SCIENTIFIC RESEARCH LICENCE APPLICATION
LAND, FRESHWATER & MARINE BASED RESEARCH

NRI strongly recommends that applicants review the following documents prior to submitting an application: *Scientific Research Licencing Guidelines* and *Negotiating Research Relationships in Inuit Communities: A Guide for Researchers.*
For more information about the Nunavut Research Institute (NRI) please visit our web site www.nri.nu.ca

IMPORTANT
This application fulfills the requirements for the NIRB environmental screening.
Please be advised that your application will not be processed until the application form, project summary, and maps are received.

SECTION 1: APPLICANT INFORMATION

1a. Project Title **Evaluation of simulated snow properties across the Arctic**

1b. Project Number

Please indicate if applicant has submitted any previous application(s) to NRI related to this project proposal?	Yes	No X
If yes, please indicate the previous NRI licence number:		
Please indicate if applicant has submitted any previous application(s) to NIRB related to this project proposal?	Yes	No X
If yes, please indicate the previous NIRB project number(s):		

2. Applicant's full name and mailing address:

Prof. Alexandre Langlois, Universite de Sherbrooke	Phone:	819-821-8000 #65690
Departement de geomatique appliquée	Fax:	819-821-7944
2500, blvd. de l'Universite, Sherbrooke, QC, J1K2R1	Email:	a.langlois2@usherbrooke.ca

3. Field Supervisor's name and mailing address:

Canadian High Arctic Research Station (CHARS)	Phone:	819-934-1156
Aboriginal Affairs and Northern Development Canada	Fax:	
Contact: Don McLennan	Email:	Donald.McLennan@aadnc-aandc.gc.ca

4. Other Personnel list (name, position, affiliation)

SECTION 2: AUTHORIZATION NEEDED

1. Indicate <u>all</u> authorizations associated with the project proposal:

☐ Regional Inuit Association (RIA) ☐ Nunavut Water Board (NWB)

	Nunavut Planning Commission (NPC)		Environment Canada (EC)
	Department of Indian And Northern Development (DIAND)		Department of Environment (GN)
	Department of Fisheries and Oceans (DFO)		Department of National Defense (DND)
	Community Government & Services (CG&S)		Hamlet
X	Nunavut Research Institute (NRI/GN)		Parks Canada (PC)
	Department of Culture, Language, Elders, and Youth (CLEY/GN)		Canadian Wildlife Service (CWS)
	Canadian Launch Safety (CLS)		Other (please specify):

2. **List the <u>active</u> permits, licences, or other rights related to the project proposal and their expiry date:**

NA: this is a new application for a starting project

3. **Have you applied for all authorizations required to conduct the project proposal activities?**

X YES ☐ **NO**

SECTION 3: PROJECT PROPOSAL DESCRIPTION

1. Indicate the activities related to the project proposal:

	Temporary camp (to be removed at end of field season)		Soil disposal/ soil storage
	Permanent camp (to remain for life of authorization)		Incineration of combustible wastes and removal of non-combustible wastes
	Construction of recreational or safety cabin		River/ stream/ lake crossing or work/ bridge
	Temporary fuel storage (to be removed at end of field season)		Drainage alteration
	Permanent fuel storage (to remain for life of authorization)		Geoscientific sampling by diamond drilling
	Placement of structures for life of permit (other than camp or cabin – i.e. scientific instruments)		Geoscientific sampling by soil sampling
	Placement of permanent structures (other than camp or cabin – i.e. scientific instruments)		Geoscientific sampling by trenching
	Air surveys (i.e. geophysical, wildlife)		Geoscientific sampling by borehole core
	Use of aircraft/watercraft/land vehicle for personnel drop-off and pick-up to project location		Blasting
x	Use of on-site mechanized vehicles (i.e. atv, snowmobile, truck, zodiac)		Channeling
	Sewage or grey water disposal via sump		Excavation
	Hazardous waste storage or disposal		Hydrological testing
	Solid waste disposal		Abandonment and restoration
	Chemical storage		Site restoration (fertilization/ grubbing/ scarification/ spraying/ recontouring)
	Explosives storage	**X**	Research
	Soil testing		Ecological survey
			Harvesting
			Removal of vegetation for scientific purposes
			Other: snow measurements

2. Personnel

Total No. of personnel on site = (A) 4

Total No. of days on-site = (B) 10

Total No. of Person days (A) × (B) = 40

3. Timing

Period of operation: **April 7th 2015** *to* **April 17th 2014**

Proposed term of

authorization: _____ *to* _____

Please outline the phases of the proposed project (construction/ operation/ decommissioning) including the timing and scheduling of each phase.

