

Maumee River nutrient loading

March 1 – July 31, 2018

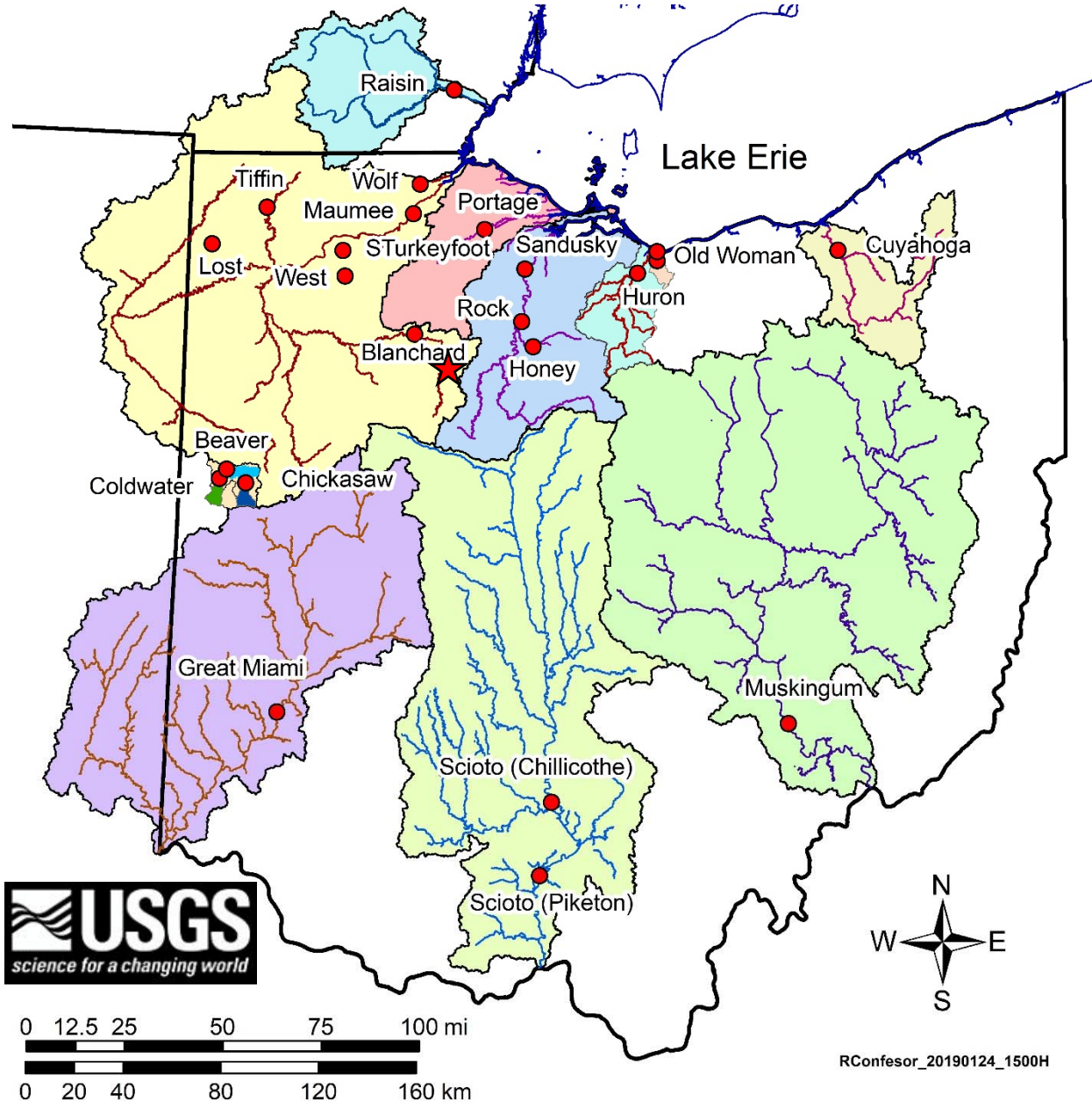
Laura Johnson

12 July 2018

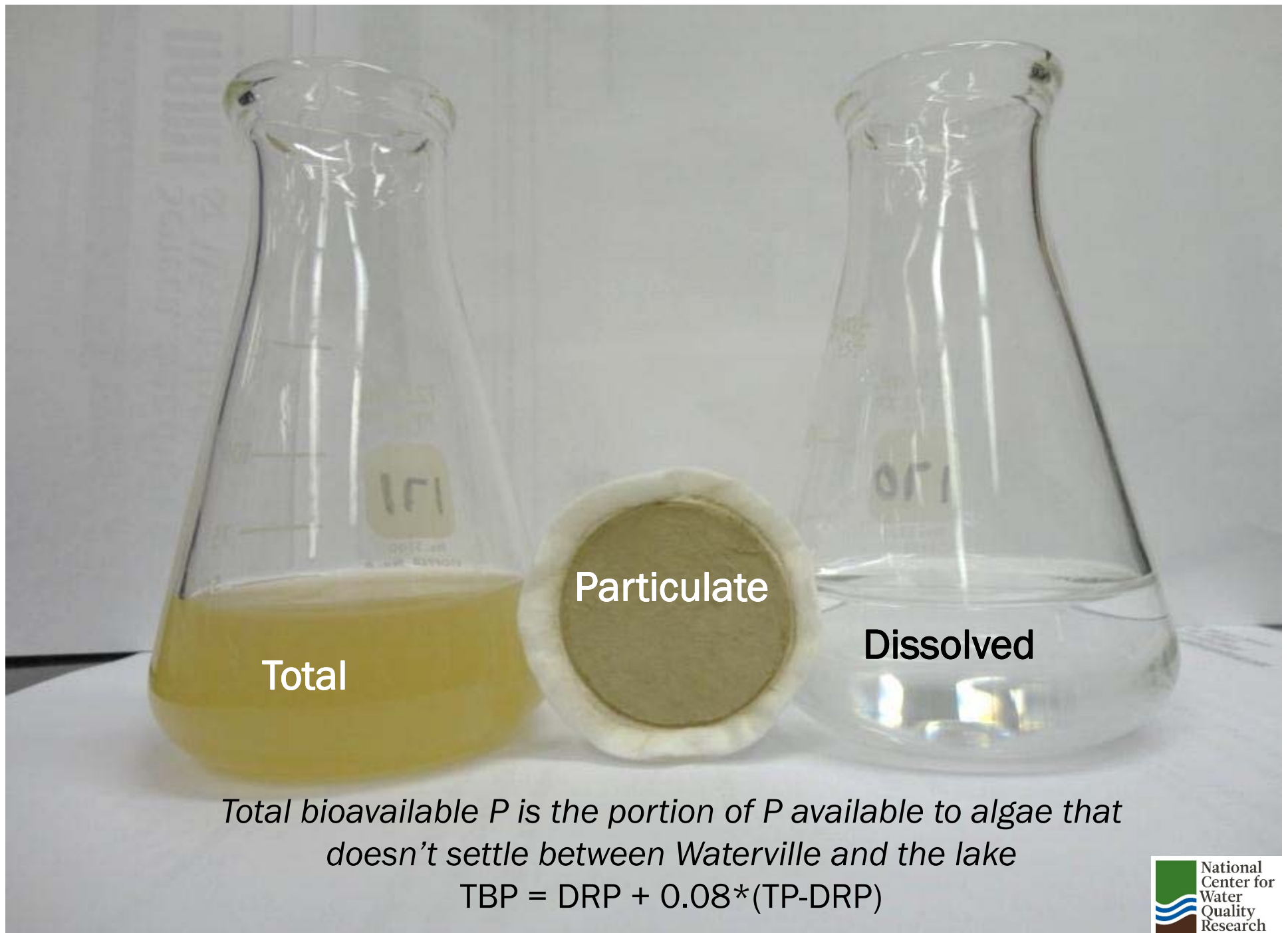


Photo credit: Ted Bowman, flickr

