



The Lake CONNECTION

Blue-green algae blooms and potential health risks

Hot summer days on the lake! Many of us share common memories of good times on the water. Unfortunately, smelly, soupy algae blooms are also a common occurrence on many of our developed lakes, and can make boating and swimming unpleasant.

But beyond being a nuisance, blue-green algae blooms can make us and our pets sick. So what are blue-green algae, and how do you know if green water at the end of your pier is just ugly, or potentially unsafe?

The function of algae in lakes

Algae and blue-green algae species are an ever-present part of our lakes' ecosystem, and many species of each are found in Wisconsin waters.

True algae are a vital part of the food chain. Algae acts like other plants and converts sunlight into energy, forming the base of the lake's food chain. Algae are eaten by zooplankton, which are in turn eaten by small fish, then larger fish, and eventually the larger fish are eaten by birds, shoreland animals, and people.

Although unsightly and unpleasant, most algae blooms present no health risks. But blue-green algae can produce toxins that can make people and animals sick.



Beach sign warning of the presence of a blue-green algae bloom, sampling a near shore algae bloom, and a bloom of several species of algae. Photos by Jennifer L. Graham, U.S. Geological Survey.

But blue-green algae—despite its name—are not true algae. Blue-green algae are actually photosynthetic bacteria. Like true algae, they can convert sunlight into energy. But unlike algae, other aquatic organisms prefer to not eat blue-green algae, and they are not as an important part of the food chain.

What causes an algae bloom?

Algae are ever-present in a healthy lake ecosystem. When conditions make it

favorable for more algae to reproduce and grow, the algal population increases. A rapid increase in the density of the algal population can result in an algae bloom. During an algae bloom, high numbers of microscopic algae can grow quickly, clouding water green and/or forming thick mats on top of the water and washing ashore. Algae blooms tend to occur when there is a lot of sunlight, nutrients like phosphorus are plentiful, the temperature is warm, the water

is shallow, and there is little wind. Although unsightly and unpleasant, most algae blooms present no health risks.

What's the concern over blue-green algae blooms?

Certain species of blue-green algae produce toxins that can make people and animals sick, and even cause death. These toxins are produced by some species of blue-green algae, but they are not produced all of the time. Unfortunately, there is no easy way to tell when blue-green algae may be producing toxins. The presence of blue-green algae does not mean that blue-green algae toxins are present. Nor does it mean that blue-green algae toxin levels are concentrated enough in a lake to pose a health risk to people or pets.

Again, blue-green algae are always present in our lakes, but when conditions are right

a blue-green algae bloom can occur. In addition to the availability of light and food like phosphorus, the presence of zebra mussels in a lake may worsen blue-green algae growth. Zebra mussels filter water, which means sunlight can penetrate into deeper waters. The mussels also eat all species of algae with the exception of blue-green, which gives blue-green algae a competitive advantage over other algal species.

Higher concentrations of blue-green algae increase the potential for higher concentrations of the toxin they may produce. The blue-green algae bloom itself is not toxic. The toxins are actually released when dead blue-green algae decays. So using herbicide or algaecide on a blue-green algae bloom will have the unintended effect of releasing all the toxins into the water at once.

Things you and your neighbors can do to reduce the risk of algae blooms

- Maintain a shoreline buffer of native plants on your property
- Use phosphorus free lawn fertilizer, if you use fertilizer at all
- Fix leaking septic systems
- Use phosphorus free detergents in dishwashing machines
- Minimize activities that cause erosion.

WAL is working toward several statewide policies—including a statewide ban on phosphorus in lawn fertilizer, shoreland zoning (NR 115) revisions, and better manure management methods—to curb the amount of nutrients entering our lakes, which can reduce the likelihood of blue-green and other algae blooms.



Fish kill associated with a blue-green algae bloom, sampling an algae bloom to look for the presence of blue-green algae species, and a wind-blown accumulation of blue-green algae in a recreational area. Photos: Jennifer L. Graham, U.S. Geological Survey.

These blooms are most often blue-green in color, but they can also be blue, green, reddish-purple, or brown. Blue-green algae species are buoyant and will follow light and nutrients by floating to the surface, where they form scum layers or mats. Most blooms generally occur between mid June and late September, although they have also been observed rarely in winter.

Are blue-green algae blooms a new problem?

Recent media attention and more people observing algae blooms have resulted in increased concern about blue-green algae blooms, but this

is not necessarily a sign of a worsening problem.

Blue green algae blooms are not new phenomena. Fossil evidence suggests these species have been around for millions of years, and reports of blue-green algae blooms have been reported as early as the 12th century. In Wisconsin, there are reports of blue-green algae blooms from the 1890s and before.

