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Climate - terrestrial biodiversity investigation in tundra vegetation along an Arctic longitudinal gradient

ᐅᑲ ᓯᕐᑲ ᐃᑦᐅᓴᓴᑲ ᕐᑲᓄᐱᑦᐅᓂᕐᒪ: New

$\Lambda \subset \mathbb{N} \triangleleft \mathbb{N}$

Scientific Research

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ᐅᑦᓂᕈᖅ ᐃᑦᓂᕈᖅᐅᑦᓂᕈᖅ: 1/24/2018 6:54:55 PM

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

ᠪᠠᠵᠤᠨᠪ᠋ᠠᠳᠤᠭᠣᠰᠡᠢᠬᠡ: from 0001-01-01 to 0001-01-01

Λεπτομέρεια:

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כ"ה ל"ז ב' כ"ה

ፍጹም ልዩ ጋራ ለፍጹም ልዩ ፍጹም ልዩ ፍጹም ልዩ

We would like to conduct a biodiversity study next summer near Cambridge Bay (from the end of August to middle of September, with about two people). Our main objective is to clarify plant biodiversity and microorganism biodiversity living in the tundra ecosystem. In addition, we also would like to clarify relationships between plant biodiversity, diversity of soil microorganisms and environmental factors such as carbon dioxide flux from soil surface, soil carbon and nitrogen content. As for investigation of the plant and soil biodiversity in a small specific area, we plan to use non-destructive and non-disruptive methods. The vegetation survey will be undertaken for 50-70 quadrants ($1\text{m}(=39.4\text{inches}) \times 1\text{m}(=39.4\text{inches})$). A small (about 20 cm or 8 inches by 20 cm or 8 inches sample size) amount of vegetation will be cropped in each quadrat to quantify the living plants per area. As for the investigation of soil microorganisms, we plan to collect small amount of soil sample using a metal cylinder (5 cm or 2 inches in diameter by 5 cm or 2 inches in depth) from the plant cropped area, in addition, we plan to collect about two spoonfuls soil using a clean plastic spoon and putting into a clean plastic tube in each quadrat (The volume is about 2 -3 ml per quadrat). A non-destructive and non-disruptive equipment will be used to measure the carbon dioxide fluxes from the soil surface. We will place a plastic chamber (20 cm or 8 inches in diameter and 15 cm or 6 inches in height) with a carbon dioxide sensor on a soil surface for ten or so minutes to determine carbon dioxide flux from soil surface. As a result, we would like to clarify how many plant and soil microorganisms are living in the area and to clarify relationships between plant species, plant biomass (the total quantity (= weight) of plants in a particular area), the carbon dioxide fluxes from the soil surface and diversity of soil microorganisms. We are setting the research points along a north to south latitudinal gradient in the eastern Canadian Arctic (which include Salluit (62°N) and Kuujuarapik (55°N)). Pond Inlet (72°N) will be additional research place next summer. Cambridge Bay is the most suitable place along a west to east longitudinal gradient investigation, because of its geographical location and scientific logistical support. Our Canadian collaborator Dr. Johann Wagner of Polar Knowledge Canada has worked in this region and has maintained a good relationship with the community of Cambridge Bay. We have been discussing with him our intention of a very low impact on the soil and vegetation. We would like to report to the community and other Nunavut organizations about our scientific surveys and findings by e-mail after the expedition. In addition, if we have a chance, we would like to visit Cambridge Bay in 2019 and be available to the community to share our findings.

▷ΔΛΠΩ^c: N/A

 $\Delta \mathcal{L}^b \cap \mathcal{D}^c$: N/A

Inuinnaqtun: Havagiyumayavut uumayuvaluit aalatqikni naunaiyaqni auyanguqmikpan. Tapkuanut naunaiyainiq

nauhimayunik nunalu uumayuvaluit aalatqikni mikiyuni taihimayut inaitni, parnaktugut atuqni huguqtigilaittut ulapihautaungittutlu pityuhit. Tamna nauhimayut naunaiyaqni havagiyauniaq tapkununga 50-70 h akltilanga (1m hitamauyaqni 1m). Tamna mikiyuq (mikhaani 20 cm tamnaluniit 8 insit tamnalu 20 cm tamnaluniit 8 insit naunaiyagaq aktilanga) aktilaq nauhimayut amuqhagauniat atuni aktilangani quadrat naunaiyaqnuumayut nauhimayut atuni inaini. Taphumunga naunaiyaqniqmun nunami mikkataannuit uumayuvaluit, parnaktavut katitigini mikait aktilat nunat naunaiyagakhat atuqhugit haviit kaivyagiktut (5 cm tamnaluniit 2 insit kaivyagiknia tamnalu 5 cm tamnaluniit 2 insit ilutunia) talvanga nauhimayuq aviktaunia inaa, ilagiplugulu, parnaktavut katitigini tapkuninga malguknik alluut tatamayuq nuna atuqhugu halumayuq haviungittuq alluut iliuqaqhugulu halumayumun haviungittuq napayuq atuniqlugit hitamauyaqni (Tamna aktilanga mikhaanittuq 2 -3 ml per quadrat). Ahiguqtillaittuq ulapihalaittuqlu hanalgut atuqtauniaq uuktugaqninut tapkuat carbon dioxide katittaqnit nunap qanganit. Iliniaqtavut haviungittuq puugiya (20 cm tamnaluniit 8 insit kaivyagiknianik tamnalu 15 cm tamnaluniit 6 insit puqtunia) piqaqhunilu carbon dioxide naunaiqtutai nunap qangani tapkununga qullit avataaniluniit minitsit naunaiqninut carbon dioxide katittaqnit nunap qanganit. Parnaktavut malguk pingahutluniit naunaiyaiyt pulaqniat talvunga Kanatamiuni Quttiktuq Ukiurtartuq Naunaiyaivik (CHARS) havaginiaqtailu ublukkut aularniq maniqami naunaiyainiq mikhaanut atauhiq havaguhiqmik. Atuqniagavut akhaluut tamnaluniit haantaq maniqamungauyami.

