

Illinois EPA Algal Bloom Program

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Presentation Outline



- ▶ Cyanobacteria blooms and potential impacts
- ▶ Cyanotoxins, exposure, and possible health effects
- ▶ Illinois EPA Algal Bloom Monitoring
- ▶ Bloom Report Form
- ▶ Next steps and sample analysis
- ▶ Algal Bloom Webpage
- ▶ Illinois EPA Algal Bloom Dashboard
- ▶ Contact information

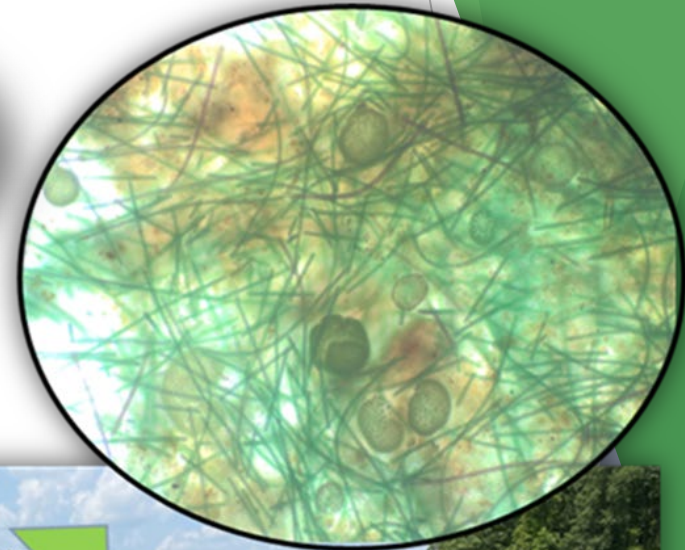
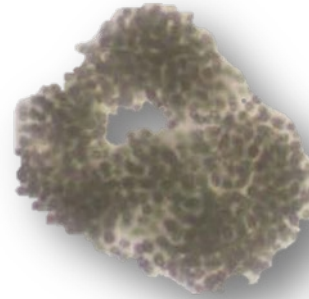
Cyanobacteria Blooms

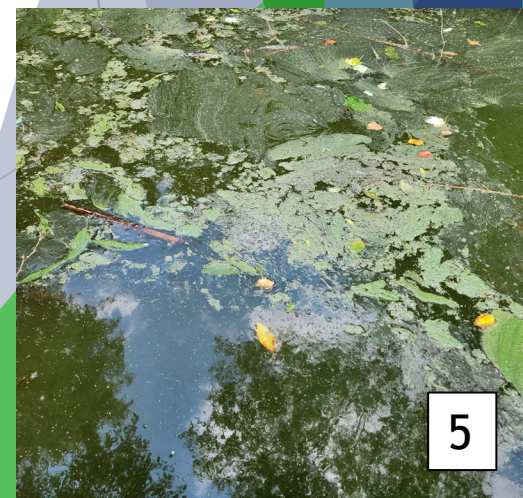
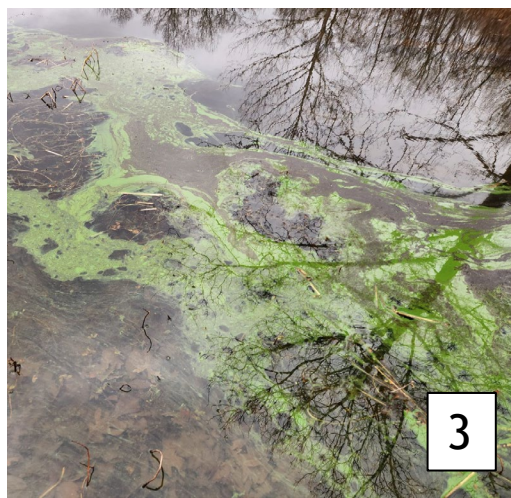
► Cyanobacteria

