Commission	Conformity Determination was issued on June 8th.	Active	2026-06-09	
Nunavut Research Institute	In contact with Mosha Cote, who advises that once a decision is made by the NIRB, he will be able to renew our license from 2025 for 2026. Communication on April 30th.	Not Yet Applied	2026-05-01	
Qikiqtani Inuit Association	Applied for access to Inuit Owned Lands through the Qikiqtani Inuit Association. Submitted May 4th.	Applied, Decision Pending	2026-05-05	
Kitikmeot Inuit Association	In contact with the Kitikmeot Inuit Association regarding renewing our Certificate of Exemption from 2025 for 2026 to access Inuit Owned Lands. Communication on May 19th advises that we will wait for the NIRB decision before we proceed.	Not Yet Applied	2026-05-20	

Project transportation types

Transportation Type	Proposed Use	Length of Use
Water	Travelling with Adventure Canada on their vessel (Ocean Victory) and following their expedition itinerary. Land will be accessed from the vessel by small 10-passenger inflatable zodiacs as per the Adventure Canada staff.	
Land	Sampling sites will be accessed from landing sites by foot.	

Project accomodation types

Other,

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Shovel	1	25 x 150 cm	The shovel will be used for digging to collect soil (overlying the permafrost).
Forceps	2	2 x 12 cm	Forceps will be used to collect small bryophyte samples from sampling sites.
Trowel	1	10 x 35 cm	The trowel will be used for digging to collect soil (overlying the permafrost).
Electric-powered drill (Hilti DD 150-U-22)	1	10 x 37 cm core bit size	The drill will be used to drill permafrost cores where site conditions and circumstances allow. The SPX-A speed core bit has a diameter of 10 cm and length of 37 cm. The drill's overall dimensions will be larger to accommodate the motor and frame. Permafrost depth is expected to range from 1 to 2 meters below the surface. Where necessary, additional 31 cm bit extensions will be used to access deeper permafrost layers.

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
NA	fuel	0	0	0	Liters	There will be no fuel used.
NA	hazardous	0	0	0	Liters	There will be none used.

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0		

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Researching	Other, There will be no waste created from this project.	NA	NA	NA

Environmental Impacts:

At each site, a small quantity of overlying soil, a permafrost core, and a small bryophyte sample will be collected from sampling areas no larger than 3 x 3 meters. Soil and permafrost sampling may result in small-scale localized soil and vegetation disturbance; however, dug plots will be narrow to minimize environmental impact and all sensitive vegetation and wildlife habitats will be avoided. Any disturbance to the environment will be carefully restored, with soil layers and plant material kept separate during sampling using various tarps and carefully returned to their original positions post-sampling. Additionally, the collection of small bryophyte samples will be done carefully to ensure that no other vegetation is disrupted and that impacts remain localized. All equipment will be cleaned between each site to prevent the introduction of non-native species or microorganisms into new sampling areas.

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

The Project Activities section in this form best describes the proximity of each proposed terrestrial sampling site to protected areas and communities, as well as their linked cultural and historical significance. All proposed sampling sites are remote and uninhabited. Throughout the duration of sampling there will be no access to roads/trails, nor will the work occur in designated environmental areas, such as parks, protected areas, heritage areas, cultural areas, sensitive environmental or geological areas (e.g., eskers or unique landscapes), or in disruption with wildlife species and their habitats (including breeding/spawning areas, migration routes, etc.). Sampling will also avoid recreational areas, community use areas, as well as those used for fishing and hunting. This work will not have any contact with water or aquatic ecosystems, and if lakes, streams, etc. are encountered, sampling will not proceed near these areas. Marine use will only apply to accessing land from the ship, for which Adventure Canada has permitting approval. Noise will be very minimal, as the auger is expected to run for no longer than one minute at each site, and will have no effect on air quality. Climate impacts resulting directly from this research will also be very minimal, while this work will generate data to aid in future climate modelling in each area. The topography at each site will vary. However, sampling is aimed to occur in plains and valleys, where the ground is flat and most conducive to soil and permafrost collection. There may be eskers, wetlands, or other unique landscapes present, although sampling will not occur within these landforms. Permafrost will be accessed, although the exact stability, depth, thickness, and continuity will likely vary across the proposed sites and is to be determined and recorded during field work (depth is expected to range from one to two meters). Exposure of permafrost may have small-scale climate impacts; however, careful restoration of each site will be carried out using the original overlying soils to protect permafrost layers. The active layer (above the permafrost) will also be accessed, where solid bedrock, large sediments, and unstable rock will be avoided. Soil quality is expected to reflect that of the Arctic tundra: nutrient-poor and varied in moisture content. It is not expected that there will be thermokarsts or ice lenses, but in the case that there are, these areas will be avoided and undisturbed during sampling, as well as documented. Overall, within these proposed locations, there is flexibility in choosing a suitable and appropriate sampling site. All sensitive areas will be cautiously avoided during site selection (i.e., trails, areas of biological interest, natural features such as streams, etc.) and we are looking to take our sample from an area that is representative of the physical environment, and to not disrupt any part of the environment that is unique or fragile. No structures are to be erected in the area, and there will be no use of water or creation of waste. Transportation while on land will be by foot. Sampling conducted by Gwen will take no longer than 2 hours at each site.

