



## Cyanobacteria (Blue-green Algae) FAQs

### What are cyanobacteria?

These unicellular microscopic organisms are not actually algae but belong to an ancient group of *bacteria* called **cyanobacteria** that have been on earth for at least 2.1 billion years. Cyanobacteria are the only bacteria currently known to utilize the process of photosynthesis to generate energy from sunlight.

Scientists have described 2,700 species of cyanobacteria, though the total number is probably thousands more. It is no surprise that cyanobacteria have evolved to survive in almost every terrestrial and aquatic environment, though they are most commonly found in large quantities in marine and freshwater ecosystems. Cyanobacteria may live as single cells or colonies that create filaments, spheres, or irregular globs. The distinctive blue-green color comes from a pigment used to capture sunlight called 'phycocyanin'.



*Cyanobacteria bloom on the Yahara River near the Tenney Locks, June 2017*

### Have they always been in our lakes?

Cyanobacteria have probably been present in Madison's lakes since they formed. However, the large-scale blooms that harm our lakes have only become a problem in the last hundred years due to human activity.

### Where, why, and when does a bloom form?

A cyanobacterial bloom occurs when there is a sudden concentrated increase in cyanobacteria cells. Blooms can develop in a manner of hours and persist for days, often traveling across the lakes as they are pushed by winds or the current. They can occur anywhere on the five Yahara lakes and along the Yahara River.

In Wisconsin, blooms typically arise during the warm-weather months between June and September. Blooms are often jump-started by intense rain events that wash nutrient-rich agricultural and urban wastes, especially those containing phosphorus, into the water. When combined with the right conditions - warm water, sunlight,

and little wind - the excess phosphorus in the water creates the perfect environment for cyanobacteria to grow.

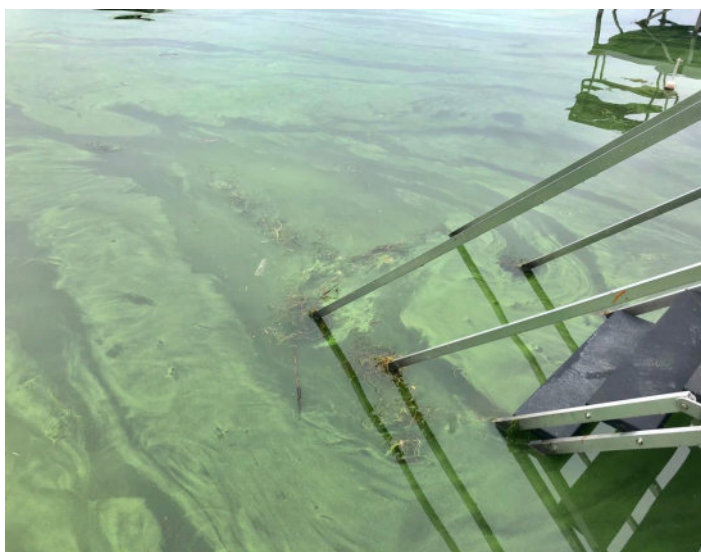
The risk of a bloom increases greatly after several days of high temperatures or intense rains, meaning that we will see more blooms as climate change continues to drive average summer temperatures upwards as well as increases the likelihood of extreme rainfalls. Tracking blooms by our network of volunteers across the Yahara lakes is thus a key objective of [lakeforecast.org](http://lakeforecast.org).

### How do I identify cyanobacteria?

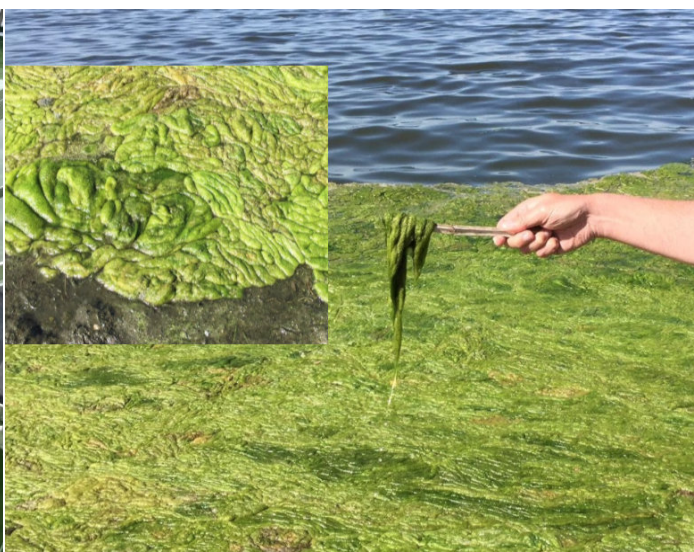
You will come across two big bloom-forming organisms in our lakes: green algae (not harmful to humans) and cyanobacteria (blue-green algae). If you see something green on the surface of the lake, it's likely one of these two types of blooms.

