

Lake Water Quality Program

Environmental Planning Initiatives



2020 Annual Report

City Of Lakes

The City of Greater Sudbury is recognised as the 'City of Lakes'. With over 330 lakes, it contains more lakes than any other municipality in Canada. These lakes are prized by our citizens who have a vested interest in their health and quality.

Lake Water Quality Program

The Lake Water Quality Program helps ensure that Greater Sudbury is positively recognised as a City of Lakes. The Lake Water Quality Program advocates for the ecological health of the lakes, provides lake water quality monitoring and education, offers technical support to lake stewardship groups and the community, and provides research into various issues related to lake water quality.

Staffing

The City of Greater Sudbury provides funding for the full-time position of the Program Co-ordinator and a seasonal summer student. These positions are responsible for the day-to-day program and activities including water quality monitoring, shoreline home visit program, technical assistance to lake stewardship groups and the Watershed Advisory Panel. Additional duties include website content management and report writing.

Summary of Activities

This year, in collaboration with its partners, the Lake Water Quality Program carried out its annual spring phosphorus sampling, the Love Your Lake shoreline assessment program, aquatic vegetation mapping, weekly cyanobacteria watch on Ramsey lake, the Lake Stewardship Grant Program and co-ordinated the Shoreline Home Visit Program. In summary:

- 4 lakes sampled for spring phosphorus, sodium and chloride.
- 274 properties on Nepahwin Lake totaling 11.8 km of shoreline were surveyed through the Love Your Lake shoreline assessment program.
- Robinson Lake was selected to be a part of the aquatic vegetation mapping project undertaken by the Lake Water Quality program. Mapping of all 214 points on Robinson Lake was completed during the 2020 season.
- Weekly cyanobacterial bloom (blue-green algae) watch conducted on Lake Ramsey during the summer for early detection of cyanobacterial blooms.
- 10 lake stewardship grants awarded for a total of \$4900 in funding to local lake stewardship groups.
- 5 Watershed Advisory Panel meetings held in 2020.
- 31 active lake stewardship groups.

Lake Water Quality Program Components

Spring Phosphorus Sampling Program

The City of Greater Sudbury has been sampling a group of approximately 67 local lakes for spring phosphorus since 2001 on a rotating basis. These lakes were chosen based on their historical phosphorus levels, waterfront development pressures, and requests from lake stewardship groups. Phosphorus is the main contributing nutrient that controls the growth and development of algae. Spring phosphorus samples are taken during a natural phenomenon called “spring turnover”. This event occurs shortly after ‘ice off’ in spring when the water on the surface warms up and becomes the same temperature as the bottom of the lake. Through wind action the surface water mixes with the bottom layers creating equilibrium in the water column. With the water column is entirely mixed, spring turnover is optimal for sampling for phosphorus concentration in Canadian Shield lakes as recommended by the Ontario Ministry of the Environment, Conservation and Parks. Phosphorus can enter a lake through natural sources, such as aerial deposition, wildlife, vegetation cover, and soil. Phosphorus can also enter our local lakes through human activity, including fertilization of lawns and gardens, agricultural practices, detergents and cleaners, and private, industrial and municipal wastewater.

Spring Phosphorus Results

2020 spring phosphorus sampling was conducted in May and included Ramsey Lake, Red Deer Lake, Nepahwin Lake and Long Lake. In former years, annual sampling has been conducted by helicopter, which allows around 40 to 45 lakes to be sampled in one day. A helicopter could not be used due to protocols in place to protect against COVID-19. Water samples are typically analyzed through the provincial Lake Partner Program in conjunction with the Dorset Environmental Lab. Due to the COVID-19 pandemic, the Dorset Lab was not accepting any samples for 2020. The Lake Water Quality Program instead chose a number of high priority lakes in the area and samples analyzed locally at Testmark Laboratories Ltd as well as ALS Ltd in Waterloo.

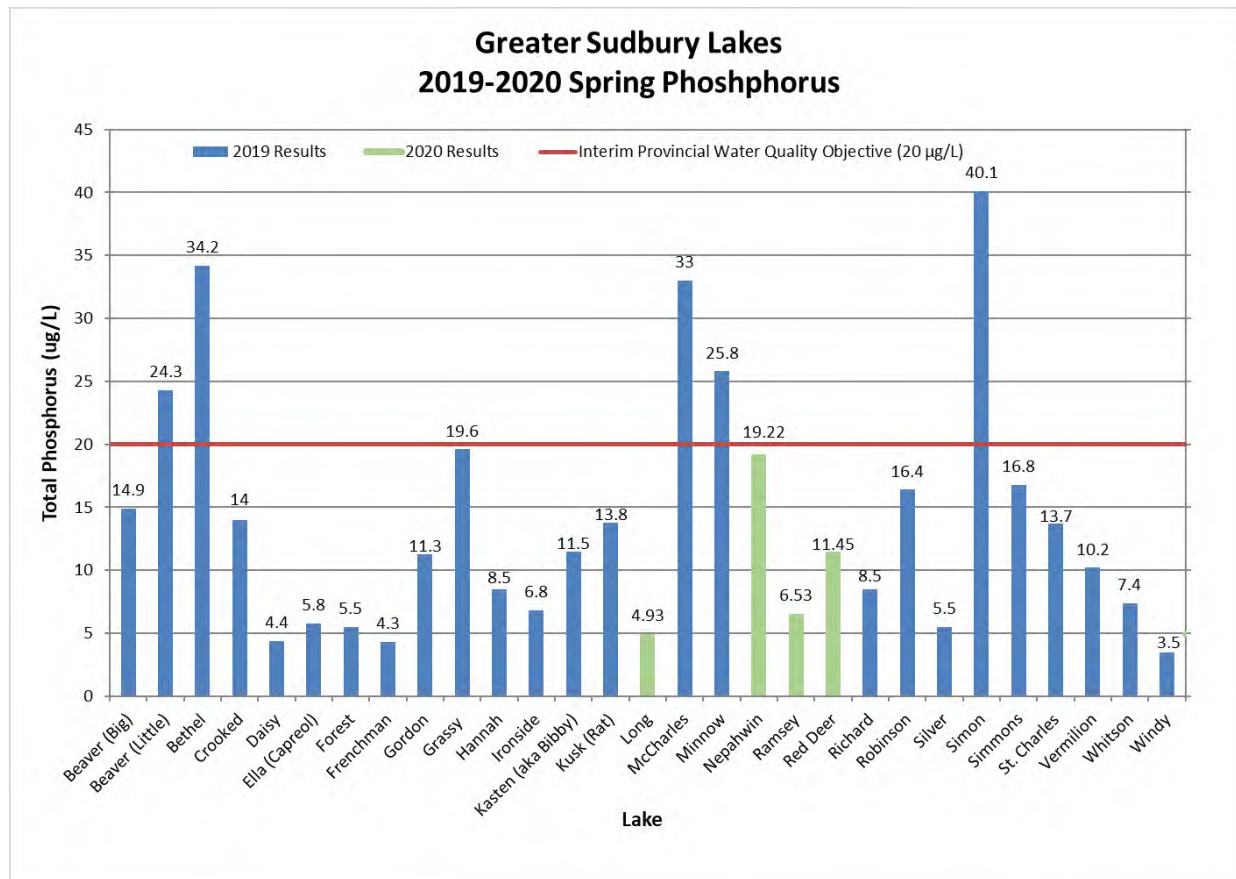
Of the lakes sampled, none had phosphorus concentrations greater than the Interim Provincial Water Quality Objective of 20 µg/L (micrograms per litre). Phosphorus concentrations that are at, or above this level indicate that the lake is likely eutrophic (nutrient rich) and at greater risk of developing algal blooms.

A graph on page 3 shows the 2019 and 2020 spring phosphorus results. Graphs detailing spring phosphorus results for each lake from 2019-2020 can be found in Appendix A of this report.

Weekly Cyanobacteria (Blue-green Algae) Watch

Lake Water Quality Program staff checked for signs of cyanobacterial blooms on Lake Ramsey once a week throughout the summer. This was the fifth year that the City undertook this initiative which aims to provide early warning of developing cyanobacterial blooms for residents and operators of the David Street water treatment plant. The initiative involved a weekly visual check of the entire lake, including beaches, main basins and small bays by way of a motor boat. No cyanobacterial blooms were detected on Ramsey Lake during the 2020 season by this initiative. Public Health Sudbury and Districts, however, confirmed one cyanobacterial bloom on July 14, 2020.

The bar graph below indicates the 2019-2020 spring phosphorus sampling results for 29 local lakes.



Aquatic Vegetation Mapping – Robinson Lake

Between July 21, 2020 and July 24, 2020 staff performed a vegetation survey of Robinson Lake to identify aquatic plant species present within the lake during this period. The goal of the project is to create a database of locations in which aquatic plant species are present including the invasive Eurasian Watermilfoil (EWM). Lakes will be revisited in future years to determine changes in EWM presence, which may aid in the development of invasive species management strategies.

The sampling procedures adopted for this project are based on those outlined in the Wisconsin Department of Natural Resources’ “Recommended Baseline Monitoring of Aquatic Plant in Wisconsin: Sampling Design Field and Laboratory Procedures, Data Entry and Analysis, and Applications.” Using calculations outlined in this document as well as a journal article¹, 214 sampling points were created based on lake surface area, depth and the shoreline development factor. Each point was sampled by canoe using a double-sided rake and three rake tosses at each location. Aquatic plants were identified for each toss. Maps were created showing the distribution of each species within the lake and the relationship between the various species found within the lake.

¹ Mikulyuk A, Hauxwell J, Rassmussen P, Knight S, Wagner KI, Nault ME, Ridgely D. 2010. Testing a methodology for assessing plant communities in temperate inland lakes. *Lake Reserv Manage* 26:54–62.

The survey reveals the presence of thirteen (13) aquatic plant species in Robinson Lake (Table 1). The mapping also shows the relative density of vegetation at the site and the dominate vegetation found at each site. A complete report will be available under a separate cover.

Table 1. Aquatic plant species composition and percentage of sampling locations in descending order for species present from Robinson Lake vegetation sampling conducted in 2020.

