Lake Water Quality Program

Environmental Planning Initiatives

2018 Annual Report

Greater | Grand Sudbury
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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 Lake Water Quality Field Intern. 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

In collaboration with its partners, the Lake Water Quality Program carried out 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:

- 44 total sites sampled on 37 lakes sampled for spring phosphorus, sodium and chloride
- 232 properties on Long Lake were surveyed through the Love Your Lake shoreline assessment program
- Richard Lake was selected to be a part of the aquatic vegetation mapping project undertaken by the Lake Water Quality program. Mapping of all 260 points on Richard Lake was completed during the 2018 season.
- Weekly cyanobacterial bloom (blue-green algae) watch conducted on Lake Ramsey during the summer months including the use of the Lake Water Quality Programs fluorometer to test reflectance values of water samples to help detect potential cyanobacterial blooms
- 6 lake stewardship grants awarded for a total of $3000 in funding to local lake stewardship groups
- 7 Watershed Advisory Panel meetings held in 2018
- 30 active lake stewardship groups

Lake Water Quality Program Components

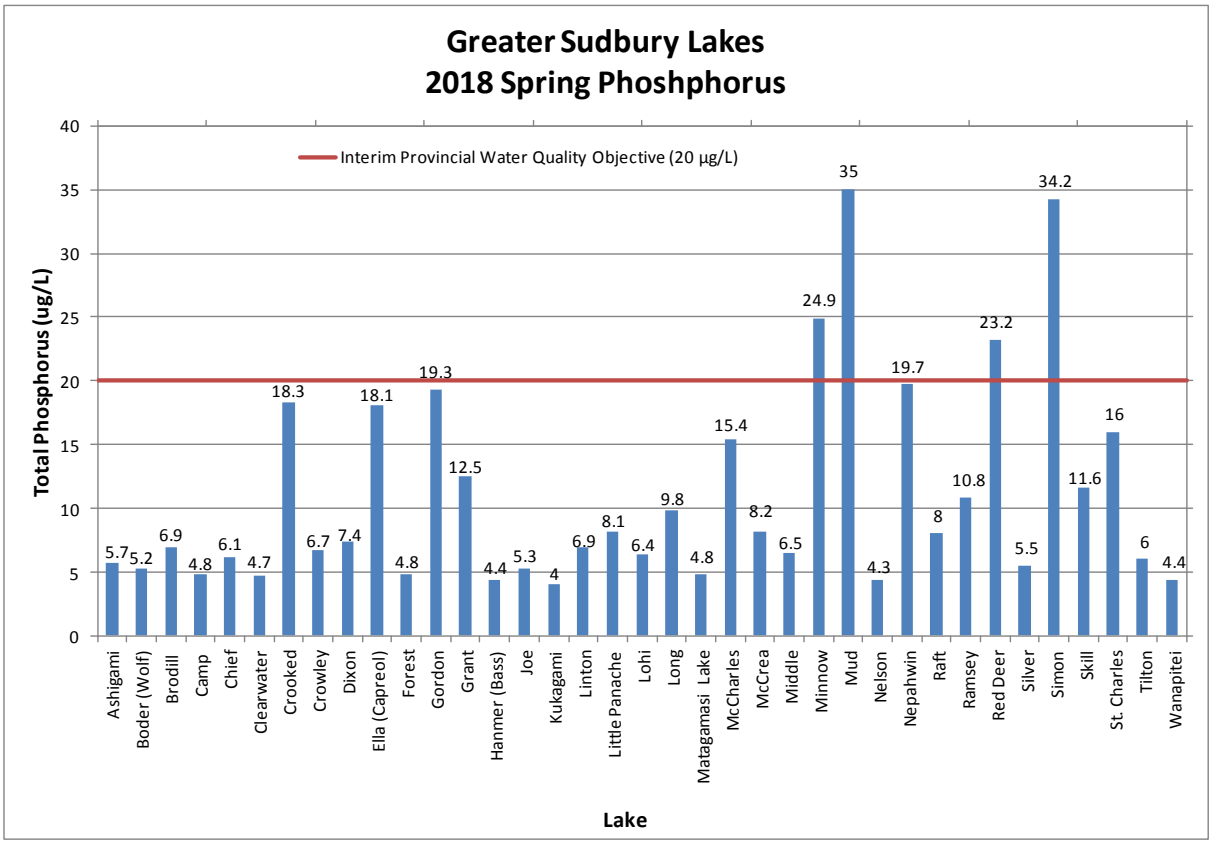
Spring Phosphorus Sampling Program

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 the early 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. This is the optimal time for phosphorus samples in the Canadian Shield 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

The spring phosphorus sampling was conducted in May on 37 lakes, at 44 total sites. Sampling results are shown in the graph below. Individual spring phosphorus graphs for lakes sampled this year are found at the end of this report. Of the lakes sampled, eight lakes 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 and nutrient rich.

The bar graph below indicates the 2018 spring phosphorus sampling results for 34 local lakes.



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 third 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. The 2018 season also included the use of an Aquafluor Fluorometer which helps detect trace levels of cyanobacteria in the water during the weekly surveys. The 2018 visual check confirmed three (3) cyanbacterial blooms on Ramsey Lake during the season. Blooms were found: August 9th in Moonlight Bay near Camp Sudaca, August 14th in Moonlight Bay along the northern portion of the beach area, August 16th near Amphitheatre beach.

Aquatic Vegetation Mapping – Richard Lake

Between August 1, 2018 and August 20, 2018 members of the Lake Water Quality program at the City of Greater Sudbury performed a vegetation survey of Richard Lake to identify all species present within the lake at the time of the survey. The goal of the project was to create a database of locations in which aquatic vegetation species are present including invasive Eurasian Watermilfoil. Lakes will be revisited in future years to determine whether various species populations are growing or shrinking which will help the city create invasive species management strategies.

The sampling procedures done by the City of Greater Sudbury were based on procedures outlined in the Recommended Baseline Monitoring of Aquatic Plant in Wisconsin: Sampling Design Field and Laboratory Procedures, Data Entry and Analysis, and Applications by the Wisconsin Department of Natural Resources. Using calculations outlined in the Wisconsin Department of Natural Resources document as well as a journal article (Mikulyuk et al 2010), 260 sampling points were created based on lake surface area, depth and the shoreline development factor. Each point was sampled by boat using a double sided rake and three rake tosses at each location as per the outlined procedure. Aquatic vegetation was identified and recorded. Maps were then created to show the distribution of each species within the lake and the relationship between the various species found within the lake.

The mapping project identified fourteen (14) different aquatic vegetation species across the lake, see Table 1 below. The mapping also identified 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 is present for Richard Lake vegetation sampling conducted in 2018.

Common Name	Scientific Name	Locations Present	% of Sampling Locations
Muskgrass/Stonewort	***Chara spp.***	**77**	**29.6%**
Flat-Stem Pondweed	***Potamogeton Compressus***	**73**	**28.1%**
Eurasian water-milfoil	***Myriophyllum spicatum***	**64**	**24.6%**
Northern water-milfoil	***Myriophyllum sibiricum***	**56**	**21.5%**
Richardson's pondweed	***Potamogeton richardsonii***	**39**	**15.0%**
Nitella spp	*Nitella spp.*	19	7.3%
Largeleaf pondweed	*Potamogeton amplifolius*	18	6.9%
Spiny-spored quillwort	*Isoetes echinospora*	16	6.2%
Slender Naiad	*Najas flexilis*	12	4.6%
White water-lily	*Nymphaea odorata*	7	2.7%
Slender pondweed	*Potamogeton pusillus*	5	1.9%
Canada Waterweed	*Elodea canadensis*	3	1.2%
Tapegrass	*Vallisneria americana*	3	1.2%
Illinois pondweed	*Potamogeton illinoensis*	1	0.4%

Community Outreach

Love Your Lake Program

Love Your Lake, a program of the Canadian Wildlife Federation and Watersheds Canada, offers comprehensive shoreline surveys and stewardship education to individual shoreline residents. 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 2018 the Lake Water Quality program continued the Love Your Lake shoreline assessments on Long Lake that was started in 2017. All remaining shoreline properties on Long Lake were assessed during the 2018 field season. In 2018, a total of 232 properties and their shorelines were assessed and completed. Final reports for each property are to be sent to property owners in spring 2019.

Sudbury Children's Water Festival

This was the 14th year that the Lake Water Quality Program participated in the water festival, which was attended by over 800 grade 3 students. The Lake Water Quality Program staff present taught students the need for diversity in shorelines and the impacts and causes of erosion. The Children's Water Festival in Greater Sudbury is organized by the City's Earthcare Program with the support of many community organizations.

Natural Shoreline Demonstration Site

The City of Greater Sudbury's Lake Water Quality Program in partnership with Science North and the Nickel District Conservation Authority's Source Water Protection Program established a Natural Shoreline Demonstration site on Ramsey Lake. Funding for this educational project was received from the Ministry of Environment's Source Water Protection Program, the City of Greater Sudbury and Science North. Natural shoreline planting workshops and tours of the demonstration site are available to the community and shoreline homeowners to learn how they can improve the health of shorelines on their property.

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. The current Panel members were appointed in 2015 for a three -year term, ending with the term of Council in 2018. A total of 7 meetings were held in 2018.

Members

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

Community Volunteers

Lin Gibson - Chair
Mary Henderson – Vice Chair
Jeffery Huska
Margaret McLaughlin
Lily Noble
Paul Truskoski
Wendy Wisniewski
Sarah Woods

Technical Experts

Burgess Hawkins – Sudbury & District Health Unit
Derrick Luetchford - MNRF
Dr. John Gunn – Vale Living With Lakes Centre
Ed Snucins – Ontario Ministry of Environment
Anoop Naik –Conservation Sudbury
Dr. Charles Ramcharan – Laurentian University

City Councillors

Mark Signoretti

Lake Stewardship Grant Assistance Program

Introduction

Established as a pilot project in 2005, 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, 6 applications for funding were received with all applicants receiving the full $500 grant. The following is a list of the successful applicants.

Funding recipients for 2018

Clearwater Lake Stewardship Group
Project Name: On Water Educational/Information/Fun Paddle
Amount Received: $500

Four Lakes Community Association
Project Name: Four Lakes Waterfront Garden Tour
Amount Received: $500

Lake Panache Camper's Association
Project Name: Association Communication & Hazardous Waste Day
Amount Received: $500

Richard Lake Stewardship
Project Name: Richard Lake Stewardship - Newsletter
Amount Received: $500

Long Lake Stewardship
Project Name: Long Lake: Ours to Protect
Amount Received: $500

Lake Wahnapitae Home And Campers Association
Project Name: Shoal Markers
Amount Received: $500

Stewardship Groups

Currently, there are 30 lake stewardship groups throughout the Greater Sudbury area, acting as important agents for positive change in shoreline living practices.

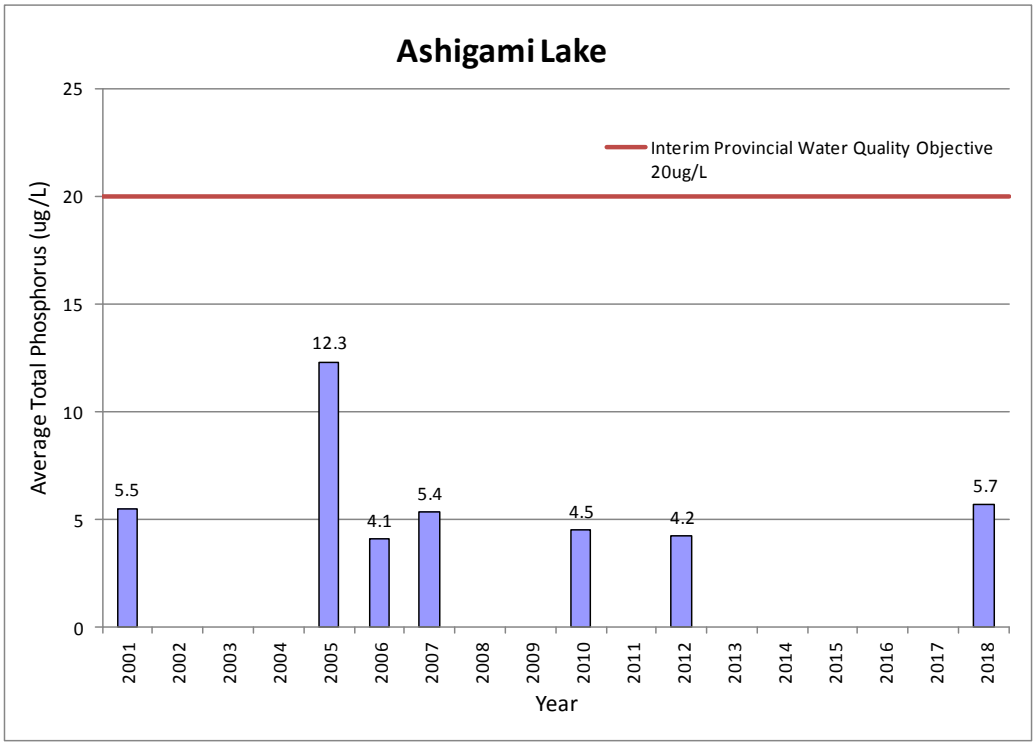
The following is a list of the active lake stewardship groups in Greater Sudbury.

