

Lake Erie Harmful Algal Bloom Early Season Projection

NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE AND THE NATIONAL CENTER FOR WATER QUALITY RESEARCH

8 June 2015, Projection 04

The severity of the western Lake Erie cyanobacterial harmful algal bloom (HAB) is dependent on phosphorus inputs from March 1st through July 31st, henceforth called the loading season. This new product projects the bloom severity based on the combination of current measurements of discharge and phosphorus loading from the Maume River for the season to date with historical records from past years to estimate the remainder of the loading season.



Based on data from March 1 to this week, the extensive severe blooms observed in 2011 and 2013 are not projected to occur this year. So far, this spring has been relatively dry, resulting in less discharge and lower phosphorus loads into the western basin. Heavy rains on May 31 have caused a slight increase in the projection over last week. The range of uncertainty continues to decrease.

The uncertainty will decrease over time as the loading season progresses.

This experimental product involves the Maume River phosphorus load data from Heidelberg University's [National Center for Water Quality Research](http://www.heidelberg.edu/national-center-for-water-quality-research) and the western Lake Erie bloom severity models by NOAA's [National Center for Coastal Ocean Science](http://www.coastalscience.noaa.gov).

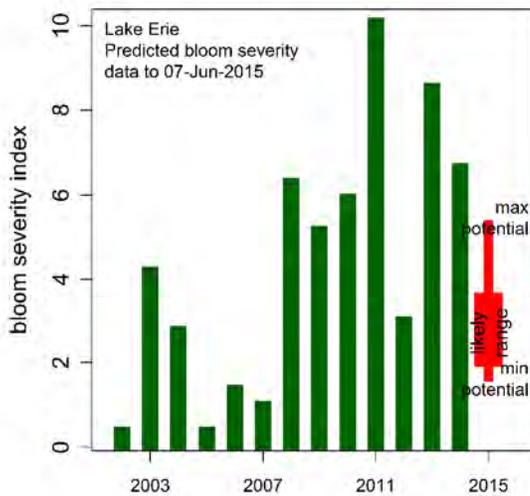


Figure 1. Projected bloom compared to previous years. The wide bar is the likely range of severity based on data from the last 15 years. The narrow bar is the potential range of severity, indicating that a bloom of severity of 6 remains possible (as occurred in 2008-2010). While a non-bloom year is unlikely, the projection still remains below the severe blooms of the last few years.

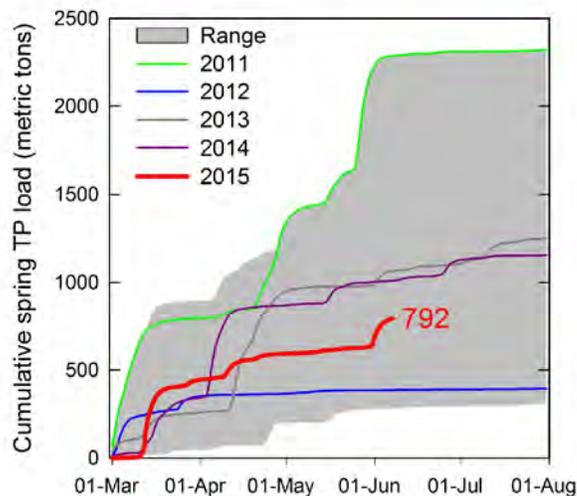


Figure 2. Cumulative total phosphorus projected to June 7, compared to the range from 2000-2014 (gray and the most recent past years). The red line and text denotes data through June 2. Projection is based on past date and discharge through June 7. Nutrient loads are below those of 2013 and 2014.

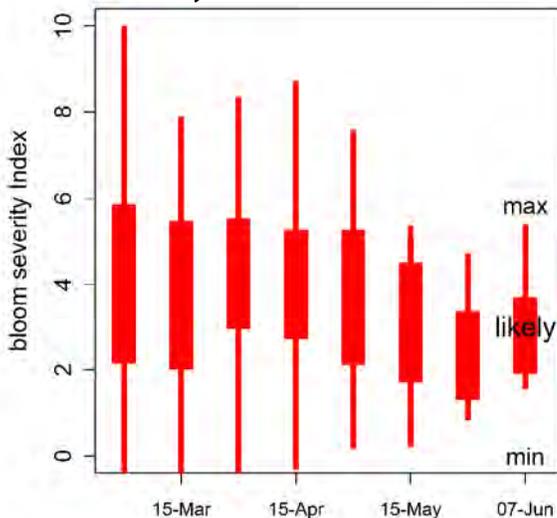


Figure 3: Loading season projections for 2015 starting March 1st, where a bloom severity of 10 indicates the record-breaking bloom of 2011. The event caused by intense rainfall on May 31 caused a slight increase in the projected bloom. Large flow events in the next month could cause an additional increase in the projection.



Figure 4: MODIS Terra true color image from June 4, 2015. Sediment is still stirred up in the lake from the high (30 knot) winds on May 31, and moderately high winds (10-15 knots) of the previous few days. The darker brown plume of water from the Maume River is visible in the far southwest corner of the lake. Additional processing has shown that the Sandusky Bay has a bloom of the cyanobacteria, Planktothrix, confirmed by Bowling Green State University. This bloom occurs each year in the bay, and does not indicate any unusual conditions. Otherwise, there are no blooms in Lake Erie.