Nunavut Research Institute

License Holder Reporting requirements

For research undertaken in the 2025 calendar year
(commencing January 01, 2025 and ending December 31, 2025)

Project Title:
Coastal dynamics in Kugluktuk and Grise Fiord (Aujuittuq), Nunavut.

Project Leader(s):
Full name, affiliation, and contact information (address, phone number, email) of each project leader (principle investigator and co-PIs)

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Project Team:

Full name, affiliation, and address (name of city/community and province/territory/state) of each member of the project team

Full name	Affiliation	Role	Location of fieldwork	Nunavut Inuit	Nunavut Resident
Béatrice Noël	UQAR, QC	MSc student	Grise Fiord		
Béatrice Roberge	UQAR, QC	MSc student	Grise Fiord		
Émile Bujold	UQAR, QC	MSc student	Grise Fiord		
Felix Parkinson	UQAR, QC	PhD student	Grise Fiord		
Julie Malenfant-Lepage	NTNU, Norway	Postdoc	Grise Fiord		
Rémi Lord-Quintric	U of Montreal, QC	MSc student	Grise Fiord		
Ana Heras Duran	U of Alberta, AB	PhD student	Grise Fiord		
Charlotte Stancu	UQAR, QC	Research Assistant	Grise Fiord		
Patrick White	Dalhousie U., NS	MSc student	Grise Fiord		
Kathryn Hunter Halloran	Dalhousie U., NS	Postdoc	Grise Fiord		
Terry Noah	Ausuittuq Adventures, NU	Community research partner	Grise Fiord	Yes	
Laisa Audlaluk Watsko	Hamlet of Grise Fiord	Community research partner	Grise Fiord	Yes	
Silas Pijamini	Ausuittuq Adventures, NU	Community research partner	Grise Fiord	Yes	
David Watsko Jr.	Qikiktani Inuit Association/Iviq HTA	Community research partner	Grise Fiord	Yes	
Mykayla Noah	Ausuittuq Adventures, NU	Community research partner	Grise Fiord	Yes	
Tristan Pearce	UNBC, BC	Professor, PI	Kugluktuk		
Samuel Binette	UQAR, QC	MSc student	Kugluktuk		
Madeleine Fisher	UNBC, BC	MA student	Kugluktuk		
Arnaud Kouekam	UQAR, QC	PhD student	Kugluktuk		
Théau Leclerck	UQAR, QC	PhD student	Kugluktuk		
Richard Akana	Kugluktuk Angoniatit Association (HTO), NU	Community research partner	Kugluktuk	Yes	
Jonathan Niptanatiak	Kugluktuk Angoniatit Association (HTO), NU	Community research partner	Kugluktuk	Yes	

Amanda Rose Dumont	Kugluktuk Angoniatit Association (HTO), NU	Community research partner	Kugluktuk	Yes	
June Akana	Kugluktuk Angoniatit Association (HTO), NU	Community research partner	Kugluktuk	Yes	

Abstract:

*A concise summary of what was done, found, and concluded to date, and how the results/information will be used. This summary must be translated into the appropriate dialect of Inuktut. Suggested length: 250-300 words. *This section will be published in the NRI's annual compendium of licensed research*

This project examines environmental changes in and around the communities of Kugluktuk and Grise Fiord, Nunavut. The aim is to better understand how coastlines, permafrost, oceans, and slopes are evolving, and how these changes impact community safety, travel, and ecosystems. Fieldwork took place from June to October 2025 and involved researchers, students, and community members working collaboratively.

In Kugluktuk, the team monitored coastal and river changes using drones, cameras, water-level sensors, and boat-based surveys. Community members also shared their observations through interviews and site visits. Results show that some parts of the coast are eroding while others are forming new beach features. These changes are linked to river movement, waves, and high water levels, and they have impacted access to traditional travel routes and harvesting areas.

In Grise Fiord, coastal surveys showed increased flooding of low-lying areas during high tides and storms. Changes in beach shape and sediment were found to increase wave run-up towards the community. Marine measurements and experiments indicated that stronger storms and warmer water can boost ocean productivity and may promote the growth of harmful plankton. Ocean data also suggest that more Atlantic water might be entering Jones Sound. Permafrost samples, ground temperature sensors, and geophysical surveys were collected in Grise Fiord to better understand frozen ground conditions and to establish long-term monitoring of climate change impacts on local permafrost. Additionally, several steep rock slopes near the community were identified as potentially unstable and will be monitored in the future.

