NIRB Application for Screening #126137

Permafrost organic carbon fluxes to the Canadian Arctic Ocean

Application Type: New

Project Type: Scientific Research

Application Date: 2/17/2025 10:33:27 AM

Period of operation: from 2025-06-01 to 2028-04-01

Project Proponent:

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DETAILS

Non-technical project proposal description

English: This scientific research project led by professor Stephanie Kusch (University of Quebec Rimouski) will investigate changes in permafrost organic carbon remineralization and erosion in response to climate change. Activities performed by a team of 3 university researchers during the duration of the project (yearly sampling for 2-3 weeks in July/August from 2025 to 2028) include permafrost soil sampling to study greenhouse gas production and organic matter transformation as well as sampling of marine sediments (0-2cm depth) to study erosion of permafrost organic carbon into the ocean and oceanic feedback mechanisms. Soil samples will be taken from small 15x15cm soil pits reaching the permafrost table (30-50cm depth) and sediments will be taken using small grab samplers. Samples will be brought back to the laboratory at the University of Quebec Rimouski for direct analysis and long-term incubations in the laboratory. The observations made in this research project will be linked to longer sediment records to understand past permafrost dynamics beyond observational records, which allows assessing the sensitivity and response of permafrost OC to natural climatic as well as anthropogenic forcing and helps predicting the future response of permafrost to climate change. This research will aid the community of Qikiqtarjuaq better understand on-going changes in the environment and their fishing and hunting grounds.The researchers will use the new Qikiqtarjuaq research station operated by Laval University, which handles all waste disposal. No environmental impact on the land is expected. No chemicals or plastics will be used for sampling. Equipment cleaning protocols will be followed to prevent any import of invasive species. Sample volumes are small (500ccm) and soil pits will be closed after sampling so that they do not represent any safety concern.

French: Ce projet de recherche scientifique dirigé par la professeure Stephanie Kusch (Université du Québec Rimouski) étudiera les changements dans la reminéralisation du carbone organique du pergélisol et l'érosion en réponse au changement climatique. Les activités réalisées par une équipe de 3 chercheurs universitaires pendant la durée du projet (échantillonnage annuel pendant 2 à 3 semaines en juillet/août de 2025 à 2028) comprennent l'échantillonnage du sol du pergélisol pour étudier la production de gaz à effet de serre et la transformation de la matière organique, ainsi que l'échantillonnage des sédiments marins pour étudier l'érosion du carbone organique du pergélisol dans l'océan et les mécanismes de rétroaction océanique. Les échantillons de sol seront prélevés dans de petites fosses de 15 x 15 cm atteignant la table du pergélisol (30 à 50 cm de profondeur) et les sédiments (0-2cm de profondeur) seront prélevés à l'aide de petites bennes. Les observations faites dans le cadre de ce projet de recherche seront reliées à des enregistrements de sédiments plus longs afin de comprendre la dynamique passée du pergélisol au-delà des enregistrements d'observation, ce qui permettra d'évaluer la sensibilité et la réponse du pergélisol OC aux forçages climatiques naturels et anthropogéniques et aidera à prédire la réponse future du pergélisol au changement climatique. Cette recherche aidera la communauté de Qikiqtarjuaq à mieux comprendre les changements en cours dans l'environnement et dans leurs territoires de pêche et de chasse.Les chercheurs utiliseront la nouvelle station de recherche de Qikiqtarjuaq, exploitée par l'Université Laval, qui s'occupe de l'élimination des déchets. Aucun impact environnemental sur les terres n'est prévu. Aucun produit chimique ou plastique ne sera utilisé pour l'échantillonnage. Les protocoles de nettoyage de l'équipement seront respectés afin d'éviter toute importation d'espèces envahissantes. Les volumes d'échantillons sont faibles (500 cm3) et les fosses pédologiques seront fermées après l'échantillonnage afin qu'elles ne posent pas de problème de sécurité.