Common Name	Scientific Name	Locations Present	% of Sampling Locations
Muskgrass	<i>Chara spp.</i>	90	42%
Eurasian Water Milfoil (non-native)	<i>Myriophyllum spicatum</i>	54	25%
Slender Pondweed	<i>Potamogeton diversifolius</i>	43	20%
Common Waterweed	<i>Elodea canadensis</i>	35	16%
Sago Pondweed	<i>Stuckenia pectinata</i>	33	15%
Wild Celery/Tapegrass	<i>Vallisneria americana</i>	13	6%
Northern snail-seed pondweed	<i>Potamogeton spirillus</i>	4	2%
White Waterlily	<i>Nymphaea odorata</i>	5	2%
Arrowhead	<i>Sagittaria latifolia</i>	2	1%
Slender Niad	<i>Najas Flexis</i>	2	1%
Yellow Waterlily	<i>Nuphar lutea</i>	2	1%
Northern Water Milfoil	<i>Myriophyllum sibiricum</i>	1	0.5%

Watershed Advisory Panel

The Watershed Advisory Panel is appointed by City Council to provide advice and recommendations to the municipality on matters relating to watershed and lake water quality in Greater Sudbury. Current Panel members were appointed in 2018 for a three-year term, ending with the term of Council in 2021. A total of 5 meetings were held in 2020.

Members

The Watershed Advisory Panel is made up of one City Councillor, eight community volunteers, five technical experts and two City staff.

Community Volunteers

Krishnan Venkatraman - Chair
Elaine Porter
Jean-Yves Bujold
Justin Vaillancourt

Kimberly Wagg
Leo La Sorsa
Richard Witham
Stewart Meikelham

Technical Experts

Burgess Hawkins – Sudbury & District Health Unit
Derrick Luetchford - MNRF
Dr. Charles Ramcharan – Laurentian University

Ed Snucins – Ontario Ministry of Environment
Anoop Naik – Conservation Sudbury

City Councillors

Deb McIntosh

City Staff

Stephen Monet – Manager of Environmental Planning Initiatives
Taylor Menard – Lake Water Quality Program Coordinator

Community Outreach

Love Your Lake Program

Love Your Lake, an outreach program of the Canadian Wildlife Federation and Watersheds Canada, offers stewardship education to individual shoreline residents based on comprehensive shoreline assessments. In Greater Sudbury, the field work and administration of this program is undertaken by Lake Water Quality staff. Underway locally since 2014, Love Your Lake yields individualized, confidential recommendations to shoreline residents over an entire lake. Residents are encouraged to become stewards of their lake by acting on the recommendations to improve the health of their lake.

In 2020 the Lake Water Quality program initiated the Love Your Lake shoreline assessments on Nepahwin Lake. A total of 247 properties and their shorelines were assessed and completed. Final reports for each property will be sent to property owners in spring 2021.

Lake Stewardship Grant Assistance Program

Introduction

Established as a pilot project in 2005, the Lake Stewardship Grant Program assists lake stewardship groups in carrying out projects that protect and improve the water quality and natural environment of the lakes. The Grant Program is funded by the City of Greater Sudbury through its Lake Water Quality Program. The Lakes Advisory Panel awards individual grants to stewardship groups in Greater Sudbury.

Grant applicants were required to demonstrate how their proposed project would improve or protect the water quality of the lake and/or watershed and increase support from the lake community. In total, 10 applications for funding were received with a total funding allocation of \$4,900. The following is a list of the successful applicants.

Funding recipients for 2020

Four Lakes Community Association

Project Name: Shoreline Plant Growing Contest

Amount Received: \$500 (\$200 by way of a cash grant and the remainder by way of provision of native shoreline plants purchased by City of Greater Sudbury to a maximum cost of \$300)

Lake Wahnapiatae Home and Campers Association

Project Name: Septic Tank Pump Out & Maintenance Incentive

Amount Received: \$500 by way of a cash grant

Long Lake Stewardship

Project Name: Lake Aquatic Invaders Control in Sudbury – Phase 2

Amount Received: \$500 by way of a cash grant

Nepahwin Lake Watershed Stewardship Group

Project Name: Love Our Lake Initiative

Amount Received: \$500 by way of a cash grant

Lake Panache Camper's Association Inc

Project Name: Association Communication, Hazardous Waste Day & Semi-annual Water Sampling

Amount Received: \$500 by way of a cash grant

Richard Lake Stewardship

Project Name: Richard Lake Calendar

Amount Received: \$500 by way of a cash grant

Clearwater Lake Stewardship

Project Name: 4 Seasons of Events

Amount Received: \$500 by way of a cash grant

Onwatin Lake Stewardship Committee

Project Name: Onwatin Lake Cleanup and Information Session

Amount Received: \$500 (\$300 by way of a cash grant and the remainder by way of provision of native shoreline plants purchased by City of Greater Sudbury to a maximum cost of \$200)

St Charles Lake Watershed Stewardship Association

Project Name: St. Charles Lake Watershed 2020 Initiatives

Amount Received: \$400 by way of a cash grant

Ramsey Lake Stewardship Committee

Project Name: Tree and Shrub Plantings and Newsletter

Amount Received: \$500 (\$100 by way of a cash grant and the remainder by way of provision of native shoreline plants purchased by City of Greater Sudbury to a maximum cost of \$400)

Stewardship Groups

Currently, there are 31 lake stewardship groups throughout the Greater Sudbury area, acting as important agents for positive change in shoreline living practices.

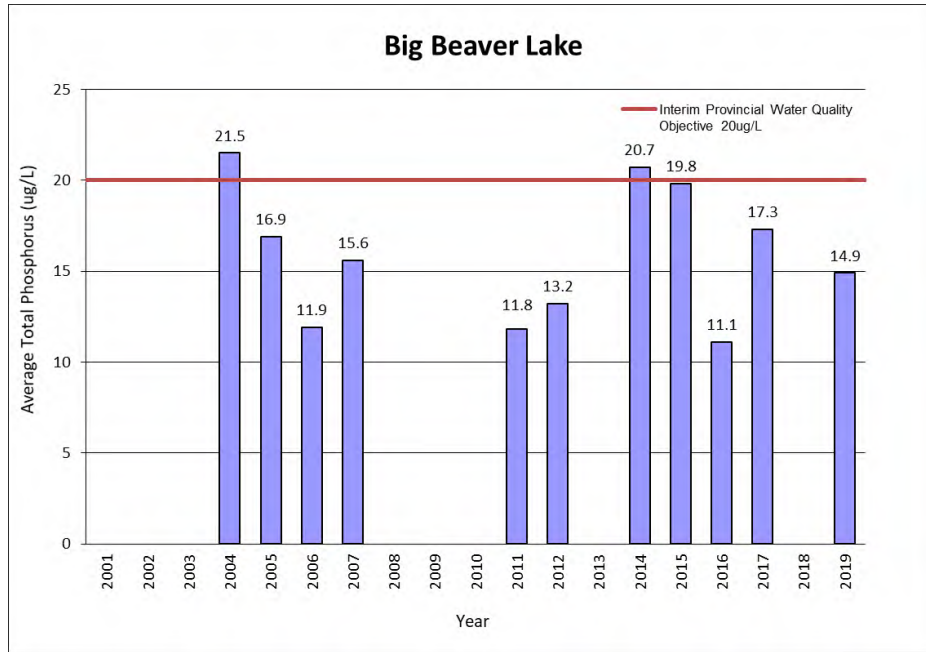
The following is a list of the active lake stewardship groups in Greater Sudbury.

Stewardship Group	Lake(s)	Website
Friends of Bennett Lake	Bennett Lake	
Black Lake	Black Lake	
Broder 23	Broder 23 Lake	
Clearwater Lake Stewardship	Clearwater Lake	
Crooked Lake	Crooked Lake	
Fairbank Lake Cottagers Association	Fairbank Lake	
Friends of McFarlane Lake	McFarlane Lake	
Grassy Lake	Grassy Lake	
Forest Lake Stewardship Committee	Forest Lake	
Four Lakes Association	Joe, Hanmer, Frenchman and Dixon Lakes	
Ironside Lake	Ironside Lake	
Kukagami Lake Campers Association	Kukagami Lake	
Kusk (Rat) Lake	Kusk (Rat) Lake	
Lake Nepahwin Watershed Stewardship	Nepahwin Lake	Website
Lake Panache Campers Association	Panache Lake	
Lake Robinson Stewardship	Robinson Lake	
Lohi Lake	Lohi Lake	
Long Lake Stewardship	Long Lake	Website
McCrea Lake Stewardship Group	McCrea Lake	
Minnow Lake Restoration Group	Minnow Lake	Website
Richard Lake Stewardship	Richard Lake	Website
St. Charles Lake	St. Charles Lake	
Silver Lake	Silver Lake	
Simon Lake	Simon Lake	
Vermilion Lake	Vermilion Lake	
Windy Lake Stewardship	Windy Lake	
Onwatin Lake Stewardship	Onwatin Lake	
Ramsey Lake Stewardship Committee	Ramsey Lake	Website
Vermillion River Stewardship	Vermillion River	Website
Whitewater Lake	Whitewater Lake	Website
Lake Wanapitei Lake Stewardship	Wanapitei Lake	Website

Appendix A Phosphorus Graphs for Lakes Sampled in 2019 & 2020

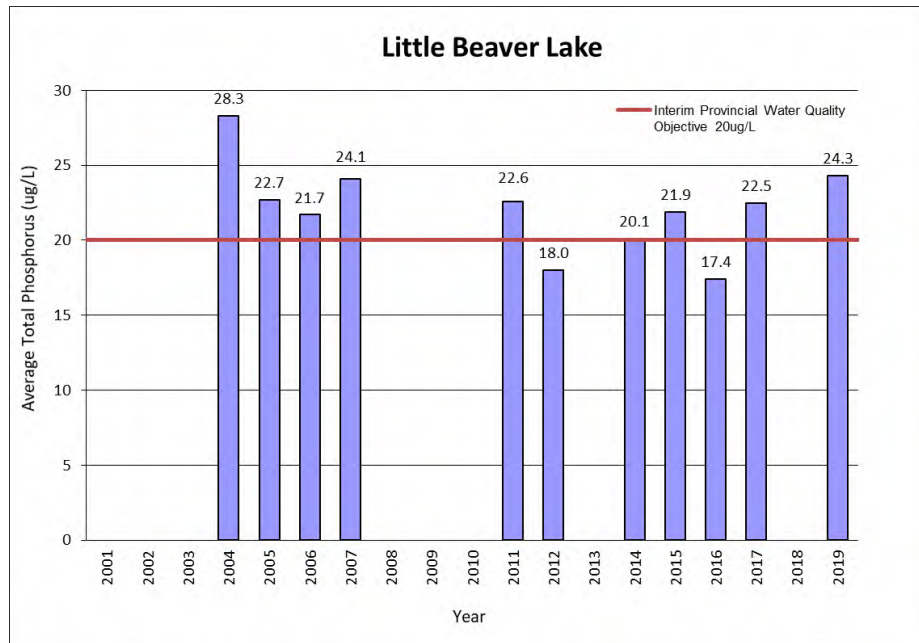
Big Beaver Lake

The bar graph below indicates the spring total phosphorus results for Big Beaver Lake 2001-2019.



