



## **Demande de la CNER faisant l'objet d'un examen préalable #126166**

### **Vermont State University**

**Type de demande :** New

**Type de projet:** Scientific Research

**Date de la demande :** Friday, April 11, 2025

**Period of operation:** from 2025-05-11 to 2025-05-25

**Promoteur du projet:** Ross Lieblappen  
Vermont State University  
124 Admin Drive  
Randolph Center VT 05061  
USA  
Téléphone :: 781-424-7268, Télécopieur ::

# DÉTAILS

## Description non technique de la proposition de projet

Anglais: X-ray computed tomography (CT) provides non-destructive 3D imaging and analysis of internal structure for any porous media. Our team utilizes CT imaging to probe permafrost and sea ice for microbes in samples collected from Alaska, Canada, and Greenland. Recent advances in this technology now allow for imaging at the nanoscale, where we ultimately seek to visualize microorganisms inhabiting the pore spaces. By characterizing this structure, we will further our understanding of how microbial communities relate to their environment, and how changes such as increased freeze/thaw cycles in a changing climate may impact their health and microbial function. In addition to imaging the permafrost and sea ice, we extract DNA from samples to examine microbe diversity to connect the physical and biological characteristics of cores from different sites and by depth. This work will provide the first images of permafrost and sea ice at the nanoscale. The entire scope of this project involves fieldwork across the Arctic, covering Alaska, Canada, and Greenland. For the fieldwork in Cambridge Bay May 11-25 2025, we will select 5-6 permafrost locations outside of town and accessible by truck. As much as possible, we will seek to co-locate field sites with previous permafrost studies for comparison with the literature and traditional ecological existing knowledge. Similarly, we will select 5-6 sea ice coring locations in the Cambridge Bayharbour to be accessed via snow machines. Both sea ice and permafrost cores will be approximately 1 m in length and 7.5 cm in diameter. All cores will be shipped back to Vermont at sub-eutectic temperatures until imaging as described above. Sharing Results: While in Nunavut, we plan to share our work with the local community via public presentations and outreach events in the local school if welcomed. For any community where we complete fieldwork, we prioritize sharing our research with the local community and thoroughly enjoy the exchange of ideas at such gatherings. For example, while in Utqiagvik, Alaska in February 2025, we presented at a community dinner gathering as well as with the local high school. We try to get students using our drills to core their own samples of either permafrost and sea ice, and let the students get hands on experience looking at the ground beneath them. Additionally, we plan to publish the scientific findings of this work in peer-reviewed academic journals and present at both scientific conferences and with the general public. Already we have presented at the American Geophysics Union annual meeting (December 2024), as well as local presentations at Vermont State University. We plan to continue reaching out to schools in our area upon returning to Vermont.

Français: N/A

Inuktitut: N/A

Inuinnaqtun: X-raymut kititauni iksulirutinut (CT) piqaqtitni huruilaittut 3D piksait qauiyhaqnilu iluanut hunat kitutliqak anigulalgit piyauni. Havaqatigivut atuqtai CT piksait naunaiqtuqni qiqumainnaqni tariuplu hikua mikkataqnut naunaiyagat katitauni talvanga Alaska, Kanata, tamnaluk Akukittuq. Qangahaq hivunmuktitni uuma pitquhiliqutit pipkalaliqtaikangiqhimanivut qanuq mikatannuit, tapkunani qiniqvigivaktaptingni takuyangi mikatannuit uumayut nayuqtai angmavinnuit. Ihuaqhautiplugu una hanahimania, kangiqhivalliqniaqtavut qanuq mikkataat uumayuvallit turangani avataini, qanuqlu ahianguqni tapkuatut ilagiaqni qiqumani/auktuqni pitquhi allanguqninut ahilap aktualaqni aaniaqtailini, mikkataatlu uumayuvallit pitquhi. Ilagiplugit piksaluqni qiqumainnaqnit tariuplu hikua, amuyavut DNA naunaipkutarnit anunaiyagat mikkatat allatqikni attatariangi timait uumayuvallitlu pityquhit angmanivaluinit allatqini inait itinilu. Una havaq piqaqtitniagai hivullit piksat qiqumainarniqnut tariuplu hikua talvani mikkataat uukturautit. Tamna tamaat havakhait uuma havanguyuq ilalgit maniqami havat humiliqak Ukiurtaqtumi, tamnaluttauq Alaska, Kanata, tamnaluk Akukittuq. Tapkununga maniqami havat Ikaluktutiakmi Mai 11-25, 2025, tikkuqaqniaqtavut 5-6 qiqumainnaqtuq inait hilataani nunaluuyuq tikitauluq akhaluutikkut. Ayuqnaittarangat, qiniqniaqtugut inikanikhanik maniqami inait hivuani qiqumainnaqnit naunaiyaqni hutqigiakhait tapkununga pitquhit uumayuliquitit atuqtut ilihimanit. Taimattauq, tikkuqaqniaqtavut 5-6 tariuqni hikut amuhiviuni inait tahamani Ikaluktutiak tulaktaqviani naunaiyariangi atuqhugit sikiitut. Tamaknik tariuq hikua qiqumainnarniqlu amuhiviuni mikhaanitniat 1 miitat takini tamnaluk 7.5 cm akimut. Tamaita amuhiviuni aulagtitauniat utimut talvanga Vermont qiqittaqniani auktuqtaqniani uunaqnit utaqilugu piksaluqnit unniqtuqnigut qulaani. Atuqatigikni Qanuritnit: Tahamanitluta Nunavutmi, parnakhimayugut atuqatigikni havavut nunalikni nunaluuyunut atuqlugit inungnik hatqigtaitait pipkarahuaqnilu huliniit nunalikni iliaqvikni qaitquyagupta. Kitunutliqak nunalikni iniqhigupta maniqami havat,

