

D⁹b_cD⁹c: +41 76 723 55 46, 7b⁹d⁹c:

$\epsilon_b \Delta^c \dot{\gamma} \Pi \sigma^b \quad \Lambda c_n \nabla^{\epsilon_b} \sigma \nabla n \nabla^{\epsilon_b} L^a \sigma^b$

ᐅᓂᕈᑦ: Rapid assessment of tundra plant diversity using small bits of genetic code found in the soil.
Lead researcher: Jakob J. Assmann, University of Zurich, Switzerland. Climate change and industrial activity are changing the Arctic tundra. Since tundra plants are small and hard to identify, it is often difficult to know which different kinds are found in an area of tundra. Not knowing which plants are present makes it difficult to support nature conservation efforts and measure changes in plants over time. The main objective of our study is to test a new protocol that could make finding the different kinds of plants in the tundra a lot easier. The protocol uses small fragments of the plants' genetic code found in soil that can tell us which plants are found close by. To test the protocol, we will collect soil samples from three 300 m x 300 m tundra locations around Cambridge Bay and extract the plants' genetic code in the laboratory of the Canadian High Arctic Research Station. We will also survey the plants by eye and use drones to create maps of each location. The plant surveys will help us test the quality of the protocol and the maps will show us how the samples fit into the landscape. The collected soil also holds information about nutrients and which microbes are present. In addition to testing the protocol, we will examine how soil nutrients and microbes influence the kinds of plant that can be found in an area of tundra. We plan to complete the field research between July 1st and August 12th, 2023. The scientific analysis and evaluation of the protocol will be carried out at the University of Zurich in Switzerland. We aim to conclude the project by summer 2024. All data and results will be made available to everyone through an online database and in a scientific publication. In addition, we will share all data and observations of interest to community members, local authorities, and researchers at Polar Knowledge Canada in advance. We will give a public talk to introduce the project during Polar Knowledge Canada's "Speaker Series" in Cambridge Bay this summer and hope to return later in 2023/24 to share the findings. To make it easier to engage with our research, we will introduce our team on the appropriate Facebook groups prior to arrival in Cambridge Bay. We are also coordinating with Polar Knowledge Canada to plan a potential workshop for a school holiday club if this is of interest to the community. The impact on the environment, wildlife, and people will be small. We will collect only small amounts of soil (estimated 162 samples of 50 ml each) and around five leaves for about 150 plants to create a library of the local plant's genetic code. We will prioritize respect for the community when we fly drones. As such, we will not fly within 150 m of people, camps, and houses. We will obtain all required permits.

▷ΔΛΠD^c: Not applicable

[illegible]

