

Demande de la CNER faisant l'objet d'un examen préalable #125593
Instability of permafrost landscapes from climate change and the hydrological implications to high Arctic watersheds.

DÉTAILS

Description non technique de la proposition de projet

Anglais: Researchers and affiliation:-Kethra Campbell-Heaton; graduate student; Department of Geography, Environment and Geomatics, University of Ottawa, Canada-Denis Lacelle; professor, Department of Geography, Environment and Geomatics, University of Ottawa, Canada-Wayne Pollard; professor, Department of Geography, McGill University, Canada

What:Proposed is scientific research, to be carried out over 3-4 years. This project seeks to understand the impact thawing permafrost has on two watersheds in the high Arctic. This project's scale is small, as it will focus on two streams near the Eureka Weather Station. However, this project's results can be used to address the impacts of permafrost thaw on other high arctic watersheds. There are approximately three people involved in the project, with one to two participating in fieldwork. Planes will be the primary means of transport to and from Eureka, transportation will be arranged on a commercial aeroplane from Ottawa to Resolute. Then, from Resolute to Eureka a Twin Otter will be used, this is provided by PCSP.

Why:The importance of this project is rooted in climate change research. Much of the circumpolar Arctic is experiencing rapid climate change; thus, northern communities are experiencing permafrost thaw firsthand. Thawing permafrost can alter a regions' water resources, increase surface flooding and cause terrain instability. This project aims to understand the impact climate-induced permafrost thaw has on two high Arctic watersheds. The long-term implications of permafrost thaw are unknown; as climate warming increases, we see a shift in the Arctic tree line, more flooding events, a thicker active layer and more carbon emissions. Therefore, it is more important than ever to study permafrost thaw in relation to water resources in the high Canadian Arctic.

Where:This study location for this project is near the Eureka Weather Station, Nunavut. This area has the PEARL research station and a national defence base. This area is over 500km away from northern communities and protected areas.

When:This is a multi-year project (2021-2024), with fieldwork occurring during the summer months (May-August).

Français: Chercheurs et affiliation :-Kethra Campbell-Heaton; étudiant diplômé; Département de géographie, d'environnement et de géomatique, Université d'Ottawa, Canada-Denis Lacelle; professeur, Département de géographie, d'environnement et de géomatique, Université d'Ottawa, Canada-Wayne Pollard; professeur, Département de géographie, Université McGill, Canada

Quel est le projet de recherche scientifique, qui s'effectuera sur une période de 3 à 4 ans. Ce projet vise à comprendre l'impact du dégel du pergélisol sur deux bassins versants de l'Extrême-Arctique. L'échelle de ce projet est petite, car il se concentrera sur deux cours d'eau près de la station météorologique Eureka. Toutefois, les résultats de ce projet peuvent être utilisés pour s'attaquer aux impacts du dégel du pergélisol sur d'autres bassins hydrographiques de l'Extrême-Arctique. Environ trois personnes participent au projet, dont une à deux participent à des travaux sur le terrain. Les avions seront le principal moyen de transport à partir d'Eureka, le transport sera organisé à bord d'un avion commercial d'Ottawa à Resolute. Ensuite, de Resolute à Eureka, un Twin Otter sera utilisé, ce qui est fourni par pcp. Pourquoi : L'importance de ce projet est enracinée dans la recherche sur les changements climatiques. Une grande partie de l'Arctique circumpolaire connaît des changements climatiques rapides; ainsi, les collectivités du Nord connaissent un dégel du pergélisol de première main. Le dégel du pergélisol peut modifier les ressources en eau d'une région, augmenter les inondations de surface et causer l'instabilité du terrain. Ce projet vise à comprendre l'impact du dégel du pergélisol causé par le climat sur deux bassins versants de l'Extrême-Arctique. Les implications à long terme du dégel du pergélisol sont inconnues; à mesure que le réchauffement climatique augmente, nous voyons un changement dans la limite des arbres de l'Arctique, plus d'inondations, une couche active plus épaisse et plus d'émissions de carbone. Par conséquent, il est plus important que jamais d'étudier le dégel du pergélisol par rapport aux ressources en eau de l'Extrême-Arctique canadien. Où : Ce lieu d'étude pour ce projet se trouve près de la station météorologique d'Eureka, au Nunavut. Cette région possède la station de recherche PEARL et une base de défense nationale. Cette zone se trouve à plus de 500 km des collectivités et des aires protégées du Nord. Quand : Il s'agit d'un projet pluriannuel (2021-2024), dont le travail sur le terrain a lieu pendant les mois d'été (mai-août).

