



$\gamma_b \Delta^c \dot{\gamma} \cap \sigma^b \quad \wedge c_n \nabla^{\gamma_b} \gamma_{\sigma} \nabla^{\alpha_b} L^{\alpha}_{\sigma}$

Marine Based Scientific Research: This is a low impact study using a vessel of opportunity. The research group is made up a graduate student Nicole Trenholm, an American Polar Explorer Matt Rutherford and two Canadian pleasure yacht adventurers on the Sailing Vessel Toboggan. The study will occur during the voyage from July 28 to August 26, 2018. The graduate student heads back to University Maryland Baltimore County Geographic Environmental System Program departing at Gjoa Haven, while the rest of the team continues on through the passage. The work involves a 4 day stop at Croker Bay in a 40 foot sailing boat for oceanographic surveys. Alternative fly out locations includes Pond Inlet and Resolute. Location: Qikiqtani Region [Croker Bay and Northwest Passage Transit]In Croker Bay, the graduate student will assess the ocean warming factor in glacial mass ice loss of the Devon Ice Cap. She is collaborating with Dr. Clark Richards at DFO and Dr. Andrew Hamilton of University of Ottawa on the greater contribution of their research assessing Canadian ocean circulation and Devon Ice Cap Cryospheric conditions.Nicole, intends to test additional sea and ice surface observation collection methods to improve satellite models of sea ice concentration of the National Weather Service. This will occur only with appropriate conditions. If her observations are greatly beneficial to improve National Weather Service models then she will apply for permits and contact NIRB and NPC to request local volunteer observations from Nunavut communities as well as her own additional observations on future cruises.She does not have a community outreach component associated with this earlier project phase in 2018 but is open to Nunuvut school and public collaborators in contacting her to consider educational outreach partnerships going forward. nicolet3@umbc.eduThis project is sponsored by the Ocean Research Project 501c3 and the team of the vessel of opportunity, SV Toboggan.

▷ΔΑΠΝΩ<sup>c</sup>: n/a

[illegible]

Inuinnaqtun: n/a

## Personnel

Personnel on site: 4

Days on site: 4

Total Person days: 16

Operations Phase: from 2018-07-28 to 2018-08-26

## ለፍጥነት ማጠቃለያ

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NW Passage, Croker Bay	Marine Based Activities	Marine	N/A	N/A	Pond Inlet, Cjoa Have, and Resolute

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Information is not available			

$\Delta^{\alpha} \Gamma^{\beta} \Lambda^{\gamma} \Sigma^{\delta}$

$a^b r^c \Lambda_{\sigma} \Delta_{\tau} \delta \rho \varphi^{\eta} \chi^{\zeta}$  በበፍጋቦ:

## Transboundary

## Kitikmeot

North Baffin

[illegible][illegible]

## Project transportation types

Transportation Type	Transportation Mode	Length of Use
Water	recreational yacht	

## Project accomodation types

◁ ୨୦୧୬,

◁▷ℒ▷σ◁<sup>96</sup>▷<sup>96</sup>

Λ<sup>9</sup>d<sup>c</sup> d<sup>a</sup>b<sup>r</sup>z<sup>s</sup> b<sup>d</sup><sub>56</sub>cdσd<sup>y</sup>z<sup>s</sup> Δc<sup>s</sup>b<sup>r</sup>dbn<sup>a</sup>r<sup>c</sup> ΔjCΔ<sup>c</sup>, Γ<sup>c</sup>δqPñ<sup>c</sup>, s<sup>b</sup>lCj<sup>s</sup>, μεr<sup>d</sup> dr<sup>a</sup>r<sup>c</sup>δ

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yacht	1	39 feet	cruise, research
Might have backup instrument: USB2000+	1	0.1m	Back up sea surface observations, temperature
RBR Conductivity, temperature and sound speed (CTD) probe	1	0.3	surface and water column data

[illegible][illegible]
$$\Delta L^{\epsilon_b} \quad \triangleleft \triangleright^{\epsilon_b} C \triangleright \triangleleft \dot{L}^{\epsilon_b} \triangleright^{\epsilon_b}$$

$\Delta^c \rightarrow C\bar{L}^{sb} \rightarrow D^{sb}CD_{\sigma}\Delta^{sb}^{sb}$	$^{sb}_{\sigma}^{sb} \Delta\Gamma^{sb}C^{sb}C^{\dagger}_{\sigma}\Delta^{sb}<^c$	$aP^c \Delta\Gamma^{sb}C^{sb}C^{\dagger}_{\sigma}\Delta^{sb}<^c$
1	Carry drinking and washing water needs from Greenland	Greenland

$\triangleleft^b C d^c$ 
$$\Delta^b C d_C \sim \sigma \Delta^a \sigma^a$$
[illegible]
$$4^a 6^b 7^c 8^d 9^e 10^f 11^g 12^h 13^i 14^j 15^k 16^l 17^m 18^n 19^o 20^p 21^q 22^r 23^s 24^t 25^u 26^v 27^w 28^x 29^y 30^z$$

More collaborative research discoveries between Canadian agency and academic researchers with US academic researchers.

# **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

Survey observations regarding the ice and ocean physical and environmental conditions in the NW Passage and Crocker Bay.

## SECTION H2: Disposal At Sea

## SECTION I1: Municipal Development

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## Miscellaneous Project Information

7/12/2018 Additional details request: As the Canadian vessel approaches the Northwest Passage the Canadian Captain will assess the ice conditions to determine if the 2 Americans can be checked into the country in a navigable open port. If conditions do not permit stopping in Pond Inlet then the Canadian Captain will call the proper authorities to provide arrival Passport information and details for checking in the 2 Americans. All aboard are familiar with this process. The 2 Americans are planned to depart from Gjoa Haven and fly back to the US around the 25th of August. If ice conditions do not allow the 2 Americans may depart from a different ice free harbor town such as Resolute or Pond Inlet. The two Canadians will continue on through the Northwest Passage keeping to the Canadian Coast Guard mandatory 24 hour position check in and departure from Canadian waters. The two Canadians continue through the Northwest Passage to International waters and then Alaska.

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## Cumulative Effects



## Impacts

[illegible][illegible]
$$(P = \langle b \rangle \dot{a} \dot{p} \cap \dot{r}^a \dot{q}^b)^c, N = \langle b \rangle \dot{p} \dot{r}^a \dot{r}^b \dot{q}^c \langle \dot{c} \dot{d} \dot{r}^a \dot{r}^b \rangle^c \dot{q}^c \dot{r}^c \dot{q}^c, M = \langle b \rangle \dot{p} \dot{r}^a \dot{r}^b \dot{q}^c \langle \dot{c} \dot{d} \dot{r}^a \dot{r}^b \rangle^c \dot{q}^c \dot{r}^c \dot{q}^c, U = \dot{q} \dot{b} \dot{r}^a \dot{q}^b \dot{r}^c \dot{q}^c)$$

PROJECT MAP



LIST OF PROJECT GEOMETRIES:

1	polyline	NW Passage, Croker Bay
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