

**ORIGINAL**

**IN THE SUPREME COURT OF OHIO**

**STATE OF OHIO EX REL.  
WAYNE T. DONER, ET AL.,**

Relators,

v.

**SEAN D. LOGAN, DIRECTOR  
OHIO DEPARTMENT OF  
NATURAL RESOURCES, ET AL.,**

Respondents.

Case No.: 2009-1292

Master Commissioner Campbell

**RELATORS' MOTION FOR LEAVE TO FILE SUPPLEMENT TO  
PRESENTATION OF EVIDENCE**

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Thomas H. Fusonie (0074201)  
Kristi Kress Wilhelmy (0078090)  
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**FILED**  
AUG 11 2010  
CLERK OF COURT  
SUPREME COURT OF OHIO

## MEMORANDUM IN SUPPORT

Pursuant to S. Ct. Prac. R. 14.4, Relators, by and through their counsel, respectfully move this Court for leave to file a supplement to their Presentation of Evidence. No prejudice to Respondents (“ODNR”) will result from this Court permitting Relators to file the requested supplemental evidence, attached hereto as Exhibit 1, Affidavit of Thomas H. Fusonie, dated August 10, 2010.

### **A. Supplemental Evidence of Linn Grove Gauge Station<sup>1</sup>**

Relators request leave to supplement their Presentation of Evidence with public records reflecting the annual elevations of the Wabash River as measured at the Linn Grove, Indiana Gauge Station, the nearest gauge station to the Beaver Creek. These records are publicly available on the U.S. Geological Survey website and were accessed by Relators on August 10, 2010. The Linn Grove Gauge data is highly relevant to this Court’s determination of Relators’ claims because it shows that since ODNR completed construction on the new Spillway for Grand Lake St. Marys in 1997, the two highest recorded elevations and stream flow measurements, and four of the six highest recorded elevation and stream flow measurements on the Wabash River have occurred. This evidence is relevant because it confirms the first-hand observations of long-time farmers downstream of the Spillway who testified that since 1997, they have suffered more acres flooded, more frequent flooding, and longer-lasting flooding.

### **B. Supplemental Evidence Regarding Toxic Algae in Grand Lake St. Marys<sup>2</sup>**

In support of this Motion, Relators state that after filing their Presentation of Evidence on June 1, 2010, ODNR, the Ohio Environmental Protection Agency, and the Ohio Department of Health (collectively, “the Agencies”) issued a press release advisory cautioning citizens to avoid

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<sup>1</sup> The supplemental Linn Grove Gauge Station evidence is to Exhibit 1 as ¶¶ 2-3, Exs. A-B.

<sup>2</sup> The supplemental toxic algae evidence is attached to Exhibit 1 as ¶¶ 4-12, Exs. C-K.

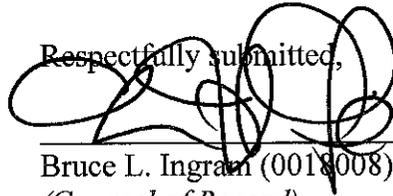
contact with the water in Grand Lake St. Marys. Testing of the lake water revealed the presence of toxic algae in the lake at levels much higher than recommended for human contact. The Agencies have warned that contact with the toxic algae found in the lake can cause liver and respiratory distress and neurological symptoms in humans and death in pets and wildlife.

As the issues in this case revolve around ODNR's interference with the use and enjoyment of Relators' property when the water from Grand Lake St. Marys flows over the Spillway. If ODNR floods the Relators' downstream property with toxic algae, Relators' use and enjoyment of their property is even further impaired. Not only will ODNR be casting high volume of surface waters on the Relators' property with hog carcasses, tires, and other debris, but with toxic algae. Relators should be able to put this evidence before the Court. ODNR has persisted in continuing its ongoing lake level management practices, which include refusing to annually drawdown the lake, despite knowing that the Grand Lake contains toxins that can wash over the Spillway and flood and contaminate Relators' property.

Granting this Motion will not prejudice ODNR as it has not filed its Response Brief, which is not due for thirty days (September 10, 2010). Contemporaneously with filing this Motion, Relators have hand delivered a copy of it to ODNR's counsel. Moreover, Respondents cannot be prejudiced by the inclusion of statements made by ODNR itself and articles quoting Agency spokespeople or public record documents.

Therefore, Relators respectfully request that this Court grant the foregoing Motion to allow the filing of supplemental evidence to their Presentation of Evidence, attached hereto as Exhibit 1, Affidavit of Thomas H. Fusonie, dated August 10, 2010.

Respectfully submitted,



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Bruce L. Ingram (0018008)

*(Counsel of Record)*

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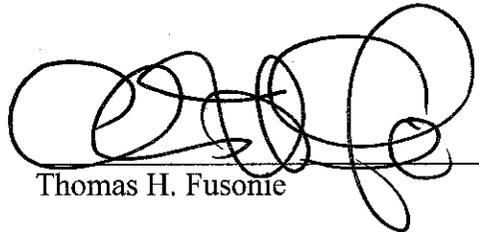
**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that a true copy of the foregoing was served upon the following, via hand delivery, this 11th day of August, 2010:

William J. Cole  
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*Attorneys for Respondents*



Thomas H. Fusonie



at the U.S. Geological Survey website:

[nwis.waterdata.usgs.gov/in/nwis/peak?site\\_no=03322900&agency\\_cd=USGS&format=img](http://nwis.waterdata.usgs.gov/in/nwis/peak?site_no=03322900&agency_cd=USGS&format=img)

4. Attached as Exhibit C is a true and accurate copy of a June 18, 2010 press release issued by the Environmental Protection Agency (“OEPA”) which I obtained from the OEPA Grand Lake St. Marys informational website (“OEPA GLSM website”), located at: [www.epa.ohio.gov/pic/glsm\\_algae.aspx](http://www.epa.ohio.gov/pic/glsm_algae.aspx).

5. Attached as Exhibit D is a true and accurate copy of a June 25, 2010 press release issued by the OEPA and the Ohio Department of Natural Resources (“ODNR”) which I obtained from the OEPA GLSM website.

6. Attached as Exhibit E is a true and accurate copy of a July 2010 document issued by the Ohio Department of Health (“ODH”), OEPA, and ODNR, titled “Grand lake St. Marys Algal Toxins – Common Questions,” which I obtained from the OEPA GLSM website.

7. Attached as Exhibit F is a true and accurate copy of a July 16, 2010 website update issued by the OEPA which I obtained from the OEPA GLSM website.

8. Attached as Exhibit G is a true and accurate copy of a July 29, 2010 press release issued by the OEPA which I obtained from the OEPA GLSM website

9. Attached as Exhibit H is a true and accurate copy of a July 30, 2010 release from ODH, OEPA, and ODNR, entitled, “ State Actions for Water Quality Improvement at Grand Lake St. Marys.”

10. Attached as Exhibit I is a true and accurate copy of a July 2, 2010 article from the Associated Press titled, “Ohio lake’s algae dangerous to swimmers, economy,” and which quotes state agency spokespeople.

11. Attached as Exhibit J is a true and accurate copy of a July 22, 2010 article from the Dayton Daily News titled, "Neurotoxin levels in Grand Lake St. Marys reach new high, EPA says," and which quotes state agency spokespeople.

12. Attached as Exhibit K is a true and accurate copy of a July 30, 2010 article from The Columbus Dispatch titled, "Algae may be killing pets: At least three dogs dead, nine humans ill," and which quotes state agency spokespeople.

**FURTHER AFFIANT SAYETH NAUGHT.**



Thomas Fusonie

Sworn to before me and subscribed in my presence this 10<sup>th</sup> day of August, 2010.



Notary Public

MARTHA C. BREWER, Attorney At Law  
NOTARY PUBLIC - STATE OF OHIO  
My commission has no expiration date  
Sec. 147.03 R.C.

National Water Information System: Web Interface

USGS Water Resources

Data Category:  
Surface Water

Geographic Area:  
Indiana



News - updated July 20, 2010

# Peak Streamflow for Indiana

**NOTE:USGS Indiana historic, recent, and real-time data will continue to be provided in Eastern Standard Time.**

Flow-duration tables and other streamflow statistics for selected gaging stations are available on another web page by clicking this link!

