

ALGAL BLOOM MONITORING

WHY

While algal blooms may be naturally occurring in a healthy watershed, when they become more frequent, and/or last longer, it can be an indicator of poor watershed health. Blooms of both green and blue-green algae (cyanobacteria) have been observed in lakes, ponds, streams and bays in the Ottawa River watershed, and can be linked to increased temperatures and inputs of nutrients like phosphorus to water bodies. Such blooms have the potential to cause oxygen depletion in aquatic systems, reduce biodiversity, and in the case of blue-green algae, produce toxins that are dangerous to humans and animals alike!

WHEN

Algal blooms are most common when the weather is warm. Green algae tends to bloom most often during the spring and early summer, while blue-green algae will typically bloom during mid to late summer and into the fall.

WHERE

Algal blooms are most likely to occur in calm or slow-moving water, that receives direct sunlight. Nutrient input can also influence algal growth, so blooms may be more likely to occur near agricultural land or CSO outputs.



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HOW: Helpful Definitions

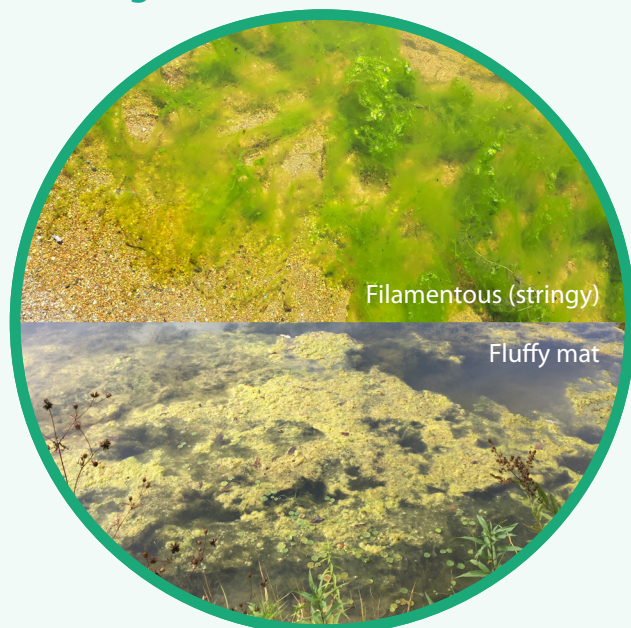
Bloom Frequency

Refers to how often are algal blooms occurring in a given location. Measured as the number of times blooms occurring over a certain amount of time.

Bloom Intensity

Refers to how much algal biomass is being produced in a given bloom event. For blooms of both green and blue-green algae this is estimated in terms of overall surface area covered. More context can be provided for blooms of blue-green algae by indicating bloom category (i.e., density of algal cells; see images on page 4) and for green algae by estimating the bloom thickness.

Green Algae



Green

Filamentous (stringy) or fluffy mats

Septic or grassy odour

Typically appears in the spring or early summer

Most do not produce toxins and are unlikely to pose a threat to humans or animals

Blue-green Algae



Blue-ish green/turquoise, green

Looks like spilled paint or pea soup; small green specks or clumps

Pigpen odour

Typically blooms in mid to late summer and into the fall

May produce toxins and pose a threat to humans and animals

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HOW: Equipment

Camera, GPS, Ruler/measuring stick, Data sheets, Pencil/pen

HOW: Observations

Step 1: Initial Observation and Reference Photo

Encountered an algal bloom? Snap a reference photo and log your observations. Make note of overall bloom size, intensity, surrounding land use, and any other things you notice at your site (e.g smells, animal presence, signs of erosion, plant life, etc.).

If you plan to monitor a location before coming across a bloom you can take your reference photo whether or not a bloom is present to serve as a baseline for your site. For information on how to take an appropriate reference photo consult our **guidance on Benchmark Photography**.

Don't forget to report this observation to Ottawa Riverkeeper right away so we can help confirm bloom type and make sure your reference photo is suitable!

Step 2: Follow-up Observations

Return to your monitoring site within 24-48 hours and make a follow up observation. Log your observations documenting any changes in the bloom's size and intensity. Continue to return to your monitoring site every 24-48 hours until the bloom is gone.

Note: If it rains over any of the 24-48 hour periods between monitoring activities, it is possible that the bloom will disappear. If this happens, please record the type of weather event and any other observations you may make at your site in your log.

Step 3: Long-term Observations

Continue visiting your monitoring site periodically over the course of the season to track how frequently blooms are occurring at this location. Try to visit once a week if possible. The best times to capture a bloom are during and/or just following a heat wave, or after a few days of 25+ °C temperatures.

HOW: Assessing Bloom Size and Intensity

Estimating Bloom Size (both green and blue-green algal blooms)

Algal blooms can start out small and grow to cover a significant area of a waterbody. To get a sense of the overall coverage of an algal bloom, provide an estimation of the surface area covered. You can do this by comparing it to an everyday object, for example does the bloom cover the same surface area as a beach towel? A queen size mattress? A tennis court? Provide a comparison using an everyday object of your choosing, just let us know what it is so we can make the appropriate estimate.

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HOW: Assessing Bloom Size and Intensity (cont'd)

Bloom Intensity: Green Algae

Blooms of green algae present quite differently than cyanobacterial blooms. Since they are also unlikely to produce toxins, there is less concern when it comes to coming into physical contact with a green algae bloom. Therefore, if it is safe for you to do so, you can use a ruler or other measuring device to assess the thickness of green algae surface blooms. If possible try and measure the bloom at its thickest spot and give an estimation of average bloom thickness. Record your measurement in your monitoring log. Be sure to wash your hands after taking measurements!

Bloom Intensity: Blue-green Algae

Blooms of blue-green algae don't form in a way that is easily measurable with a ruler, plus they have the potential to produce harmful toxins, so it's important to avoid entering water that contains a bloom of blue-green algae. To assess the intensity of blooms of blue-green algae we can use the categories below, adapted from those of the Quebec Ministry of the Environment. The table below provides a description of each of the three categories to help you assess bloom intensity. *If you are ever unsure about what category your bloom is don't hesitate to reach out to Ottawa Riverkeeper's Science Team. Don't forget to share photos of your bloom!*



Category 1

Water is cloudy, but you can still see through it.

Algae may be visible as small balls suspended in the water column



Category 2

Water colour begins to change as algae rise and concentrate at surface

Algae may form larger colonies visible as small balls or flakes in the water.



Category 3

Algal bloom is at its most dense and may resemble spilled paint on the water surface.

Bloom material may wash up on shore and leave a visible scum.

Remember, blue-green algae has the potential to be toxic, if you encounter a bloom avoid touching it or entering the water. If you do make contact with bloom material be sure to thoroughly wash your hands as soon as possible. In addition, if you are accompanied by a four-legged sampling buddy, be sure to keep them from drinking or entering the water as well.

CONTACT

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