



# Experimental Lake Erie Harmful Algal Bloom Bulletin

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**2017 Bloom Analysis.** The *Microcystis* cyanobacteria bloom in 2017 had a severity index (SI) of 8, which is a severe bloom. This is roughly equivalent to 2013 (SI = 8.5) which was the third worst bloom observed this century, after 2011 (SI = 10) and 2015 (SI = 10.5). The severity index captures the amount of bloom biomass over 30 days. While the severity in 2017 was slightly less than that for 2013 using this metric, because of variability through the season, the peak bloom size in mid-September, 2017 was greater than the peak in 2013. The severity was consistent with the forecast of 7 and within the range from the ensemble of models of a likely severity between 6.6 and 8.

During the week following September 20th, the bloom covered a maximum area of 1000 square miles from Toledo to the Ontario coast, reaching the mouth of the Detroit River. During that week, scum covered up to 280 square miles of the western basin. For comparison, the 2015 bloom covered over 4000 square miles of the lake at its maximum extent, yet had similar scum coverage at any one time to 2017. In the western Lake Erie basin, the bloom biomass was less toxic than several of the recent bloom years.

Like 2016, this bloom had a “double peak”, one in August followed by a decrease in biomass, then a strong reappearance in mid-September. The densest bloom in August was mostly in the center of the western basin, while the bloom impacted more shorelines in September. Isolated pockets of the *Microcystis* bloom persisted into late October along the Michigan shoreline.

The forecast models are based primarily on the load of bioavailable phosphorus from the Maumee River. Heavy rains in May and late June resulted in high discharge from the Maumee River. The high concentration of phosphorus in the river, combined with the high discharge produced conditions favorable for the bloom.

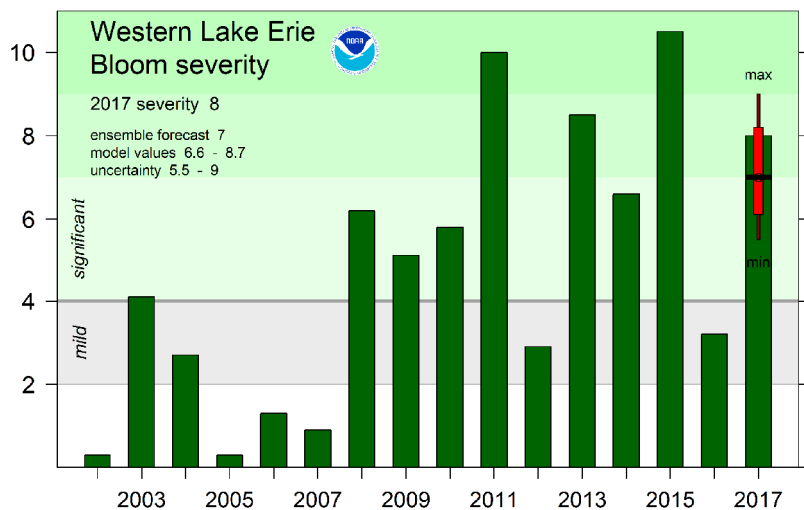


Figure 1. Bloom severity index for 2002-2017, and the forecast for 2017. The index is based on the amount of biomass over the peak 30-days. The 2017 bloom had a severity of 8, comparable to 2013 (8.5). 2011 had a severity of 10.

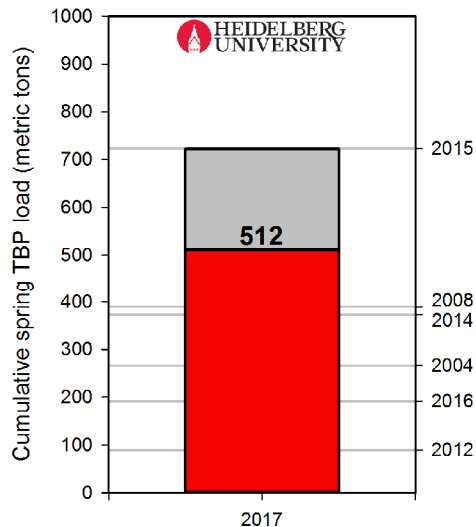


Figure 2. Total bioavailable phosphorus from the Maumee River for 2017 compared to some other years. Data collected by Heidelberg University, National Center for Water Quality Research.



Figure 3. The *Microcystis* cyanobacteria bloom in western Lake Erie on 23 September 2017 taken with data derived from Copernicus Sentinel-3 provided by EUMETSAT. The brightest green areas had scum, especially during the afternoon during this time. Gray-blue water has sediment with little algae. Sandusky Bay has a bloom of *Pantothrix*, another cyanobacteria. The central basin has other algae slightly changing the water color.