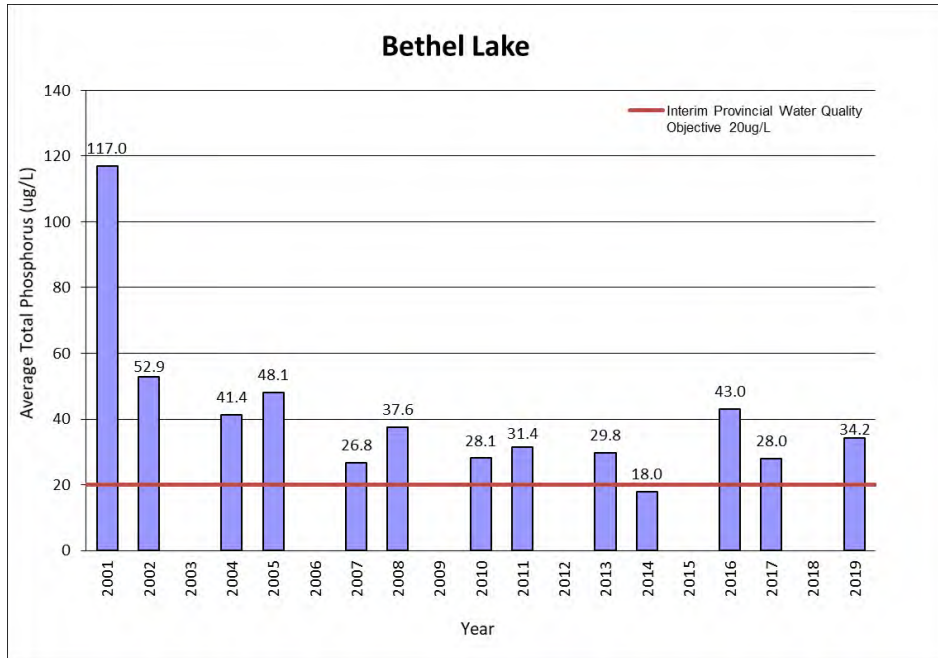
Little Beaver Lake

The bar graph below indicates the spring total phosphorus results for Little Beaver Lake from 2001-2019.



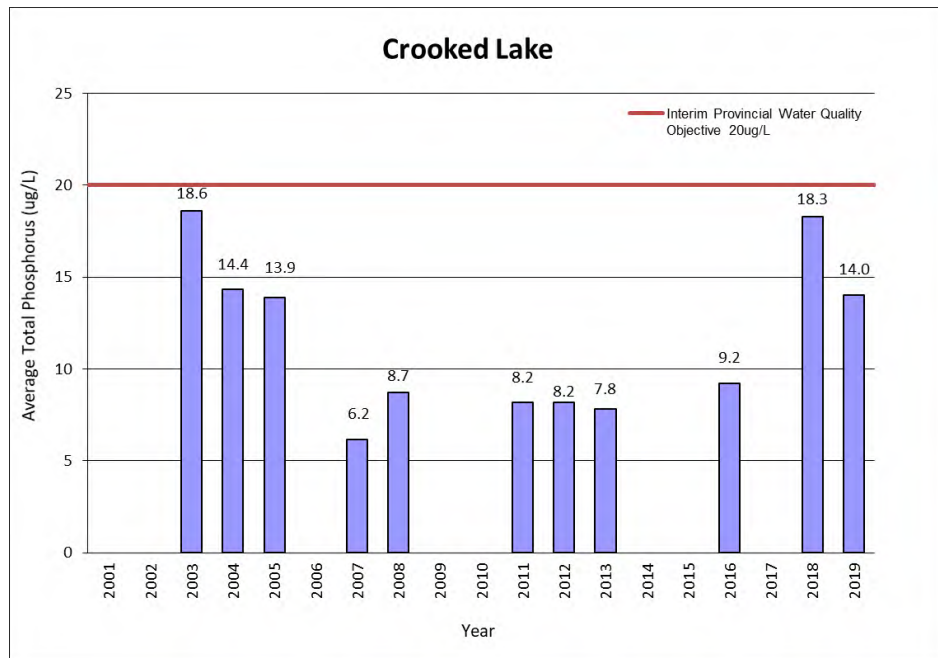
Bethel Lake

The bar graph below indicated the spring total phosphorus results for Bethel Lake from 2001-2019.



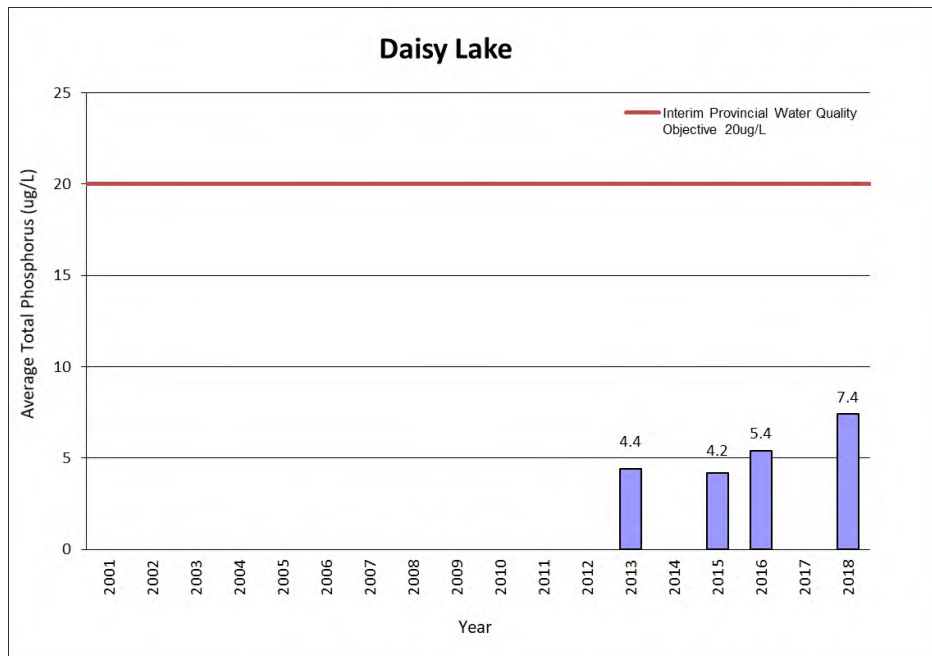
Crooked Lake

The bar graph below indicates the spring total phosphorus results for Crooked Lake from 2001-2019.



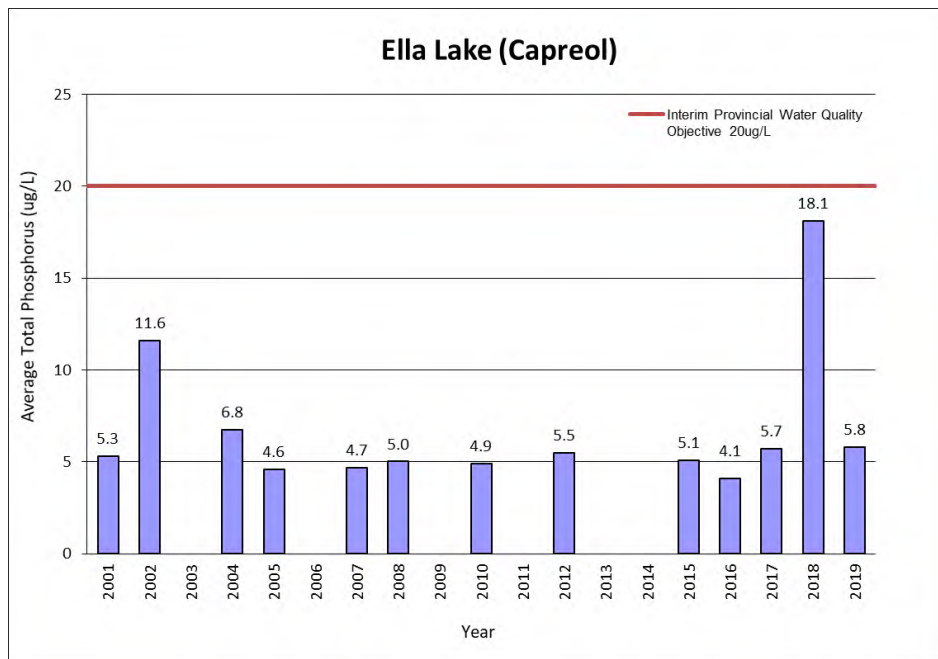
Daisy Lake

The bar graph below indicates the spring total phosphorus results for Daisy Lake from 2001-2019.



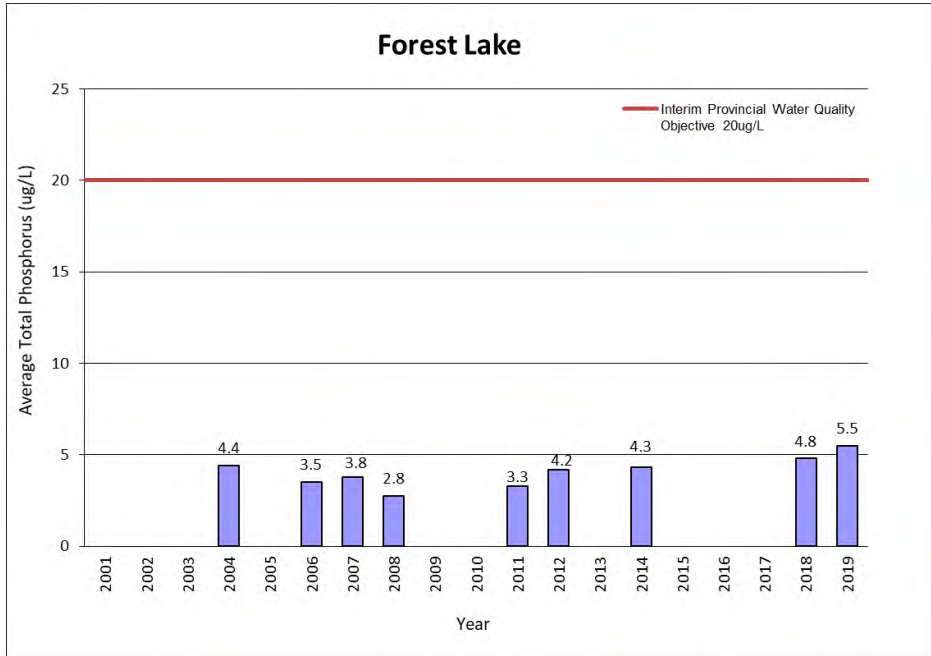
Ella Lake (Capreol)

The bar graph below indicates the spring total phosphorus results for Ella Lake from 2001-2019.