Stewardship Group	Lake(s)
Friends of Bennett Lake	Bennett Lake
Black Lake	Black Lake
Broder 23	Broder 23 Lake
Crooked Lake	Crooked Lake
Fairbank Lake Cottagers Association	Fairbank Lake
Friends of McFarlane Lake	McFarlane Lake
Grassy Lake	Grassy Lake
Forest Lake Stewardship Commmittee	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 Stewardship Group	Nepahwin Lake
Lake Panache Campers Association	Panache Lake
Lake Robinson Stewardship	Robinson Lake
Lohi Lake	Lohi Lake
Long Lake Stewardship	Long Lake
McCrea Lake Stewardship Group	McCrea Lake
Minnow Lake Restoration Group	Minnow Lake
Richard Lake Stewardship	Richard Lake
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
Vermillion River Stewardship	Vermillion River
Whitewater Lake	Whitewater Lake
Lake Wanapitei Lake Stewardship	Wanapitei Lake

Appendix A
Phosphorus Graphs for Lakes Sampled in 2018

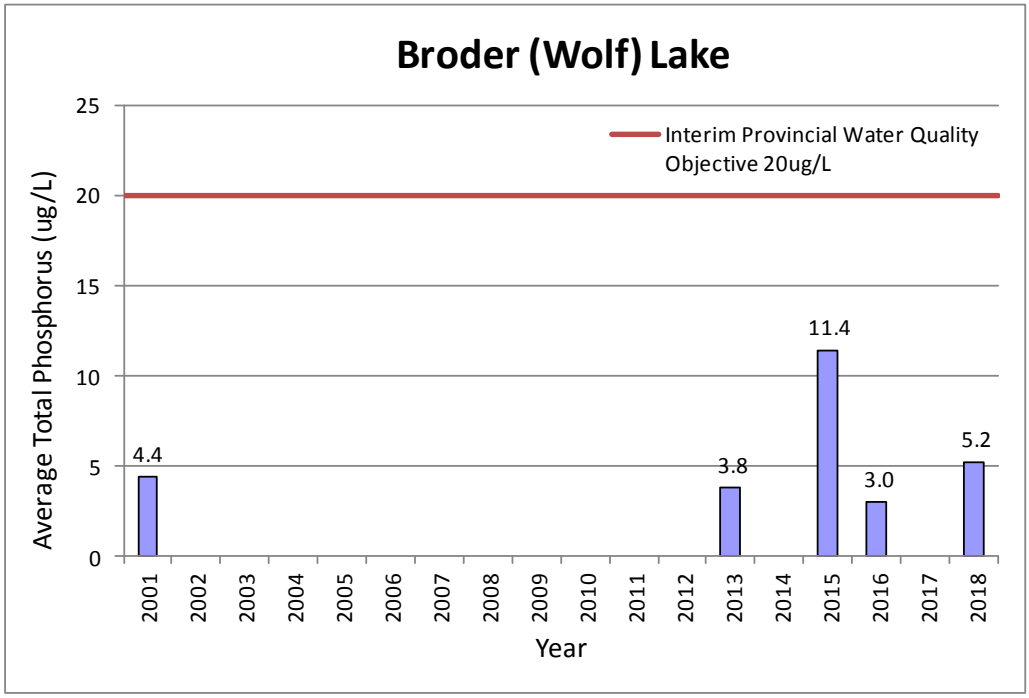
Ashigami Lake

The bar graph below indicates the spring total phosphorus results for Ashigami Lake from 2001-2018.



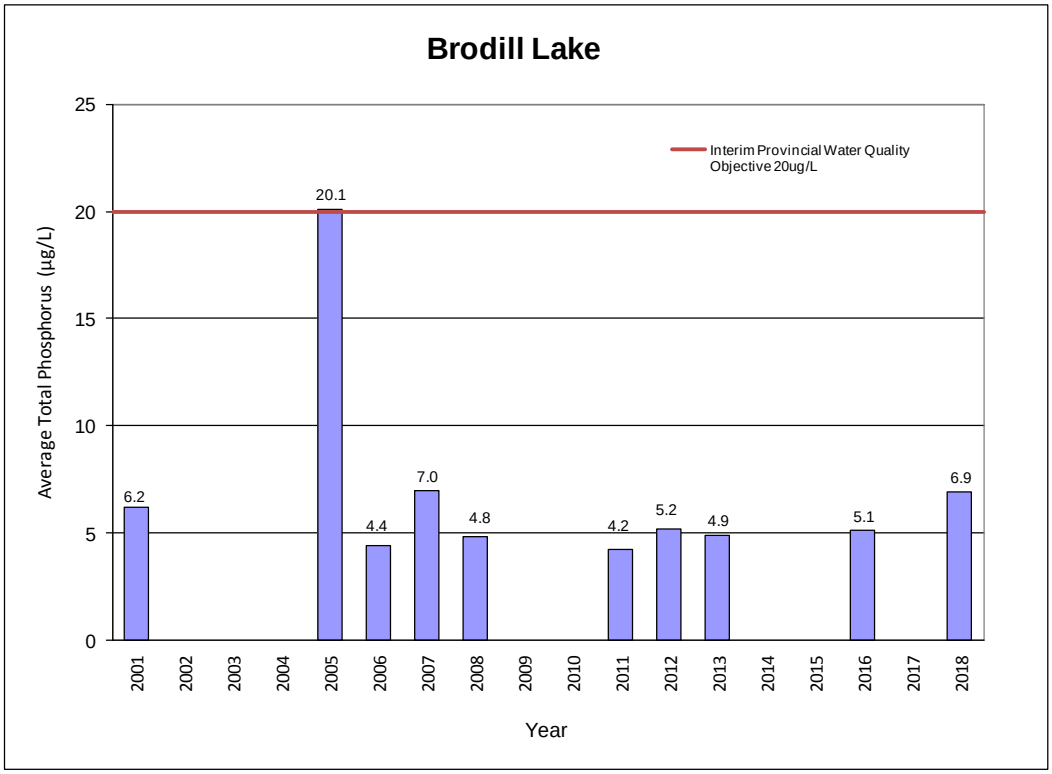
Broder (Wolf) Lake

The bar graph below indicates the spring total phosphorus results for Broder (Wolf) Lake from 2001-2018.



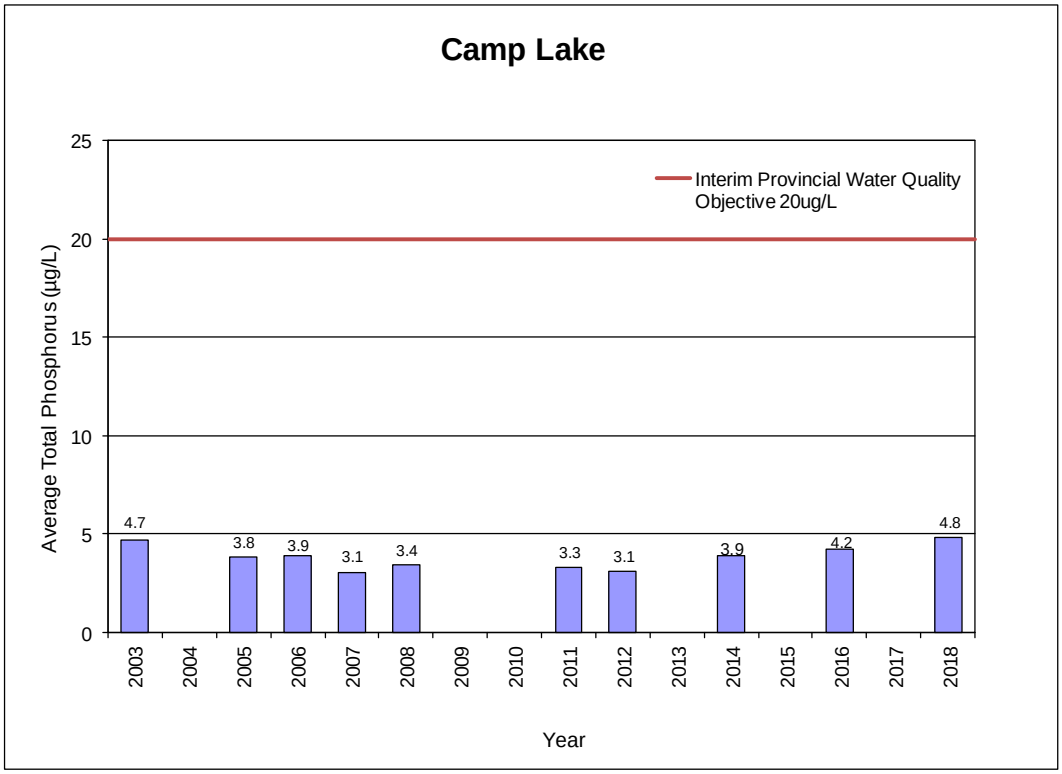
Brodill Lake

The bar graph below indicated the spring total phosphorus results for Brodill Lake from 2001-2018.



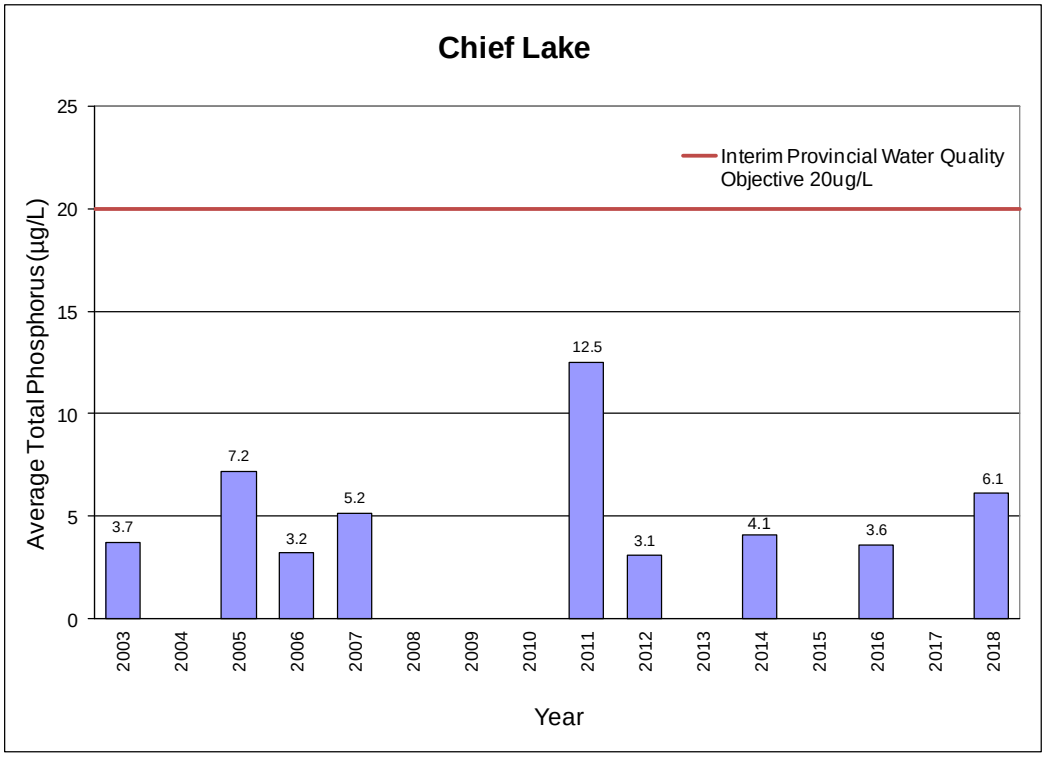
Camp Lake

The bar graph below indicates the spring total phosphorus results for Camp Lake from 2003-2018.



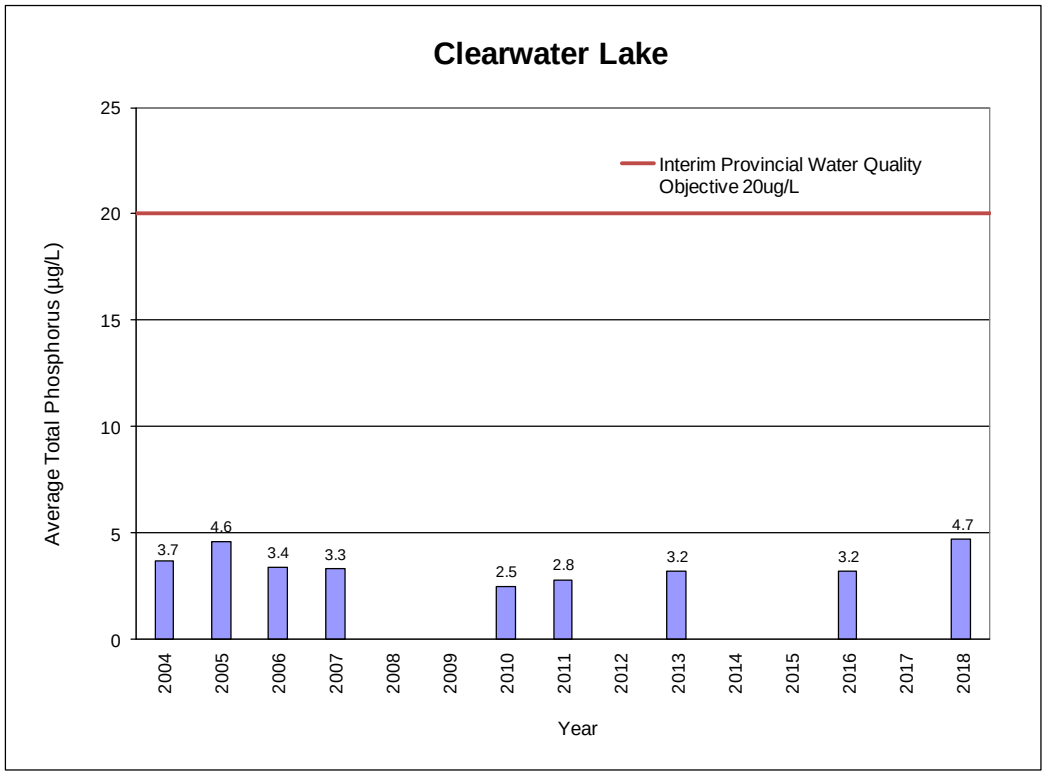
Chief Lake

The bar graph below indicates the spring total phosphorus results for Chief Lake from 2003-2018.



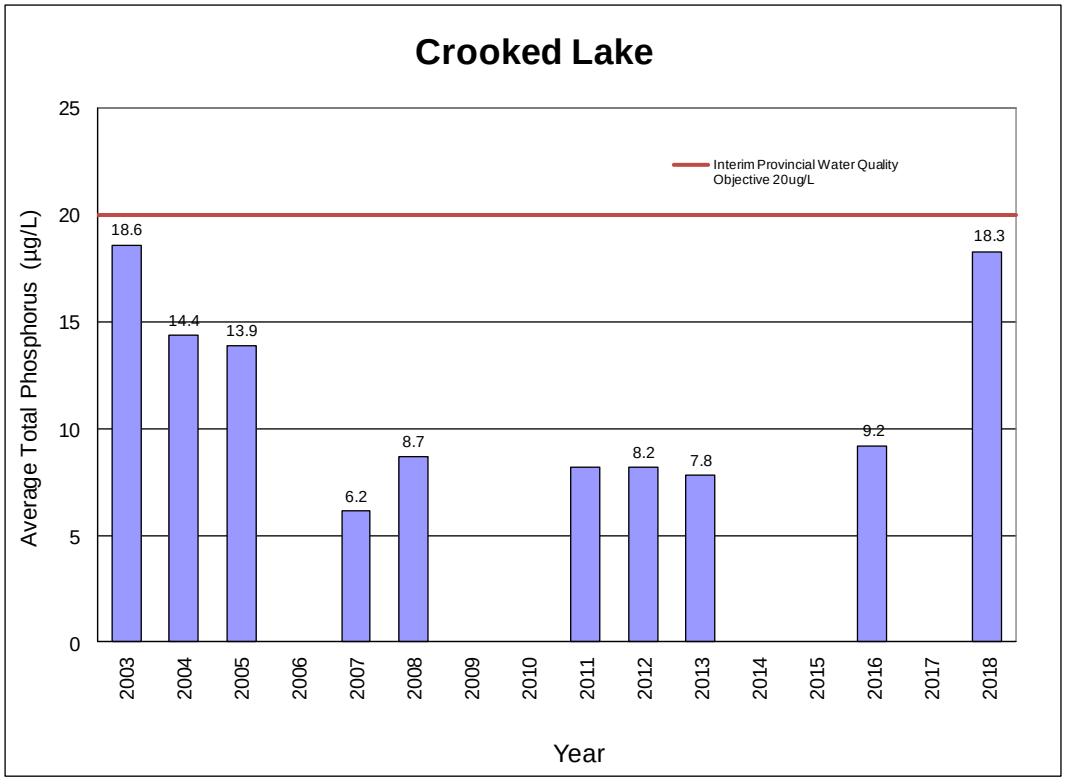
Clearwater Lake

The bar graph below indicates the spring total phosphorus results for Clearwater Lake from 2004-2018.



