# SHERBROOKE LAKE 2019 WATER QUALITY REPORT CARD

## SHERBROOKE LAKE STEWARDSHIP

Water quality monitoring at Sherbrooke Lake is led by the Sherbrooke Lake Stewardship Committee (SLSC). SLSC is comprised of citizen representatives appointed by the Municipality of Chester and the Municipality of the District of Lunenburg, in addition to a water quality expert, and officials from both municipalities. SLSC receives technical support from Coastal Action, who have also led the LaHave River Watershed Project since 2007. Both municipalities provide funding to support the SLSC, while trained volunteer lake residents conduct the monthly sampling from May to October. 2019 marked the second year of comprehensive monitoring at the lake.

## SHERBROOKE LAKE SAMPLING

Water samples are collected from lake and inlet stream sites and analyzed for total suspended solids, total nitrogen, total phosphorus, E. coli, hydrocarbons, and chlorophyll a. Four inlet streams are monitored bimonthly, while seven streams are sampled after a large rainfall to monitor water quality changes related to high volumes of runoff. Bottom sediment samples are collected from three lake sites and one river site to assess the long-term accumulation of nutrients and metals, which can influence the lake's water chemistry.

## HOW IS SHERBROOKE LAKE'S WATER QUALITY?

### Bacteria

All lake sites were consistently below Health Canada's recreational guideline for E. coli (400 CFU/100 mL). This guideline was exceeded only once at a stream site on Forties River, on September 9, 2019. This exceedance, along with bacteria concentration spikes at other stream sites, was associated with a large rainfall event during Hurricane Dorian. Elevated bacteria levels after rainfall are common and were observed during the 2018 season as well. Lake and stream water should always be treated prior to consumption (i.e., bathing, washing, drinking).

### Algal Blooms

Several algal blooms were reported in June and July of 2019 at Sherbrooke Lake, covering vast areas of the lake. Algal bloom samples were collected twice and neither sample had detectable levels of microcystins – the toxin associated with cyanobacteria (sometimes referred to as blue-green algae). An assessment of the algal species present in these samples determined that non-harmful green algae were the dominant species. Blooms are caused by a complex interaction of biological, chemical, atmospheric, and hydrographic conditions; many of which are uncontrollable. However, excessive nutrient inputs are one of the most influential factors in promoting a bloom and one of the most controllable.

### Nutrients

For much of the sampling season, nitrogen and phosphorus concentrations fell within their respective guidelines for freshwater streams and lakes; however, both nutrients spiked following the Hurricane Dorian rainfall event due to overland runoff, which transports nutrients from roads, lawns, gardens, and agricultural lands into the water. While nutrient concentrations in the water column remain low, concentrations sampled from bottom sediment were higher. This indicates a level of nutrient pollution entering the lake and settling to the bottom. In low oxygen conditions, these nutrients may become resuspended causing internal nutrient loading in the lake. Nutrient inputs from human activities should be minimized as much as possible to protect the lake from eutrophication and algal blooms.

### Overall Lake Health

Sherbrooke Lake is generally healthy but vulnerable. Human activities such as fertilizing, removing shoreline vegetation, and poor septic system maintenance can all impact the lake's water quality.

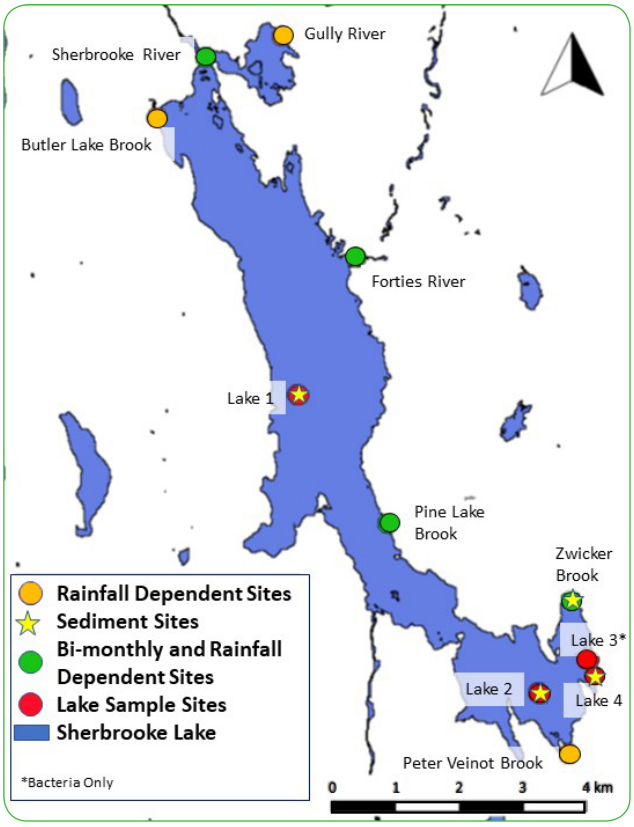


*Figure 1: 2019 map of Sherbrooke sampling sites.*

## DID YOU KNOW?

**Algal blooms** are a natural part of lake ecology but can be enhanced in size and frequency if pollution sources add extra nutrients into the environment. In a balanced ecosystem, algae and other organisms' growth is limited by the amount of nutrients available; however, if nutrients become available in excess (both naturally through fall and spring turnover and sediment resuspension, or through human-caused pollution), algal blooms can occur. Not all plumes are algae (i.e., pine tree pollen forms a film on the water's surface), and not all algae are toxic; however, only a water test can confirm the presence/absence of toxic algae species. **Algal blooms should be reported to the Nova Scotia Environment Office in Bridgewater (902-543-4685)**.

## TAKE CHARGE OF YOUR ENVIRONMENT!

*Limit your footprint with these at-home tips:*

### Try this

#### VEGETATED BUFFERS
Leave a section of natural vegetation between any lawns and the lake to filter runoff.

#### PICK UP PET WASTE
Put pet waste in its place: the garbage bin.

#### FENCED LIVESTOCK
Keep livestock out of the water with fences (provide livestock with alternate sources of drinking water).

#### MANURE LINERS
Line manure piles to prevent bacteria and nutrients from leaching into adjacent waterways.

### Avoid this

#### STRAIGHT PIPES
Replace illegal straight pipes with septic systems and keep your systems properly maintained.

#### FERTILIZING BEFORE RAIN
Avoid fertilizing your lawn before a storm, as excess nutrients will be washed into nearby waterways.

#### DISH SOAPS WITH PHOSPHATE
Avoid using dish soaps with phosphates, especially at the cottage, as the nutrients can cause harmful algal blooms in the water.



**1:** *A weather station was placed at Sherbrooke Lake to help monitor rainfall in the area. Data from the station is open to the public.* **2:** *Trained volunteers collecting water samples from Sherbrooke Lake during the 2019 field season.*

Coastal Action is a charitable organization on the south shore of Nova Scotia that believes in safeguarding a healthy environment for future generations. For over 25 years, our goal has been to promote the restoration and conservation of our environment through research, education, and action. We work in four core areas: Watersheds & Water Quality, Species at Risk & Biodiversity, Climate Change & Education, and Coastal & Marine.