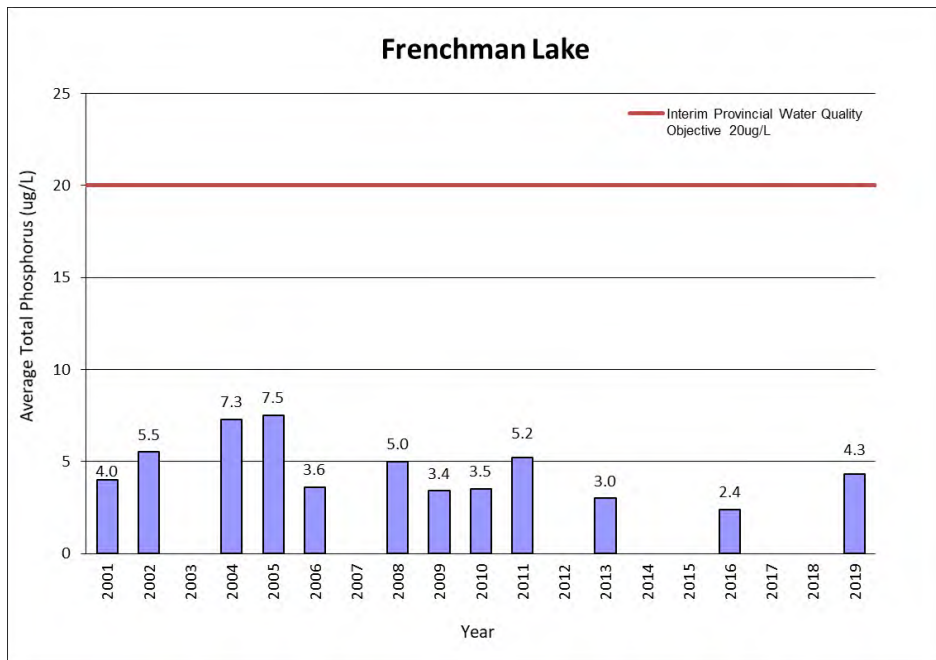
Forest Lake

The bar graph below indicates the spring total phosphorus results for Forest Lake from 2004-2019.



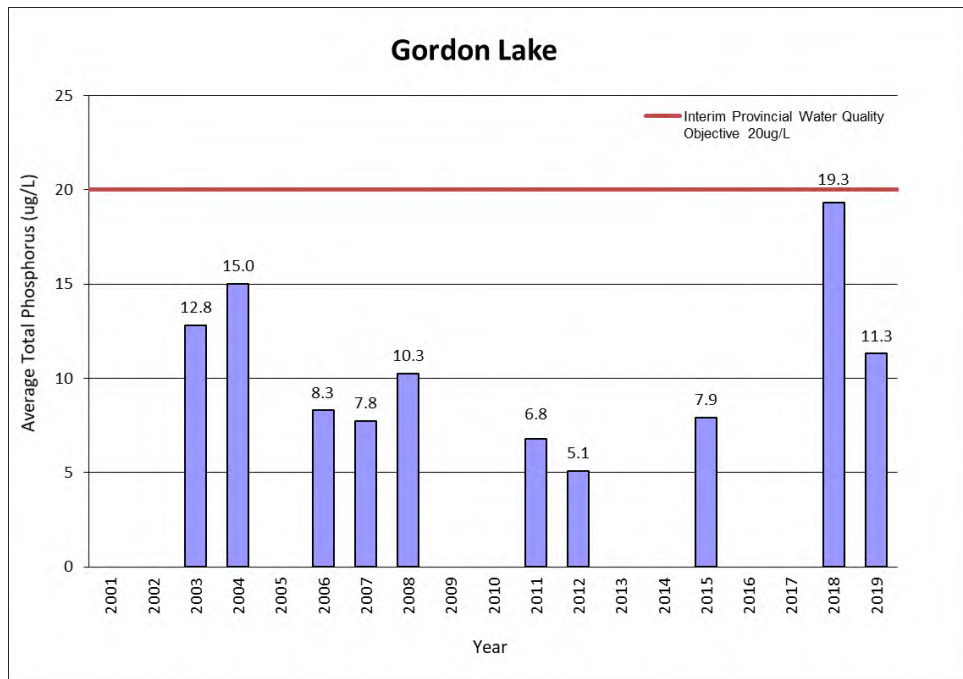
Frenchman Lake

The bar graph below indicates the spring total phosphorus results for Frenchman Lake 2001-2019.



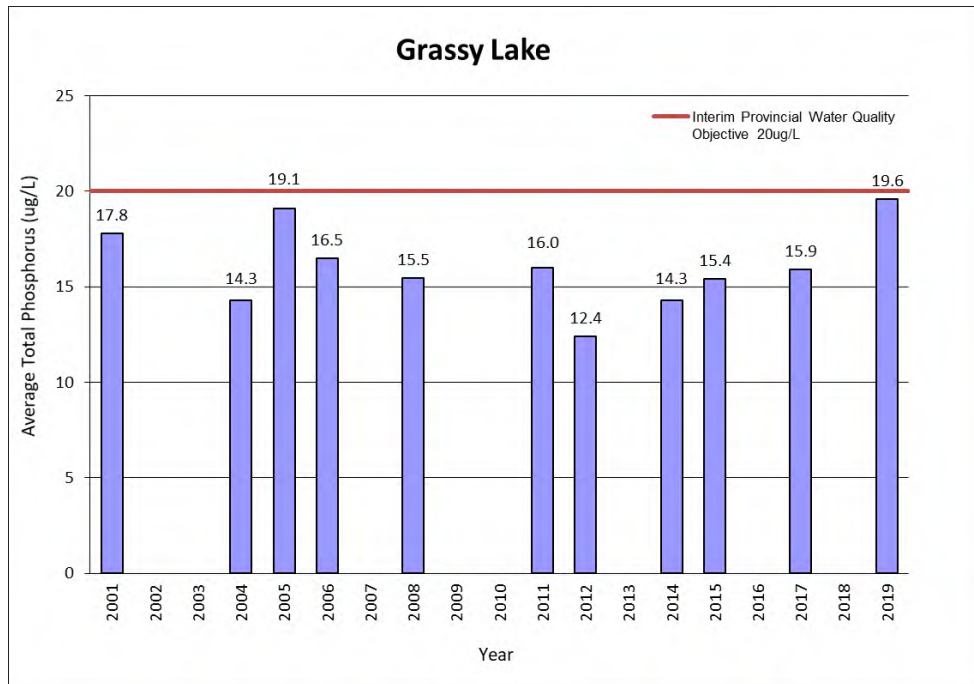
Gordon Lake

The bar graph below indicates the spring total phosphorus results for Gordon Lake from 2003-2019.



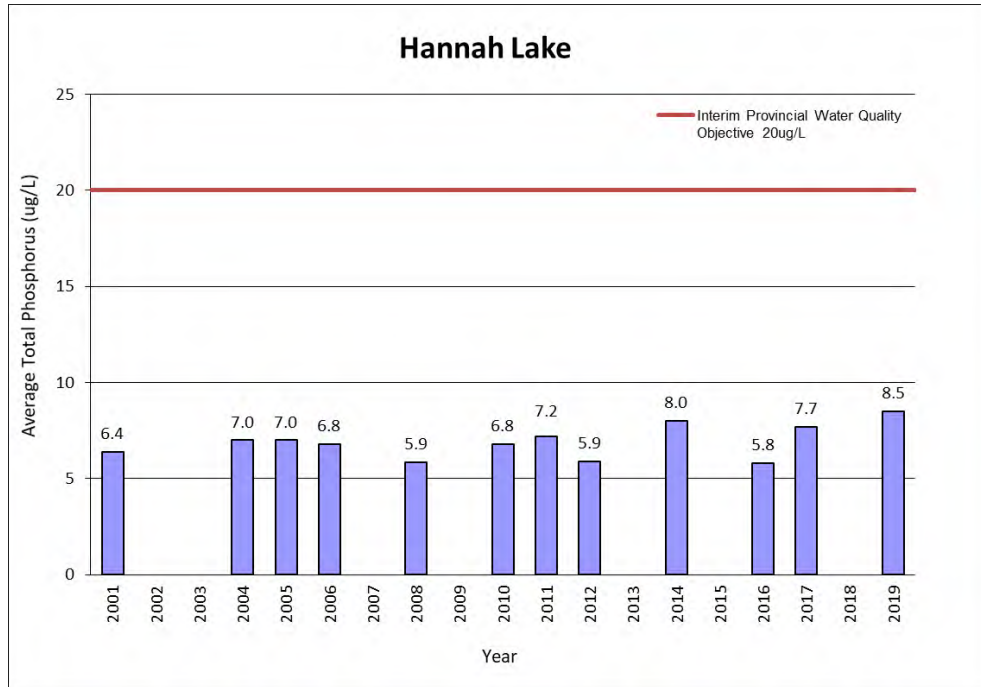
Grassy Lake

The bar graph below indicates the spring total phosphorus results for Grassy Lake from 2001-2019.



