



Stream Team Academy Fact Sheet Series

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Collect this entire educational series for future reference! Contact us at 1-800-781-1989 if you'd like copies of previous Fact Sheets and a binder for storing them.

BLUE-GREEN ALGAE AND HARMFUL ALGAL BLOOMS

An Educational Series For Stream Teams To Learn and Collect

By Lynn Milberg, Missouri Department of Natural Resources

Cases of harmful algal blooms (HABs) have multiplied in recent years, leading to water advisories and shut-downs of recreational areas. In August of 2014, a massive bloom on Lake Erie impacted the public water supply for Toledo, Ohio. This resulted in a "Do Not Use" order for 500,000 residents.

WHAT ARE BLUE-GREEN ALGAE?

The term "blue-green algae" is actually a misnomer. Although they typically have a blue-green color, these microscopic organisms are bacteria, not algae. For this reason, the scientific community more appropriately calls these organisms *cyanobacteria*. Unlike most bacteria, they have the ability to photosynthesize, or make their own food, and produce oxygen. They can also bloom when conditions are right. In these respects, they are like algae.

WHEN, WHERE, AND WHY DO BLOOMS DEVELOP?

Blooms may consist of algae and/or cyanobacteria. Blooms will most likely be encountered during summer and

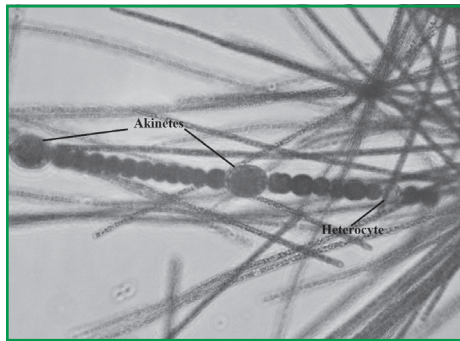
early fall when the weather is warm and water temperatures are high. However, certain cyanobacteria genera have been known to flourish under ice. Generally occurring in lakes and ponds, they may also appear in slow-moving water, such as pooled streams. When in lakes, a bloom may occur in a cove or across the entire waterbody. All blooms require an overabundance of nitrogen and phosphorus to thrive. These nutrients usually come from wastewater or runoff from lawns and fields.

WHAT MAKES A BLOOM HARMFUL?

Environmental and health managers may classify a bloom (algal or cyanobacteria) as harmful if it produces detrimental effects by impairing aquatic ecosystems or adversely affecting the health of people, livestock, and/or pets. Blooms of true algae most commonly deplete oxygen levels, resulting in a fish kill. Cyanobacteria blooms, also known as *cyanoHABs*, are more concerning because they may produce dangerous toxins. The most common freshwater toxins produced are microcystin, cylindrospermopsin, anatoxin, and saxitoxin. Microcystin and cylindrospermopsin are hepatotoxins – affecting the liver. Anatoxin and saxitoxin are neurotoxins – affecting the brain. Without testing, it is impossible to tell if a cyanoHAB is toxic.

WHAT DO HARMFUL ALGAL BLOOMS LOOK LIKE?

CyanoHABs typically look like pea soup or spilled green paint, but may also appear red, white, yellow-brown, or blue in color. Some blooms will form thick foams or a scum on the water's surface.



Microscope image of the cyanobacteria *Dolichospermum* (formerly known as *Anabaena*) showing akinetes and a heterocyte (or heterocyst). Akinetes are specialized cells that allow survival in adverse environmental conditions. Heterocytes are cells where nitrogen fixation occurs. Photo by Lynn Milberg.

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HOW DO CYANOHABS AFFECT PEOPLE?

Exposure while swimming, boating, waterskiing, tubing, bathing, or showering may produce a variety of symptoms. The most common symptoms include skin irritations such as rash or hives, and gastrointestinal illnesses such as diarrhea and vomiting. In cases of extreme toxicity, people may suffer liver or brain damage, or even death. The most severe reactions occur when large amounts of water are swallowed.

Inhalation of tiny airborne droplets containing toxins may result in allergy or asthma-like symptoms. Individuals with asthma or other respiratory diseases may experience more severe symptoms, so they should avoid exposure if possible.

If you believe you have been exposed to a cyanoHAB and are experiencing symptoms, seek medical attention. Let medical personnel know that you have been in an area affected by a bloom.

IS IT SAFE TO EAT FISH FROM A WATERBODY EXPERIENCING A CYANOHAB?

Fish caught in cyanobacteria-affected waters pose unknown health risks and may have an undesirable taste. Because of the unknown risks, the Missouri Department of Health and Senior Services recommends you do not eat fish from affected areas for two weeks after the cyanoHAB visually dissipates. If you choose to eat potentially contaminated fish, remove all fat, skin and organs before cooking because toxins are more likely to concentrate in these tissues. Always cook fish thoroughly.

HOW DO CYANOHABS AFFECT PETS AND LIVESTOCK?

Missouri has had cases of illness – and possibly death – in pets and livestock. To limit exposure:

- Block access to areas of water that appear to have a bloom.
- If the affected waterbody is used for

watering, provide another source of drinking water.

- Prevent animals from rolling in or eating scum accumulated on shore, even if it has dried.
- If your animals come in contact with water that may contain cyanobacteria, wash them off immediately with fresh water. Dogs have been known to become ill by licking contaminated fur.

If you are concerned about possible contact or ingestion, contact your veterinarian immediately.

When in doubt, stay out!



Satellite image of Lake Erie during an algal bloom in 2014.

To report a potentially harmful bloom, call one of two 24-hour hotlines:

Missouri Department of Natural Resources
Environmental Emergency Response Spill Line
573-634-2436

Missouri Department of Health & Senior Services
Public Health Emergency Hotline
800-392-0272

You can also download the [Bloom Watch App](#) on your smart device.

The app allows you to submit the location, a description, and pictures of the bloom. Information goes to Missouri's response team for follow-up.

To learn more about cyanobacteria and view pictures of blooms, visit dnr.mo.gov/env/cyanobacteria.htm.