Inuktitut: ᑖᓐᓇ ᑭᓪᓕᓯᓂᐊᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᓂᖅ ᓯᕗᓕᖅᑎᐅᓪᓗᓂ ᐃᓕᓴᐃᔨᒻᒪᕆᒻᒧᑦ Stephanie Kusch (University of Quebec Rimouski) ᖃᐅᔨᓴᕐᓂᐊᖅᑐᖅ ᐊᓯᔾᔨᕐᓂᐅᔪᓂᒃ ᖁᐊᙳᐃᓐᓇᖅᑐᒥ ᐳᔪᕐᓗᙵᒃ ᐅᕙᕋᖕᓂᐊᒃᑳᓂᕐᓂᕐᒥᒃ ᐊᒻᒪᓗ ᓄᖑᑉᐸᓪᓕᐊᓂᕐᒥᒃ ᑭᐅᔾᔪᑕᐅᓪᓗᓂ ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᖓᓄᑦ. ᐱᓕᕆᐊᖑᔪᑦ ᑲᒪᒋᔭᐅᔪᑦ ᐱᖓᓱᓄᑦ ᓯᓚᑦᑐᖅᓴᕐᕕᒃᔪᐊᕐᒥ ᖃᐅᔨᓴᖅᑎᓄᑦ ᐱᓕᕆᐊᖑᑎᓪᓗᒍ (ᐊᕐᕌᒍᑕᒫᑦ ᐆᒃᑐᕋᐃᓂᖅ ᐱᓇᓱᐊᕈᓯᕐᓄᑦ 2-3-ᓄᑦ ᔪᓚᐃ/ᐋᒡᒌᓯᒥ 2025-ᒥᑦ 2028-ᒧᑦ) ᐃᓚᖃᖅᐳᑦ ᖁᐊᙳᐃᓐᓇᖅᑐᒥᒃ ᓄᓇᒥᒃ ᐆᒃᑐᕋᐃᓂᕐᒥᒃ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐅᖅᑰᓯᕙᓪᓕᐊᔪᒥᒃ ᑳᓯᒥᒃ ᓴᖅᑭᑦᑎᓂᕐᒥᒃ ᐊᒻᒪ ᐆᒪᔪᐃᑦ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᖏᓐᓂᒃ ᐊᒻᒪᓗᑦᑕᐅᖅ ᐆᒃᑐᕋᐃᓂᕐᒥᒃ ᐃᒪᕐᒥᐅᑕᓂᒃ ᐃᑎᔪᓂᒃ ᑎᓐᓂᓂᐅᔪᓄᑦ) ᐳᔪᕐᓗᒃ ᐃᒪᕐᒧᑦ ᐊᒻᒪᓗ ᐃᒪᕐᒥᐅᑕᓄᑦ ᑐᓴᖅᑎᑦᑎᔾᔪᑕᐅᕙᒃᑐᑦ. ᓄᓇᐅᑉ ᖃᐅᔨᓴᖅᑕᐅᓂᖏᑦ ᐱᔭᐅᓂᐊᖅᑐᑦ ᒥᑭᔪᓂᒃ 15x15cm ᓄᓇᐅᑉ ᖄᖓᓂᒃ ᑎᑭᐅᑎᔪᓂᒃ ᖁᐊᙳᐃᓐᓇᖅᑐᒧᑦ ᖁᐊᙳᐃᓐᓇᖅᑐᒧᑦ (30-50cm ᐃᑎᓂᖃᖅᑐᒥᒃ) ᐊᒻᒪᓗ ᓯᐅᕋᐃᑦ ᐱᔭᐅᓂᐊᖅᑐᑦ ᐊᑐᕐᓗᑎᒃ ᒥᑭᔪᓂᒃ ᑎᒍᓯᔾᔪᑎᓂᒃ ᖃᐅᔨᓴᕈᑎᓂᒃ. ᖃᐅᔨᓴᕈᑏᑦ ᐅᑎᖅᑎᑕᐅᓂᐊᖅᑐᑦ ᖃᐅᔨᓴᕐᕕᖕᒧᑦ ᓯᓚᑦᑐᖅᓴᕐᕕᒃᔪᐊᖓᓂ ᑯᐸᐃᒃ ᓇᒨᒃᑭ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᕐᒪᑕ ᐊᒻᒪᓗ ᐊᑯᓂᐅᔪᒃᑯᑦ ᐆᓇᖅᓯᑎᑕᐅᓗᑎᒃ ᖃᐅᔨᓴᕐᕕᖕᒥ. ᖃᐅᔨᔭᐅᔪᑦ ᑕᕝᕙᓂ ᖃᐅᔨᓴᕐᓂᐅᔪᒥ ᐊᒃᑐᐊᓂᖃᕐᓂᐊᖅᑐᑦ ᐊᑯᓂᐅᓂᖅᓴᒧᑦ ᑎᓐᓂᓂᐅᔪᒥ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓄᑦ ᑐᑭᓯᐅᒪᔭᐅᖁᓪᓗᒋᑦ ᑭᖑᓂᑦᑎᓐᓂ ᖁᐊᙳᐃᓐᓇᕐᓂᑲᓚᐅᖅᑕᖓ ᖃᓄᐃᓕᖓᓕᕐᓂᑲᓚᐅᖅᑕᖓ ᐅᖓᑖᓄᑦ ᖃᐅᔨᔭᐅᓯᒪᔪᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ, ᑕᒪᓐᓇ ᐱᕕᖃᖅᑎᑦᑎᔪᖅ ᑭᐅᔪᓐᓇᕐᓂᕐᒥᒃ ᓯᓚᐅᑉ ᖃᓄᐃᓐᓂᖓᓄᑦ ᐊᒻᒪᓗ ᖁᐊᙳᓂᖓᓄᑦ ᐃᓄᓐᓄᑦ ᓴᖅᑭᑕᐅᓯᒪᔪᑦ ᐊᒻᒪᓗ ᐃᑲᔪᕐᓂᖃᖅᑐᑎᒃ ᓇᓚᐅᑦᑖᕐᓂᕐᒥᒃ

