

Harmful Algal Blooms

Algae are small photosynthetic organisms found in almost every environment on Earth, even in desert sand. Most people are familiar with aquatic algae, those found in rivers, lakes and streams. Algae are an important source of food for many organisms and also produce oxygen. Under the right conditions, such as high nutrients and sunlight, algae can grow rapidly and “bloom.” Algal blooms often accumulate on the surface of waterbodies, giving the water a green, brown, or red appearance.

What is a Harmful Algal Bloom (HAB)?

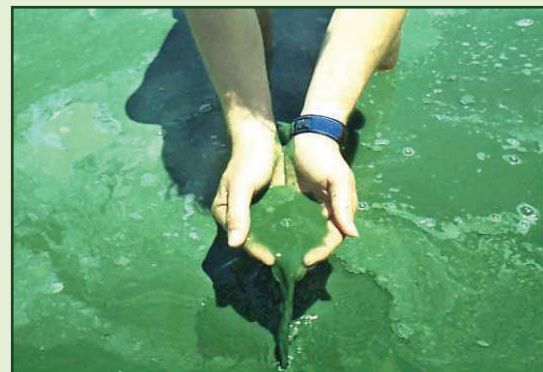
A Harmful Algal Bloom (HAB) is a bloom of certain types of algal species that produce toxins as it blooms or dies. These toxins may harm wildlife and humans when ingested or inhaled. Other algal blooms may negatively affect aquatic organisms by reducing sunlight and oxygen in the water, but they do not produce toxins and are not considered HABs. In the Great Lakes, the algal species that are commonly associated with HABs are the cyanobacteria or blue-green algae known as *Microcystis*.

What effects do HABs have on people and wildlife?

HABs can cause illness and death in humans, pets, and wildlife.

Symptoms include:

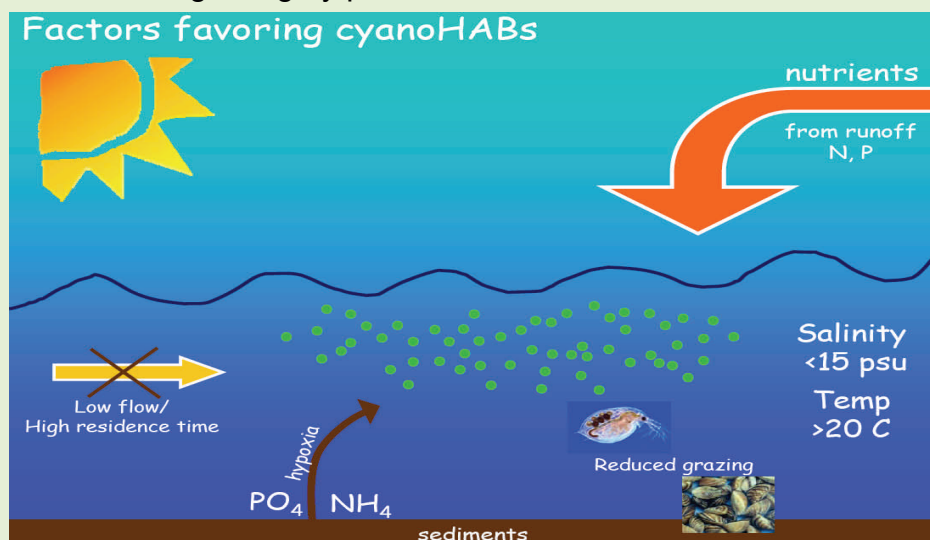
- Skin rash
- Muscle cramps
- Twitching
- Paralysis
- Nausea and vomiting
- Cardiac or respiratory failure
- Acute liver failure



Source: <http://cyanolab.com/images/jpgs/Algae%2014.jpg>

What factors affect HABs?

There are many factors that contribute to HABs. Nutrients, such as nitrogen and phosphorus, can contribute to blooms. Sources of nutrients include agricultural activities, application of lawn fertilizers, wastewater treatment facilities, septic tanks, sewer overflows, and runoff. Iron and other minerals can also contribute to the occurrence of blooms. Other factors that can promote blooms are warm surface water temperatures and reduced grazing by predators.



This figure illustrates the many factors that can contribute to a harmful algal bloom of cyanobacteria (cyanoHAB). Conditions which promote HABs include:

- Sunlight
- Increases in nutrients
- Low flow conditions
- Still water
- Release of nutrients from sediments
- Reduced grazing by predators
- High temperature
- Low salinity

Figure by Dr Juli Dyble

Do HABs occur in the Great Lakes?

Yes. The Great Lakes have a history of HABs, particularly in warm, shallow areas such as Saginaw Bay and western Lake Erie. HABs occurred regularly in these areas in the 1960s and 1970s. Blooms decreased during the 1980s and 1990s, most likely due to reductions in the amount of phosphorus input into the Lakes. Surprisingly, HABs occurred again in the mid to late 1990s and continue today. Scientists have attributed this latest resurgence of HABs to changes in the food web structure of the Great Lakes caused by the invasion of zebra and quagga mussels.

What can I do about HABs?

- When you see an algal bloom, the safest course of action to take is to stay away from the water. Also, keep pets away from the water as the toxins can also harm them.
- Remember that you can't always see, taste, or smell harmful algae. Rinse yourself and your pets off after swimming. Do not drink lake or river water. Bring water for your pets; drinking untreated water may also harm them.
- Obey beach closures and advisories.
- Report suspected blooms to your local health department. To find contact information for your local health department see http://www.deq.state.mi.us/beach/public/search_hd.aspx



Image: Lake Erie, Put-in-Bay, September 2006 (Juli Dyble)

For More Information

Harmful Algal Blooms: A newly emerging pathogen in water.

http://www.cws.msu.edu/documents/HarmfulAlgalBloomsWhitePaper_Boyer_Dyble.pdf

NOAA Center of Excellence for Great Lakes and Human Health

<http://www.glerl.noaa.gov/res/Centers/HABS/habs.html>

NOAA Monitoring and Event Response for Harmful Algal Blooms

<http://www.cop.noaa.gov/stressors/extremeevents/hab/current/fact-merhab.html>

Search for Michigan Local Health Departments

http://www.deq.state.mi.us/beach/public/search_hd.aspx

MSU Center for Water Sciences Pathogen Workshop Site

http://www.cws.msu.edu/pathogen_wkshop.htm

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