

Scott Lamoureux **Melissa Lafrenière**



Scott is an Associate Professor of Geography at Queen's University; Melissa is an Assistant Professor of Geography at Queen's University



Project profile #7 - November 2010

Cape Bounty Arctic Watershed Observatory (CBAWO), Melville Island

Summary

Water is crucial for northern communities and ecosystems and plays a vital role, in conjunction with climate and permafrost, in the morphology and stability of arctic landscapes. To determine the impacts of climate change on terrestrial ecosystems and freshwater quality and availability in the High Arctic, we created a watershed and landscape ecosystem observation network.

The research is conducted primarily at the Cape Bounty Arctic Watershed Observatory on Melville Island, near the Nunavut/NWT border, with additional work at Polar Bear Pass on Bathurst Island.



Water sampling at Cape Bounty

Research at the Cape Bounty Arctic Watershed Observatory will investigate how climate change will affect rivers, permafrost, soils, vegetation, greenhouse gas emissions and the release of contaminants into High Arctic rivers and lakes.



Instruments to measure water quality in a small stream

Our integrated watershed network will provide an unprecedented understanding of the sensitivity and anticipated future effects of climate change to the High Arctic water, permafrost and ecosystem.

By closely integrating related water and ecosystem process studies, this project is trying to identify key environmental and societal vulnerabilities. Our goal is to develop impact models to assess linkages between anticipated environmental change and possible adaptations by communities and government agencies (clean water supply and ecological integrity) and industry (resource extraction, infrastructure protection).

Study site locations



*Cape Bounty, Melville Island:
74°50'N, 109°30'W*

Polar Bear Pass, Bathurst Island:
75°40'N, 98°30'N

Local collaborations

Resolute community members
Qarmartalik School

Questions to Researchers

ArcticNet recognizes the importance of framing climate change issues from various perspectives. Below we are asking a few questions to the project leaders in order to identify scientific priority issues and demonstrate how the research results can be used by policy and decision-makers in terms of community and climate change adaptation planning in the Eastern Canadian Arctic.

1) From your own research perspective can you identify and describe the key issues that are (will be?) affecting social, economic or environmental conditions in the Eastern Canadian Arctic?

From our perspective of land and water, the key issues are: 1) how will climate change effect water and land, 2) how will the permafrost be affected by short term and longer term warming and loss of ground ice, 3) how do changes in soil and vegetation affect the water quality, and 4) how will downstream lakes and ponds change in response to these changes to the rivers and land. A key component to this work is to understand how long the land and water take to recover from disturbance. For instance, if there is an exceptionally warm summer that causes permafrost melt and disturbance, how long will it take for the land to stabilize and for water quality to return to what it was before. These issues are all closely related but have rarely been studied together, so it is difficult to know how a change in one part of the system might affect the others.

2) How will your ArcticNet project contribute to a better understanding of these issues affecting the Eastern Canadian Arctic?

One of the key things our work is providing is an indication of how climate changes will affect the land and water. For instance, if climate change causes the permafrost to melt and cause more landslides and erosion, how will that affect the water in rivers and lakes?

And how will that affect important parts of the ecosystem that the communities depend on, like the charr? Our work is focused on providing the details to fill in our understanding on our system, to go from "climate change will impact charr" to "climate change will have these effects that we can identify as first indications of potential charr stress".

3) Provide an example of how the results of your project may contribute to the decision-making process with respect to these issues.

One key thing that drives our work is to provide information that managers and policy makers can use to determine what constitutes the short and long term impact of climate change and land uses (e.g., mining) on the land and water. For instance, how will a localized disturbance caused by road building affect downstream water quality? Will it be measurable in the lakes or will it have a minimal impact. In many situations, the latter is the case, and this knowledge can guide how environmental protection is defined by Nunavut in development plans. This type of specific knowledge will help communities and managers make decisions on land use and development.

General information

Contact us if you have suggestions, feedback or questions regarding the research projects presented in this newsletter.

Project contact information:

Scott Lamoureux

Associate Professor
Department of Geography
Queen's University

Melissa Lafrenière

Assistant Professor
Department of Geography
Queen's University

ArcticNet IRIS-2 contact

Philippe LeBlanc

ArcticNet IRIS Coordinator
Eastern Arctic Region
Memorial University of Newfoundland
pleblanc@mun.ca

Upcoming Newsletter

Researcher

James Ford

Research project

*Climate change and food security
in regional Inuit centers*