- Blue-green algae, toxic algae, HABs
- Naturally occurring
- Microscopic

► Bloom

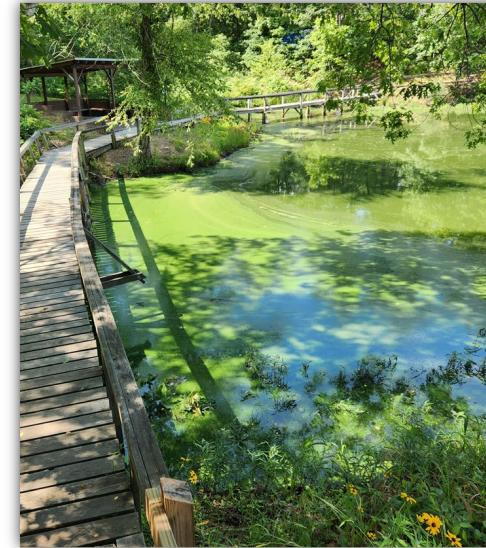
- May be visible to naked eye
- Green, blue, brown, or white
- Scums, swirls, blobs
- Peak in summer
- Can produce toxins





Potential Impacts of Cyanobacteria Blooms

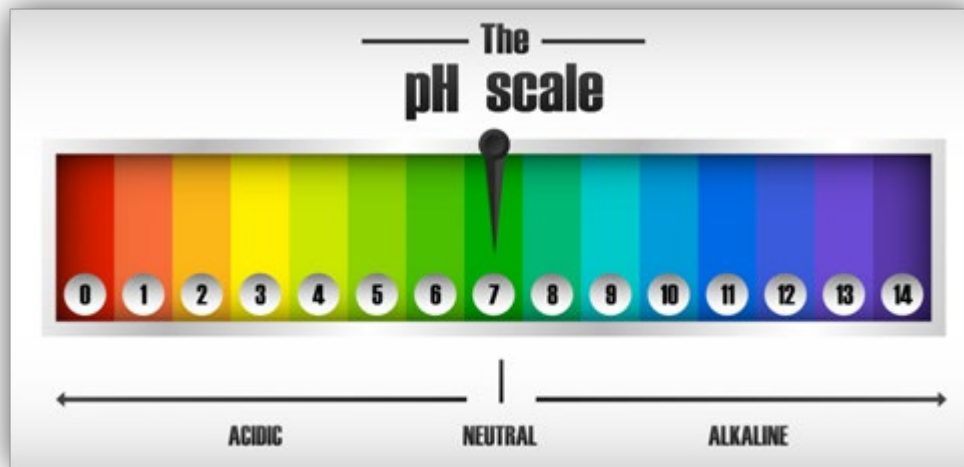
- ▶ Environmental
- ▶ Economic
- ▶ Health



06.22.2023



08.30.2023



https://www.freepik.com/free-vector/ph-scale-diagram_4707964.htm>Image by brgfx on Freepik

DO NOT DRINK Water Advisory

Do not boil water. It will not make it safe to drink.

The [water utility name] advises customers:

- **Do not** consume tap water.
- **Do not** use tap water to water pets or livestock.
- **Do not** use tap water to brush teeth.
- **Use** bottled water until the advisory has been lifted.

For more information, go to (www.watersystemwebsite.org) or call (800-888-8888).

DO NOT USE Water Advisory

Do not boil water. It will not make it safe to use or drink.

The [water utility name] advises customers:

- **Avoid** using tap water.
- **Do not** boil the water, as it will not make it safe to drink or use.
- **Do not** consume tap water.
- **Do not** use water for watering pets or livestock.
- **Do not** use water for washing, bathing, watering, or medical devices.

Common Toxins

► Microcystin

- Commonly detected
- Often detected above recommended guidance values
- Hepatotoxin

► Cylindrospermopsin

- Not often detected
- Cytotoxin

► Anatoxin-a

- Neurotoxin

► Saxitoxin

- Neurotoxin
- Associated with Paralytic Shellfish Poisoning (PSP)

