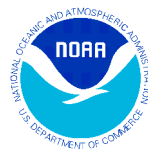


# Western Lake Erie Harmful Algal Bloom Early Season Projection

11 May 2021, Projection 01



The severity of the western Lake Erie cyanobacterial harmful algal bloom (HAB) depends on input of bioavailable phosphorus from the Maume River during the loading season (March 1-July 31). This product gives an estimate of potential bloom severity based on a combination of measurements and forecasts of river discharge and phosphorus loads from now into July. These projections will be updated with new data and weather models each week until the NOAA seasonal Lake Erie HAB Forecast is issued on June 30th, using measured spring phosphorus loads, and a more complete set of bloom models.



With data through May 9, the bloom is likely to be smaller than average, and it is expected to have a severity <6. We do not expect a large bloom (like 2017 or 2019). Discharge of water from the Maume River was below average in March and April, due to lower than average rainfall, which led to low phosphorus loads in early spring. Weather systems in May are bringing rain to the region, which will lead to a wetter than normal month that will bump up the phosphorus load. There is uncertainty in the weather models on exact amounts, placement and intensity of rainfall in May which leads to uncertainty in the discharge, and the HAB forecast. In June, we expect a return to normal rainfall with less uncertainty.

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, J. Noel (NOAA), Johnson (Heidelberg University), with assistance from Davenport and Tomlinson (NOAA), and D. Noel (Dayton Regional STEM School).

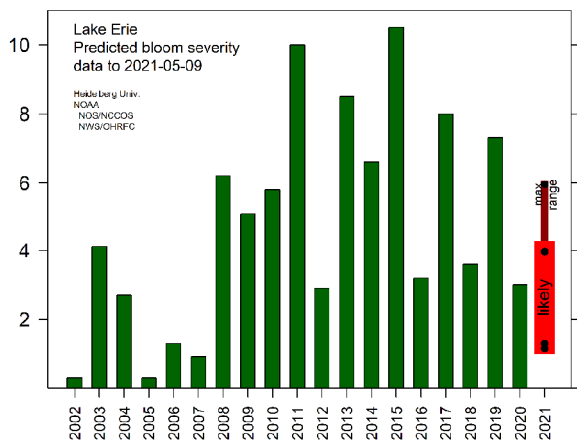


Figure 1. Projected bloom severity compared to previous years. The wide bar is the likely range of severity based on limits of model uncertainty. The narrow bar is the potential range of severity. Because the forecast uses modeled discharge for a month, there is uncertainty in maximum bloom severity.

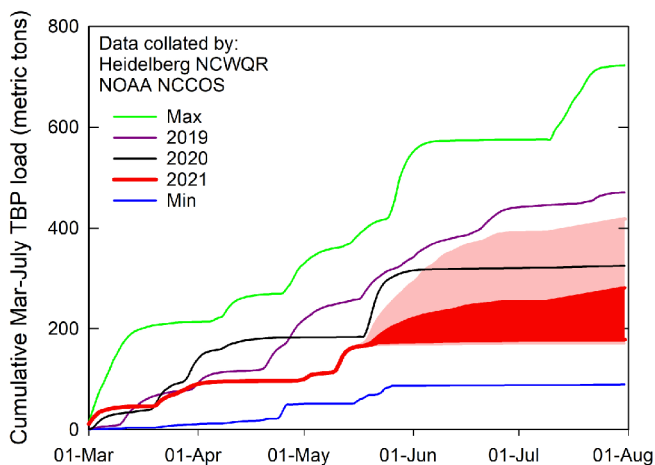


Figure 2. Cumulative total bioavailable phosphorus (TBP) loads for the Maume River (based on Waterville). Each line denotes a different year. 2021 is in red, the solid line is the measured load to May 9, the red area shows the likely range for the remainder of the loading season, and the light red shows the possible range.

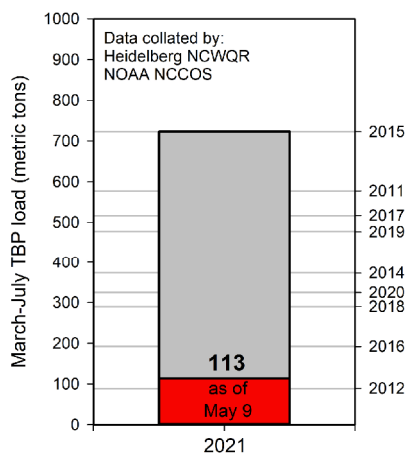


Figure 3. Total bioavailable phosphorus (TBP) load accumulated from the Maume River near Waterville to date. The right axis denotes the TBP load from selected previous years. Loads to date are currently below the total for 2016.

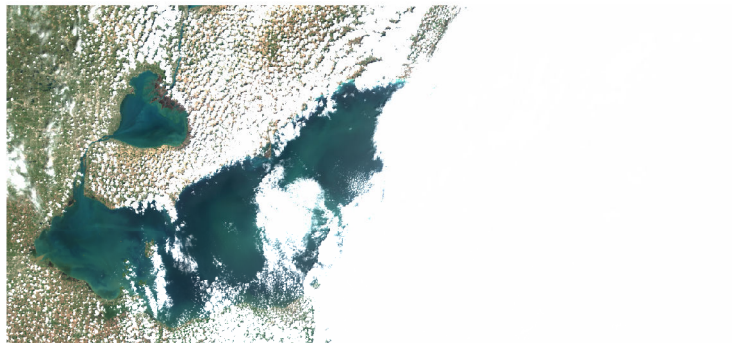


Figure 4. True color image on 7 May 2021, derived from the Copernicus Sentinel-3a satellite on the last clear day before two days of clouds and heavy rain. This image captures the lake after weeks of relatively dry weather.