



NIRB Uuktuutinga Ihivriughikhamut #126466

Developing local capacity and tools for on-board ship monitoring to better understand ecological risks and identify actions to improve mitigations for ship traffic in Arctic Canada's largest port

Uuktuutinga Qanurittuq:	New
Havaap Qanurittunia:	Scientific Research
Uuktuutinga Ublua:	Friday, July 17, 2026
Period of operation:	from 2026-08-24 to 2027-12-23
Havauhikhaq Ikayuqtinga:	Justine Sutherland Fisheries and Oceans Canada 501 University Crescent Winnipeg Manitoba R3T2N6 Canada Hivayautit Nampanga:: 431-334-2759, Kayumiktukkut Nampanga::

QANURITTUT

Tukihiannaqtunik havaariyaumayumik uqauhiuyun

Qablunaatitut: The introduction of non-indigenous species (NIS) is one of the top drivers of global biodiversity loss, with ballast water discharge from ships being the primary source of aquatic NIS introductions around the world [1]. Shipping activity has dramatically increased in the Canadian Arctic due to climate change and increased resource extraction [2] with Milne Inlet having the largest increase in shipping traffic due to raw iron exports [3,4]. Ballast water discharge in this previously undeveloped inlet brings NIS introduction risks with potential impacts to sensitive Arctic marine species/habitats (e.g. areas important for feeding/breeding of narwhal/bowhead, bird colonies and Arctic char), consequences for food security/ local community well-being, and more widespread effects if NIS become established and spread to other Arctic regions. Recent updates in regulations have led to the requirement for ballast water management systems (e.g. chlorination or UV) onboard vessels, to treat ballast water before discharge, although there is uncertainty about their efficacy in Arctic environments. Southern ballast water studies found approximately half of sampled vessels exceeded international treatment standards (Regulation D2 [5]) with 10 to 1000s of organisms/m³ of ballast water [6,7,8], including NIS to Canada [7,8]. Colder temperatures often lead to slower chemical reactions, suggesting treatment efficacy to ballast water treatment systems may be lower on Arctic voyages [8] than voyages to southern Canadian ports. In addition, organisms that survive treatment may be hardy, and may be more likely to establish in Arctic environments [9]. This project will assess the number and types of organisms in ballast water discharged, as well as efficacy of ballast water treatment systems on-board ships travelling to the arctic to better understand the potential risk of NIS under Arctic conditions. Further, it will assess the feasibility of ballast water sampling and analysis methods for future use by community members/organizations for future ballast water monitoring. In 2026 and 2027, we propose to sample for up to 8 weeks (length of sampling will be dependant on resources and capacity at Milne Inlet) during the shipping season to sample a total of up to ~64-80 vessels over the duration of the trial monitoring program. Sampling will require a team of 4-5 people who will work with ship's staff to connect sampling equipment to the appropriate sample port on-board. Sampling would include the use of the Ballast Catch tool to filter at least 1000-L of ballast water and collect large size class ($\geq 50 \mu\text{m}$) organisms samples as well as the collection of raw (unfiltered) water samples for the small size class ($\geq 10 \mu\text{m}$ and $\leq 10 \mu\text{m}$) organisms. In addition to large and small size class samples, water quality parameters (water temperature, pH, and salinity) will be measured, residual chlorine levels will be assessed (i.e. to assess if the chlorine used to kill living organisms in ballast water neutralized properly) and environment DNA/RNA (eDNA/eRNA) will be collected for later individual- and meta-barcoding to determine the types of organisms present in ballast water samples. Sample processing will happen on-site at Milne Inlet port where an indicative tool (SATAKE Ballast eye) will be used to count the number of live organisms in ballast water samples, and assess levels of compliance with the D-2 ballast management standards. A portion of all ballast water samples collected will be preserved for later taxonomic assignment using morphological and genomic methods. Each year, we will host a training workshop where Inuit youth from Pond Inlet, Igloodik and Sanirajak (Hall Beach) involved in the project will learn how to use sampling equipment, and essential safety measures for sampling ships at industrial port sites. A second workshop will take place in the fall where involved Inuit youth will provide feedback on the sampling season and do outreach in each of their communities with support from DFO to share knowledge of the project and discuss questions and concerns with community members. A third workshop will be hosted in the winter where Inuit youth with support from DFO, will analyze data from each field season using mapping and data analysis platforms.