	Microcystins	Cylindrospermopsin	Anatoxin-a	Saxitoxins
Type of Chemical	Cyclic heptapeptides with specific amino acid (ADDA) Many Congeners (>250)	Alkaloids with tricyclic guanidino moiety and uracil	Amine alkaloid	Alkaloids
Mechanism toxicity	Inhibit protein phosphatases; act predominantly on the liver	Cytotoxic; act predominantly on the liver, kidneys, erythrocytes	Neurotoxic, pre- and post-synaptic depolarization	Neurotoxic; block Na ⁺ channels in neuronal cells, and Ca ⁺⁺ and K ⁺ channels in cardiac cells
Comments	The cyanotoxins most frequently found at hazardous concentrations. Numerous animal deaths. Occur largely cell bound, thus accumulating in scums; concentrations dissolved in water are usually low. Occur widely in fresh water and sometimes in brackish areas.	Frequent in some regions. Concentrations of dissolved CYN are often as high as, or higher than, those of cell bound CYNs and can persist for weeks even after the producing organism is no longer present.	Scum ingestion has caused numerous deaths of dogs, livestock, and waterfowl; animal deaths can also be due to ingestion of detached lumps of benthic cyanobacteria or submerged vegetation with attached cyanobacteria beached on shorelines.	Animal deaths have been attributed to saxitoxin in planktonic freshwater cyanobacteria. Known from paralytic shellfish poisoning but also produced by some freshwater cyanobacteria. Freshwater mussels and crustaceans can contain saxitoxins

(WHO, 2021) [Guidelines on recreational water quality: Volume 1 coastal and fresh waters \(who.int\)](https://www.who.int/publications-detail/WHO-Guidelines-on-recreational-water-quality-volume-1-coastal-and-freshwaters)

Routes of Exposure

- ▶ Direct skin contact
 - Swimming
 - Petting animals that have scum on them
 - Wading
 - Handling scums
- ▶ Inhalation
 - Aerosolized water droplets during water recreation
- ▶ Consumption
 - Drinking untreated water
 - Accidental ingestion
 - Breakthrough to finished drinking water
 - Eating contaminated fish or shellfish



https://www.cdc.gov/harmful-algal-blooms/media/images/2024/04/342010-A_Oginga_HABs_GoingInWater_1200x675.jpg

Health Effects of Cyanotoxins

Acute

- Skin irritation or rash
- Upset stomach
- Headaches
- Lung irritation
- Eye irritation
- Liver damage



Chronic

- Currently being studied



Illinois EPA Algal Bloom Monitoring

Illinois EPA Algal Bloom Monitoring

Routine Monitoring

Routine monitoring occurs at preselected sites. Sites are selected based on the Ambient Lake Monitoring Program schedule, which has lakes on a 5-year rotation.

▶ Lake Beaches

- IDPH Licensed Public Bathing Beaches
- 3x between May and September

▶ Public water supply intakes on Lake Michigan

▶ Public Water Supply intakes

- Intake depth
- 4x between April and October
- All four toxins

▶ Raw and finished taps at water treatment facilities

- 4x between April and October
- All four toxins



Illinois EPA Algal Bloom Monitoring

Event Response

Event Response investigates cyanobacteria blooms in publicly owned lakes or streams where blooms may threaten public health

- ▶ **Credible reports of a bloom**
 - Direct bloom observation
 - Contact with Illinois EPA staff
 - Bloom Report Form
- ▶ **Publicly owned waterbodies**
- ▶ **Approximately 50-70 Event Response sampling events each year**
 - May conduct follow-up sampling



Signs a Waterbody may be Experiencing a Bloom Event

- ▶ **Taste and odor complaints**
 - Geosmin and MIB
 - May be detected by public in extremely low amounts
 - Earthy/musty flavor
- ▶ **Decreased Filter Run Times**
- ▶ **Elevated pH**
 - 8.5 or higher not uncommon
- ▶ **Visible Scums, unusual odor**
 - Water may appear green
 - Scums can be moved by wind or waves
- ▶ **Fluctuations in dissolved oxygen**
- ▶ **Detection of cyanotoxins**
- ▶ **CyAN**



Bloom Report Form

IEPA Bloom Report Form

Bloom Reporting

Provide as much information as possible when reporting a suspected algal bloom.

Report Completed By:

Name*

Your name.

Organization

Optional field.

Phone Number

Optional field.

E-mail Address*

Provide a valid e-mail address in case of follow up questions.

