2020 Forecast Western Lake Erie Cyanobacterial Harmful Algal Bloom

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With forecast results from
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And support by Ohio Sea Grant and OSU Stone Lab
Additional input by NOAA NWS Ohio River Forecast Center

Photo: R. Stumpf
2019 Recap

Accurate forecast
Really wet spring (TP and Q equal to 2011 & 2015.
TBP much lower. (bloom confirms TBP)
Intense in western basin.
Did not spread much.
Peak of each bloom 2002-2019

Lake Erie Peak Bloom Severity
From MERIS and OLCI (ESA) and MODIS (NASA)
Bulletins are now online: 
[https://tidesandcurrents.noaa.gov/hab/lakeerie.html](https://tidesandcurrents.noaa.gov/hab/lakeerie.html)

Online includes 3-D model of bloom.

Subscribe at: 
[https://public.govdelivery.com/accounts/USNOAANOS/subscriber/new](https://public.govdelivery.com/accounts/USNOAANOS/subscriber/new)

Weekly and real-time measurements 
[https://www.glerl.noaa.gov/res/HABs_and_Hypoxia/habsMonWLE.html](https://www.glerl.noaa.gov/res/HABs_and_Hypoxia/habsMonWLE.html)
Daily satellite imagery, low concentration bloom appeared July 5

Lake Erie daily satellite imagery of bloom: Go to: go.usa.gov/xfC8q
2020 Ensemble of models

- NOAA: NOAA_TBP, P2
  - NOAA-TBP is Empirical statistical-heuristic using discharge and bio-available P from March to early summer, P2 is mechanistic
- UMich/NCSU/GLERL-Bayes
  (Manning, Bertani, Obenour, Scavia)
  - empirical Bayesian model relating spring phosphorus loading to multiple estimates of HAB size and temporal component
- Carnegie/Stanford (Michalak, Ho, Zhou)
  - Linear statistical model based on April-July and decadal cumulative DRP

![Total bioavailable phosphorus (TBP)](image)

Data collated by:
- Heidelberg NCWQR
- NOAA NCCOS
2020 Western Lake Erie

Smaller than 2019

Greater than 2018 and GLWQA objective
Impact of phosphorus reduction

This year, a 30% reduction in TBP would lead to a forecast that meets GLWQA threshold.

A 40% reduction would lead to a negligible bloom in 2020.
Severity 4.5; 4 – 5.5 likely range.
between 2018 (3.6) and 2019 (7.3).
Much of the lake will be fine most of the time.

- The high lake level should not be a factor in bloom.
- Areas with high concentration have strong risk of scums during calm days.
- Check NOAA bulletin for bloom location!

- Keep kids, pets, and yourselves out of scums.
- As always: Bloom impact on western basin varies with wind.
  - Wind from south and west better for Ohio and Michigan.
  - Wind from north, better for Ontario.

Photo: Ohio Sea Grant
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