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



Load
Mass/time
Metric tons/spring



Concentration
Mass/H₂O volume
mg/L

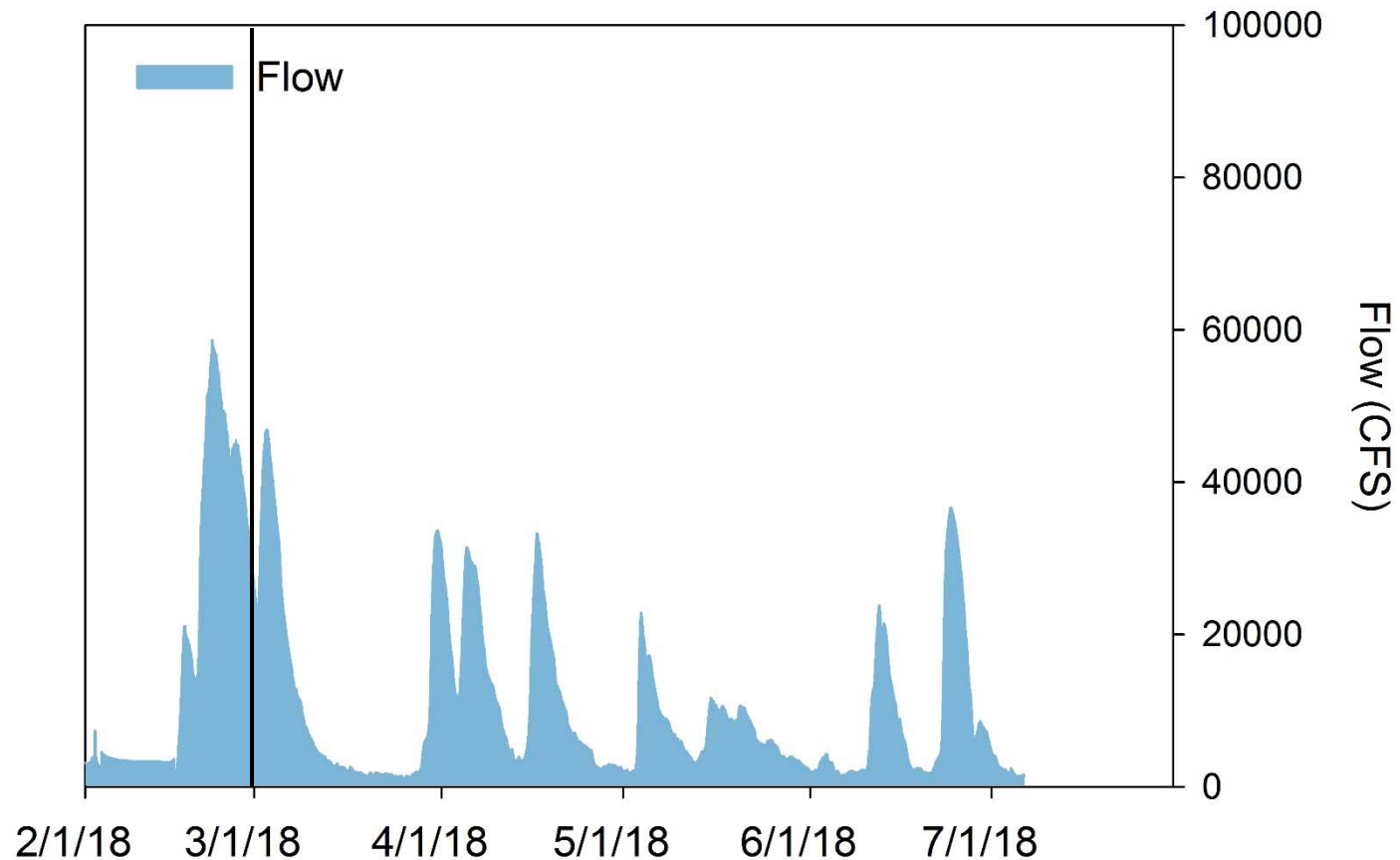


Flow or Discharge
H₂O volume/time
ft³/s (CFS)



