# Western Lake Erie Harmful Algal Bloom Early Season Projection

**23 May 2019, Projection 03**

The severity of the western Lake Erie cyanobacterial harmful algal bloom (HAB) is dependent on input of bioavailable phosphorus from the Maumee River during the loading season (March 1-July 31). This product gives an estimate of potential bloom severity based on a combination of measurements to date and forecasts of phosphorus loads into July. The projection will be updated weekly with new data and weather models through the end of June. The final seasonal forecast will be made on July 11 using the measured phosphorus loads for the spring.

We project that the bloom will have a severity greater than 6 (noticeably greater than 2018). This change results from exceptionally heavy rains within the Maumee River basin. While precipitation is forecast to be near normal going into summer, uncertainty in forecasting local heavy rainfall events remains a significant challenge. The maximum severity includes the possible occurrence of heavy rain over the next several weeks. As we continue to add data, this uncertainty will continue to decrease. Any bloom that develops will change with time and move with the wind. Severity forecasts do not indicate toxicity.

Total bioavailable phosphorus (TBP) is the sum of dissolved phosphorus and the portion of particulate phosphorus available for HAB development. The TBP loads are projected based on Heidelberg University data, river forecasts from the National Weather Service Ohio River Forecast Center (through early July), and previous years to the end of July.

Stumpf, Noel (NOAA), Johnson (Heidelberg University) with assistance from Davenport and Tomlinson (NOAA)

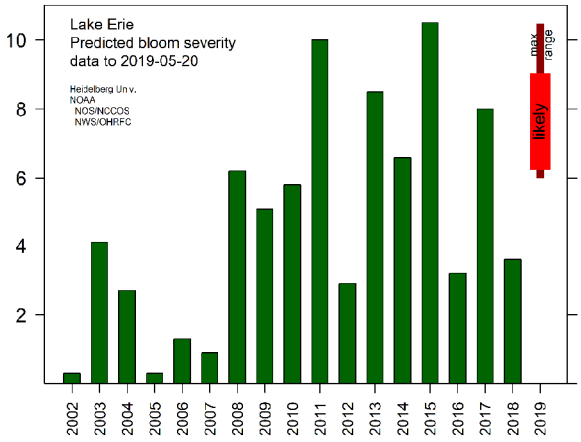


Figure 1. Projected bloom compared to previous years. The wide bar is the likely range of severity based on data from the last 15 years. The narrow bar is the potential range of severity. Because the forecast uses modeled discharge for two months, there is uncertainty in maximum bloom severity.

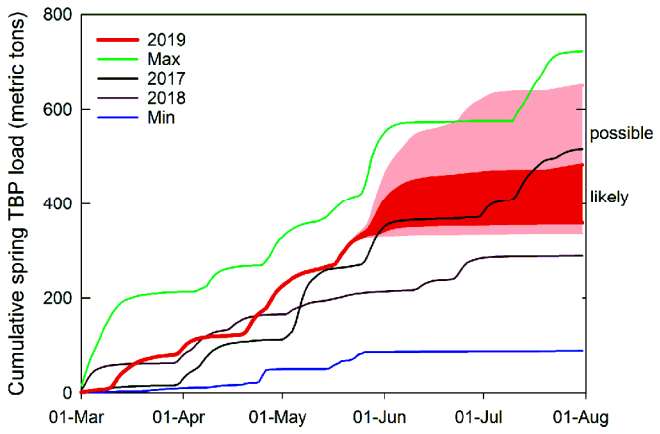


Figure 2. Cumulative total bioavailable phosphorus (TBP) loads for the Maumee River (based on Waterville). Each line denotes a different year. 2019 is in red, the solid line is the measured load to May 21st, the red area shows the likely range for the remainder of the loading season, and the light red shows the possible range.

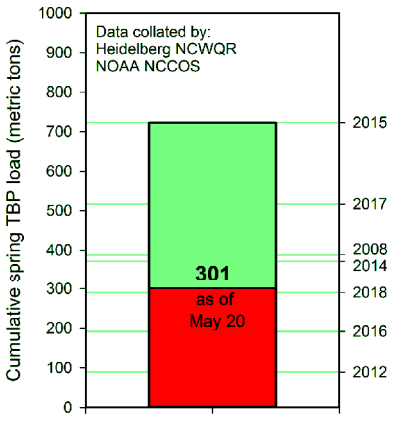


Figure 3. Total bioavailable phosphorus (TBP) load accumulated from the Maumee River near Waterville to date. The right axis denotes the TBP load from selected previous years. Loads through May 21 fall between those for 2018 and 2014.

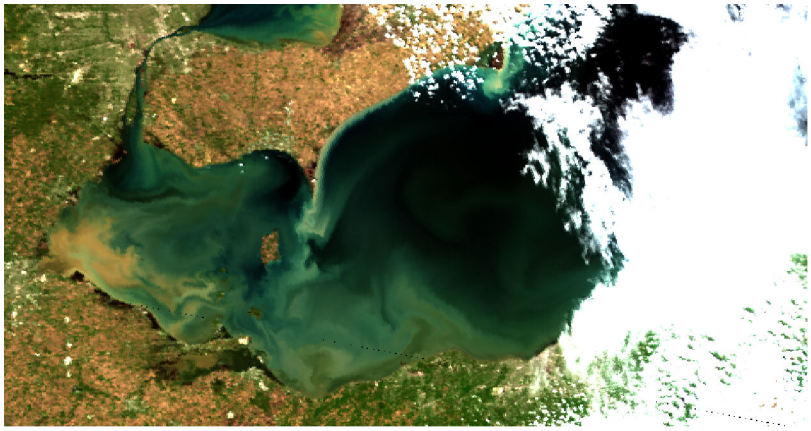

Figure 4. True color image on 18 May 2019 taken by the MODIS on the NASA Aqua satellite. Sediment from the Maumee River (and other rivers) causes the tan color in the western basin. Sediment resuspended from near the shore produces gray colors in the central basin.

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