



NIRB Application for Screening #125739

Atmospheric monitoring observatory in Canadian Arctic

Application Type: New

Project Type: Scientific Research

Application Date: 8/24/2022 12:18:20 AM

Period of operation: from 0001-01-01 to 0001-01-01

Proposed Authorization: from 0001-01-01 to 0001-01-01

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DETAILS

Non-technical project proposal description

English: Arctic warms at a rate twice the global average and the sea-ice declines at an unprecedented rate. While the decline in sea-ice is concurrent with the atmospheric/ocean warming, the observed variability is elusive of simple relationships. Recent studies indicate the role of the phase of precipitation on sea-ice growth and decay. There is evidence that extreme events are increasing, be it ice melting, precipitation, storms, pollution etc., in which atmosphere-Ocean -ice interact at different time and spatial scales. e.g. Atmospheric circulation transport and disperse aerosols that contribute to the observed changes by altering the radiative forcing, and may eventually lead to ice melting by changes in albedo. Sometimes unexpected consequences follow. Uncertainties in our formulations of these processes mainly arises from the paucity in observations and lead to less reliable climate projections and can take a toll on food security and human health. Therefore, there is a need to observe the ocean-atmosphere-ice system in the Arctic. We will begin by setting up atmospheric measurements in Cambridge Bay.

French: L'Arctique se réchauffe à un rythme deux fois plus rapide que la moyenne mondiale et la glace de mer diminue à un rythme sans précédent. Bien que le déclin de la glace de mer soit concomitant au réchauffement de l'atmosphère et de l'océan, la variabilité observée est insaisissable des relations simples. Des études récentes indiquent le rôle de la phase des précipitations sur la croissance et la pourriture de la glace de mer. Il existe des preuves que les événements extrêmes augmentent, qu'il s'agisse de la fonte des glaces, des précipitations, des tempêtes, de la pollution, etc., dans lesquels l'atmosphère, l'océan et la glace interagissent à différentes échelles temporelles et spatiales. p. ex. transport de la circulation atmosphérique et aérosols dispersés qui contribuent aux changements observés en modifiant le forçage radiatif, et peuvent éventuellement conduire à la fonte des glaces par des changements dans l'albédo. Des conséquences parfois inattendues s'ensuivent. Les incertitudes dans nos formulations de ces processus découlent principalement du manque d'observations et conduisent à des projections climatiques moins fiables et peuvent avoir des répercussions sur la sécurité alimentaire et la santé humaine. Par conséquent, il est nécessaire d'observer le système océan-atmosphère-glace dans l'Arctique. Nous commencerons par mettre en place des mesures atmosphériques à Cambridge Bay.

[illegible]

Inuinnaqtun: Ukiuqtaqtumi uunaqnia malguiqtuqhugu nunaqyuami uunavyaktuq uvalu tariup hikua ikiliyuumiqtut angiyumik. Uunaqpalaqtut hulaqutiyyut tariup hikuanun ikiliyuumiqtut. Qanganuaq naunaiyautit tautungnaqtut tapkua nipaluit uvalu aputit pidjutiqaangniaqtut tamaqpalianirmun uvalu angiklivialianiaqtut hikumi. Unaluttauq, halumailrut aktuutauvaktut nunaryuami auladjutikhanut maniit atugakhat. Piqaqtuq ikitunik hilatigut tautuktamingnik Kanatami Ukiuqtaqtumi uvalu pidjutiqaqtut nalunikkut mikhaagun hilap itqungniagutit. Una akhuurutauyuq niqighaqattiarniqmik inuuhiqattiarnirmunlu. Talvuuna, munagigiaqaqtukhauyugut hilaptingni talvani Kanaitian Ukiuktaqtuni. Iliurarniaqtugut ikiani munarinirnik Iqaluktuuttiami.

Personnel

Personnel on site: 3

Days on site: 30

Total Person days: 90

Operations Phase: from 2022-11-01 to 2026-10-30

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Canadian High Arctic Research Station (CHARS)	Scientific/International Polar Year Research	Municipal	CHARS station	CHARS station	Not applicable

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Cambridge Bay	Beverly Maksagak	Ekaluktutiak Hunters and Trappers Organization	2022-07-27

Authorizations

Indicate the areas in which the project is located:

Kitikmeot

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	Application submitted on 05 August 2022	Applied, Decision Pending	2022-08-05	

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	We shall reach via air transport to Cambridge Bay	

Project accomodation types

Permanent Camp

Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Particulate Matter (PM2.5) High Volume Samplers	01	3x2x2	High Volume sampler PM2.5 is used to collect aerosol samples on filter paper for further chemical analysis and estimation of mass concentrations of different aerosol species in the size of less than 2.5 micrometres.
Particulate Matter (PM10) High Volume Samplers	01	3x2x2	High Volume sampler PM10 is used to collect aerosol samples on filter paper for further chemical analysis and estimation of mass concentrations of different aerosol species in the size of less than 10 micrometres.
Microwave Radiometer Profiler (MWRP)	01	3x2x2 m	To measure vertical profiles of Temperature, Humidity, Liquid Water Path and water vapour
Laser Disdrometer	1	3x1x1 m	To measure precipitation rate, the number of drops/particles, and liquid water content.

