

Mercury Methylation Potentials in Water and Sediments in the Wabigoon River System

BEATRIZ BENTO AND HOLGER HINTELMANN

Trent University

Presenting Author: beatrizbento@trentu.ca

The Wabigoon River is known for an historic mercury (Hg) pollution source, caused by a chlor-alkali facility operating in the 60's. The legacy Hg contamination persists to current days, causing adverse health effects to local communities. Methylmercury (MMHg) is one of the most toxic mercury species due to its potential for bioaccumulation in the food chain, attaining its highest concentrations in the tissues of top predatory fish due to biomagnification. These contaminated fish are the main pathway for mercury exposure in humans. That said, the tendency of an environment to produce methylmercury from inorganic mercury is important in determining the potential impact of Hg on human health and the environment. In order to understand which areas within the system are impacting negatively the local communities, mercury stable isotope tracers were used to assess Hg methylation at different locations along the river system, including lake, river and wetland sediments as well as water. Hotspots for methylmercury formation were found to be at the Hydro dam and Clay Lake locations, where up to 4.4 % and 3.8 % of the added mercury spike were methylated, respectively. These locations have the potential to produce and distribute methylmercury throughout the Wabigoon River system. This work establishes for the first time, Hg methylation potentials in several ecosystems across the Wabigoon River System, discerning risk areas for MMHg production.

