

Potential effect of climate on the bioaccumulation of mercury in two large-bodied fish species in northern Ontario

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Abstract

Increasing temperatures in Canada's subarctic region are expected to alter many components of aquatic ecosystems, including the bioaccumulation of mercury in fish. It is important to understand how climate influences the concentration of this neurotoxin in fish in order to assess the future impacts that climate change might have on the safety of consuming wild fish in northern Ontario. To better understand how climate influences mercury bioaccumulation, I am investigating patterns in fish mercury concentrations across a climatic gradient in Ontario. Two species of large-bodied fish, walleye and white sucker, have been sampled from 75 lakes throughout the Near and Far North of Ontario. These lakes are distributed over 9.0° of latitude and represent a range of climatic conditions (annual growing degree days 604 - 1599). Additionally, fish mercury concentrations are being analyzed with respect to chemical, physical and biological variables known to be influential, such as lake pH, dissolved organic carbon concentration and fish trophic positions and growth rates. The results of this study will address important gaps in our current understanding of how climate affects fish mercury levels, and will be useful in assessing reference conditions in advance of further climate change.

Keywords: mercury, methylmercury, bioaccumulation, fish

Geographic Location:

See Excel file named "ASumner_LakeCoordinates_CNAES2015.xlsx"

How does your project link to Canadian aquatic ecosystem services?

The results of this study will provide current information on fish mercury levels in Canada's sub-arctic and help update and refine fish consumption guidelines. We will also gain insight into how fish mercury levels may change with a changing climate and the implications for the food quality of fish in the northern diet.