ᓯᕗᓂᒃᓴᒥ ᑭᐅᔾᔪᑕᐅᓂᐊᖅᑐᓂᒃ ᖁᐊᖑᔪᓄᑦ ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᖓᓄᑦ. ᑖᓐᓇ ᖃᐅᔨᓴᕐᓂᖅ ᐃᑲᔫᑕᐅᓂᐊᖅᑐᖅ ᓄᓇᓕᓐᓄᑦ ᕿᑭᖅᑕᕐᔪᐊᕐᒥᐅᓄᑦ ᑐᑭᓯᐅᒪᓂᖅᓴᐅᓕᕐᓗᑎᒃ ᐊᓯᔾᔨᐸᓪᓕᐊᖕᖓᓐᓇᖅᑐᓂᒃ ᐊᕙᑎᒥ ᐊᒻᒪᓗ ᐃᖃᓗᒡᓯᕙᕆᕙᑦᑕᖕᖏᓐᓂᒃ ᐊᖑᓇᓯᕙᕆᕙᑦᑕᖕᖏᓐᓂᓪᓗ.ᖃᐅᔨᓴᖅᑏᑦ ᐊᑐᕐᓂᐊᖅᑐᑦ ᓄᑖᒥᒃ ᕿᑭᖅᑕᕐᔪᐊᕐᒥ ᖃᐅᔨᓴᕐᕕᖕᒥ ᐊᐅᓚᑕᐅᔪᒥᒃ Laval University, ᑕᒪᐃᓐᓂᓕᒫᖅ ᐊᒃᑕᑯᓂᒃ ᐃᒋᑦᑎᕋᒃᑐᓂᒃ ᑲᒪᖃᑦᑕᖅᑐᖅ. ᐊᕙᑎᒨᑦ ᐊᑦᑐᐃᓂᖃᕐᓂᐊᕋᓯᒋᔭᐅᖏᑦᑐᖅ ᓄᓇ. ᓱᕈᕐᓇᖅᑐᓂᒃ ᐊᐅᑦᑕᔫᓂᓪᓘᓐᓃᑦ ᐊᑐᔾᔮᖏᑦᑐᑦ ᖃᐅᔨᓵᕆᓄᑦ. ᓱᓇᒃᑯᑖᑦ ᓴᓗᒻᒪᖅᓴᖅᑕᐅᓂᖏᓐᓄᑦ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ ᒪᓕᒃᑕᐅᓂᐊᖅᑐᑦ ᑎᑭᑎᑦᑎᑦᑕᐃᓕᒪᕐᑯᓪᓗᒋᑦ ᐸᒡᕖᓵᕆᔭᐅᔪᓂᒃ ᐆᒪᔪᓂᒃ. ᐆᒃᑐᕋᐅᑎᑦ ᐊᖏᓂᖏᑦ ᒥᑭᑦᑐᑦ (500ccm) ᐊᒻᒪᓗ ᓄᓇᐅᑉ ᖌᖓᓃᑦᑐᑦ ᒪᑐᔭᐅᓂᐊᖅᑐᑦ ᐆᒃᑐᕋᖅᑕᐅᓚᐅᖅᑎᓪᓗᒋᑦ ᑭᒡᒐᖅᑐᐃᖁᓇᒋᑦ ᐊᑦᑕᕐᓇᖅᑕᐃᓕᒪᓂᕐᒧᑦ ᐃᓱᒫᓘᑎᓂᒃ.

