



መጀገጥ ፈቃዣናውንፋይ ክበላጊውን በንግድ ጽሑፍ የጥቅምት ነው #125689

## Characterization and delineation of oil-in-water at the Scott Inlet seeps through robotic autonomous underwater vehicle technology

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New

የመስማሪያ:

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Marine Based Activities

ሰዓት

ርብኩል መረጃ:

4/19/2022 11:08:08 AM

Period of operation:

from 0001-01-01 to 0001-01-01

የፈጸም ሰነድ የሚቀርቡትን ደንብ:

ለመስማሪያ ስራውን:

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Canada

የስልክ ስም:

## ડ્રાઇવર્સ

નોર્થ એસ્ટેરિયોપ્સી અને એન્ફોર્મેશન સાંસ્કૃતિક

વિભાગ: There has been an increase in offshore oil and gas as well as shipping operations in the northern Atlantic and Arctic Oceans. Hence, there is an urgent need to enhance state-of-the-art technologies to strengthen our readiness in case of emergencies. The primary objectives of this multi-year project are to develop and test autonomous underwater technology to enhance marine robotics capability for oil spill response in the ocean. Our focus is on the research questions: What level of artificial intelligence is needed on autonomous underwater vehicles (AUVs) to effectively delineate an oil spill; and how does adaptive sensing and sampling advance oil spill delineation? We plan a period of about 14 days of field trials during August – September 2023. The field trials will be done from a ship. The operating site will be close to the natural oil seeps in Baffin Bay (approximately 50km offshore from Scott Inlet) as shown in Figure 1. The survey class AUV, Memorial Explorer (5.5m) will be deployed and recovered daily from the ship, while an underwater glider (1.5m) will be stationed continuously offshore during the period of the trials. Both vehicles will be equipped with a variety of hydrocarbon sensors selected from a methane sniffer, acoustic scanning sonars and fluorometers. They will be launched from a known position to search and survey the dissolved and undissolved oil in the water column near the source of the natural seep in this region. A water sampling unit installed on Explorer will be triggered by our developed algorithms to collect oil-in-water samples. Our research aims to produce significant improvements in the use of AUVs to respond to a potential accidental oil spill. It will also reveal information on levels of oil concentration below the surface adjacent to Scott Inlet and our understanding of behaviour of crude oil and gas in the ocean will be enhanced. We aim that the impacts on the environment, wildlife, and hunting in the area of operation will be minimal as our AUV field missions will be done primarily in open waters offshore from Scott Inlet. It is possible that the ship might require to shelter in the inlet in periods of adverse weather. We will invite 1-2 additional Ittaq staff and/or Clyde River community members to participate in the field trials and engage in familiarization with our underwater robotics equipment. We will store data generated on Memorial University's computer systems. Memorial is putting in place centralized data management processes in line with Tri-Agency policy. We also plan to meet with the Municipality of Clyde River and the Ittaq Heritage and Research Centre during 2022, at the time of the field trials in 2023 and also in 2024, towards the end of our project, to present and discuss the outcomes from the research.

વિભાગ: Il y a eu une augmentation des activités pétrolières et gazières offshore ainsi que des opérations de transport maritime dans les océans Atlantique Nord et Arctique. Par conséquent, il est urgent d'améliorer les technologies de pointe pour renforcer notre préparation en cas d'urgence. Les principaux objectifs de ce projet pluriannuel sont de développer et de tester une technologie sous-marine autonome pour améliorer la capacité de la robotique marine pour la réponse aux déversements d'hydrocarbures dans l'océan. Nous nous concentrons sur les questions de recherche : quel niveau d'intelligence artificielle est nécessaire sur les véhicules sous-marins autonomes (AUV) pour délimiter efficacement un déversement de pétrole ; et comment la détection et l'échantillonnage adaptatifs font-ils progresser la délimitation des déversements d'hydrocarbures ? Nous prévoyons une période d'environ 14 jours d'essais sur le terrain d'août à septembre 2023. Les essais sur le terrain seront effectués à partir d'un navire. Le site d'exploitation sera proche des suintements de pétrole naturels dans la baie de Baffin (à environ 50 km au large de Scott Inlet), comme illustré à la figure 1. L'AUV de classe d'enquête, Memorial Explorer (5,5 m) sera déployé et récupéré quotidiennement du navire, tandis qu'un planeur sous-marin (1,5 m) sera stationné en permanence au large pendant la période des essais. Les deux véhicules seront équipés d'une variété de capteurs