The results from this project will be shared with community members and local organizations through in-person meetings, community presentations, and written reports. The findings will also be published in peer-reviewed scientific journals to support a broader understanding of environmental change in Arctic regions.

Key messages:

Concise, plain language summary of key take-away messages of work to date, findings and conclusions. Preferably 3-5 points, in bullet form.

- The project is putting in place and maintaining long-term environmental monitoring of coastlines, permafrost, ocean conditions, and slopes to better understand how these systems change and interact over time.
- Coastal change varies across the landscape: some shorelines are eroding while others are building up, affecting travel routes, access to harvesting areas, and community safety.
- Marine measurements show that stronger storms and warmer water can increase ocean productivity and may lead to more harmful plankton.
- Community knowledge and participation are critical for interpreting environmental change and for identifying impacts that may not be visible from scientific measurements alone.

Objectives:

Project objectives, preferably in bullet form.

The overall objective of this project is to assess and monitor coastal changes and processes in the communities of Kugluktuk and Grise Fiord, with a focus on coastal and permafrost dynamics, as well as marine geochemistry and microbial processes. The project has twelve specific objectives. Objectives 1 to 8 apply to both communities, while Objective 9 is specific to Kugluktuk, and Objectives 10 to 12 are focused on Grise Fiord. In the long term, the project aims to develop and maintain a monitoring program for various environmental parameters to assess the effects of climate change, optimize risk management, and reduce the vulnerability of community infrastructure.

The objectives are:

1. Co-design research with communities to generate information for adaptation planning to coastal change, identify communication channels for progress and findings, and document community exposure and sensitivity to coastal change.
2. Identify decision-making needs and tools for raising awareness to support adaptation, and work continuously with community members to co-interpret findings and co-create relevant outputs.
3. Collaborate with communities to develop medium-term (30 years) adaptation strategies based on research outcomes.
4. Enhance understanding of coastal erosion processes, wave and current dynamics, and flooding, while monitoring the effects of storms on these processes.
5. Model nearshore wave and current conditions using historical wind datasets.
6. Develop coastal hazard maps based on numerical and empirical models of total coastal water levels.
7. Characterize permafrost conditions, including thermal state, ice content, physical properties, and thaw-induced landscape changes, with an emphasis on coastal permafrost dynamics.
8. Engage local community members throughout the research process, develop community-based sampling approaches, and provide training and skill-building opportunities to facilitate knowledge exchange.
9. Advance understanding of the morphodynamic evolution of the Coppermine River delta (Kugluktuk).
10. Investigate and identify potentially unstable rock masses, using GPRI to detect rock instabilities and quantify pre-failure deformation rates (Grise Fiord).

11. Quantify the presence of phycotoxin producing plankton and the activity of primary producers at the base of the food web over time and identify factors driving observed variation (Grise Fiord).
12. Assess the nutritional content (nutrients, carbon, vitamins) of seawater that supports the growth of primary producers and other microbes, and test how coastal changes, such as melting glaciers, permafrost thaw, increasing storm intensity, and sea ice loss, impact these processes (Grise Fiord).

Annual activities:

A description of activities and methods carried out during the current reporting period. This section should answer the questions: What? Where? When? Who? How? Include dates team members conducted research at remote field sites or collected data (including interviews) in communities; append a map with locations and/or coordinates of remote field sites, if applicable.

Fieldwork was carried out from June 19 to July 2 in Kugluktuk and throughout August in Grise Fiord. The team included 26 members, including research scientists, community members, professors, and MSc and PhD students, with nine team members working in Kugluktuk and seventeen in Grise Fiord, along with community members. In addition to the summer fieldwork, a second campaign took place from October 1 to October 15 in Kugluktuk to recover instruments deployed in the water during the summer, before winter and ice freeze-up. The methods used in both communities included:

In Kugluktuk, activities consisted of:

1) Throughout 2025, project team members met regularly with the Hunters and Trappers Organization (HTO), Government of Nunavut staff, and local leadership in Kugluktuk in May, June, and October to discuss ongoing research activities and provide updates.