National Weather Service River Forecasts

## USGS 03322900 WABASH RIVER AT LINN GROVE, IN

Available data for this site

Adams County, Indiana  
Hydrologic Unit Code 05120101  
Latitude 40°39'22", Longitude 85°01'58" NAD27  
Drainage area 453.00 square miles  
Gage datum  
808.00 feet above sea level NGVD29

**Output formats**

- Table
- Graph
- Tab-separated file
- peakfq (watstore) format
- Reselect output format

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)	Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
1964	Apr. 1964	13.13	6,900 <sup>B</sup>	1986	Dec. 13, 1985	11.54	4,340 <sup>5</sup>
1965	Apr. 08, 1965	10.13	2,740	1987	Jun. 05, 1987	8.28	1,860 <sup>5</sup>
1966	Feb. 12, 1966	7.22	1,260	1988	Apr. 08, 1988		

1967	Dec. 11, 1966	13.01	6,620		8.38 <sup>2</sup>	1,930 <sup>5</sup>
1968	Feb. 03, 1968	12.15	4,560	1989	May 27, 1989	12.75 6,030 <sup>5</sup>
1969	Jan. 31, 1969	12.50	5,500	1990	Feb. 17, 1990	11.83 4,600 <sup>5</sup>
1970	Jan. 31, 1970	12.82	6,200	1991	Dec. 31, 1990	13.38 7,650 <sup>5</sup>
1971	Feb. 20, 1971	11.27	3,870	1992	Jul. 17, 1992	11.55 4,350 <sup>5</sup>
1972	Apr. 22, 1972	12.78	6,210	1993	Jul. 03, 1993	13.79 9,380 <sup>5</sup>
1973	Nov. 15, 1972	12.33	5,190	1994	Nov. 19, 1993	11.84 <sup>2</sup> 4,610 <sup>5</sup>
1974	Jan. 20, 1974	12.73	6,040	1995	Aug. 11, 1995	13.11 6,890 <sup>5</sup>
1975	Feb. 24, 1975	12.71	6,000	1996	Jan. 19, 1996	13.20 7,140 <sup>5</sup>
1976	Feb. 18, 1976	12.66	5,840	1997	Jun. 03, 1997	12.58 5,670 <sup>5</sup>
1977	Feb. 28, 1977		3,700 <sup>2</sup>	1998	Jul. 24, 1998	13.61 8,500 <sup>5</sup>
1978	Mar. 17, 1978	13.87	9,560	1999	Jan. 24, 1999	13.29 7,390 <sup>5</sup>
1979	Mar. 05, 1979	12.72	5,970 <sup>5</sup>	2000	Apr. 10, 2000	8.79 2,230 <sup>5</sup>
1980	Mar. 09, 1980	12.22	5,050 <sup>5</sup>	2001	Apr. 13, 2001	10.68 3,570 <sup>5</sup>
1981	Jun. 15, 1981	12.57	5,640 <sup>5</sup>	2002	Mar. 31, 2002	11.95 4,820 <sup>5</sup>
1982	Mar. 13, 1982	12.63 <sup>2</sup>	5,770 <sup>5</sup>	2003	Jul. 08, 2003	14.76 14,500 <sup>5</sup>
1983	May 04, 1983	10.94	3,540 <sup>5</sup>	2004	Jan. 06, 2004	12.22 5,460 <sup>5</sup>
1984	Mar. 18, 1984	11.73	4,510 <sup>5</sup>	2005	Jan. 13, 2005	13.73 9,300 <sup>5</sup>
1985	Feb. 24, 1985	13.23	7,820 <sup>5</sup>	2006	Dec. 31, 2005	11.07 4,280 <sup>5</sup>
				2007	Jan. 16, 2007	12.42 5,700 <sup>5</sup>
				2008	Feb. 07, 2008	13.52 9,890 <sup>5</sup>

■ Peak Gage-Height Qualification Codes.

- 2 -- Gage height not the maximum for the year

■ Peak Streamflow Qualification Codes.

- 2 -- Discharge is an Estimate
- 5 -- Discharge affected to unknown degree by Regulation or Diversion
- B -- Month or Day of occurrence is unknown or not exact

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**Title: Surface Water for Indiana: Peak Streamflow**

**URL: <http://waterdata.usgs.gov/in/nwis/peak?>**



Page Contact Information: [Indiana Water-Data Support Team](#)

Page Last Modified: 2010-08-10 13:40:12 EDT

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### USGS 03322900 WABASH RIVER AT LINN GROVE, IN

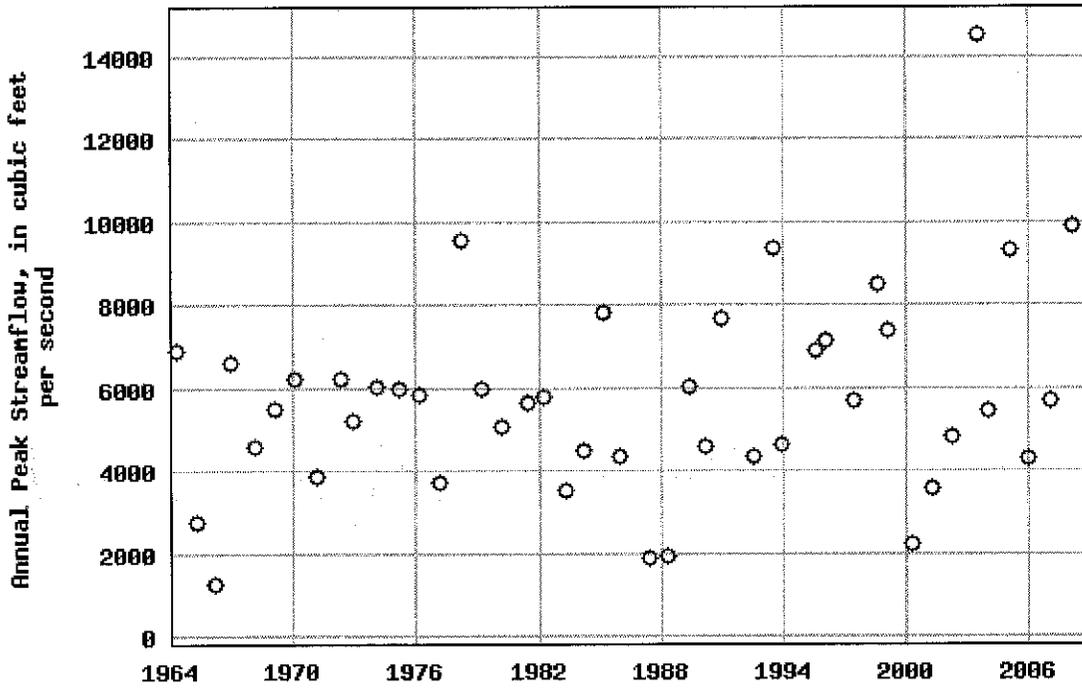


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Public Interest Center | P.O. Box 1049 | Columbus, OH | 43216-1049

**FOR RELEASE:** June 18, 2010  
**MEDIA CONTACT:** Dina Pierce, (614) 644-2160  
**CITIZEN CONTACT:** Darla Peelle, (614) 644-2160

### Ohio EPA Updates Algae Results for Grand Lake St. Marys

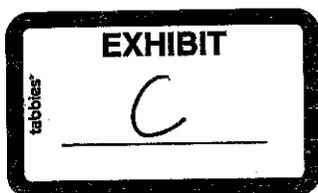
Analysis of the microcystin samples taken from a large blue-green algae bloom on Grand Lake St. Marys on June 14 shows microcystin was not detected in several samples and ranged between 3.3 ppb and 12.9 ppb in four sampling locations.

All of these numbers are below the World Health Organization's guideline for recreational contact concerns. However, the current algae bloom is *Aphanizomenon gracile*, a different species than the *Planktothrix* that was dominant in the summer of 2009. Cyanobacteria (blue-green algae) are capable of producing a variety of toxins. Because different algae have been identified in recent samples, Ohio EPA is conducting further analysis to determine if public health concerns exist.

Public drinking water in the area is supplied by the city of Celina. Sampling results indicate that the treated water does not contain microcystin or other algal toxins. 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. Ohio EPA will continue to work with Celina to monitor the finished water and document the effectiveness of the treatment.

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[www.epa.ohio.gov](http://www.epa.ohio.gov)





**Ted Strickland**  
Governor

**Chris Korleski**  
Director  
Environmental Protection Agency

**Sean D. Logan**  
Director  
Department of Natural Resources

**FOR RELEASE:** June 25, 2010

**CONTACT:** Dina Pierce or Heather Lauer, Ohio EPA, (614) 644-2160  
Mike Shelton, ODNR, (614) 265-6891

### More Sample Results in for Grand Lake St. Marys

This afternoon, Ohio EPA received laboratory results from water samples collected in Grand Lake St. Marys on Wednesday, June 23, 2010. The results showed the presence of cylindrospermopsin, a liver toxin, at the West Beach of the state park. In addition, saxitoxin, a nerve toxin, was found at low levels (just above the detection limit) in the same area. At the boat ramp, there was a very low level of cylindrospermopsin.

Due to the highly unpredictable nature of bluegreen algae and the toxins it can produce, it is impossible to know with certainty if toxins are present in the water on any given day at a particular location. Since there are no national standards or benchmarks for these toxins in water, state officials are advising the public to continue to avoid contact with the water.

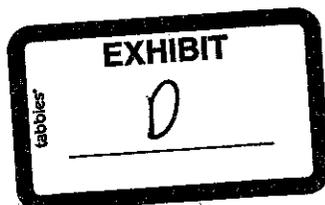
Ohio EPA and ODNR have developed a new frequently asked questions document about the recent algae bloom at Grand Lake St. Marys. The document can be found at:  
[http://www.epa.ohio.gov/pic/glsm\\_algae.aspx](http://www.epa.ohio.gov/pic/glsm_algae.aspx).