However, where blue-green algae blooms are increasing in frequency and/or severity, human impacts—such as more nutrients like phosphorus and nitrogen being washed into our lakes—may be partially responsible. Eutrophication of waters, whether from natural or human sources, is often characterized by more frequent and severe blue-green algae blooms.

More people are also using lakes, which increases the likelihood that someone will see and report an algae bloom on a lake. Climate change, with

increased temperatures and more extreme rainfall events, may also create conditions conducive to blue-green algae growth.

What does monitoring tell us?

Increased monitoring is adding to the information we have about blue-green algae in Wisconsin. Monitoring tools have improved over time. Scientists are able to more accurately measure the amount of blue-green algae toxins in water than in years past. Better detection methods have enabled monitors to find blue-green algae that may have always been present, but gone undetected before.

Recently Wisconsin DNR conducted a multi-year study to investigate the frequency, severity, and duration of blue-green algae blooms over the summer. The sampled lakes were chosen because they had had blue-green algae blooms before, or were likely susceptible to blooms because of high nutrient concentrations.

Because these lakes are not representative of lakes statewide, the results of the monitoring cannot be assumed to be true for all Wisconsin lakes.

Blue-green algae were present in 74% of the samples. However, the presence of blue-green algae did not mean that blue-green algae toxins were present, nor did it mean that blue-green algae toxin levels were concentrated enough in a lake to pose a health risk to people or pets. Because of the variability of the results, monitoring for blue-green algae remains difficult as a means of determining if the water is safe. The best approach is to use common sense when recreating in waters with the potential for blue-green algae blooms.

Only the Department of Health and Family Services or the local public health agency has the authority to close beaches because of high levels of blue-green algae toxins.

Preventing illness from blue-green algae

Most people and pets become ill from blue-green algae toxins by swallowing water or having their skin come in contact with contaminated water. Using common sense can go a long way towards preventing exposure to blue-green algae toxins. Stay out of the water if:

- The water looks like “pea soup,” green or blue paint or has a scum layer or puffy blobs floating on the surface
- Do not boat, water ski etc., over such water (you can inhale the spray)
- Don’t let children play with scum layers (even from shore)
- Don’t let pets or livestock swim in or drink such waters
- Don’t treat blue-green algae blooms with herbicide or algaecide (toxins are released into the water when blue-green algae cells die)
- Always take a shower after coming into contact with any surface water.
- Wash pets that have swum in surface waters. Blue-green algae could be ingested if the animal licks its fur.
- Don’t water your garden with lake water containing large amounts of blue-green algae.

Blue-green algae can produce several different toxins. Toxins be absorbed through the skin; swimming is a common way that toxins can come in contact with skin. People can inhale toxins in water—breathing in the spray from water skiing or motor boating for example. Swallowing contaminated water can also expose people to blue-green algae toxins.

Unlike pets, most people avoid entering and drinking algae laden water. Skin reactions or respiratory problems are the primary danger for people exposed to blue-green algae toxins.

Although green lake conditions are common, reports of human health problems related to exposure to algal toxins are rare. Studies suggest that allergic reactions to blue-



Many people avoid using algae laden water when recreating, which limits exposure to blue-green algae toxins. Many pets do not necessarily share our aversion to green water and may readily swim or drink algae laden water. If blue-green algae toxins are present, animals can become very sick and even die.

green algae toxins occur in only 20-25% of people. Although there can be serious health effects—one man has even died from blue-green algal toxins—many symptoms can resolve within a few hours or days without medical attention.

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Contact information for Wisconsin's local public health departments is available online at <http://dhs.wisconsin.gov/localhealth/>.

If you are (or your local community is) interested in collecting water samples to test for blue-green algae, please contact the Wisconsin State Laboratory of Hygiene at (800)442-4618.

How do I know if I may have been exposed to blue-green algae toxins?

Symptoms skin contact: visible rash, hives and blisters, especially under clothing or wetsuits

Treatment: Immediately rinse exposed skin with clear water

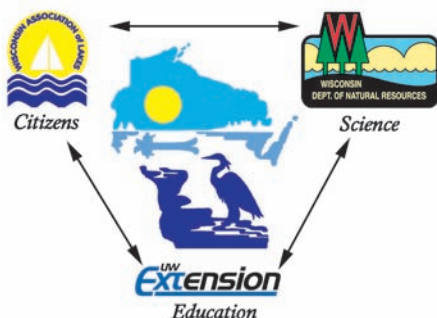
Symptoms inhalation reaction: Runny eyes and nose, sore throat, asthma-like symptoms or allergic reactions.

Treatment: Remove from exposure and provide supportive treatment.

If you think you are experiencing symptoms related to exposure to blue-green algae (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.

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

Wisconsin Lakes Partnership



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