



NIRB Application for Screening #126400

Testing the impact of early land plants on the Earth system

Application Type: New

Project Type: Scientific Research

Application Date: Monday, March 16, 2026

Period of operation: from 2026-07-04 to 2026-08-04

Project Proponent: Erik Sperling
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DETAILS

Non-technical project proposal description

English: Erik Sperling, professor at Stanford University in California, would like to have a one year research program at sites on Cornwallis Island, Bathurst Island, and Truro Island. The project is proposed for mid July-early August 2026. We would like to work near Read Bay on eastern Cornwallis Island (75° 0.763' N; 93 ° 45.606' W) and near Twilight Creek on northwest Bathurst Island (76 ° 10.827' N; 99 ° 10.766' W). If we cannot land at Twilight Creek we have planned an alternative site at the established landing strip on Truro Island (76 ° 18.637' N; 97 ° 9.229' W). The Read Bay camp is expected to take eight people into the field for 8-10 days by helicopter from Resolute Bay (Polar Continental Shelf Project). The Twilight Creek camp is expected to take six people into the field for 6-7 days by Twin Otter, also from Resolute Bay. The camp would be small tents, with one central cooking/working tent. Water will be taken from a local creek (about 25 litres a day). The site will be cleaned of all material when the camp is removed. Our research group worked in Qausuittuq National Park on Bathurst Island in 2023 and can provide pictures of the area when we left. Our research group led by Erik Sperling involves numerous researchers from the United States, Canada, and around the world. This includes students at Stanford (Emily Ellefson, Leah Kahn, Sarah Leibovitz), professors and students at Yale University (Lidya Tarhan, Sydney Riemer, David Havlat), and professors at the University of Ottawa (Malcolm Hodgskiss) and Imperial College London (Martin Brazeau). We are also collaborating on this project with Keith Dewing and Sofie Gouwy, who are researchers with the Canadian federal government at the Geological Survey of Canada. Sofie Gouwy may collaborate with us in the field. We would like to have the support of a wildlife expert from Resolute Bay to provide safety and advice about animals in the area. The main activity is to describe the rock layers and sample the outcrop in localities near our camp. Samples (~100 grams, size of an egg) would be taken from the outcrop every 1 metre. Samples are collected by hand, hammer or shovel. A total of 300-400 samples would be taken at each camp. Graptolite and conodont fossils are common in these rocks and would be sampled to provide a way to compare to other outcrops in the region and world. These samples would be returned to the university for processing to understand the rock chemistry, organic matter (including fossil spores and plant particles), and fossil molecules. The purpose of the study is to examine changes in the rocks related to the rise of land plants, which took place at the time these rocks were deposited. The spread of land plants is proposed to have changed the way iron, organic matter, and other elements were weathered from the soil. These changes should be preserved in the rocks we would like to collect. This work will help understand how the Earth's climate and other Earth cycles changed about 415 million years ago. Our next steps will be to apply for a Nunavut Science License and Paleontological Collection permit, and to apply for a research permit through Parks Canada Nunavut Field Unit to work in Qausuittuq Park. We look forward to hearing any advice or concerns you have on these proposed activities and to explore the opportunity for contracting a wildlife expert from Resolute Bay. Should you have any question about the field work, please do not hesitate to contact me by email at esper@stanford.edu