To see Grand Lake St. Marys water sampling data, visit:  
[http://www.epa.ohio.gov/portals/35/inland\\_lakes/glsm\\_microcystin\\_data.pdf](http://www.epa.ohio.gov/portals/35/inland_lakes/glsm_microcystin_data.pdf)

-30-

[www.epa.ohio.gov](http://www.epa.ohio.gov)

[www.dnr.ohio.gov](http://www.dnr.ohio.gov)





## Grand Lake St. Marys Algal Toxins – Common Questions

### What causes algal blooms?

Under the right water conditions, usually in the warmer months, the number of these blue-green algae can dramatically increase, or “bloom.” Warm, slow-moving water containing high nutrients is optimum. Nutrients, including phosphorus and nitrogen, can drain from the landscape into the lake. Streams in the Grand Lake St. Marys watershed are impaired primarily by high levels of nutrients from livestock and row crop agriculture. Residential use of lawn and garden fertilizers, failing septic systems and other sources are among other, smaller sources. Stream channel modification can contribute excess soil to streams, leading to damaged aquatic life habitat and downstream transport to the lake.

### What is algal toxin?

There are many species of algae and most do not produce toxins. However, some algae do produce toxic chemical compounds. In fresh water, a type of bacteria called cyanobacteria — more commonly called blue-green algae — produce toxins under certain conditions. Scientists do not fully understand what causes the same species of blue-green algae to produce toxin during one bloom and not produce toxin during the next.

### What kinds of toxins have been found in the lake?

In 2010, two species of blue-green algae emerged. Both are capable of producing toxins. *Microcystis* produces the toxin microcystin. *Aphanizomenon* can produce multiple toxins including cylindrospermopsin, saxitoxin and anatoxin.

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

There are currently no federal or state regulations for algal toxins in drinking water or recreational water. However, the World Health Organization (WHO) set guidelines for microcystin toxin at 1 part per billion (ppb) in drinking water and 20 ppb for recreational waters. No similar guidance has been issued for toxins produced by *Aphanizomenon*.

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

Microcystin levels in Grand Lake St. Marys reached 82 ppb in 2009 and were measured above 2,000 ppb in 2010. Toxins produced by *Aphanizomenon* have been detected at relatively low levels (less than 1 ppb), with cylindrospermopsin levels up to 9 ppb at the end of June 2010. Algal toxin levels vary considerably in different locations and on different days. This is expected. Ohio EPA continues to monitor the water quality and is posting the sampling results on its website regularly.

### How often and how are samples collected?

Ohio EPA and its partner agencies, Ohio Department of Natural Resources, U.S. Geological Survey (USGS) and city of Celina Water Department, are working together on sampling throughout the summer in an effort to maintain updated information about the presence of algal toxins. Samples are currently being collected once a week at the three public beaches (East Beach, West Beach and Camp Beach). Samples are collected from lake water where there is dense biomass of bacteria in the shallow water along each beach. Collecting water with dense biomass captures free toxins and endotoxins inside bacteria that may be ingested during recreational activities. Also, endotoxins are eventually released into the water when the cells die. This sampling method allows the state to be the most protective of human health. Drinking water samples are also collected on a regular basis (see “Is Celina’s drinking water safe?”).

### Are algal toxins present throughout the entire lake?

USGS is sampling regularly at the state park beaches and the Celina PWS is collecting samples at the Celina water plant intake area. 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.

EXHIBIT

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# Grand Lake St. Marys

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## 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. At levels above the WHO 20 ppb guidance for recreational waters, there is a higher risk of health effects from dermal (skin) contact that can include rash, hives or skin blisters (especially on the lips and under swimsuits). Drinking (ingesting) contaminated water above the WHO's 1 ppb guideline may cause gastrointestinal illness (including diarrhea and vomiting). Ingesting large quantities of contaminated water also can potentially cause liver, kidney or neurological issues. Inhaling aerosolized water – suspended droplets of water – during activities such as power boating, jet skiing, tubing or lawn irrigation can cause runny eyes and nose, a sore throat, asthma-like symptoms or allergic reactions.

## Are the odors hazardous to my health?

Information obtained by the Ohio Department of Health suggests that some of the blue-green algae detected in the lake produce an odor-generating byproduct (geosmin) when the algae die. The human nose is extremely sensitive to geosmin; people can detect it at very low concentrations. Although these odors are not chemically toxic, the unpleasant smell can cause sensitive individuals to become nauseous (upset stomach) and have headaches. In addition, the decomposition of dead algae and fish in the lake can generate hydrogen sulfide gas (a rotten egg smell), contributing more unpleasant odors in and around the lake. Unpleasant odors can lead to short-term, non-life threatening health effects such as nausea and headaches.

## Can toxins be released to the outside air and pose an inhalation hazard to residents?

The chemical toxins produced by these blue-green algae are not known to volatilize (change from a liquid to a gas) and they are not released as vapors to the outside air. However, recreational activities like power-boating, water-skiing, jet-skiing and tubing can whip up the surface of the water and create aerosols (toxin-containing water droplets) that can be inhaled or ingested and potentially result in health issues (headaches, nausea, runny eyes and nose, sore throat, asthma-like symptoms and skin rashes). Other activities that have the potential to aerosolize the lake water — like using lake water to spray lawns and gardens — should be avoided to minimize exposure to the toxins in the lake.

## What if I get sick after visiting the lake?

Ohio EPA is not aware of any confirmed illnesses that can be attributed to algal toxins in Ohio. Citizens should contact their personal physician if they have specific questions about their health. If you develop symptoms consistent with algal toxin exposure following contact with the water, contact your physician or the Poison Control Center.

## Is Celina's drinking water safe?

Yes. Public drinking water in the area is supplied by the city of Celina, which gets its water from the lake. Sampling results indicate that the treated water does not contain algal toxins. The Celina public water system conducts routine monitoring of the raw and finished waters. The current treatment processes used at the Celina water treatment plant are advanced and are known to be effective at removing algal toxins. Celina's treatment processes include granular activated carbon treatment and ozonation providing additional removal of toxins.

## Is the water in other lake communities and my private well safe?

The city of St. Marys draws its drinking water from deep wells and not from the lake. Like Celina, this water is monitored regularly for contaminants. St. Marys' wells and most private wells in the area are deep and should not be affected by the lake.

## Is it safe to swim or boat?

Due to the extremely high levels of microcystin found in the lake in mid-July 2010, the state is recommending people avoid all contact with the water, including boating. Boating previously was considered a minimal risk to people because of the low risk of ingestion. However, toxin-containing water droplets can become airborne and be inhaled or swallowed, creating a potential health risk when toxin levels are high. Swimming, power boating, jet skiing, water skiing, tubing and lawn irrigation also are not recommended.

# Grand Lake St. Marys

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

Typically, the toxins do not build up in fish filets in amounts that would make people sick and fish filets would be safe to eat as long as the internal organs, fat and skin of the fish are discarded. However, the extremely high levels measured in July 2010 coupled with the uncertainty of the buildup of toxins in fish tissues at this high level led the state to advise against eating fish from the lake at this time. Pending further evaluation of microcystin levels in fish filets from Grand Lake St. Marys, the advisory will be revisited.

The usual Ohio fish consumption advisory for Grand Lake St. Marys (which is NOT based on algal toxin analysis) states that largemouth bass, sunfish and yellow perch from the lake are safe to eat twice per week; meals of all other species should be limited to one per week due to mercury contamination. Go to [www.epa.ohio.gov/dsw/fishadvisory/index.aspx](http://www.epa.ohio.gov/dsw/fishadvisory/index.aspx) to view the current Ohio Fish Consumption Advisory.

## Can I still use lake to water my lawn and garden?

The state advises against this practice because toxin-containing water droplets from hoses and sprinklers can become airborne and be ingested through the nose or mouth.

## 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 algal toxin levels are elevated. Do not allow animals that have been in the water to groom themselves because the algae clings to their fur and can be ingested when they groom. Do not allow animals to eat algae off the beach. For more information on risks to pets and livestock, go to [www.epa.ohio.gov/dsw/HAB.aspx](http://www.epa.ohio.gov/dsw/HAB.aspx) and click on the link to the "Harmful Algal Blooms – Protect Your Pets and Livestock" brochure.

## Can harmful algae be transported from Grand Lake St. Marys to other lakes by boaters?

Algae is already transported in many different ways, including wind dispersal in dust, and most of the nuisance cyanobacteria are fairly widespread and common in lakes already. Algae is more likely to become a problem based on the level of nutrients present in the water and not the

amount of bacteria that may be transported from one lake to another. Transport of the small amount of algae that would be on a boat after traveling in the lake isn't enough to cause a significant algal bloom if that boat is used elsewhere.

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

The presence of algae is probably a long-term problem because phosphorus in the lake sediment will continue to be stirred up in the water, even if no additional nutrients were added to the lake from tributary streams. Scientists cannot accurately predict how long it will take for toxin levels to drop.

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

Algal species that have the potential to produce toxins have likely been present in the lake for a long time. Ohio EPA does not know how long algal toxins have been present. The state became aware of the problem in 2009 after getting results from its participation in a national lake survey for U.S. EPA.

