

Lake Winnipeg Basin Indicator Series

INTRODUCTION

Lake Winnipeg is the tenth largest freshwater lake in the world by surface area and the third largest freshwater reservoir. The Lake Winnipeg watershed encompasses four provinces and four states. The lake is important to Manitobans as a major commercial and subsistence fishery, a drinking water source for permanent and seasonal residents, as well as for recreation and tourism.

Rivers can transport phosphorus, nitrogen, and suspended solids from throughout the basin to the lake. Point and non-point sources of pollutants such as municipal and industrial effluents and run-off from the land also go into the rivers. As a result, the lake is undergoing accelerated nutrient enrichment (eutrophication) and algal blooms are increasing in frequency and severity. Other considerations related to human activities within the Lake Winnipeg Basin include:

- water withdrawal
- drainage
- water diversions
- soil erosion
- agricultural practices
- changes in the extent of wetlands



Canada and Manitoba, as parties to the Memorandum of Understanding Respecting Lake Winnipeg and the Lake Winnipeg Basin, committed to a co-operative and co-ordinated approach to understand and protect the water quality and ecological health of Lake Winnipeg and its basin. As part of that agreement, Canada and Manitoba agreed to adopt appropriate indicators for assessing the status and trends in the ecosystem health of Lake Winnipeg.

WHAT ARE INDICATORS?

Environmental indicators are measurements of the condition of an ecosystem, or the state of its health. They condense complex environmental data into understandable information, and can help show progress towards targets or goals. Examples of indicators include:

- descriptions of observed conditions within the lake, such as water quality conditions
- other ecosystem conditions, such as the health of the fishery
- watershed indicators, such as status of wetlands in the basin

■ **Figure 1.** The Lake Winnipeg drainage basin is a vast and varied landscape mosaic, with varied human activities throughout.



The indicators described in this series will evolve as knowledge and data availability improves. The objectives of the Lake Winnipeg Basin indicators are to:

- communicate the issues facing Lake Winnipeg and its basin
- describe each selected indicator and why it is important
- describe the current status and trends of each indicator
- describe why a status or trend is observed
- connect each indicator to the overall long term health of the lake and its basin
- describe what actions are underway to improve the health of Lake Winnipeg

OUTLOOK

Lake and watershed-based indicators will describe the current status and trends in the health of the Lake Winnipeg Basin. Issues related to the health of the lake include point and non-point sources of nutrient loading. These affect the nutrient concentrations in the lake, the magnitude and extent of algal blooms, fish population health and aquatic invasive species.

Over the next several years, a series of indicator fact sheets will be released about Lake Winnipeg and its basin. They are being developed by local experts in each topic area. Planned topics include:





- nutrients (nitrogen and phosphorus)
- recreational beach water quality
- fish populations
- zooplankton
- algal blooms
- land use
- aquatic invasive species

Additional indicators related to upstream (basin) and socio-economic topics will be identified. Fact sheets will be revised periodically as datasets are updated. The Lake Winnipeg Basin Indicator Series is intended to improve our understanding of the lake and its basin, the issues it faces and what we can all do to improve the state of the lake.



Each indicator factsheet will include information on indicator status and trends (whenever possible), and will be compared to criteria or benchmarks where available.

In the Lake Winnipeg indicator fact sheet series, the following colours and symbols will show the general status of each indicator.

-  **Good:** Most or all of the indicator (and/or components) are in acceptable condition.
-  **Fair:** Only some indicator components are in acceptable condition.
-  **Poor:** Very few or no indicator components are in acceptable condition.
-  **Undetermined:** Data are not available or are insufficient to assess the condition of the components.

In the Lake Winnipeg indicator fact sheet series, the following terms show the general trend of each indicator.

- Improving:** Metrics show a change toward a more acceptable condition.
- Stable:** Metrics generally show no overall change in condition.
- Deteriorating:** Metrics show a change away from acceptable condition.
- Undetermined:** Metrics do not indicate a clear overall direction, or data are not available.

FOR MORE INFORMATION:

Manitoba Sustainable Development
www.manitoba.ca/sd/index.html

Environment and Climate Change Canada
www.canada.ca/en/environment-climate-change

Canadian Environmental Sustainability Indicators: Nutrients in Lake Winnipeg.
<https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/nutrients-in-lake-winnipeg.html>

The Canadian Watershed Information Network (CANWIN)
<http://lwbin-datahub.ad.umanitoba.ca/>



CONTRIBUTORS:

The Lake Winnipeg Indicators Steering Committee (Last Updated: March 2018)

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