2) **Coastal and river monitoring (imagery and surveys)**
   a) Time-lapse photographs from six cameras and drone surveys (summer and fall) were used to document changes in coastal features, erosion, and permafrost dynamics along the Coppermine River, its estuary, and the adjacent coastline.
   b) Cross-shore topobathymetric beach profiles (~50 m) were collected at specified intervals using an RTK-GPS.
   c) Bathymetric surveys were conducted with community members using local boats to map water depth and bed morphology in the Coppermine River and nearshore coastal zone.
3) **Hydrodynamic measurements**
   a) Wave and water-level data were collected using an offshore buoy and nearshore bottom-mounted sensors. Instruments were retrieved in the fall.
   b) Water temperature, current speed, and current direction in the Coppermine River estuary and nearshore coastal waters were measured using bottom-mounted acoustic Doppler instruments.
   c) River discharge surveys were conducted with community members in October to document fall hydrological conditions downstream of Bloody Falls.

4) Interviews with community members

Semi-structured interviews were conducted in summer 2025 with community knowledge holders identified by the Hunters and Trappers Organization (HTO) to document local observations of coastal change and its impacts on community access to subsistence areas. In fall 2025, go-along interviews with a local research partner were carried out at monitored sites around Kugluktuk

(Beach, Graveyard Island, and the Coppermine River) to capture site-specific impacts and land use from a local perspective. One additional phone interview in fall 2025 was conducted to address information gaps from earlier interviews.

In Grise Fiord:

1) **Coastal monitoring (imagery and surveys)**
   a) Drone surveys were done in Grise Fiord, east of town at Naqsaq, and at Jakeman Glacier. All surveys were carried on with community members and Ausuittuq Adventures.
   b) Cross-shore topobathymetric beach profiles (~50 m) were collected at specified intervals using an RTK-GPS in front of town and at Naqsaq (3 profiles only at Naqsaq)..
   c) Bathymetric surveys were conducted with community members using local boats to map water depth and bed morphology in the Coppermine River and nearshore coastal zone.
   d) Time-lapse stations were deployed at Naqsaq and Jakeman glaciers to monitor waves and storm impacts.
2) **Hydrodynamic measurements**
   a) Wave and water-level data were collected using an offshore buoy and nearshore bottom-mounted sensors. Instruments were retrieved in the fall by Ausuittuq Adventures.

3) **Marine geochemistry and microbial processes**
   a) 34 profiles of ocean temperature, salinity and chlorophyll fluorescence were obtained with community-owned and operated research vessels and 34 profiles were obtained from the RV Nuliajuk
   b) 30 sets of samples from which measurements of ocean nutrients, vitamins, and microbial activity will be measured were obtained with community-owned and operated vessels, and 37 sets were obtained with the RV Nuliajuk
   c) An experiment was conducted, using community-owned and operated vessels, examining the response of Jones Sound ocean plankton and chemistry to increasing storm-driven mixing and changing temperature

4) **Permafrost and ground temperature monitoring**
   a) Permafrost coring at four sites, with samples shipped south for laboratory analysis.
   b) Installation of two permafrost monitoring stations.
   c) Geophysical (ERT) surveys were conducted to characterize subsurface permafrost conditions

5) **Slope stability and rockfall processes**
   a) Five ground markers were installed to set up a portable ground-based radar interferometry (GPRI) system.
   b) Seven rock slopes were scanned using the GPRI to detect possible rock instability.
   c) Installation of three permafrost monitoring stations.

Results and Achievements:

Findings and results to date of the above activities, highlighting any key research achievements (see guide below for formatting tips regarding tables and figures).

The following findings and achievements were made during the reporting period:

1) **Coastal and hydrodynamic processes**

   In Kugluktuk, coastal changes have been studied west of the town, where notable landward shoreline retreat has been documented. This erosion is offset downdrift by beach accumulation and the formation of new spits along the coast near 4-Miles Bay. On Graveyard Island, shoreline erosion rates have remained stable at around 0.25 m/yr, although erosion hotspots have shifted due to river channel migration. Waves and high water levels are linked to these events. The impacts of coastal change on safety and access to subsistence areas are clear in Kugluktuk. Community members reported that changes along the coast have caused beach breaching, resulting in longer trail access and more complicated travel routes.

   In Grise Fiord, waves and water levels were also linked to beach overwash, with some waves flooding the low-lying areas of the town. Erosion caused sediment sorting over time, removing fine sediments from the beach during high-energy conditions. This process increased the beach's steepness and sediment size, which also led to more wave uprush (runup) on the beach. Currently, the coast floods nearly every spring tide, especially when waves are generated under southwesterly winds. In both communities, conducting year-round beach surveys with our local partners has been crucial to the project's success and has helped deepen the understanding of beach dynamics in Nunavut.

