

Lake Erie Harmful Algal Bloom Early Season Projection

NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE AND THE NATIONAL CENTER FOR WATER QUALITY RESEARCH
23 June 2015, Projection 06



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 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, a significant spike in the cumulative total phosphorus load was estimated over the last week. While an extensive severe bloom similar to 2011 is not projected to occur this year, our current estimates indicate that it may fall just below 2013 levels. Stone Laboratory of Ohio State University and GLERL have detected low levels of *Microcystis* cells and toxins in the western basin, which is typical this time of year.

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](#) and the western Lake Erie bloom severity models by NOAA's [National Center for Coastal Ocean Science](#).

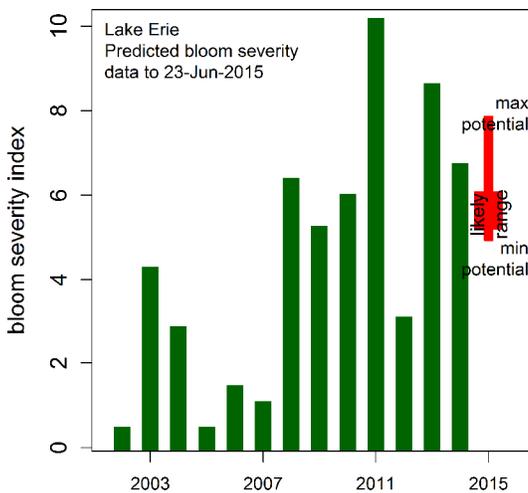


Figure 1. Projected bloom compared to previous years. The wide bar is the likely range of severity based on data from the last 15 years. The narrow bar is the potential range of severity, indicating that a bloom of severity of 6 is likely (as occurred in 2008 and 2010).

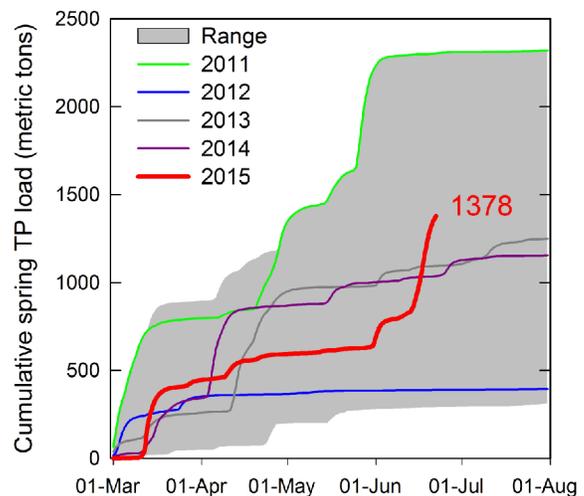


Figure 2. Cumulative total phosphorus projected to June 22, compared to the range from 2000-2014 (gray and the most recent past years). The red line and text denotes data through June 22. Projection is based on past date and discharge through June 22. Nutrient loads have surpassed those of 2013 and 2014, but remain below 2011.

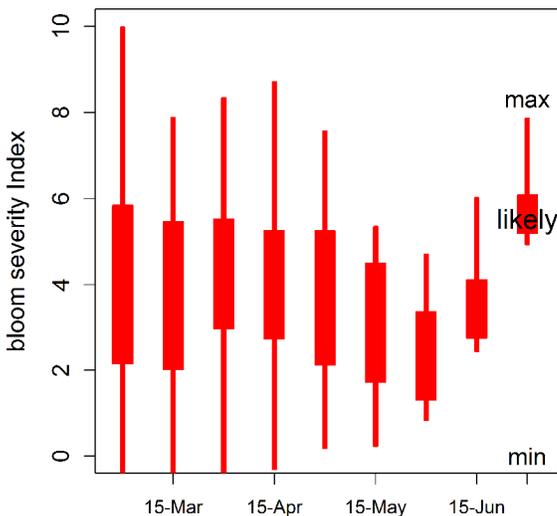


Figure 3: Loading season projections for 2015 starting March 1st, where a bloom severity of 10 indicates the record-breaking bloom of 2011. Recent rainfall has significantly increased the phosphorus load over the last week, indicating an increase in the bloom severity index compared to previous projections.



Figure 4: MODIS Terra true color image from June 22, 2015. Clear imagery has been unavailable for the past week. A very dense bloom of *Planktothrix* continues in Sandusky Bay of the cyanobacteria (confirmed by Stone Laboratory of Ohio State). This bloom occurs each year in the Bay, and does not indicate any unusual conditions.