



CYANOBACTERIA, MICROCYSTIN, & YOU: BLUE-GREEN ALGAE BLOOMS IN MONTGOMERY PARKS

What are cyanobacteria & microcystins?

- Cyanobacteria, also called blue-green algae, are specialized bacteria with the ability to photosynthesize and resemble true algae.
- Cyanobacteria occur naturally in the environment and may be microscopic or form dense visible colonies.
- The cyanobacteria species *Microcystis aeruginosa* is very common and can produce a toxic compound known as microcystin that is harmful at elevated levels occurring during algal blooms.
- Microcystin was first detected at concerning levels at Lake Needwood in Rock Creek Park in 2009.

What does an algal bloom look like?

- Blooms can change the water color and may appear as a mat of growth floating on or just below the surface of water. A typical algal bloom is often referred to as “pond scum”.
- A cyanobacteria bloom is typically bright green or blue-green, often with surface streaks which resemble spilled paint.



Cyanobacteria bloom near the Lake Needwood boathouse.

What causes algal blooms?

- Blooms of cyanobacteria and true algae occur when air and water temperatures are warm, there is ample sunlight, and the water is enriched by nutrients such as phosphorus and nitrogen. These conditions are common during summer.
- Nutrient input increases when stormwater runoff, fertilizer, and sewage enter our waterways.
- It is likely that algal blooms occurring in Montgomery County are due to overuse of fertilizers on lawns and excess pet waste entering lakes, ponds, and streams during rain events.
- Large quantities of cyanobacteria may result in harmful levels of the toxin microcystin.
- **However, not all algal blooms are cyanobacteria and not every cyanobacteria bloom is harmful!**

Where do blooms most frequently occur?

- Algal and cyanobacteria blooms tend to occur in still or very slow-moving water.
- In Montgomery Parks, there have been cyanobacteria blooms and elevated levels of microcystin in portions of Lake Frank and Lake Needwood.
- The lake edges are of greatest concern because they retain the warmth from sunlight and receive the least amount of wind movement.



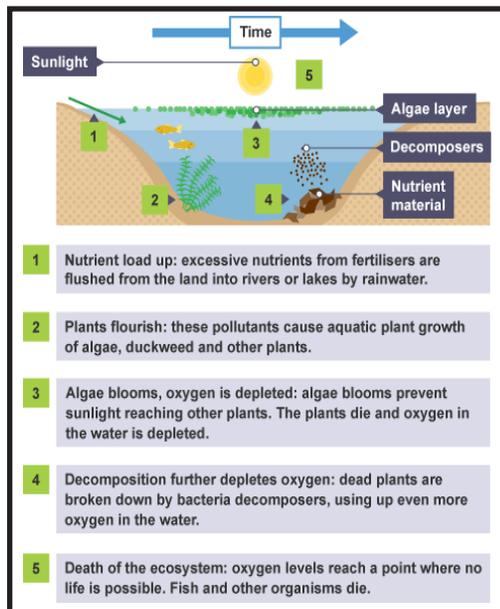
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How long do cyanobacteria blooms last?

- Blue-green algae blooms will appear in late summer and early fall and last from a few days to several months.
- Large populations of cyanobacteria will typically die and disappear after one to two weeks, but if conditions are favorable, a new bloom can rapidly replace the previous one.
- Currently, treatment is not available to remove microcystin toxins from affected lakes in Montgomery Parks, but the toxins do breakdown naturally over time.

Why are algal blooms problematic?

- Bloom impacts include:
 - water discoloration,
 - unpleasant odor, and
 - a process known as eutrophication which may result in fish kills.
- Cyanobacteria blooms may result in harmful levels of microcystin toxins.



Source: [BBC Bitesize Program](#)

What makes microcystin harmful?

- Microcystin is a toxic substance produced by cyanobacteria. It is a hepatotoxin which disrupts proteins that keep the liver functioning.
- Liver damage can occur when large quantities of water contaminated by microcystin are ingested by people and animals. Liver damage may occur over the course of several days to weeks.
- Stomach discomfort, nausea, and headaches may also occur.
- Contact with microcystin can cause skin and eye irritation.
- This toxin can bioaccumulate in fish and invertebrates, meaning it is stored in the fat and organs of those animals and can adversely affect organisms that eat them.

