# The Lake Partner Program Monitoring Ontario's Inland Lakes





Federation of Ontario Cottagers' Associations

#### The Lake Partner Program

The Lake Partner Program (LPP) is Ontario's volunteer-based, water-quality monitoring program. The Ontario Ministry of the Environment, Conservation and Parks (MECP) coordinates this program from the Dorset Environmental Science Centre (DESC) in partnership with the Federation of Ontario Cottagers' Associations (FOCA). Through the use of citizen scientists, water quality data has been collected for more than 23 years.



Figure 1: geographic extent of LPP sites sampled in Ontario. Generally, lakes on the Canadian Shield are sampled once in the spring, and lakes off the Shield are sampled monthly from May-October.

#### Who Uses the Lake Partner Program Data?

The LPP data is published the following spring on a provincial website, as well as the FOCA website. The posted data are used by members of the public, partner agencies, government and academic researchers, and private consultants to assess and report on water quality in lakes across Ontario.





In over 500 lake associations





Sampling on over 550 inland lakes

At over 800 sample sites





Contributing over 2600 hours annually

To gather over 4,400 phosphorus samples





Contributing over \$500,000 in in-kind field research every year

With over 23 years of data collected



### **The Lake Partner Program Parameters**

The LPP focuses on the parameters phosphorus, calcium, chloride, and water clarity. By measuring these parameters, it is possible to detect long-term changes that may be due to impacts of shoreline development, climate change and other stresses.

	Why is it important?	What do changes in this parameter cause?
Phosphorus	Phosphorus is the element that limits aquatic plant (including algae) growth in the majority of Ontario lakes.	Increases in phosphorus may stimulate algal growth, resulting in decreased water clarity, reduced deep-water oxygen concentrations that can affect fish health, and, in extreme cases, cause algal blooms that may produce toxins, affect the aesthetics of the lake, and/or cause taste and odour problems in the water.
Calcium	Calcium, the "backbone of life," is an essential nutrient for all living organisms.	Calcium levels are declining in Canadian Shield lakes, which can lead to stress on aquatic ecosystems, especially when combined with warmer temperatures that are predicted with climate change.
Water Clarity	Water clarity is directly related to the depth that sunlight can penetrate a lake.	Water clarity readings are valuable to track changes in the lake that would not be noticed by monitoring TP concentrations alone, such as impacts from invading species (e.g., zebra mussels), climate change effects, or watershed disturbances.
Chloride	Chloride is an essential element found in fresh and salt water.	As road salt more frequently makes its way to waterbodies through runoff, it is important to monitor Ontario's inland lakes for any harmful effects of excess chloride.

Table 1: LPP parameters, their importance, and their impacts.

#### Lake Partner Program Data Uses: Case Examples

The LPP database contains data from the 1990s, through to this year. This database is tremendously helpful in understanding lake health and trends. Lakes that have been sampled for long periods of time have a strong background of information which can aid in lake management. This database is used by a variety of people, organizations, associations, and researchers.

#### Case Study: Algal blooms Reports Echo High Phosphorus Sampling

From 1994-2009, algal blooms reported to the MECP significantly increased. From 2002-2009, lakes where cyanobacteria blooms were reported had higher median total phosphorus concentrations (15  $\mu$ g/L), compared to a dataset from 1074 LPP monitored lakes (9  $\mu$ g/L). Monitoring nutrient levels, especially phosphorus, of Ontario's lakes will be crucial in order to protect Ontario's aquatic ecosystems, and to limit algal blooms in the future.



Figure 2: Total number of algal bloom events reported to the Ontario Ministry of the Environment each year from 1994 to 2009 with breakdown of reports by dominant algal group.

#### Case Study: The Relationship Between Water Clarity and Real Estate Values

A 2014 study by Clapper and Caudill used LPP data to study the relationship between water clarity and cottage prices. Using data modeling, a 1-foot increase in water clarity as measured by Secchi depth was found to be associated with about a 2% increase in cottage value. The results of this study emphasize the fact that Ontario's water quality impacts multiple facets of life in the Province; in addition to environmental health, the economy and recreational enjoyment are directly effected.



## Thank you to our volunteers across Ontario!



# To find out more, check out:

- https://foca.on.ca/lake-partner-program-sampling-assistance/
  https://desc.ca/programs/LPP
- https://www.ontario.ca/environment-and-energy/map-lake-

partner