





### Annual P Loads to Lake Erie

- Point source loading has decreased substantially due to regulation
- Non-point source pollution prevents attainment of recommended load levels

Figure 3-5. Annual loading of total phosphorus to Lake Erie by major sources. (Data provided by Dr. David Dolan of the University of Wisconsin Green Bay (May 2013). Graph prepared by Heidelberg NCWQR staff.)

Source: Ohio Lake Erie Phosphorus Task Force II Final Report, Nov 2013

Zoom participants: Joe Yurko, Joseph Ortiz, joe spagnuolo

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 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. 2020 is in red, the solid line is the measured load to June 7, the red area shows the likely range for the remainder of the loading season, and the light red area shows the possible range.

Zoom participants: Diane Konyk, Joanné M Belovich, Will Hemker, Mike Galgoczy



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 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.

Year	Projected Bloom Severity
2002	1.0
2003	2.0
2004	3.0
2005	1.0
2006	1.0
2007	1.0
2008	1.0
2009	1.0
2010	1.0
2011	1.0
2012	1.0
2013	1.0
2014	1.0
2015	1.0
2016	1.0
2017	1.0
2018	1.0
2019	1.0
2020	1.0

**Figure 2. Cumulative total bioavailable phosphorus (TBP) loads for the Maume River (based on Waterville).** Each line denotes a different year. 2020 is in red, the solid line is the measured load to June 7, the red area shows the likely range for the remainder of the loading season, and the light red area shows the possible range.

Date	2019 (Max)	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
01-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-Apr	100	50	30	20	15	10	8	6	5	4	3	2	1	1	1	1	1	1
01-May	200	100	60	40	30	20	15	10	8	6	5	4	3	2	2	2	2	2
01-Jun	350	180	100	60	40	30	20	15	10	8	6	5	4	3	3	3	3	3
01-Jul	500	250	130	70	45	35	25	18	12	10	8	6	5	4	4	4	4	4
01-Aug	600	300	150	80	50	40	30	20	15	12	10	8	6	5	5	5	5	5

### Western Lake Erie Harmful Algal Bloom Early Season Projection

09 June 2020, Projection 05

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 weekly with new data and weather models through the end of June. A NOAA seasonal Lake Erie HAB Forecast will be issued on July 9th, using measured spring phosphorus loads.

The projection has not changed from last week. We continue to project that the bloom will be smaller than last year (severity of 7.5), with a likely severity between 3 and 5, and a potential severity of up to 6. We expect few substantial rainfall events over the next few weeks, although magnitude cannot be forecasted exactly. Slight changes in the projected range of bloom severity have resulted from better consideration of uncertainty in the bloom models. Any bloom that develops will change with time and move with the wind; we will provide information on the presence and location of the bloom throughout the summer.

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.**

Year	Projected Bloom Severity
2002	1.0
2003	2.0
2004	3.0
2005	1.0
2006	1.0
2007	1.0
2008	1.0
2009	1.0
2010	1.0
2011	1.0
2012	1.0
2013	1.0
2014	1.0
2015	1.0
2016	1.0
2017	1.0
2018	1.0
2019	1.0
2020	1.0

**Figure 2. Cumulative total bioavailable phosphorus (TBP) loads for the Maume River (based on Waterville).**

Date	2019 (Max)	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
01-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-Apr	100	50	30	20	15	10	8	6	5	4	3	2	1	1	1	1	1	1
01-May	200	100	60	40	30	20	15	10	8	6	5	4	3	2	2	2	2	2
01-Jun	350	180	100	60	40	30	20	15	10	8	6	5	4	3	3	3	3	3
01-Jul	500	250	130	70	45	35	25	18	12	10	8	6	5	4	4	4	4	4
01-Aug	600	300	150	80	50	40	30	20	15	12	10	8	6	5	5	5	5	5



**Lake Erie 9/26/18, Detroit Plume Transect Sampling**

Surface Towed Fluoroprobe

092618 DPT Total concentration (chl a : ug/l)

KENT STATE NASA

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Approx. sample locations

2019 HAB Grab-2019 KSWR KSWR Fluoroprobe raw (ug/L)

n = 5,982

WLE02, WLE04, WLE06, WLE12, DPT01, DPT03

Standardized units

Participants: Joe Yurko, Joseph Ortiz, joe spagnuolo



