

Theme 1, Project 1.5

Modeling mercury (Hg) cycling and accumulation in aquatic biota across the Attawapiskat watershed; implications for subsistence fisheries and the Ring of Fire development in Ontario's Far North

Gretchen Lescord, PhD candidate

Laurentian University

glescord@laurentian.ca

https://www.researchgate.net/profile/Gretchen_Lescord

Supervisor:

John Gunn, Laurentian University

Tom Johnston, Ministry of Natural Resources



Abstract

The consumption of mercury (Hg), a toxic metal, is a concern for both wildlife and humans, and elevated concentrations of Hg in freshwater and wildlife have been reported in remote regions across Canada. The main goal of this project is to study mercury cycling and bioaccumulation in aquatic biota from the Attawapiskat drainage basin in Ontario's Far North. This vast watershed begins as headwater lakes in the Boreal Shield and transitions into shallow lakes, small tributaries, and finally the Attawapiskat River in the Hudson Bay lowlands. Lakes located in the shield are deeper, more oligotrophic, and have markedly different water chemistry profiles compared to lowland lakes. This diverse watershed will allow us to better understand how physical, geological, biological, and chemical gradients affect Hg concentrations in water, sediments, invertebrates, and fish on a large scale. Sampling areas also include several lakes surrounding the mineral-rich area known as the "Ring of Fire," where extensive mining development is expected over the next decade; this project will therefore provide vital baseline data for future monitoring programs in this area.

Keywords: Mercury, Far North, Subsistence Fisheries, Dissolved Organic Material (DOM)

Geographic Location: Attawapiskat Drainage Basin, Kenora District, Ontario, Canada

How does your project link to Canadian aquatic ecosystem services?

The Boreal Ecozone is facing major changes in the coming decades due to climate variability and industrial development and the data generated from this project (and others like it) will be vital in properly monitoring these systems to ensure their preservation, the conservation of their species, and continued traditional use by First Nation community members.