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
No Fuel use	fuel	0	0	0	Liters	No Fuel use
No Hazardous Material or Chemical	hazardous	0	0	0	Liters	NA

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0		

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Scientific/International Polar Year Research	Sewage (human waste)	000	As per usual practice of CHARS	As per usual practice of CHARS

Environmental Impacts:

This is an atmospheric observation project and does not have any bad environmental impact

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 of Existing Environment: Physical Environment

Description of Existing Environment: Biological Environment

Description of Existing Environment: Socio-economic Environment

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

Cumulative Effects

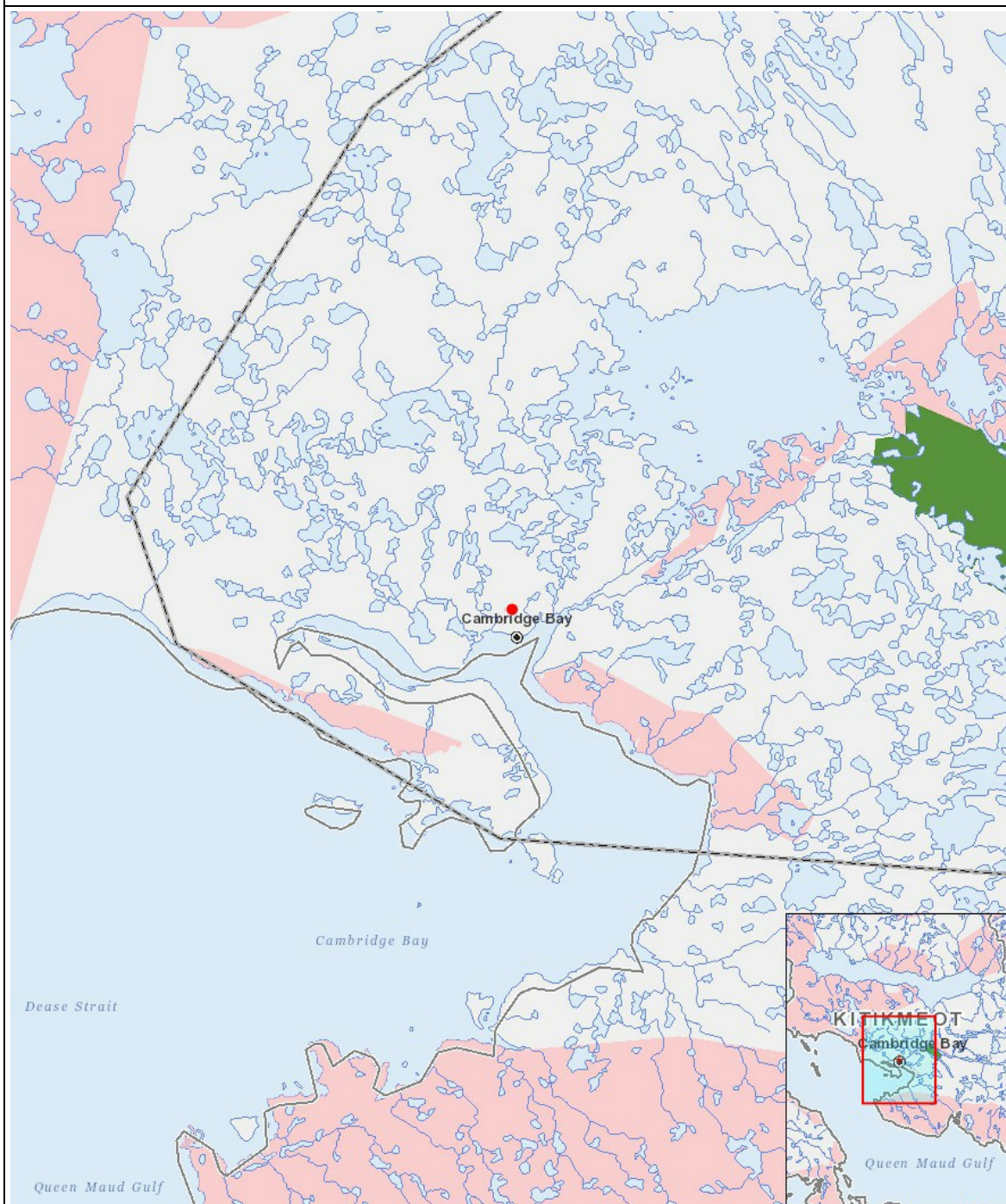
Impacts

Identification of Environmental Impacts

	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																									
-		-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-
Operation																									
Scientific/International Polar Year Research		N	N	N	-	N	N	N	N	N	N	N	N	N		N	N	N	N		U	P	P	P	P
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

- | | | |
|---|-------|---|
| 1 | point | Canadian High Arctic Research Station (CHARS) |
|---|-------|---|