hivulliutyaqtavut atuqatigikni naunaiyagavut nunaliknut nunaliuyut aliagiqpiaqhugitlu uqaqatigiknit ihumaliurutit taimaittuni katitviuni. Naunaipkutariplugu, talvanillakhuta Utqiagvik, Alaska talvani Fibruari 2025, hatqigtavut nunalikni unnugumitarniq katitviuni nunaliknilu puqtunighani ilihaqvik. Pipkarahuaqtavut ilihaqtut atuqni ikuutavut amuhiyangi inmingnik naunaiyagat naliaknik qiqumainnaqni tariuplu hikua, pipkaqnilu ilihaqtut tiguttaqni atuqhimaninut qiniqni maniqami ataani tapkuat. Ilagiahugit, paraktugut makpiraliuqni naunaiyainiq nalvagai uumatut havaq havaqatimingni naunaiyaqni ilihaqpiqhimagunit tuhagakhaliuqvut hatqigtitnilu tamatkikni naunaiyaqni katimaqyuarnit tamaitnutlu inungnut. Hatqigtittariqtavut talvani American Geophysics Unionnga ukiumut katimaniq (Tisaipa 2024), talvaniluttauq nunalikni hatqigtitaunit talvani Vermont State Universitynga. Parnaktavut atuinaqni pipkarahuaqni ilihaqvut nunagiyaptingni utirangat talvunga Vermont.

**Personnel**

Personnel on site: 6

Days on site: 8

Total Person days: 48

Operations Phase: from 2025-05-11 to 2025-05-25

## 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
Sea ice in Cambridge Bay	Sampling sites	Marine	This is our first year sampling in Nunavut. We have no history at this site.	N/A	Cambridge Bay, 15-20k.
Permafrost accessible by road outside of town	Sampling sites	Municipal	This is our first year sampling in Nunavut. We have no history at this site.	N/A	Cambridge Bay, 10k.

### Engagement de la collectivité et avantages pour la région

Collectivité	Nom	Organisme	Date de la prise de contact
Cambridge Bay	Gabriel Ferland	Viventem	2024-12-15
Cambridge Bay	David Hik	POLAR - Canadian High Arctic Research Station	2024-11-12

# Autorisations

Indiquez les zones dans lesquelles le projet est situé:

Autorisations

Organisme de régulation	Description des autorisations	État actuel	Date de l'émission/de la demande	Date d'échéance
Institut de recherche du Nunavut	Scientific Research Licence	Applied, Decision Pending		

## Project transportation types

Transportation Type	Utilisation proposée	Length of Use
Water	snowmobile	
Land	truck, snowmobile	

## Project accomodation types

Collectivité

## 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
Drill	2	7 cm	permafrost and sea ice coring drills
Snowmobile	5	2 m x 1 m	Access to coring site
Truck	1	2 m x 1 m	Access to permafrost sites along road

## 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	50	50	Liters	For snowmobiles and drills
Ethanol	hazardous	1	1	1	Liters	Sterilization

## Consommation d'eau

Quantité quotidienne (m3)	Méthodes de récupération de l'eau proposées	Emplacement de récupération de l'eau proposé
0		

# Déchets

## Gestion des déchets

Activités du projet	Type des déchets	Quantité prévue	Méthode d'élimination	Procédures de traitement supplémentaires
Information is not available				

## Répercussions environnementales :

We will be using snowmobiles and pickup trucks but will have no waste. Anything taken into the field will leave with us. We will fill any coring holes in the ice and ground.

# **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 will be sampled on the tundra away from Cambridge Bay. Sea ice will be sampled off the coast of Cambridge Bay.