Personnel

Personnel on site: 3

Days on site: 80

Total Person days: 240

Operations Phase: from 2024-12-08 to 2028-04-01

Operations Phase: from 2025-06-01 to 2028-04-01

Post-Closure Phase: from to

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
permafrost 1	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 2	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 3	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits,	N/A	within 5km aerial distance to Qikiqtarjuaq

			approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.		
permafrost 4	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 5	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess	N/A	within 5km aerial distance to Qikiqtarjuaq

			soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.		
permafrost 6	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 7	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 8	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide	N/A	within 5km aerial distance to Qikiqtarjuaq

			and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.		
permafrost 9	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 10	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will	N/A	within 5km aerial distance to Qikiqtarjuaq

			be used to close pits after a sample of 500ccm has been taken.		
permafrost 11	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 12	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 13	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the	N/A	within 5km aerial distance to Qikiqtarjuaq

			permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.		
permafrost 14	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Permafrost soils samples will be taken from small soil pits, approximately 15x15cm wide and 30-50cm deep (to the permafrost table). Soil pits will be opened with knifes and shovels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits after a sample of 500ccm has been taken.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 11	Scientific/International Polar Year Research	Inuit Owned Surface Lands	Sediment samples will be taken from a small boat using a Ponar grab sampler. Approximately 200ccm sediment will be sampled. One to two 40L canisters will be filled with water to filter suspended sediments.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 12	Scientific/International Polar Year Research	Marine	Sediment samples will be taken from a small boat using a Ponar grab	N/A	within 5km aerial distance to Qikiqtarjuaq

			sampler. Approximately 200ccm sediment will be sampled. One to two 40L canisters will be filled with water to filter suspended sediments.		
sediment 13	Scientific/International Polar Year Research	Marine	Sediment samples will be taken from a small boat using a Ponar grab sampler. Approximately 200ccm sediment will be sampled. One to two 40L canisters will be filled with water to filter suspended sediments.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 14	Scientific/International Polar Year Research	Marine	Sediment samples will be taken from a small boat using a Ponar grab sampler. Approximately 200ccm sediment will be sampled. One to two 40L canisters will be filled with water to filter suspended sediments.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 15	Scientific/International Polar Year Research	Marine	Sediment samples will be taken from a small boat using a Ponar grab sampler. Approximately 200ccm sediment will be sampled. One to two 40L canisters will be filled with water to filter suspended sediments.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 1	Scientific/International	Inuit	One to two 40L	N/A	within 5km

