



## Algae Cyanobacteria and Drinking Lake Water Frequently Asked Questions

### *What are Algae and Cyanobacteria?*

Critical to aquatic food webs, algae and cyanobacteria are naturally-occurring photosynthetic organisms. They occur because of certain conditions for growth, and do occur even in the absence of human activities.

[Algae](#) are similar to aquatic plants, but they lack roots, stems and leaves.

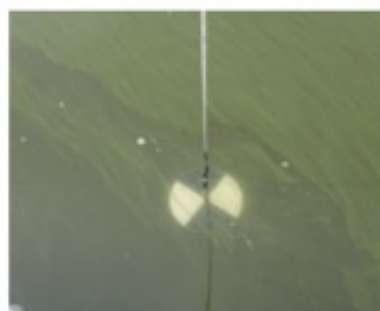
Algae may multiply quickly when conditions are right, and can create what is known as a "bloom" in a body of water. There are many different types of algae and cyanobacteria. They may be single-celled or multicellular; forming mats or filaments.

Cyanobacteria are single-celled organisms that are photosynthetic like algae, and they do not form mats or filaments. Cyanobacteria may produce a type of neurotoxin called "[cyanotoxins](#)". (Health Canada)

A "bloom" is an overgrowth of microscopic algae or cyanobacteria in freshwater, or salt water. Blooms may be many colours, and they may also be invisible to the naked eye. A bloom may be harmful to other aquatic organisms, and it may be harmful to animals and humans, so it is important to know about algae and cyanobacteria that may bloom in water bodies that you are consuming or visiting.



credit: Rideau Valley Conservation Authority, Algae Manual



A surface bloom of the cyanobacteria *Aphanizomenon flos-aquae* in Ellison Lake, B.C.

credit: Province of B.C., Algae Watch

### *What factors affect growth of algae and cyanobacteria in lakes?*

- Sunlight
- Wind
- Temperature
- Water clarity
- Fish species changes
- Available nutrient concentrations



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*Are blooms always visible to the naked eye?*

No

*What kinds of natural chemicals might be created during a cyanobacterial bloom?*

- Microcystins are potentially harmful toxins that may be produced by cyanobacterial blooms (blue-green algae).
- Microcystins are an indicator for a whole family of toxins – they are not the only type that might be produced by cyanobacteria.
- Blooms may occur at any time of year
- If toxins are produced, their concentration in the body of water may vary unpredictably. Maximum allowable concentration of microcystins in drinking water is 0.0015 mg/L ([Health Canada](#)).

*Who is responsible to test the quality of lake water for drinking?*

If you withdraw and treat lake water for potable use in a residence:

- Owners of onsite lake water treatment systems for drinking purposes are responsible for the safety and potability of the water produced by their system.
- The Province regulates drinking water safety for multi-connection systems
- Private single-connection domestic potable water system owners

withdrawing from a surface water source have the same personal responsibility for treated water quality as a domestic groundwater wellowner does.

- This requires water quality testing

*The following factors may indicate an algal or cyanobacterial bloom:*

- changes in total organic compound (TOC)
  - changes in turbidity, taste and odour of the water
  - portable pigment analyzer instrumentation for chlorophyll-a or phycocyanin
  - fish species present
  - plankton/algae/cyanobacterial species present
  - seasonal temperature and sunlight changes
- 
- Phosphorus – **not necessarily indicative of algae blooms**
    - Phosphorus concentration is one of the available nutrients that impacts algal and cyanobacterial growth
    - The presence of elevated concentrations of phosphorus (which has many forms) **is not a confirmation** that there is a harmful algal bloom or cyanobacterial bloom in the lake



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- phosphorus and other nutrient levels change over a year and from year-to-year



*Can one predict a harmful algae bloom from phosphorus concentration in St. Mary Lake, Salt Spring Island, British Columbia? Is it getting worse each year?*