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

In addition to Grand Lake St. Marys, Ohio is conducting routine sampling at Buckeye Lake southeast of Columbus. Microcystin levels have measured between 0.2 and 0.8 ppb this summer. Low levels of microcystin were discovered in Buckeye Lake and Indian Lake in 2009. Ohio EPA is aware of algal blooms on Lake Erie that are capable of producing algal toxins.

Ohio EPA accepts reports of potential algae issues in other Ohio lakes and investigates them as appropriate.

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

Efforts promoting conservation farming practices, improved manure management and upgraded septic systems are ongoing. More than \$3.5 million in state and federal dollars have been leveraged in the watershed for projects including whole farm conservation planning and conservation practice projects, purchasing Airy-Gators and home septic system repairs or replacement. A state-sponsored plan to reduce nutrients from agricultural lands

## Grand Lake St. Marys

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has led to almost a quarter of the cropland acreage in the watershed obtaining an approved nutrient management plan. A U.S. EPA-funded report on strategies for restoring and managing the lake was recently released. Proposals in the report include treating the lake with alum to clear algae from the water column and strategic dredging.

### What can farmers and livestock producers do to help improve water quality?

Focus on manure management and reducing the amount of phosphorus applied to fields. Use best management practices such as planting winter cover crops and avoiding winter application of manure. Work with their local soil and water conservation districts and/or farm service agencies to obtain technical and financial assistance.

### What can lakefront homeowners do to help improve water quality?

Homeowners throughout the watershed are encouraged to limit the amount of phosphorus-containing fertilizer that they apply to their lawns. In addition, all homeowners who have septic systems should keep those systems properly cleaned and maintained to prevent additional nutrients from leaching into the lake.

### What should I do if I see a spill or someone dumping in or near the lake?

Ohio EPA's Emergency Response Team is available 24/7 to respond to emergency releases and spills. Ohio EPA's spill hotline is (800) 282-9378. You may report spills anonymously. To report a non-emergency environmental problem, contact Ohio EPA's Northwest District Office at 1-800-686-6930. Be prepared to provide as much of the following information as possible:

- responsible party;
- date and time discovered or occurred;
- location;
- material(s) spilled/dumped;
- quantity released;
- hazards, e.g., hazardous material placard or materials safety data sheet (MSDS);
- affected media/area such as air, land or waterway, including threats to ditches, sewers, streams; and/or
- contacts on the scene such as the responsible party, contractor, facility's point of contact.

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

Ohio EPA suggests the following Web links:

#### 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)

#### Grand Lake St. Marys Algal Toxin Web page:

[www.epa.ohio.gov/pic/gism\\_algae.aspx](http://www.epa.ohio.gov/pic/gism_algae.aspx)

#### Direct link to Grand Lake St. Marys sampling data:

[www.epa.ohio.gov/portals/35/inland\\_lakes/gism\\_microcystin\\_data.pdf](http://www.epa.ohio.gov/portals/35/inland_lakes/gism_microcystin_data.pdf)

#### Ohio EPA Harmful Algae Blooms Web page:

[www.epa.ohio.gov/dsw/HAB.aspx](http://www.epa.ohio.gov/dsw/HAB.aspx)

#### Ohio Department of Health Web page: Blue-Green Algae/Cyanobacteria Harmful Algae Bloom (HABs) fact sheet

[www.odh.ohio.gov/odhPrograms/eh/hlth\\_as/chemfs1.aspx](http://www.odh.ohio.gov/odhPrograms/eh/hlth_as/chemfs1.aspx)

### Public Interest Center Grand Lake St. Marys Toxic Algae

#### Office Links

- [Online Newsroom](#)
- [Public Meeting Calendar](#)
- [Public Participation Publications](#)
- [For Students and Teachers](#)
- [Office Contacts](#)
- [Office Home](#)

#### Agency Links

- [Divisions and Offices](#)
- [Topic Index](#)
- [Regulatory Ombudsman](#)
- [Rules and Laws](#)
- [Pollution Prevention](#)
- [Funding Sources](#)
- [Publications](#)
- [Public Records](#)
- [Public Participation](#)
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#### Learn More About...

- [Fish Consumption Advisory](#)
- [Stimulus Projects](#)
- [Great Lakes Restoration Initiative](#)
- [Climate Change](#)
- [ToxMinus](#)
- [E-Check](#)
- [High-Interest Sites](#)

#### Grand Lake St. Marys Algal Bloom Update, July 16, 2010

Ohio EPA has received the latest lab reports for toxins produced by the blue-green algae species at Grand Lake St. Marys. As a result of extremely high levels of microcystin, Ohio EPA, Ohio Dept. of Natural Resources and Ohio Dept. of Health are raising the advisory level at the lake to ensure public health. At this time, **the state recommends people do not contact the water, do not allow pets to contact the water and do not take boats onto the lake.**

Most Recent Documents
<a href="#">Fact Sheet, July 20, 2010 (PDF)</a>
<a href="#">Media Advisory, June 25, 2010 (PDF)</a>
<a href="#">Frequently Asked Questions, June 23, 2010 (PDF)</a>

In addition, due to the high levels of microcystin, coupled with the uncertainty of the buildup of microcystin toxins in fish tissue, **people are advised to not consume fish caught in Grand Lake St. Marys.**

Water samples were taken by Ohio EPA at the three state park beaches on Monday. Lab analysis by the Celina Water Department indicate microcystin levels have reached very high levels of at least 2,000 parts per billion at East Beach, West Beach and Campground Beach.

Ohio EPA has not received the lab analysis from Green Water Labs in Florida for three toxins produced by Aphanizomenon, one of the bluegreen algae species present in Grand Lake St. Marys. We will update the GLSM web page with lab results for anatoxin, saxitoxin and cylindrospermopsin shortly after we receive them.

It is important to continue noting that Celinas treated drinking water is tested regularly and remains free of algal toxins.

[Click here for information on algal toxins danger to pets and livestock.](#)

[Click here to see Grand Lake St. Marys water sampling data.](#)

#### Grand Lake St. Marys Algal Bloom Update, July 2, 2010

The latest analysis of microcystin in Grand Lake St. Marys indicates concentrations of at least 50 parts per billion at West Beach, the Celina drinking water intake and the St. Marys Boat Club launch ramp. The World Health Organization's guideline for recreational contact concerns is 20 parts per billion.

Other toxins (detected during the week of June 21) were not detected in the most recent samples taken at the Celina drinking water intake and of treated drinking water.

Celina's treated drinking water continues to be free of algae-related toxins. The current no-contact advisory remains in place for the lake.

#### Grand Lake St. Marys Algal Bloom Update, June 25, 2010

This afternoon, Ohio EPA received laboratory results from water samples collected in Grand Lake St. Marys on Wednesday, June 23, 2010. The results showed the presence of cylindrospermopsin, a liver toxin, at the West Beach of the state park. In addition, saxitoxin, a nerve toxin, was found at low levels (just above the detection limit) in the same area. At the boat ramp, there was a very low level of cylindrospermopsin.

Due to the highly unpredictable nature of bluegreen algae and the toxins it can produce, it is impossible to know with certainty if toxins are present in the water on any given day at a particular location. Since there are no national standards or benchmarks for these toxins in water, state officials are advising the public to continue to avoid contact with the water.

#### Grand Lake St. Marys Algal Bloom Update, June 18, 2010

Analysis of the microcystin samples taken from a large blue-green algae bloom on Grand Lake St. Marys on June 14 shows



microcystin was not detected in several samples and ranged between 3.3 ppb and 12.9 ppb in four sampling locations.

All of these numbers are below the World Health Organization's guideline for recreational contact concerns. However, the current algae bloom is *Aphanizomenon gracile*, a different species than the *Planktothrix* that was dominant in the summer of 2009. Cyanobacteria (blue-green algae) are capable of producing a variety of toxins. Because different algae have been identified in recent samples, Ohio EPA is conducting further analysis to determine if public health concerns exist.

Public drinking water in the area is supplied by the city of Celina. Sampling results indicate that the treated water does not contain microcystin or other algal toxins. 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. Ohio EPA will continue to work with Celina to monitor the finished water and document the effectiveness of the treatment.

### Grand Lake St. Marys Algal Bloom Update, June 16, 2010

Ohio EPA is aware of the current algal bloom at Grand Lake St. Marys and has received numerous photos from concerned residents. An environmental specialist from the Agency's Division of Surface Water staff collected water samples on June 14. These samples were sent to an independent lab to determine the algal species and to Celina's Water Treatment Plant lab to determine whether the algae are releasing microcystin. Results of the toxin analysis will be posted on this site when Ohio EPA receives them. Results of the species determination should be available in two to three weeks and will be posted at that time. Additional updates will be posted on this site as they become available.

Inquiries should be directed to Public Involvement Coordinator Daria Peelle by sending an e-mail to [daria.peelle@epa.ohio.gov](mailto:daria.peelle@epa.ohio.gov) or by calling (614) 644-2160. Please do not call the EPA Spill Hotline number.