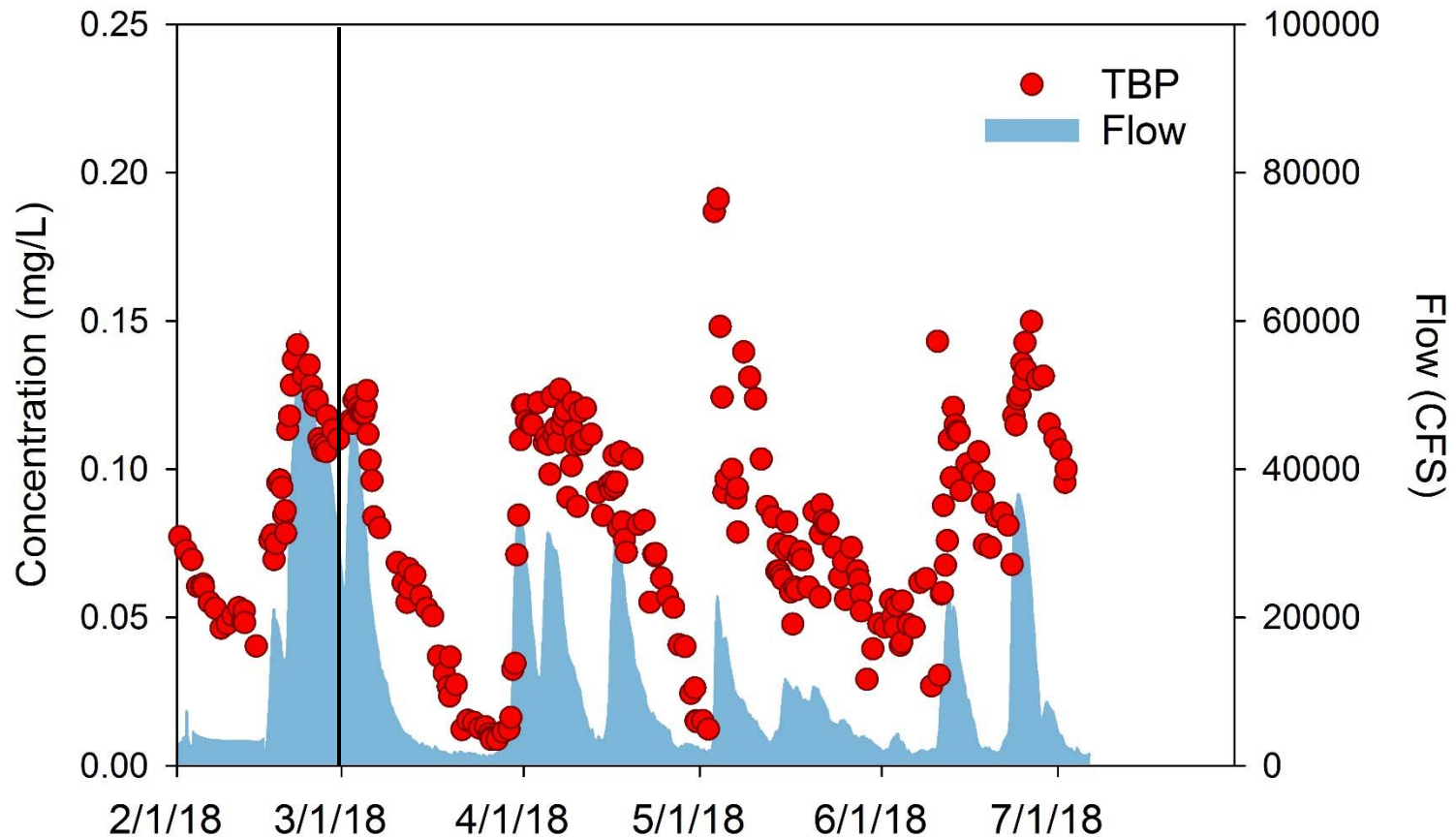
Flow at the Maumee River in Waterville

March 1 – July 5, 2018



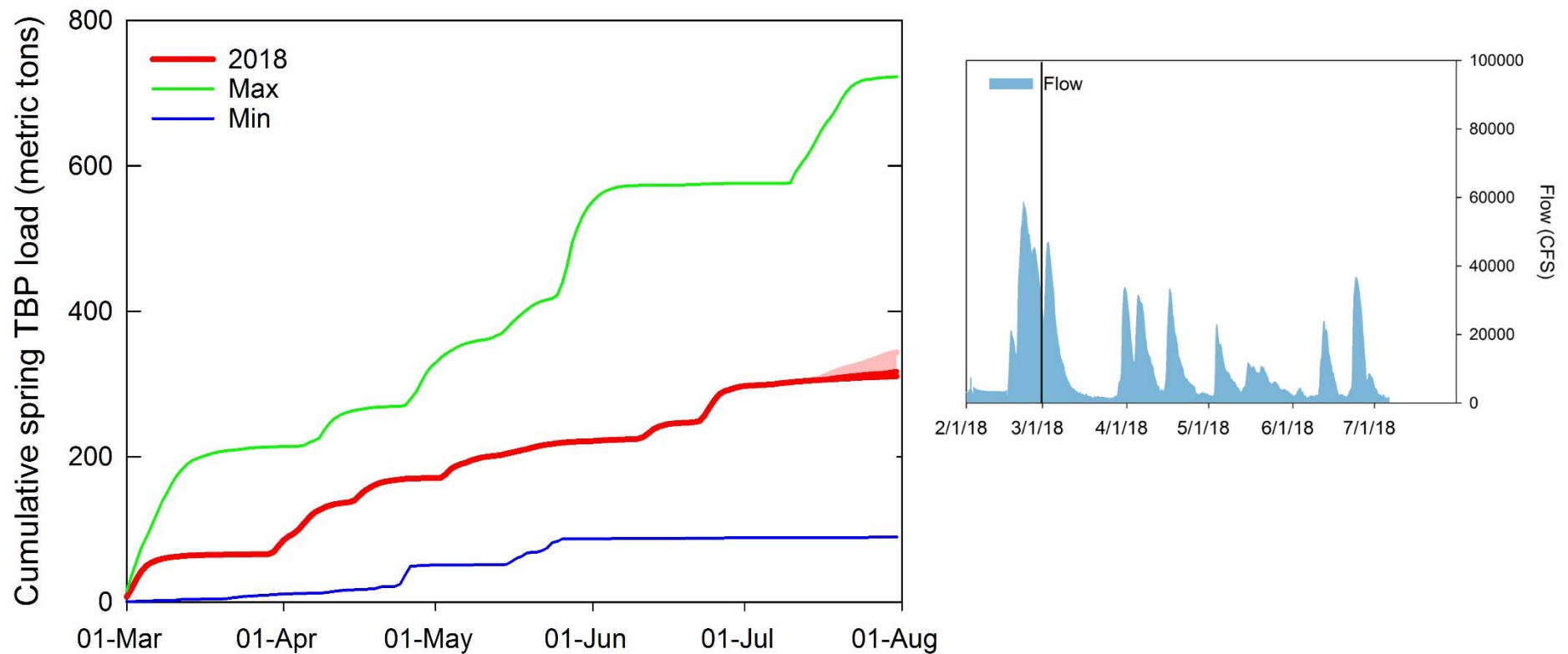
Total bioavailable phosphorus at the Maumee River in Waterville