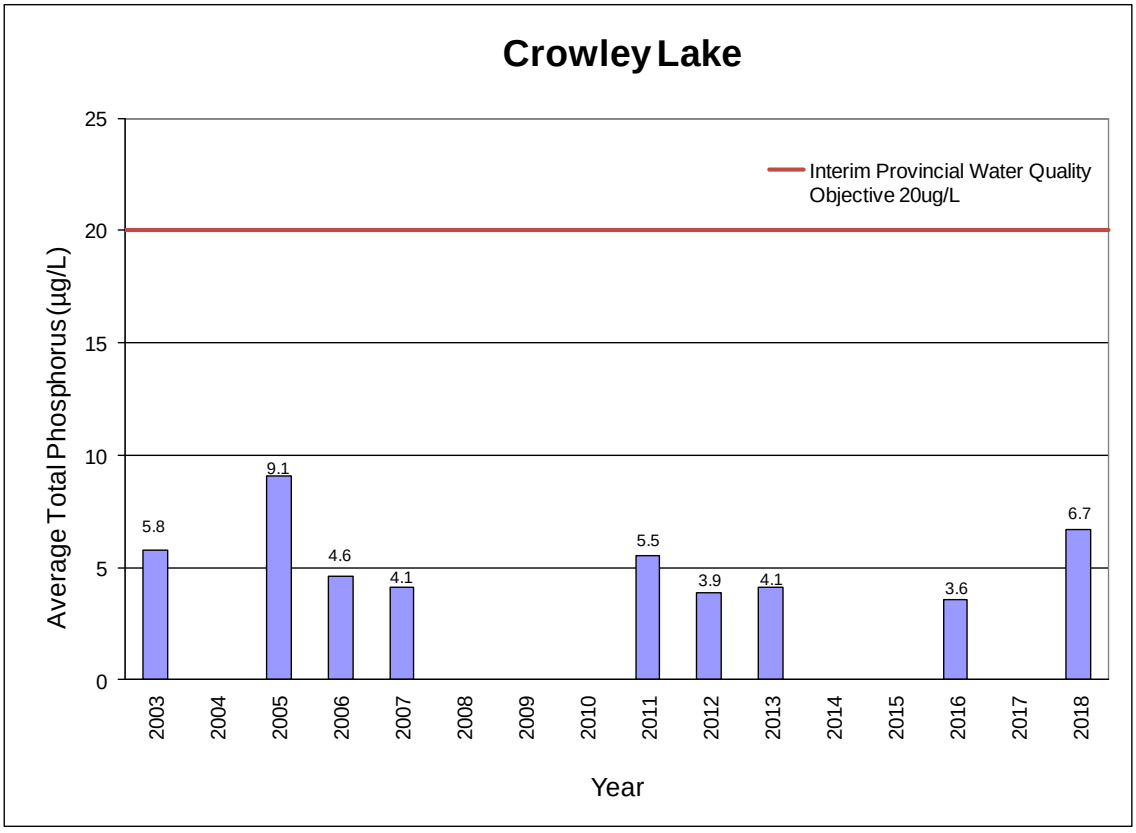
Crooked Lake

The bar graph below indicates the spring total phosphorus results for Crooked Lake from 2003-2018.



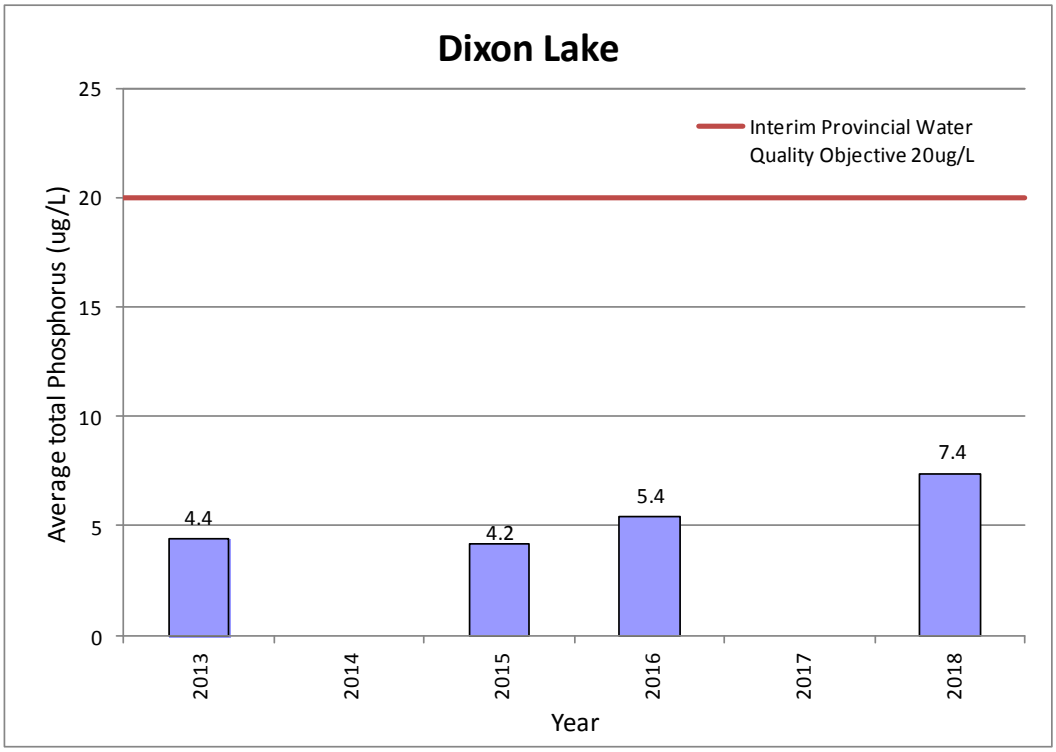
Crowley Lake

The bar graph below indicates the spring total phosphorus results for Crowley Lake 2003-2018.



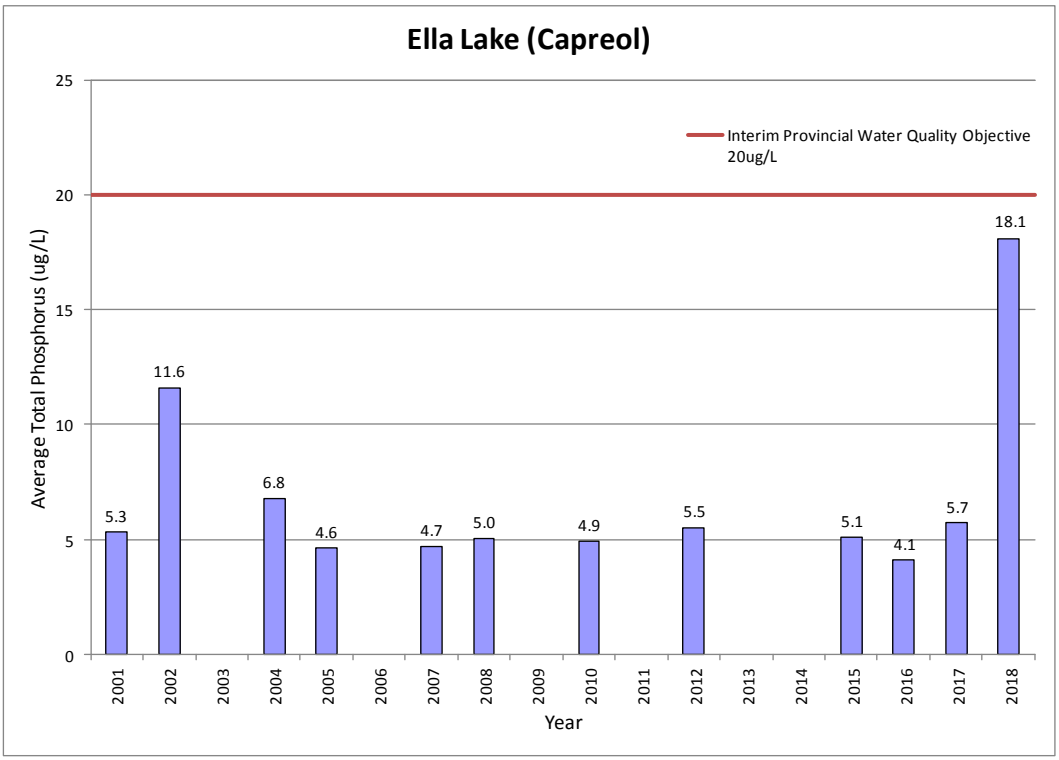
Dixon Lake

The bar graph below indicates the spring total phosphorus results for Dixon Lake from 2013-2018.



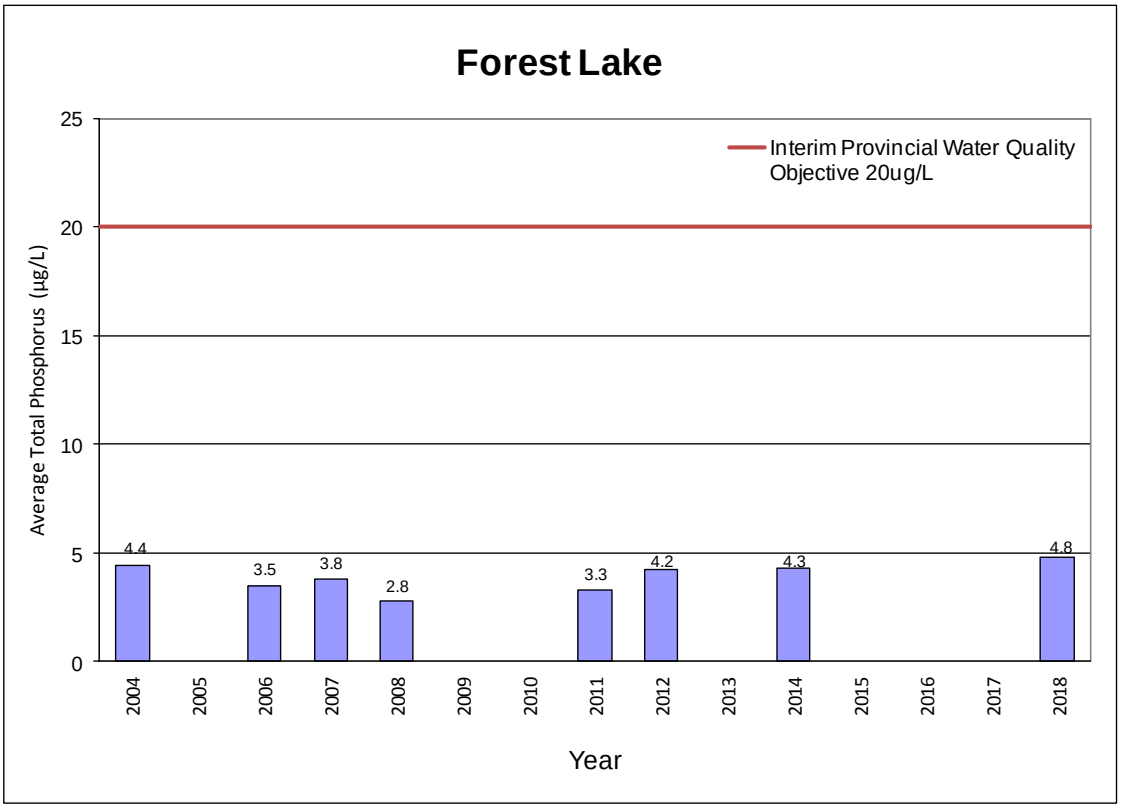
Ella (Capreol) Lake

The bar graph below indicates the spring total phosphorus results for Ella Lake (Capreol) from 2001-2018.



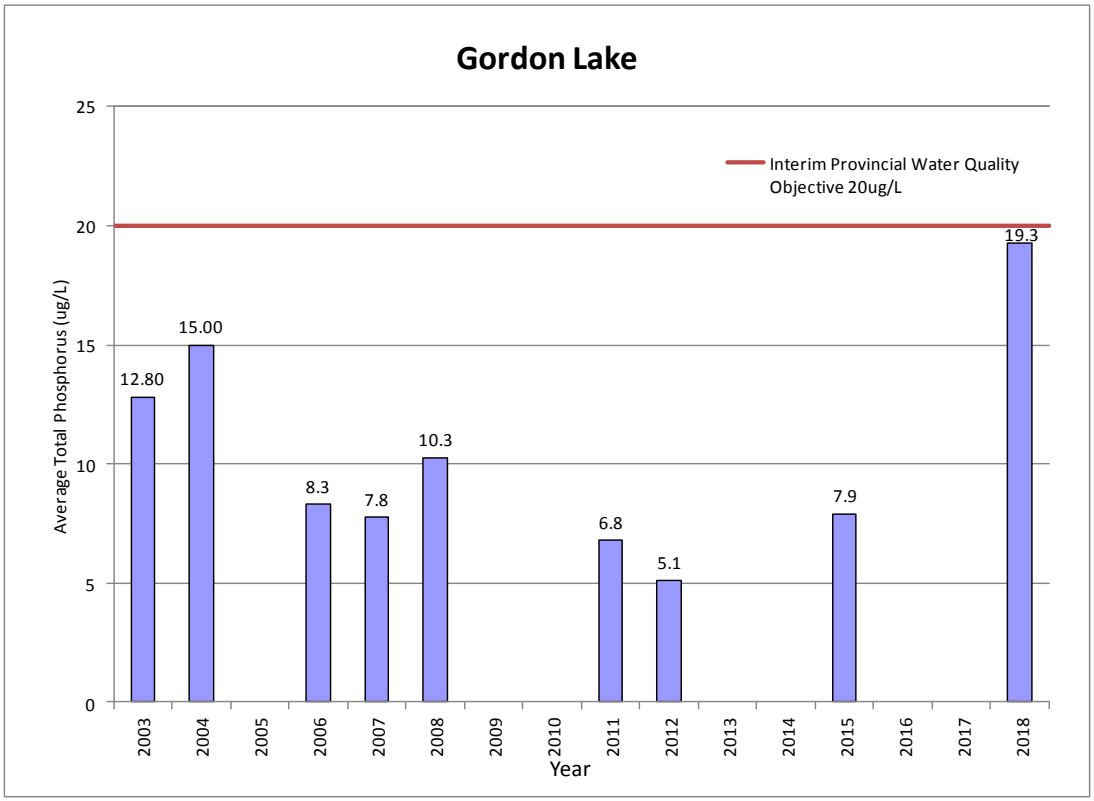
Forest Lake

The bar graph below indicates the spring total phosphorus results for Forest Lake from 2004-2018.



