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MAP (Multidisciplinary Arctic Program) - Last Ice

[illegible]
$$\Lambda \subset \mathbb{N} \triangleleft \mathbb{N} \hookrightarrow \mathbb{D} \triangleleft \mathbb{L} \triangleleft \mathbb{I}^{\prec}$$

Scientific Research

⁂₆Δ^cḡσ^q₆:

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

b3r^bbA7Dσ49JrE7J^c: from 0001-01-01 to 0001-01-01

Λαμβάνονται ως δεδομένα:

Freshwater Institute, Christine Michel

Freshwater Institute, Christine Michel

Fisheries and Oceans Canada, 501 University Crescent, Winnipeg, MB R3T 2N6,

Phone: 204-984-8726, Email: christine.michel@dfo-mpo.gc.ca

Winnipeg Manitoba R3T 2N6

Canada

ᐃᓴᑦᑕᑦᐃᓴᓴᑦ: 204-984-8726, ᓴᑦᑕᓴᓴᑦ: 204-984-2403

25DLZ^bY^c

$\epsilon_b \Delta^c \dot{\bar{O}}_b \sigma^b \wedge \epsilon_c \Delta^d \epsilon_b \epsilon_d \sigma^b$

The general objective of this project is to better understand the sea ice ecosystem in the northern Canadian Archipelago, in particular the old multiyear ice. Because this old ice is disappearing from the Arctic and changing into thinner annual ice, this has many impacts on the ecosystem. The study will take place on the sea ice off Alert, during the spring of 2018, from end of April to beginning of June. We will use snowmobiles to go a station on the sea ice where ice conditions are safe (see map for tentative location). We will have a temporary shelter tent on the ice; which will be used to process sea ice and water samples. At the station, we will collect sea ice cores and cut them in sections for analysis of the ice conditions. We will also collect water samples using sampling bottles and measure salinity and biological conditions. We will use oceanographic instruments to measure the properties (temperature, salinity) of the water column. We also plan to install instrumentation to measure meteorological conditions, ocean currents, and zooplankton during the spring.. Twice during the study, we will carry out marine mammal surveys using a Twin Otter. The surveys will help identify the use of the sea ice by seals and polar bears. At the end of the spring field season, we will remove all the equipment installed on the ice, including temporary shelter. We plan to return to the station in the fall to deploy the same oceanographic instruments and have measurements until the next spring. We are planning to continue this study over subsequent years, in 2019-2020, to assess year-to-year changes in conditions. The results of this study are needed to better understand the sea ice ecosystem and how it will respond to climate change. This is important since many Arctic marine species depend on the sea ice.

▷ΔΛΠΣ^c: n/a

[illegible]

$\triangleright P \triangleright^c C^c \triangleright \Gamma \triangleright \Delta \triangleright \triangleright^c L \triangleleft \Delta^c \supset \neg \delta \Gamma^b \Delta \triangleleft \neg \cap^c b^c LC.$

Inuinnaqtun: n/a

Personnel

Personnel on site: 6

Days on site: 35

Total Person days: 210

Operations Phase: from 2018-04-21 to 2018-05-28

$$\Lambda \subset \mathbb{N} \subset \mathbb{Z} \subset \mathbb{R} \subset \mathbb{C}$$
[illegible]

$\epsilon \Delta^{\frac{1}{2}} j^c \wedge J^{\circ} e D \dot{N} \nabla^{\circ} r^{\flat} C D r L \dot{\iota}^c$

$a^{\dagger}r^b r^c \sigma^b \Lambda_{\tau} n_4 n^e \delta D \sigma^f b^c c$ $n n f^g r^c$

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[illegible]

$\triangleleft \triangleright \sigma \triangleleft^{\epsilon_b} \triangleright^{\epsilon_b}$