Uiviitut: L'introduction d'espèces non indigènes (ENI) est l'une des principales causes de la perte de biodiversité à l'échelle mondiale. Le rejet d'eau de ballast par les navires est la principale voie d'introduction de ces espèces dans les milieux aquatiques partout dans le monde [1]. Les activités maritimes ont fortement augmenté dans l'Arctique canadien en raison des changements climatiques et de l'intensification de l'exploitation des ressources naturelles [2]. Le détroit de Milne Inlet a connu la plus forte hausse du trafic maritime en raison de l'exportation de minerai de fer brut [3,4]. Le rejet d'eau de ballast dans cette région auparavant peu développée entraîne un risque d'introduction d'espèces non indigènes, ce qui pourrait avoir des répercussions sur les espèces et habitats marins sensibles de

[illegible]

Personnel on site: 5
Days on site: 20
Total Person days: 100

Operations Phase: from 2026-08-24 to 2027-12-23

Closure Phase: from 2027-12-23 to 2028-03-23

Hulilukaarutit

Inigiya	Hulilukaarut Qanurittuq	Nunannga Qanurittaakhaanik	Initurlinga qanuritpa	Initurlinga utuqqarnitat unaluuniit Ingilraaqnitat Uyarannguqtut akhuurninnga	Qanitqiyauyuq qanitqiamut nunallaat kitulluuniit ahiruqtaliyainnit nuna
Milne Inlet Port - ship sampling on-board bulk carrier vessels.	Scientific/International Polar Year Research	Marine	Milne Inlet Port has been used for a number of years to ship out iron ore mined by Baffinland Iron mines between July and Oct. We will be boarding vessels to collect ballast water samples in September. No environmental samples will be collected as part of this project.	Baffinland is committed to identifying and surveying archeological sites if/when discovered on project lands. We will comply with all guidelines outlined in required training and project certificate as outlined by Baffinland contacts during project activities.	Closest communities are Pond Inlet and Arctic Bay and is within the tallurutiup imanga national marine conservation area.

Nunaliin Ilauyun, Aviktuqhimayuniitunullu Ikayuuhiarunguyun

Nunauyuq	Atia	Timiuyuq	Upluani Uqaqatigiyaungmata
Sanirayaak	Office Manager	Hall Beach (Sanirajak) Hunters and Trappers Association	2026-03-31
Mittimatalik	Office Manager	Mittimatalik Hunters and Trappers Organization	2026-03-12
Igloolik	Office Manager	Igloolik Hunters and Trappers Association	2026-03-17

Angiuttauvaktunik

Naunaiqlugu nunanga talvani havauhikhaq ittuq:

North Baffin

Angiuttauvaktunik

Munariniqmut Ayuittiaqtuq	Angirutinga Qanurittuq	Tadja Qanurittaakhaanik	Ublua Tuniyauyuq/Uuktuqtuq	Umikvikhaa Ublua
Iqalukhiurniqmut Tariuqmilu Kaanata	License to Fish for Scientific Purposes (LFSP; includes zooplankton collection in water samples). Authorizations through NPC and NIRB are required prior to submission for an LFSP.	Not Yet Applied		

Project transportation types

Transportation Type	Qanuq Atuqtauniarmangaa	Length of Use
Air	The sampling team will get to/from site using charter flights alongside Baffinland iron mine employees.	
Land	The sampling team will use a truck to get to/from accommodations to the dock/lab for sampling each day.	