March 1 – July 5, 2018



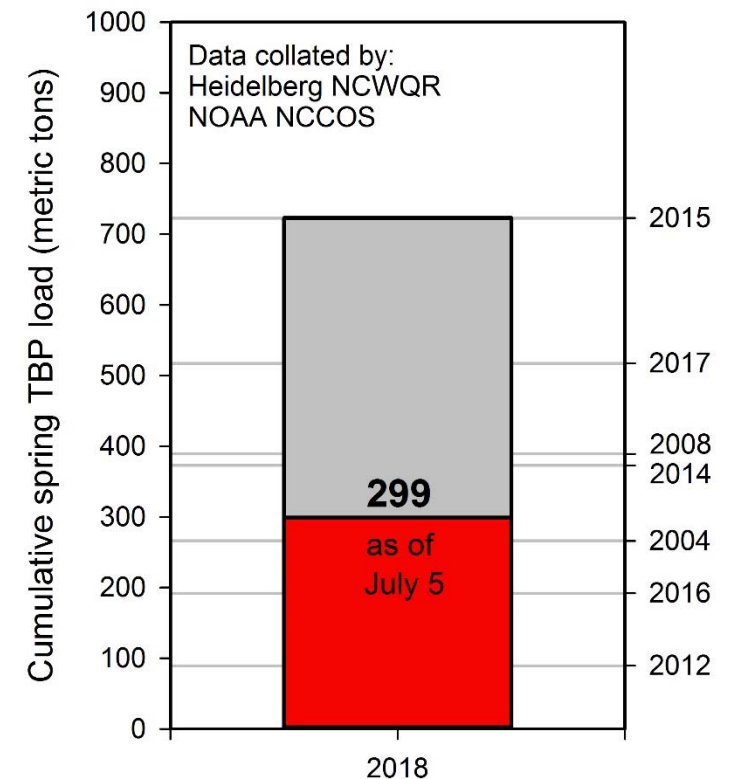
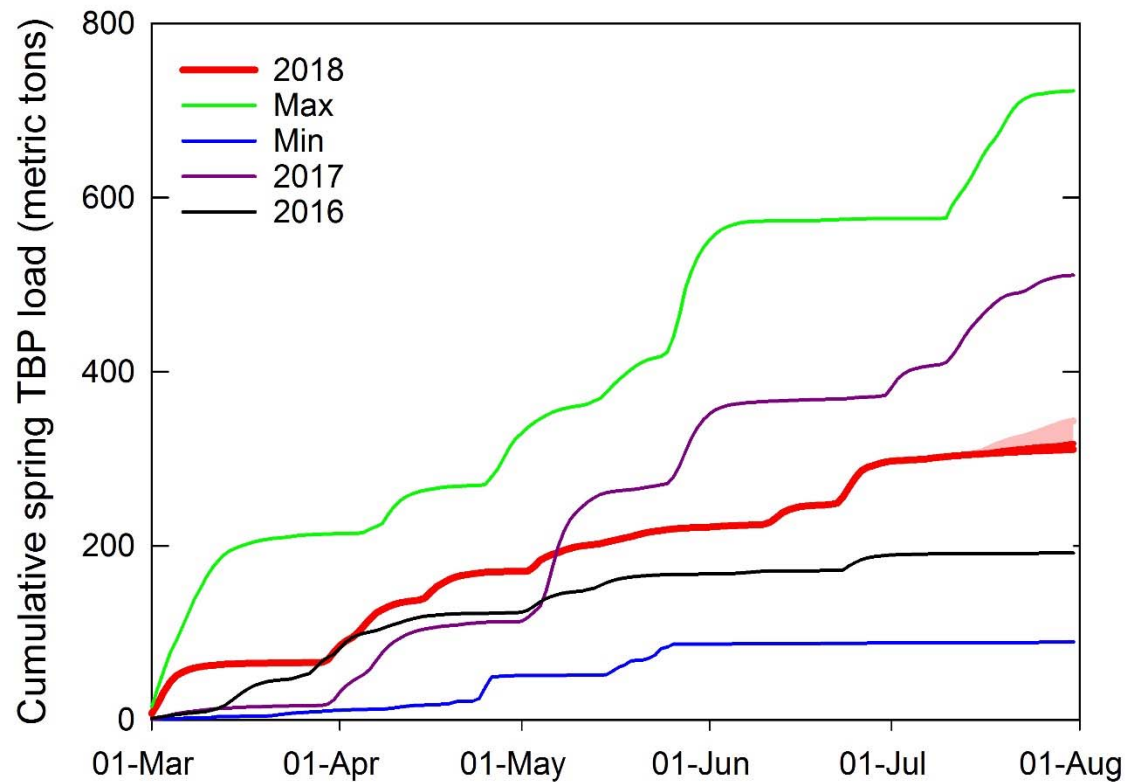
Total bioavailable phosphorus Maumee River in Waterville

*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

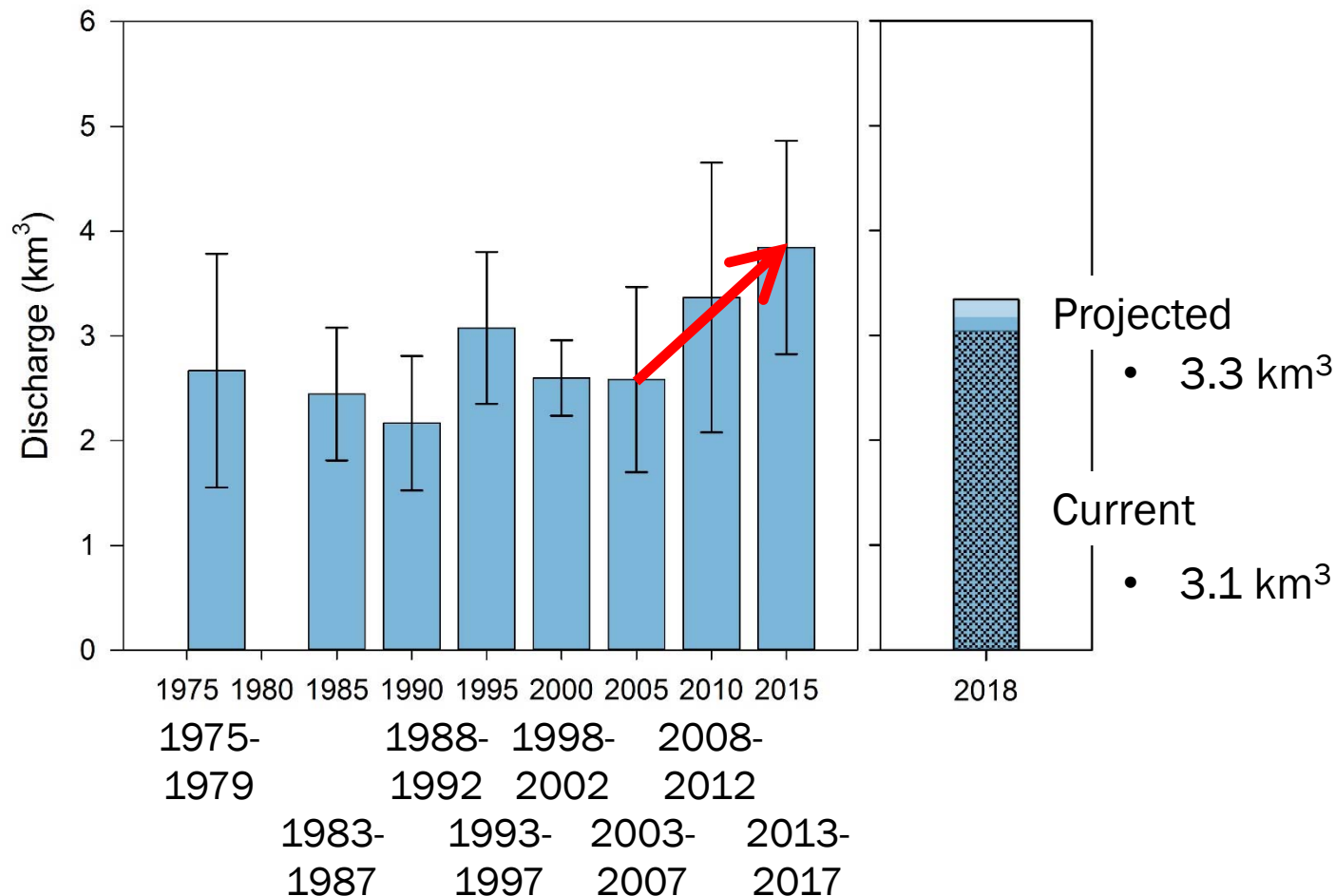
*March 1 – July 5, 2018;
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NWS Ohio River Forecast Center*



