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Coastal Baseline Inventory: Benthic community composition and food web structure in waters adjacent to Qikiqtarjuaq, NU 2025.

Scientific Research

📅: Wednesday, August 27, 2025

Period of operation: from 2025-08-15 to 2026-10-15

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ᑦᑲᐅᑦᑲᐅᑦ: The project will use a bottom trawling, traps and baited cameras to collect baseline data on benthic habitats and species (fishes and invertebrates) near Qikiqtarjuaq. All work will be completed off of a vessel-based platform. The collected data will allow assessments of current and potential impacts of climate change on the benthic community. The bottom trawl is an efficient gear for catching Greenland Halibut, sculpins and shrimp, the traps will target shrimp and benthic invertebrates (e.g. whelk), and the camera will collect data on urchins, crabs and other species that are not susceptible to the trawl, as well as data on habitat characteristics (e.g. bottom material, roughness) and effects of sampling equipment on habitats. The combination of sampling gear creates an excellent opportunity to observe any new species in the area that may be expanding because of climate change. Tissue samples will be taken from all species encountered for stable isotope analysis to determine food web structure and linkages. Fish stomachs will be examined to determine their diets, which will be compared with the results of the stable isotope analyses. The objectives of the project are to 1) determine which benthic fish and invertebrate species are currently present near Qikiqtarjuaq; 2) quantify fish diets and food web structure and dynamics; 3) quantify habitat characteristics and conditions, and assess impacts of sampling gears on habitats. Sampling would occur during the open water season (August or September) using a contracted research or fishing vessel; sampling would require approximately 7 days each year (vessel with 24 hour operations capacity). Reports on fish and invertebrate species encountered will be provided each year within a month following fieldwork. Specimens collected will be shipped to Winnipeg for diet and stable isotope analyses during the winter following collection. A report on the diet and food web analyses will be provided at the conclusion of the project (after 3 or 4 years of sampling) and will include consideration of year-to-year variability in the results. These baseline data on the benthic community and food web interaction will capture the current conditions at Qikiqtarjuaq and allow examinations of the effects of climate change or human development activities on benthic habitats and communities. Data on potential commercial species, such as Greenland Halibut and Northern Shrimp, will also be available to the community to support fishery development. Three years of sampling is considered the minimum to account for year-to-year variation in catches and environmental conditions when analyzing the data, four years would improve that consideration of year-to-year variation. Similar trawling surveys, but without traps and baited cameras, were conducted near Qikiqtarjuaq in 2017-2019. Data from those surveys will be combined with the proposed work. Some specimens from those earlier years have been used for stable isotope analyses, but not stomach content analyses. The addition of the trap collections and baited camera observations will help put the trawling results in context regarding habitat structure and conditions. Methods: Bottom trawling, deployment of traps and a baited camera system, CTD casts, and zooplankton tows will be conducted using a vessel based platform. Two people from the Nattivak HTA will be contracted as members of the science crew during the survey. Bottom trawls will be run for 15 min bottom contact; 6-8 trawls can be completed in one day. At the end of each day a string of fish and invertebrate traps (4 traps) will be deployed; the traps will be retrieved ~12 h later, at the start of the next morning. At each sampling station a baited camera will be deployed to characterize the sea floor and record observations of species that are not caught in the trawl and traps, a CTD cast will be conducted to obtain a vertical profile of the water column, and a vertical zooplankton net tow will collect samples of the local zooplankton community. This sampling program will be coordinated with other coastal monitoring programs to minimize overlap in sampling and to provide as much complementary sampling as possible (i.e. collect additional samples that would aid other projects. Stable isotope analyses involve chemical sampling and use of an isotope analyzer in the lab. Two members of the science crew will be contracted through the Nattivak HTA. These crew members will be trained in use of the bottom trawl, fish traps, baited camera, zooplankton net, CTD and processing of the sample catch. Deliverables: •Map of sampling locations showing dominant species in the catches/observations. •Annual report to the Nattivak HTA on sampling activities, catches and food web and genetic analyses. •Annual DFO Technical Reports describing the fieldwork completed and data. •Primary publication describing the benthic community and food web at Qikiqtarjuaq. •Primary publication comparing benthic communities and food webs among Nunavut communities.