Project accomodation types

Permanent Camp

Alaanut,

Ihuaqutivaluin Atuqtauyukhan

Hanalrutit atuqtaunahuat (ukuallu ikuutat, pampiutainnik, tingmitinik, akhaluutinik, hunaluuniit)

Hanalrutit Qanurittuq	Qaffiuyut	Aktikkulaanga – Qanurittullu	Qanuq Atuqtauniarmangaa
Truck	1	NA	Travel from accommodations to dock/lab
Ballast CATCH	2	24 x 12	filter ballast water
Ballast EYE	1	12 x12	counting viable organisms in ballast water samples
TRO	1	12 x12	measuring residual chlorine in ballast water
Citizen sampler	1	12 x 6	collecting environmental DNA and RNA from ballast water samples

Qanurittuq Urhuqyuaq unalu Qayangnaqtut Hunavaluit Aturninnga

Qanurittuq urhuqyuaq hunavaluit aturninnga:	Urhuqyuaq Qanurittuq	Qaffiuyut qattaryut	Qattaryuk Aktikkulaanga	Atauttimut Qaffiuyut	Ilanga	Qanuq Atuqtauniarmangaa
Gasoline	fuel	1	50	50	Liters	fuel for truck
Ethanol	hazardous	1	4	4	Liters	Sample Preservation (20 ml samples - up to 32 samples per year)

Imaqmik Aturninnga

Ubluq qanuraaluk (m3)	Aturumayain imavaluin utiqittagaani qanuq	Atulirumayain imavaluin utiqittagani humi
0		

Iqqakuq

Ikkakunik Munakgiyauyunik

Havauhikhaq Hulilukaarut	Qanurittuq Iqqakut	Ihumagiyauyuq Qanuraaluktut Atuqtait	Qanuq Iqqakuurniarmangaa	Halummaqtirarnirutikhan piyutin
Scientific/International Polar Year Research	Other, Chemical waste	Ethanol (1L max); FDA (2.5L max); TRO (1L max)	All waste will be collected in a waste container and given to the Baffinland water treatment facility for treatment and disposal or shipped back down south for disposal by contracted professionals if Baffinland waste water treatment plant does not have the equipment to safely dispose of waste.	Ethanol will be used to preserve ballast water samples. Ethanol needs to be changed once after 24 hours, generating wasteFDA waste is generated when counting live organisms in ballast water samples. FDA stains the live organisms which would then glow in the Ballast Eye. TRO waste will be generated when adding DPD dye packs to ballast water samples.

Avatiliriniqmut Ayurhaulingit:

There are no anticipated impacts to the environment resulting from this project. We are using only existing methods of transportation as permitted by Baffinland based on their project authorizations/certificates and are only collecting sample while on bulk carrier vessels. No samples will be taken from the environment.

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

Qanurittuq Ittunik Avatinga: Avatingalluanga

Qanurittuq Ittunik Avatinga: Inuuhimayunut Avatinga

Qanurittuq Ittunik Avatinga: Inungit-maniliurutingit Avatinga

Miscellaneous Project Information

1000-2000L of ballast water will be filtered per ship, filtered water will be directed into the ships bilge or other holding tank as directed by the ships' crew . 14L of raw (unfiltered) water and 1-2L of filtered water will be collected and taken off ship for further analysis/preservation. 8L of water will also be collected for eDNA filtrations. Anticipated total number of samples collected per 2-week trip is 15 preserved ballast water samples. This season we anticipate to collect 15 ballast water samples given current restrictions at Baffinland and a maximum of 80 samples collected over the next 2 years. Retained ballast water samples are 20ml -120 ml each (depending on sediment load and number of organisms). Environmental DNA/RNA will be preserved on a filter, no sample volume will be retained.

Naunaiyainiq ukuninnga Ayurhautingit unalu Piumayaat Ikikliyuumiutinahuarutit

When using chemicals, only small containers (500 ml or less) will be handled to prevent large spills in the lab, a spill kit will be available at all times to contain and clean up chemical spills. Containers of ethanol will be stored in flammables cabinet to prevent accidental fires. A fire extinguisher will be available at all times in case of fire at the lab. The SATAKE ballast Eye (Viable organism analyzer) would be used for all samples.

