PARKS CANADA AGENCY
RESEARCH AND COLLECTION PERMIT
(NOT TRANSFERABLE)

PERMIT No.: QUT-2019-31997

START DATE: 2019-05-22 **EXPIRY DATE:** 2021-08-06

Project Title: Northern Ellesmere Island in the Global Environment (NEIGE)

Principal Investigator Name: Warwick F Vincent

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Affiliation: Centre for Northern Studies (CEN) & Département de Biologie, Pavillon Vachon, Université Laval, Québec QC G1V 0A6, Canada

Is hereby authorized to conduct the research project entitled "Northern Ellesmere Island in the Global Environment (NEIGE)" , Research and Collection Permit Application Number 38461, In Quttinirpaaq National Park of Canada, subject to the terms and conditions set out below and/or attached to and forming part of this Research and Collection Permit

Members of Research Team:

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10. Iqaluk, Pilipoosie (Field Assistant), Resolute Bay, NU X0A 0V0
11. Kochtitzky, Will (PhD student), Dept of Geography, UOttawa, Ottawa, ON K1N 6N5, william.kochtitzky@maine.edu

Updated research team information will be submitted annually by the Principal Investigator.

Issuing Authorities and Terms and Conditions:

Permit issued pursuant to:
National Parks General Regulations: Section(s) 7(5), 11(1)
National Parks Wildlife Regulations: Section 15(1)(a)
Federal Real Property Regulations: Section 4(2)

Project proposals within National Parks, National Marine Conservation Areas and National Historic Sites administered by Parks Canada in Nunavut are subject to the Nunavut Land Claims Agreement (NLCA) and therefore screening by the Nunavut Impact Review Board (NIRB) in accordance with Section 8.2.11. However, Schedule 12-1 of the NLCA exempts certain types of project proposals from screening by the NIRB. Under an agreement through 12-1(7), the NIRB and Parks Canada have agreed to exempt Research and Collection Permits for the National Parks from screening by the NIRB.

National General Conditions:

Failure to comply with applicable Heritage Area regulations or the conditions of the permit may constitute grounds to cancel or suspend the permit, refuse to issue future permits, and may be considered as grounds for prosecution under the applicable Act(s) or Regulation(s).

All permit holders must be in possession of a valid permit before the fieldwork commences and at other periods as stated on the permit.

Permits are not transferable and each member of the field work team must have a copy of the valid permit in their possession.

The permit is valid only for the geographic location, the time period, the activities, and under the terms and conditions described on the permit, unless amended and revalidated by the Superintendent.

Restrictions:

The Superintendent may suspend, cancel, or restrict the scope of the permit.

The permit shall cease to be valid if the fieldwork is not started within six months of the date of issue.

Other Acts and Regulations:

The Principal Investigator must abide by applicable regulations and all other federal, provincial, territorial or municipal regulations applying to the Heritage Area.

If requested by the Superintendent, an authorized Heritage Area staff member, or police constable, the Principal Investigator or any team member will identify themselves and show the permit.

Principal Investigator Responsibilities :

A site, or site component(s) that has been excavated or disturbed shall be restored or conserved by the Principal Investigator to the satisfaction of the Superintendent.

The Principal Investigator must advise the Research Coordinator of any adjustments in work location, research plan and methodology, implementation schedule, or main personnel, etc., during the course of the research.

Unless otherwise negotiated, Researchers working in a Heritage Area are required, as a condition of their permit, to submit:

a) A report of progress sixty (60) days following the completion of the field season, unless otherwise agreed with the Research Coordinator;

b) A final report, one (1) electronic copy and three (3) hard copies, no later than eight (8) months following the completion of the field season, unless otherwise agreed with the Research Coordinator;

c) Submission of an online Investigator's Annual Report (IAR) within one year of signing the permit. In the case of a multi-year permits, the principal investigator will submit an IAR for each year of the research.

The reporting requirements above do not replace any reporting requirements set out in any contract between Parks Canada and the Principal Investigator.

The Principal Investigator will be responsible for all members of their party. All field assistants must observe any general or specific conditions of the permit.

The Principal Investigator shall at all times indemnify and save harmless the Crown from and against all claims, demands, loss, costs, damages, actions, suits, or other proceedings, by whosoever made, sustained, brought or prosecuted, in any manner based upon, occasioned by, or attributable to, anything done or omitted by the Principal Investigator or the project personnel in the fulfillment or purported fulfillment of any of the conditions of the Permit.

General Conditions Governing Natural Science Research:

Any natural objects collected under authority of this permit remain the property of the Crown (Canada) and are considered on loan to the permit holder. Final disposition of natural objects must be as shown in the project proposal unless amended by the Superintendent. Export of objects or specimens require approval by the Superintendent and is subject to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Cultural Property Export and Import Act and the Export and Import Permits Act. Intention to export specimens must be indicated in the project proposal.