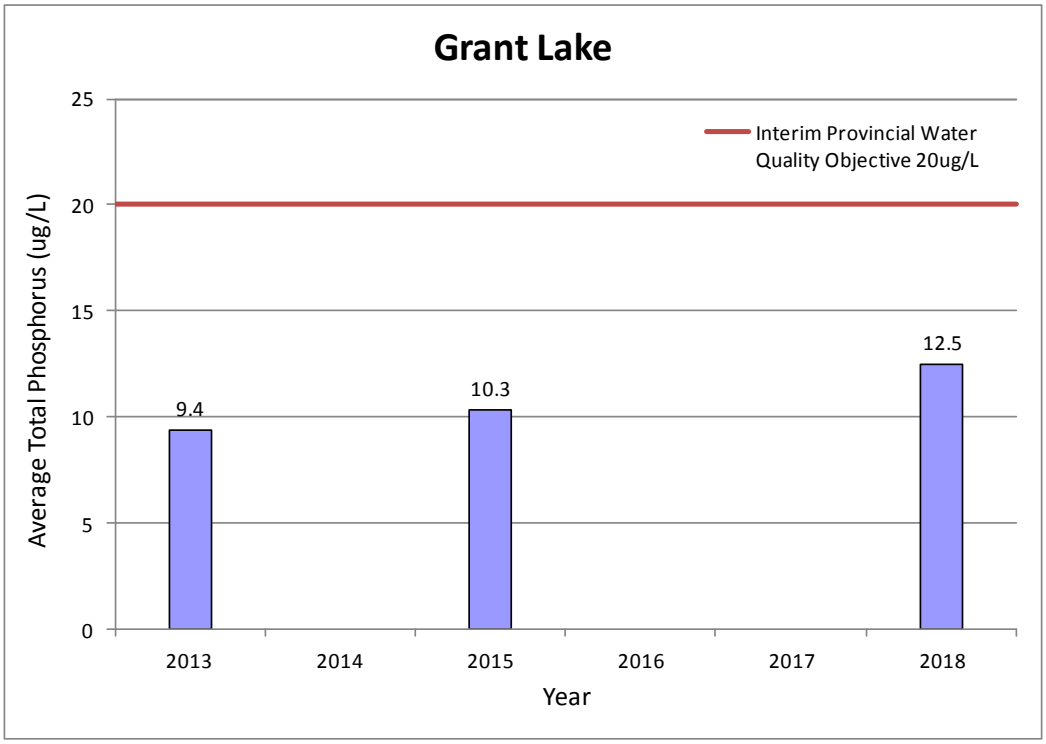
Gordon Lake

The bar graph below indicates the spring total phosphorus results for Gordon Lake from 2003-2018



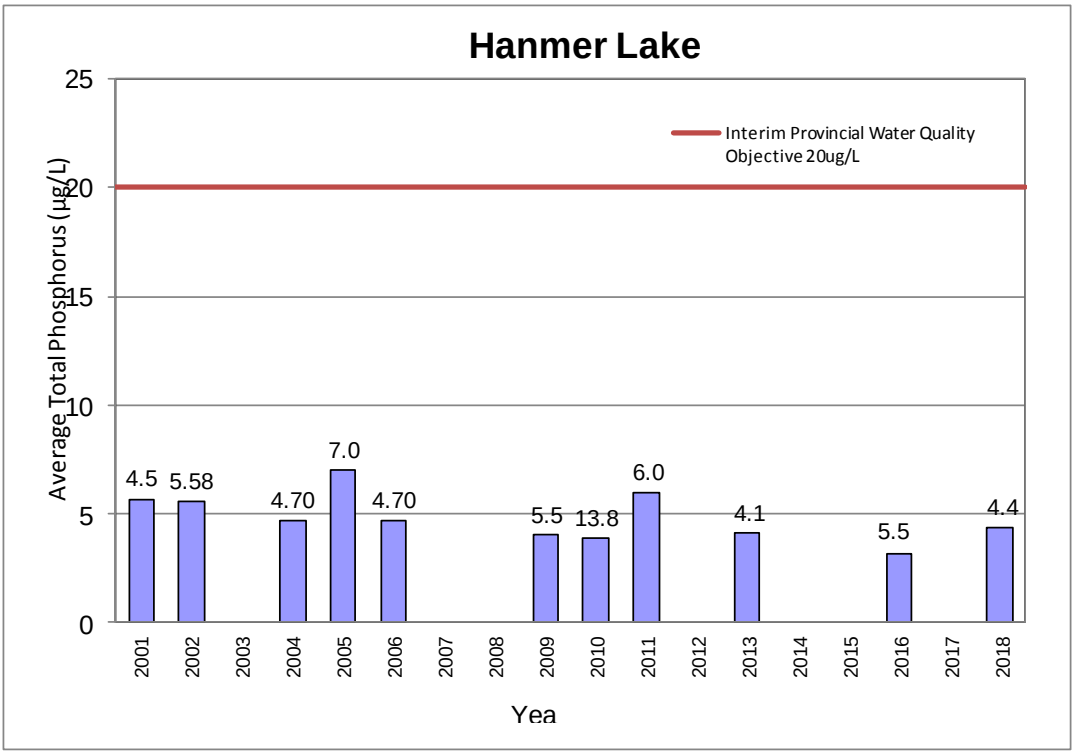
Grant Lake

The bar graph below indicates the spring total phosphorus results Grant Lake from 2013-2018.



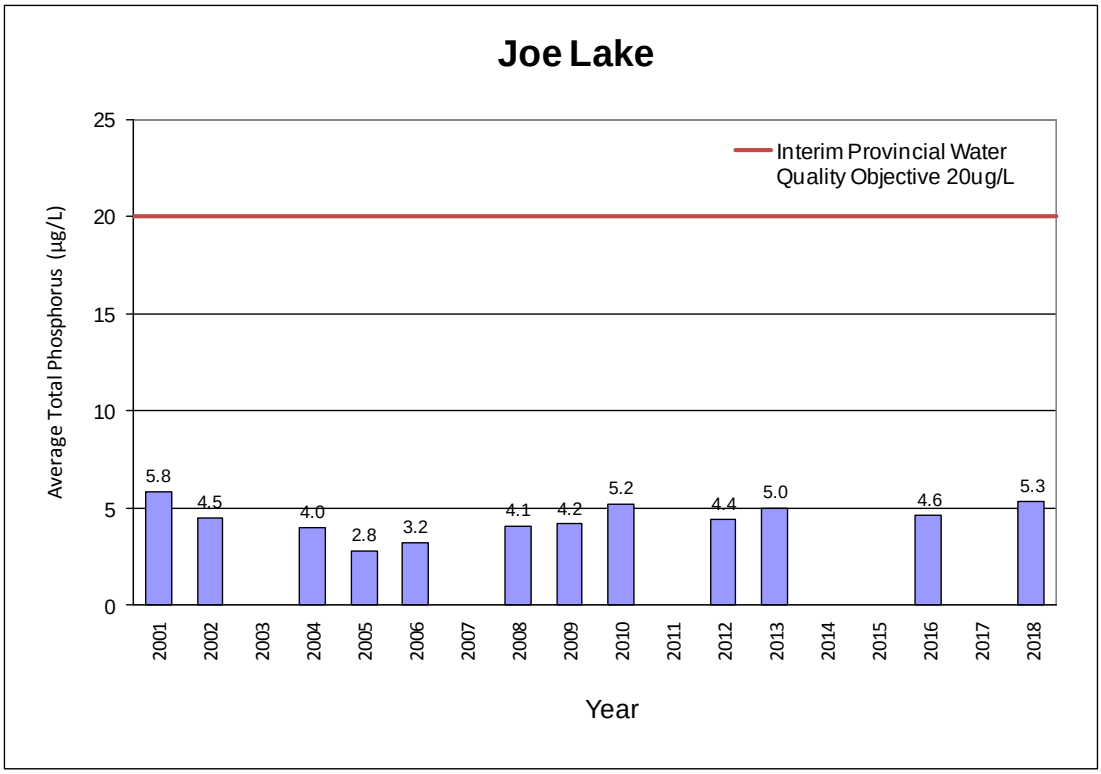
Hanmer (Bass) Lake

The bar graph below indicates the spring total phosphorus results for Hanmer Lake from 2001-2018.



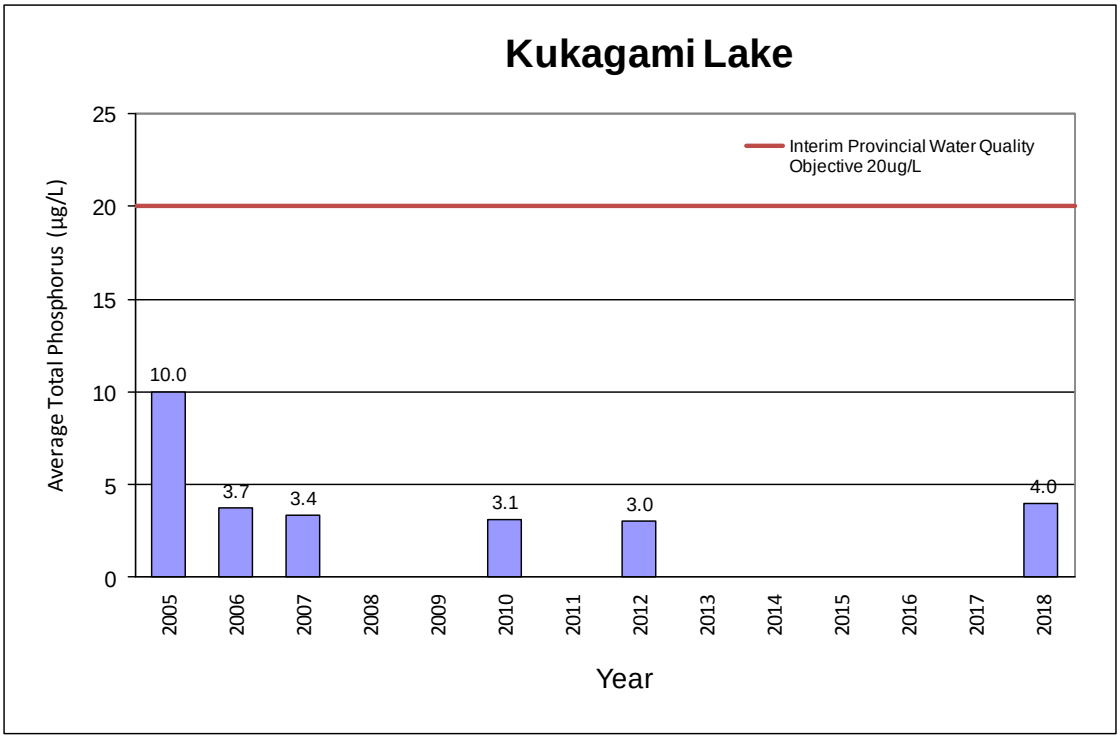
Joe Lake

The bar graph below indicates the spring total phosphorus results for Joe Lake from 2001-2018.



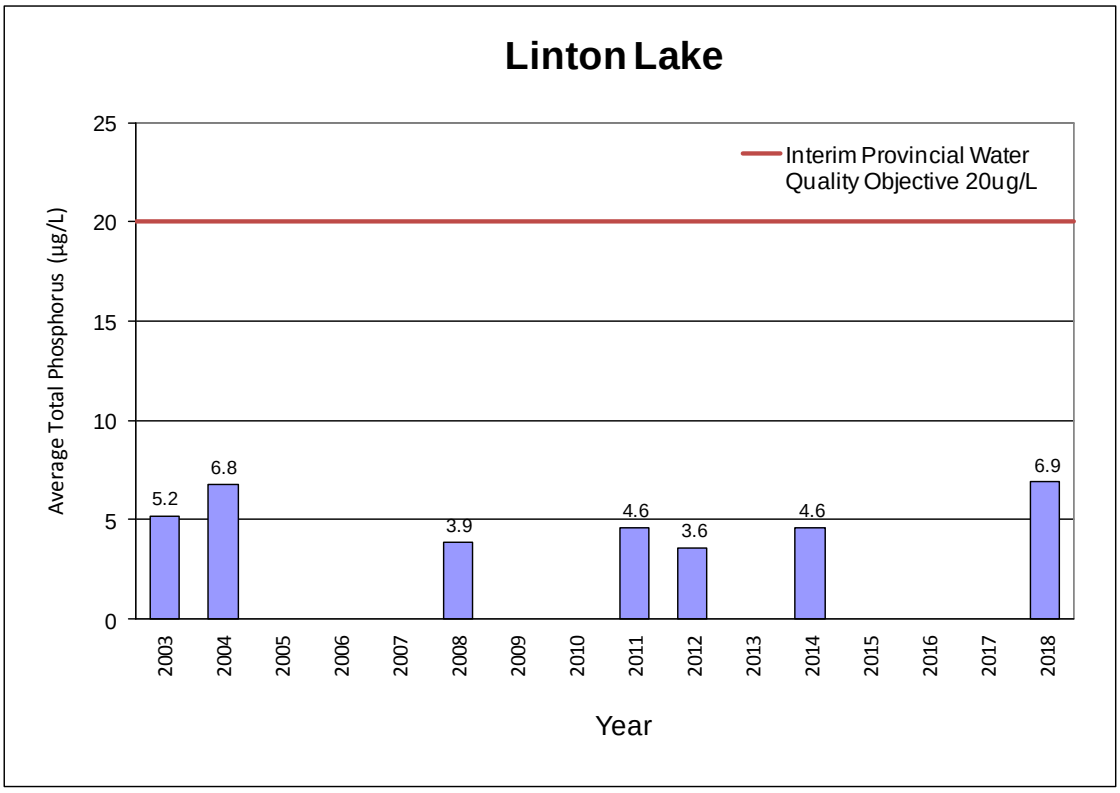
Kukagami Lake

The bar graph below indicates the spring total phosphorus results for Kukagami Lake from 2005-2018.