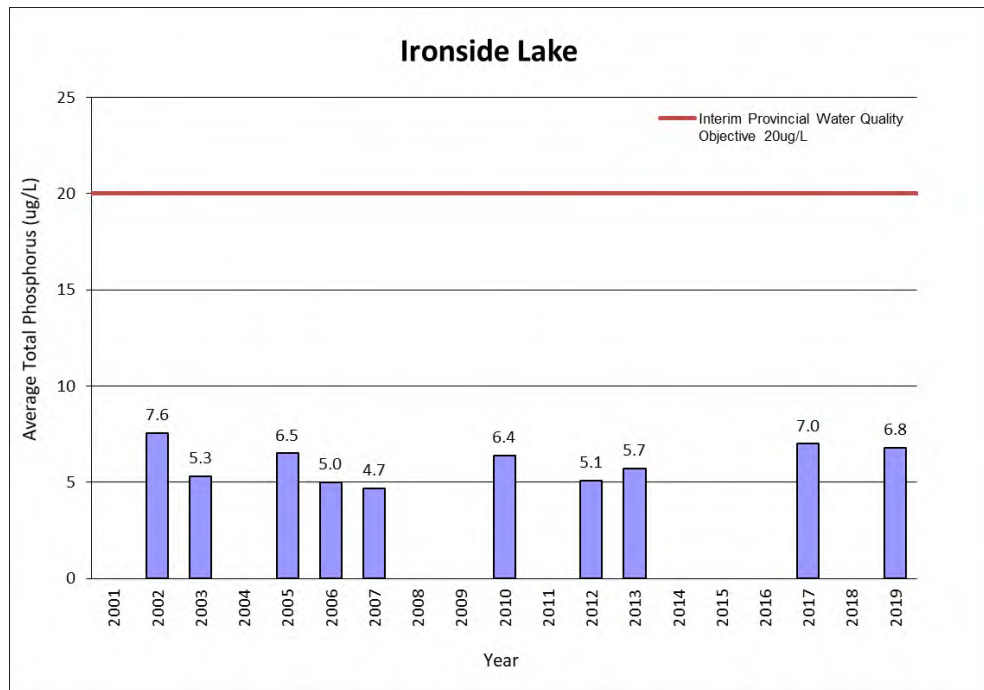
Hannah Lake

The bar graph below indicates the spring total phosphorus results for Hannah Lake from 2001-2019.



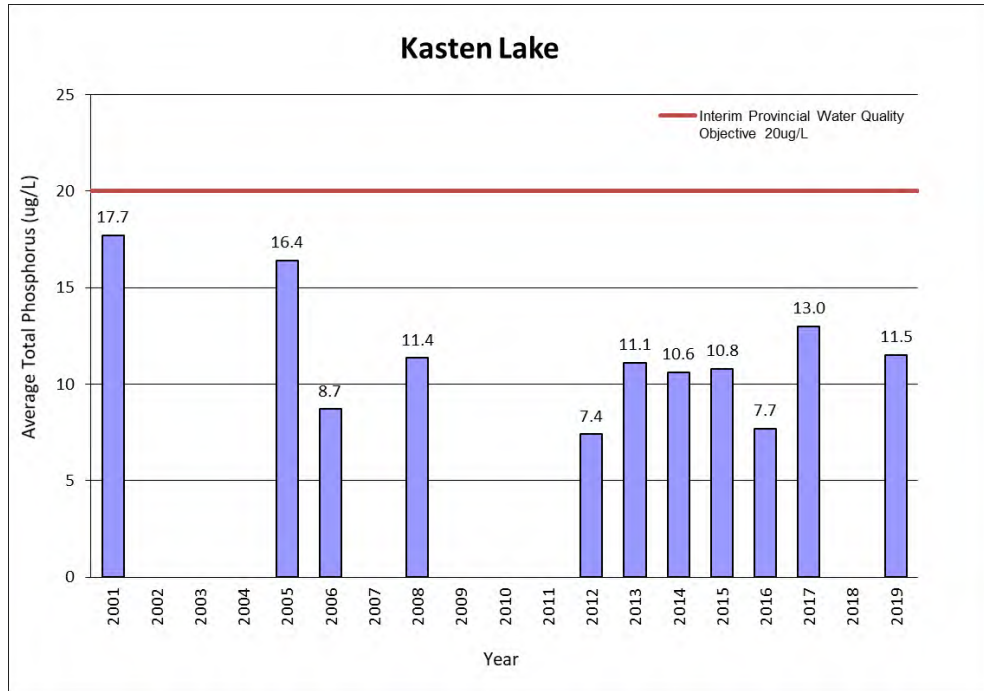
Ironside Lake

The bar graph below indicates the spring total phosphorus results for Ironside Lake from 2002-2019.



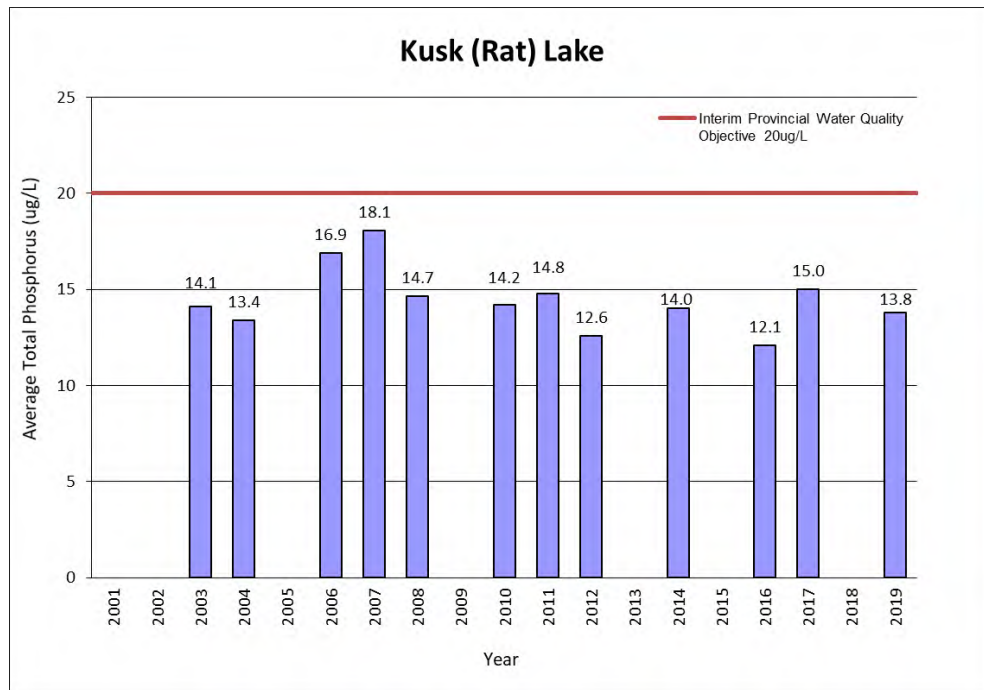
Kasten Lake

The bar graph below indicates the spring total phosphorus results Kasten Lake from 2001-2019.



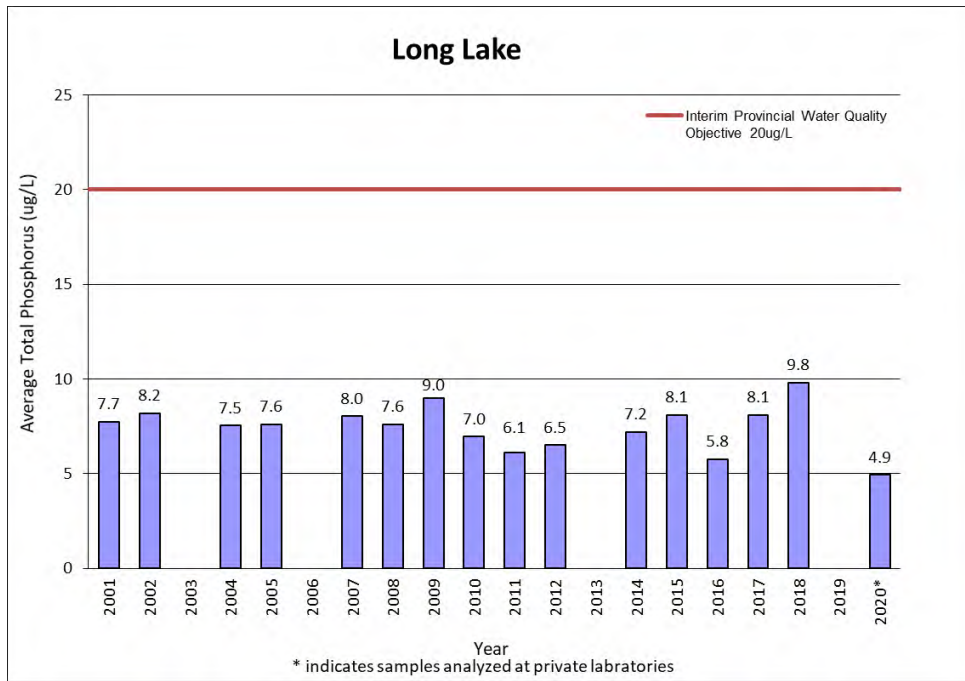
Kusk (Rat) Lake

The bar graph below indicates the spring total phosphorus results for Kusk Lake from 2001-2019.



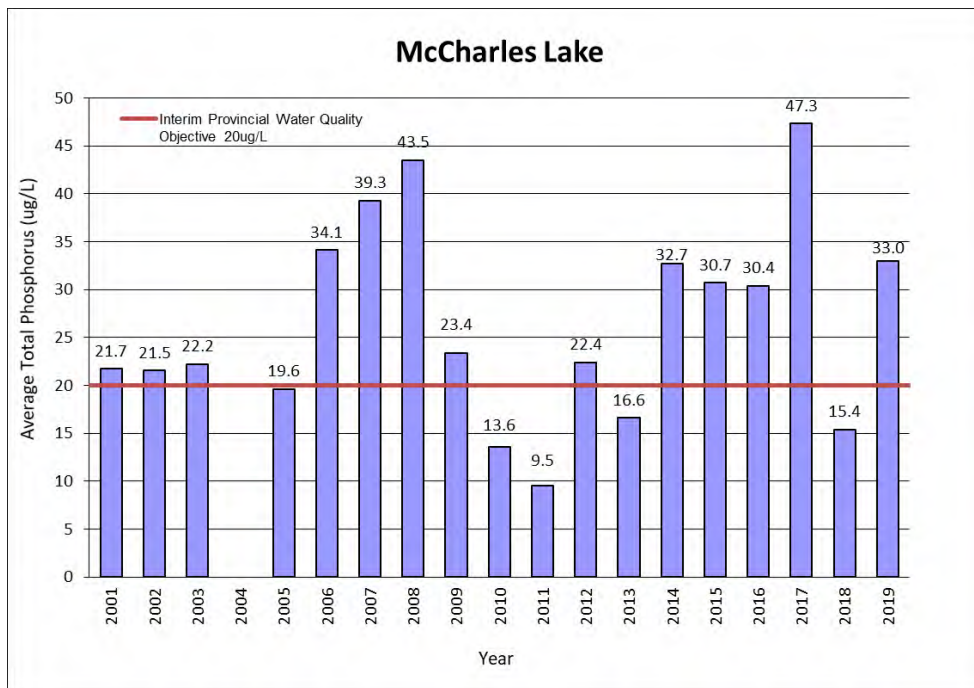
Long Lake

The bar graph below indicates the spring total phosphorus results for Long Lake from 2001-2020.