Description of Existing Environment: Biological Environment

The biological environment surrounding the proposed sampling sites includes the terrestrial tundra vegetation and the wildlife. Considering that the proposed sampling sites are at different locations, each area is expected to harbour unique wildlife and vegetation. Vegetation includes mosses, lichens, shrubs and grasses. Vegetation presence may vary, with some sites harbouring sparse plant life. Soil and permafrost sampling will occur in vegetation-poor sites when present, and vegetation will be avoided to the best of our

abilities. Small bryophyte samples (≤ 5 grams) will be collected, and sampling will be sure to not disturb any vegetation beyond the material that is being collected. Terrestrial wildlife in the area includes polar bears, seals, walrus, foxes, voles, and lemmings. Wildlife, including habitat and migratory areas, will be avoided in site selection. Birds present in these areas include thick-billed murres, terns, and gulls, among others. This work will not impact birds, including their habitat (especially ground nesting) and migration patterns. Species at risk, including those of terrestrial wildlife (e.g., polar bears) and birds (e.g., species of gull) will not be impacted by this work, as their populations and habitats will be completely and carefully avoided as described above. Adventure Canada has chosen these locations with careful consideration to not inflict harm on wildlife, vegetation, or bird species. If sampling will cause harm to any of these biotic aspects of the environment, sampling in that area will not proceed.

Description of Existing Environment: Socio-economic Environment

The associated proximities of sampling sites to communities, archaeological sites, and culturally significant sites are described in the Project Activities section in this form. When present, archaeological sites will be avoided and left undisturbed. Paleontological sites are likely to be present within the areas we are visiting; however, this work will not result in the disturbance of bedrock or its excavation and therefore will aid in the avoidance of these sites. There is likely to have been land use by Inuit for centuries in the areas we are visiting, and as such, caution will be used when proceeding with site selection and sampling. In travelling with Adventure Canada, there will be a resource team of scientists and local Nunavut residents onboard, who Gwen will consult prior to sampling regarding any possible archaeological or paleontological sites, as well as culturally significant areas to be avoided. This work is expected to have no impact on the socioeconomic environment of the locations visited. Local and regional traffic patterns will not be affected, as site access is by foot and all sampling locations are remote.

Miscellaneous Project Information

The project dates are from August 26th to September 27th, 2026. Attached in Project Documents are Adventure Canada's associated NPC/NIRB file numbers for the Ocean Victory vessel and a proposed 100 km sampling radius around each of the listed coordinates.

Identification of Impacts and Proposed Mitigation Measures

Impacts are identified in the Impacts tab on this application, and includes both permafrost and vegetation, both as mitigable. Permafrost and vegetation will be disturbed at a very small scale, and these effects will be mitigated through limiting sampling area and resource collection, as well as through careful restoration of each sampling site. Sensitive vegetation will also be avoided during sampling. The Impacts tab further details our proposed mitigation strategies for any negative effects. There will be no transboundary effects as this research is localized and will not cause greater harm, and there will be no adverse effects to species under the Species at Risk Act and their habitats, as these species and their habitats will be avoided during sampling. There is flexibility in sample site selection, which further allows the avoidance of sensitive areas and enables us to carefully choose the most appropriate sampling site. As stated previously, aboard the Adventure Canada vessel there will also be a resource team of scientists and local Nunavut residents. We will consult with these individuals prior to site selection and sampling regarding any possible environmental concerns in the area. If there are environmental concerns, sampling will not occur. As above, this work is expected to have no negative socioeconomic impacts on the locations visited. Longer term, we hope this data will allow better prediction of greenhouse gas emissions from permafrost, and how local environmental factors may influence carbon flux in different Arctic regions. We hope this will improve climate modelling, and in turn aid in supporting climate resilience planning for northern communities. Furthermore, we will discuss our research with the passengers travelling with Adventure Canada to raise awareness for northern communities experiencing the effects of climate change in their local environments. Our aim is to create increased global advocacy for Nunavut communities navigating the future of climate warming in the Arctic.

Cumulative Effects

There will be no cumulative effects resulting from this work.

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																									
Researching		-	-	M	-	-	-	-	-	-	-	-	-		M	-	-	-	-		-	-	-	-	-
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

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

Project Location

List of Project Geometries

1	point	Prescott Island
2	point	Pasley Bay
3	point	Grise Fiord Inlet
4	point	Coutts Inlet
5	point	Maxwell Bay
6	point	Aston Bay
7	point	Strzelecki Harbour
8	point	Fort Ross
9	point	Wrottesley Inlet
10	point	Dundas Harbour

11	point	Powell Inlet
12	point	Port Leopold
13	point	Beechey Island