Smaller summer harmful algal bloom forecast for western Lake Erie

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A Lake Erie algae bloom in September 2009. This photo was taken on the southeast shore of Pelee Island, Ontario. Credit: Tom Archer

University of Michigan researchers and their partners predict that western Lake Erie will experience a harmful algal bloom of cyanobacteria this summer that is smaller than in 2017 but larger than the mild bloom in 2016.

Scientists expect this year's bloom to measure 6 on the severity index but could range between 5 and 7.5. The severity index is based on a bloom's biomass—the amount of its harmful algae—over a sustained period. The largest blooms, in 2011 and 2015, were 10 and 10.5, respectively. Last year's bloom had a severity of 8.

The annual Lake Erie harmful algal bloom forecast was released today by the National Oceanic and Atmospheric Administration, which funds the research. Officials said that while continued efforts are needed to reduce the size of future harmful algal blooms, Lake Erie residents and visitors will still be able to safely enjoy much of the lake this summer.

The main driver of Lake Erie's harmful algal blooms is elevated phosphorus from watersheds draining to the lake's western basin, particularly from the heavily agricultural Maumee River watershed. An estimated 85 percent of the phosphorus entering Lake Erie from the Maumee River comes from agricultural sources.

"Until the phosphorus inputs from agriculture are reduced significantly and consistently so only the mildest blooms occur, the people, ecosystem and economy of this region are being threatened," said U-M aquatic ecologist Don Scavia, a member of the forecast team.

Scavia is professor emeritus of environment and sustainability and a member of NOAA-funded research teams that produce annual forecasts for the Gulf of Mexico, Chesapeake Bay and Lake Erie. Scavia's Lake Erie forecast team includes Dan Obenour of North Carolina State University and U-M's Isabella Bertani and Nathan Manning.

The size of a harmful algal bloom, or HAB, is not necessarily an indication of its toxicity. The toxins in a large bloom may not be as concentrated as in a smaller bloom.

"NOAA continues to develop tools that provide early warning systems for harmful algal blooms, which help visitors and the community make better informed decisions about recreation activities," said W. Russell Callender, assistant NOAA administrator for the National Ocean Service. "The resources and services the lake provides drive our economy, and we'll keep working with our partners to bring the most

accurate forecasts for the region."

The Lake Erie forecast is part of a NOAA ecological forecasting initiative that aims to deliver accurate, relevant, timely and reliable ecological forecasts directly to coastal resource managers and the public. In addition to the seasonal forecast, NOAA also issues HAB bulletins twice a week during the bloom season, which provide a three- to five-day forecast.

This year, NOAA will increase use of the Sentinel-3a satellite data, which first became available last year. The satellite measures coastal water color, which shows the location of HABs, as part of the European Union's Copernicus program, which just launched the sister satellite, Sentinel-3b, that will start providing imagery by next summer.

The Sentinel-3 series can see features 10 times smaller than has been seen in the HABs forecasts for the last several years. Sentinel-3 provides more detail to improve the forecasts used by the water treatment plants and public safety managers.

In recent years, visible blooms have not appeared until late July or early August. Microcystis, the cyanobacteria that form the bloom, will typically start growing when water temperatures reach 65-70 degrees, usually in mid-June. This year, the western basin warmed almost two weeks earlier than usual, reaching 70 degrees the last week of May, leading to the appearance of a small bloom.

"This early start does not change the forecast severity, because the bloom is determined by the amount of phosphorus that goes into the water," said NOAA oceanographer Richard Stumpf. "Close attention to the weekly bulletins will be important through July and August to find the best places to enjoy the lake."

"Research efforts across the state have helped our communities prepare for blooms of this size, from developing new technologies to keep toxins out of our drinking water to assessing the human health impacts of harmful algal bloom toxins," said Christopher Winslow, director of the Ohio Sea Grant College Program.

More information: U-M Lake Erie HAB forecast: scavia.seas.umich.edu/hypoxia-forecasts/

Provided by University of Michigan