Daily snow sampling within 50km of Cambridge Bay. This is a 10-day field project, which we want to repeat every year.

4. Location(s) of data collection:

Location Name	**Region** North Baffin, South Baffin, Kivalliq, Kitikmeot	**Co-ordinates** Lat (degree / minute), Long (degree / minute)	**NTS Map Sheet #**	**Land Status** Crown, Commissioners', Inuit Owned
Transect 1	**Cam Bay**	**69°09'46'' N 105°14'30'' W**	**077D**	**Unknown**
Transect 2	**Cam Bay**	**69°13'54'' N 104°16'15'' W**	**077D**	**Unknown**
Transect 3	**Cam Bay**	**69°08'02'' N 104°16'53'' W**	**077D**	**Unknown**

If the project proposal includes a **camp**, please provide the coordinates of the camp location
Lat (degree/minute) No camp Long (degree/minute) No camp
NTS Map Sheet # (if different from above) No camp

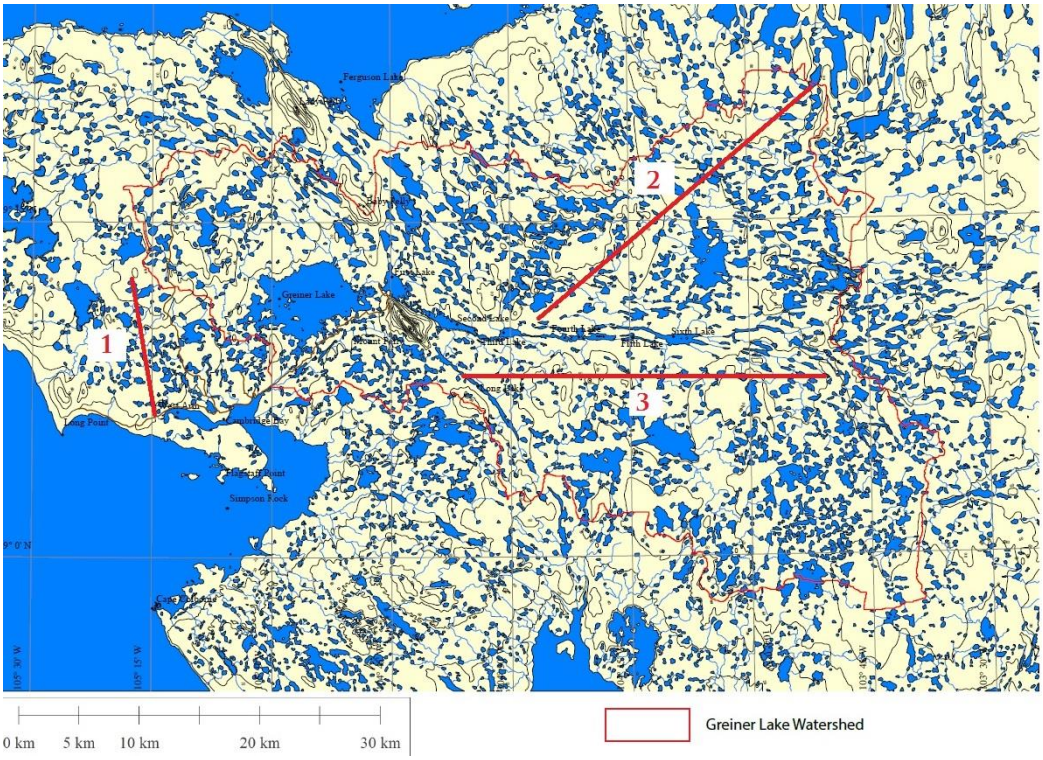

Figure-1: Proposed snow measurement transects (April 2015)

The Nunavut Impact Review Board may require additional location information in a subsequent Project Specific Information Requirement (PSIR) submission. This may take the form of a digital Geographic Information Systems (GIS) file.

SECTION 4: NON-TECHNICAL PROJECT PROPOSAL DESCRIPTION

Please attach a non-technical description of the project proposal, no more than 500 words, in English and Inuktitut (+Inuinnaqtun, if in the Kitikmeot). The project description should outline the following:

Evaluation of simulated snow properties across the Arctic

Prof. Alexandre Langlois
Université de Sherbrooke

Project location: Cambridge Bay area (south Victoria Island)
April 7th-17th 2015

Project Description:

The project is motivated by the increase in extreme weather events in the Arctic such as rain-on-snow (ROS) events. ROS are known to be the consequence of global warming, and given the anticipated increase in arctic temperatures; more events are likely to occur. Those events lead to the formation of ice layers that affect transportation, travel on the land while have direct consequences on permafrost melt. ROS events also affect caribou grazing conditions, and several events killed many animals, not only in Canada but also in other parts of the Arctic.