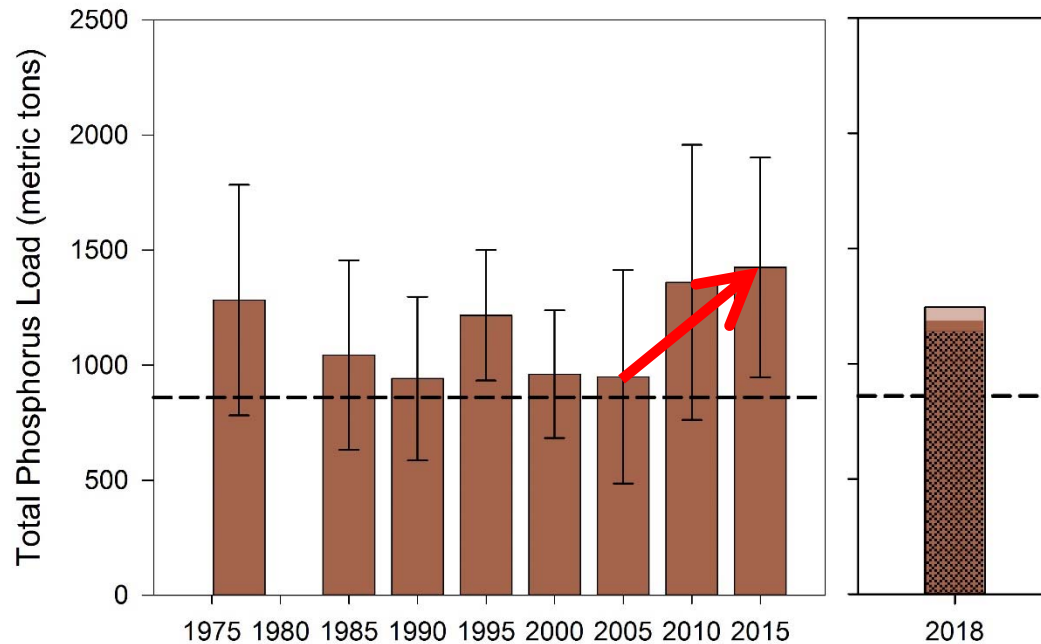
Projected to 343 metric
tons by July 31

March - July flow at the Maumee River in Waterville

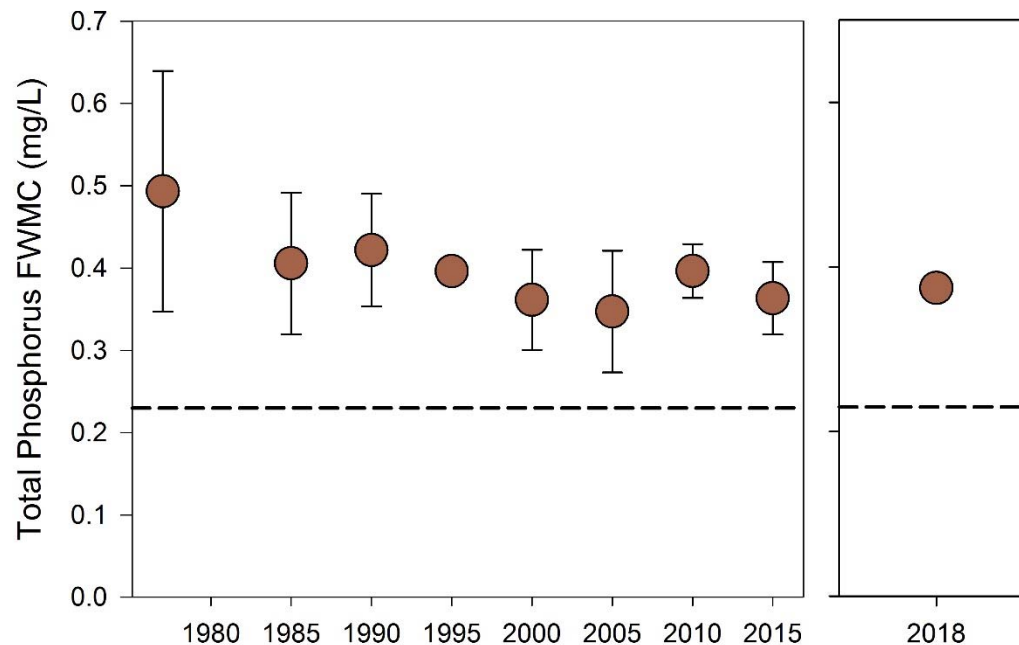
1975 - 2017 Averaged over 5 year periods



