



NIRB Uuktuutinga Ihivriughikhamut #125492

The effect of warming on aquatic invertebrates in the Kitikmeot

Uuktuutinga Qanurittuq: New

Havaap Qanurittunia: Scientific Research

Uuktuutinga Ublua: 11/19/2019 3:58:55 PM

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

Piumayaat Angirutinga: from 0001-01-01 to 0001-01-01

Havauhikhaq Ikayuuqtinga: Michelle Tseng
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QANURITTUT

Tukihinnaqtunik havaariyaumayumik uqauhiyun

- Qablunaatitut:** Who: Michelle Tseng, Aquatic and Insect Ecologist, University of British Columbia What: Researchers are currently studying the health of lakes, ponds, streams, and rivers in the Kitikmeot Region. This ongoing project is a collaboration between several universities, the Ministry of Environment (Government of Canada), and POLAR Knowledge Canada. I am joining this group of researchers to study in particular, whether increased water temperature in lakes and ponds is changing the health of small aquatic animals called zooplankton. In summer 2020, I propose to take 100 live zooplankton from each of 10 lakes. This amount is less than 0.01% of a typical lake zooplankton population. I will employ one local guide through the Ekaluktutiak Hunters and Trappers Association, and one local high school student. We will travel to these lakes by truck or ATV. At the Canadian High Arctic Research Station (CHARS), I (and the guide or student if they are interested), will measure the respiration rate (breathing rate) of live individual zooplankton held at different temperatures. I am testing the idea that zooplankton collected from warmer lakes will be able to maintain normal breathing rates at warmer temperatures, compared to zooplankton collected from cooler lakes. Why: Zooplankton are important components of healthy aquatic environments. They filter water and they are food for larger insects and for fish such as lake trout and Arctic char. Without zooplankton, lakes would become cloudy with algae, and fish would become malnourished or unable to survive at all. This study will give us information about how tolerant zooplankton are to warmer water temperatures, and also how quickly they may be able to adapt to changing temperatures. This study is part of a three-year study that will also investigate (a) whether zooplankton collected at different times of the year show different responses to warmer temperatures, and (b) whether differences in the ability of zooplankton to withstand warmer temperatures are due their environment, or to specific genes. Together this information will allow us to make more accurate predictions for whether important fish like trout and char will still have enough high-quality food to grow and thrive as climate change continues. Where: I propose to sample zooplankton from a subset of the lakes being currently being studied by the lake research group. All sites will be within a three-hour ATV or truck ride from CHARS. We will depart from CHARS in the morning and return by late afternoon each day. When: I plan to consult with the community from June 23 to June 30, 2020. Pending positive feedback from the community, we will sample lakes from July 1 to July 7, 2020. If the community would like me to change my proposed research, I will postpone lake sampling until the suggested changes have been integrated.
- Uiviititut:** In our instruction letter we were asked to provide the Non-technical Project Summary in English and Inuinnaqtun
- Inuktitut:** In our instruction letter we were asked to provide the Non-technical Project Summary in English and Inuinnaqtun
- Inuinnaqtun:** Please see the attached document.

Personnel

Personnel on site: 3

Days on site: 7

Total Person days: 21

Operations Phase: from 2020-06-14 to 2020-06-28

Hulilukaarutit

Inigiya	Hulilukaarut Qanurittuq	Nunannga Qanurittaakhaanik	Initurlinga qanuritpa	Initurlinga utuqqarnitat unaluuniit Ingilraaqnitat Uyarannguqtut akhuurninnga	Qanitqiyauyuq qanitqiamut nunallaat kitulluuniit ahiruqtaliyainnit nuna
Tseng (UBC) Kitikmeot aquatic invertebrate health	Sampling sites	Municipal	We propose to study the zooplankton within a subset of the lakes currently being investigated by Prof. Milla Rautio and colleagues. The plants and animals living in these lakes, and the environmental features (temperature, dissolved oxygen, pH, etc) have been documented by Dr. Rautio's group. Pending the outcome of community consultation, we are proposing to conduct assays on live zooplankton from a subset of these lakes.	N/A	Within 2-3 hr ATV ride of the Canadian High Arctic Research Station

