

Western Lake Erie Harmful Algal Bloom Early Season Projection

2 June 2021, Projection 04



The severity of the western Lake Erie cyanobacterial harmful algal bloom (HAB) depends 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 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 31, the bloom is likely to be smaller than average, with severity expected to be < 5, no change from last week. Discharge of water from the Maumee River was below average in March and April, due to lower than average rainfall, which led to low phosphorus loads in early spring. While weather systems in early June are bringing rain to the region, there is still uncertainty in the weather models on exact amounts, placement and intensity of rainfall which leads to uncertainty in the discharge and the phosphorous load. Later in June, we expect a return to normal rainfall with less uncertainty in the discharge.

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.

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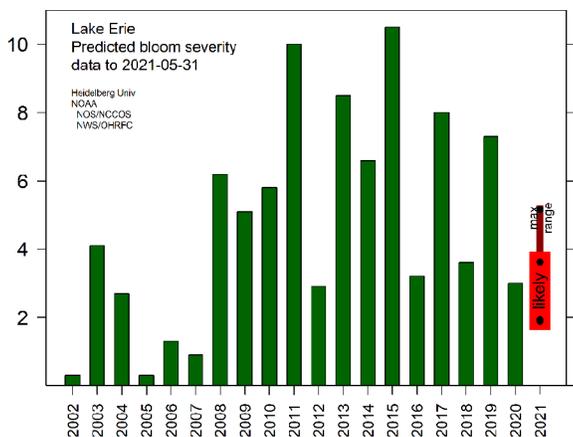


Figure 1. Projected bloom compared to previous years. The wide bar is the likely range of severity based on limits of uncertainty in the discharge model. The narrow bar is the potential range of severity. Because the forecast uses modeled discharge for a month, there is uncertainty in maximum bloom severity.

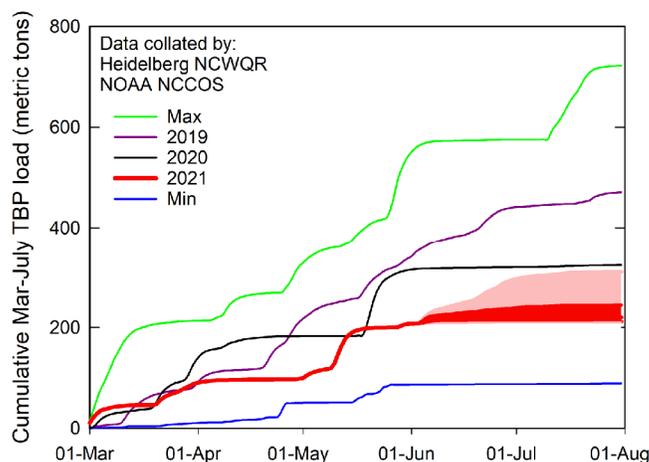


Figure 2. Cumulative total bioavailable phosphorus (TBP) loads for the Maumee River (based on Waterville). Each line denotes a different year. 2021 is in red, the solid line is the measured load to May 31, the red area shows the likely range for the remainder of the loading season, and the light red shows the possible range.

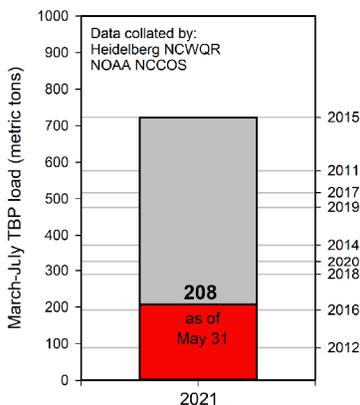


Figure 3. Total bioavailable phosphorus (TBP) load accumulated from the Maumee River near Waterville to date. The right axis denotes the TBP load from selected previous years. Loads to date are currently below the total for 2016.



Figure 4. True color image on 30 May 2021, derived from the Copernicus Sentinel-3b satellite. Sediment throughout the western and central basins and the Ontario coast are mostly caused by resuspension of bottom sediments by 30+ mph winds during the weekend.