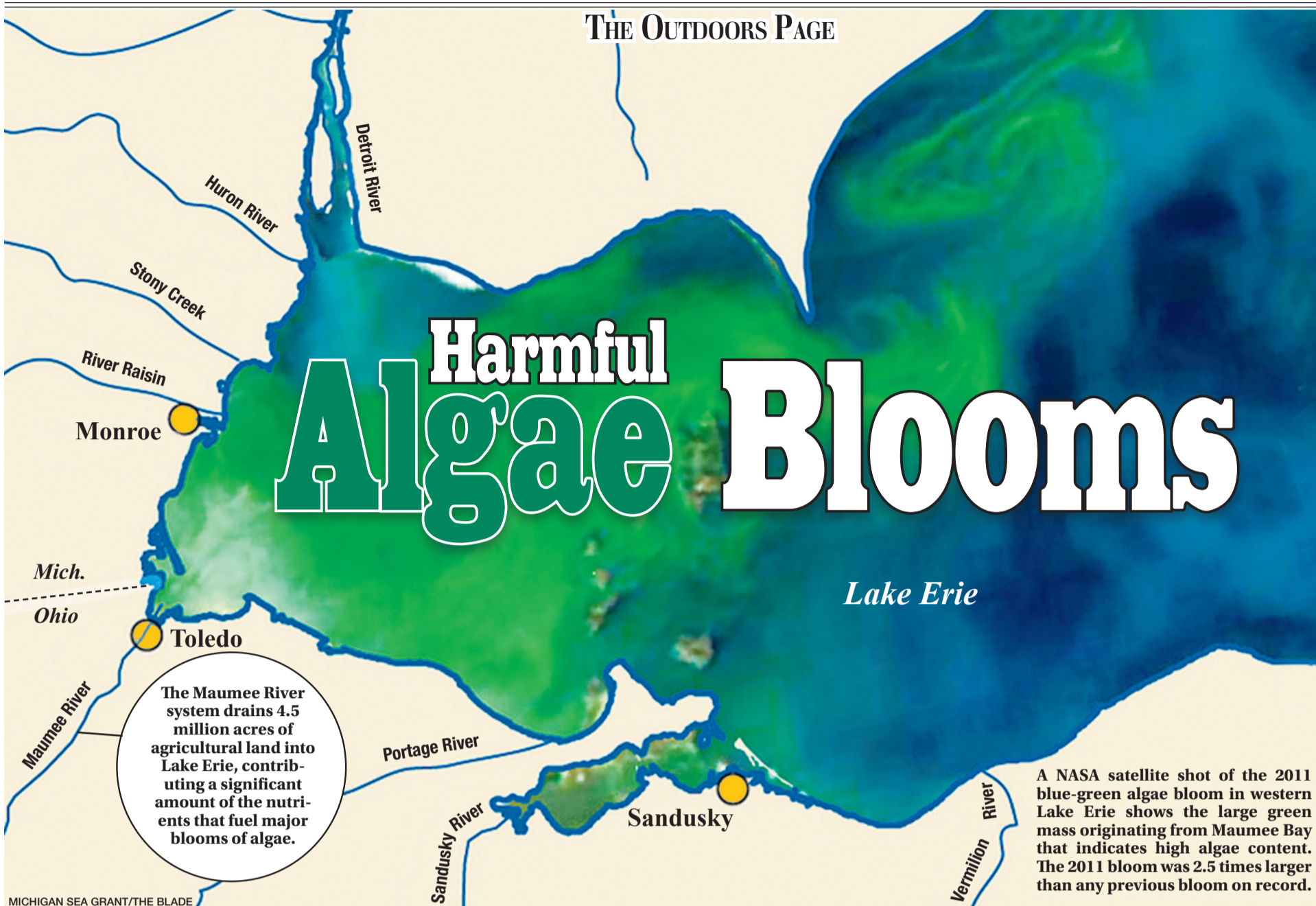


THE OUTDOORS PAGE



By MATT MARKEY and JEFF BASTING

PUT-IN-BAY, Ohio — In August and September of 2011, large areas of western Lake Erie became coated with a goeey 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 phosphorus.

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 blue-green 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.

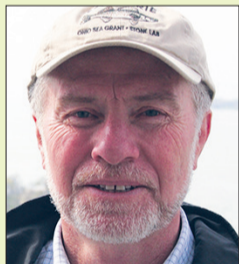
"Lake Erie is such a critical resource," Mr. Reutter said. "But we sometimes find ourselves too close to it, so people tend to take the lake for granted."

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."



Jeff Reutter of OSU's Lake Erie Stone Lab.