There are several ways of differentiating between cyanobacteria and green algae. First, note the color. Cyanobacteria and green algae may both appear bright green or even brown, but only cyanobacteria can showcase hues of blue and white. You can also look for a paint-like sheen or pea-soup appearance, especially if the cyanobacterial bloom has yet to start decaying.

Another effective way to differentiate between cyanobacteria and green algae is the “stick test” as shown below. Many species of green algae may appear as long, interconnected filaments, while cyanobacteria grow as single cells or colonies. Therefore, cyanobacteria will not cling together enough to hang off the end of a stick or paddle. If you reach a stick into the bloom and come up with a clump hanging off the end, you are likely looking at green algae.



Cyanobacteria (Photo credit: Arlene Koziol)



Green Algae (Photo credit: Joe Campshure & Terri Lefebvre)

### When are cyanobacteria toxic?

Many species of cyanobacteria can be present in Wisconsin lakes and rivers, but only certain species can produce toxins that cause illness. Unfortunately, there is no immediate way to know if a cyanobacterial bloom is dangerous or not without chemical testing.

If you see green specks floating in the water column, but you can still see the bottom in two to three feet of water (i.e. at knee depth), cyanobacteria may be present, but not in bloom concentrations. At this point, sensitive individuals (e.g. children, persons with compromised immune systems, pets, etc.) may want to find another place to swim.



Large surface scums, as pictured below, should always be avoided. These blooms may have elevated concentrations of toxins, which can be released all at once as the cells are damaged by the sun (as signaled by blue or white-colored blooms).

### **How can I be exposed to cyanobacteria?**

You can expose yourself to cyanobacterial toxins through skin contact (i.e. swimming), inhalation (e.g., when water skiing), or by swallowing contaminated water. Children and pets may be especially vulnerable to exposure, as they are more likely to drink or accidentally swallow the water.

### **Is it safe to swim in cyanobacteria contaminated water?**

No. Swimmers, boaters, and recreational lake users are urged to avoid contact with waters containing visible levels of cyanobacteria.

### **When can I go back in the water again after a toxic bloom?**

Fortunately, it is easy to avoid potentially toxic blooms because the most dangerous blooms also make the water look unappealing. The risk from a bloom is proportional to the number of cells in the water. So, if the water looks clear, your risk is probably low.

### **What are the symptoms of coming into contact with a bloom?**

Common human symptoms include respiratory issues such as difficulty breathing and congestion, dermatological symptoms such as itchy skin or the development of rashes, eye and ear infections, and other symptoms such as diarrhea or abdominal pain. Common animal symptoms include difficulty breathing, weakness, diarrhea, and even seizures.



*Large cyanobacterial blooms exhibiting green, blue, and white colors. (Photos credit: Arlene Koziol)*

### **How does cyanobacteria impact the ecosystem?**

Just as the toxins produced by cyanobacteria can harm humans and pets, they can also adversely affect or kill other non-aquatic wildlife such as waterfowl, amphibians, and insects. Cyanobacteria blooms also reduce light penetration and oxygen concentrations in the water, harming aquatic plants, plankton, and even resulting in potential fish kills, particularly when the bloom decomposes.

**Where can I go to know where blooms are occurring on the lakes?**

Check [lakeforecast.org](http://lakeforecast.org) to get the latest updates from our monitors on beach conditions throughout the Yahara watershed, including beach closure information provided by Public Health Madison & Dane County. Beach conditions can vary significantly across the same lake, with some remaining clear and safe even while others are closed due to cyanobacteria. Use [lakeforecast.org](http://lakeforecast.org) when planning your next day out on the water!

**What should I do when I think I see a bloom?**

If you think you see a cyanobacterial bloom, take a photo and note the location. Report the bloom to the Public Health Madison and Dane County at 608-266-4821, Clean Lakes Alliance at 608-255-1000, and the Wisconsin Harmful Algal Blooms Program at 608-266-1120.

**What should I do if I think myself or my dog have been exposed to cyanobacteria?**

Rinse off well when you get out of the water. Take care to rinse your dog off as soon as possible after being in the water. Dogs can ingest toxins from licking their fur even after they have dried off.

**When should I seek medical assistance if having impacts from coming into contact with a bloom?**

If you think you are experiencing symptoms from exposure to cyanobacterial toxins (e.g., stomach cramps, diarrhea, vomiting, headache, fever, muscle weakness, difficulty breathing), contact your doctor or the Poison Information Hotline (800-222-1222) right away. Please report all cyanobacterial-related illness to the Wisconsin Harmful Algal Blooms Program by calling 608-266-1120.

If your pet displays symptoms such as seizures, vomiting, or diarrhea after contact with surface water, immediately contact your veterinarian.

For more information about cyanobacteria, visit [cleanlakesalliance.org/cyanobacteria/](http://cleanlakesalliance.org/cyanobacteria/)