	Polar Year Research	Owned Surface Lands	canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.		aerial distance to Qikiqtarjuaq
sediment 2	Scientific/International Polar Year Research	Inuit Owned Surface Lands	One to two 40L canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 3	Scientific/International Polar Year Research	Inuit Owned Surface Lands	One to two 40L canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 4	Scientific/International Polar Year Research	Inuit Owned Surface Lands	One to two 40L canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 5	Scientific/International	Inuit	One to two 40L	N/A	within 5km

	Polar Year Research	Owned Surface Lands	canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.		aerial distance to Qikiqtarjuaq
sediment 6	Scientific/International Polar Year Research	Inuit Owned Surface Lands	One to two 40L canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 7	Scientific/International Polar Year Research	Inuit Owned Surface Lands	One to two 40L canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 8	Scientific/International Polar Year Research	Inuit Owned Surface Lands	One to two 40L canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.	N/A	within 5km aerial distance to Qikiqtarjuaq
sediment 9	Scientific/International	Inuit	One to two 40L	N/A	within 5km

	Polar Year Research	Owned Surface Lands	canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.		aerial distance to Qikiqtarjuaq
sediment 10	Scientific/International Polar Year Research	Inuit Owned Surface Lands	One to two 40L canisters will be filled with water to filter suspended sediments. If no surface flow is observed, surface sediment samples (200ccm of uppermost 2cm) taken with a small shovel.	N/A	within 5km aerial distance to Qikiqtarjuaq
permafrost 12	Scientific/International Polar Year Research	Inuit Owned Surface Lands	reference site to analyze CO2 emissions from permafrost soil. A flux chamber will be placed onto the soil and CO2 emissions will be recorded using a LI-COR LI-870 CO2/H2O Analyzer. Non-destructive analysis without impact on the sampling site.	N/A	within 5km aerial distance to Qikiqtarjuaq

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Qikiqtarjuaq	Geela Kooneeliusie	hamlet Qikiqtarjuaq	2025-02-03
Qikiqtarjuaq	Billy Arnaquq	Nunavut Experience Outfitting Services	2025-02-01

Authorizations

Indicate the areas in which the project is located:

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Hamlets and Municipalities	Consultation with hamlet and hunters and trappers organization on 2025-02-03 in Qikiqtarjuaq. Project well received by both organizations. Support letters to be issued.	Applied, Decision Pending		
Nunavut Research Institute	Scientific Research License for Natural/Physical Sciences research, excluding terrestrial and aquatic wildlife. Application will be submitted as soon as support letters from hamlet and HTO are available	Not Yet Applied		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Water	boat	
Land	ATV, by foot	

Project accomodation types

Community

Other,

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
ATV	2	50x50x80inch	Transport across island to individual sampling sites, transport of material and samples; to be rented on site. Will be rented from Nunavut Experience Outfitting Services/Billy Arnaquq
boat	1	unknown	Transport to sampling sites for surface sediment sampling with Polar grab sampler. Will be rented from Nunavut Experience Outfitting Services/Billy Arnaquq
knives, trowels, tarp	6	10x4x2inch	open permafrost soil pits by hand, store excess soil and vegetation cover on tarp to contain overburden until closure of soil pits with overburden