2) **Marine geochemistry and microbial processes**

   In Grise Fiord, our experiment revealed that storm-driven mixing and rising temperatures in Jones Sound increased carbon fixation and the growth of potentially toxin-producing plankton. Our measurements of ocean chemistry and physics suggest that an increasing amount of water from the Atlantic may be entering Jones Sound.

3) **Permafrost and ground temperature monitoring**

   Laboratory analyses are underway, and final results are not available at the time of submission. Preliminary observations have enabled the identification and characterization of site stratigraphy and suggest a relatively low permafrost ice content, which is unexpected for fine-grained marine sediments and will be confirmed through ongoing analyses. Monitoring station data have been collected but will be fully available after download during the next onsite visit in spring. An ongoing collaboration with Worley, a consulting engineering firm working in the community, supports the sharing of data and field observations, strengthening interpretation of results.

4) **Slope stability and rockfall processes**

   During reconnaissance to install GPRI base plates and rock-wall temperature probes, numerous potentially unstable rock masses were identified near Grise Fiord. Field observations also confirmed several large-magnitude instabilities previously mapped from lidar and satellite imagery (Eamer et al., 2022). These observations, together with discussions with Elders and community members, guided the selection of target slopes and radar installation sites for the radar monitoring campaigns. Repeated GPRI surveys over the coming years will allow detection and quantification of pre-failure deformation rates.

Challenges/Obstacles

In this section, please comment on any challenges/obstacles (if any) that you experienced during this project year. If there were any actions to mitigate or resolve these challenges, please list them here. Were any concerns raised regarding the conduct of research team members or the impacts of the project?

Over the project year, changes in housing availability in both Kugluktuk and Grise Fiord presented ongoing challenges for fieldwork logistics. Limited and fluctuating access to short-term accommodations made it difficult to plan field visits with certainty and, at times, required adjustments to project timelines and staffing arrangements. To address these challenges, the project team collaborated closely with local partners and community organizations to find temporary housing options when available, adjusted fieldwork schedules to align with periods of greater accommodation availability, and altered staffing and travel plans as necessary. In Grise Fiord, to provide a facility to work from, the research group deployed a sea-can lab, installed on a lot in town. This place provides a small but very important space for community members and scientists to work.

Expected Project Completion Date:

Provide month and year of expected completion date of the project.

For both communities, this project is partly supported by CIRNAC's CCPN program, with funding available until March 2027 for Kugluktuk and March 2025 for Grise Fiord. Additionally, Professor David Didier and his collaborators have received funding from NRCan's Climate-Resilient Coastal Communities Program (CRCC) and NSERC-ALLIANCE, which will support research activities in Kugluktuk until December 2027 and in Grise Fiord until December 2029. The work examining the impact of coastal processes on ocean chemistry and microbiology are supported by the Transforming Climate Action Uncertain-Seas program (grant to E. Bertrand, D.Didier), ending in Feb 2030. We were recently successful in obtaining continued funding for work in Grise Fiord, with community members as lead investigators, to continue research into the impact of storms on coastal processes and phycotoxin production, from the IQP and CCHAP programs, respectively, and both will end in Winter 2028. Given the strong monitoring component of this project, we plan to continue the research and monitoring efforts for as long as possible, beyond the current funding period.

Project website (if applicable):

If your project has a presence on the internet, including a website and/or social media page, please provide the link and/or account handle.

Currently, there is no dedicated project website, but one is in the planning stages. Updates will be provided once the website is live.

POLICY RELEVANCE

Does this research support policy development or decision-making in Nunavut? If yes, please describe.

This research could support policy development and decision-making in Nunavut. The focus on coastal erosion, permafrost thaw, and climate change impacts in Kugluktuk and Grise Fiord provides valuable data that could inform local and territorial policies aimed at addressing the challenges posed by environmental change. The data generated on coastal hazards, phycotoxins, flood risks, and permafrost conditions will help local governments and communities develop more effective adaptation strategies to protect infrastructure, natural resources, and community resilience.

Additionally, the project's engagement with local communities and its emphasis on knowledge exchange ensures that the research is directly relevant to the needs and priorities of the people living in these areas. This collaboration helps ensure that the research outcomes align with community-based decision-making processes, fostering locally-driven policy development.

Moreover, the findings will contribute to broader regional policies related to climate change adaptation, environmental protection, and sustainable land use. Through partnerships with governmental organizations such as the Nunavut Climate Change Secretariat (GN) and the Department of Community & Government Services (CGS-GN), the local hamlets and other community organizations, this research could provide the evidence base needed to inform long-term planning and policy interventions in the face of ongoing environmental changes in the North.

