

# NIRB Application for Screening #125345

## Monitoring Seasonal Environmental Change in Rivers of the Kitikmeot Region

<b>Application Type:</b>	New
<b>Project Type:</b>	Scientific Research
<b>Application Date:</b>	5/7/2018 3:07:12 PM
<b>Period of operation:</b>	from 0001-01-01 to 0001-01-01
<b>Proposed Authorization:</b>	from 0001-01-01 to 0001-01-01
<b>Project Proponent:</b>	Kristina Brown Fisheries and Oceans Canada Institute of Ocean Sciences, 9860 West Saanich Rd, P.O. Box 6000, Sidney BC V8L 4B2 Canada Phone Number:: 778-835-8374, Fax Number::

## DETAILS

### Non-technical project proposal description

English: Monitoring Seasonal Environmental Change in Rivers of the Kitikmeot Region Project Description: Rivers directly link the land and the ocean by delivering freshwater, heat, nutrients, and carbon to the coastal system. Observing river systems is therefore key to understanding the impacts of terrestrial environmental change on Arctic ocean health. This project aims to enhance our capacity to directly observe the physical and biogeochemical characteristics of rivers across the Kitikmeot Region by developing in-situ observational systems ("river moorings") to carry out these measurements continuously. These river moorings will provide the first time series observations of river physical and biogeochemical parameters in the Kitikmeot Region, observations that are crucial to understanding and predicting the impacts of terrestrial change on the Kitikmeot marine system. This project proposes to deploy four (4) autonomous observational systems (moorings) in rivers throughout the Kitikmeot Region for the continuous measurement of physical and biogeochemical properties of these rivers over the summers of 2018 and 2019. Moorings will record measurements of the river's physical conditions, including temperature, conductivity, and water level, as well as biogeochemical parameters, including dissolved oxygen content, turbidity (cloudiness), and coloured dissolved organic material (CDOM) concentration. The proposed project has three main parts: (1) deployment; (2) recovery; and (3) assessment for future applications. Deployment: River moorings will be deployed within four (4) rivers throughout the Kitikmeot Region, including the Tree River, Hood River, Burnside River, and Western River. Each river mooring will be deployed from a float plane, within the river's main channel, close to the river mouth. Each mooring will be held in place by a river-bottom anchor, as well as a shore line fixed with a metal stake. Recovery: After approximately 2-months of measurements, river moorings will be completely removed from all four river locations. Access to the sites for recovery will be carried out either by float plane or by a small aluminum skiff launched from the R/V Martin Bergmann. Assessment: A primary goal of this project is to develop observational arrays that can be used by community-directed research programs in Kugluktuk and Cambridge Bay to inform community concerns around environmental stewardship. Lessons learned during the development, deployment, and recovery of the river mooring arrays will be discussed with local community groups to develop river mooring systems that directly meet community monitoring needs. This project contributes directly to Polar Knowledge Canada's research priorities to collect observations on the present state of the Kitikmeot Marine Region. Results from this project will be shared with the communities of Kugluktuk and Cambridge Bay, as facilitated through local contacts such as the Kugluktuk HTO, Cambridge Bay HTO, and Canadian High Arctic Research Station.

French: N/A

[illegible]