## **Personnel**

Personnel on site: 10

Days on site: 14

Total Person days: 140

Operations Phase: from 2023-08-15 to 2023-09-16

Closure Phase: from 2024-08-20 to 2024-09-14

## አርብናኩልናኩር

አገልግሎት	የኢትዮጵያውያን አርብናኩልናኩር	የኢትዮጵያውያን አርብናኩልናኩር	የኢትዮጵያውያን አርብናኩልናኩር	የኢትዮጵያውያን አርብናኩልናኩር	የኢትዮጵያውያን አርብናኩልናኩር
Explorer AUV operation area (Depth range 0m- 300m)	Marine Based Activities	Marine	N/A	N/A	The test area is 20 miles offshore and 60 nautical miles of North of Clyde River.

## መዝገብ ደረሰኝነት መዝገብ ቅጽ ስምምነት ሲሆን አይነት ማረጋገጫዎች

መዝገብ	አባሪ	ቤትና ቤት	የመዝገብ ደረሰኝነት
Clyde River	Mr. Jerry Natanine	Municipality of Clyde Rover	2022-03-07
Clyde River	Ms. Shari Fox	Ittaq Heritage and Research Centre	2022-04-11

## ᓇΔਨੋਜਿਕ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ

ਪੰਜਾਬ ਸਰਕਾਰ ਮੁਖ ਵਿਭਾਗ ਦੀ ਪੱਧਰ ਵਿਖੇ।

Transboundary

North Baffin

## ਨੋਜਿਕ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ

ਨੋਜਿਕ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।	ਨੋਜਿਕ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।	ਨੋਜਿਕ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।	ਨੋਜਿਕ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।	ਨੋਜਿਕ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।
ਮਾਨਸਿਕ ਵਿਵਾਹ ਮੁਲਕੀ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।	NPC File # 149723 [Characterization and delineation of oil-in-water at the Scott Inlet seeps through robotic autonomous underwater vehicle technology]The following works and activities have been proposed in the above-noted project proposal:1. Scientific research that will test the use of autonomous underwater vehicle (AUV) technology for betterunderstanding oil plume behavior and improving the efficiency of Canada's oil spill response.2. Location: Qikiqtani Region; [100 KM northwest of Clyde River]	Applied, Decision Pending	2022-04-14	

### Project transportation types

Transportation Type	ਮਾਨਸਿਕ ਵਿਵਾਹ ਮੁਲਕੀ ਅਤੇ ਸਾਡੀ ਦੁਆਰਾ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।	Length of Use
Water		

## **Project accomodation types**

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## ፳፻፲፭ ዓ.ም ቀን

ለፌርማ ፈዴራል የፌርማው ማስተካከል የሚገኘው አይነት ስምምነት የሚያሳይ

ፈዴራል ለፌርማ የፌርማው ማስተካከል የመስቀል	የፊርማው	ፈዴራል ማስተካከል	የፊርማው
Autonomous Underwater Vehicles	2	5.4m, 1.5m	Ocean use and underwater deployment of two autonomous underwater vehicles. 1: Explorer AUV (5.4m long)2: Glider (1.5m long)
Ship	1	22-60m	AUV support vessel

በበኩረም ማስተካከል የሚገኘው የሚያሳይ

የፊርማው የመስቀል	የፊርማው	የፊርማው	የፊርማው	የፊርማው	የፊርማው	የፊርማው
Diesel	fuel	4	7110.5	28442	Liters	Ship is powered by diesel. AUVs are powered by electric batteries.