RESEARCH OUTCOMES: BENEFITS

Community engagement:

Briefly list and describe any community consultation, engagement, collaboration and outreach activities that you have undertaken for the project; describe the role(s) that community members and/or specific organizations have played in research co-design and activities.

We held both in-person and virtual meetings with key groups, including:

- Coordinators of the HTO/HTA from both Kugluktuk and Grise Fiord.
- Representatives from CGS's Planning and Lands at the Government of Nunavut.
- Nunavut Climate Change Secretariat at the GN (both virtual meetings and discussions at the Arctic Change conference).
- Manager of territorial parks in the Kitikmeot Region (GN)
- Mayor of Kugluktuk
- Hamlet of Grise Fiord

On Aug 10, we hosted an open community meeting in Grise Fiord, where we discussed research results, research plans, and how we should handle data sharing in our collaboration. This meeting was attended by nearly 25% of the community of Grise Fiord, including elders, community leaders from the Hamlet and HTA, and youth and families. Key outcomes were 1) the agreement that writing a proposal to better understand the risk of phycotoxins is critical, 2) the agreement that all data we collect together should be shared openly to encourage collaborations and interactions with other communities and researchers and 3) that we should continue our current practices to ensure that all research we conduct in Grise Fiord is rooted in community needs and always responsive to community concerns.

Youth engagement:

Briefly list and describe any outreach, school or classroom activities that you have undertaken for the project; describe the role(s) that youth have played in your research activities.

No formal youth engagement activities were planned for Kugluktuk this year.

In Grise Fiord, youth were invited to participate in research activities when their parents were present or to engage in training opportunities on research equipment in town. Future work was planned during this

field season, which includes delivering tailored training modules to different youth groups (by Grise Fiord community members)

Training and Employment:

How many Nunavummiut received training from team members? Please describe training and/or compensation provided.

In Kugluktuk, 3 community members participated in the project in May, July and October field campaigns. One member, in particular, an elder, has been actively involved since the beginning. This individual has consistently supported the team, co-leading and assisting with tasks such as instrument checks and providing valuable insights throughout the year. The other team members have been on board since October 2024. He's been actively supporting research activities and bathymetric work with his logistical and technical contributions throughout the year.

In Grise Fiord, several community members have supported the research team in the field, assisting with data collection, study design, and boat transport to research sites outside the community. We collaborated with 10–15 people in August and September. Some work was carried out by Ausuittuq Adventures, while other tasks were completed jointly by the research team, Ausuittuq Adventures, and local partners hired through the HTO or UQAR. Importantly, all work in Grise Fiord is carried out with the involvement of community members, ensuring that research activities are a collaborative effort between our colleagues from Grise Fiord and the research team. In both communities, these community members were compensated for their time and contributions in line with local wage standards.

How many team members received training from Nunavummiut?

Please describe training received and/or what knowledge sharing and/or skills exchange took place.

This year, no formal knowledge exchange activities were planned with Nunavummiut team members. However, in Kugluktuk, the work has always been done in close collaboration with an elder, who systematically accompanies the research team in the field. This elder provides valuable advice and shares knowledge and experience of the land, helping to inform and guide the research process. While this is not formal training, it represents an ongoing and important exchange of local knowledge that significantly enriches the project and makes it a flexible, evolving study.

This field season, we planned the creation of training modules to be delivered by Nunavummiut research collaborators to the southern researchers who will visit Grise Fiord in 2026, with the purpose of sharing knowledge about the history of the community, important cultural practices and norms, and helping the southern researchers understand the depth of Nunavummiut knowledge of the region. In 2026, the project in Grise Fiord will expand to include a social/human component, featuring interviews and community workshops. Details regarding these activities, along with plans for further knowledge exchange, will be outlined in our next research application for 2026, where we aim to integrate local knowledge and community involvement more deeply into the project.

How many Nunavummiut received employment?

Please describe employment type and length, role(s) and responsibilities, and compensation provided.

In Kugluktuk, one elder was employed for one week in spring, two weeks in summer, and one week in fall. This individual co-led field activities and served as a local guide, providing technical and logistical support to the team. Their responsibilities included deciding sampling days, assisting with instrument

installation and recovery, downloading data from monitoring stations, and assisting with drone surveys. Additionally, two community members supported research activities in the fall and co-led the bathymetric survey as vessel captains, planning and surveying continuously for two weeks during the summer. They were compensated based on the wages recommended by the HTO, including fees for the use of their vehicles. Additionally, in the summer of 2025, a research assistant was hired and paid $90 for two hours of work, as recommended by the HTO. This research assistant chose not to remain on the project long-term but provided temporary support, including recommendations for potential interview participants. An Inuinnaqtun translator from Cambridge Bay was hired to translate a recruitment poster and was paid $200.