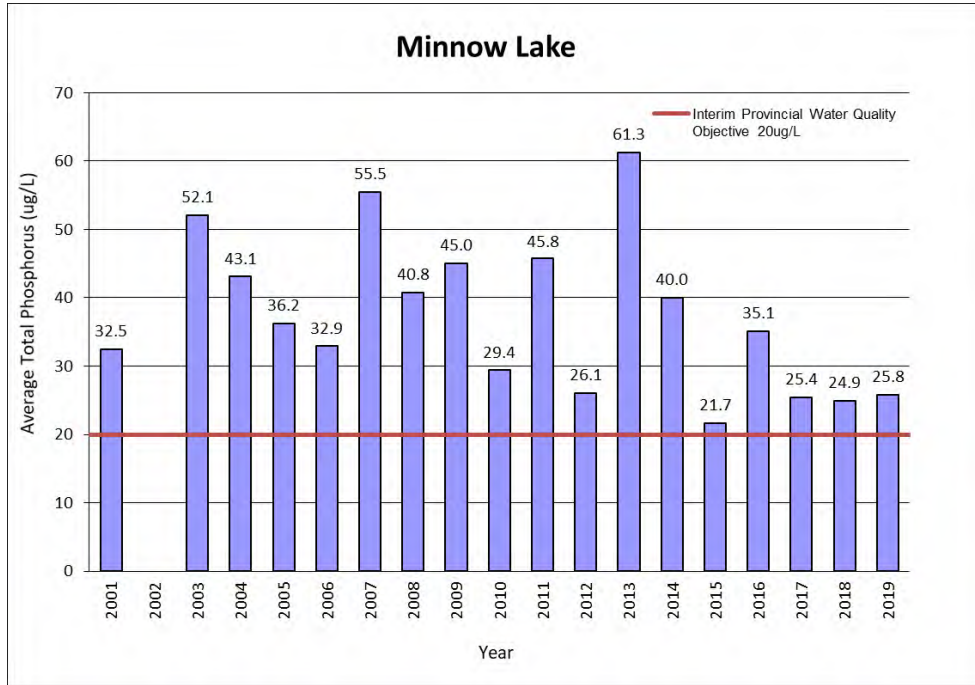
McCharles Lake

The bar graph below indicates the spring total phosphorus results for McCharles Lake from 2001-2019.



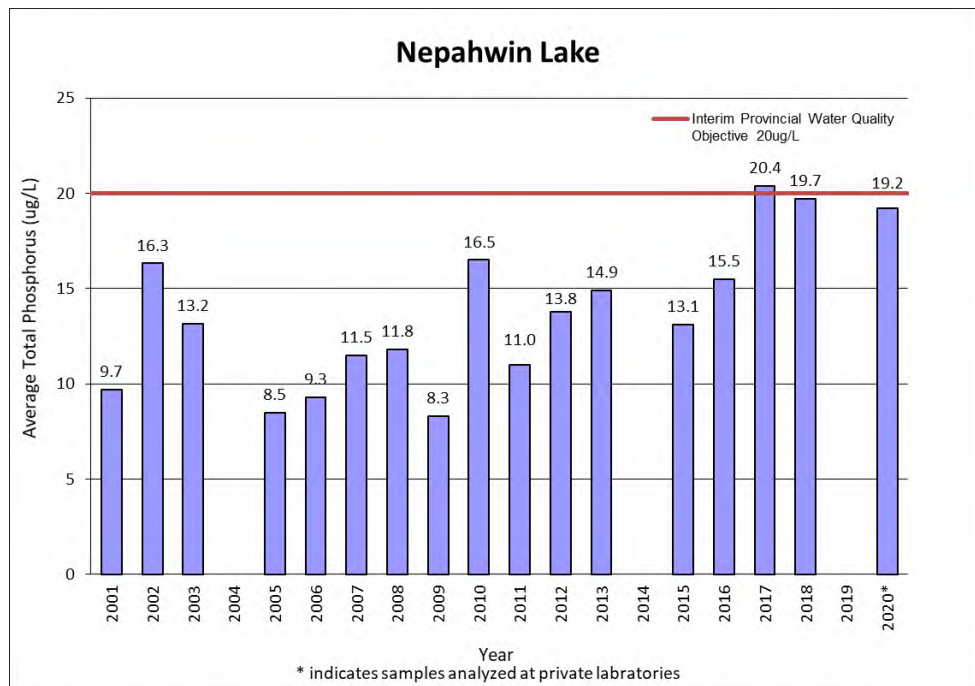
Minnow Lake

The bar graph below indicates the spring total phosphorus results for Minnow Lake from 2001-2019.



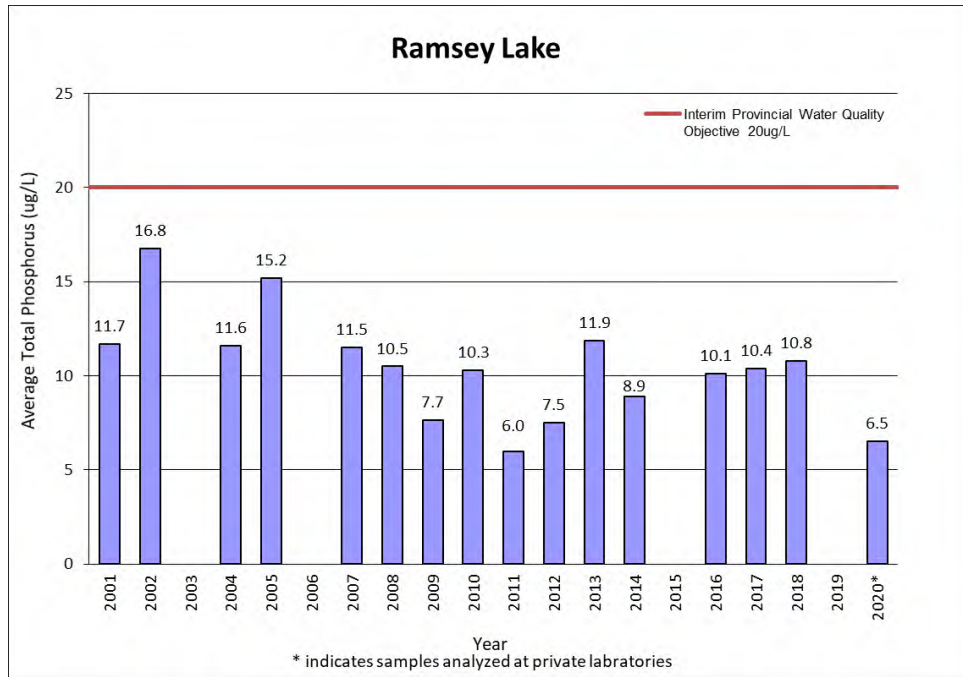
Nepahwin Lake

The bar graph below indicates the spring total phosphorus results for Nepahwin Lake from 2001-2020.



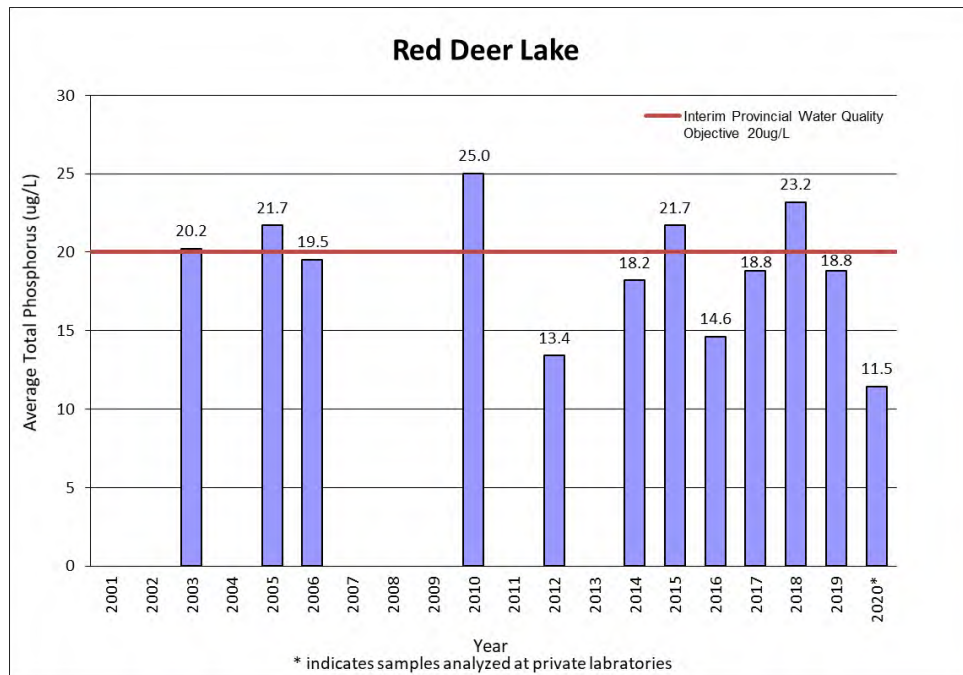
Ramsey Lake

The bar graph below indicates the spring total phosphorus results for Ramsey Lake from 2001-2020.



