

February 3, 2014

Project Title: Limnology and Aquatic Ecology of High Arctic lakes and ponds on Cornwallis Island and surrounding islands

Researcher's Name and Affiliation: John Smol, Queen's University, Kingston, ON

Project Location: Resolute, NU; Prince Leopold Island, NU; Tern Island (unofficial name, NE of Crozier Island), NU

Timeframe: July 2014 to July 2017

Project Description:

The purpose of this project is to collect and assess water and sediment samples from lakes and ponds on Cornwallis Island and surrounding islands. On Cornwallis Island near Resolute Bay, our research group at Queen's University has been monitoring several freshwater lakes and ponds for the past 30 years, constituting one of the longest and most valuable freshwater monitoring programs in the High Arctic. These data have given us critical insight into how aquatic systems respond to climate warming and other anthropogenic stressors in the High Arctic. Our goal in the next three years is to continue this monitoring program, as well as collect data from new sites.

This coming field season (July 2014), based at the PSCP station in Resolute, we would like to use PCSP aircraft to access freshwater lakes and ponds on Prince Leopold Island, which is home to an important migratory seabird colony. We plan to be on the island for one day only. Our research group has previously tracked seabird populations using the biological, chemical and physical remains preserved in lake sediments, and here we aim to reconstruct past seabird population levels in order to extend the historical population data that has been collected by seabird researchers for approximately the past 30 years. Our methods avoid contact with the seabirds, as we work on lakes away from, but draining, the colony. Our research will reconstruct population changes from approximately 200 years ago or more. Similarly, we will return to Tern Island and resample sites we sampled in 2008 to see how the ecosystem has changed.

In addition, we hope to sample sites near Resolute on foot, working out of the Polar Continental Shelf Program research station, and travel to nearby islands (this year Prince Leopold Island and Tern Island) by twin otter aircraft for sampling during one day each.

From each site, we collect approximately 2 litres of water for environmental testing using Nalgene bottles, and approximately the same volume of sediment in the form of a sediment core (a plexiglass tube of sediment). We will collect sediment from an inflatable row boat. We do not sample or disturb any wildlife or fish and have no environmental impact on our sites. We will not be using a remote camp, and will not have to dispose of any waste.

These data will be of interest to a wide range of people, and therefore we propose to communicate our data to Northern communities who have interest in the impact of recent climate warming on their freshwater resources, and/or who are interested in the changes in the seabird population on Prince Leopold Island. These data could help inform management decisions by putting current changes in historical context.

As we have done in the past, we will continue to communicate our results using published literature, which we distribute to the Arctic and local hamlet offices, as well as using talks and seminars in the Arctic, and media interview on the radio and newspapers.