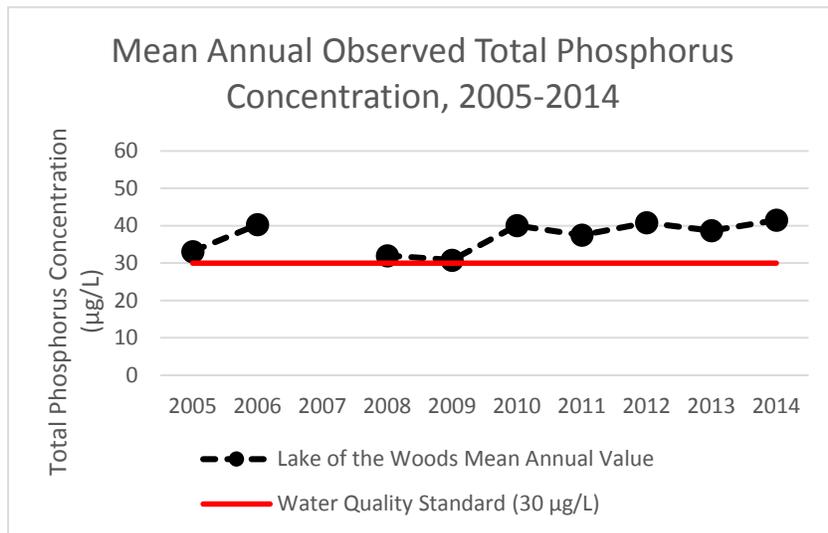

LAKE OF THE WOODS TOTAL MAXIMUM DAILY LOAD (TMDL) STUDY

Sampling conducted on Lake of the Woods (LoW) indicates that the lake is eutrophic, with high rates of both total phosphorus and chlorophyll *a*. Eutrophic lakes are lakes that are high in nutrients which cause algal blooms and other conditions harmful to aquatic life and recreation. Since the lake water quality exceeds Minnesota water quality standards, it is not able to support its designated use for recreation and therefore is deemed to be “impaired”. Under the US Clean Water Act, states are required to develop total maximum daily load (TMDL) studies for their impaired waters.

The TMDL study project also includes the development of a detailed implementation plan which outlines the necessary actions to restore water quality. When a water body is restored, to meet applicable water quality standards, it can be removed from the impaired waters list. In addition, monitoring will continue over the long term to ensure standards are maintained.

This two-year project, which began in July 2015, builds on and makes use of existing data and research, and will result in a study document available for public review and comment prior to submission to the United States Environmental Protection Agency for approval.



What is a Total Maximum Daily Load (TMDL) study?

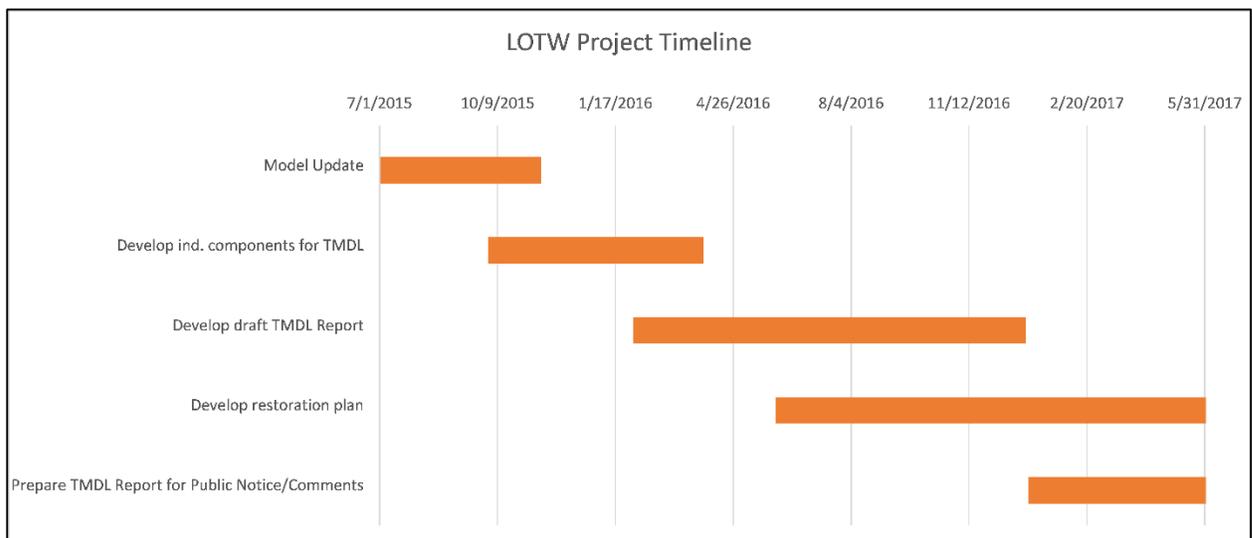
The Minnesota lakes’ nutrient standard requires that each lake complies with Total Phosphorus (TP) limits and at least one of the primary response variable standards (chlorophyll *a* and Secchi transparency). The Lake of the Woods TP exceeds the 30 microgram per liter (µg/l) limit and the chlorophyll *a* 9 µg/l limit. The TMDL study examines the pollutant sources that are contributing to the water quality standard exceedances. These sources could include the Rainy River Watershed tributaries, tributaries that drain directly into the lake, the immediate watershed area including the