Inuinnaqtun: Qilamik ilituqhainiq maniqami nautianik aalatqiinik atuqlugit mikiyut iliturijutaayut nahautit naniyaayut nunainaqmi. Ilituqhaiyiluq: Jakob J. Assmann, University of Zurich, Switzerland. Hilap aalaguqniga havakviuyunilu hulijutit aalaguqpaliajutiyut Ukiuqtaqtumi maniqamik. Manirainaqmi nautiat mikigaluaqtilugit naunaqhutiklu hunauniginik, ayuqnaqataqtuq qauyimayaagani kitut aalatqiit naniyauniginik maniqami. Qauyimaginiganik kitut nautiaq talvaniiniginik ayuqnaqhitiyuq ikayuqturiagani hilami ilipkamajutininik akhuurutinik nalunairutiniklu aalaguqniginik nautiat hivunikhami. Pijutauluaqtuq ilituqhautiptikni nalunaiyariagani nutaamik havauhikhamik nanihijutaayunik aalatqiinik nautianik maniqami ayuqnaitqiyauliriagani. Havauhiq atuqtuq mikiyunik ilanuaginik nautiat hunauniginik nalunairutinik nunainaqmi ilituripkalaaniginik kitut nautiat naniyauniginik qanitumi maniqami. Ilituqhariagani havauhiq, katitiriniaqtugut nunainaqmik nau-naiyagakhanik pigahunit 3-hanat miitamit 3-hanat miitamut maniqami inigiyaayuni haniani lqaluktuutiap piyaaganilu nau-tiat hunaqaqniginik naunaiyautimik ilituqhaivikmi Kanatamiut Qutiktumik Ilituqhaiyinit Havakviani. Nalunaiyaqniaqtavulu nautiaq takulugit atuqlugilu tikmijutinuut inuitut nunaiyiuriami humiiniginik. Nautianik naunaiyautit ikayuqniaqmatigut ilituqhariagani aulaniqatiaqnigan havauhiyup nunaayalu takuupkainiaqmat qanuq ilituqhaqtauyut ilauniginik manirainaqmi. Katitiqtauhimayut nunainait hivuniqhijutikhaqqtut kitunik nauvaalirutininik kitulu uumayunuit talvaniiniginik. Ilagiarut ilituqhaqniganik havauhiq, naunaiyainiaqtugut qanuq nunainaqmi nauvaalirugit uumayunuilu qanurililurutiqaqmaga qanuritunik nautianik naniyaulaaqtunik ilagani manirainaup. Upalugaiqtugut iniqtiriagani maniqami ilituqhainiqmik akungani Taaqhivaliavia1-mit Niqiliqivik 12-mut 2023-mi. Naunaiyautini ilituqhautit nalunaiyaqniganiklu havauhiq havaariyauniaqut Ilihaqpaaliqviki Zurich-mi Switzerland-mi. Iniqtirumayaqut havaa auyami 2024-mi. Tamaita naunaipkutit qanurilijutulu qahakhiniaqtut tamainit qaritauyakut naunaipkutinit naunaiyautiniklu takuupkaijutimit. Ilagiarutaayuq, atuqtiniaqtavut tamaita naunaiyautit takuyavulu ihumagiyait nunagiyaayuni ilaayut, ataniqtuiyut, ilituqhaiyulu Ukiuqtaqtumi Qauyimayaayunik Kanatami hivuagut. Inuknut uqaqniaqtugut qauyipkaqtitiyaaptikni havaamik atuqtilugu Ukiuqtaqtumi Qauyimayaayunik Kanatami "Uqaqtit Ilagiyainiitut" lqaluktuutiami talvani auyami utirumayugulu nuguliqaat 2023-mit 2024-mut ukiuq uqariami naluhuiqtaptiknik. Ayuqnaitqiyauliriagani upitaaptikni ilituqhautiptikni, uqaqniaqtavut ikayuqtigiyavut ihauqtumi Facebook-mi ilaayuni tikitinata lqaluktuutiamut. Ihuaqhaiqatiriikniaqtavulu Ukiuqtaqtumi Qauyimayaayunik Kanatami upalugaiyariagani ayuiqhavikhamik ilihavikmit iliharuiqhimalaktulugit ilaayut ihumagiyaukpat una nunagiyaayumit. Aktuqniga avatauyumik, uumayunik, inukniklu mikiniaqtuq. Katitiriniaqtugut mikiyunik nunainaqnik (nalautagaayumi 162-nik ilituqhagakhanik 50-milaliitanik atuni) talimaniklu nauninuaginik 150 nautiat hatqiqhiyaaptikni ilipqamayakhanik nunami nautiat qanurinigini naunairutini. Atuqaarumayaqtiknik piniaqugut nunagiyaayuni tikmipkaigupta tikmianuanik inuqagitunik. Taimainigani, tikmilimagitugut iluani 150-miitamik inuknit, maniqamiuviknik, iglunuklu. Pinaqtugut tamainik aturiaqaqtunik piyunautinik.

Operations Phase: from 2023-07-01 to 2023-08-12

$\Lambda \subset \mathbb{N} \triangleleft \mathbb{N} \hookrightarrow \mathbb{D} \sigma \triangleleft^{\mathfrak{f}_b} \mathbb{D}^c$

Inuktitut	Eskimo-Aleut Languages	Crown Land	Recently established research station run by Polar Knowledge Canada.	Not applicable.	The research station is in the community of Cambridge Bay.
Canadian High Arctic Research Station - Laboratory and Lodging.	Scientific/International Polar Year Research	Crown	Recently established research station run by Polar Knowledge Canada.	Not applicable.	The research station is in the community of Cambridge Bay.
Target area for the establishment of three temporary research sites (each 300 m x 300 m) in summer 2023.	Scientific/International Polar Year Research	Crown	The target area for the establishment of the three research sites (300 m x 300 m each), contains different areas with various histories, ranging from currently settled areas to open tundra.	The area contains various sites of archaeological / paleontological value. We will coordinate closely with our collaborators in the team at the Canadian High Arctic Research Station, to ensure that our choice of site locations will not interfere with these.	The area of interest contains parts of the community of Cambridge Bay and the Ovayok Territorial Park. We will coordinate closely with the team at CHARS and all relevant organisations to ensure that our research will cause as little impact on the cultural and natural environment as possible. (See also environmental impacts section). Note: The area contains a mixture of land ownership types, including Inuit owned land.