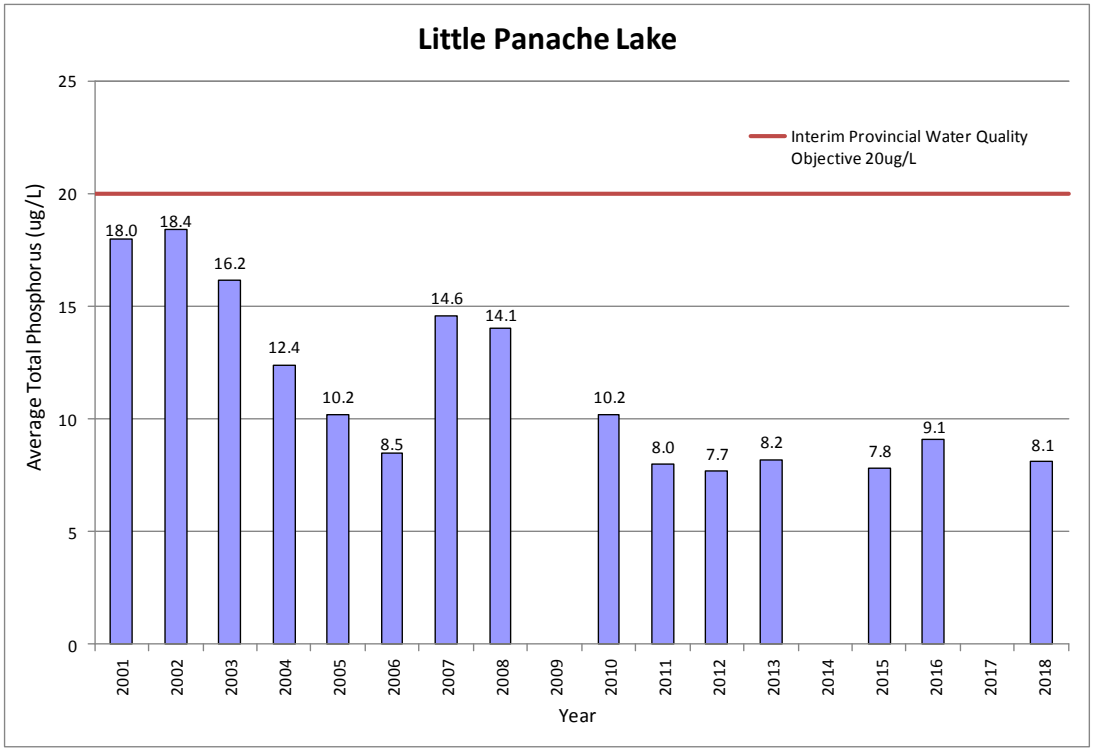
Linton Lake

The bar graph below indicates the spring total phosphorus results for Linton Lake from 2003-2018.



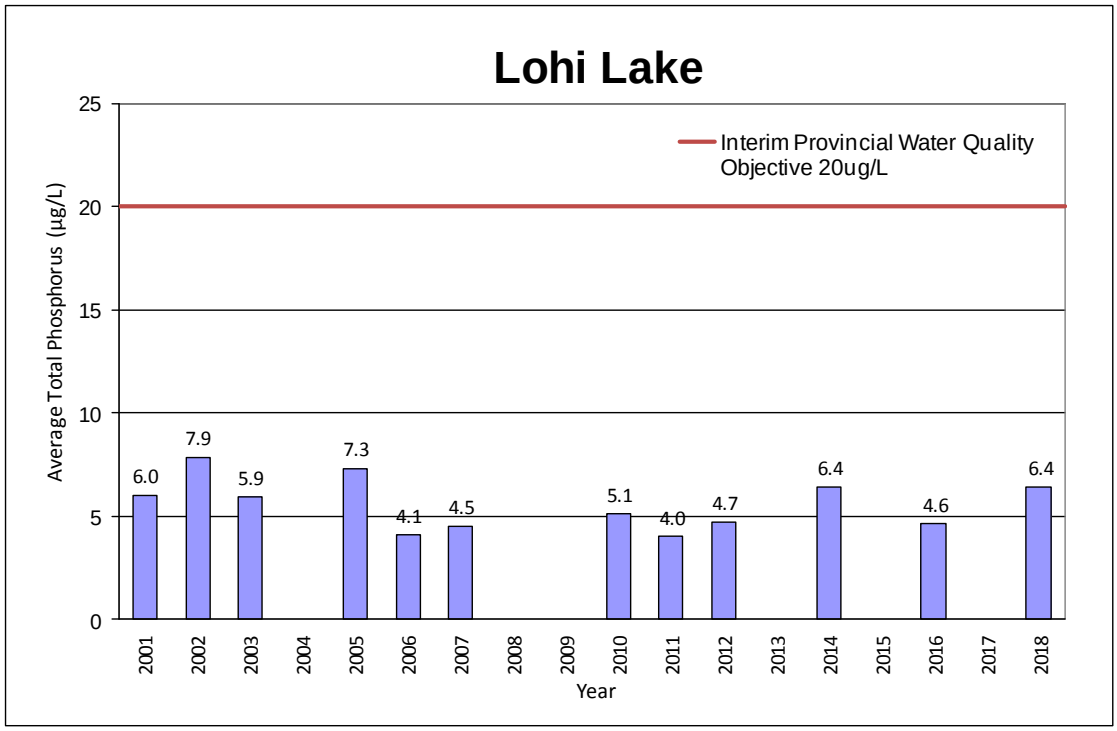
Little Panache Lake

The bar graph below indicates the spring total phosphorus results for Little Panache Lake from 2001-2018.



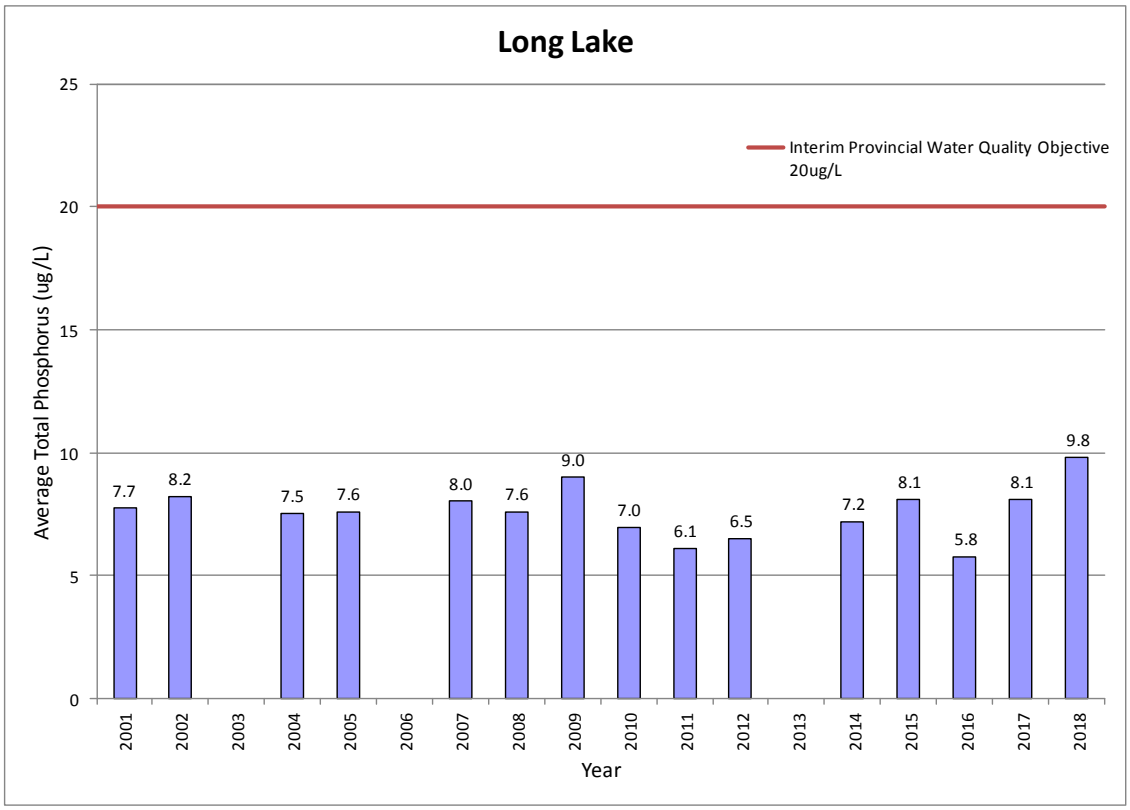
Lohi Lake

The bar graph below indicates the spring total phosphorus results for Lohi Lake from 2001-2018.



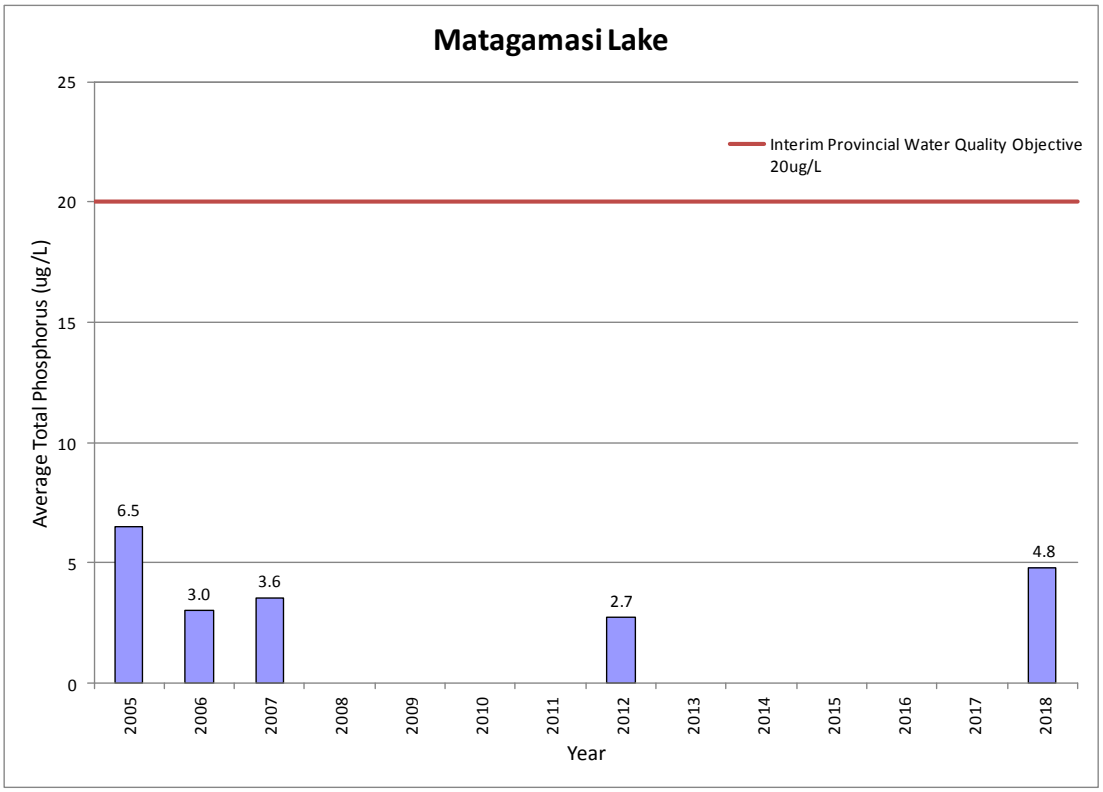
Long Lake

The bar graph below indicates the spring total phosphorus results for Long Lake from 2001-2018.



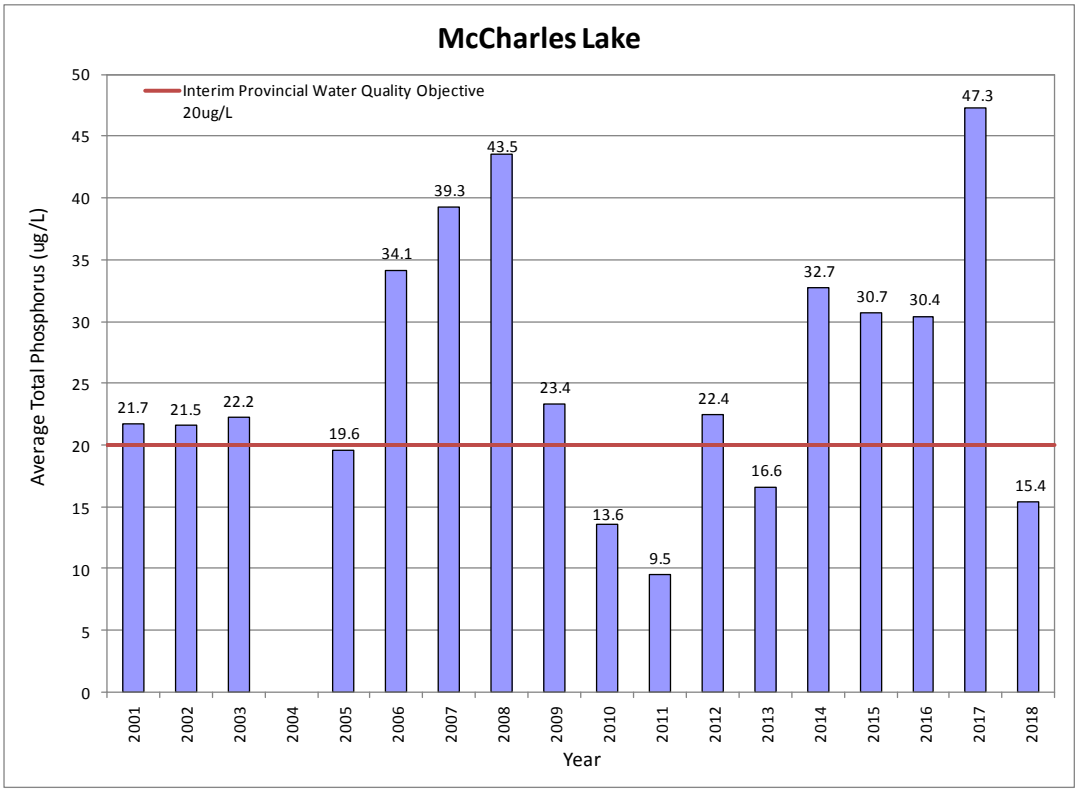
Matagamasi Lake

The bar graph below indicates the spring total phosphorus results for Matagamasi Lake from 2005-2018.