shoreline, septic systems, wastewater treatment plants, and industrial facilities. An additional source could be the lake itself, through a process referred to as 'internal loading'. Nutrient-rich lake sediments can release nutrients back into the lake water under certain low-oxygen conditions. Finally, atmospheric deposition can be a source when nutrients are carried into the system through wind currents and precipitation. Since the Lake of the Woods has such a large surface area, the effects of atmospheric deposition will likely be higher than with most other lake TMDL studies.

Once the nutrient sources are identified, the TMDL study will examine how much pollutant loading Lake of the Woods can take in without becoming impaired. Once the lake's 'loading capacity' is determined, the pollution reduction needed to restore water quality is calculated by subtracting the current amount of pollution loading from the lake's loading capacity. The TMDL study must also account for a margin of safety and future growth. All of this information is combined to determine the maximum amount of pollution that the lake can receive, on a daily basis, without becoming impaired.

Project Timeline

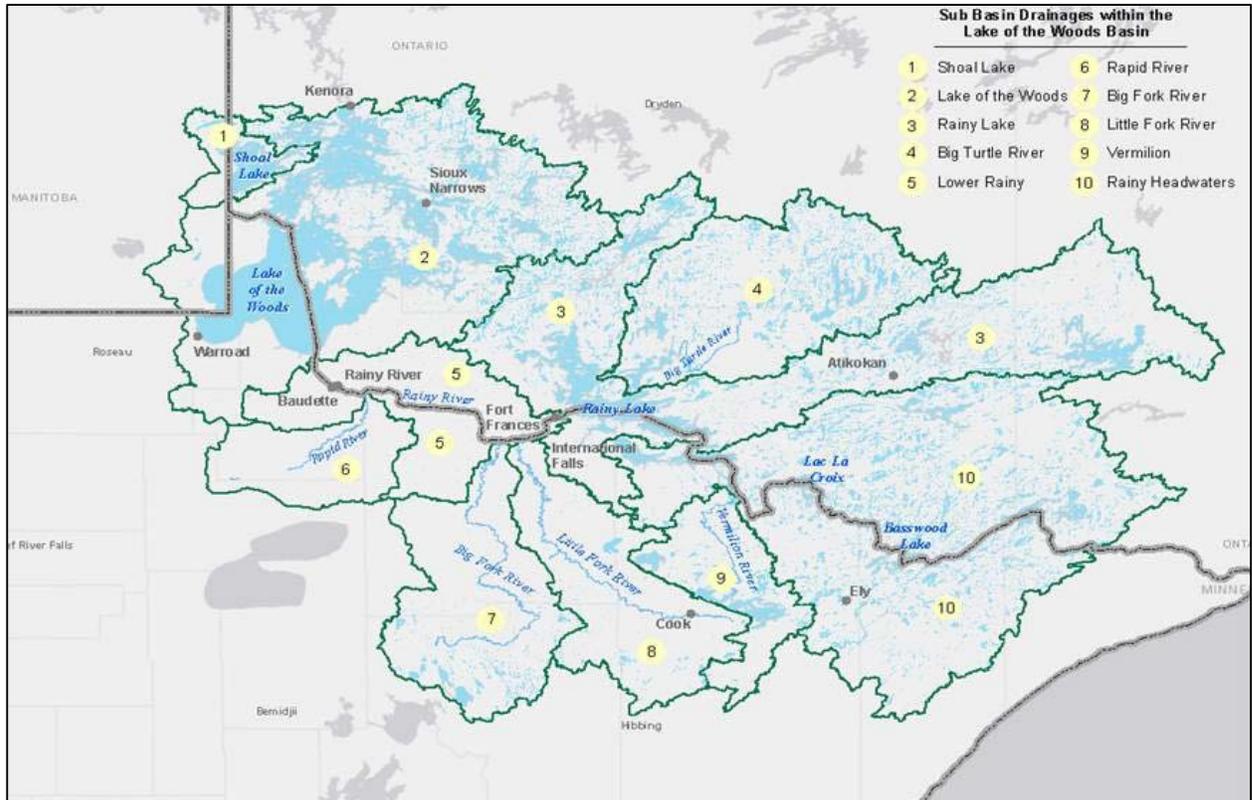
November 2015	Update Hydrologic Simulation Program –Fortran (HSPF) and BATHTUB models
October 2015 - April 2016	Develop individual components of the TMDL Study
February - December 2016	Develop draft TMDL Report
June 2016 - June 2017	Develop restoration plan
January - June 2017	Prepare TMDL Report for Official Public Notice of Comment Period



What areas are comprised in the Lake of the Woods TMDL?