French: Erik Sperling, professeur à Stanford University en Californie, souhaite mener un programme de recherche d'une durée d'un an sur des sites situés sur Cornwallis Island, Bathurst Island et Truro Island. Le projet est proposé pour la mi-juillet au début août 2026. Nous souhaiterions travailler près de Read Bay, dans l'est de Cornwallis Island (75° 0.763' N; 93 ° 45.606' W), et près de Twilight Creek, dans le nord-ouest de Bathurst Island (76 ° 10.827' N; 99 ° 10.766' W). Si nous ne pouvons pas atterrir à Twilight Creek, nous avons prévu un site de rechange sur la piste d'atterrissage existante de Truro Island (76 ° 18.637' N; 97 ° 9.229' W). Le camp de Read Bay devrait mobiliser huit personnes sur le terrain pendant 8 à 10 jours, avec transport par hélicoptère depuis Resolute Bay (Polar Continental Shelf Project). Le camp de Twilight Creek devrait mobiliser six personnes sur le terrain pendant 6 à 7 jours, en Twin Otter, également depuis Resolute Bay. Le camp sera constitué de petites tentes, avec une tente centrale pour la cuisine et le travail. L'eau sera prélevée dans un ruisseau local (environ 25 litres par jour). Le site sera entièrement nettoyé de tout matériel lors du démantèlement du camp. Notre groupe de recherche a travaillé dans Qausuittuq National Park sur Bathurst Island en 2023 et peut fournir des photos de la zone après notre départ. Notre groupe de recherche, dirigé par Erik Sperling, comprend de nombreux chercheurs des États-Unis, du Canada et d'ailleurs dans le monde. Cela comprend des étudiants de Stanford (Emily Ellefson, Leah Kahn, Sarah Leibovitz), des professeurs et des étudiants de Yale University (Lidya Tarhan, Sydney Riemer, David Havlat), ainsi que des professeurs de University of Ottawa (Malcolm Hodgskiss) et de Imperial

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Read Bay-- primary research camp locality	Scientific/International Polar Year Research	Crown	This is the type section for many of the Silurian-Devonian regional geology type sections and has been studied by multiple geological field parties	These Silurian-Devonian stratigraphic sections have an outstanding record of Paleozoic invertebrates (brachiopods, conodonts, stromatolites, etc.), plants, and vertebrates. This site has been the subject of multiple studies.	Nearest community is Resolute Bay. It is not near any protected areas.
Cape Martyr-- possible research locality if extra days at PCSP base	Scientific/International Polar Year Research	Municipal	This area has not been studied in depth but there are strikes and dips on the map of Thorsteinsson 1626A, suggesting that there are rocks worthwhile to study	Unknown, site has not been studied before	Resolute Bay.
Signal Hill-- possible research locality if extra days at PCSP base	Scientific/International Polar Year Research	Municipal	This area has not been studied in depth but there are strikes and dips on the map of Thorsteinsson 1626A, suggesting that there are rocks worthwhile to study	Unknown, site has not been studied before	Resolute Bay
Read Bay-- primary research camp locality	Scientific/International Polar Year Research	Inuit Owned Surface Lands	This is the type section for many of the Silurian-Devonian regional geology type sections and has been studied by multiple	These Silurian-Devonian stratigraphic sections have an outstanding record of Paleozoic invertebrates (brachiopods, conodonts, stromatolites, etc.), plants, and	Nearest community is Resolute Bay. It is not near any protected areas.

			geological field parties	vertebrates. This site has been the subject of multiple studies.	
Twilight Creek--primary research camp locality	Scientific/International Polar Year Research	Crown	Twilight Creek and Cut Through Creeks are some of the best exposures of the Eids, Blue Fiord, and Bird Fiord formations in the southern Queen Elizabeth Islands. These are the reference sections in Fortier et al. 1963 and Kerr 1974, which are the definitive sources on the geology of this area.	These sites have not been studied in depth but based on Fortier et al. and Kerr this site appears to have numerous Devonian invertebrate fossils including sponges, brachiopods, corals, and conodonts	Nearest community is Resolute Bay. This site is in Qausuittuq National Park
Storm exploration camp--work on existing drill cores	Scientific/International Polar Year Research	Crown	This site is currently being explored by American West Minerals. If permission is granted, we would be visiting the camp to work on existing drill cores to address our academic questions regarding the impact of plants on the Earth system	None known.	Resolute Bay
Truro Island--backup site if we cannot land at Twilight Creek	Scientific/International Polar Year Research	Inuit Owned Surface Lands	The Ordovician-Devonian stratigraphy and geochemistry at Truro Island has been studied by various research groups including Melchin and Holden 2006	This site preserves graptolite fossils primarily and likely Devonian fossils such as corals, brachiopods, sponges, etc.	Resolute Bay