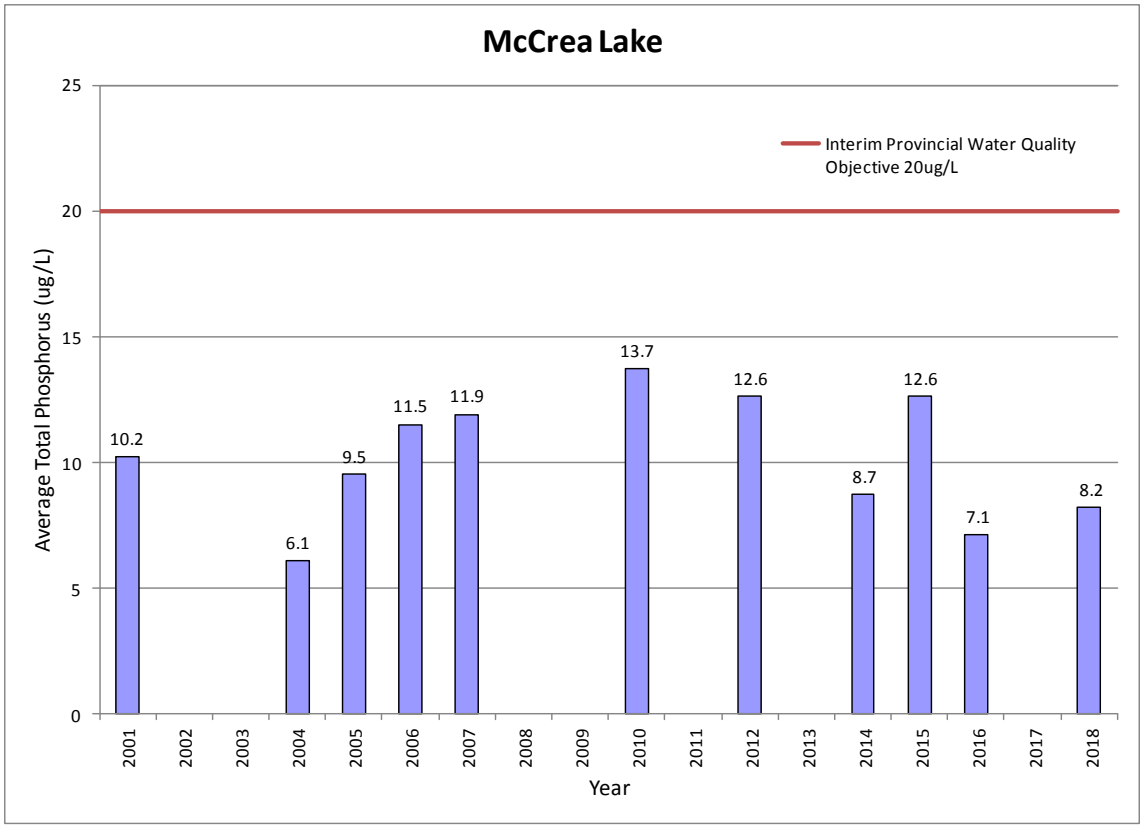
McCharles Lake

The bar graph below indicates the spring total phosphorus results for McCharles Lake from 2001-2018.



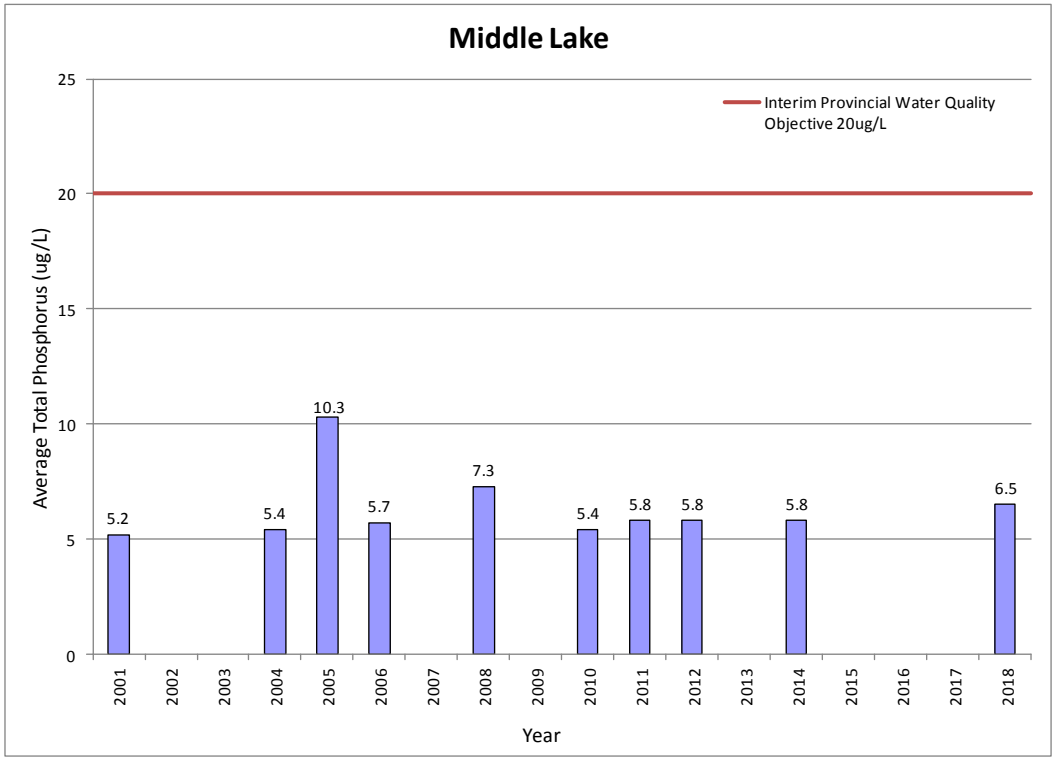
McCrea Lake

The bar graph below indicates the spring total phosphorus results for McCrea Lake from 2001-2018.



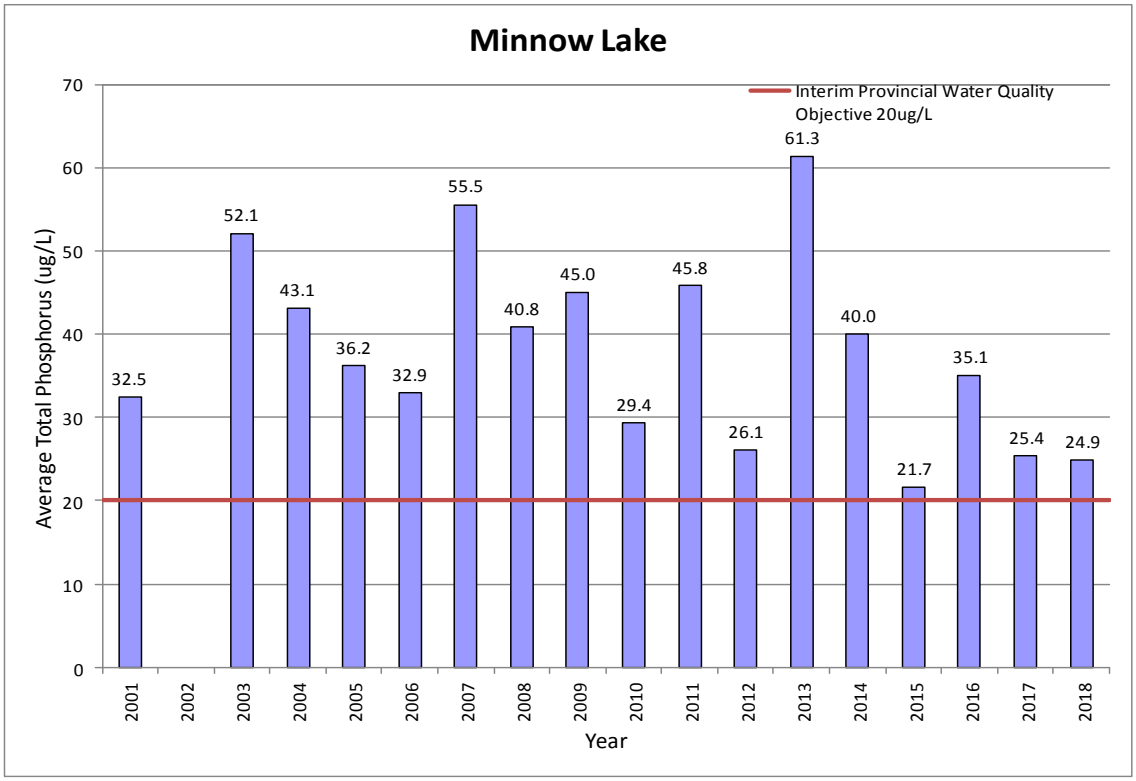
Middle Lake

The bar graph below indicates the spring total phosphorus results for Middle Lake from 2001-2018.



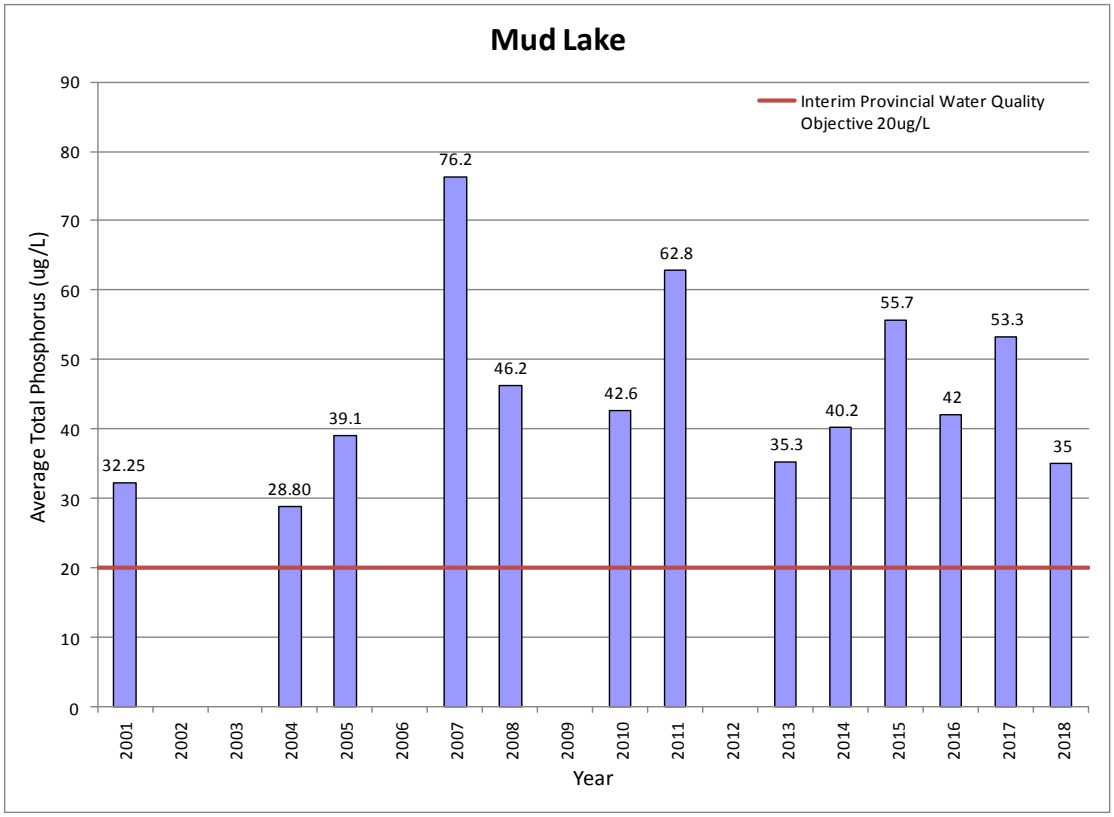
Minnow Lake

The bar graph below indicates the spring total phosphorus results for Minnow Lake from 2001-2018.



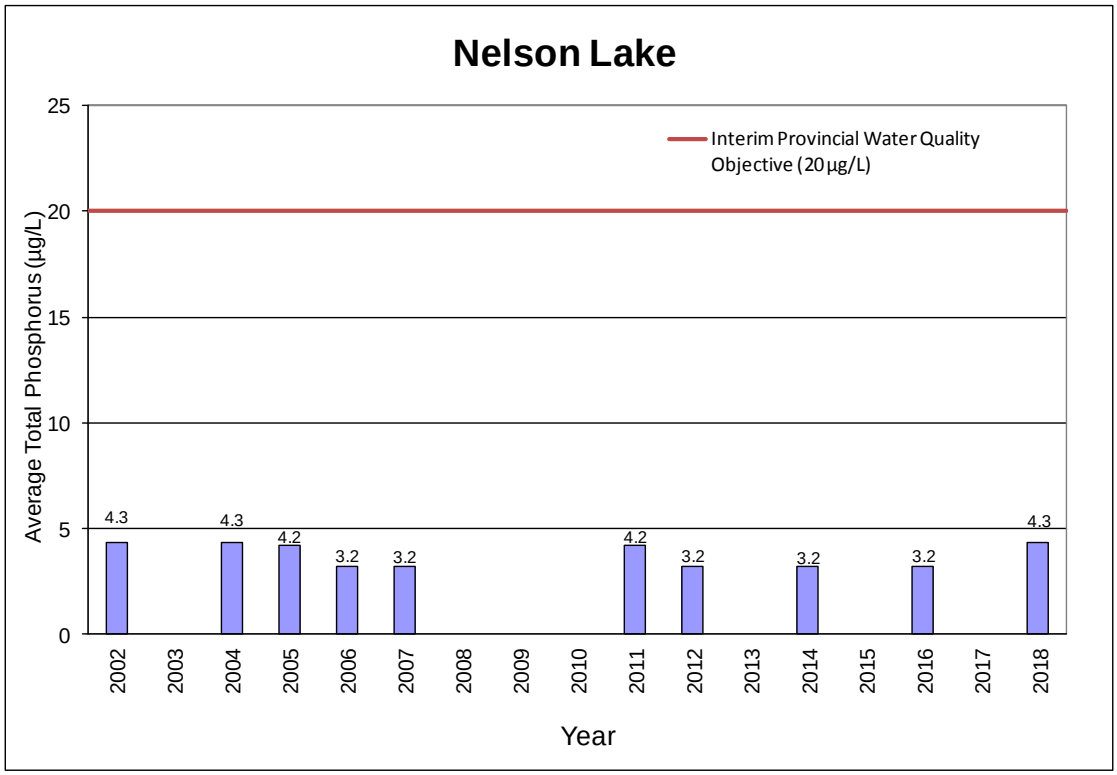
Mud Lake

The bar graph below indicates the spring total phosphorus results for Mud Lake from 2001-2018.



