Blue-Green Algae Monitoring 2020 Report

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Water Resources Management Division

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Background

Cyanobacteria, commonly called 'blue-green algae', are microscopic, plant-like bacteria that occur naturally in many aquatic and terrestrial environments throughout the world. Individual organisms are not normally visible, but aquatic populations can increase rapidly when conditions are favorable, causing the bacteria to congregate in large masses or 'blooms' that are often, though not always, easily visible.

These blooms most commonly occur in summer or early fall, when surface waters are warmest, but they can also occur at other times during the year. In addition to water temperature, a key factor contributing to the growth of blue-green algae and the formation of a bloom is the amount of available nutrients such as phosphorus and nitrogen in the water.

Many species of blue-green algae can produce toxins that are potentially harmful to humans and animals. The most common blue-green algae toxins encountered and monitored in Canadian waters are microcystins. Health Canada has established guidelines for the cyanobacterial toxin 'microcystin-LR'. The guidelines are "believed to be protective of human health against exposure to other microcystins (total microcystins) that may also be present" (Health Canada, 2016).

Health Canada's '*Guidelines for Canadian Drinking Water Quality*' recommend that microcystin-LR not exceed 1.5 µg/L. There are also '*Guidelines for Canadian Recreational Water Quality*' that recommend total cyanobacteria not exceed a density of 100,000 cells/mL and total microcystins not exceed 20 µg/L (expressed as microcystin-LR).

Summaries of blue-green algae monitoring in the province for the years 2007 to 2019, are available on the Department of Environment, Climate Change and Municipalities website at:

https://www.mae.gov.nl.ca/waterres/quality/background/bgalgae.html

Blue-Green Algae Occurrences in 2020

On June 11, 2020, a blue-green algae bloom was reported and observed in Miller's Pond, Portugal Cove - St. Philip's (Figures 1 and 2). Grab samples were collected on June 11 by Water Resources Management Division (WRMD) staff. Samples were taken from an area where the bloom was most intense and analyzed at the York-Durham Regional Environmental Laboratory in Pickering, Ontario.

Results showed microcystin levels to be low at 0.279 µg/L, while the cell density level (cell count) was 840,000 cells/mL. The cell count exceeds the '*Guidelines for Canadian Recreational Water Quality*' (100,000 cells/mL) and indicates that the water was not safe for recreation at that time.

The cyanobacteria bloom which occurred in Miller's Pond in 2020 was, as in all previous years, a proliferation of cyanobacteria belonging to the Anabaena genus.

Figure 1: Miller's Pond (Portugal Cove – St. Philip's), June 11, 2020

Figure 2: Miller's Pond (Portugal Cove – St. Philip's), June 11, 2020

The cyanobacteria bloom in Miller's Pond in 2020 dissipated relatively quickly. Subsequent sampling on June 18 revealed cell counts to be 47,000 cells/mL, which is below the *Guidelines for Canadian Recreational Water Quality* ell below and microcystin was not detectable. Samples collected on July 14 did not contain Anabaena, and microcystin levels remained below the detection limit of 0.10 µg/L .

No other occurrences of cyanobacteria blooms were observed or reported in 2020.