Inuinnaqtun: Amiqhayingit Halaqtigit Hilaup Aallannguqpallianinga Kuukkanat iluani Qitirmiit Nunangani Havaatigit Tukiliutaa: Kuukkait taimaa katilviuvaktangit nunanut taryurnullu turaaqhivaktut halumayumik imait, uunnarninga, ilulingnut aturnaqtut, anirninut taryum hinaanut. Tautukhutik kuukkait taimaa kangiqhittiarnaqhutik aktuqhimaningit uumani nunamiuttait avataita aallannguqpallianianut Ukiuqtaqtuq taryuata aanniarnairutinga. Una havaak hivunigivlugu pivalliyakhaat inikhautivut ayurnaittumik tautukhimalugit qaanganiittut iluaniittut uumayuit ilitquhiita kuukkanut tamainnut Qitirmiut Avikturnianit pivallianahuarlugit iluani (“kuukkanut tulagviat”) havaktaugiami uuktuqhimaatqakhait. Hapkuat kuukkat tulagvingit ikayuutauniaramik tautunngaqhimalugit kangiqhiyuummirahuariami aktuqhimaningit uumani nunamiuttait aallannguqpallianingit qaangani Qitirmiut imarmiuttauyut. Una havaangit tukhiutigiyangit iliurailugit hitamat (4) inmi munariyaayut tautuktakhaat (tulagvit) iluani kuukkait tamainnut Qitirmiut Avikturniani uuktuqhimmataqtut nunaup qaanganiittuq imaup ilaliutitgit kuukkanut auyannguraangat 2018 mi 2019 milu. Tulagvit illitupkainiaqtut nalunaiqhilitik kuukkam ilitquhingit qanurilinganingit, uuminngalu niklaumaninga, qanuq naunairahuaqtangit hakugingnia, imaup aktilaanga, ilaurutigit ilitquhiita, uuminngalu nungutpaktut anirniqarumik ilaliutinga, takunnarluanngettut halumailrua (halumaininga), avitaangillu nungutpaktut uumayuit ilulgit (CDOM) ihuqhiyuq ilahimagamik. Una tukhiutiyangit havaatigit pingahunit ilaqaqtut: (1) auladjutinga; (2) utiqhimaniga; unalu (3) ihivriurninga hivunikhamut atuqtakhainnit. Auladjutinga: Kuugaq tulagvingit auladjutauniaqtut iluani hitamat (4) kuukkat tamainnut Qitirmiut Avikturniani, ilaginiaqtangit Kugluktualuk Kugaa, Hivogakhit Kugaa, Qingauk Kugaa, unalu Kiluhiktuk Kugaa. Tamaat kuugaq tulagvingit iliurainiaqtuq kuukkam ataanit kihaqhimalugit, uuminngalu hinaanit ihuaqhimaniaqtuq uuminngat havigalik tunngavikhamut. Utiqhimaniga: Malruk tatqiqhiutigit uuktuutiginiaqtangit, kuukkam tulagvingat ahivaqpiqhimaniamiaqtuq hamannat tamaat kuukkat nayugaanit. Pinahuaqtangit nayugaanut utiqtakhainnit agyaqtakhait uuminngat puptalaaqtukkut tingmianut uumaniluunait havigalingnit agyaqtuutikkut uvanngat umiakut R/V Martin Bergmann. Ihivriurningit: Hivunngani hivunikhaa havaariyakhanut pivalliyukhaq tautukhimayangit kitiirningit parnautigiyakhaat nunaqatigiiktunut-aulavikhangit qauiyiaqtut piliriakhat Qurluqtumi Iqaluktuuttiarmilu illituvikhaat nunalingni ihumaaluutigiyangit avataanut avatingnut munaqhainikhanut. Ilihautikhangit illituvikhangit pivallianikhainut, iliurainingit, utiqhimaningit kuukkait tulagvikhangit illituvikhangit kitiirningit nalunaiyaqhimaniaqtangit nunaqatigiiktunut ilauhimayut pivalliyakhaat kuukkanut tulagvikhait tunigianganit nunalingnit amiqhaidjutinut piyumayangit. Una havaangit aulapkaikhimayangit uumani Ukiuqtaqtuq Qauiharaningit Kanata’m qauiyaqhimayangit hivunikhaat kititiqhimayangit tautukhimayangit ublunganit ilitquhingit haffumani Qitirmiunmi Imarmiuttangit Avikturnia. Nalunaiqhiiyangit haffumani havaangit avvautiginiaqtangit nunaliit Qurluqtuq Iqaluktuuttiarmilu, nunaqatigiiktunut tuhaqtittiniaqtangit Qurluqtuq HTO ngit, Iqaluktuuttiaq HTO ngit unalu Kanatamiunut Ukiuqtaqtumi Qauiharvingit.