In Grise Fiord, 12 community members received compensation from the research teams, with four employed daily throughout August. Since research in Grise Fiord continues year-round, three community members also work part-time during the winter. Overall, about $130,000 was transferred to the partners for various tasks over the year, almost all related to ship-based work.

How many Nunavummiut received honoraria as research participants?
Please describe method of participation (interview, observation, sample, survey, etc.), including compensation provided.

- Three Kugluktukmiut took part in semi-structured interviews and received $100 cash each, in accordance with the HTO's honorarium standard.
- One individual participated in three go-along interviews at different field sites. This person was paid a total of $600 in cash, distributed across the interviews. The HTO suggested $200 per go-along interview to cover machine expenses required to access each field site, as well as the participant's time and knowledge.
- A fifth resident of Kugluktuk was interviewed by phone and received a $100 co-op gift card as compensation. This participant was given the option to choose between the gift card or cash.

Please explain how the project directly benefited Nunavut organizations and/or *businesses (e.g., through contract services, local purchases, equipment donations, etc.)*
Essential supplies, field tools, and other consumables were purchased from local grocery stores, supporting community-based businesses. In both communities, the research team stayed at local hotels, which further supported the local hospitality sector and ensured accommodation for team members during fieldwork.

OPTIONAL: Nunavut Team Members, hires, and/or trainees (excluding research participants e.g., interviewees) *The NRI is creating an inventory of Nunavummiut who are skilled and/or interested in research. The information provided below will not be shared publicly but will support long-term capacity sharing by connecting local and visiting researchers with research talent in each community.*
Grise Fiord: Terry Noah, Jesse Ningiuk, Nathan Qaunaq, Silas Pijamini, Nolan Kiguktak, Ben Audlaluk, Laisa Audlaluk Watsko, Jaypetee Peter, David Watsko Jr., Larry Audlaluk,

Academic Mobility
If you are affiliated with an academic institution, please answer the following question: For which Level of Project(s) will the data be used? (Check all that may apply)

☒ Research
☐ Post-Doctoral Research
☒ PhD Thesis
☐ Masters (Major Research Paper)
☒ Masters (Thesis)
☐ Graduate Course Project
☒ Staff/Administration Research
☐ Undergraduate Honours Thesis

BUDGET

Please complete the table below to detail your projected and actual research expenditures during the reporting period.

Category	*Planned/Approved Expenditure*	*Actual Expenditure*
Travel and Accommodation	*$ 25,000 (slope stability - UQAR)* *$ 140 000 (UQAR)* *$ 30,000 (Dalhousie U.)* *$ 35,000 (Kugluktuk-UNBC)*	*$ 40,000 (slope stability-UQAR)* *$40,000 (Dalhousie U.)* *$ 18,633.76 (Kugluktuk-UNBC)* *$ 140 000 (UQAR)*
Equipment, Materials and Supplies	*$ 15,000(permafrost)* *$ 5,000 (slope stability)* $ 2,200 (UNBC)	*$ 17,000 (permafrost)* *$ 7,500 (slope stability)* $ 1,430 (UNBC)
Salaries/Wages for Nunavut residents	*$* 150 000	$ 150 000
Salaries/Wages for non-Nunavut resident researchers	*$20,000 (slope stability-UQAR)* *$25,000 (Dalhousie U.)*	*$20,000 (slope stability-UQAR)* *$25,000 (Dalhousie U.)*
Professional Fees and services in Nunavut		*$ 6,000 (slope stability)*
Professional Fees and Services outside of Nunavut	*$60,000 (NovaDrilling)*	*$72,000 (NovaDrilling)*

List the total $ amount of funding from each funding source for your full research program, including in-kind support.

NSERC-ALLIANCE (2025-2030): 420k$/1,5M$ + 36k$ (in-kind)
CFI (2025-2039): 0,5M$ GPRI (100% infrastructure)
TCA (2024-2030): $250,000
NSERC Discovery (2015-2025 EMB) $40,000
PCSP: $ 43 000
NSTP (UNBC): $6,000
NSTP (UQAR): $ 5,000
SSHRC (UNBC): $ 27,000
SSHRC Indigenous Scholars Supplement (UNBC): $5,000
Prince Rupert Port Authority Award (UNBC): $1,500
CIRNAC: $60,000
Polar Knowledge Canada: $30,000

RESEARCH OUTPUTS / REPORTING TOOLS

What research outputs were generated? Please list below and append copies of each. Specify which outputs (if any) may be made public on the NRI research licensing database.