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Gasoline	fuel	6	40	240	Liters	Operation of ATV; fueling handled on site by Nunavut Experience Outfitting Services/Billy Arnaquq
none	hazardous	0	0	0	Liters	no chemicals will be 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
Sampling sites	Combustible wastes	0kg	No waste will be produced during the permafrost soil sampling process. Any personal waste produced by the researchers (e.g., tissues/napkins, lunch bags) will be transported back to the research station to use their waste disposal system.	Soil pits will be opened with knifes and trowels. Soil and sediment samples will be sampled into pre-combusted glass jars closed with lids (no plastic bag use). Soil pits will closed after subsamples have been taken; surface vegetation will be used to close pits. The sample containers are transported back to the laboratory in Rimouski, Quebec, where any packaging material will be discarded. No chemicals will be added to the samples. Samples are stored frozen until analysis in the laboratory.Knives and trowels will be cleaned properly in the laboratory prior to transport to Qikiqtarjuaq to prevent any import of invasive species seeds/pollen.
Fuel and chemical storage	Hazardous waste	0L	Boat and ATVs will be rented from a local partner (Nunavut Experience Outfitting Services, owned by Billy Arnaquq). The aerial distance between the research station and the sampling sites is around 5km, thus, no re-fueling in the field is planned. Any re-fueling will be handled by the local partner and	In case of spillage due to a driving accident, contaminated soil will be placed into plastic garbage bags and transported to the research station for proper disposal.

			distances travelled during day trips will be planned to not exceed the total distance afforded by mileage/tank capacity.	
Other	Sewage (human waste)	daily human waste produced by 3 researchers	The research team will stay at the new research station operated by Laval University. The station is equipped with a septic tank that will be used for sewage disposal. No human waste will be disposed of in the field.	Septic tank clean up is managed by the research station operators.

Environmental Impacts:

The environmental impact of this project is minimal. Soil pits will be opened with knifes and trowels and closed after subsamples have been taken; excess soil and surface vegetation will be used to close pits, small depressions of the ground (15x15cm) are expected, but do not pose a safety issue. All soil and sediment samples will be transported back to the laboratory in Rimouski (no treatment of samples on site / no use of chemicals).

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

Description of Existing Environment: Biological Environment

Description of Existing Environment: Socio-economic Environment

Miscellaneous Project Information

The research team will stay at the new research station operated by Laval University. Field trips will be carried out in July/August at peak annual temperatures when active layer depths are highest. Individual trips are planned to last approximately 2-3 weeks. Any waste (organic from food and personal hygiene products such as tissues, toilet paper) and sewage removal will be handled by the station.

Identification of Impacts and Proposed Mitigation Measures

The soil pits dug for permafrost sampling will have a very small footprint (15x15cm opening with 30-50cm depth). Samples of 500ccm will be taken and soil pits will be closed with the remaining soil and original vegetation cover. A minor depression resulting from the removal of 500ccm soil can be expected in the landscape. These minor depressions do not present a safety concern.Samples will be stored in pre-combusted glass jars with lids. All glass jars will be transported back to the laboratory. No plastics will be used for sampling.All sampling material will be properly cleaned with water and organic solvents in the laboratory prior to transport to Qikiqtarjuaq to prevent any import of evasive species.