[illegible]

Operations Phase: from 2021-06-01 to 2024-08-31

Activités

Emplacement	Type d'activité	Statut des terres	Historique du site	Site à valeur archéologique ou paléontologique	Proximité des collectivités les plus proches et de toute zone protégée
Eureka Region	Camp	Crown	Researchers will be staying the PCSP weather haven located near the Eureka Airstrip. This haven is provided by PCSP.	This site has no-known archaeological value/ significance. However, ~500 meters away, on the other side of the runway is Late Dorset and Thule Inuit settlements. This was originally identified by Sutherland (2000).	Over 50km to either
Eureka Region	Scientific/International Polar Year Research	Crown	Research will focus on active layer water balance, thawing permafrost (thaw slumps and ice wedge degradation) and water quality. Focus will be on the polygonal terrain nearby the Eureka Airport and the two creeks in eureka (Station creek and Blacktop creek).	Besides the Thule Inuit site previously mentioned, there is no other known sites with archaeological value. No field work will be conducted on or near the Thule Inuit settlement.	Over 50kms

Engagement de la collectivité et avantages pour la région

Collectivité	Nom	Organisme	Date de la prise de contact
Information is not available			

Autorisations

Indiquez les zones dans lesquelles le projet est situé:

North Baffin

Autorisations

Organisme de régulation	Description des autorisations	État actuel	Date de l'émission/de la demande	Date d'échéance
Gouvernement du Nunavut, Institut de recherche du Nunavut	Application for a research license	Not Yet Applied		
Autre	Nunavut Planning Commission (NPC) Application for a research license.	Active	2021-02-21	

Project transportation types

Transportation Type	Utilisation proposée	Length of Use
Air	Regular prop-plane will be used to go from Ottawa to Resolute, then a Twin Otter will be used to go from Resolute to Eureka.	
Land	ATV and by foot, used to travel on pre-existing trails in Eureka.	

Project accomodation types

Temporary Camp

Utilisation de matériel

Équipement à utiliser (y compris les perceuses, les pompes, les aéronefs, les véhicules, etc.)

Type d'équipement	Quantité	Taille – Dimensions	Utilisation proposée
All Terrain Vehicle	2	4x3x3 ft	To access study sites

Décrivez l'utilisation du carburant et des marchandises dangereuses

Décrivez l'utilisation de carburant :	Type de carburant	Nombre de conteneurs	Capacité du conteneur	Quantité totale	Unités	Utilisation proposée
Gasoline	fuel	1	220	220	Liters	Used to run the ATVs; this is provided by the Polar Continental Shelf Project, we will not need the entire container.

Consommation d'eau

Quantité quotidienne (m3)	Méthodes de récupération de l'eau proposées	Emplacement de récupération de l'eau proposé
0	The tap at the weather station, will fill up 20L containers and bring back to camp.	From the Eureka Weather Station, the station has the infrastructure already in place to accommodate our water usage.

Déchets

Gestion des déchets

Activités du projet	Type des déchets	Quantité prévue	Méthode d'élimination	Procédures de traitement supplémentaires
Camp	Eaux usées (matières de vidange)	6lbs/ day/ human	At the Eureka Weather Station, there is infrastructure already in place to accommodate us.	N/A

Répercussions environnementales :

Our impacts are minimal, as we are staying in the PCSP weather haven near the Eureka airport. We access our drinking water and the washroom facility at the Eureka Weather Station and our food waste is disposed in the same fashion as that of the EWS. Travel to our field sites will be similar to that of normal activity in the area (travel by ATV or by foot along existing trails). Our equipment is hand-operated by one person. During the field study, active layer and stream sites will be regularly monitored and sampled. Approximately 500mL to 1L of water will be collected for laboratory analysis. The stream monitoring and sample collection will be conducted out of the stream to ensure no disruption downstream. Environmental impacts resulting from our methodology will be minimized by sampling the least amount necessary for laboratory purposes. All collected samples will be utilized for planned analyses. Study sites will be left in initial conditions as much as possible.

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 de l'environnement existant : Environnement physique

Permafrost is continuous >500m deep, location is a polar desert. Rich with ground ice and polygonal terrain.

Description de l'environnement existant : Environnement biologique

Low-laying vegetation. Animals: Arctic fox, Arctic Tern, Muskox, Arctic Wolf, Arctic Hare. Note that in 2019, much of the wildlife was not encountered because of the noise from the runway construction.

Description de l'environnement existant : Environnement socio-économique

Not close to communities or protected areas. This area is considered crown land. Currently there is the Eureka Weather station, the National Defence base, the PEARL research Station and the runway construction crew.