Have peer-reviewed manuscripts been published as a result of your project? If Yes, complete the following table:

Full citation	*Publicly available/ Free to access (Y/N)*	*Link (if available) and DOI (if available)*
Patrick L. White, Erin M. Bertrand, Jenifer S. Spence, Maria A. Cavac[1], Claire Parrott, Stephanie Waterman[3], Elden Rowland, Megan E. Roberts, Terry Noah, Travis Mellett, Danielle Hallé, Andrew K. Hamilton, Randelle M. Bundy, David Didier, and Maya P. Bhatia. (2025). Shifting phytoplankton ecological strategies along a continuum of tidewater glacier retreat. ISME Comm.	*Y*	*https://doi.org/10.1093/ismeco/ycaf045*
Didier, D., Zouaghi, F., Coulombe, S., Noah, T., Bertrand, E., Stolle, J., Jourdain Bonneau, C., Baudry, J., Binette, S., Nicot, P., Akana, R., Noël, B., Boisson, A., Dubuc, D., Berry, B., Ferland, G., Lafosse, L., Omonigbehin, O., Stancu, C., … Bhatia, M. (2025). Community-based nearshore wave and water level monitoring along the Nunavut coast of the Canadian Arctic Archipelago (2021-2023) [Data set]	*Y*	*https://zenodo.org/records/17049447*
Allard, M., Coulombe, S., Ducharme, M.-A., Bilodeau, S., Adjun, L., Papatsie, L., Attatahak, G. and Gagnon, S. (2025). Permafrost characterization, mapping, modelling, and knowledge sharing in support of construction of community roads and trails over sensitive tundra. Kugluktuk, Nunavut, Canada. Arctic Science. 11:1-19	*Y*	*https://doi.org/10.1139/as-2025-0004*

If No, do you intend to submit a manuscript (or manuscripts) for peer reviewed publication?
Yes, there are currently several manuscripts in preparation by different team members, which will be submitted for peer-reviewed publication in 2026. Three are in review and five more are planned for submission in 2026

Were **non-peer reviewed materials** produced to either communicate or synthesize results to the public? Examples of these materials include (but are not limited to): websites, reports, brochures, podcasts, webinars, presentations, non-peer reviewed publications, etc.

If Yes, complete the following table:

Title	*Description of Materials*	*Link (if available)*	*DOI (if available)*
Evaluating Coastal Hazards in Nunavut Communities using Advanced Modelling	*Poster presentation ArcticNet ASM 2025*		
Collaborative Approaches in Hydrography and Oceanography to the Study of Coastal Morphodynamics in Nunavut	*Poster presentation ArcticNet ASM 2025*		
Crossing the ice bridge: a place-based, interactive discussion of the development of a collaborative, community-led environmental monitoring program with Qaanaaq, Greenland and Ausuittuq (Grise Fiord), Canada	*Oral presentation ArcticNet ASM 2025*		
Characterizing Water Masses in Jones Sound, Canadian High Arctic, with a Focus on Atlantic Water: Insights from Long-Term CTD and Nutrient Observations	*Oral presentation ArcticNet ASM 2025*		
Systematic influence of tidewater glaciers on the marine environment in the Canadian Arctic Archipelago: Insights from a 4-year study	*Oral presentation ArcticNet ASM 2025*		
Assessing and Communicating Risk to Coastal Processes in the Canadian Arctic: A Case Study of Kugluktuk, Nunavut	*Poster presentation ArcticNet ASM 2025*		
Controls of total water levels on coastal infrastructure in Canada's northermost community	*Oral presentation ArcticNet ASM 2025*		
Molecular indicators of phycotoxin production in Jones Sound, Qikiqtaaluk region, Nunavut	*Poster presentation ArcticNet ASM 2025*		
Monitoring Coastal Change in a Permafrost Delta, Kugluktuk (NU)	*Oral presentation ArcticNet ASM 2025*		
Tracking Climate-Induced Rock Slope Instabilities Using Portable Ground-Based Radar Interferometry (GB-InRAR)	*Poster presentation 11th IAG International Conference on Geomorphology ICG 2026*		

Did your project develop a communications plan? Please describe communications/reporting tools used, and list the target audience for each and/or who requested which.

