Maumee River nutrient loading
March 1 – July 31, 2018

Laura Johnson
12 July 2018

Photo credit: Ted Bowman, flickr
Heidelberg Tributary Loading Program

- We sample the Maumee River at Waterville, Ohio
- One of 23 stations
- Samples are collected 3x a day*, year-round and retrieved weekly for analysis in the laboratory
- Sampled since 1974 for all major nutrients and sediments
Total bioavailable P is the portion of P available to algae that doesn’t settle between Waterville and the lake

\[ \text{TBP} = \text{DRP} + 0.08 \times (\text{TP} - \text{DRP}) \]
Load
Mass/time
Metric tons/spring

= Concentration
Mass/H₂O volume
mg/L

Flow or Discharge
H₂O volume/time
ft³/s (CFS)
Flow at the Maumee River in Waterville
March 1 – July 5, 2018
Total bioavailable phosphorus at the Maumee River in Waterville
March 1 – July 5, 2018
Total bioavailable phosphorus
Maumee River in Waterville
March 1 – July 5, 2018;
projected to July 31 with data from the
NWS Ohio River Forecast Center
Total bioavailable phosphorus
Maumee River in Waterville
March 1 – July 5, 2018;
projected to July 31 with data from the
NWS Ohio River Forecast Center

Projected to 343 metric tons by July 31
March - July flow at the Maumee River in Waterville
1975 – 2017 Averaged over 5 year periods

Current
• 3.1 km$^3$

Projected
• 3.3 km$^3$
March - July Total P Maumee River in Waterville 1975 – 2017 Averaged over 5 year periods

- 1140 metric tons currently
- 1250 metric tons projected
- 860 metric tons target

- 0.37 mg/L currently
- 0.23 mg/L target
March - July Dissolved P Maumee River in Waterville 1975 – 2017 Averaged over 5 year periods

- 230 metric tons currently
- 270 metric tons projected
- 186 metric tons target

Does the slightly lower FWMC mean we’re making progress??

- 0.075 mg/L currently
- 0.050 mg/L target
Tracking change in loads and flow-weighted mean concentrations
Tracking change in loads and flow-weighted mean concentrations
Why haven’t we seen more progress?

*Practices are not effective??*

- NRCS and the Ohio DAP focus on nutrient management plans, cover crops, drainage water management, erosion control
- 4R Certification Program
- Nutrient applicator certification
- Ban on fertilizer and manure application on frozen or saturated ground
Why haven’t we seen more progress?  

*Not enough implementation?*

- NRCS has invested ~$277 million per year as of 2012, and the Western Lake Erie Basin Initiative promised an additional $77 million from 2016-2018.
- As of 2012, there were ~2.4 practices per acre and an investment of $57 per acre.
- WLEB Initiative goals are to cover ~18% in additional practices specifically aimed to reduce edge-of-field nutrient loss.

*Has there been enough time to tell?*
Look for up-to-date data on GLOS
http://data.glos.us/maumee/
Thanks!

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Precipitation from March – May 31, 2018

Accumulated Precipitation (in)
March 1, 2018 to May 31, 2018

Accumulated Precipitation: Percent of Mean
March 1, 2018 to May 31, 2018

Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Mean period is 1981–2010.
Nitrate-N (NO$_{2+3}$-N)
Maumee River in Waterville
March 1 – July 5, 2018
Total Phosphorus
Maumee River in Waterville
March 1 – July 5, 2018
Dissolved Reactive Phosphorus
Maumee River in Waterville
March 1 – July 5, 2018
Most P and N comes from nonpoint sources

Maumee River

OEPA report 2018
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