The main objective of this project is two-fold: 1) to develop a ROS detection method using satellite image, and 2) use a snow model to simulate caribou grazing conditions. While on the field, the researchers will use snowmobiles and no permanent infrastructure are to be erected. The measurements are non-destructive so that no restoration plans are required.

Our research group will be on the field to collect snow data (temperature, grain size, density, wetness, layers structure). The data will be collected along pre-designed transects (see map above) on a daily basis, for 10 consecutive days. A field guide will be hired for the field days, and the process will be facilitated by CHARS in Cambridge Bay.

A short term use of the data will allow us to validate the snow properties simulated by our model. In order to use the model to evaluate access to food for caribous, it is required to know the uncertainties in the simulations. In the long-term, the data collected on the field will be compared to satellites in order to see if they can detect changes in snow conditions (especially those during ROS events). We will also use the data form e meteorological station (CHARS license) that will provide the weather observation we need to conduct the snow simulations and identifying ROS events.

The results will be shared with the community and the process is to be facilitated through local contacts. Pamphlets of results will be produced and shared, and we hope to be able to develop a community based-monitoring program of weather observations. This program will be discussed with the community during our April 2015 visit. We aim this to be a long-term project (i.e. multi-year). It is also anticipated that peer-review publications be published from this project.

SECTION 5: MATERIAL USE

1. List equipment (including drills, pumps, aircrafts, vehicles etc.):

Equipment type and number	Size – dimensions	Proposed use
2 snowmobiles	NA	Travel
Snow measurement equipment	Approx. ½ komatik	Snow measurements

2. Detail fuel and hazardous material use:

Fuel	Number of Containers and Capacity of Containers	Total Amount of Fuel (in Litres)	Proposed Storage Methods
Diesel			
Gasoline	10 x 25L	250L	Jerricans stored in container
Aviation fuel			
Propane			
Other			
Hazardous Materials and Chemicals		**Total Amount of Hazardous Materials and Chemicals (in Litres)**	

3. Detail daily water consumption rates

Daily amount (in Litres)	Proposed water retrieval methods	Proposed water retrieval location
0 (staying in a house)	0	0

4. Have you applied for a Class A License with the Nunavut Water Board?

☐ **YES** **X NO**

SECTION 6: WASTE DISPOSAL AND TREATMENT METHODS

1. List the types of waste:

Type of waste	Projected amount generated	Method of Disposal	Additional treatment procedures
Sewage (human waste)	NA		
Greywater	NA		
Combustible wastes	NA		
Non-Combustible wastes	NA		

Overburden (organic soil, waste material, tailings)	NA		
Hazardous waste	NA		
Other:	NA		

2. Will you be incinerating combustible waste, removing all solid waste, and removing the ash generated from incineration?

☐ **YES** **X NO**

Note: we will be staying in a house in Cambridge Bay

SECTION 7: COMMUNITY INVOLVEMENT & REGIONAL BENEFITS

1. List the community representatives that have been contacted and provide the minutes of the meetings if available:

Community	Name	Organization	Date Contacted
Cambridge Bay	Meaghan Bennett	Aboriginal Affairs	October 2014
Cambridge Bay	Crystal Qaumariaq	Aboriginal Affairs	October 2014

Note: At this stage, we do not have the name of the field guide that will participate in the project. This process will be facilitated by M. Bennett.

2. How will the proposed project benefit Nunavut?

An increased understanding and monitoring of ROS events will be very helpful for the community development for the planning of mitigation measures for infrastructure for instance. Furthermore, it will provide crucial information on the fate of caribou in the near future.

4. Describe and attach documentation regarding community support or concerns for the proposed project:

5. Is there a traditional knowledge component to this research project? If yes, please explain:

TEK will be integrated by collecting information on caribou behaviour. This will help our research identify key areas of interest. TEK will also be essential in addressing changes in local climate observed in the past 30 yrs.

SECTION 8: GENERAL QUESTIONS

1. Do you give NRI permission to publish project information in the Nunavut Research Institute Annual Compendium of Research Undertaken in Nunavut?

X YES ☐ **NO**

3. In addition to the application form, applicants are required to submit additional information in an electronic format to the Manager, Research Liaison, cfilion@nac.nu.ca. Please check that the following have been submitted to NRI:

☐ **Project Summary** -in English and Inuktitut (+Inuinnaqtun, if in the Kitikmeot)
☐ **NTS Maps** of the project

Applicant:

Signature	**Title**	**Date**