

Ward Hunt Island Observatory

Climate Impact Monitoring in Quttinirpaaq National Park, Northern Nunavut

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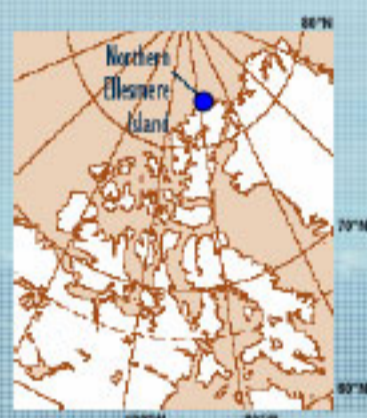


Quttinirpaaq, a National Park at the Top of the World

Located on Ellesmere Island, the park is a vast region of diverse landscapes.

These environments and their biological communities are shaped by extreme cold and likely to be sensitive indicators of climate change⁵.

As part of the program ArcticNet, university researchers are working in partnership with Parks Canada to develop a climate impact monitoring program based out of Ward Hunt Island, at the northern limit of the park.



Long term objectives

Our work to date in this region shows the onset of significant change³⁻⁵. Our aim is to develop and follow a series of environmental impact indicators including the following:

- Climate variables measured at automated weather stations
- Paleoclimate indicators from lake and fiord sediments
- Integrative variables such as lake and fiord CTD profiles
- Vegetation structure and dynamics
- Ablation rates on the adjacent Ward Hunt Ice Shelf
- Ice shelf and lake/sea ice dynamics by RADARSAT
- Molecular analysis of microbial communities
- Comparative analyses with other polar sites via the International Polar Year program MERGE



Microbial ecosystems

A diverse range of microscopic life is to be found in this region. These communities form 'microbial consortia'; i.e., complex assemblages of different sorts of microbes that depend upon each other.

Much remains to be learned about the species diversity and functioning of these microscopic worlds.

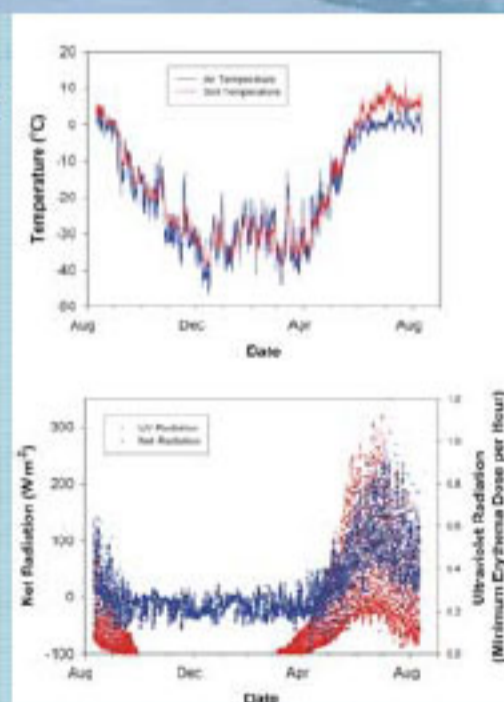
Our work on Ward Hunt Lake¹ shows that it contains two types of communities: one planktonic, and the other on the bottom of the lake, that differ greatly in their pigments and responses to nutrient enrichment. The adjacent Ward Hunt Ice Shelf is also rich in microbes.



Climate monitoring

Global circulation models predict that the largest and most rapid climate change is likely to take place at high northern latitudes. However high arctic climate stations to detect such change are sparsely distributed.

As part of the SILA network, ArcticNet, CEN, and Parks Canada installed a 10-m automated climate station on Ward Hunt Is. and a 3-m station at Lake A on Ellesmere Is. An ablation stake network has also been established on the ice-shelf^{2,3}.



Plants and wildlife

Despite the severe climate regime at this extreme northern latitude, a variety of plant and animal communities can be found on the island and along the nearby coastline of adjacent Ellesmere Island.

Our plant surveys have revealed 26 species of vascular plants on Ward Hunt Island within only 500 m of the landing site and camp.

Several species of birds and mammals also occur in the region including arctic hares, lemmings, and foxes. Vegetation analysis has begun, and further plots should be established to monitor long term change at this site.



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