## ፳፻፲፭ ዓ.ም ቀን

የፊርማው	የፊርማው	የፊርማው
0	All water used will be from the ship.	The ship's water will be replenished from port supply locations and town water as needed.

## 4.6 Cj<sup>c</sup>

### 4.6 Cj<sup>c</sup> - σ-4<sup>c</sup>σ-<sup>b</sup>

አርናፋኑኬዎች	የቤመናርግኩ	የቤመናርግኩ ፊርማ	የቤመናርግኩ ማስረጃ	የቤመናርግኩ በአገልግሎት
Marine Based Activities	ΔLΔ <sup>c</sup> ΔC <sup>b</sup> C <sup>b</sup> L <sup>b</sup> R <sup>c</sup>	Ship operations for two weeks	The work will be done from a ship and will comply with the Arctic Waters Pollution Prevention Act AWPPA.	As above
Marine Based Activities	የኤርጥሪ	10 people for two weeks	The work will be done from a ship and will comply with the Arctic Waters Pollution Prevention Act AWPPA.	As above.

### 4.8 ተደራሽኝነት ፊርማ

Underwater sound from the presence and operation of vessels generated from project operations may result in effects to fish and invertebrates. The sound produced by vessels, AUVs and other equipment during project activities can be carried through the water column and could disturb marine fish and mammals in the vicinity of the proposed project site. The effects may vary given the varying sensitivities of fish and invertebrates, and fish health (including changes to food availability and abundance). Responses include avoidance or attraction by individual fish, as well as possible physiological effects with continuously exposure to noise, which may in turn affect feeding, reproduction, and communication. The short-term, low-frequency sounds from vessel operations may elicit temporary avoidance due to startling effects and potentially longer-term avoidance with higher frequency or continuous emissions. These effects can be transient in nature and reversible once the sound source has been removed or reduced, decreasing the potential for long-term negative effects. Typically, most fish species are expected to avoid underwater sound at levels that are harmful to them. Therefore, physical harm associated with vessel sounds is unlikely, and the magnitude of potential effects is low.

# **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**

We are working with several ship operators and have not yet finalized a choice of vessel.

### **SECTION H2: Disposal At Sea**

Once we have selected the vessel we will be able to confirm the exact disposal plans for the particular vessel. Operations will conform to the Arctic Waters Pollution Prevention Act AWPPA.

### **SECTION I1: Municipal Development**

Location of proposed activities: Baffin Bay

The proposed area of activities is in Baffin bay (minimum of 5 miles from shore).

Location of proposed activities: Existing fish stocks

Potentially migration routes of marine mammals. Existing fish stocks.

Location of proposed activities: Delta of the Mackenzie River

N/A

### **Miscellaneous Project Information**

We are conducting a comprehensive risk analysis of the AUV operations to minimise loss of our AUVs which could lead to equipment being lost on site. No human health risks are expected.

Location of proposed activities: Mackenzie River

The impacts are expected to be minimal consisting of ship operations and operation of our autonomous underwater vehicles. These vehicles will operate low battery powered sonars (Pingers/chirpers) during operation which will be for periods of upto 10hours/day during the period of trials. Ship operations will be done at reduced speeds to reduce ship based noise levels and disturbance to marine life.