## Grand Lake St. Marys Toxic Algae April 2010

Ohio EPA has developed this Web page to give people easy access to information regarding the high levels of algal toxins in Grand Lake St. Marys.

On May 21, 2009, Ohio EPA, Ohio Department of Health and Ohio Department of Natural Resources issued an advisory urging people to use caution and limit their contact with the water due to the presence of microcystin, a type of toxin produced by a blue-green algae called planktothrix.

Documents are available at the links below. This page will be updated periodically as new test results or other information is announced.

### Background

Grand Lake St. Marys is Ohio's largest inland lake at 12,700 acres. Straddling the Augulaize-Mercer County line between St. Marys and Celina, the lake was constructed in the mid-1800s to store water for the Miami-Erie Canal. In 1949, Grand Lake St. Marys was among the first state parks established in Ohio.

Today, it is a popular recreation lake for boating, personal watercraft, fishing and swimming. It also is the drinking water supply for the city of Celina. The Ohio Department of Natural Resources maintains a campground, three public beaches and several picnic areas in a state park along the lake.

Over the years, the lake has become increasingly enriched by phosphates and nitrates from a number of man-made and natural sources. These nutrients have contributed to the decline of the lake's water quality. Ohio EPA and various state and local partners have been working within the lake's watershed for many years to achieve improvements along streams that feed the lake which in turn, will improve water quality in the lake.

Ohio EPA participated in a national study of water quality conditions in lakes across the United States in 2007 by collecting one day of sampling data in Grand Lake St. Marys and 19 other Ohio lakes. Laboratory analysis included testing for the presence of algal toxins. Ohio EPA received lab results for microcystins levels on April 27, 2009. The level of toxins recorded in Grand Lake St. Marys was very high compared to the other lakes sampled.

Ohio EPA conducted more extensive follow-up sampling on May 20 and June 2, 2009, which confirmed the high levels of microcystins throughout the lake. No microcystin is present in Celina's treated drinking water.

The state's monitoring for microcystin will be conducted throughout the summer recreation season by ODNR and the Celina public water system.

### Information Available Online

#### ■ Reports

- [Grand Lake St. Marys & Its Watershed: Water Quality Improvement Initiatives](#)

#### ■ News releases

- [State Urges Caution for Recreational Activities at Lake \(Issued 5/21/09\)](#)
- [Lab Results: Celina Drinking Water Clear; Limit Physical Contact with Grand Lake St. Marys Water \(Issued 5/22/09\)](#)
- [Water Quality Advisory Lifted at Grand Lake St. Marys \(Issued 4/6/10\)](#)
- [More Sample Results in for Grand Lake St. Marys \(Issued 6/25/10\)](#)

#### ■ Fact sheets

- [Ohio EPA - Efforts to Improve Water Quality in Grand Lake St. Marys \(June 2009\)](#)
- [Ohio EPA - Grand Lake St. Marys Algal Toxins - Common Questions \(August 2009\)](#)
- [Centers for Disease Control - Facts About Cyanobacteria and Cyanobacterial Harmful Algal Blooms](#)
- [Great Lakes Sea Grant Extension Office - Harmful Algal Blooms - Frequently Asked Questions](#)
- [Grand Lake St. Marys Water Quality Update, June 18, 2010 \(PDF\)](#)
- [Grand Lake St. Marys Frequently Asked Questions, June 23, 2010 \(PDF\)](#)
- [Grand Lake St. Marys Fact Sheet, July 20, 2010 \(PDF\)](#)

### For More Information

Citizens or other interested parties who would like more information should call Ohio EPA's Public Interest Center at (614) 644-2160 or e-mail Daria Peelle.

Media inquiries should be directed by e-mail to [Dina Pierce](mailto:Dina.Pierce@epa.ohio.gov) or by calling (614) 644-2160.

- [Grand Lake St. Marys Sport Fish Consumption Information \(Updated 2010\)](#)
- [Grand Lake St. Marys Sampling Data](#)
- [Beaver Creek and Grand Lake St. Marys Watershed Studies](#)
- [Harmful Algal Blooms](#)
- [USGS podcast regarding algal blooms](#)



**Contact the Public Interest Center**  
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Street Address: 50 West Town Street, Suite 700 Columbus, OH 43215  
Phone: (614) 644-2160 ~ Fax: (614) 644-2737 ~ [E-mail](#)  
Emergency Response Hotline (800) 282-9378

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Public Interest Center | P.O. Box 1049 | Columbus, OH | 43216-1049

**FOR RELEASE:** July 29, 2010  
**MEDIA CONTACT:** Heather Lauer, (614) 644-2160  
**CITIZEN CONTACT:** Darla Peelle, (614) 644-2160

### Water Contact Advisories to Remain at Grand Lake St. Marys

Ohio EPA has received the latest lab reports for toxins produced by the blue-green algae species at Grand Lake St. Marys.

The latest microcystin levels from samples collected on or near public beaches range from 0.8 parts per billion (ppb) to 416 ppb. The World Health Organization (WHO) has set 20 ppb as the upper end of the moderate-risk range for contact with microcystin. Anatoxin-a levels have dropped from last week's high of 4 ppb to 1.2 ppb at the East Beach; 4 ppb to 0.9 ppb at the West Beach and 3 ppb to 0.8 ppb at the Camp Beach. Anatoxin-a is a neurotoxin.

Because microcystin levels fluctuate, still exceed the WHO recommendations and anatoxin-a is above non-detect the State of Ohio is maintaining the advisory levels at the lake to ensure public health. At this time, the state recommends people do not contact the water, do not allow pets to contact the water and do not take boats onto the lake. Additionally, Ohio EPA still urges people not to eat fish caught in Grand Lake St. Marys.

Water samples were taken by the U.S. Geological Survey at the three state park beaches, East Beach, West Beach and Campground Beach, on Sunday, July 25, 2010. Ohio EPA sampled on July 26, 2010. The Celina Water Department analyzed the water for microcystin.

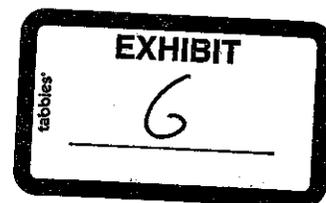
Green Water Labs in Florida analyzed the water for the three toxins produced by *Aphanizomenon*, one of the blue-green algae species present in Grand Lake St. Marys. Links below explain the results for anatoxin, saxitoxin and cylindrospermopsin.

It is important to continue noting that Celina's treated drinking water is tested regularly and remains safe and free of algal toxins.

For additional information, go to  
[www.epa.ohio.gov/pic/glsm\\_algae.aspx](http://www.epa.ohio.gov/pic/glsm_algae.aspx).

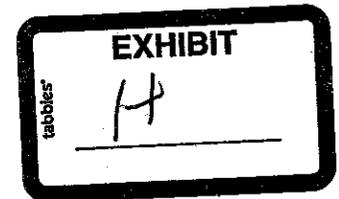
For information on algal toxins' danger to pets and livestock, go to  
[www.epa.ohio.gov/LinkClick.aspx?fileticket=UFRre5bxCasU=&tabid=4659](http://www.epa.ohio.gov/LinkClick.aspx?fileticket=UFRre5bxCasU=&tabid=4659).

For an updated fact sheet about the Grand Lake situation, go to  
<http://www.epa.ohio.gov/portals/47/citizen/GLSMfactsheet.pdf>.



## State Actions for Water Quality Improvement at Grand Lake St. Marys

July 30, 2010



### Introduction

Grand Lake St. Marys (GLSM), Ohio's largest inland lake, continues to struggle with degraded water quality as manifested by fluctuating levels of cyanobacteria (blue-green algae) that can produce neurotoxins (which affect the nervous system) and hepatotoxins (which affect the liver). The State of Ohio recognizes the historical recreational value afforded by the lake to Ohio's citizens and the significant role GLSM plays in the local economy. The state further recognizes the need to attempt find short and long-term solutions to help fix the impaired lake.

The Ohio Departments of Natural Resources (ODNR), Health (ODH), Agriculture (ODA) and Ohio EPA have worked diligently to identify the following actions intended to address both internal phosphorus loading and external nutrient and sediment loading, which together causes the unstable and degraded water quality in the lake.

These actions reflect a start to the process of restoring GLSM, but are by no means an exhaustive list. The State of Ohio remains committed to the GLSM communities and will continue to analyze new ideas and possible remedies. In addition, the State of Ohio looks forward to continuing its existing relationships with federal and local agencies, as well as forming unique public-private partnerships with citizen groups and landowners throughout the GLSM watershed to implement the actions outlined below (and any further appropriate actions) in an effort to restore this valuable shared resource.

### Internal Loading

**Problem:** The lake already contains an excessive amount of reactive phosphorus that is continually recycled during the normal life cycle of cyanobacteria species present in the lake. The phosphorus is absorbed by cyanobacteria as they grow and is released upon the death and decomposition of the cyanobacteria, thereby becoming available again for up-take by newly growing algae. The very large amount of reactive phosphorus contributes to explosive growth (or blooms) of cyanobacteria species. This continual recycling of phosphorus already in the lake by cyanobacteria is considered to be a problem of "internal loading", as opposed to the continual addition of phosphorus to the lake from external sources in the watershed, which is considered "external loading".

