

# Project Dashboard

Characterization and delineation of oil-in-water at the Scott Inlet seeps through robotic autonomous underwater vehicle technology (149723)

## Proposal Status: Conformity Determination Issued

- **Overview**
- Documents
- Correspondence
- Questionnaire

### Project Overview

Type of application: **New**

Proponent name:	Neil Bose
Company:	Memorial University

**Schedule:**

Start Date:	2023-08-15
End Date:	2023-09-16
Operation Type:	Annual

**Project Description:**

Increased risks of oil spills associated with the offshore oil and gas as well as shipping operations in the northern Atlantic and Arctic oceans of Canada call for advanced technologies for subsurface data collection. Autonomous underwater vehicle (AUV) technology is proposed in this project to help understand oil plume behavior and improve the efficiency of Canada's oil spill response. High-resolution subsurface data provided by AUVs has proven to be more suitable for searching and delineating patchy oil plumes compared with other traditional survey methods. This project aims to address gaps in current AUV technology by considering the realistic behaviour of oil in water and the time-critical nature of disaster response. The project will develop an innovative underwater data collection strategy for AUVs, based on an adaptive sampling approach. Using this approach, an AUV autonomously modifies its mission in real-time based on features of the plumes detected by on-board sensors, resulting in a path concentrated nearby or within the plume and in information-rich areas identified by the sensors. To date, AUV and oil sensing technologies specific to the characteristics of underwater oil spills are still under development. Only a few experiments were done in real oil spill conditions; most in laboratory and mesoscale experiments or with oil proxies, which significantly limits the ability to understand and capture the complexity found in the field. Hence, another key feature of our project is to test our oil detection methods in real oil-in-water ocean environments through field trials near Baffin Island where oil is naturally present in the water. Our project, in partnership with Canadian AUV operators and manufacturers, will result in a substantial step forward in delineation of subsurface oil plumes using AUVs, providing a significant improvement in Canada's oil spill response and underwater artificial intelligence capacity, as well as enhanced knowledge of marine oil contaminants and monitoring.

**Personnel:**

Persons:	10
Days:	14

### Project Map

List of all project geometries:

ID	Geometry	Location Name
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8660	point	Scott Inlet Oil seep AUV mission (center)
8661	polygon	Scott Inlet Oil seep AUV mission

**Planning Regions:**

Kivalliq

**Affected Areas and Land Types**

Settlement Area

North Baffin Planning Region

**Project Land Use and Authorizations**

**Project Land Use**

Marine-Based Activities

Marine-Based Activities

**Licensing Agencies**

NRI: Scientific Research Licence

**Other Licensing Requirements**

No data found.

**Material Use**

**Equipment**

Type	Quantity	Size	Use
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	67m	MV Polar Prince support vessel (67m long), Ex-CCG ice breaker, Sir Humphrey Gilbert.

**Fuel Use**

Type	Container(s)	Capacity	UOM	Use
Diesel	2	16	Metric Tons	Ship is powered by diesel. AUVs are powered by electric batteries.

**Hazardous Material and Chemical Use**

Type	Container(s)	Capacity	UOM	Use
No records found.				

**Water Consumption**

Daily Amount (m <sup>3</sup> )	Retrieval Method	Retrieval Location
0		

## Waste and Impacts

### Environmental Impacts

Water used and waste will be kept on the vessel.

### Waste Management

Waste Type	Quantity Generated	Treatment Method	Disposal Method
No data found.			