Experimental Lake Erie Harmful Algal Bloom Bulletin

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Our initial analysis indicates that the 2015 bloom in western Lake Erie was the most severe this century (Figure 1). The severity index, which captures the amount of biomass in the bloom, is 10.5 for 2015, as compared to 10 for the 2011 bloom. Fortunately, the bloom moved into the center of the central basin, rather than along the shore (as happened in 2011), resulting in less impact along both central basin coasts. The seasonal forecast made at the beginning of July was for the 2nd worst bloom since we began measurements in 2002, with a severity index of 8.7.

This bloom was unusual in that it started early, in mid-July, achieving maximum biomass in mid-August. Over a 40-day period from late July to the end of August, the biomass detected from satellite exceeded that of any other time period we have monitored, except for the first week of October, 2011. On August 5th, dense scum covered up to 300 square miles of the western basin (Figure 2); this occurred again on August 15th. The 2015 bloom did expand to cover a large area of the central basin (Figure 3). In September, two major cold fronts brought strong winds that disrupted bloom growth and weaken the bloom, causing it to decline much faster than previous major blooms.

While we correctly forecasted an extremely large bloom, the forecast was still an underestimate. Our preferred models consider primarily the nutrient loads through the end of June. The newest models indicate that load in July may be important to the bloom. This appears to be the case in 2015. Heavy rains in June (7" at Toledo), not only caused record discharge for the Maumee River for June, but led to continued high discharge in July. Including the high July loads with the new models would have led to a revised forecast of a bloom at least as large as what was experienced in 2011. We will update future forecasts with the new models and July discharge data.

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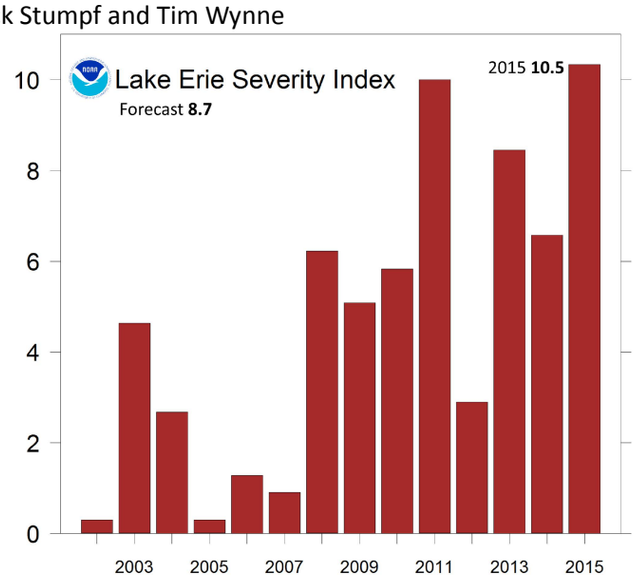

Figure 1. Bloom severity index for 2002-2015. 2011 is 10, 2015 is 10.5. The index is based on the amount of biomass over the peak 30-days.

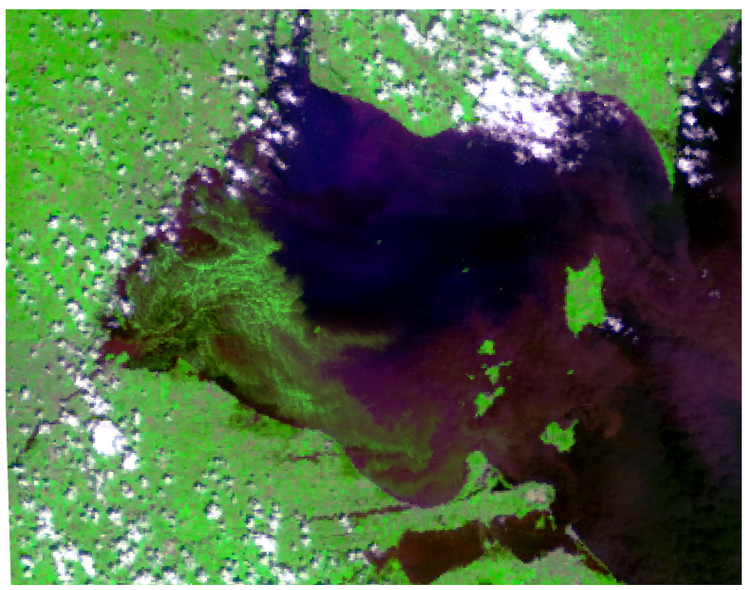

Figure 2. Scum product, with image showing only scum in the lake (bright green) on 5 August 2015. This area of dense scum covered about 300 square miles of the lake on this day from Monroe to Toledo almost to the Islands. Bright green on land shows dense vegetation. Raw data was obtained from NASA's MODIS-Terra sensor.

Figure 3. The maximum extent of the bloom on 6 September 2015 shown as a true color image. The bloom was less concentrated at this time than in August. Raw data was obtained from NASA's MODIS-Terra sensor.

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