Waterbody Information:

- ▶ Online form available to the public
- ▶ Preferred method of reporting blooms to Illinois EPA
- ▶ Contains all information needed for Illinois EPA staff to respond
 - Contact Information
 - Waterbody Information
 - GPS
 - Photo(s) of Bloom
 - Bloom Description
 - Human/Animal Illness Report



Next Steps

► Illinois EPA staff review submitted information

- Look at photos
- Look for key words
- May request more information if needed

► If cyanobacteria bloom is likely the ABC Unit Determines:

- if water body is publicly or privately owned.
- Associated uses (recreation, dog training, drinking water supply...)
- Who in the Agency should be contacted
- If there are any suspected animal or human illnesses
- If a field investigation is warranted

► Field Investigation

- Collect from raw and finished tap at water treatment plant
- May collect water samples and other field parameters
- Determine if offensive conditions are present



Sample Analysis

- ▶ **All samples sent to Illinois EPA Division of Laboratories in Springfield, IL**
 - One of the only accredited labs in Illinois for cyanotoxins
- ▶ **Toxin results within 7-14 business days,**
 - Faster TAT can be requested for emergencies
 - Results tell us how much, if any toxin is present
 - Illinois EPA also has rapid strip tests on hand for immediate presence/absence
- ▶ **Staff at Headquarters send results to regional staff or water body managers**
 - Illinois EPA uses U.S. EPA recommended guidance values for microcystin and cylindrospermopsin and the WHO values for anatoxin-a and saxitoxin

Cyanotoxin	Recreational Advisory	Drinking Water Advisory
Microcystin *US EPA	8 ug/L	0.3 ug/L
Cylindrospermopsin*US EPA	15 ug/L	0.7 ug/L
Anatoxin-a *WHO	60 ug/L	6 ug/L
Saxitoxin *WHO	30 ug/L	3 ug/L

Water Quality Monitoring

303(d) List

Water Resource Assessments

River and Stream Monitoring

Inland Lake Monitoring

Lake Michigan Monitoring

Algal Bloom

Fish Contaminant Monitoring

Water Monitoring Strategy

Water Quality Monitoring
Contacts

Volunteer Lake Monitoring

Water Monitoring

The Agency's Bureau of Water - Surface Water Section is responsible for monitoring the quality of Illinois' surface water resources, including its inland lakes, streams and rivers, and Lake Michigan. By collecting chemical, physical and biological data, we can assess the quality of our water resources and answer commonly asked questions like:

- Is it safe to swim in this lake?
- Can I eat the fish my kids catch in this stream?
- How does the quality of my lake or stream compare to the others in Illinois?
- Is the water safe to drink?
- Since I'm buying lakefront property, what can you tell me about the quality of this lake?
- Are the fish found in my stream indicative of good water quality?
- What are the causes and sources of pollution found in my water?

The Agency receives federal funds through the U.S. Environmental Protection Agency (USEPA) to conduct various monitoring programs on an annual basis. These funds are authorized through the Federal Clean Water Act (CWA). Since the 1970's, the CWA has had a national goal of making all of the nation's surface waters "fishable and swimmable." To determine whether that goal is being

