

Lake Erie Harmful Algal Bloom Early Season Projection

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

3 June 2015, Projection 03



The severity of the western Lake Erie cyanobacterial harmful algal bloom (HAB) is dependent on phosphorus inputs from March 1st through July 31st, henceforth the loading season. This new product projects the bloom severity based on the combination of current measurements of phosphorus loading from the Maumee 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 relatively small adjustments in the projection based on the NOAA River Forecast Center projection through June 6. The range of uncertainty continues to decrease.

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

This experimental product involves the Maumee River phosphorus load data from Heidelberg University's [National Center for Water Quality Research](http://www.heidelberg.edu/academiclife/distinctive/ncwqr) and the western Lake Erie bloom severity models by NOAA's [National Center for Coastal Ocean Science](http://coastalscience.noaa.gov/research/habs/forecasting/).

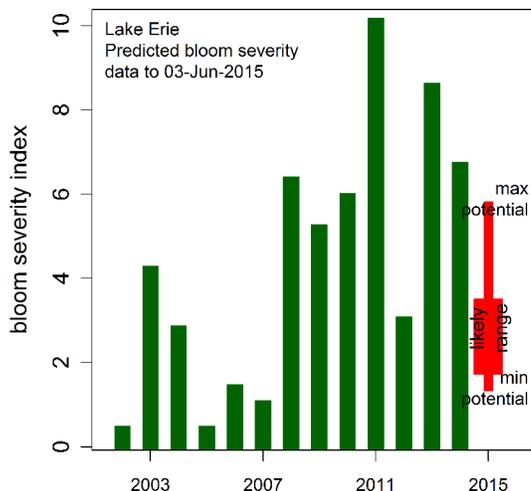


Figure 1. Projected bloom compared to previous years. The wide bar is the likely range of severity based on data from the last 15 years. The narrow bar is the potential range of severity, indicating that a bloom of severity of 6 remains possible (as occurred in 2008-2010).

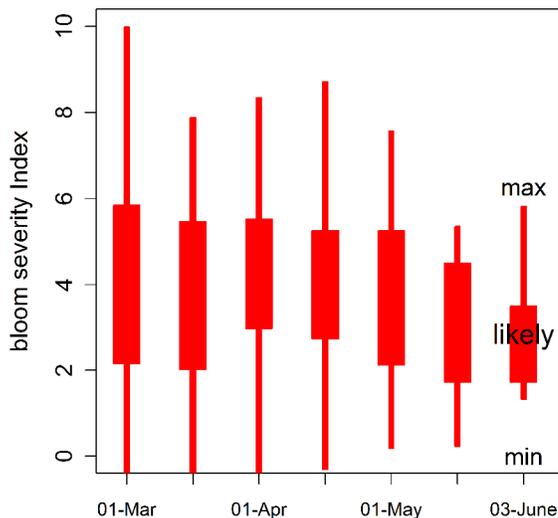


Figure 3: Loading season projections for 2015 starting March 1st, where a bloom severity of 10 indicates the record-breaking bloom of 2011. There have been fewer large runoff events in 2015 thus far compared to past years resulting in a decrease in the maximum potential bloom severity. The downward trend reflects relatively low load from the Maumee River so far.

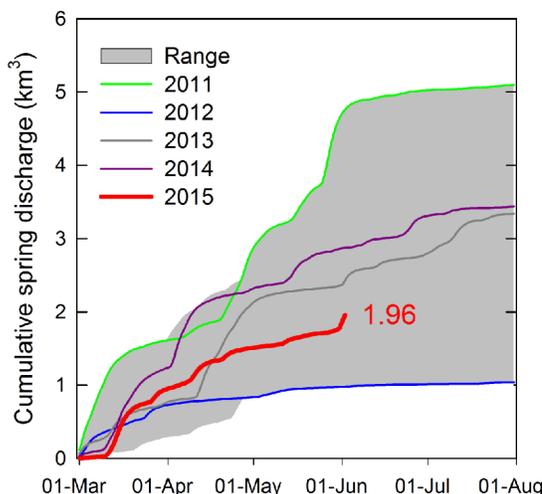


Figure 2. Cumulative discharge starting March, compared to the range from 2000-2014 (gray and the most recent past years). The red line and text denotes data through June 2. Because of the storm on May 31, we are using discharge to show the magnitude of the event. The phosphorus load typically follows discharge, and the nutrient loads also remain below those of 2014 at this time. The phosphorus load for this event will be reported next week.



Figure 4: MODIS Aqua true color image from June 2, 2015. Most of the sediment in the lake was resuspended by 30 knot winds during the storm on May 31. The heavy rainfall in the Maumee River basin resulted in high flow, peaking on June 2. A plume of water from the Maumee River has just entered the far southwest corner of the lake, and will expand somewhat over the next few days. Sandusky Bay now has a bloom of the cyanobacteria, Planktothrix, confirmed by Bowling Green State University. Planktothrix appears in the Bay each year about this time and does not indicate any unusual conditions in the Lake. Otherwise, there are no blooms in Lake Erie.