### **Cumulative Effects**

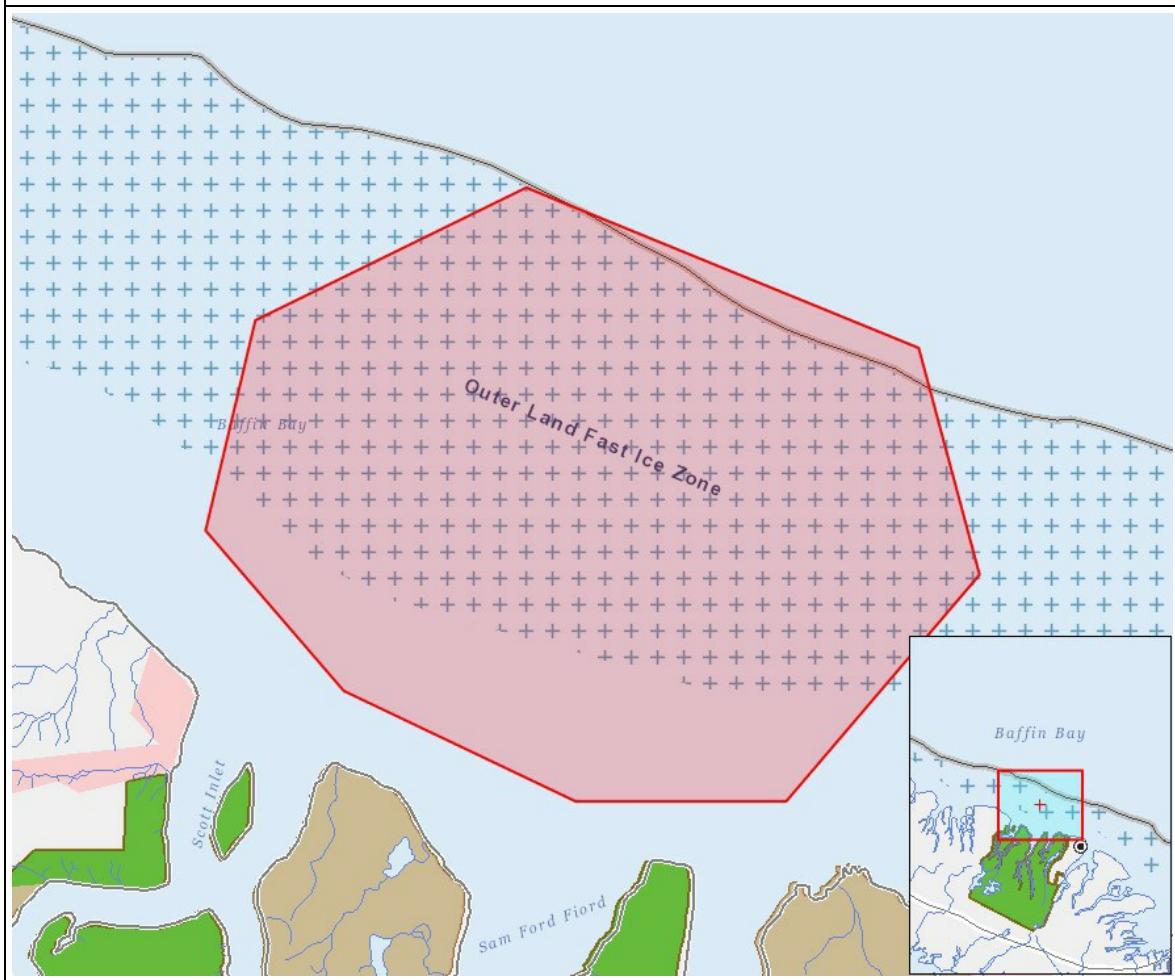
No cumulative effects are expected.

# Impacts

物理影响 水文影响 气候影响 土壤影响 生物影响 社会经济影响

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
<b>物理影响</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>水文影响</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>气候影响</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>土壤影响</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>生物影响</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>社会经济影响</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>考古和文化历史遗址</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>就业</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>社区福祉</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>社区基础设施</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>人类健康</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(P = 物理影响, N = 水文影响, M = 气候影响, U = 土壤影响)



List of Project Geometries

1 polygon      Explorer AUV operation area (Depth range 0m-300m)