

# Western Lake Erie HAB Seasonal Assessment

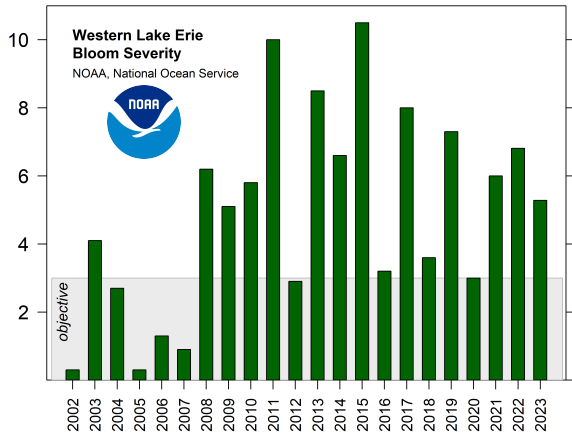
2023-11-02

## Summary:

The 2023 western Lake Erie cyanobacterial bloom had a severity index (SI) of 5.3, which is moderately severe. The SI captures the amount of biomass over the peak 30-days of the bloom and is calculated using satellite imagery to assess bloom biomass and spatial extent. The *Microcystis* bloom started at the beginning of July and was fully developed by mid-July, with a peak in mid-August and persisted to early-September. The bloom stayed closer to the U.S. coast this year, primarily from Monroe, MI to Port Clinton, OH. Unlike 2022, cooler temperatures and elevated winds in early-September reduced cyanobacterial biomass, although some bloom continued until mid-October.

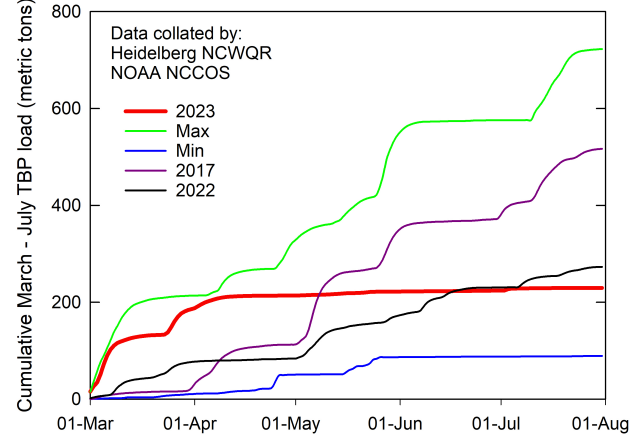
The 2023 bloom (SI of 5.3; 312 square miles) was less intense than in 2022 (SI of 6.8; 416 square miles). The 2023 SI was slightly above the seasonal forecast (2-4.5; issued Jun. 29), but within the range of the updated forecast (4.5-5.5; issued Jul. 27). The seasonal forecast used an ensemble of different models, each of which include phosphorus loading into the lake during the spring and early summer (Mar.-Jul.). Since 2002, the 2023 bloom was the second earliest bloom start (Jul. 4, 2023), following 2018. The early bloom start likely allowed the cyanobacterial bloom to approach the higher end of the updated forecasted bloom severity (5.5). Like 2022, the 2023 bloom lasted for several weeks (~5 weeks) at or near its highest bloom intensity.

## Bloom Severity



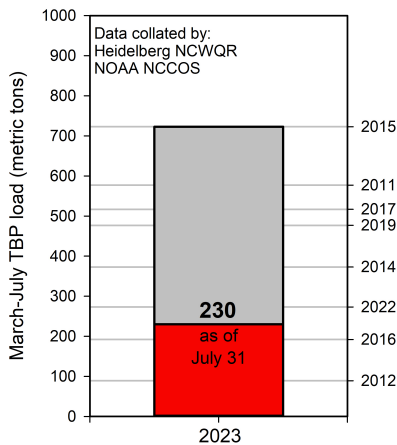
**Fig. 1.** Bloom severity index (SI) for 2002-2023. The SI is based on the amount of biomass over the peak 30-days. The 2023 bloom had a severity of 5.3. A severity below 3 is the goal of the Great Lakes Water Quality Agreement (GLWQA).

## Cumulative Total Bioavailable Phosphorus



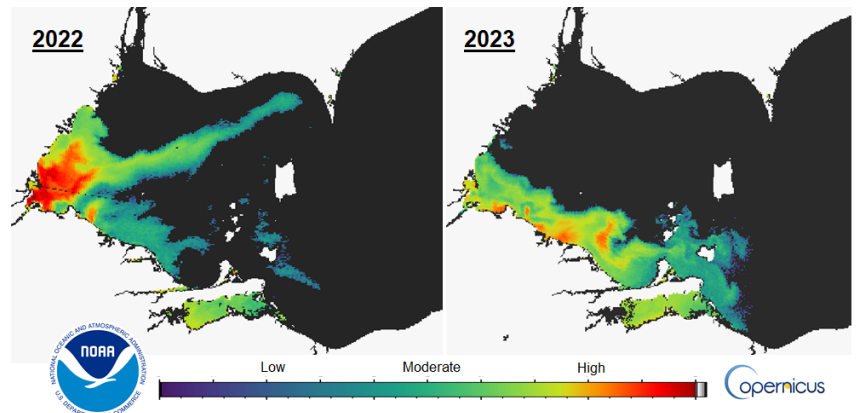
**Fig. 2.** Cumulative TBP loads for the Maumee River (Waterville, OH). Each line denotes a different year. 2023 is in red. TBP loads in 2023 were just below those observed in 2022.

## Total Bioavailable Phosphorus



**Fig. 3.** Total bioavailable phosphorus (TBP) load accumulated from the Maumee River near Waterville, OH from March-July 2023. The right axis denotes the TBP load from selected previous years.

## Comparative Bloom Severity



**Fig. 4.** The maximum bloom severity in 2022 (Aug. 10-19) and 2023 (Aug. 10-19). Bluish-green to dark blue indicates low cyanobacterial concentrations. Sandusky Bay has a different type of cyanobacteria that typically does not form scum.

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