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Resolute Bay	SAO	Hamlet of Resolute Bay	2026-02-18
Resolute Bay	rbhta@baffinhto.ca	Resolute Bay Hunters and Trappers Association	2026-02-18

Authorizations

Indicate the areas in which the project is located:

North Baffin

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Government of Nunavut, Nunavut Research Institute	Scientists license	Applied, Decision Pending		
Nunavut Planning Commission	Planning conformity	Active	2026-03-09	
Government of Nunavut, Department of Culture, Language, Elders, and Youth	Archeology and Paleontology permit (presuming this is the Government of Nunavut Department of Culture and Heritage)	Not Yet Applied		
Nunavut Water Board	Water license (or specifically statement that we do not need a water license)	Not Yet Applied		
Parks Canada	Research permit	Applied, Decision Pending		
Qikiqtani Inuit Association	Land use permit I, non-Inuit	Applied, Decision Pending		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	We will travel by PCSP helicopter to our Read Bay camp, and by PCSP Twin Otter to our Twilight Creek camp.	
Land	Access to Cape Martyr and Signal Hill will be on foot or bicycle from the PCSP Resolute Bay research station	

Project accommodation types

Temporary Camp

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Helicopter	1	36 feet	A helicopter will be used for transport to and from the Polar Continental Shelf base in Resolute Bay to our research camp in Read Bay
Twin Otter plane	1	50	A Twin Otter will be used for transport to and from the Polar Continental Shelf base in Resolute Bay to our research camp at Twilight Creek (or our backup site on Truro Island)

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Propane	fuel	2	25	50	Liters	Cooking on two-burner stoves
Gasoline	fuel	1	5	5	Gallons	Small generator for telepresence outreach activities

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	Buckets and/or handheld water bladders	Unnamed streams and creeks near our campsites.

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Scientific/International Polar Year Research	Sewage (human waste)	8 days x 8 ppl (Read Bay), 7 days x 6 ppl (Twiligh	All human waste will be collected using portable toilet systems available from PCSP, and transported back to Resolute Bay. None will be left in the field.	This will be properly disposed of at the PCSP base in Resolute Bay.

Environmental Impacts:

The impacts are primarily those associated with a small team of researchers in a temporary camp, and sampling the rock strata. To mitigate this, we operate on the philosophy of no (or at least minimal) impact. We will leave no rubbish or other trace of our base camps or sampling locations. No campfires are allowed in camp and we only use small, gas-powered stoves. We use small personal tents (no structures). Team leader Dr. Sperling and Dr. Tarhan have worked and camped in many remote areas during previous field seasons throughout northwestern Canada (and elsewhere in the Arctic) during previous field seasons, and have left campsite areas essentially indistinguishable from before arriving, in keeping with the wild character of these field areas. All human waste will be packed out with the team. With respect to rock sampling, we will be collecting geological rock samples via hand or geological hammer. We will not be making any holes or excavations or using any mechanized equipment. All rock samples to be collected are normal rock samples with no aesthetic or commercial value. We will attempt to minimize the amount of sample being removed and use our rock hammers as little as possible and we will target easily accessible broken or fractured outcrops to avoid excessive hammer use. We are experienced at sampling with minimal impact on the outcrop, and as stated above, strive to minimize our impact on the environment.

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

These areas represent standard physical environments in the region, in the sense there is nothing particularly observably different (except the particulars of the underlying geology, which we are interested in studying). We have not been to this area before so are primarily providing this information based on aerial photographs. Our camp areas will be near the helicopter/twin otter landing areas on flat ground. The rocks we are studying will primarily be near small streams, which is how the rocks are best exposed on Cornwallis and Bathurst Islands.