Cumulative Effects

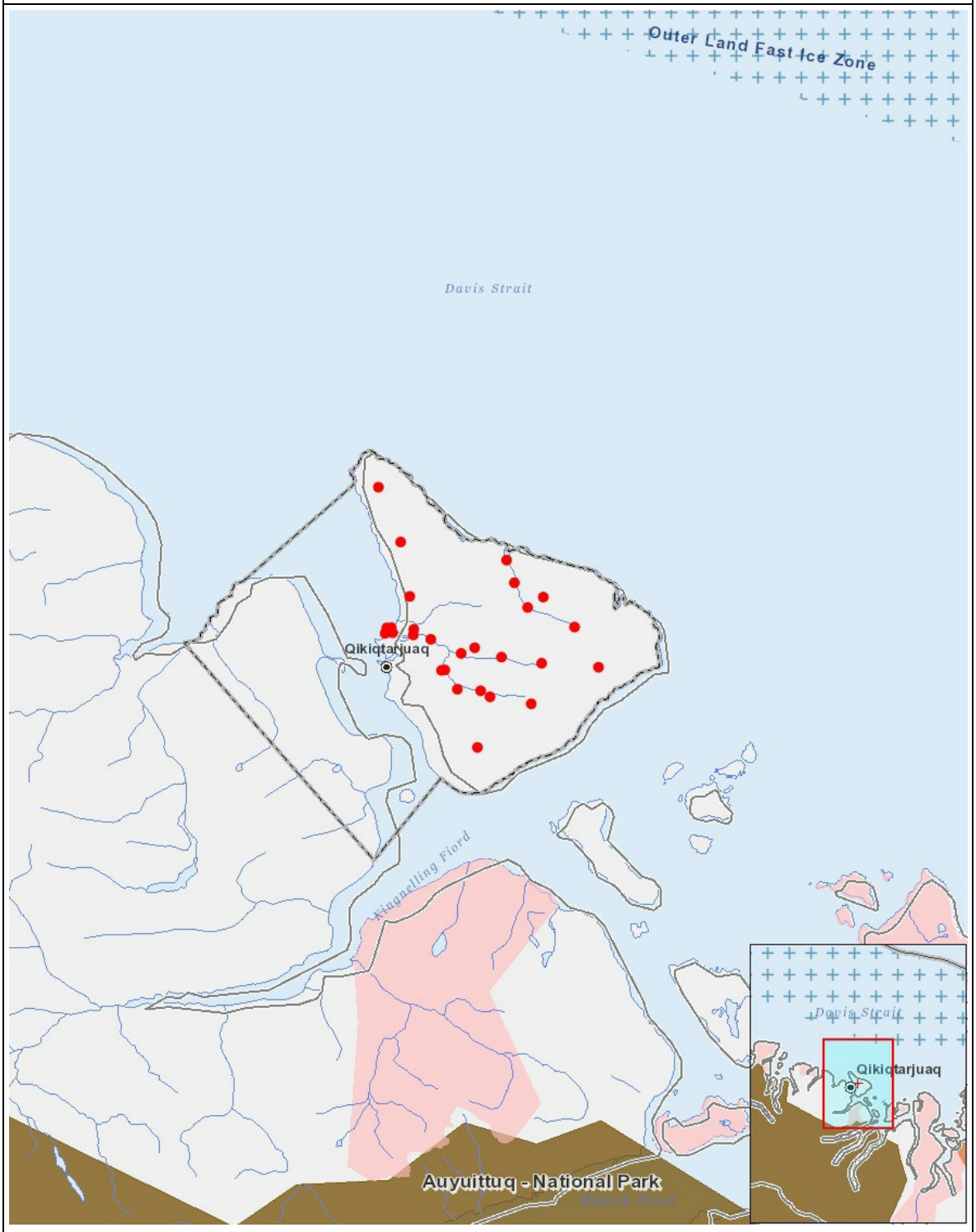
Impacts

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
Construction																									
-			-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Operation																									
Scientific/International Polar Year Research			-	-	M	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Decommissioning																									
-			-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

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

Project Location



List of Project Geometries

1	point	permafrost 1
2	point	permafrost 2
3	point	permafrost 3
4	point	permafrost 4
5	point	permafrost 5
6	point	permafrost 6
7	point	permafrost 7
8	point	permafrost 8
9	point	permafrost 9
10	point	permafrost 10

11	point	permafrost 11
12	point	permafrost 12
13	point	permafrost 13
14	point	permafrost 14
15	point	sediment 1
16	point	sediment 2
17	point	sediment 3
18	point	sediment 4
19	point	sediment 5
20	point	sediment 6
21	point	sediment 7
22	point	sediment 8
23	point	sediment 9
24	point	sediment 10
25	point	sediment 11
26	point	sediment 12
27	point	sediment 13
28	point	sediment 14
29	point	sediment 15