Miscellaneous Project Information

Identification des répercussions et mesures d'atténuation proposées

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Répercussions cumulatives

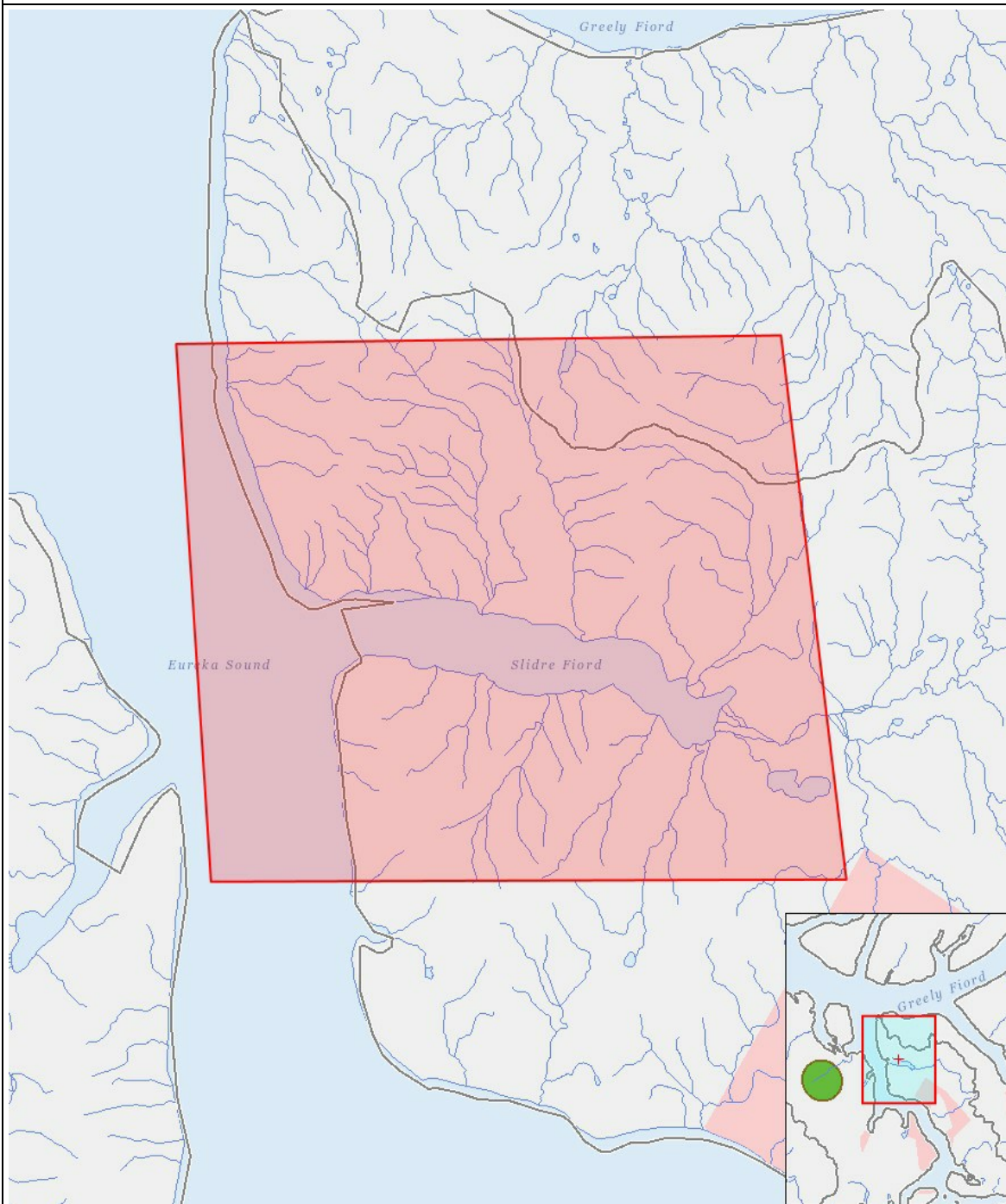
Impacts

Identification des répercussions environnementales

	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																									
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Exploitation																									
Scientific/International Polar Year Research		-	P	P	-	P	P	-	-	P	-	-	-	-	P	-	-	P	-		-	-	-	-	-
Désaffectation																									
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(P = Positive, N = Négative et non gérable, M = Négative et gérable, U = Inconnue)

Site du projet



Liste des géométries de projet

1	polygon	Eureka Region
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