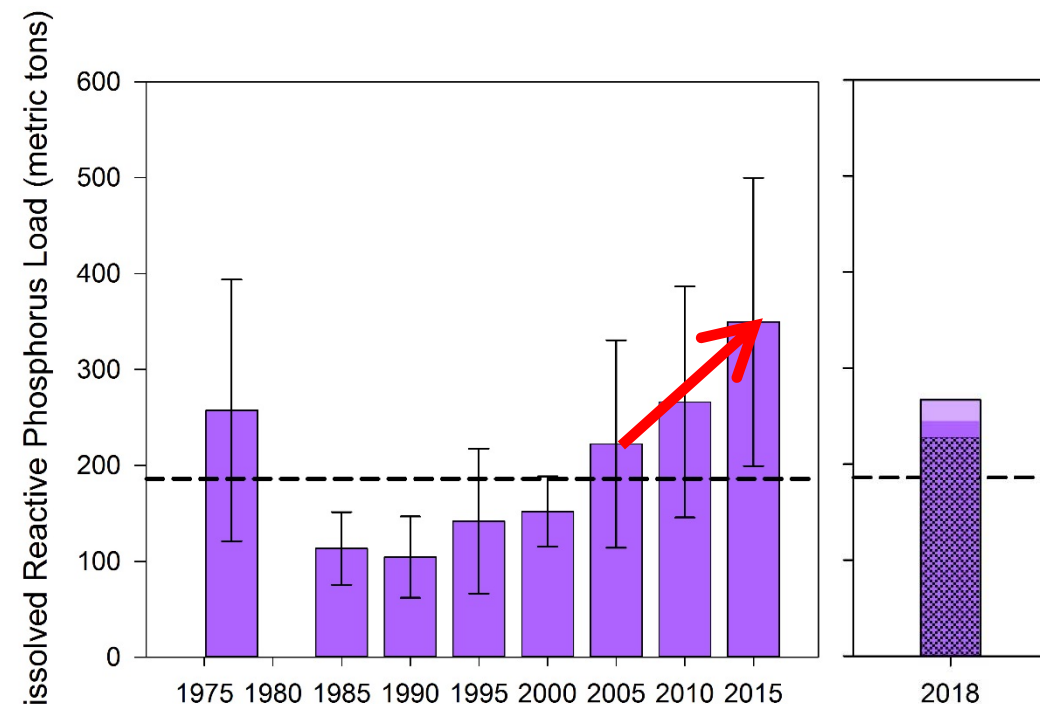
March - July Total P Maumee River in Waterville 1975 - 2017 Averaged over 5 year periods



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

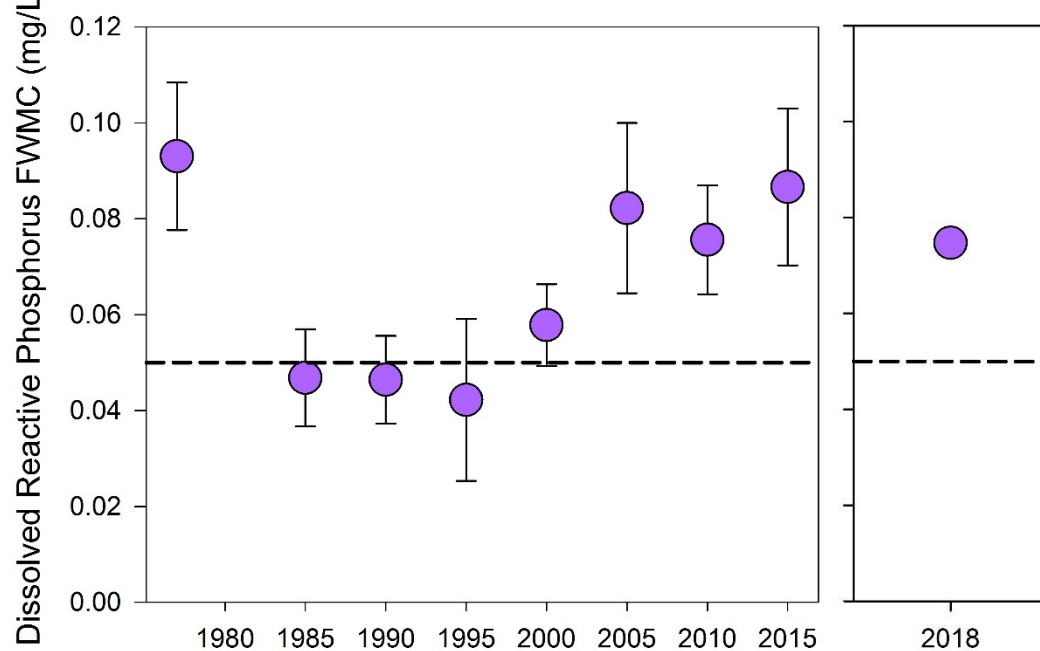


- 0.37 mg/L currently
- 0.23 mg/L target



March - July Dissolved P Maumee River in Waterville 1975 - 2017 Averaged over 5 year periods

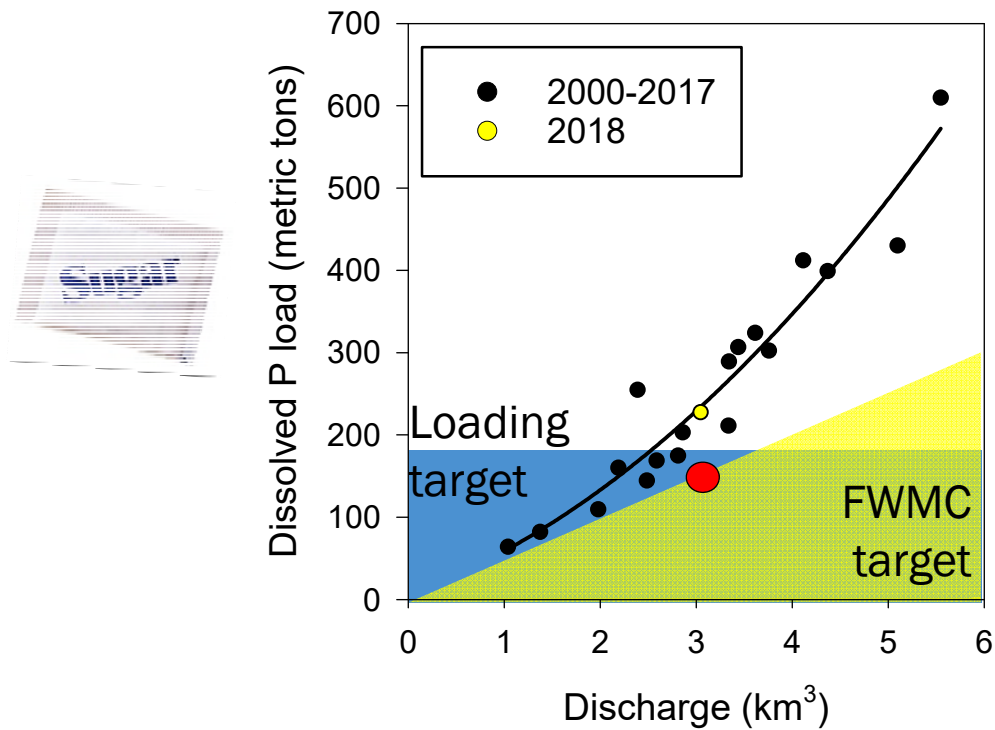
- 230 metric tons currently
- 270 metric tons projected
- 186 metric tons target