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ᐃᓄᓴᓴᓴ ᐱᓴᓴ ^c ᐃᐃᓴᓴᓴ ᐃᓄᓴᓴᓴ ^b ᓴᓄᓴᓴᓴᓴᓴ	ᓴᓄᓴᓴᓴᓴᓴ ^c	ᐃᓄᓴᓴᓴᓴᓴ - ᓴᓄᓴᓴᓴᓴᓴ ^c	ᓴᓄᓴᓴᓴ ᐃᐃᓴᓴᓴᓴᓴᓴᓴ ^c
snowmobiles	3	regular	regular travel to-from sampling site - Alert
Twin Otter	1	regular	for marine mammal surveys (30 h total)
ice corer	2	9 cm diam	to collect sea ice cores
ice auger	1	8/10 in diam	to auger in the ice and collect water samples
weather haven tent	1	12 x 20	for temporary shelter on ice
generator	1	2.2	to power scientific equipment at station

$\Pi \cap \langle D^{\perp} \rangle = \{0\}$, $D^{\perp} \subseteq C$, $C \subseteq D^{\perp}$, $D^{\perp} = C$.

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Propane	fuel	1	20	20	Lbs	for stove/heat in temporary shelter
Diesel	fuel	1	45	45	Gallons	for heat for temporary shelter
Gasoline	fuel	1	5	5	Gallons	for generator and snowmobiles

ΔL^{5b} ΔD^{5b} CD^{5b} ΔL^{5b} ΔD^{5b}

[illegible] $\triangleleft^b C d^c$
$$\Delta^b C d_c n_\sigma \Delta^q \sigma^q b$$

ለፍጥነት ምርመራ የሚያስፈልጉትን ምርመራዎች ይጥቅሙ	የፍጥነት ምርመራው ውጤት	የፍጥነት ምርመራው ውጤት	የፍጥነት ምርመራው ውጤት	የፍጥነት ምርመራው ውጤት
Researching	ፍጥነት ምርመራው ምንም ዓይነት ፍጥነት ምርመራ አያሳይም	negligible	combustible waste will be brought back and disposed of at Alert station	standard procedure at Alert station
Researching	ፍጥነት ምርመራው ምንም ዓይነት ፍጥነት ምርመራ አያሳይም	negligible	grey water will be brought back and disposed of at Alert station	standard disposal procedure at Alert station

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 11: Municipal Development

[illegible]

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[illegible][illegible]

Cumulative Effects

Impacts

$\Delta^{\text{fb}} \text{CD} \sigma^{\text{fb}} \Gamma^{\text{C}} \quad \Delta^{\text{C}} \text{N} \Gamma \text{D} \text{C} \dot{\sigma}^{\text{C}} \text{D}^{\text{C}} \quad \Delta^{\text{b}} \text{D}^{\text{fb}} \text{CD} \text{r} \text{L} \text{r}^{\text{C}}$

Σ α σ ^{5b}																									
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Π β γ ^b C ^γ σ ^{5b}																									
Sampling sites		-	-	-	-	-	-	-	-	-	-	-	N		-	-	-	-	-		-	-	-	-	-
Δ γ ^c Π α σ ^{5b}																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

$$(P = \mathbb{A}^1_{\mathbb{B}} \times \mathbb{P}^1 \cap \mathcal{L}^a_{\mathbb{B}} \mathcal{L}^b_{\mathbb{B}})^c, N = \mathbb{A}^1_{\mathbb{B}} \times \mathbb{P}^1 \cap (\mathcal{D}^a_{\mathbb{B}} \mathcal{L}^b_{\mathbb{B}})^c \subset (\mathcal{L}^a_{\mathbb{B}} \mathbb{P}^1 \times \mathbb{P}^1 \cap \mathcal{L}^b_{\mathbb{B}} \mathcal{L}^c_{\mathbb{B}})^c, M = \mathbb{A}^1_{\mathbb{B}} \times \mathbb{P}^1 \cap (\mathcal{D}^a_{\mathbb{B}} \mathcal{L}^b_{\mathbb{B}})^c \subset (\mathcal{L}^a_{\mathbb{B}} \mathbb{P}^1 \times \mathbb{P}^1 \cap \mathcal{L}^b_{\mathbb{B}} \mathcal{L}^c_{\mathbb{B}})^c, U = \mathbb{B} \times \mathbb{L}^a_{\mathbb{B}} \mathcal{L}^b_{\mathbb{B}} \mathcal{L}^c_{\mathbb{B}})$$