

August 2009

# Grand Lake St. Marys Algal Toxins – Common Questions

## What is algal toxin?

Bluegreen algae are actually bacteria (cyanobacteria), but are commonly described as algae.

There are many species of algae and most do not produce toxins. One type of toxin produced by some bluegreen algae is known as microcystin.

Scientists do not fully understand what causes the same species of algae to trigger toxin production during one bloom and then not produce toxin during the next. This is an emerging issue in the scientific community.

## What causes it?

Nutrients, including phosphorus, drain from the landscape into the lake. The nutrients can contribute to algae growth.

## What is the safe level of algal toxins in water?

The World Health Organization (WHO) guideline for microcystin toxin is 1 part per billion (ppb) in drinking water and 20 ppb for recreational waters.

*Grand Lake St. Marys Algal Toxin Web Page*  
[www.epa.state.oh.us/pic/gls\\_m\\_algae.html](http://www.epa.state.oh.us/pic/gls_m_algae.html)

*Direct link to Grand Lake St. Marys sampling data*  
[www.epa.state.oh.us/dsw/inland\\_lakes/gls\\_m\\_microcystin\\_data.pdf](http://www.epa.state.oh.us/dsw/inland_lakes/gls_m_microcystin_data.pdf)

## What are the algal toxin levels in Grand Lake St. Marys?

Sampling began in May 2009 and will continue through the summer. Algal toxin levels have ranged from 6 ppb to 82 ppb, and vary considerably in different locations and on different days. This is expected. There is also variation in results due to the type of analytical procedure used.

Ohio EPA is posting the sampling results on its Web site regularly.

## Are algal toxins present throughout the entire lake?

The State has a limited amount of sampling data. However, it is reasonable to assume that algal toxins could be present anywhere in the lake.

This is because the lake is shallow and the water is easily moved by wind.

In addition, scientists would have predicted higher concentrations on the eastern end of the lake, due to wind typically moving from west to east.

But the highest concentration of algal toxin was found in the western end of the lake.

## Is my health at risk?

The health effects from recreational contact (swimming, boating, water skiing, fishing) with algal toxins can vary depending on the type of bacteria, level of bacteria, duration of contact and an individual's sensitivity.

Health effects from contact can include skin irritation such as a rash or hay fever-like symptoms. Ingestion may cause gastrointestinal illness and eventually liver issues, according to the World Health Organization.

The primary exposure pathway of concern is ingestion of the untreated water.

## Is it safe to swim or boat?

The State is concerned about the presence of algal toxins in Grand Lake St. Marys.

With the limited information that is available, people are advised to minimize or eliminate direct contact with the water, especially where accidental ingestion may occur.

Non-contact recreation, such as boating, fishing and sunbathing, should not result in problems.

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Swimming, jet skiing and water skiing are not recommended due to the higher potential for ingestion of lake water.

## Is the Celina drinking water safe?

Yes. Public drinking water in the area is supplied by the City of Celina. Sampling results indicate that the treated water does not contain microcystin.

The Celina public water system is aware of the data and has initiated routine monitoring of microcystin in the raw and finished waters.

The current treatment processes used at the City of Celina water treatment plant are advanced and are known to be effective at removal of microcystin and other algal toxins.

Celina treatment processes include granular activated carbon treatment and ozonation providing additional removal of toxins.

Ohio EPA will continue to work with Celina to monitor the finished water and document the effectiveness of the treatment.

## Is it safe to eat the fish I catch?

Yes. Ohio's current fish consumption advisory (which is NOT based on microcystin analysis) states that largemouth bass, sunfish and yellow perch from Grand Lake St. Marys are safe to eat twice per week; meals of all other species should be limited to one per week due to mercury contamination.

Following these recommendations should be protective for microcystin as well.

Microcystins do not build up in fish fillets in amounts that would make people sick.

Therefore, it is especially important to discard the fish organs and eat only the fillets.

Most of the toxin will be in the liver; less than one to two percent of the toxin makes it into the meat or flesh that is consumed.

## Can my pet go in the water?

Pets, particularly dogs, are especially susceptible to harmful health effects if they are in the lake water, due to the amount of water they tend to ingest compared to their size.

Pets should not be allowed to play in or drink water where algal blooms are present or when microcystin toxin levels are 20 ppb or higher.

## Has anyone reported getting sick after visiting Grand Lake St. Marys?

Ohio EPA is not aware of any illnesses that can be attributed to algal toxins.

## Who can I call if I have health concerns?

Citizens should contact their local health department or personal physician.