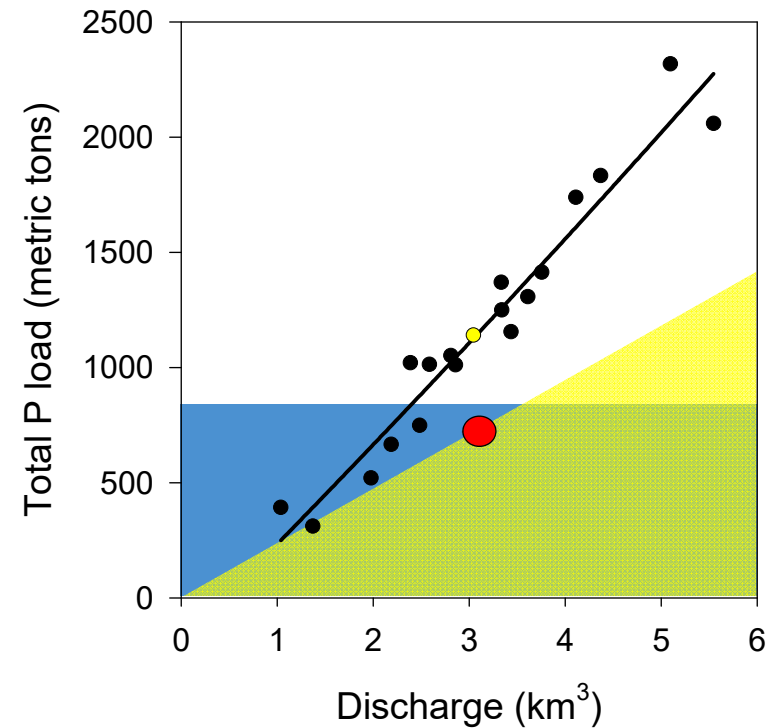
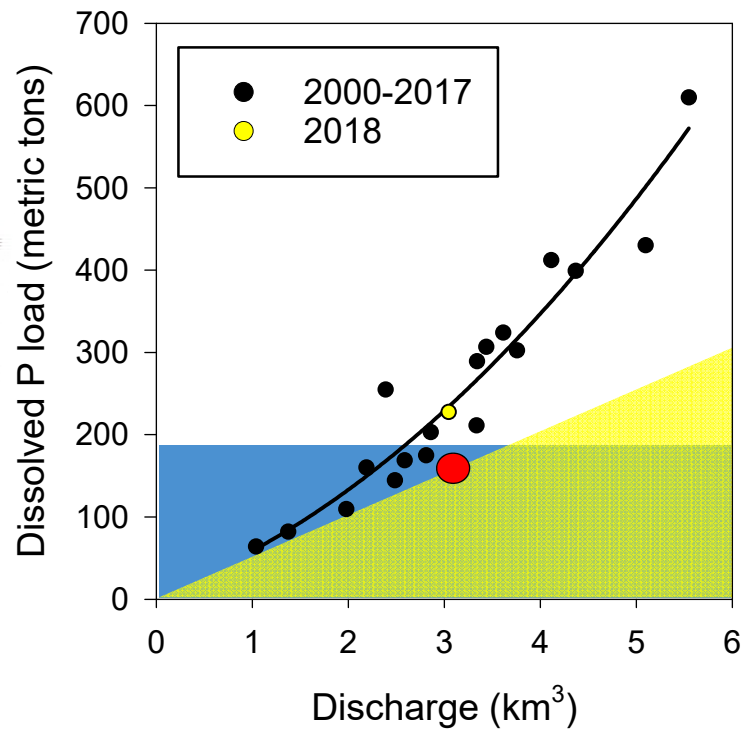
Does the slightly lower FPMC mean we're making progress??

- 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?

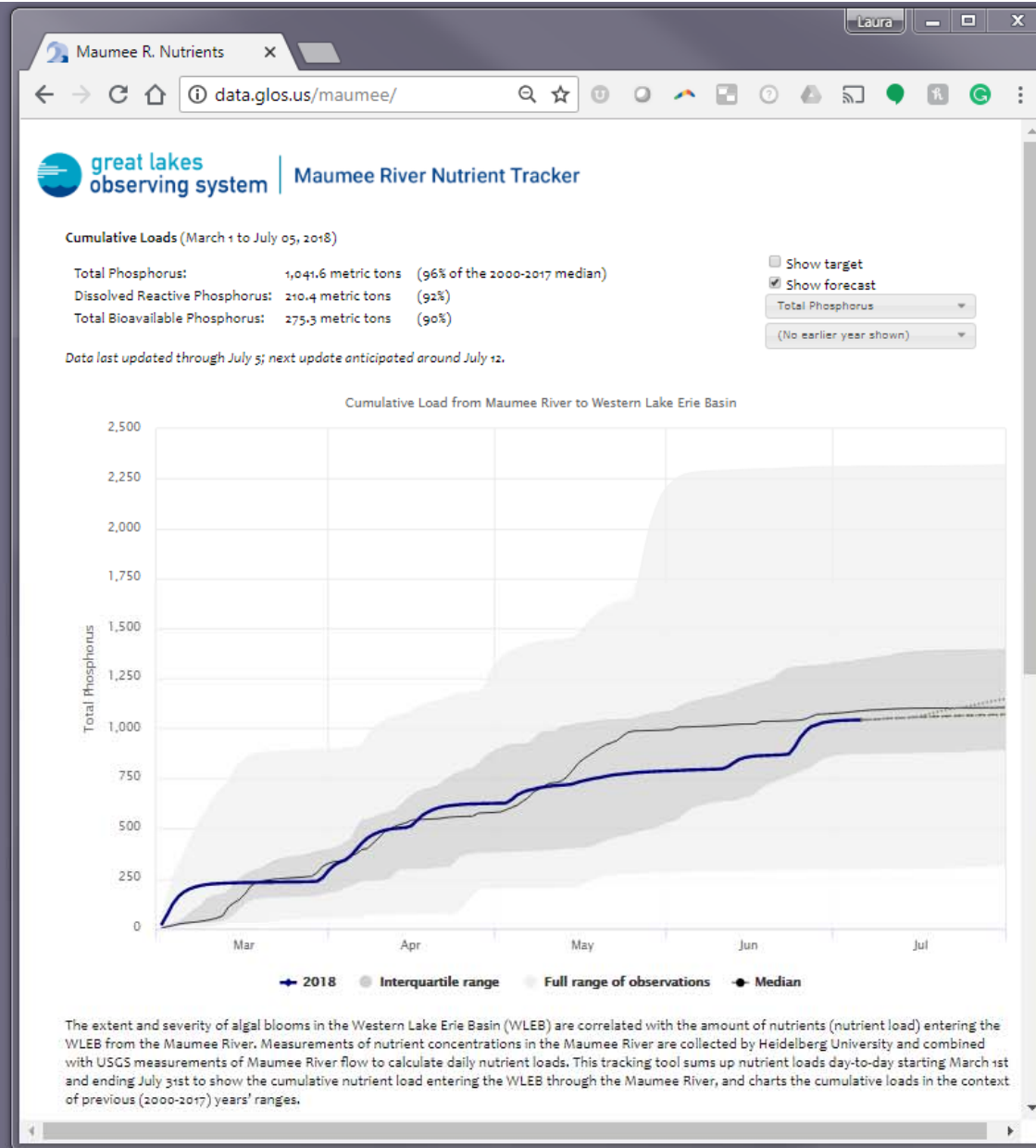
Not enough implementation??