Tamatkiumayunik Ihuikgutivaktunik

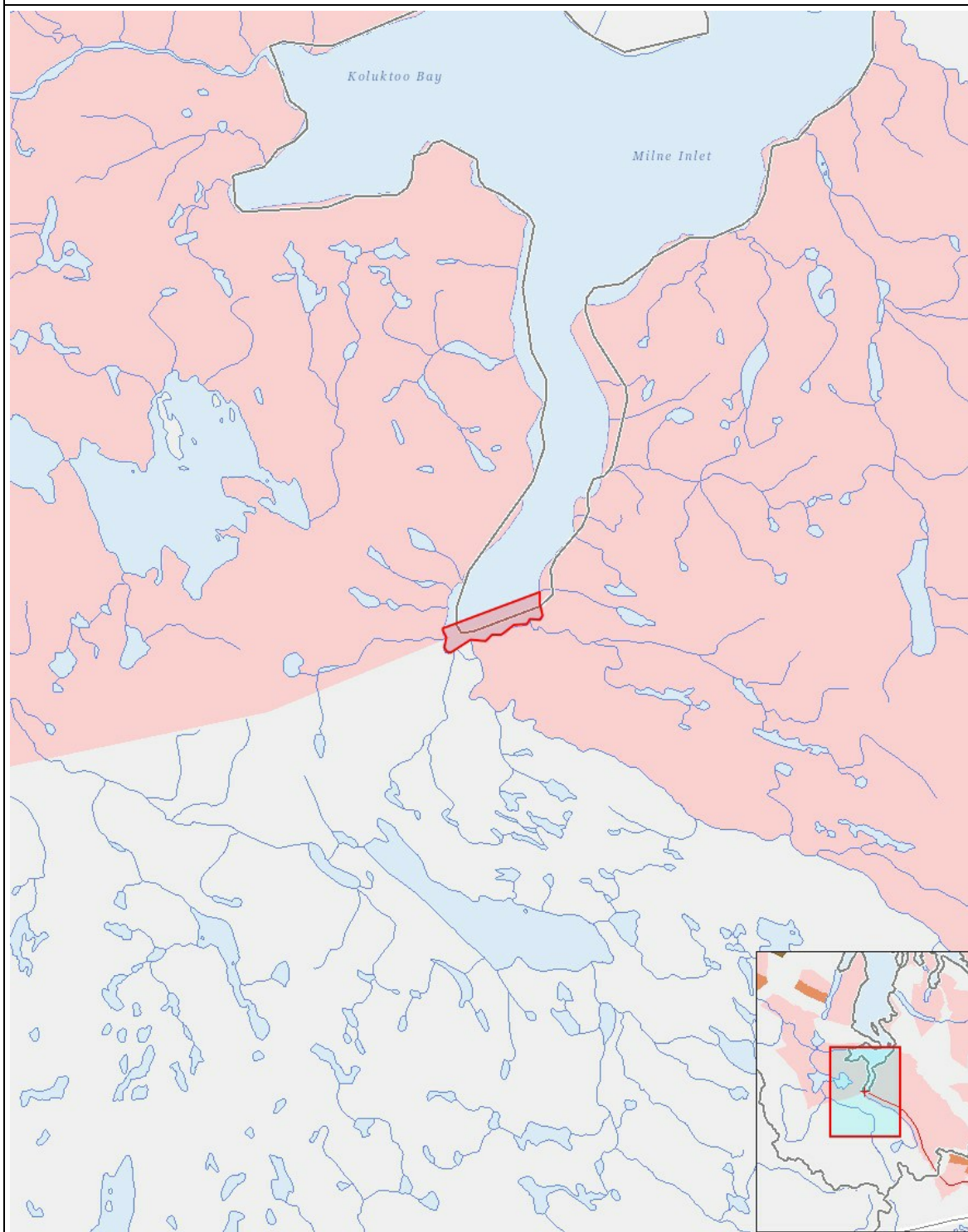
Impacts

Ilitariyauniq Avatiliriniqmut Ayurhautingit

[illegible]

(P = Nakuuyuq, N = Nakuungittut unalu mikhilimaittuq, M = Nakuungittut unalu mikhittaaqtuq, U = Naluyauyuq)

Havaariyauyukhamut Nayugaa



List of Project Geometries

- | | | |
|---|---------|---|
| 1 | polygon | Milne Inlet Port - ship sampling on-board bulk carrier vessels. |
|---|---------|---|