Personnel

Personnel on site: 3

Days on site: 7

Total Person days: 21

Operations Phase: from 2018-09-09 to 2018-09-16

ለሥራ ለሚደረግ የፍጥነት ምርመራ

ለሥራ ለሚደረግ የፍጥነት ምርመራ

ጽሑፍ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ
Biodiversity investigation for vegetation and soil microorganisms	Scientific/International Polar Year Research	Municipal	Unknown	Unknown	Cambridge Bay

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የፍጥነት ምርመራ	ሰነድ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ
የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	Dr. Johann Wagner	Polar Knowledge Canada	2018-01-04

ለሥራ ለሚደረግ የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ

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Kitikmeot

ለሥራ ለሚደረግ የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ

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የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	2018-02-15	Active		
የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	2018-02-15	Active		

Project transportation types

Transportation Type	የፍጥነት ምርመራ	የፍጥነት ምርመራ ለሥራ ለሚደረግ የፍጥነት ምርመራ	Length of Use
Water	0	By a boat	
Land	0	By a car and/or an ATV	

Project accomodation types

የፍጥነት ምርመራ

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በበፍጥረቱ ሂደት ውስጥ ለሚከሰቱ ለውጦች ምሳሌዎችን ለመግለጽ ለሚያስፈልግ የሚችሉ የሚከተሉትን ምሳሌዎች እንጥቅም፡

ΔL⁹⁶ ΔD⁹⁶ CD⁹⁶ ΔL⁹⁶ ΔD⁹⁶

 $\mathbb{Q}^b C d^c$
$$\Delta^b C d \subseteq \mu \sigma \Delta^a \sigma^a$$

$\Delta^{\circ} \text{G}_{\text{f}}^{\circ}(\text{C}_6\text{H}_6) = -123.4 \text{ kJ mol}^{-1}$

As for investigation of the plant and soil biodiversity in a small specific area, we plan to use non-destructive and non-disruptive methods. The vegetation survey will be undertaken for 50-70 quadrants (1 square meter (39 square inches)). A small (about 20cm (=8 inches) by 20cm (=8inches) sample size) amount of vegetation will be

cropped in each quadrat to quantify the living plants per area. As for the investigation of soil microorganisms, we plan to collect small amount of soil sample using a metal cylinder (5cm(= 2inches) in diameter by 5 cm(=2inches) in depth) from the plant cropped area, in addition, we plan to collect about two spoonfuls soil using a clean plastic spoon and putting into a clean plastic tube in each quadrat (The volume is about 2 -3 ml per quadrat). A non-destructive and non-disruptive equipment will be used to measure the carbon dioxide fluxes from the soil surface. We will place a plastic chamber (20 cm(=8inches) in diameter and 15 cm(=6 inches) in height) with a carbon dioxide sensor on a soil surface for ten or so minutes to determine carbon dioxide flux from soil surface. We will recover original condition after sampling as much as possible.

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

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The research will take place in the Greiner Lake watershed, north of Cambridge Bay. The physical environment consists tundra, lakes and streams. Our research will have little to no impact on the physical environment.

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The land areas where the research will take place have a tundra vegetation dominated by purple saxifrage, mountain avens and sedges in the drier sites, and sedges, grasses and willows in moister areas and wetlands. Common wildlife species here are muskoxen, arctic hare and arctic foxes, as well as many nesting birds. Freshwater vertebrate species are represented by arctic char, lake trout, least ciscoes and sticklebacks. Our project will have little to no impact on the biological environment.

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The site of our project is around the hamlet of Cambridge Bay in the Kitikmeot region of Nunavut. The bedrock in this area consists of Cambrian limestone. There are no archaeological or culturally significant sites nearby. The nearby areas are used by locals from Cambridge Bay for subsistence harvesting and fishing, although the precise locations of the river stations are rarely accessed. Our project will not have any negative impacts on the socioeconomic environment.

[illegible]

Our project won't have any negative impacts on the physical, biological or socioeconomic environment. It will have however a positive impact on the employment opportunities in Cambridge Bay, by guides and summer students hired by our partners Polar Knowledge Canada. The project will also have a positive impact on the general advancement of knowledge of the area, which is beneficial both for Cambridge Bay and Nunavut.

Cumulative Effects

Since our sampling will conduct once per one plot, I think that there will be no cumulative effects.

Impacts

$\Delta^{\frac{5}{6}}CD\sigma^{\frac{7}{8}}r^C$ $d^n n r d C \dot{\sigma}^C D^C$ $d^b D^{\frac{5}{6}}CD r L \dot{r}^C$

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Scientific/International Polar Year Research		N	N	N	-	N	N	N	N	N	U	U	U		N	N	N	N	N		N	-	-	-	-
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