Illinois EPA Algal Bloom Webpages

IEPA -> Topics -> Water Quality -> Water Quality Monitoring -> Algal Bloom

<https://epa.illinois.gov/topics/water-quality/monitoring/algal-bloom.html>



Illinois EPA Algal Bloom Webpages

▶ Algal Bloom

- Landing page
- FAQs

▶ 2025 Harmful Algal Bloom Program

- Anticipated routine monitoring sites
- Archive of past years' webpages

▶ Reporting a Harmful Algal Bloom

- Link to Illinois EPA Bloom Report Form
- Link to US EPA's bloomWatch

▶ Identifying Cyanobacteria Blooms

- Gallery of bloom photos
- Written description of blooms

▶ Information for Physicians and Healthcare Providers

- Signs of cyanotoxin exposure
- Links to resources

▶ Information for Animal Owners and Veterinarians

- Signs of cyanotoxin exposure
- Links to resources

▶ Cyanobacteria Bloom Information for Water Operators

- Links to resources
- Example advisory templates

Illinois EPA Algal Bloom Dashboard





Illinois Environmental Protection Agency Algal Bloom Dashboard

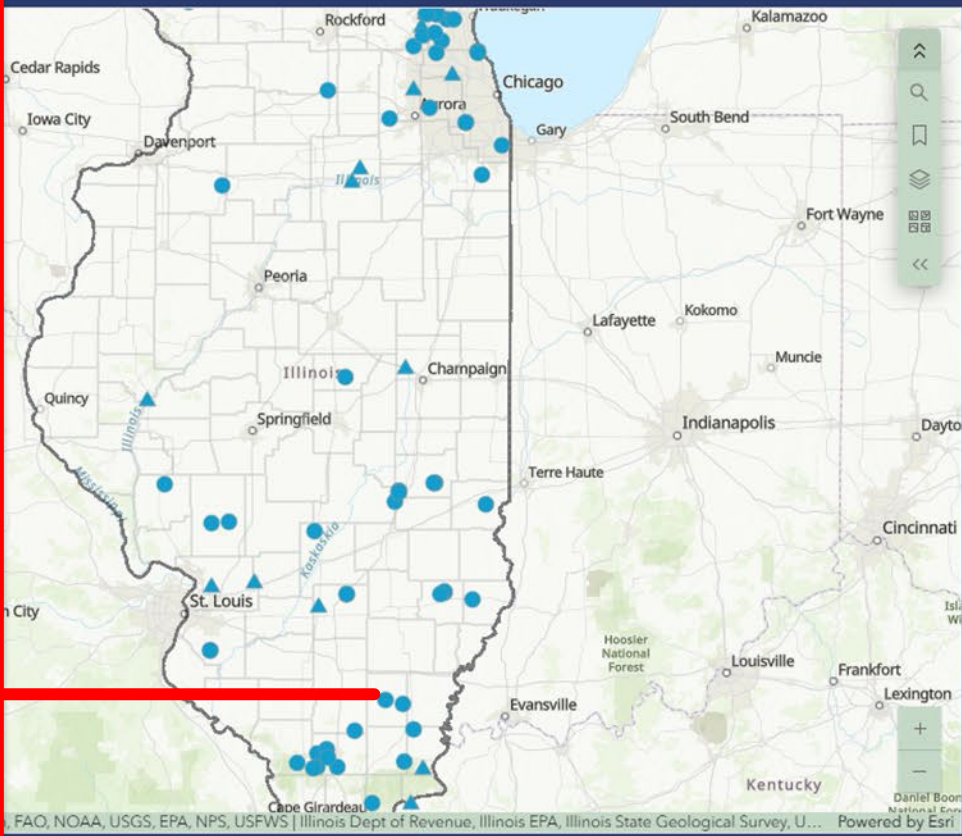
Best Experienced with Google Chrome or Microsoft Edge Browsers

Waterbody Name: McLeansboro New



County	Hamilton
Waterbody Type	Lake
Latitude	38.08
Longitude	-88.55
Collection Date	September 17, 2025





Public Bloom Report Form

- Lake
- Stream/River
- Other

Political Boundaries

- State Outline
- County Boundary

Recommended Magnitude for Cyanotoxins in Recreational Water

Microcystins	8 µg/L ^a
Cylindrospermopsin	15 µg/L ^a

^a Swimming Advisory: not to be exceeded on any day.

- McLeansboro New | September 17, 2025**
- Sangamon River | August 17, 2025
- Salt Creek downstream of Busse Woods Dam | August 15, 2025
- Ohio River | August 14, 2025
- Charleston Side Channel Reservoir | August 14, 2025
- Glendale | August 13, 2025
- Ramsey Lake State Park | August 8, 2025
- Charleston Side Channel Reservoir | August 8, 2025
- Charleston Side Channel Reservoir | August 7, 2025
- Smithton Park Lake | August 6, 2025
- Red Hills Lake | July 15, 2025
- Vernor Lake | July 15, 2025