AGRICULTURAL RUNOFF

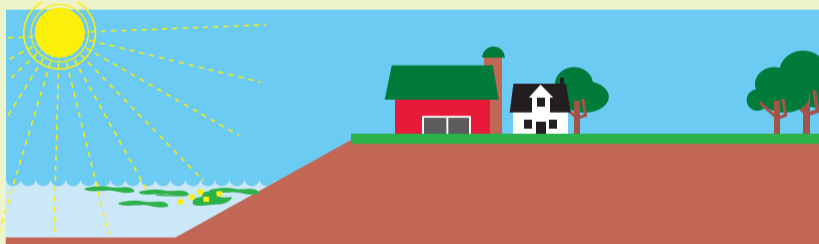
Phosphorus in the Maumee River from agricultural fertilizer and manure runoff is believed to be the leading cause of algae blooms in Lake Erie, but fertilizer used on lawns and golf courses, along with discharge from water and sewage treatment plants, also contributes to high levels of phosphorus in the lake. Excess phosphorus from agriculture can be limited by incorporating the fertilizer into the soil rather than spreading it on its surface. Farmers are encouraged to test the soil so the appropriate amount of phosphorus is applied. In addition to surface runoff, phosphorus enters the lake when it soaks through the soil and is drained through field tiles.



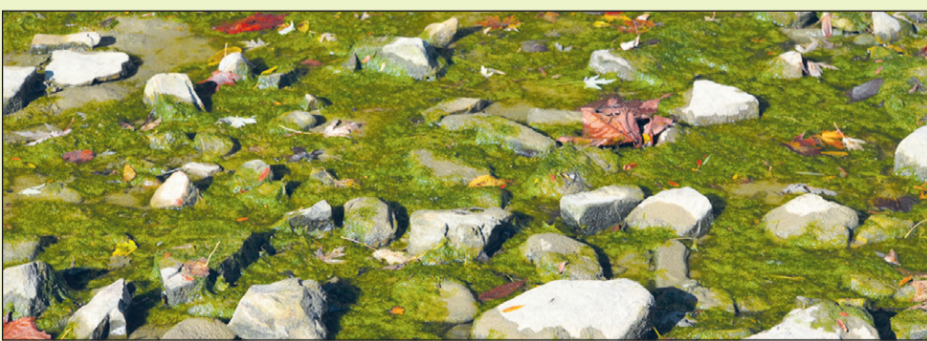
Farming practices often involve spreading fertilizers and manure containing phosphorus and nitrogen on frozen ground in winter or early spring.



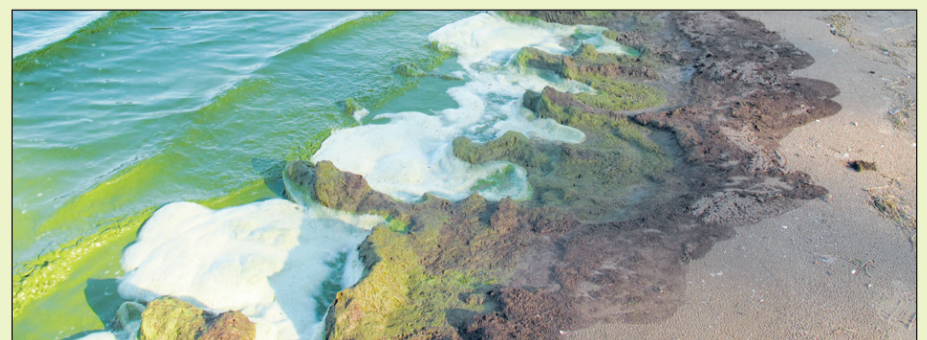
The frequency of heavy rains is increasing, and when a lot of rain falls in a short period of time, excess fertilizer is washed off the surface of the fields before it is absorbed into the ground. Rivers and streams carry the phosphorus-laden runoff to the lake, where it can feed algae blooms.



Ideal conditions in the lake that can produce an explosion of algae growth include warm water and high levels of phosphorus. The invasive zebra mussels present in Lake Erie compound the problem by eating beneficial algae that normally compete with the blue-green algae. Zebra mussels also release more phosphorus into the water as they digest their food.



Masses of blue-green algae collect on the rocks in the Maumee River.



Water laden with blue-green algae pushes against the Lake Erie shoreline at East Harbor State Park, fouling the beach and often prompting bans on swimming.



OHIO SEA GRANT

On the surface of the lake, blue-green algae often looks like floating paint. It can be toxic to fish, waterfowl, pets, and people. It produces a potent liver toxin when ingested or absorbed through the skin.



OHIO SEA GRANT/STONE LAB

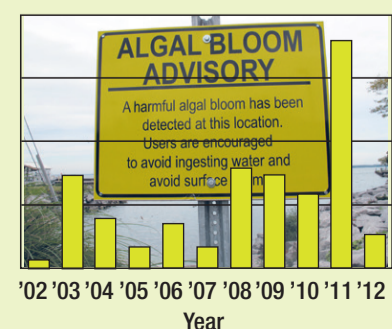
A Lake Erie water snake swims through a mass of blue-green algae produced by the 2011 bloom along the shore near Ohio State's Stone Lab research facility at Put-in-Bay.



STONE LAB

Blue-green algae collected at Ohio State's Lake Erie research lab.

Severity of blue-green algae blooms



SOURCE: JUSTIN CHAFFIN THE BLADE