Only the natural objects or categories of natural objects indicated on the permit may be collected.

A detailed inventory of material collected will be provided to the Heritage Area prior to its removal by the researcher.

When fossils or evidence of previous human occupation are found, they should be reported to the Superintendent and must be left undisturbed until inspected by a Parks Canada palaeontologist or archaeologist.

Special Conditions:

The following conditions apply to Research & Collection Permits issued for Quttinirpaaq National Park and are in addition to those outlined above.

_X_ The Permit holder(s) are required to check in at the Tanquary Fiord or Lake Hazen Camp prior to the commencement of their field activities. Exceptions to this must be discussed with the Park Manager prior to the start of the field season.

_X_ The Permit holder(s) are required to confirm their arrival and departure from the field research camp to the Tanquary Fiord and Hazen Camp via their PCSP scheduled radio call.

_X__ For air access, Permit holder(s) will confirm aircraft operators have an Aircraft Access Permit authorized by the Superintendent. Landings identified for this Research and Collection Permit (helicopter use beyond landing sites at Tanquary Fiord and Lake Hazen camps) are authorized by the Superintendent as per Section 5 of the National Parks of Canada Aircraft Access Regulations subject to the following provisions:

- A list of all aircraft use must be provided to the Superintendent and Park Manager prior to commencement of fieldwork. This list must include: dates, location, and type of aircraft for all landings and take offs;
- Conflict with wildlife, wildlife habitat and park visitor use must be minimized;
- A minimum flying height of 610 meters (2000 feet) must be adhered to except during landing, takeoff or as part of the approved research methods. For areas with known concentrations of migratory birds (e.g., bird colonies, moulting areas) a lateral distance of at least 1,500 metres (4,900 feet) must be respected. If this is not possible, a minimum flight altitude of 1,100 metres (3,500 feet) must be maintained over these areas.

_X_ The use of UAVs or drones is not permitted.

_X__ A list of all fuel caches associated with research activities must be provided to the Superintendent and Park Manager prior to commencement of field work and must include: location, amount, and the type of fuel at each cache

- All fuel caches and empty drums are to be clearly and indelibly marked with the project leader's name, year that fuel was cached, and Polar Continental Shelf Project (PCSP) number if applicable
- All fuel drums are to be removed from the park at the end of the field season unless otherwise agreed upon

_X_ All garbage is to be removed from the park in accordance with the National Park Regulations.

_X_ Solid Human waste: in field camp situations, human waste is to be collected in sealable metal or plastic containers. The project leader is responsible for ensuring that all containers of human waste must be removed for disposal at an appropriate facility. The cost of this disposal is the project leader's responsibility. At field stations (Tanquary Fiord, Lake Hazen and Ward Hunt), researchers will use facilities provided.

_X_ The project leader will ensure that all party members understand and comply with the Canada National Parks Act and Regulations.

_X_ Nunavut Agreement Inuit employed by the research project are not permitted to use research or Parks Canada chartered aircraft and vessels to transport any materials gathered, fished or hunted during their leisure hours while in the park.

_X_ The project leader is responsible to ensure that all party members read available polar bear safety information

_X_ All polar bear observations and encounters must be reported to the Park Manager

_X_ The permittee shall not remove, disturb or displace any archaeological artifact or site.

_X_ Should an archaeological site or specimen be encountered or disturbed by any land use activity, the permittee shall immediately contact the Parks Canada (Nunavut Field Unit) Cultural Resources Management Advisor at (867) 975-4673.

_X_ The permittee shall immediately cease any activity that disturbs an archaeological site encountered during the course of a land use operation, until permitted to proceed with the authorization of Parks Canada.

_X_ A field season summary report must be submitted to Parks Canada by 30th October each year that the permit is valid (email: pc.rechercheparcsnunavut-nunavutparksresearch.pc@canada.ca) and to the following community groups: Hamlet Councils of Resolute Bay and Grise Fiord, Resolute Bay HTO, & Iviq HTO.

_X_ The project leader or designate must present the research project and results to Parks Canada staff in Iqaluit at a mutually agreed upon time.

_X_ The project leader or designate must present the research project and results to the communities of Resolute Bay &/or Grise Fiord at a time mutually agreed upon between the project leader and the communities.

_X_ Copies of all reports, scientific papers, and posters must be provided to the Parks Canada office in Iqaluit.

_X_ Data files will be provided to Parks Canada upon request.

_X_ The Joint Park Management Committee for Quttinirpaaq National Park will review annually the terms and conditions of this permit. The permit may be revoked if terms and conditions are not adhered to.

