

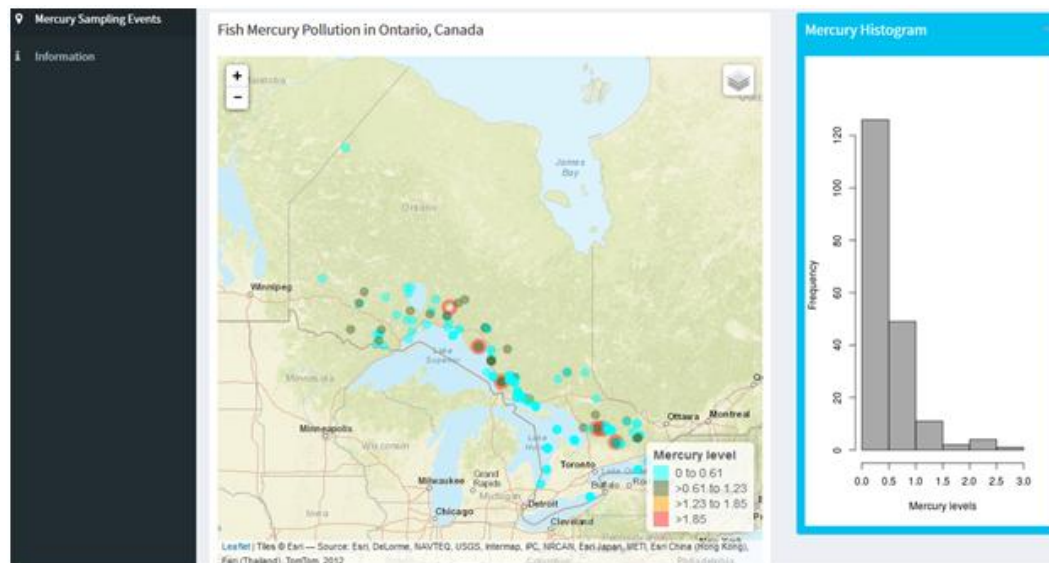
Understanding how Fish Contaminants Vary Throughout Ontario using Spatial and Spatio-temporal Statistics

NSERC Engage Grant \$25,000; PI: Stephanie Melles; Co-PI: Dr. Shyam Thomas; collaborators: Satyendra Bhavsar – MOECC, Patrick Cieslar, Eric Tietz, Tim Sutherns – Eramosa Engineering

Duration: Aug 2016- Feb 2017

Significance:

- Eramosa Engineering developed expertise in predictive analytics of space-time series data, GIS, and spatial analyses in order to develop design specifications and pseudo code for future versions of *eRIS*.
- An interactive geospatial web application was developed using R shiny and leaflet packages to visualize large amounts of fish mercury data in an efficient manner. An early version of the web app can be found [here](#).



Eramosa Engineering is a data analytics firm that works with water, wastewater, and renewable energy sectors to provide solutions to their facility reporting and data analytic needs. *eRIS* is a web-based reporting and information system designed and created by Eramosa that allows municipal clients (for example) to perform various tasks. Nevertheless the *eRIS* software system is limited to analysis of time series data: the firm would like to extend their software in order to visualize data on a map or to spatially analyze and temporally aggregate data with results from other municipalities.

The Melles Lab in spatial analysis performs cutting edge research in the area of statistical modelling of large environmental datasets to understand how critical features (e.g., water quality | fish productivity) vary in space and time (S-T). Dr. Melles works predominately with provincial environmental datasets to develop an understanding of key

predictors of ecosystem features that we all rely on for our survival. MOECC provided a large spatial and temporally explicit dataset on food fish mercury levels distributed across Ontario (1971-2014) from the 'Ontario Guide to Eating Sport Fish' – OGESF.