

Fact Sheet: Harmful Algal Blooms and the Toledo Event

What is a harmful algal bloom?

A harmful algal bloom (HAB) is any large increased density of algae that are capable of producing toxins. Many species of blue-green algae, also called cyanobacteria, float in calm water, forming a scum at the surface. However, wind and waves can mix algae throughout the water column.

What happened in Toledo on August 1st-4th, 2014?

Wind and water currents pushed the algal bloom that was present in the western basin of Lake Erie, near Toledo, into the area where the Toledo water plant intake is located. Wind also caused waves that mixed the cyanobacteria into the water column, causing them to be sucked into the water plant. The plant was removing toxins from the raw lake water to produce the final drinking water, but on August 2nd, the treated drinking water had a microcystin concentration that was above the 1.0 ppb level recommended by the World Health Organization (microcystin is the toxin found in the microcystis algae). There is no Federal or State standard for microcystin.

Why do we focus so much on phosphorus?

Blue-green algae grow the best in warm water loaded with phosphorus. The Western basin of Lake Erie is very shallow; therefore, the water is warm. The watershed around Lake Erie has the least forest land of all Great Lakes watersheds, the most agricultural land and the second most urban/suburban land. Therefore, Lake Erie gets more sediment and nutrients (fertilizer runoff, sewage, etc.) than the other lakes. Because it is the southernmost, shallowest, warmest, and gets the most nutrients, biologically Lake Erie is the most productive of the Great Lakes and more vulnerable to algae blooms.

How do we eliminate harmful algal blooms?

The main lever in eliminating HABs is to greatly reduce phosphorus loadings. Both point and non-point* urban and agricultural sources must contribute to the reduction in phosphorus loadings to Lake Erie. These are a **few** examples of the **many** ways to reduce phosphorus loadings to Lake Erie and its tributaries:

- Stop the application of fertilizer, natural or artificial, on frozen or snow-covered ground
- Implement best management practices for wastewater management post-treatment discharges
- Encourage the use of fertilizer containing less phosphorus
- Implement green infrastructure in urban and suburban environments to reduce stormwater runoff

Does climate change have an impact on Harmful Algal Blooms?

Cyanobacteria prefer warm water, and temperatures over the last 50 years have been increasing, but a more important impact of climate change is an increased frequency of severe storms. In Ohio and the Midwest, severe storms that produce over 3 inches of rain in a 24-hour period have increased very significantly. Since 80-90% of the phosphorus entering the lake comes with the runoff created by such events, any significant increase in severe storms will add more phosphorus to the lake and make the HAB problem worse.

*The U.S. Clean Water Act defines point source as “any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel [...]”. Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. (USEPA, <http://goo.gl/8qSgQi>)

Information provided by the Ohio Sea Grant College Program, Dr. Jeff Reutter and the Ohio Environmental Council (<http://goo.gl/VHTf4Z> and <http://www.theoec.org/LakeErie>)