### **Description de l'environnement existant : Environnement biologique**

Existing permafrost environment will be open tundra. There will be minimal disruption of grass, lichen, and soil to sample permafrost. Wildlife (caribou, birds, foxes, bears) will be avoided.

### **Description de l'environnement existant : Environnement socio-économique**

Both permafrost and sea ice will be sampled away from the town of Cambridge Bay.

### **Miscellaneous Project Information**

### **Identification des répercussions et mesures d'atténuation proposées**

There are no significant impacts identified for either permafrost or sea ice sampling.

### **Répercussions cumulatives**

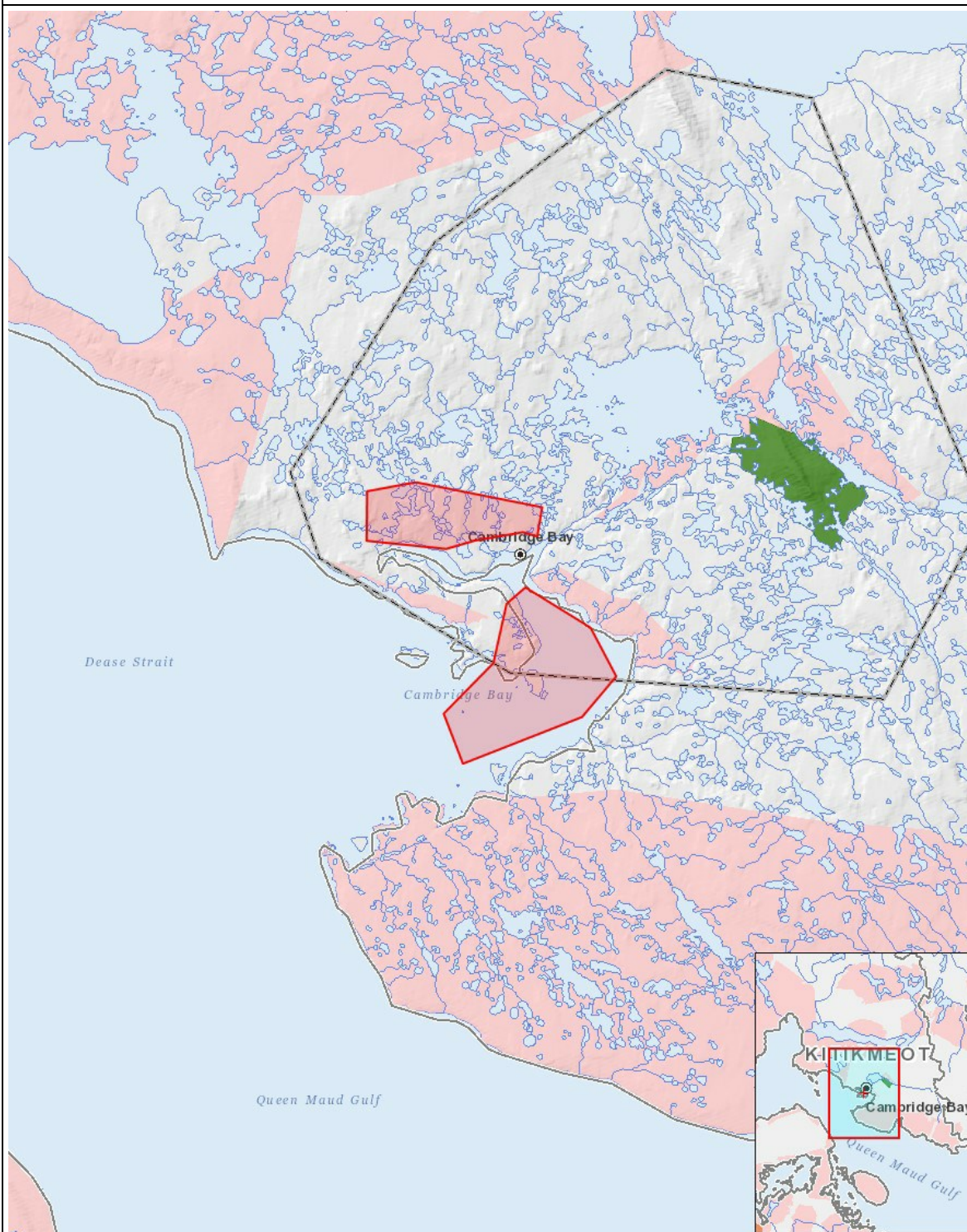
Impacts

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																										
-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exploitation																										
Sampling sites		-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Désaffectation																										
-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(P = Positive, N = Négative et non gérable, M = Négative et gérable, U = Inconnue)

## Site du projet



## Liste des géométries de projet

- |   |         |   |
|---|---------|---|
| 1 | polygon | Sea ice in Cambridge Bay                      |
| 2 | polygon | Permafrost accessible by road outside of town |