Are all algal blooms toxic?

- No. Algae, and even bacteria, are important components of the aquatic food web. Only a subset of blue-green algae (cyanobacteria) and true algae produce toxins.
- Not all cyanobacteria blooms result in toxic levels of microcystin. Parks staff look for visual indicators of cyanobacteria and will collect and send samples to Maryland Department of Environment (MDE) for identification, testing, and additional coordination.



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Is it true that microcystin could harm my dog?

- Unfortunately, yes. The population most at risk are dogs, who may try to enter contaminated water to drink and play.
- Dogs may also ingest the microcystin toxin while grooming following contact with the water.
- Animals can get sick very quickly so seek veterinary care immediately if you are concerned.

How do I stay safe during blue-green algae blooms?

- **Avoid contact with water** that may have elevated levels of microcystin, particularly during the summer and early fall.
- **Obey posted signs.** Do not enter the water and wash your hands if you come in contact with it.
- **Follow park regulations.** Dogs must be leashed at all times. Swimming in lakes is prohibited.
- **Protect your pets** by not letting them play in or drink from standing water. Bring your own water and bowls for dogs. Promptly rinse and wash skin and fur that touch scummy-looking or discolored water.



Look for and obey park signs.

What about fishing during the summer?

- Practice catch-and-release fishing and good handwashing.
- Follow Maryland regulations and limit consumption to properly cooked muscle meat of fish caught in Montgomery Parks lakes.

Is it safe to boat and kayak during an algal bloom?

- In general, yes, but boating increases potential contact with water and exposure through aerosolized droplets, so be sure to wash with soap and water after any exposure to lake water.
- Boating is not allowed on Lake Frank. Private boats are permitted on Lake Needwood at Rock Creek Park and Little Seneca Lake at Black Hill Regional Park from March 1 - December 15. All boats must have a Seasonal Permit or Daily Permit.

How is Montgomery Parks keeping visitors safe?

- Staff monitor lake conditions, document visual indicators, and collect and send samples for identification and testing. The presence and levels of the microcystin toxin cannot be determined without laboratory analysis.
- Signage is posted to notify park users to avoid contact with lake water. Media advisories and outreach through the Department's website and social media accounts are also used to inform the public.



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Do harmful algal blooms happen in other places?

- Yes. Elevated levels of cyanobacteria and microcystin toxins are not unique to Lakes Needwood and Frank. It is a global phenomenon and the Chesapeake Bay region in particular has suffered from nutrient enrichment and repeated harmful algal blooms.
- The U.S. National Office for Harmful Algal Blooms hosts distribution maps and other resources (hab.who.edu/maps/).

Is there anything else that can be done?

- If you see something unusual in one of our parks, contact **Montgomery Parks' Public Information & Customer Service Office**:
 - Call **301-495-2595**
 - Email info@montgomeryparks.org
 - Visit montgomeryparks.org/services/report-a-problem/
- Check out the Bloomwatch App, a crowdsourcing effort to find and report potential cyanobacteria blooms (cyanos.org/bloomwatch/).
- Learn about how you can prevent stormwater pollution that contributes to increased nutrients and water temperatures in our watersheds through Montgomery County Department of Environmental Protection's RainScapes program (montgomerycountymd.gov/water/rainscapes/index.html).

Where can I learn more?

- Maryland Department of Health: Harmful Algae Blooms (phpa.health.maryland.gov/OEHFP/EH/Pages/harmful-algae-blooms.aspx)
- Maryland Department of the Environment (MDE): Harmful Algal Blooms (mde.maryland.gov/programs/Water/HAB/Pages/index.aspx)
- Maryland Department of Natural Resources (DNR): Harmful Algal Blooms in Maryland (dnr.maryland.gov/waters/bay/Pages/algal_blooms/Microcystis.aspx)
- US EPA: Learn about Cyanobacteria and Cyanotoxins (epa.gov/cyanohabs/learn-about-cyanobacteria-and-cyanotoxins)
- CDC: Harmful Algal Bloom (HAB)-Associated Illness (cdc.gov/habs/be-aware-habs.html)



Source: U.S. Centers for Disease Control.