#### **Action: Nutrient stabilization/neutralization (Alum Treatment)**

Recommended initially as pilot project(s) in discrete areas (20-40 acres) with consideration of whole lake application only after completion and positive evaluation of pilot studies.

Two pilot projects will be implemented to test the effectiveness of aluminum sulfate (alum) for Grand Lake St. Marys. Alum has been used to inactivate phosphorus in lake sediments in more than 300 lakes worldwide since its first application in 1960. Results demonstrate improved water quality, reduced harmful algae blooms and increased water clarity in all but a very small number of these previous projects. *Tetrattech Inc.* recently completed a draft report titled: "*Recommended Actions for Grand Lake St. Marys, Ohio*" which estimates the potential duration of effectiveness of a whole lake alum treatment on Grand Lake to be eight to ten years. The recommended projects are designed to test alum's effectiveness on issues directly contributing to Grand Lake's decline, as well as to evaluate potential shortcomings and provide needed data for future decisions regarding a whole-lake alum treatment. The two demonstration sites of 20-40 acres in size will be selected during August 2010, with actual treatment targeted for September 2010. Costs associated with the recommended demonstration projects are estimated to be approximately \$250,000 and would be paid through a Section 319(h) subgrant from Ohio EPA to ODNR's Division of Parks & Recreation.

**Action: Replace cyanobacteria with non-harmful algae (diatoms) capable of being harvested for energy generation purposes**

Recommended as a larger pilot project in a two-acre area of the lake.

The state, through ODNR, is already participating in a small pilot project to determine whether it would be feasible to replace the cyanobacteria in GLSM by creating conditions more conducive to the development of non-harmful algae (i.e., diatoms). This would be accomplished by adding a silica material that would theoretically give rise to a population of silica-based diatoms. Theoretically, rather than fostering cyanobacteria blooms, the lake would instead foster the growth and development of non-harmful diatoms. In turn, the diatoms could be harvested for energy purposes. The state's current partner in this pilot project is already operating under a special use permit granted by ODNR's Division of Parks & Recreation. The current project is utilizing a withdrawal from the lake of 10 gallons per day for off-site laboratory demonstration. This pilot study is testing whether lake conditions can actually be manipulated to foster the growth of non-harmful algae in Grand Lake St. Marys. Once this off-site demonstration is complete, the state will review the results to determine whether an in-lake pilot project is feasible. If it is feasible, the in-lake pilot project will be sized appropriately and funded through ODA.

The larger scale project is estimated to cost approximately \$25,000. ODA will coordinate implementation of the larger pilot project with ODNR's Division of Parks and Recreation.

**Action: Dredging of lake sediments**

Recommended in certain discrete areas only.

The Division of Parks & Recreation will strategically focus dredging activities in and around the mouths of tributaries leading into Grand Lake St. Marys. Removal of the phosphorus-enriched layer of sediment on the bottom of the lake through suction dredging is probably the most permanent solution to reduce internal phosphorus loading. Unfortunately, dredging is the most expensive of all lake restoration practices with some estimates for dredging all of Grand Lake reaching as high as \$90 million. However, when strategically focused on areas in and around the mouths of tributaries where sediment deposition is happening most regularly, dredging can be a cost-effective and efficient tool to help contribute to water quality improvements. For example, as a component of “wetland treatment train systems”, targeted dredge activities will remove nutrient-laden sediments prior to or shortly after they are deposited into the lake.

This practice should be implemented in conjunction with installation of wetland treatment train systems that are already proposed for installation, beginning with Prairie Creek.

#### **Action: Increase levels of oxygen in the lake**

Recommend deploying additional aeration devices within GLSM.

Currently, local partners have installed a number of aeration devices within GLSM in an effort to provide additional oxygen to the lake’s waters. As part of this effort, the stakeholders have established a contract with Battelle Memorial Institute to review operational data from the aeration devices to determine how effective they are in reducing algal growth. The state, through ODNR, will request that Battelle review their findings with appropriate state agencies and provide a recommendation on whether further strategic aeration implementation would be of benefit.

#### **No Action: Mechanically harvest or chemically destroy the algae in the lake**

Mechanical harvesting of the cyanobacteria from Grand Lake St. Marys and/or the use of chemical algaecides to control or eliminate harmful algal blooms (HABs) is not recommended given the current levels of cyanotoxins detected across the lake. Cyanotoxins are stored and isolated within the cyanobacterial cells and they do not readily diffuse or leak into the surrounding water as long as the individual bacterial cell is alive and intact. Under normal environmental conditions during a reproducing active toxin-producing bloom event, 95-98% of the toxins would be intracellular. Cyanotoxins are released to the water as the result of the natural cell rupture (“lysis”) upon the death of the cyanobacterial organism or as the result of “artificial lysis” due to the use of mechanical collection devices or algaecides. Use of algaecides can be effective prior to the occurrence of a visible algal bloom but is not recommended after the bloom has occurred. The process of “artificial lysis” could rapidly release a major slug of cyanotoxin into a lake already containing cyanotoxins, thereby increasing the potential for harm from water contact or ingestion and potentially generating an amount of cyanotoxin capable of exceeding the treatment capacity at the Celina drinking water plant.

## **External Loading**

**Problem:** External loading to GLSM includes the addition of phosphorus, other nutrients, and sediment to the lake from a number of external sources, including agricultural operations. External nutrient loading adds to the potential for cyanobacteria to grow and proliferate.

### **Action: Request additional assistance from the U.S. Department of Agriculture**

Governor Ted Strickland has recently requested assistance from the U.S. Department of Agriculture to help address GLSM's external loading problems. Thankfully, Secretary Tom Vilsack has already responded, recently announcing additional funding and other assistance for the watershed.

Federal cost-share programs through USDA's Natural Resource Conservation Service (USDA-NRCS) have provided \$2.5 million in funding over the past two years for critical work throughout the watershed. Secretary Vilsack's announcement was for an additional \$1 million to fund practices in 2010 that will help livestock producers better manage manure during the coming winter. Agricultural landowners have been actively participating in cost share programs, to the point that there are waiting lists for landowners who are seeking to implement conservation practices to aid the watershed. To ensure that all landowners have the opportunity to participate, and to address those who are already on the waiting lists, the state, through ODNR, will continue to seek additional federal cost-share funding for:

- installation of filter strips that meet USDA-NRCS Standard 393,
- installation of cover crops on low residue crop fields,
- transfer or export of manure outside the watershed, and
- installation of manure storage and treatment practices to aide in the implementation of the regulatory recommendations described below.

In addition, USDA-NRCS has established a stream gauge monitoring station on Chickasaw Creek which has provided valuable data. USDA-NRCS currently plans to continue collecting data from this monitoring station over the next two years. The data collected will be used to analyze how land use practices could be changed to minimize the amount of nutrients reaching Grand Lake St. Mary's. The data and analysis will also provide information on how effective changes in land use practices are in reducing the nutrient loading. Secretary Vilsack also announced that an additional stream gauge monitor will be placed in the watershed to provide broader data. The state, through ODNR, will assist USDA-NRCS in placing the additional stream gauge monitor in an appropriate sub-watershed.

Finally, USDA-NRCS is developing Soil & Water Assessment Tool (SWAT) teams for impaired watersheds throughout the country. These teams can quickly develop threat abatement strategies within a watershed, and work with landowners to implement those abatement strategies. The state, through ODNR, will request that USDA-NRCS establish a SWAT team as early as possible for the Grand Lake St. Mary's watershed, and will commit departmental staff to work with a SWAT team.

### **Action: Promote manure hauling practice improvements**

One of the primary causes for surplus nutrients entering the lake is the amount of animal manure being applied to land in the lake's watershed. One of the most effective means to reduce nutrients delivered to the lake is to reduce the amount of land application of manure in the watershed. Larger, permitted farm operations, especially poultry operations, have had strong success in being able to find ways to ship their manure outside of the watershed to other crop farmers that can beneficially use the manure on their fields. However, smaller operations throughout the watershed, especially dairies (since over 90% of their manure is water which is expensive to haul) have found this difficult given their lower economies of scale. The USDA-NRCS Environmental Quality Incentive Program (EQIP) has assisted producers wanting to transport manure outside of the watershed. However, there are program obstacles when an Ohio farmer makes arrangements for exporting manure to nearby areas in Indiana. Therefore, the state, through ODNR, will request that USDA-NRCS establish greater flexibility under EQIP cost share to allow for transportation of manure outside of the watershed, including to Indiana. Also, ODNR will request USDA-NRCS to allow EQIP funding eligibility for crop farmers outside the watershed to construct manure storage facilities that would allow them to accept exported manure for utilization during appropriate times for crop production under a nutrient management plan.

### **Action: In-stream nutrient abatement**

Currently, the state is working with federal partners to develop a "treatment train" on Prairie Creek. Its goal is to establish beneficial land use practices, particularly re-establishing wetlands, along the creek that will filter sediment and nutrients out of the waters that reach Grand Lake St. Marys. The state, through Ohio EPA, will continue this effort but expand its implementation to all of the Grand Lake St. Marys feeder tributaries.