Description of Existing Environment: Biological Environment

These areas represent standard biological environments in the region, in the sense there is nothing especially different or unique about them. However, we would note we are geologists and so there may be unique biological environment features that we are unaware of. If those are revealed during this NIRB review, we would be happy to revise our plans accordingly.

Description of Existing Environment: Socio-economic Environment

Our research will start at the PCSP base in Resolute Bay, where we are hiring a wildlife monitor and purchasing some of our field food. Our actual field research will be remote to this community and will not directly impact it. We are not aware of archaeological or culturally significant sites near our field areas based on our knowledge to date, but can adjust our plans accordingly if those are revealed during the NIRB screening process. There is a strong Silurian-Devonian paleontological record in the rocks we are studying-- indeed, the paleontological and geochemical record in these rocks is the prime reasons we are going to these areas (to study the impact of early land plants on the Earth systems). We have explained our scientific and paleontological research plan in all applications and are separately applying for a Government of Nunavut paleontological permit. We are not aware of any subsistence harvesting, guiding, trapping, or tourism activities in our areas, based on our research and discussions with our wildlife monitor. We have reached out to the Hamlet of Resolute Bay, Resolute Bay Hunters and Trappers Association, and Qikiqtani Inuit Association with our plans, and can adjust our plans if any of these organizations or the NIRB screening procedure reveals proximity to such activities. We do not believe this proposal relates to traffic patterns, human health, or VSEC components.

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

The impacts are primarily those associated with a small team of researchers in a temporary camp, and

sampling the rock strata. To mitigate this, we operate on the philosophy of no (or at least minimal) impact. We will leave no rubbish or other trace of our base camps or sampling locations. No campfires are allowed in camp and we only use small, gas-powered stoves. We use small personal tents (no structures). Team leader Dr. Sperling and Dr. Tarhan have worked and camped in many remote areas during previous field seasons throughout northwestern Canada (and elsewhere in the Arctic) during previous field seasons, and have left campsite areas essentially indistinguishable from before arriving, in keeping with the wild character of these field areas. Our team previously did fieldwork in Qausuittuq National Park in 2023 at Grant Point, and our camp area was essentially unchanged (pictures available on request). In fact we left it 'cleaner than we found it' by hauling out some minor trash apparently left by an older and less careful field party (the previous geological work at that site was in the late 1980s). All human waste will be packed out with the team, using the portable toilet system available from the PCSP base in Resolute Bay. With respect to rock sampling, we will be collecting geological rock samples via hand or geological hammer. We will not be making any holes or excavations or using any mechanized equipment. All rock samples to be collected are normal rock samples with no aesthetic or commercial value. We will attempt to minimize the amount of sample being removed and use our rock hammers as little as possible and we will target easily accessible broken or fractured outcrops to avoid excessive hammer use. We are experienced at sampling with minimal impact on the outcrop, and as stated above, strive to minimize our impact on the environment.

Cumulative Effects

Although there have been geological field parties where we are planning to camp and work, they have commonly been decades apart. For at least some of our sites, they have not been re-studied in nearly 50 years. Thus, we do not believe there are cumulative effects from re-study of these geological field areas.