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ᐱᓐᓂᓐᓂᓐᓂᓐᓂᓐ	Tannis Bolt	Kitikmeot Inuit Association	2023-01-31

Δᑭᑭᑭᑭᑭᑭ	David Hik	Polar Knowledge Canada	2022-10-11
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$\epsilon \Delta^{\alpha} j^{\beta} \wedge J^{\alpha} e^{\beta} \dot{N} \quad \nabla^{\alpha} r^{\beta} C D F L \downarrow^C$

$a^b r^c \sigma^d \wedge c^e d^f \delta^g \sigma^h \gamma^i \gamma^j$ $\partial \partial \gamma^k \gamma^l$:

Kitikmeot

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

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Project transportation types

Transportation Type	ᐃᓇᐱᓐ ᐃᑲᐱᐅᓂᐱᓐᐸ	Length of Use
Land	We will walk or use ATVs for transport between our accommodation in Cambridge Bay and the three field research sites. We will mainly operate the ATVs on roads and ATV tracks. We will avoid going off road as much as possible. Where possible the ATVs will be parked next to the track and the remaining distance from the ATV track to the study sites will be completed by foot. Transport across the field research sites will be by foot only.	

Project accomodation types

◁ ୨୫୬,

						used for transport between field sites and the Canadian High Arctic Research Station in Cambridge Bay. All fuel will be purchased at fuel stations in town. No fuel will be stashed at the field sites. We will only bring the amount of fuel fitting into the tanks of the ATVs. The figure provided is an estimate of fuel consumption based on an average travel distance of 20 km for 15 days of field work, using two ATV vehicles and an estimated fuel consumption rate of 13.5 L per 100 km.
Reagents for DNA extractions (flammable / harmful to environment)	hazardous	1	1	1	Liters	We require a small amount of hazardous substances to extract the genetic code ("DNA") from soil and plant tissue. The extractions will be done in the laboratory at the Canadian High Arctic Research Station in Cambridge Bay. We will use commercial extraction kits. These kits contain a combined amount of 0.7 L of hazardous

						substances classified as "flammable / harmful to environment": 350 ml ethanol solution; and 350 ml solution containing ethanol, isopropanol, and guanidine hydrochloride.
Reagents for DNA extractions (corrosive)	hazardous	1	1	1	Liters	We require a small amount of hazardous substances to extract the genetic code ("DNA") from soil and plant tissue. The extractions will be done in the laboratory at the Canadian High Arctic Research Station in Cambridge Bay. We will use commercial extraction kits. These kits contain a combined amount of 0.47 L of hazardous substances classified as "corrosive": 120 ml solution containing aluminum chloride hexahydrate; and 350 ml solution containing guanidine thiocyanate.

ΔL⁹⁶ ΔD⁹⁶CDΔL⁹⁶Δ⁹⁶

Δ ^c Δ CL ⁹⁶ ΔD ⁹⁶ CDΔ ⁹⁶ Δ ⁹⁶	96Δ ⁹⁶ ΔΓ ⁹⁶ C96C96σΔ ⁹⁶ <C	ΔP ^c ΔΓ ⁹⁶ C96C96σΔ ⁹⁶ <C
0		

$\triangleleft^b C d^c$
$$\Delta^b C d_{\sigma} \sim \Delta^{\epsilon} \sigma^{\epsilon b}$$
[illegible]

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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Miscellaneous Project Information

உடையவர்களுக்கும் அவர்களுக்கும் இடையிலான உறவுகளைப் பற்றிப் படிப்பதற்காக இவ்வாறு அமைக்கப்பட்டுள்ளது.

Cumulative Effects

Impacts

[illegible][illegible][illegible]

1 polygon	Target area for the establishment of three temporary research sites (each 300 m x 300 m) in summer 2023.
2 polygon	Canadian High Arctic Research Station - Laboratory and Lodging.