Similarly, additional stream and near-stream mitigation practices can reduce the amount of nutrients entering the lake. This includes restoring a stream's natural meander with appropriate land buffers and wetland features that will trap nutrients. The state, through ODNR, should request cooperation with USDA-NRCS and local Soil and Water Conservation Districts to identify upstream landowners to immediately implement appropriate stream and near-stream mitigation projects on the lake's feeder tributaries utilizing public and private funding.

### **Action: Implement phosphorus limits on wastewater treatment plants in the Grand Lake St. Marys watershed**

Currently permitted wastewater treatment plants discharging into tributaries leading to Grand Lake St. Mary are estimated to contribute 5 to 10% of phosphorus loads to the lake. Ohio EPA will impose, if appropriate, phosphorus discharge limits on wastewater treatment plants when their discharge permits are renewed.

### **Action: Educate home septic system owners**

The state recently passed household sewage legislation under SB 110. While rule development and implementation is not expected to be completed until after extensive stakeholder involvement, the state, through the ODH, will work with local health departments to provide homeowners with educational material regarding proper sewage treatment system maintenance and repair/replacement.

### **Action: Improve homeowner and commercial turf management practices**

Although private homeowner contributions of phosphorus to Grand Lake are relatively small, individual homeowners in the watershed, especially lakefront homeowners and commercial operations such as golf courses should revise turf management practices to eliminate phosphorus and other nutrient inputs into the lake. The state, through Ohio EPA, will encourage the use of phosphorus-free lawn fertilizers and work with the Ohio Lake Management Society (OLMS) to develop and present workshops and educational materials for improving landowner and commercial operator's awareness of nutrient-free turf management practices that can be readily implemented.

### **Action: Establish Ohio General Assembly's support for additional state regulatory authority**

The state's current regulatory program to address agricultural runoff is focused both on larger, permitted facilities and on incentive-based cooperation with medium and smaller facilities (with an enforcement backstop). Now, however, the state will seek legislative support through the Joint Committee on Agency Rule Review (JCARR) for authority that would allow it to respond in additional, quicker ways to nutrient runoff issues and work to prevent them in the first place. First, the state, through ODNR's Division of Soil and Water Resources, will seek to adopt rule revisions in the Agricultural Pollution Abatement Program that will allow the division, and its local soil and water conservation district partners, to expedite orders when pollution problems occur and timely voluntary cooperation cannot be achieved. Second, ODNR will also seek to adopt rules that will restrict land application of manure in the winter and that require non-permitted farms generating or using manure to only do so under an approved nutrient management plan.

The latter two proposed rules for which ODNR will seek legislative support would apply to the Grand Lake St. Marys watershed and other Ohio watersheds in the future if they have similar water quality issues. The two proposed rules are:

- **Restrictions on Manure Applications**

The first rule will amend the current rule for land application of manure. If enacted, the rule would prohibit manure application between December 15 and March 1 without special approval for each application. Outside of those dates, no manure application could occur if ground is frozen or snow-covered. Because many livestock owners or operators will need to make significant changes to their operations and construct additional storage, the rule would phase in the prohibition. However, between the

effective date of the new requirement and March 1, 2012, the rule would require compliance with the USDA NRCS standards and conditions for land application of manure established in Standard 633, Waste Application. Moreover, after March 1, 2012, each owner or operator of a livestock facility would need to ensure a minimum of 120 days of manure storage capacity, by November 15 of each year (unless special approval for winter application has been obtained) and maintain related records.

- Requirement for Nutrient Management Plan

The second rule would require the owners or operators of any farm generating or utilizing in excess of 350 tons of manure annually to develop a nutrient management plan addressing all sources of nutrients used in the operation, and operate in conformance with the plan. These nutrient management plans would need to be submitted to the Division of Soil and Water Resources for review and approval. The division expects to implement this rule, and the first rule above, in close cooperation with local soil and water conservation districts. The Mercer and Auglaize SWCDs cover the Grand Lake St. Marys watershed. The plans would need to be based on soil tests conducted at least every three years, and annual manure tests. The plans would need to preclude land application when weather forecasts have a prediction of certain precipitation events. The plan requirement would pertain to any operation applying more than 350 tons of manure per year which covers the vast majority of operations which actually apply any manure in the GLSM watershed. The nutrient management plans will be in the form of the Ohio Nutrient Management Workbook, a USDA NRCS Comprehensive Nutrient Management Plan, or equivalent approved format. Record-keeping would be required. Plans would need to be submitted for re-approval once every three years. Between the effective date of the new rule and December 15, 2012 (when every operation would be required to have an approved plan) operations must comply with the USDA-NRCS Standard 633. Moreover, agencies will encourage and assist with earlier plan development and approval.

**Action: Look for additional ways to implement the phosphorus task force recommendations in the GLSM watershed, which will help to reduce phosphorus loading**

In consultation with Heidelberg University, Ohio EPA convened the Ohio Lake Erie Phosphorus Task Force in 2007 to review and evaluate the increasing dissolved reactive phosphorus (DRP) loading trends and the connection to the deteriorating conditions in Lake Erie. The Task Force was charged to identify and evaluate potential point and nonpoint sources and related activities that might be contributing to the increasing trends in DRP. The Task Force included a wide range of participants and presentations by invited experts in a variety of disciplines. This report presents the findings of the Task Force along with recommendations for future management actions for Ohio. More information on the task force can be found online at:

<http://www.epa.state.oh.us/dsw/lakeerie/ptaskforce/index.aspx>

## **Action: Ohio EPA will work with local, state and federal partners to implement the TMDL recommendations**

The Beaver Creek and Grand Lake St. Marys TMDL report was approved by U.S. EPA on September 28, 2007. The TMDL report identifies and evaluates water quality problems in impaired water bodies and propose solutions to bring those waters into attainment with water quality standards. TMDLs were calculated for fecal coliform bacteria, total phosphorus and nitrate. Some of the recommendations for improvement include managing livestock manure to reduce nutrient runoff, improving erosion and sediment control in all areas, and eliminating the pervasive bacteria problems. More information on the TMDL can be found online at:  
<http://www.epa.ohio.gov/dsw/tmdl/BeaverCreekWabashTMDL.aspx>

## **Other Actions/Considerations**

### **Human health protection**

Ohio EPA and the City of Celina are currently conducting sampling of the lake's waters. Ohio EPA collects samples at the three State Park public beach areas and the City collects samples of raw and treated water near its drinking water intake pipes. Ohio EPA has established a process to make its sampling results public, including direct distribution to interested media outlets and stakeholders and postings on its website. For the remainder of the recreational season, Ohio EPA (in consultation with other the other state agencies) has established a finalized sampling protocol. The sampling data will continue to be provided to update the public.

**Action:** While the World Health Organization has a recreational contact standard for microcystin, no such standard is available to determine the threshold of threat to human health for other toxins that have been found in Grand Lake St. Marys this summer. The state, through Ohio EPA and ODH, will request that the U.S. EPA and U.S. Department of Health & Human Services develop a national standard that states can use as guidance for determining when to post health advisories when these toxins appear. Specifically, U.S. EPA and HHS should develop standards for anatoxin-a, cylindrospermopsin and saxitoxin. In addition, U.S. EPA and HHS should provide guidance on whether the presence of these toxins in water bodies poses an additional human health threat if fish from these water bodies are consumed.

### **Consideration of other/alternative technologies**

A number of companies and stakeholders have provided information to the state on how a product or technology may benefit the lake's nutrient levels or algal growth. However, state agencies do not necessarily have the appropriate expertise, experience or resources to determine which, if any, of the proposals have merit in regards to Grand Lake St. Marys.

**Action:** The state, via Ohio EPA, will request U.S. EPA's assistance in reviewing the incoming proposals to determine which, if any, should be further pursued for either demonstration or full scale implementation.

## Ohio lake's algae dangerous to swimmers, economy

By JOHN SEEWER (AP) — Jul 2, 2010

ST. MARYS, Ohio — Patches of green and turquoise slime floated like thick paint in the channel behind Kyle Biesel's home. His pontoon boat sat covered up, unused for weeks, on a wooden lift stained by the algae.

A foul smell enveloped the backyard where he used to fish and watch blue herons glide over the water. He called it a "sickening combination of manure and propane gas."

Even more alarming, tests reveal that the waters in Ohio's largest inland lake contain dangerous toxins with the potential to cause rashes, vomiting or even liver and nerve damage. State officials say it's no longer safe for swimming and skiing.

It's causing economic and environmental distress for hundreds of people who work along Grand Lake St. Marys in western Ohio, an area already hurt by manufacturing cuts that have contributed to Ohio's highest unemployment rates in a quarter century. Tourism brings an estimated \$216 million into the area with much of that coming from visitors to the lake.

"People are scared to death," said Chuck Black, who manages Windy Point Marina. "You can look out on this lake and count the boats on one hand."

Boat repairs are the only thing keeping Black in business because gasoline sales are down by more than half and could cost him well over \$50,000 this year. He now wears waterproof boots when he's fixing boats after getting a rash when water dripped on his feet.