ᐅᑦᑲᐅᑦᑲᐅᑦ: Description du projet : Le projet utilisera un chalutage de fond, des pièges et des caméras appâtées pour recueillir des données de base sur les habitats et les espèces benthiques (poissons et invertébrés) près de Qikiqtarjuaq. Tous les travaux seront effectués à partir d'une plate-forme rattachée à un navire. Les données recueillies permettront d'évaluer les conséquences actuelles et potentielles des changements climatiques sur la communauté benthique. Le chalut de fond est un engin efficace pour attraper le flétan du Groenland, les chabots et les crevettes. Les pièges cibleront les crevettes et les invertébrés benthiques (p. ex. le buccin), et la caméra recueillera des données sur les oursins, les crabes et d'autres espèces qui ne sont pas sensibles au chalut, ainsi que des

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Operations Phase: from 2025-08-15 to 2026-10-15

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Area in which research stations will be selected and represented in our research	Scientific/International Polar Year Research	Marine	N/A	N/A	approximately 20 km from the community of Qikiqtarjuaq, NU

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ᓄᓶᓄᖅᑕᖅᔪᐱᖅ	Ann Sanguya	Nattivak HTO	2025-06-25
ᓄᓶᓄᖅᑕᖅᔪᐱᖅ	Pasa Aulaqiaq	Nattivak HTO	2025-08-21

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ᐃᕐᕐᕐ ᐃᕐᕐᕐᕐ ᐃᕐᕐᕐᕐᕐ	This is the only other license as indicated by Nunavut Planning Commission required to complete this work.	Applied, Decision Pending		

Project transportation types

Transportation Type	ᐃᕐᕐᕐ ᐃᕐᕐᕐᕐᕐ	Length of Use
Air	Canadian North flight into Qikiqtarjuaq (food will be purchased by the research team in Qik. while at the research station. We will be using the research station's transportation). We are disembarking the research vessel once our project is completed in Iqaluit and will flight home from this location. Taxis and food will be purchased in Iqaluit before flying home.	
Water	Patrick and William research vessel is arriving from Newfoundland to complete this work and will return to Newfoundland once the work is completed. They will be purchasing food to resupply the vessel as needed.	
Land	Qikiqtarjuaq Research Station (beginning of the trip 4 days), We are leaving the vessel in Iqaluit and no accommodations are booked for going home presently	

Project accomodation types

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A^cd^c A^br^at^s A^cD^sC^aσ^aH^at^s Δ^cb^ap^an^aj^c ΔjCΔ^c, Γ^c⊃A^ap^an^c, ^sb^aL^cC^ai^s, ρ^ae^ap^aΔ^c A^ar^ar^c⊃

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Diesel	fuel	1	21000	21000	Gallons	The fuel tanks of the vessel is capable of storing enough fuel to sustain operations for up to 60 days.
Oil and Lubriation products	hazardous	5	5	25	Gallons	Engine Oil and lubrication products will

						be used and stored to support the proper function of the vessel's engine.
formaldehyde	hazardous	1	4	4	Liters	to preserve samples
MS222	hazardous	1	4	4	Liters	Anesthetize fish for satellite tagging
betadine	hazardous	1	2	2	Liters	clean sutures and satellite tags

ΔL^{5b} <D^{5b}C>L^{5b}5b

Δ ^{5b} CL ^{5b} <D ^{5b} C>σ<5b>5b	5b ^{5b} ΔΓ ^{5b} C5b ^{5b} C5b ^{5b} σ<5b>5b	ΔP ^{5b} ΔΓ ^{5b} C5b ^{5b} C5b ^{5b} σ<5b>5b
3	Desalination of seawater to freshwater onboard the vessel. Vessel is equipped with water makers, capable of producing fresh potable water from seawater.	Vessel is equipped with advanced water makers, capable of producing fresh potable water from seawater. This ensures a continuous supply of drinking water and fresh water for other needs.

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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

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The physical environment is the marine environment adjacent to the community of Qikiqtarjuaq and extends outwards to the NSA boundary. The study region is in the general proximity to the Auyuittuq National Park. The study region ranges in depth from 200m to 1000m.

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The biological environment includes marine fish, zooplankton, marco benthos and other marine organisms. The benthic habitat is disturbed during trawling events. Spotted Wolffish, a species at risk, live in this region and are captured in previous trawling events.

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The study area is adjacent to the community of Qikiqtarjuaq. We are working in the marine environment where community members may hunt for marine mammals or fish for anadromous Arctic Char or other marine species.

Miscellaneous Project Information

All work is done in collaboration with the Hunters and Trappers Organisation. Our research is designed to support interests in emerging marine fisheries as well as any concerns they may have regarding the presence of a research vessel in the region. All work conducted has been approved by the HTO in advance of the field season.

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1.) Remain out of all marine sanctuaries, marine protected areas and any other land identified as protected. Sampling adjacent to the boundaries of these areas will be limited.2. All Species at Risk (Wolffish) will be live released immediately upon capture. 3. If community members are hunting in an area - the vessel will move away and work in another area. We will consult with the HTO to ensure that we do not disturb specific organised hunts and areas that may be used by community members while work is being conducted.4.) We are trawling for a minimal amount of time to ensure that we minimize impacts of habitat on the ocean floor. The length of time needed to capture the wide range of biodiversity is approximately 15 minutes per tow. This is adhered to while conducting scientific research.

Cumulative Effects

Habitat damage to the ocean floor is the largest cumulative effect from trawling and marine floor disturbance.

Impacts

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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																

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1 polygon Area in which research stations will be selected and represented in our research

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