The Lake of the Woods is an international water located on the U.S. and Canadian border between Minnesota, Ontario, and Manitoba. The lake covers 1,484 miles (384,613 hectares) with approximately 3 percent of the total lake surface in Manitoba, 31 percent in Minnesota, and the remaining 66 percent in Ontario. An area of approximately 27,200 square miles (70,448 square

kilometers) drains into this lake from both the watershed surrounding the lake as well as the Rainy River Basin, with 11,152 square miles (41 percent) in the U.S. and 16,048 square miles (59 percent) in Canada. Rainy River is the largest tributary to the lake, contributing over 70 percent of the inflow to LOW.



Who is conducting the project?

The Minnesota Pollution Control Agency has overall responsibility for this project and has contracted with the Lake of the Woods Soil and Water Conservation Service and RESPEC Consulting and Services to conduct the study and coordinate activities associated with the study.

Is the public involved?

Yes the Project Team will be working with stakeholders and gathering public input to develop the TMDL study document and the restoration plan. In order to complete these documents, feedback from the public is necessary. The Project Team will hold two rounds of public meetings; one in spring 2016 and another in spring of 2017 to obtain input on the project. Project ideas gathered in these public engagement events will be addressed in the final reports. Additionally, the public can stay involved by and help keep others up-to-date by sharing this website and project updates. Finally, connect with a Key Contact (listed above) if you have suggestions about events or publications where this project could be highlighted.

What does a TMDL on LoW mean for Canada and the First Nation communities?

The Total Maximum Daily Load (TMDL) program is a construct of the United States Environmental Protection Agency (U.S. EPA) through their implementation of the requirements of the U.S. Federal Clean Water Act. In Minnesota waters, the State of Minnesota administers the program with U.S. EPA oversight. As such, Minnesota's TMDL program only applies and has jurisdiction in Minnesota.

The goal of Minnesota's TMDL program is to address Minnesota sources of pollution that contribute to a water quality problem or impairment in Minnesota's waters. The Minnesota Pollution Control Agency has determined that Minnesota's portion of Lake of the Woods (LoW) does not support its aquatic recreation beneficial use designation, due to excessive nutrients. Therefore, this TMDL project is focused on identifying, quantifying, and addressing Minnesota pollution sources that contribute to a nutrient impairment in LoW.

Minnesota recognizes and cares about the "downstream" impacts of Minnesota nutrient sources to the waters of Canada. By identifying, quantifying, and working to address "upstream" nutrient sources, Minnesota is striving to move in a positive direction to improve overall LoW water quality.

In the TMDL project, Minnesota will strive for a realistic water quality goal based on Minnesota's water quality standards and beneficial uses. While the project only applies in Minnesota, we understand and respect the authorities of our Canadian partners (federal, provincial, First Nations) with regard to LoW water quality management. Minnesota has a long history of working cooperatively with our Canadian partners, which predates this TMDL project. In fact, many of the numerous cooperative efforts and activities over the past 15+ years have generated significant data and information that will be directly used in the development of the TMDL. Therefore, as the TMDL is drafted over the next two years, Minnesota will continue to seek input and feedback from our Canadian partners.

What is the Technical Advisory Committee?

The Technical Advisory Committee (TAC) was established in order to provide critical input and review to the project team throughout the study. The objective of the TAC is to provide independent advice to the LoW TMDL project team on the scientific and technical aspects associated with the development of the TMDL for the Lake of the Woods.

TAC Members:

- Richard Kiesling, United States Geologic Service
- Kayla Bowe, Red Lake Department of Natural Resources
- Kelli Saunders, Lake of the Woods Sustainability Foundation
- Paula Spencer, Ontario Ministry of Environment and Climate Change
- Andy Paterson, Ontario Ministry of Environment and Climate Change
- Chad Severts, Minnesota Board of Water and Soil Resources
- Chris Parthun, Minnesota Department of Health
- Phil Talmage, Minnesota Department of Natural Resources

Key Contacts:

- Cary Hernandez, MPCA Project Manager, cary.hernandez@state.mn.us, 218-846-8124
- Mike Hirst, Lake of the Woods SWCD, Mike.Hirst@mn.nacdn.net, 218-634-1842 x4
- Julie Blackburn, RESPEC Project Manager, Julie.blackburn@respec.com, 651-605-5705