## How long could it take for algal toxin levels to drop below levels of concern?

It is uncertain since it depends on how long bluegreen algae is present and producing the toxin.

The presence of algae is probably a long-term problem because phosphorus in the sediment will continue to be stirred up in the water, even if no additional nutrients were added to the lake.

## How long has the algal toxin been in Grand Lake St. Marys?

The algal species that has the potential to produce toxins has likely been present in the lake for a long time.

Ohio EPA does not know how long algal toxins have been present.

## How long has Ohio known algal toxins were present?

To assist U.S. EPA with a national study of inland lake water quality, Ohio EPA sampled several Ohio lakes. It took samples from Grand Lake St. Marys on Aug. 30, 2007, as part of the National Lake Survey.

Samples were delivered to a U.S. EPA-approved lab and results were sent by the lab to U.S. EPA.

U.S. EPA anticipates releasing a report of the national study in late 2009.

However, Ohio EPA requested and on April 27, 2009, received microcystin data from the 2007 sampling effort.

One sample from Grand Lake St. Marys contained 78 ppb of microcystin, which prompted Ohio EPA to begin additional analysis.

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## How often are samples collected?

Ohio EPA and the Ohio Department of Natural Resources will work together on sampling throughout the summer in an effort to collect more data about the presence of algal toxins. Samples are generally collected once every week or two.

## What is the State doing to improve water quality in Grand Lake St. Marys?

Ohio EPA completed a thorough assessment of water quality in this watershed in 1999-2000. Additional limited sampling of livestock runoff was conducted in 2006-2007.

Streams in the watershed are impaired primarily by high levels of bacteria from livestock operations and failing residential septic systems.

In addition, livestock and row crop agriculture runoff allow phosphorus and nitrates to enter the streams and lake, resulting in heavy algal growth.

Stream channel modification can contribute excess soil to streams, leading to damaged aquatic life habitat and downstream transport to the lake.

Conservation farming practices, improved manure management and upgraded home septic systems would lead to major improvements in the watershed, according to Ohio EPA's report.

Citizens groups are working with local agricultural and government agencies to improve water quality within the rural watershed.

Ohio EPA is committed to working with the Grand Lake Wabash Watershed Alliance to implement the updated watershed action plan.

Local officials, landowners and conservation agencies are encouraged to be part of this ongoing effort to improve water quality.

## Lots of lakes have algae. Is it always dangerous?

The presence of algae does not mean algal toxins are present. Most of the time, algal toxins are not present.

## Are algal toxins present in any other Ohio lakes?

Algal toxins were detected in seven of the 19 lakes Ohio EPA sampled in 2007.

The next highest level after Grand Lake St. Marys was LaDue Reservoir in Geauga County at 3.5 ppb, below levels that would be a concern for recreation.

In July 2009, Ohio EPA and the Ohio Department of Natural Resources (ODNR) began working together to assess algal toxic information for three other lakes where ODNR operates park beaches.

Buckeye Lake, Indian Lake and Lake Loramie are being sampled due to the physical characteristics they have in common with Grand Lake St. Marys. All originally were designed and dug to serve as canal feeder lakes; all serve as locations for state parks with public beaches; and all have warm, shallow water affected by nutrient runoff.

Microcystin toxin has not been detected to date in Lake Loramie. Low levels have been detected at Buckeye Lake and Indian Lake. Sample results from these lakes are posted on the Web at [www.epa.state.oh.us/dsw/inland\\_lakes/](http://www.epa.state.oh.us/dsw/inland_lakes/).

Ohio EPA is aware of algal blooms in other lakes, including Lake Erie, that are capable of producing algal toxins. Funding has not been available to conduct sampling or analysis.

## Where can I get more information about algal toxins?

Ohio EPA has collected some informational materials from other organizations that have more experience with this topic. A list of Web links appears below.

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*NOAA Great Lakes Sea Grant Extension Office - Harmful Algal Blooms FAQ:*  
[www.glerl.noaa.gov/seagrant/GLWL/Algae/HAB/HABFAQ.html](http://www.glerl.noaa.gov/seagrant/GLWL/Algae/HAB/HABFAQ.html)

*Centers for Disease Control (CDC) - Facts About Cyanobacteria and Cyanobacterial Harmful Algal Blooms:*  
[www.cdc.gov/hab/cyanobacteria/facts.htm](http://www.cdc.gov/hab/cyanobacteria/facts.htm)

*CDC page as printable PDF:*  
[www.cdc.gov/hab/cyanobacteria/pdfs/facts.pdf](http://www.cdc.gov/hab/cyanobacteria/pdfs/facts.pdf)

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