- The 40-year record of lake water phosphorus concentration indicates no long-term trend of increasing phosphorus concentration in St. Mary Lake, Salt Spring Island, British Columbia, Canada
- Bird populations only add minimal phosphorus to most lakes; it was concluded based on bird count results that birds are not contributing significantly to harmful algal blooms in St. Mary Lake, Salt Spring Island
- It was concluded from a 2014-15 study of groundwater nutrient concentration at three septic fields around St. Mary Lake (in diverse soils) that phosphorus loading from leaching of septic systems is minimal at St. Mary Lake ([St. Mary Lake Integrated Watershed Management Plan, 2015](#))

### Resources

Health Canada. Guidelines for Canadian Drinking Water Quality – Technical Document, Cyanobacterial Toxins.

[https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-cyanobacterial-toxins-document.html#2\\_0\\_Executive\\_summary](https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-cyanobacterial-toxins-document.html#2_0_Executive_summary)

Province of British Columbia. Algae and Cyanobacteria Identification:

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/algae-watch/recognize-algae>

Province of British Columbia. Algae Watch. "Submit your observation"

<https://forms.gov.bc.ca/environment/algae-watch-observation-form/>

Province of British Columbia. Algae Watch

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/algae-watch>



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Province of British Columbia. Water Quality Reference Documents.  
<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-reference-documents>

Province of British Columbia. Decision Protocols for Cyanobacterial Toxins.  
[https://www2.gov.bc.ca/assets/gov/health/keeping-bc-healthy-safe/healthy-communities/decision\\_protocol\\_for\\_cyanobacteria.pdf](https://www2.gov.bc.ca/assets/gov/health/keeping-bc-healthy-safe/healthy-communities/decision_protocol_for_cyanobacteria.pdf)

Province of British Columbia. Surface Water Treatment Objectives.  
[https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/how-drinking-water-is-protected-in-bc/part\\_b\\_-\\_5\\_surface\\_water\\_treatment\\_objectives.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/how-drinking-water-is-protected-in-bc/part_b_-_5_surface_water_treatment_objectives.pdf)

Rideau Valley Conservation Authority. [Algae and Aquatic Plant Education Manual](#)

Salt Spring Island Watershed Protection Alliance. 2015. St. Mary Lake Integrated Watershed Management Plan.  
<https://www.ssiwpa.org/wp-content/uploads/Public-Library/SSIWPA-Projects-Reports-and-Presentations/St.-Mary-Lake-Watershed-Duck-Creek/SSIWPA-2015-St-Mary-Lake-Integrated-Watershed-Management-Plan.pdf>

### Laboratory testing of drinking water:

Saanich:  
<https://www.mblabs.com/services/water-environmental/water/drinking-water.php>  
2062 Henry Ave W, Sidney, BC V8L 1W7 250-656-1334

Victoria:  
<https://www.islandehs.ca/watertesting>  
201-990 Hillside Avenue, Victoria, B.C. V8T 2A1 778-406-0933

**Rapid testing kits for cyanotoxins:**  
<https://abraxis.euofins-technologies.com/home/products/rapid-test-kits/algal-toxins/algal-toxin-elisa-plate-kits/>

### Health Canada Guidance about Cyanobacterial Toxins:

[https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-cyanobacterial-toxins-document.html#2\\_0\\_Executive\\_summary](https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-cyanobacterial-toxins-document.html#2_0_Executive_summary)

1. Recognize and roughly identify an algal bloom

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/algae-watch/recognize-algae>

2. Take photos of algae/cyanobacteria in a water body near you

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water->



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[quality/algae-watch/submit-your-algae-bloom-observation/take-good-photos-of-  
algae-bloom](#)

3. Submit your photos to AlgaeWatchBC. Use the map.

The photos will contribute to this interactive map:

<https://www2.gov.bc.ca/gov/content/environement/air-land-water/water/water-quality/algae-watch/submit-your-algae-bloom-observation/algae-watch-observation-map>

(In the center of the page is a link in blue font "Access the Algae Watch Observation Interactive Map")