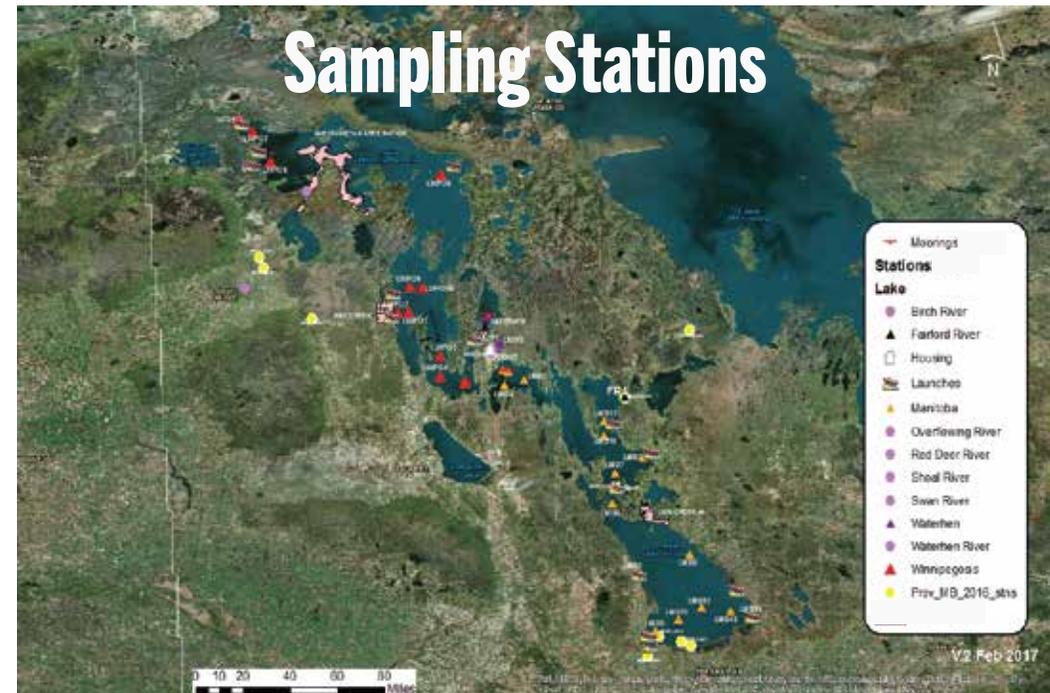


Monitoring Water Quality through the Manitoba Great Lakes Program

The upper Manitoba Great Lakes (MBGL – Lakes Manitoba, Winnipegosis and Waterhen) act as filters that intercept nutrient flow from the Lake Winnipeg watershed, both as natural nutrient sinks and especially through operation of the Portage Diversion. Extreme weather, an important aspect of climate change, can affect freshwater hydrology and water quality at local, regional and larger hemispheric scales. This includes effects such as direct lake warming (intensification of in-lake processes) and increased nutrient and contaminant movement from runoff and flooding due to high-intensity precipitation events (e.g. rain, rapid snow melt).

Unfortunately, the physical, chemical, biological, and geological processes in the lakes are not well understood. Therefore, we have a poor ability to predict the responses and understand the effects downstream in Lake Winnipeg and into Hudson Bay. This leads to lake management and governance being decided without adequate scientific support.

Basic information such as water chemistry and documentation of physical parameters for two of the three lakes had never been conducted, and the last full lake survey for Lake Manitoba occurred in 2011. In 2016, the Centre for Earth Observation Science (CEOS) at the University of Manitoba expanded their mooring project to include open water sampling. Sample sites were established on all three lakes to measure physical parameters such as conductivity, temperature, depth, oxygen and light, as well as taking water samples to measure water chemistry and biological samples for algae and zooplankton.



At the University of Manitoba, we are also studying nutrient forcing of algal biomass and associated algal toxins. We look at water quality indicators such as chlorophyll, suspended solids and dissolved organic carbon and can use them to create a map of chlorophyll concentration in surface water on Lake Winnipeg. These methods combined with satellite data can be used for early detection of algal blooms and identify potential sites where algal toxins may occur.