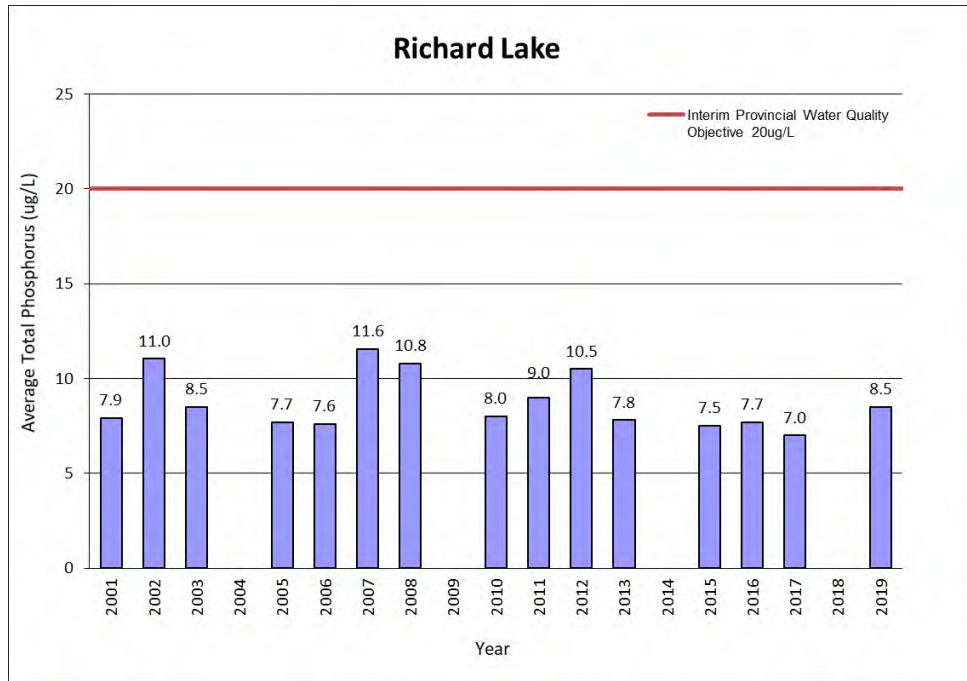
Red Deer Lake

The bar graph below indicates the spring total phosphorus results for Red Deer Lake from 2003-2020.



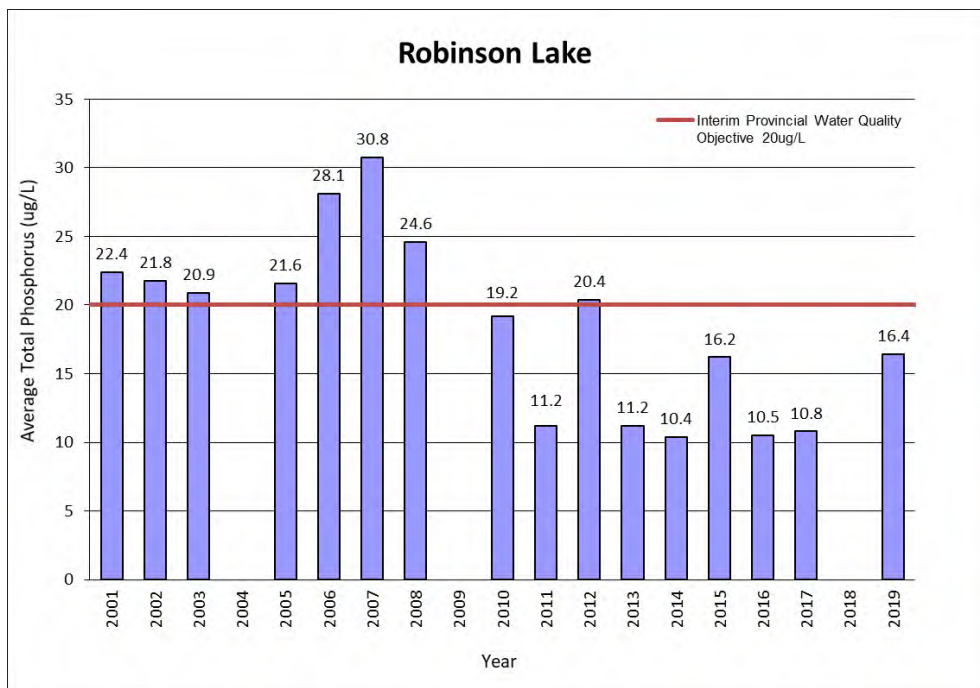
Richard Lake

The bar graph below indicates the spring total phosphorus results for Richard Lake from 2001-2019.



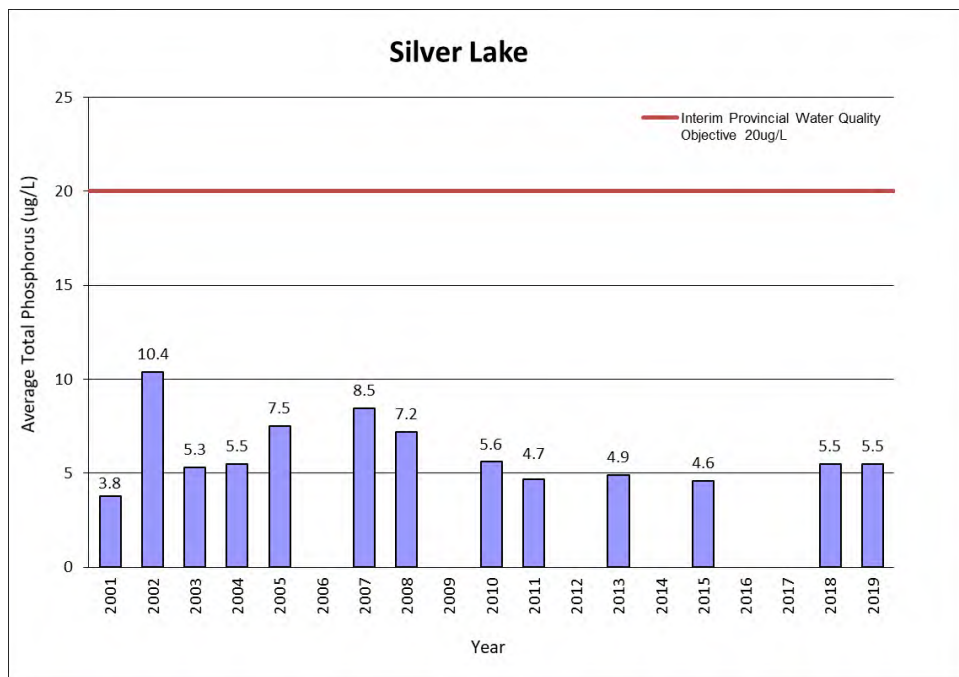
Robinson Lake

The bar graph below indicates the spring total phosphorus results for Robinson Lake from 2001-2019.



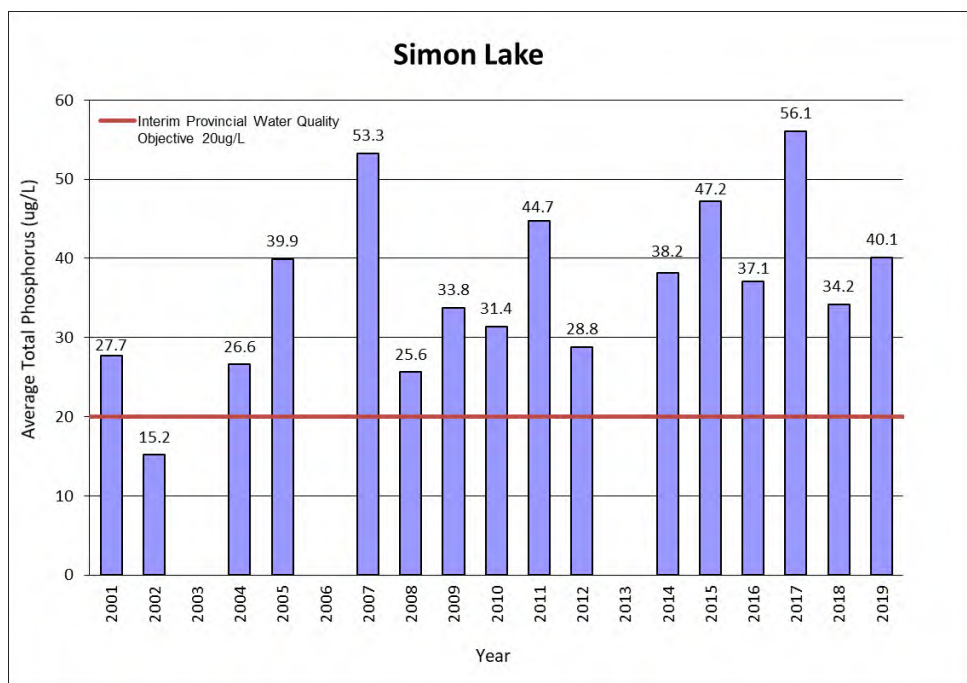
Silver Lake

The bar graph below indicates the spring total phosphorus results for Silver Lake from 2001-2019.



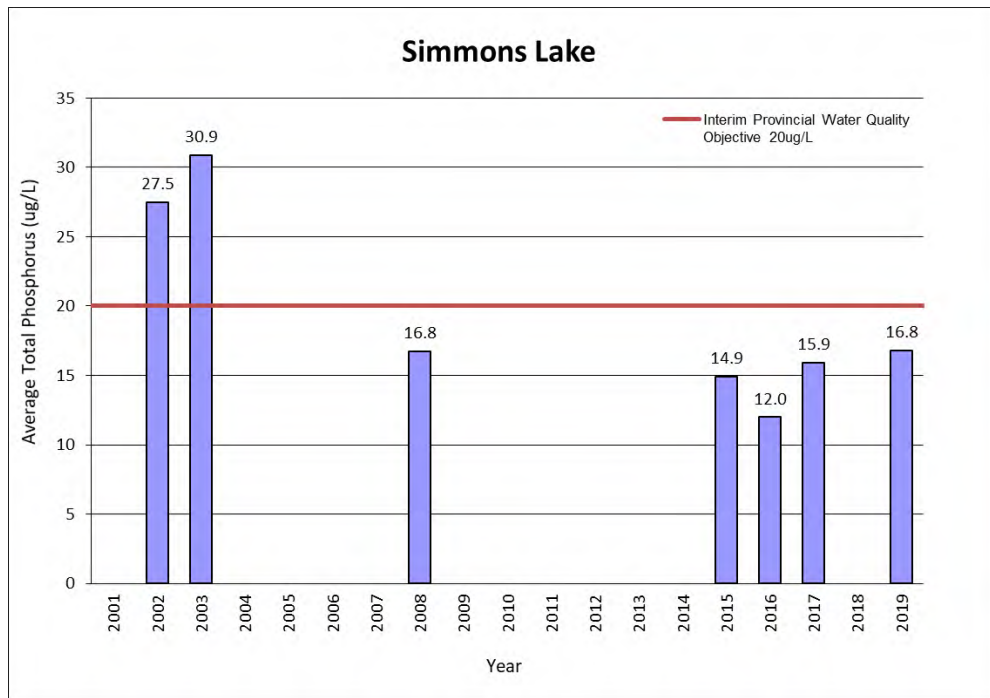
Simon Lake

The bar graph below indicates the spring total phosphorus results for Simon Lake from 2001-2019.



