**AYC Ecology North**

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**Toledo Magazine: Harmful algae blooms**
By Matt Markey and Jeff Basting, Toledo Blade, The Outdoors Page

In August and September of 2011, large areas of western Lake Erie became coated with a gooey pea soup that assaulted the senses. The biologists told us it was an explosion of blue-green algae, or what is actually cyanobacteria, and that it was dangerous.

Harmful algal blooms such as this can produce an array of problems, including polluted beaches, depleted oxygen levels that endanger fish, and taste and odor concerns in drinking water drawn from the lake. At their worst, these blooms produce toxins that can cause illness or even death in pets, livestock, and humans.

Last year we got a reprieve because conditions were not right to produce another bloom of this nasty algae, but Lake Erie’s watchdogs are predicting another difficult bout with cyanobacteria over the next few months.

“We’re going to have a pretty significant bloom this year, which says we haven’t done enough to prevent these,” said Jeff Reutter, who directs Lake Erie research for Ohio State University’s Stone Lab on South Bass Island and has been studying the lake for four decades.

When looking at the algae issue on Lake Erie, it is easy to get swallowed up by the terminology, but simply put, the same fertilizers that make our crops grow and keep our lawns lush also can cause an explosive growth of algae when these materials enter the lake.

Because Erie is the shallowest and warmest Great Lake, with the highest concentration of fish, these nutrients — primarily phosphorus — do the most damage here. The result of too much phosphorus is often a sudden spike in the growth of algae. There are hundreds of types of algae in the lake, and many are beneficial and have an important role in the food chain. Others are simply a nuisance, but the most detrimental types of algae — the blue-greens — thrive when the concentrations of phosphorus are high.

The Maumee River system, the largest in the Great Lakes and one that drains 4.5 million acres of agricultural land, injects the lake with a prodigious amount of runoff, and in the period from March through June, that runoff tends to be heavily laden with phosphorous.

When Lake Erie came back from its “dead” image of about 40 years ago, one key to that recovery was a drastic reduction in the amount of phosphorus reaching the lake. But eventually the needle started moving in the wrong direction again, and by 2000 Mr. Reutter said the grim indicators of looming problems were present.

And in the late summer of 2011, the bluegreen algae that fouled the lake in the 1970s was back at levels the lake had not experienced in a very long time.

The World Health Organization recommends that cyanobacteria presence in drinking water be no more than one part per billion, and in swimming waters it be no more than 20 parts per billion. In the 2011 bloom, the waters of Maumee Bay had 1,200 parts per billion.

If these massive harmful algal blooms continue, they would put Lake Erie’s $1.5 billion sport fishery in peril, along with the lake’s coastal county tourism that is valued at more than $11.5 billion a year and is responsible for 119,000 jobs. Eleven million people depend on the lake for their drinking water.

“Lake Erie is such a critical resource,” Mr. Reutter said. “But we sometimes find ourselves too close to it, so people tend to take the lake for granted.”

Mr. Reutter, who said climate change likely will exacerbate the problem, added that agriculture is not the sole villain. Sewage treatment plants, septic tanks, and lawn fertilizers also contribute to the phosphorus load, but the most progress will be made when agricultural practices change.

“Top-down regulation in agriculture is difficult,” Mr. Reutter said, “but the majority of farmers now accept some responsibility in helping deal with this issue.”

Major farm organizations are supporting efforts to reduce nutrient loading in the lake, and Mr. Reutter is hopeful that farmers will alter their methods, use only what is needed, not apply these nutrients on frozen ground, and incorporate them into the soil rather than broadcast them on top of the soil.

“There is no doubt that Lake Erie is an economic engine for the entire state,” Mr. Reutter said, “so a lot is at stake here.”

See the actual web page with an explanatory graph: [**http://www.toledoblade.com/A-E/2013/07/07/Toledo-Magazine-Harmful-algae-blooms.html**](http://www.toledoblade.com/A-E/2013/07/07/Toledo-Magazine-Harmful-algae-blooms.html)