This is the second straight summer of water warnings along what locals call "Ohio's other Great Lake." The water problems led to a drop in visitors last year to 687,000, down from about 737,000 a year earlier.

It's likely to be even worse this summer.

Boaters and tourists have canceled trips, leaving cottages and camp sites empty during what normally would be a bustling Independence Day weekend. Marinas and restaurants are cutting workers, and a few have shut down for good.

Ohio Gov. Ted Strickland asked the heads of the U.S. Environmental Protection Agency and agriculture department on Friday for financial and environmental assistance in dealing with the lake's water.

"We have reached a tipping point where the degraded nature of the lake is causing a significant loss to local businesses and the total livelihood of the region," the governor said in his letter.

Grand Lake St. Marys is one of the state's most lakes polluted because of the fertilizer and manure that runs off from nearby farms and into creeks and streams flowing into the lake, feeding the algae that produces toxins.

This year state environmental regulators have found a different species of algae that can produce up to seven different toxins. Water tests have shown there are low levels of two toxins that can affect the liver and nervous systems.

While this type of blue-green algae has been found elsewhere in lakes and rivers, less is known about the toxins they produce.

There are no guidelines from the federal government or the World Health Organization on how much exposure is dangerous so state regulators decided to warn people not to touch the water.

"We just don't know what's safe," said Dina Pierce, spokeswoman for the Ohio Environmental Protection Agency.

Closing public beaches or banning swimming hasn't been done because of the lack of guidelines, said Mike Helton, a spokesman for Ohio's natural resources department. "We're letting people use their own use discretion," he said.

Boating still is allowed, and the state says it's safe to eat the fish.

So far, there are no reports of anyone getting sick from the water.

Those at the greatest risk are swimmers who accidentally gulp the water and people on Jet Skis and boats who are splashed repeatedly. The spray sends particles of the bacteria into the air where it can be easily inhaled or ingested, said Linda Merchant-Masonbrink, who oversees the state EPA's monitoring of inland lakes.

There's also the potential for catastrophic fish kills with large algae blooms that rob the water of oxygen.

About 300 dead fish washed up in the algae-filled channel behind Biesel's home a week ago. "I worry about the wildlife," he said. "I watched the ducks out there, and they could hardly push through it."

**AP** Associated Press

Map



How much algae covers the water varies each day depending on the weather and winds. Earlier this week, parts of the lake showed no signs of the smell or algae, but it was apparent in some areas.

For generations, the 9-mile long lake has been lined with fishing shacks and vacation cottages, but in recent years more expensive homes have been built by retirees who have relocated near the water.

Many worry that the algae outbreak will bring down their property values, and some real estate agents say potential buyers have backed out of deals.

Some residents say they've been warning politicians about the increasing pollution flowing into the lake for at least a decade. State officials say they've been meeting with farmers, asking them to cut down on the manure that makes its way to the lake.

But residents aren't satisfied. They say stricter regulations are needed on large farms, limiting when they can apply manure to their fields and how close they can plant to streams.

"It's getting to the point where somebody needs to step on somebody's toes," said Dave Meyer, a member of the Lake Improvement Association.

No matter what happens, it may take a long time to get rid of the algae and the stigma surrounding the lake.

Jason and Delarie Adams, of Chicago, spent three days at a cabin along the lake this week, not knowing about the water warnings until they arrived.

They stayed clear of the lake and kept their 1-year-old daughter's sand toys packed away. "We saw the bubbles on the water," said Delarie Adams. "It looked like dishwashing detergent."

"I don't think we'd come back," her husband said. "I mean we can't even get in the water."

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## Neurotoxin levels in Grand Lake St. Marys reach new high, EPA says

By Steve Bennish, Staff Writer

Updated 12:28 PM Friday, July 23, 2010

The Ohio EPA said Thursday, July 22, that the latest lab tests for toxins produced by the cyanobacteria at Grand Lake St. Marys show readings still too high to recommend resuming contact with the water.

“The latest microcystin levels are lower than the previous sampling round, but some samples remain higher than the 20 (parts per billion) considered by the World Health Organization to be safe,” said spokeswoman Heather Lauer.

“In addition, anatoxin-a levels are at their highest since testing began,” she added.

Anatoxin-a is a neurotoxin, which effectively is a nerve poison.

Because of high levels of anatoxin-a, Ohio EPA, Ohio Dept. of Natural Resources and Ohio Dept. of Health are maintaining the advisory level at the lake to ensure public health, she added.

Microcystin levels do fluctuate.

“At this time, the state recommends people do not contact the water, do not allow pets to contact the water and do not take boats onto the lake. Additionally, Ohio EPA still urges people not to eat fish caught in Grand Lake St. Marys,” Lauer said.

OEPA said that water samples were taken by the U.S. Geological Survey at the three state park beaches, East Beach, West Beach and Campground Beach, on Monday, July 19.

The Celina Water Department analyzed the water for microcystin.

Green Water Labs in Florida analyzed the water for the three toxins produced by aphanizomenon, one of the bacteria species in Grand Lake St. Marys.

Celina’s treated drinking water is tested regularly and remains free of toxins, Lauer said.

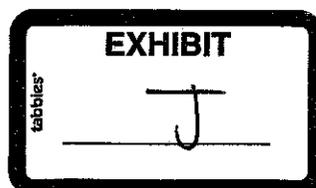
Contact this reporter at (937) 225-7407 or sbennish@DaytonDailyNews.com.

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July 30, 2010

Algae may be killing pets: At least three dogs dead, nine humans ill  
Caitlin Mcglade and Spencer Hunt  
The Columbus Dispatch, Ohio

July 30--State and local health officials are investigating reports that at least nine people have become ill and at least three dogs have died after coming in contact with the toxic blue-green algae choking **Grand Lake St. Marys**.

Dan Jenkins, 43, was hospitalized last Thursday through Sunday and is still recovering at his Celina home, family members said yesterday. Laura Jenkins said her husband started complaining of fatigue and numbness after he found the family Labrador retriever, Casey, swimming in the lake on July 15.

Mr. Jenkins washed a "thick, green sludge" off the dog's fur.

Casey died Sunday and was buried before a necropsy could be performed to determine a specific cause of death. Officials are awaiting toxicology results for another dog, a 16-year-old rat terrier named Kenzie.

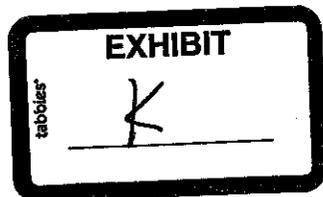
The dog washed up on a **Grand Lake St. Marys** beach early Wednesday evening.

Brian Bowling said Kenzie went missing Monday and that his girlfriend discovered the dog.

"It was just terrible," Bowling said.

The news of the illnesses came as state officials are preparing to announce short-term and long-term plans to clean up **Grand Lake St. Marys**. Gov. Ted Strickland and directors of the state health, natural resources, agriculture and environmental agencies will make the announcement this morning at the Wright State University campus in Celina.

Similar algae problems are popping up in public and private lakes across the state, including Burr Oak, Indian and Buckeye lakes.



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The 13,000-acre **Grand Lake St. Marys** has long been considered one of Ohio's most polluted bodies of water, largely because of manure and fertilizer runoff from nearby farms. Cyanobacteria, more commonly called blue-green algae, feed off phosphorus in the manure and fertilizers.

Algae has grown so thick this summer that state officials have warned people not to touch the water, boat on the lake or eat any fish caught there. Another round of tests released yesterday again found microcystin, a liver toxin, and a neurotoxin called anatoxin-a.

Pet deaths have been linked to blue-green algae in other states, including Minnesota, Nebraska, Oregon, Vermont and Missouri, according to the Ohio Environmental Protection Agency. This includes 10 dogs and five cats that died from 1976 through 2007 from algae blooms in different lakes in Washington state.

There is no test that detects microcystin or other algae-related toxins in people, said Jen House, spokeswoman for the Ohio Department of Health. House said that forces investigators to rule out other causes.

Jenkins, for example, has reported lingering memory loss and numbness.

House said Jenkins' case is the most severe of the illnesses involving four men and five women. The first was reported July 9. No information was available about the other eight or their symptoms.

House said microcystin can cause skin rashes in people who touch contaminated water, as well as stomach cramps, diarrhea and nausea in people who swallow it. Neurotoxins can cause fatigue, dizziness, numbness and breathing difficulties.

Dr. Craig Miesse, a veterinarian at the Celina Animal Hospital, said the first dog he treated was Kasie, a 9-year-old golden retriever that died in his office on July 22. He said the dog had seizures and blood clots.

Miesse said he didn't consider the lake as a factor until Jenkins' dog, Casey, died.

He has collected tissue samples from Kenzie, the terrier that washed up on the lake's shore. He said the dog had been in the lake for at least a day and the condition of its body might cloud the test results.

Miesse said he also has fielded a call from the owner of a 2-year-old cairn terrier. The owner said the dog has been vomiting since it drank some lake water a couple days ago.

"It's going to be something we have to deal with for a while," Miesse said.

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---- INDEX REFERENCES ---

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