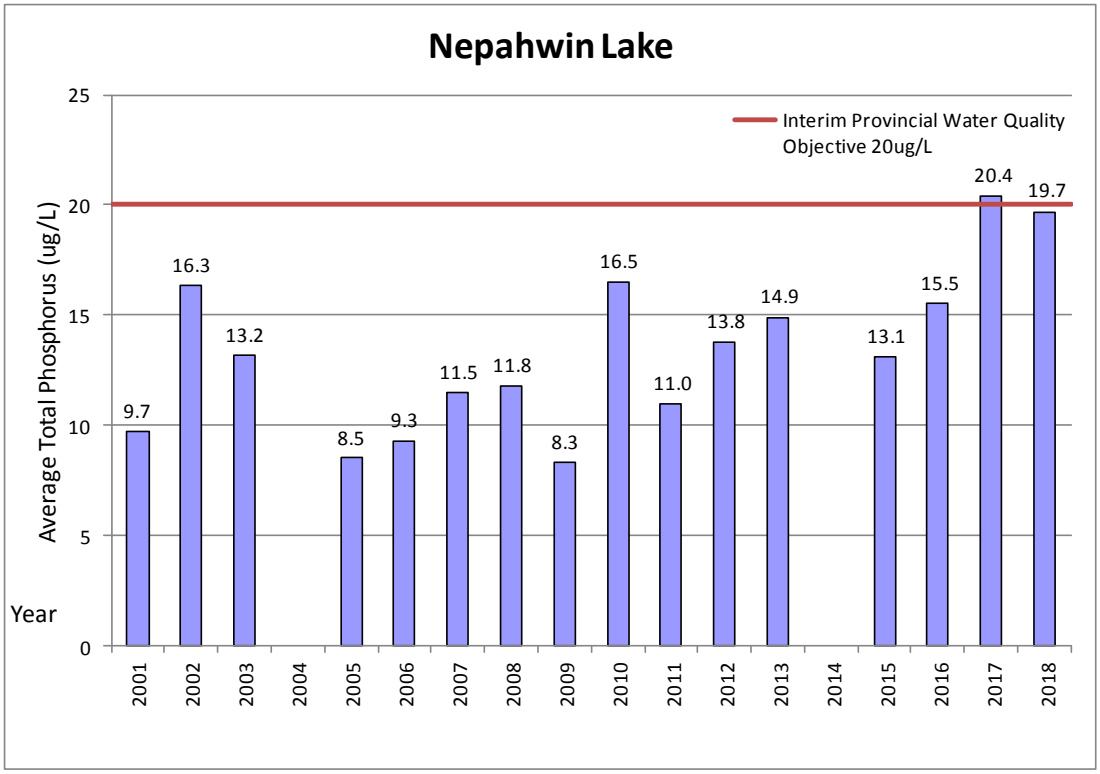
Nelson Lake

The bar graph below indicates the spring total phosphorus results for Nelson Lake from 2002-2018.



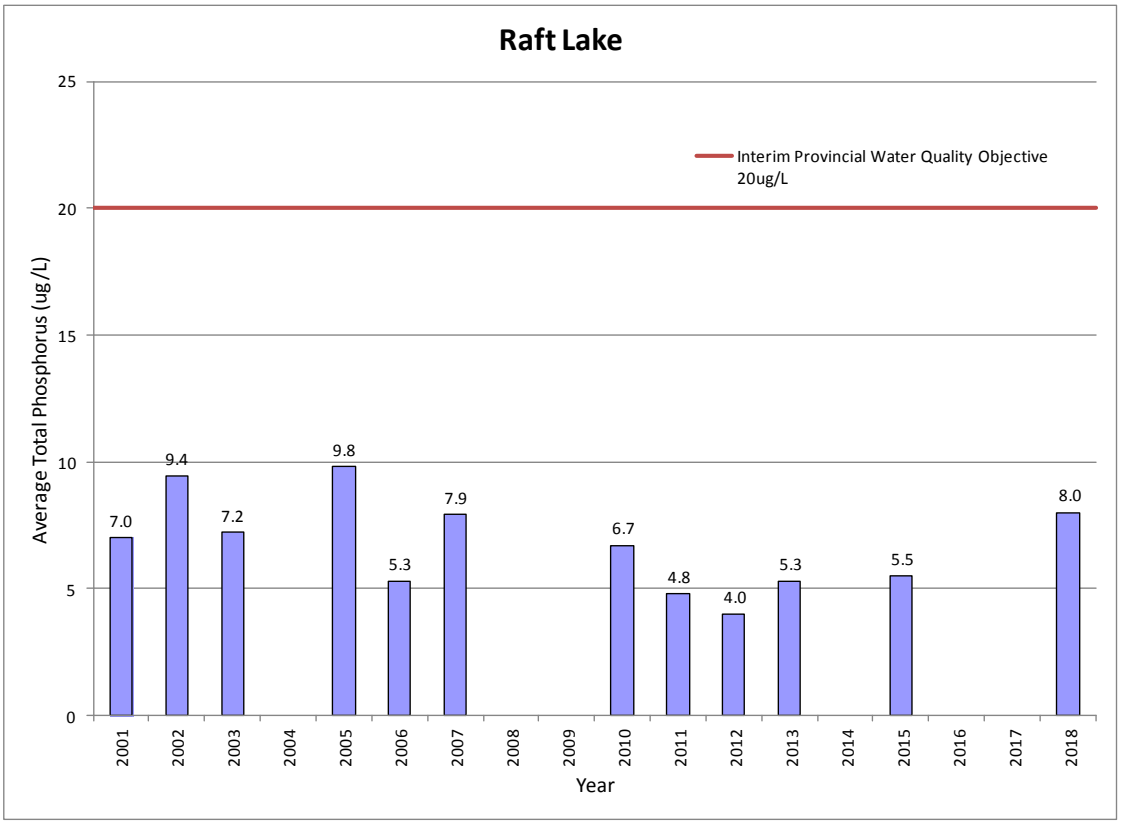
Nepahwin Lake

The bar graph below indicates the spring total phosphorus results for Nepahwin Lake from 2001-2018.



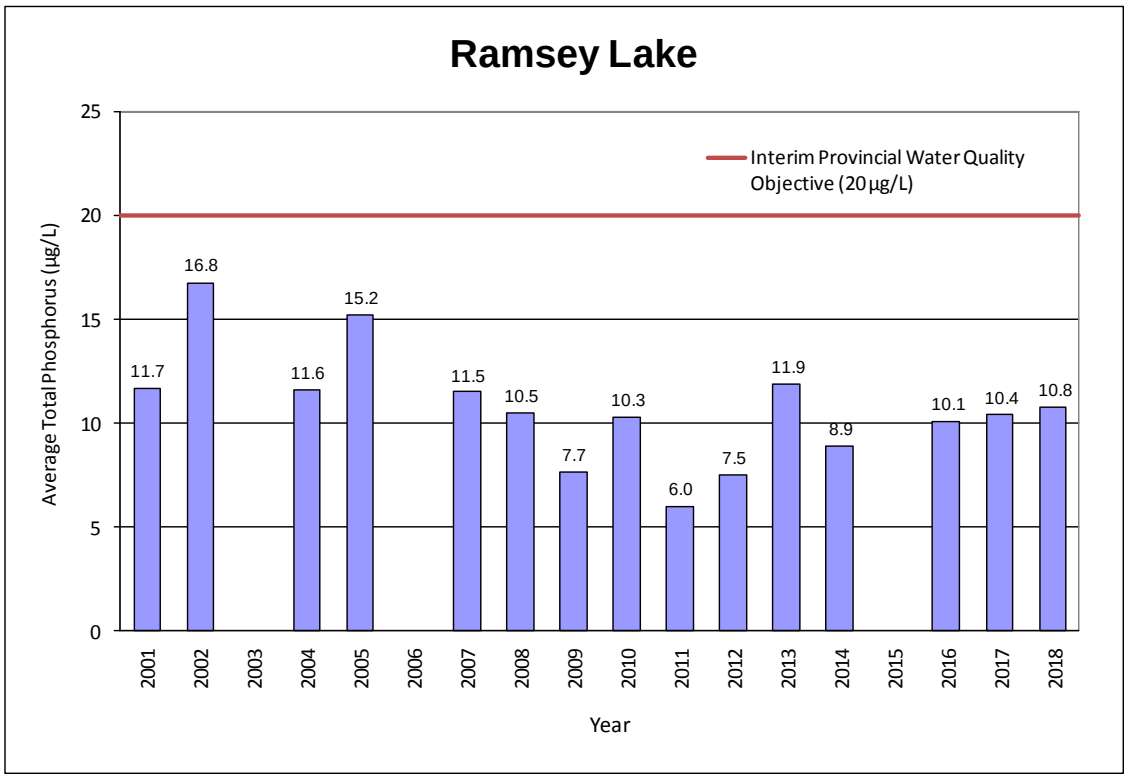
Raft Lake

The bar graph below indicates the spring total phosphorus results for Raft Lake from 2001-2018.



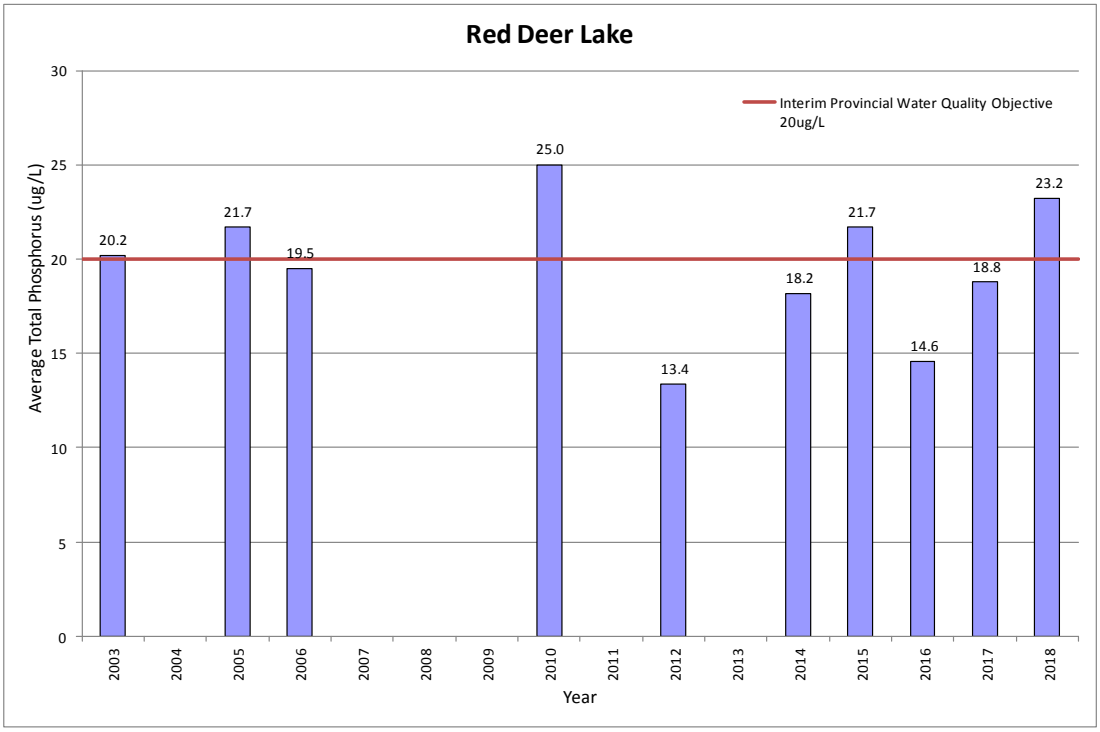
Ramsey Lake

The bar graph below indicates the spring total phosphorus results for Ramsey lake from 2001-2018.



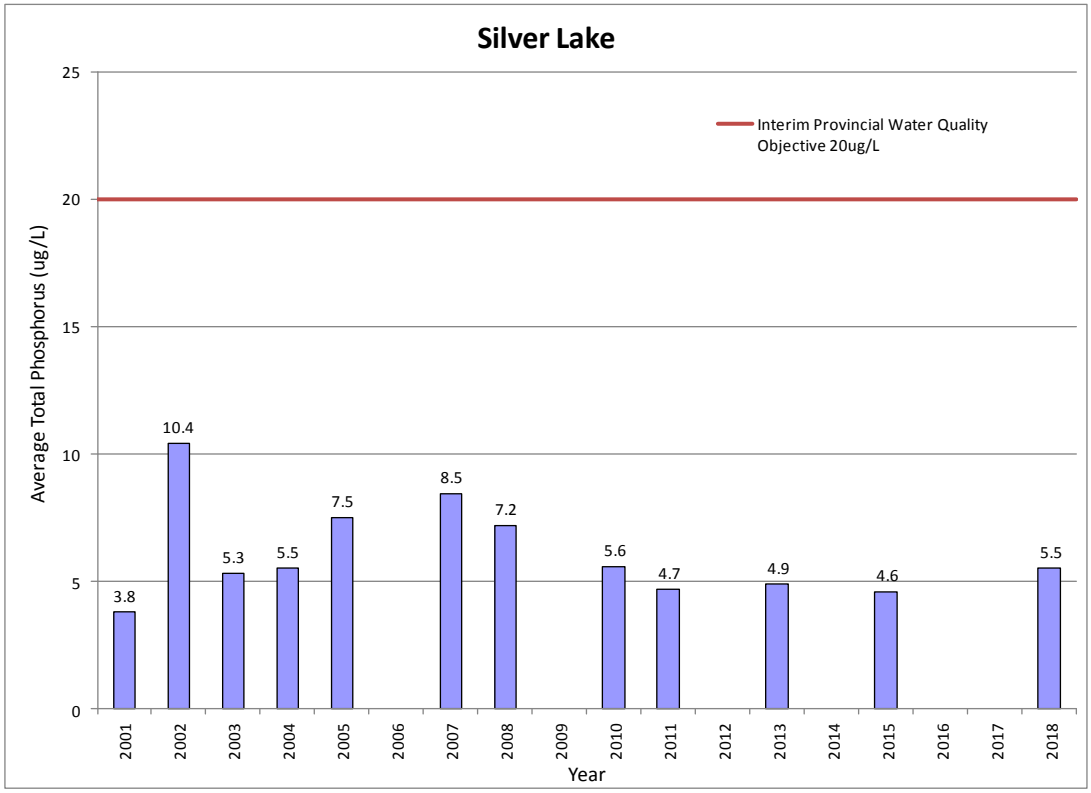
Red Deer Lake

The bar graph below indicates the spring total phosphorus results for Red Deer Lake from 2003-2018.