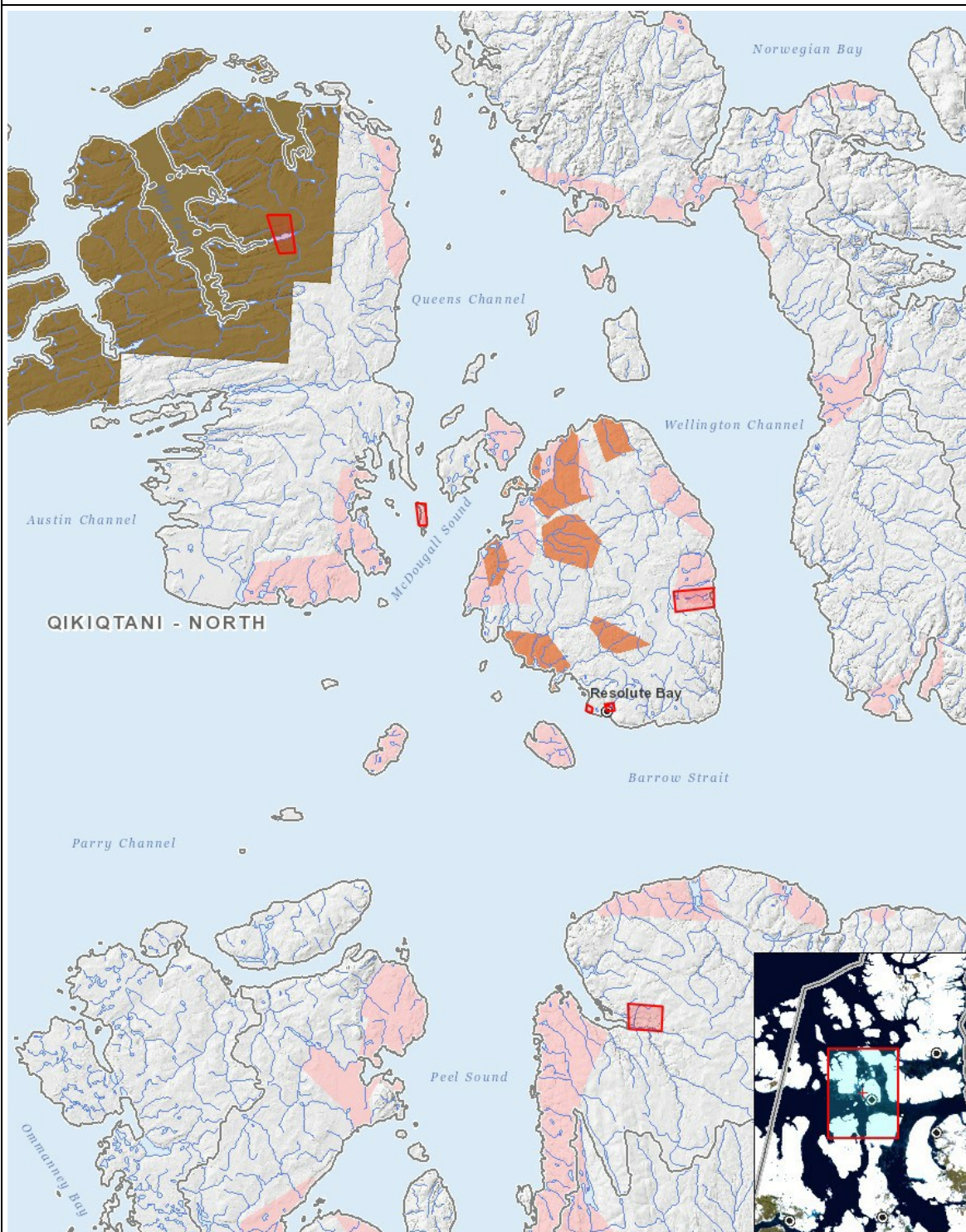
Impacts

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			N	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	P	-	-	-
Decommissioning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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

Project Location



List of Project Geometries

- 1 polygon Read Bay--primary research camp locality
- 2 polygon Cape Martyr--possible research locality if extra days at PCSP base
- 3 polygon Signal Hill--possible research locality if extra days at PCSP base
- 4 polygon Twilight Creek--primary research camp locality
- 5 polygon Storm exploration camp--work on existing drill cores
- 6 polygon Truro Island--backup site if we cannot land at Twilight Creek
- 7 polygon Signall Hill and Mechem River--possible research locality if extra days at PCSP base