No, a formal communications plan was not developed for this project. However, various informal communication and reporting tools were utilized throughout the project year. These included direct engagement with local communities and stakeholders through social media, in-person meetings, and community events. It should be noted that the projects are community-based, and we employ a participative research approach. This means that we mostly work with Nunavummiut during fieldwork, designing sampling strategies and communicating all the time, almost everyday.

How were Nunavummiut credited and/or acknowledged in all project outputs, such as co-authorship, participant biographies, article acknowledgements, etc.

Nunavummiut team members were credited as co-authors on conference presentations and manuscripts, recognizing their contributions and local expertise. Key community members and collaborators were also acknowledged in articles for their field support and valuable contributions to the project. Additionally, key community collaborators participated in ArcticNet's Arctic Change conference in Calgary.

DATA AND INTELLECTUAL PROPERTY

Did you enter into a research agreement, data-sharing agreement and/or intellectual property rights agreement with a community and/or designated Inuit organization (DIO)? If yes, please explain.

No

Who owns the data? Has the raw data been shared with the appropriate community and/or DIO? If yes, how? How is data security and storage handled by community-based co-owners?

The raw data has not yet been shared with the appropriate community and/or Designated Inuit Organizations (DIOs), and no requests have been made in the past year for such data sharing. However, once the datasets are finalized, they will be created and submitted to recognized, publicly available data repositories, such as NordicanaD, Borealis or other relevant platforms. This will ensure that the data is accessible to the community, researchers, and other stakeholders for further use. So far, the type of data we have collected has not raised any security concerns, and there are no sensitive or private data elements that would require special security protocols.

Where is the data stored and will the data be destroyed within a set timeframe?

The data is stored on the research team's secure data servers. The data will not be destroyed within a set timeframe and will be retained for future research purposes, in accordance with best practices for data preservation and security. This policy was developed in consultation with community members

Is the data trackable and/or available in a public data repository? If yes, please provide the appropriate information and/or link to ensure the findability and accessibility of the data.

Yes, the data will be trackable and made available in a public data repository. Some datasets are currently being prepared and will be submitted to recognized, publicly accessible repositories. Once finalized, links to the datasets will be provided to ensure their findability and accessibility for the broader community and researchers. Past ocean data from this project are available:

- Ice2Ocean Team. (2025). *Ocean CTD Profiles From Jones Sound, Nunavut and Adjacent Waters Collected During The Ice2Ocean Project (v1.0).* [Data set]. Canadian Integrated Ocean Observing System (CIOOS). https://doi.org/10.71708/zgvv-xk59
- Ice2Ocean Team. (2025). *Biogeochemistry Data From Jones Sound and Nares Strait, 2021 (v1.1)* [Data set]. Canadian Integrated Ocean Observing System (CIOOS). https://doi.org/10.71708/3vbv-a128

and have been made available in consultation and collaboration with community members

CLIMATE CHANGE

Is your research about climate change (causes, impacts, mitigation, adaptation, etc.)? If yes, explain.

This research directly addresses the impacts of climate change in the Arctic, focusing on how environmental changes are affecting coastal communities such as Kugluktuk and Grise Fiord. The project investigates critical climate-driven processes, including coastal erosion, permafrost thaw, and flood hazards, which are exacerbated by rising sea levels, reduced sea ice cover, warmer temperatures, and increasing storm activity. By modeling wave and current conditions and developing coastal hazard maps, this work provides valuable insights into the vulnerabilities of Arctic coastlines. The research also examines the morphodynamic evolution of the Coppermine River delta and periglacial landscape changes, which are influenced by thawing permafrost and changing hydrodynamic conditions, further illustrating the cascading impacts of climate change. Through community engagement, the project promotes knowledge exchange and builds local capacity to better understand and adapt to these challenges. By monitoring coastal and permafrost conditions, the research lays the foundation for long-term adaptation strategies and provides critical data to support policy development, helping Arctic communities address the immediate and future risks posed by climate change.

PHOTOGRAPHS

If possible, please provide high-resolution photos of licensed research activities that NRI may use in communication materials, organizational reporting, and other promotional purposes. The photographer and all recognizable people in each photo must sign the attached Photo and Video Release form. Please also complete the table below for each photo provided and submit to NRI along with all required NRI photo release forms. The photographer/owner will be credited in all uses of the photograph(s).

Please contact David Didier for high-resolution pictures, as the team has professional-quality images we could share with the NRI committee. Examples can be found on the lab webpage: www.lnar.ca.