Personnel on site: 3  
Days on site: 8  
Total Person days: 24  
Operations Phase: from 2018-07-15 to 2018-07-21  
Operations Phase: from 2018-07-15 to 2018-09-10  
Closure Phase: from 2018-08-15 to 2018-09-10  
Post-Closure Phase: from to

## Activities

### Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Tree River	Other	Crown	N/A	N/A	N/A
Hood River	Other	Crown	N/A	N/A	N/A
Burnside River	Other	Crown	N/A	N/A	N/A
Western River	Other	Crown	N/A	N/A	N/A

### Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Information is not available			

## Authorizations

### Indicate the areas in which the project is located

#### Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	Authorization requested to carry out scientific research in the proposed Kitikmeot rivers	Not Yet Applied		

### Project transportation types

Transportation Type	Quantity	Proposed Use	Length of Use
Air	0	Cessna 206 (float plane) or de Havilland Beaver (float plane)	
Water	0	aluminum boat (18ft)	

### Project accomodation types

Other,

## Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Cessna 206 float plane	1	N/A	Travel to site
de Havilland Beaver float plane	1	N/A	Travel to site

## Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Gasoline	fuel	2	22.3	44.6	Liters	fuel for aluminum boat
Aviation fuel	fuel	1	443	443	Liters	float plane travel

## Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	By hand, using a 50mL syringe and by small peristaltic pump	1-5 L river water sampled for geochemical parameter determination; Sampling will be carried out after river mooring deployment, at the same location at river mid-channel

## Waste

### Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Other	Other, Household garbage	N/A	Any trash generated on site (plastic wrap, cardboard etc.) will be taken back to Cambridge Bay and disposed of in the household waste stream, any recyclable materials will be taken south for disposal in appropriate facilities.	No negative impact to the environment is anticipated, all moored equipment will be removed at the end of each season.

### Environmental Impacts:

No negative impact to the environment is anticipated, all moored equipment will be removed at the end of each season. Any trash generated on site (plastic wrap, cardboard etc.) will be taken back to Cambridge Bay and disposed of in the household waste stream, any recyclable materials will be taken south for disposal in appropriate facilities.

## **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**

All 4 proposed mooring locations are in the main river channel, upstream of the river mouth.

### **Description of Existing Environment: Biological Environment**

N/A

### **Description of Existing Environment: Socio-economic Environment**

N/A

### **Miscellaneous Project Information**

River moorings will be deployed in four (4) rivers throughout the Kitikmeot Region using a float plane. The rivers will be accessed early in the season after spring ice break up (late-July 2018, mid-June 2019). Site selection will be as close to the river mouth as possible, based on float plane access to the main channel, keeping up-stream of the tidal influence. The moored system will be anchored to the bottom of the river, mid-channel, in 1 – 4m water depth. The mooring's location in space will be maintained with an upstream fluke anchor, as well as a shore line. A float will be used to keep the system upright, all attempts will be made to keep this float below the surface at the time of deployment. Once each mooring is deployed, river water samples for the determination of geochemical parameters will be collected to calibrate instruments. Mooring recovery will take place in late August or early September, either by water (small boat) or by air (float plane). Ship access to the river mouth may be possible aboard the RV Martin Bergmann, in which case the ship's aluminum skiff will be used to access the river and recover the moorings. Alternatively, the mooring may be recovered by air using a float plane, with the same approach as deployment.

### **Identification of Impacts and Proposed Mitigation Measures**

No negative impact to the environment is anticipated, all moored equipment will be removed at the end of each season. Any trash generated on site (plastic wrap, cardboard etc.) will be taken back to Cambridge Bay and disposed of in the household waste stream, any recyclable materials will be taken south for disposal in appropriate facilities.

### **Cumulative Effects**

N/A

## Impacts

## Identification of Environmental Impacts

Construction																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Operation																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

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