More Information on Cyanobacteria Blooms



CONTACT LCHD
Lake County Health Department
(847) 377-8020



Surface Water Section
(217) 782-3362
epa.hab@illinois.gov



Interstate Technology Regulatory Council



World Health Organization



US Environmental Protection Agency



Upper Mississippi River Basin Association

Algal Blooms Reported

75

Surface Water Section Contact Information

Algal Bloom Coordination Unit

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Managers

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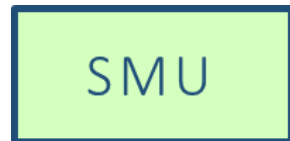
Northern Monitoring Unit

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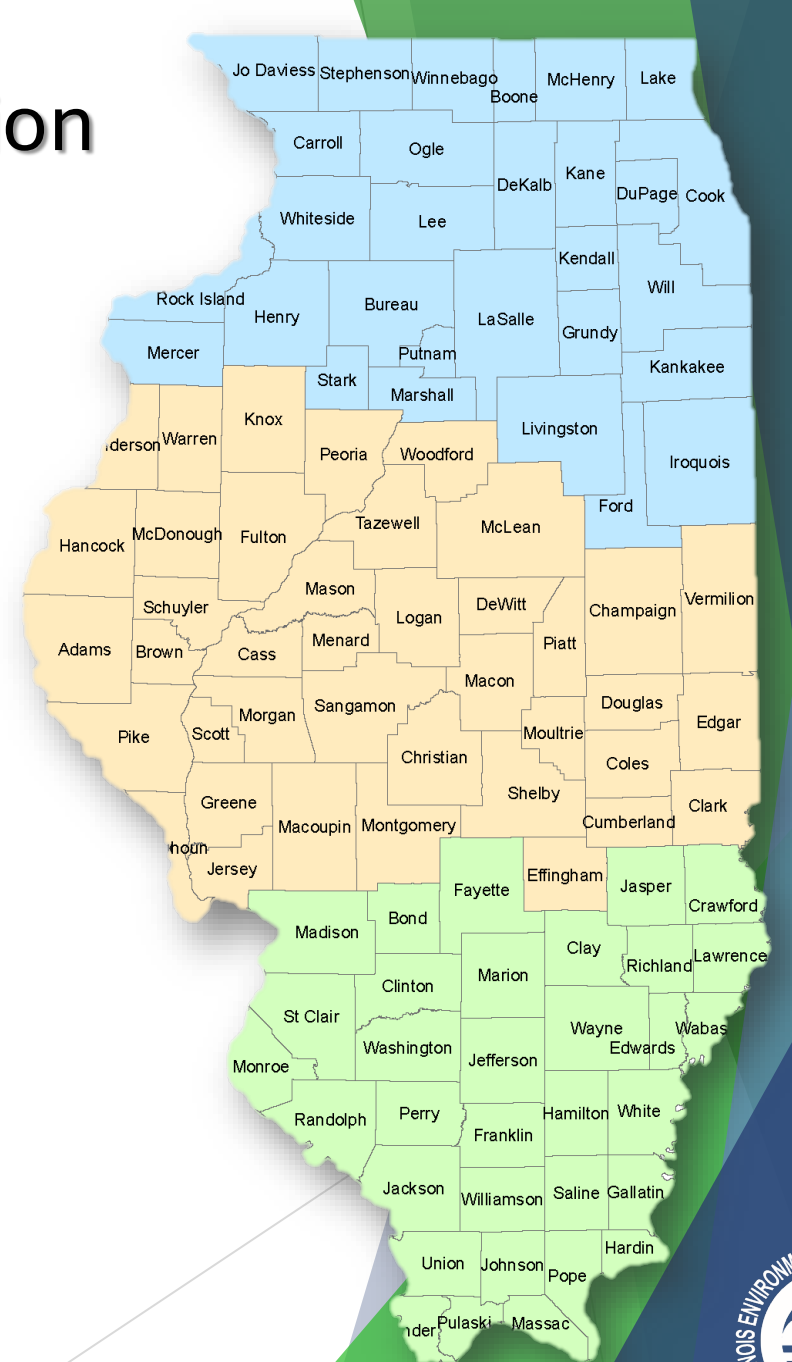
Central Monitoring Unit

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Southern Monitoring Unit

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Questions?

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