



Harmful Algal Blooms (HABs)

October 2016

Anabaena, *Aphanizomenon*, and *Microcystis*

Field Notes

General Description

When is native biodiversity not appreciated? Perhaps when 5 government agencies, including the Centers for Disease Control, the Environmental Protection Agency and others post warnings on their websites about the hazards it poses!



Warning sign. Photo: Environmental Protection Agency

We are referring to the phenomenon of Harmful Algal Blooms (or HABs). During these periods of skyrocketing population growth in cyanobacteria (blue-green algae), enough harmful toxins accumulate in the water to kill fish, birds, and amphibians. These toxin concentrations are also high enough to pose health risks to pets and humans, including fatalities.

Harmful Algal Blooms are most often composed of a handful of naturally occurring cyanobacteria, with other taxa occasionally thrown into the mix, either along with cyanobacteria or by themselves.

Identification

The term 'algae' covers a broad range of organisms, from bacteria, to other single cell and/or colonial organisms, to more complex multicellular organisms (think seaweed).

A harmful algal bloom occurs when the number of microscopic (not visible to the naked eye) cells per volume of water is high enough that toxins produced by the algae present health concerns.

The three most common types of microscopic cyanobacteria causing HABs are known as "Annie, Fannie, and Mike," short monikers for the genera *Anabaena*, *Aphanizomenon*, and *Microcystis*.

Causes

More than one factor typically contributes to a toxic bloom of cyanobacteria. Potential causes span the physical, chemical, hydrological, and meteorological spectrum. However, the most prevalent one is likely nutrient pollution, especially from Phosphorus. Sources of nutrients, including Nitrogen, are agriculture (e.g., fertilizer), stormwater (running off of pavement/roofing), wastewater (e.g., sewer and septic systems), and our homes (e.g., fertilizers, soaps, and pet waste).

Warmer waters may also contribute to algal blooms through a variety of mechanisms. For example, cyanobacteria prefer and do better in warmer waters. For this reason, climate change may increase the frequency of HABs.



Toxic blue-green algae. Photo: Environmental Protection Agency



Harmful Algal Bloom, Lake Erie. Photo: National Oceanic and Atmospheric Administration

Where to See

Some of the species responsible for algal blooms almost certainly occur in every park of the network, but a microscope would be required to see the individual alga cell when no bloom is present.

You should suspect a HAB if you see a water body that

- Smells bad
- Looks discolored
- Has foam, scum or algal mats on the surface
- Contains dead fish or other dead animals on shore or beaches

Follow all local advisories.

References and Further Reading

Environmental Protection Agency:

<https://www.epa.gov/nutrientpollution/harmful-algal-blooms>

Centers for Disease Control and Prevention:

<http://www.cdc.gov/features/harmful-algal-blooms/>

United States Geological Survey:

https://pubs.usgs.gov/fs/2006/3147/pdf/FS2006_3147.pdf