_X_ The following are the approved collections & procedures that can be made in Quttinirpaaq National Park during each field season. (For details on methodology, refer to application #38461. Exceptions or amendments to the methodology are identified here):

Field Dates:
Approximately May 22 – August 4, 2019. Field dates for 2020 and 2021 to be identified in letter due by February 28 each year.

Field Work Locations:
Field work will mostly be based out of Ward Hunt Island base camp. A temporary camp will be set up in the Stuckberry Point area from May 22 to June 5, 2019 and in the Thores Lake area from July 15-25, 2019. Updates on temporary camps will be included in annual letter due February 28.
Helicopter access to remote sites is allowed, however, landing where Peary caribou are present is not permitted.

Research Purpose:
Evaluate climate change and its effects on the Northern Ellesmere coastal environment, with emphasis on the cryosphere (snow, ice, permafrost) and aquatic environments (lakes, fiords).

Objectives:

1. Environmental monitoring:
   - Continue long-term measurements from climate stations, permafrost monitoring and automated cameras on Ward Hunt Island.
   - Service monitoring instruments for lake temperatures and underwater light at Ward Hunt Lake.

2. Limnology, palaeolimnology and microbiological research:
   - Sample Ward Hunt Island Lake, Thores Lake and other waters in the region for microbiological analysis.
   - Sample aerosols by concentrating large volumes of air onto filters.
   - Assess the microbial populations of frozen freshwater environments by sampling of ice cores from lake ice.
   - Water quality and sediment sampling in the Stuckberry Point lakes.

To meet these objectives the following field work is permitted:

Limnology, palaeolimnology and microbiological work:

1. Sample small amounts of sediment (approximately 50 samples of 5g) and microbial mats (approximately 20 samples of 5g), for analyses of microbes, sediments and food web contaminants. Microbial mat material will also be sampled for DNA and RNA analysis as well as isolation of cyanobacteria. Amounts sampled will not have any deleterious effects on the integrity of the ecosystems. Samples will be removed to laboratory for detailed analysis.
2. Take 7 litre water samples at specific depths in the water column (2-8 depths) in lakes and fiords using a Kemmerer sampler for analyses of contaminants, RNA, DNA, pigments and water chemistry variables. Water samples taken for DNA analysis will be filtered in the field using a peristaltic pump, and the filtrates will be retained for laboratory analyses.
3. Collect small ice samples using an ice axe (maximum total volume of 3 litres water equivalent at two sites, a glacier in the vicinity of Ward Hunt Ice Shelf known to the research team as "Walker Glacier" and Thores Lake).
4. Collect ice cores from Ward Hunt, Thores and meromictic lakes (3 x 9 cm diameter per site) to analyse the microbial populations of frozen freshwater environments.
5. Take in-situ measurements of the specific conductivity, temperature, pH and dissolved oxygen content of sample sites using water column profilers.
6. Collect Phytoplankton and zooplankton samples using vertical net tows. Samples will be preserved for later analyses of taxonomic composition and stable isotopes.
7. Collect littoral chironomids by net, hand sampling in shallow water or sediment sampler (approximately 5 g at each of the two sites mentioned in activity 3 above). Samples will be preserved for later analyses of stable isotopes.
8. Take sediment cores from lake, catchment, and fiord bottoms. Maximum of 20 cores (4 per lake at 5 lakes, approximately 10 cm in diameter each) in the Stuckberry Point area of the park. Analyze subsamples for biotic and abiotic geochemical markers.
9. Collect aerosol samples with a portable, generator operated air sampler mounted for periods of 3-4 24 hours on a 1 m high tripod, to sample for viruses released from the cryosphere (in Thores Lake and Ward Hunt Island regions). The research team will not use the generator-powered equipment outside of Ward Hunt Island if there are caribou in the immediate area.
10. Install year-round sensors in 2 lakes in the Stuckberry Point area to record environmental conditions during the winter. Pictures of the set up will be included in the field report due October 30.
11. Samples will be removed to laboratory for detailed analysis.

Environmental monitoring work:

12. Download and service automated stations, including automated cameras, ground and lake thermistors, and underwater light sensors.

Principal Investigator Signature
I, Warwick Vincent, the Project Principal Investigator, accept all the stated Research and Collection Permit terms and conditions.

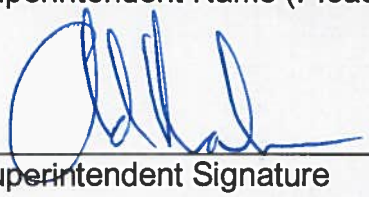
Signature

2019/05/05

Date (yyyy/mm/dd)

Approval:
Permit issued/approved by:

Andrew Maher A/FUS
Superintendent Name (Please Print)



Superintendent Signature

MAY 6 /2019
Date (yyyy/mm/dd)

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