Nunaliin Ilauyun, Aviktuqhimayuniitunullu Ikayuuhiarunguyun

Nunauyuq	Atia	Timiuyuq	Upluani Uqaqatigiyaungmata
Ikaluktutiak	Beverly Makasagak	Ekaluktutiak Hunters and Trappers Association	2019-08-20

Angiuttauvaktunik

Naunaiqlugu nunanga talvani havauhikhaq ittuq:

Kitikmeot

Angiuttauvaktunik

Munariniqmut Ayuittiaqtuq	Angirutinga Qanurittuq	Tadja Qanurittaakhaanik	Ublua Tuniyauyuq/Uuktuqtuq	Umikvikhaa Ublua
Nunavunmi Ihivriuqniqmut Timiqutigiyanga	We will apply for a research license from the Nunavut Research Institute	Not Yet Applied		

Project transportation types

Transportation Type	Qanuq Atuqtauniarmangaa	Length of Use
Water	We will sample lakes and ponds using either a) an inflatable zodiac powered by a 2.5 h.p. outboard motor, or b) a manually-powered inflatable kayak	
Land	We will travel by truck or ATV	

Project accomodation types

Nunauyuq

Ihuaqutivaluin Atuqtauyukhan

Hanalrutit atuqtaunahuat (ukuallu ikuutat, pampiutainnik, tingmitinik, akhaluutinik, hunaluuniit)

Hanalrutit Qanurittuq	Qaffiuyut	Aktikkulaanga – Qanurittullu	Qanuq Atuqtauniarmangaa
ATV or Truck	2	regular	To travel to lakes within a 3 hour drive of Cambridge Bay
Zodiac or inflatable kayak	1	6 ft	To sample zooplankton from lakes

Qanurittuq Urhuqyuaq unalu Qayangnaqtut Hunavaluit Aturninnga

Qanurittuq urhuqyuaq hunavaluit aturninnga:	Urhuqyuaq Qanurittuq	Qaffiuyut qattaryut	Qattaryuk Aktikkulaanga	Atauttimut Qaffiuyut	Ilanga	Qanuq Atuqtauniarmangaa
Gasoline	fuel	2	20	40	Liters	For the ATV and 2.5 hp outboard motor (if not provided by CHARS)

Imaqmik Aturninnga

Ubluq qanuraaluk (m3)	Aturumayain imavaluin utiqittagaani qanuq	Atulirumayain imavaluin utiqittagani humi
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Iqqakuq

Ikkakunik Munakgiyauyunik

Havauhikhaq Hulilukaarut	Qanurittuq Iqqakut	Ihumagiyauyuq Qanuraaluktut Atuqtait	Qanuq Iqqakuurniarmangaa	Halummaqtirarnirutikhan piyutin
Researching	Qirnarivyaktuq imaq	25L/day	Canadian High Arctic Research Station showers	n/a
Researching	Anaagun (inuin anaaguin)	1L/day	Canadian High Arctic Research Station toilets	n/a

Avatiliriniqmut Ayurhaulingit:

We anticipate that the collection of 100 zooplankton per lake will not result in any damage (temporary or permanent) to any of the sites. We will attempt to collect zooplankton from the shore. When that is not possible, our first option will be to use our inflatable kayak. If it is too windy for the inflatable kayak we will use the zodiac and 2.5 hp outboard motor. We will thoroughly rinse any water device we use with clean water.