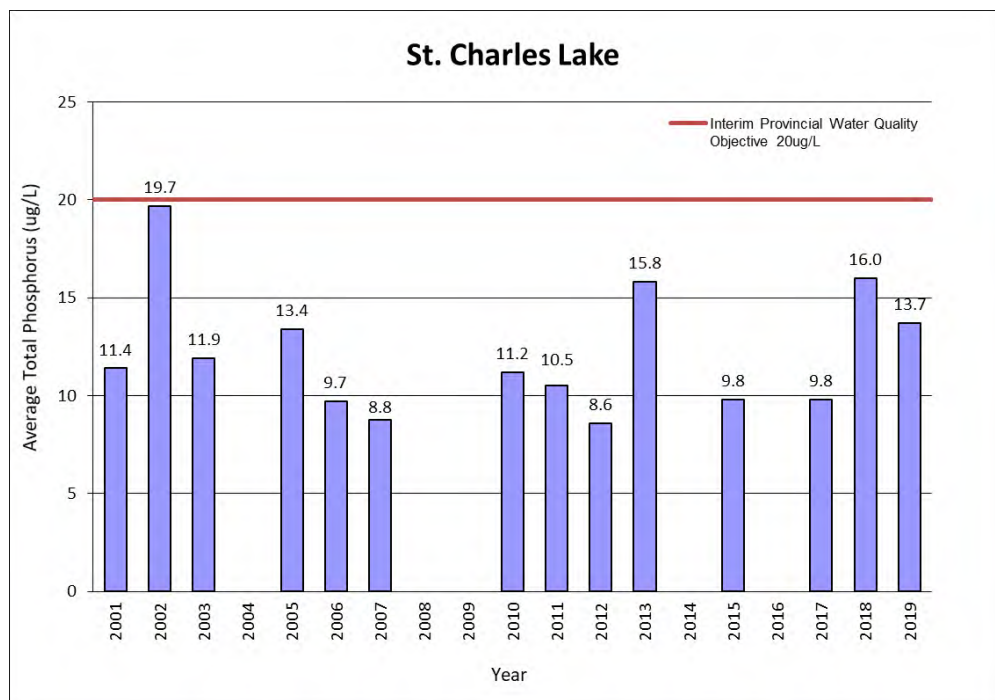
Simmons Lake

The bar graph below indicates the spring total phosphorus results for Simmons Lake from 2001-2019.



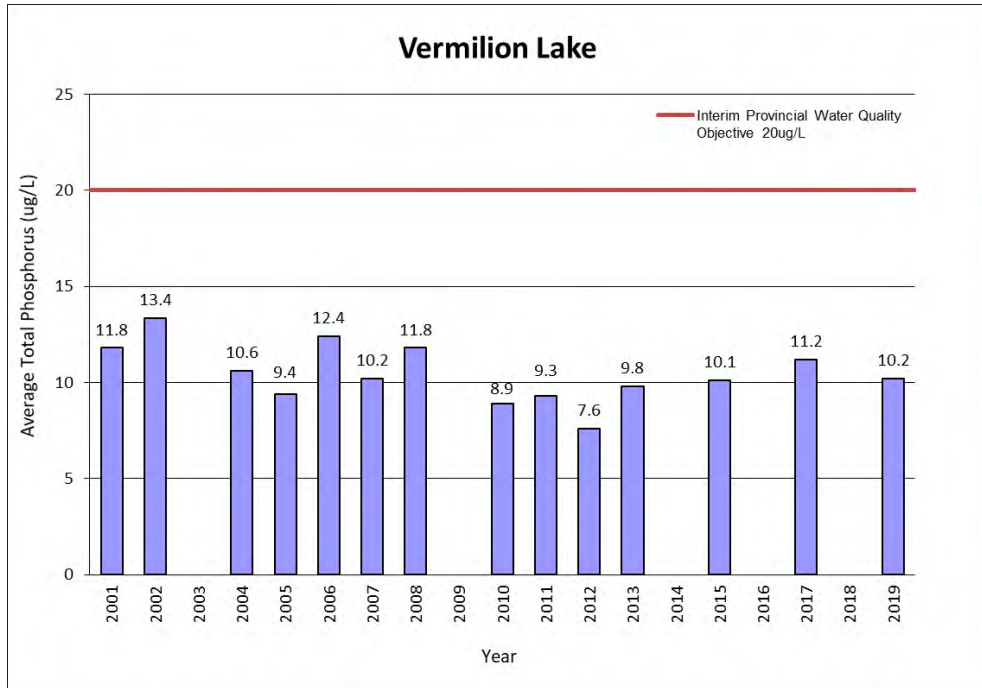
St. Charles Lake

The bar graph below indicates the spring total phosphorus results for St. Charles Lake from 2001-2019.



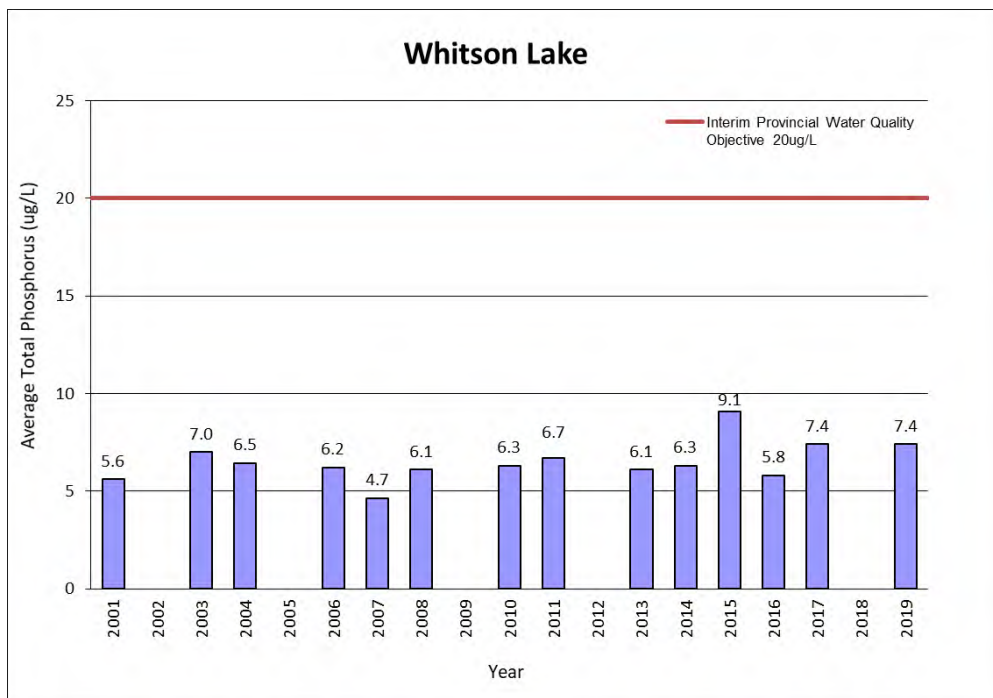
Vermilion Lake

The bar graph below indicates the spring total phosphorus results for Vermilion Lake from 2001-2019.



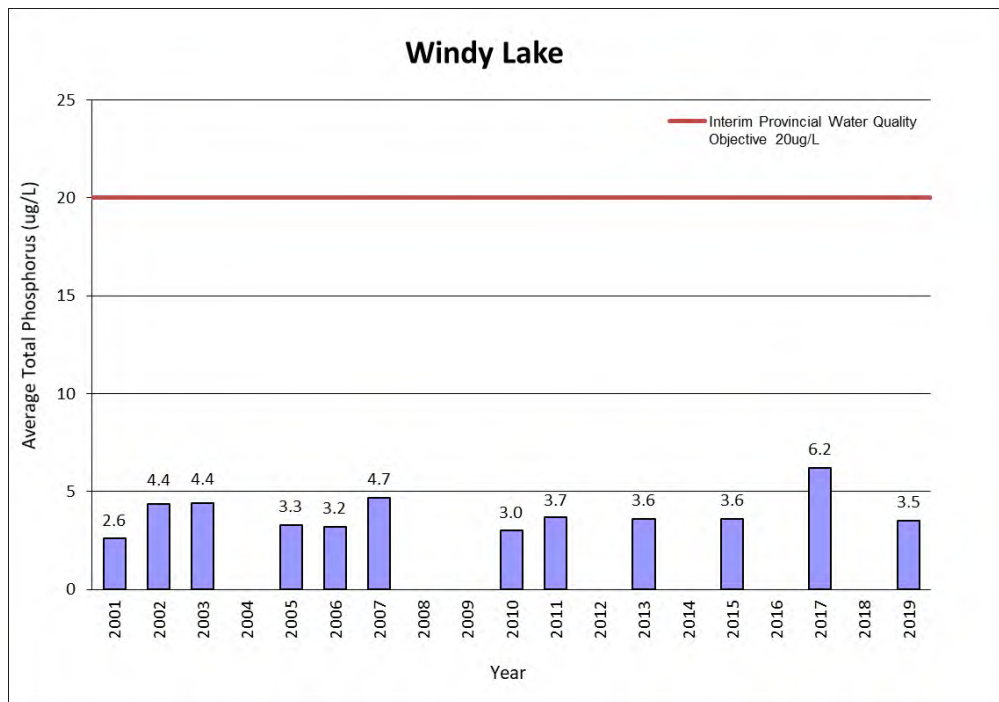
Whitson Lake

The bar graph below indicates the spring total phosphorus results for Whitson Lake from 2001-2019.



Windy Lake

The bar graph below indicates the spring total phosphorus results for Windy Lake from 2001-2019.



For further information, contact

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Environmental Planning Initiatives
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