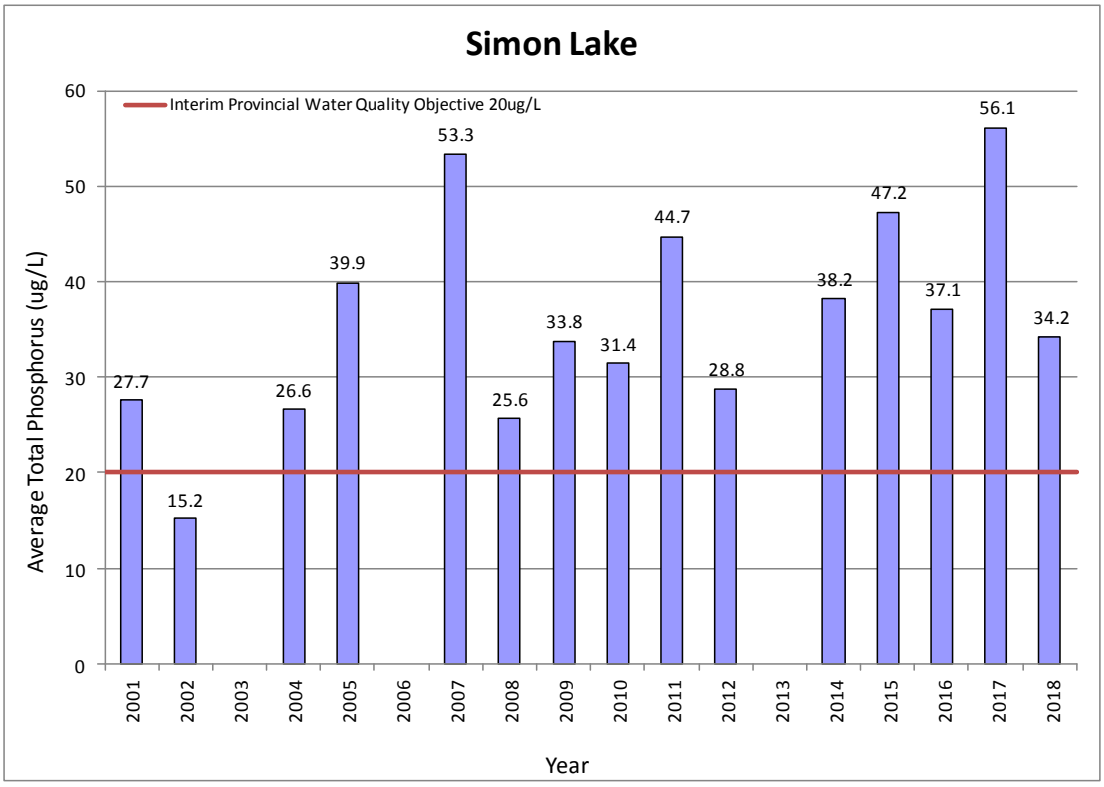
Silver Lake

The bar graph below indicates the spring total phosphorus results for Silver Lake from 2001-2018.



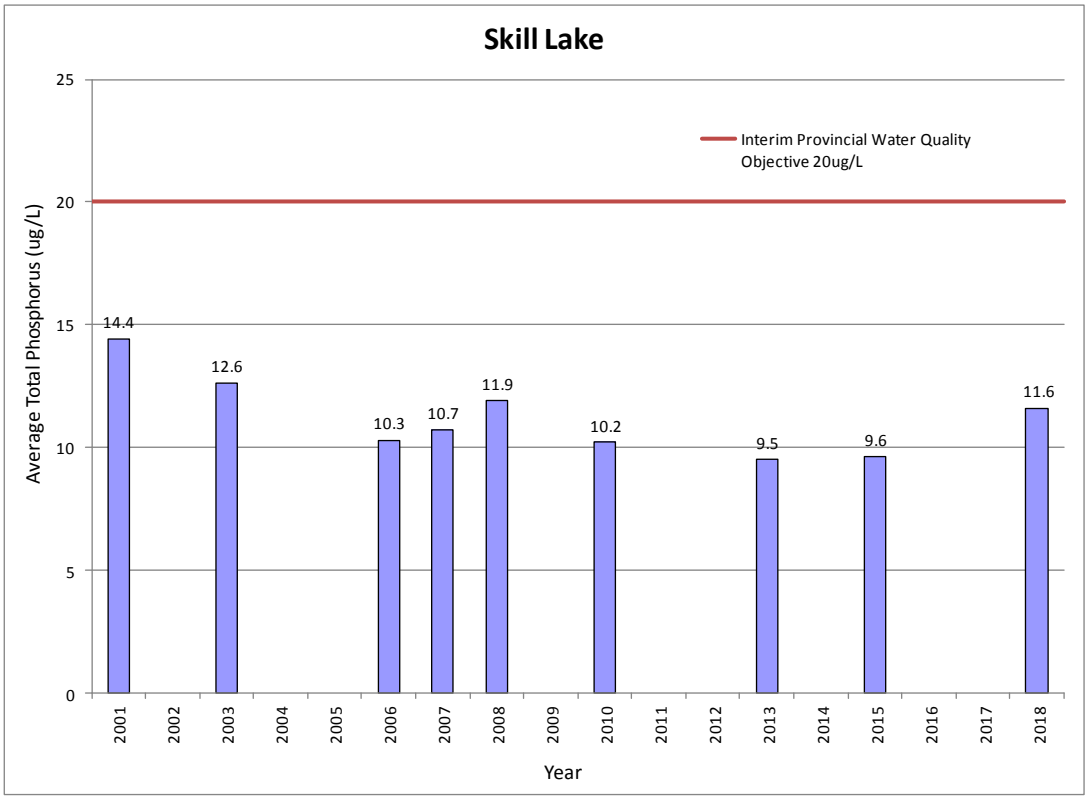
Simon Lake

The bar graph below indicates the spring total phosphorus results for Simon Lake from 2001-2018.



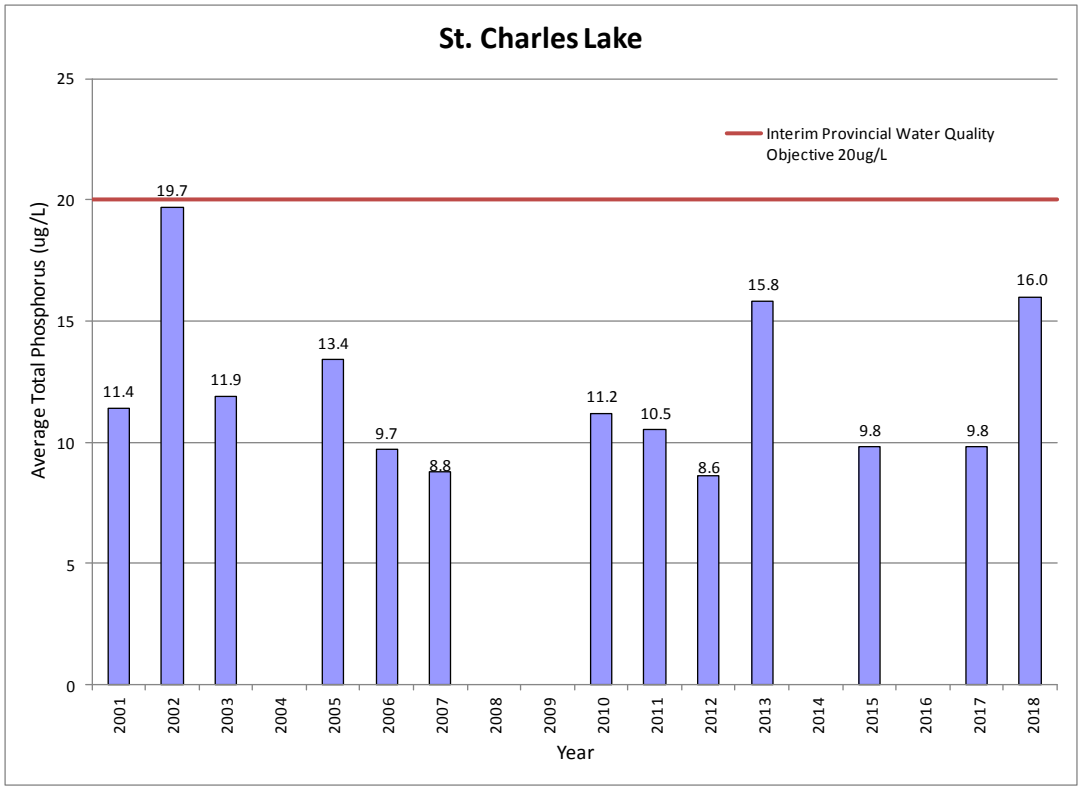
Skill Lake

The bar graph below indicates the spring total phosphorus results for Skill Lake from 2001-2018.



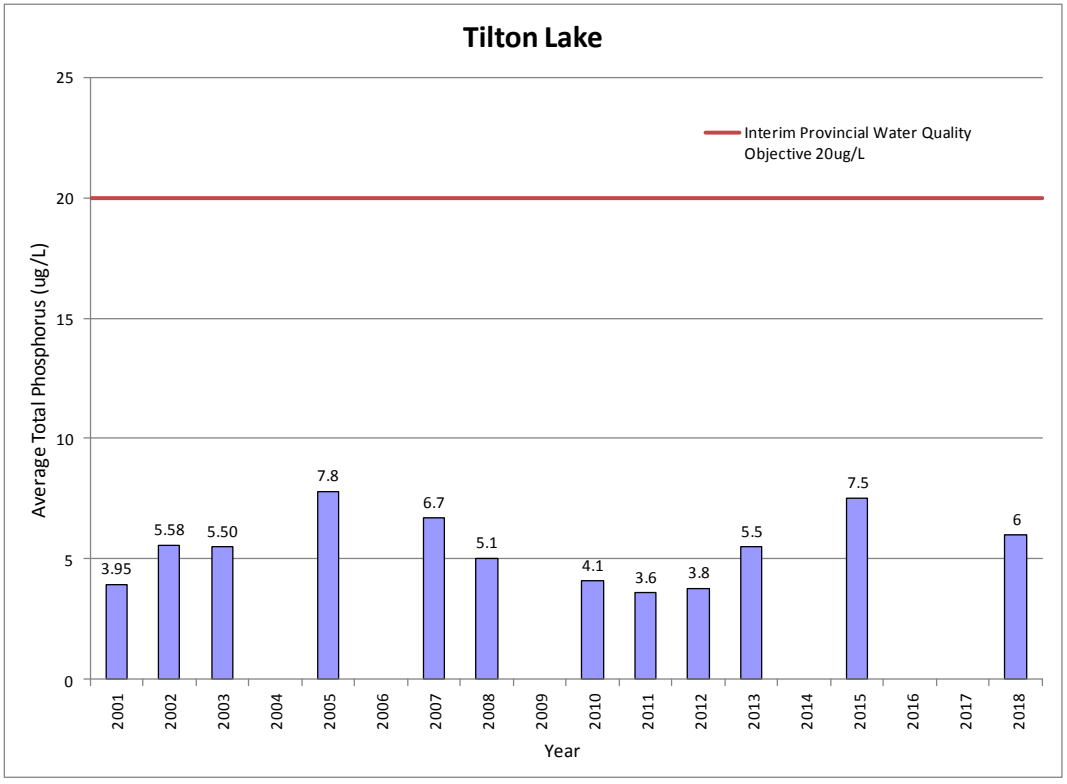
St. Charles Lake

The bar graph below indicates the spring total phosphorus results for St. Charles Lake from 2001-2018.



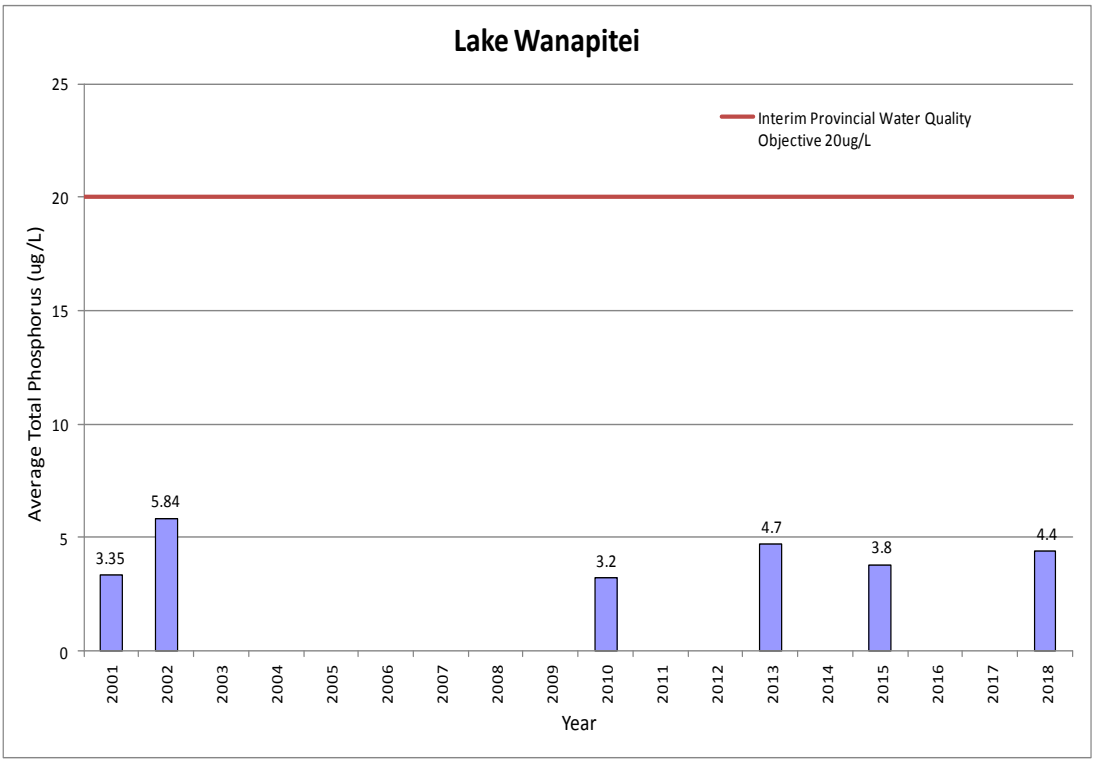
Tilton Lake

The bar graph below indicates the spring total phosphorus results for Tilton Lake from 2001-2018.



Wanapitei Lake

The bar graph below indicates the spring total phosphorus results for Lake Wanapitei from 2001-2018.



For further information, contact

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