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 I1: Municipal Development

Qanurittuq Ittunik Avatinga: Avatingalluanga

Qanurittuq Ittunik Avatinga: Inuuhimayunut Avatinga

Qanurittuq Ittunik Avatinga: Inungit-maniliurutingit Avatinga

Miscellaneous Project Information

Naunaiyainiq ukuninnga Ayurhautingit unalu Piumayaat Ikikliyuumiutinahuarutit

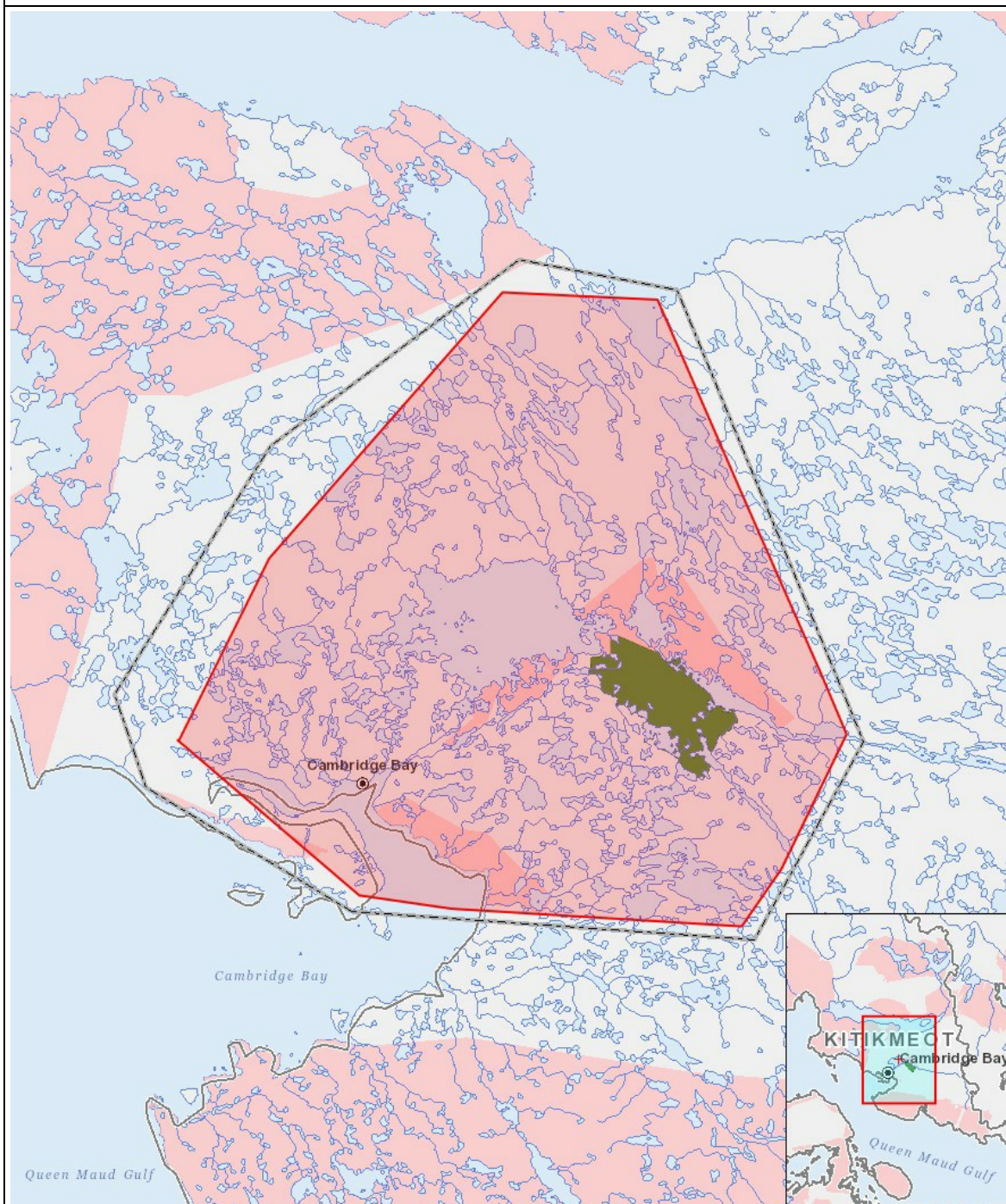
Tamatkiumayunik Ihuikgutivaktunik

Impacts

Ilitariyauniq Avatiliriniqmut Ayurhautingit

		PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO - ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Havakvinga																										
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Aulapkaininnga																										
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Piiqtauniq																										
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(P = Nakuuyuq, N = Nakuungittut unalu mikhilimaittuq, M = Nakuungittut unalu mikhittaaqtuq, U = Naluyauyuq)



List of Project Geometries

1	polygon	Tseng (UBC) Kitikmeot aquatic invertebrate health
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