

## The relationship between life history and tissue mercury concentration in subsistence fish of the Hudson Bay Lowlands



### Rachel DeJong, MSc Candidate

University of Waterloo  
ra2dejon@uwaterloo.ca

### Supervisor:

Heidi Swanson, University of Waterloo  
University

### Abstract

Mercury is a toxin that bioaccumulates in the environment, and can be detrimental to human health when consumed in large quantities. We are interested in the relationship between anadromy (movement of fish between freshwater and marine environments) and mercury, as studies in other areas of the North have shown anadromous life history types of some fish species to have lower mercury than resident fish. We are studying three species of fish that are valuable to the subsistence fishery of rivers of the Hudson Bay Lowlands (HBL): Northern Pike (*Esox lucius*), Lake Whitefish (*Coregonus clupeaformis*), and Cisco (*Coregonus artedii*). Fish will be caught from freshwater, brackish and marine waters of the Severn, Winisk and Attawapiskat Rivers in the HBL. Otolith microchemistry and stable isotope analyses will be used to determine whether a fish is anadromous or freshwater-resident, and to determine the influence of marine vs. freshwater derived nutrients; fish tissue mercury concentration will then be compared to results of these analyses. This study will help to identify the healthiest fish species and life history types in the HBL, in order to guide coastal communities of the area in their fishing practices. This data also establishes reference conditions for the area relative to future development and a changing climate.

**Keywords:** anadromy, mercury, otolith microchemistry, stable isotopes, subsistence fishery

**Geographic Location:** Severn River, Ontario, Canada; Winisk River, Ontario, Canada; Attawapiskat River, Ontario, Canada

### How does your project link to Canadian aquatic ecosystem services?

An important ecosystem service provided by rivers is the provision of fish for human consumption. It is important to understand the relationship between mercury accumulation and fish life history in order to help guide subsistence fishers in safely choosing fish to harvest and to protect the future of the sustainable fishery with a changing environment.