- 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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<http://www.ncwqr.org>

<https://www.facebook.com/ncwqr>

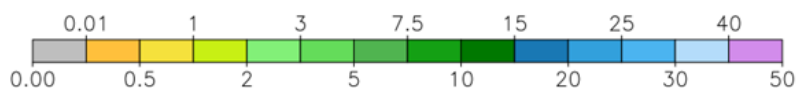
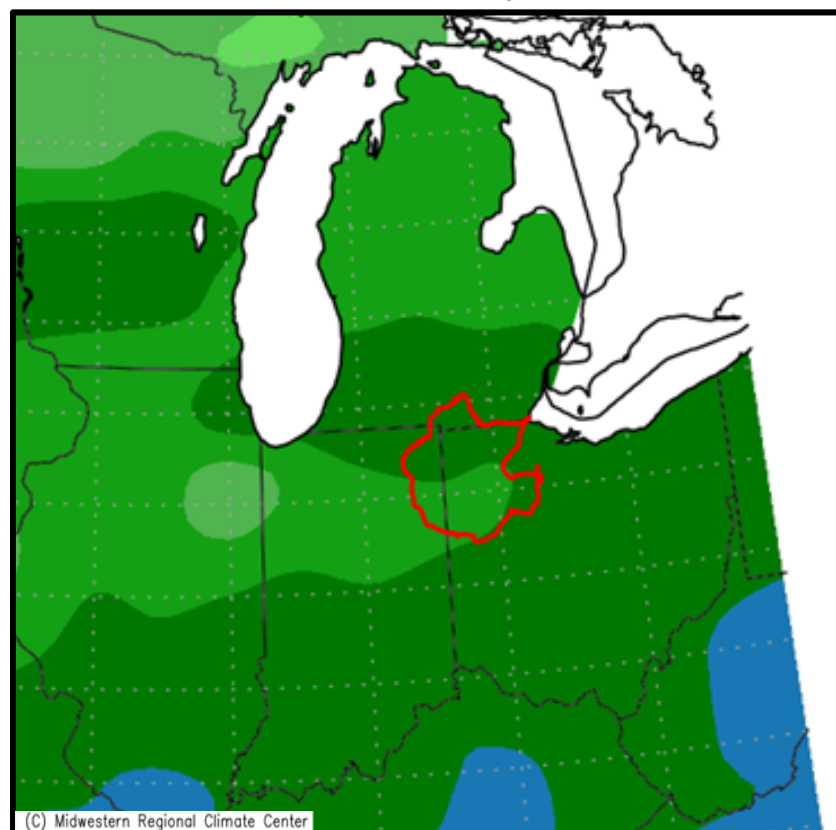
<http://www.LakeErieAlgae.com>

<http://data.glos.us/maumee/>



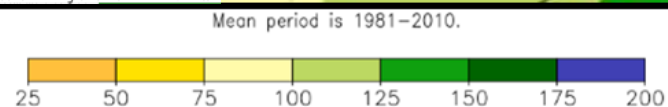
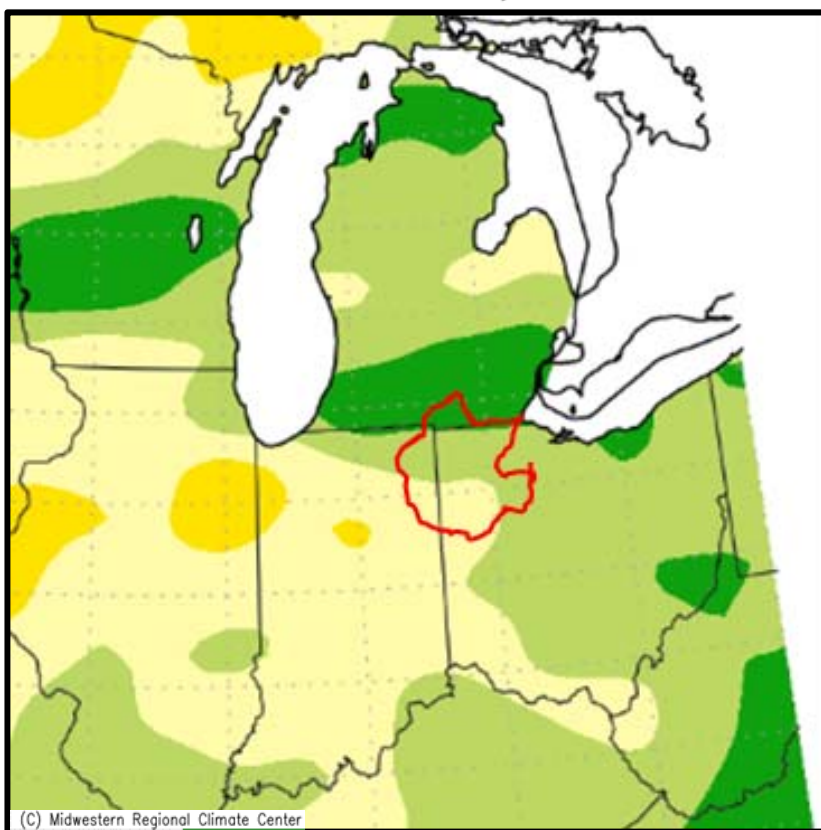
Precipitation from March – May 31, 2018

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



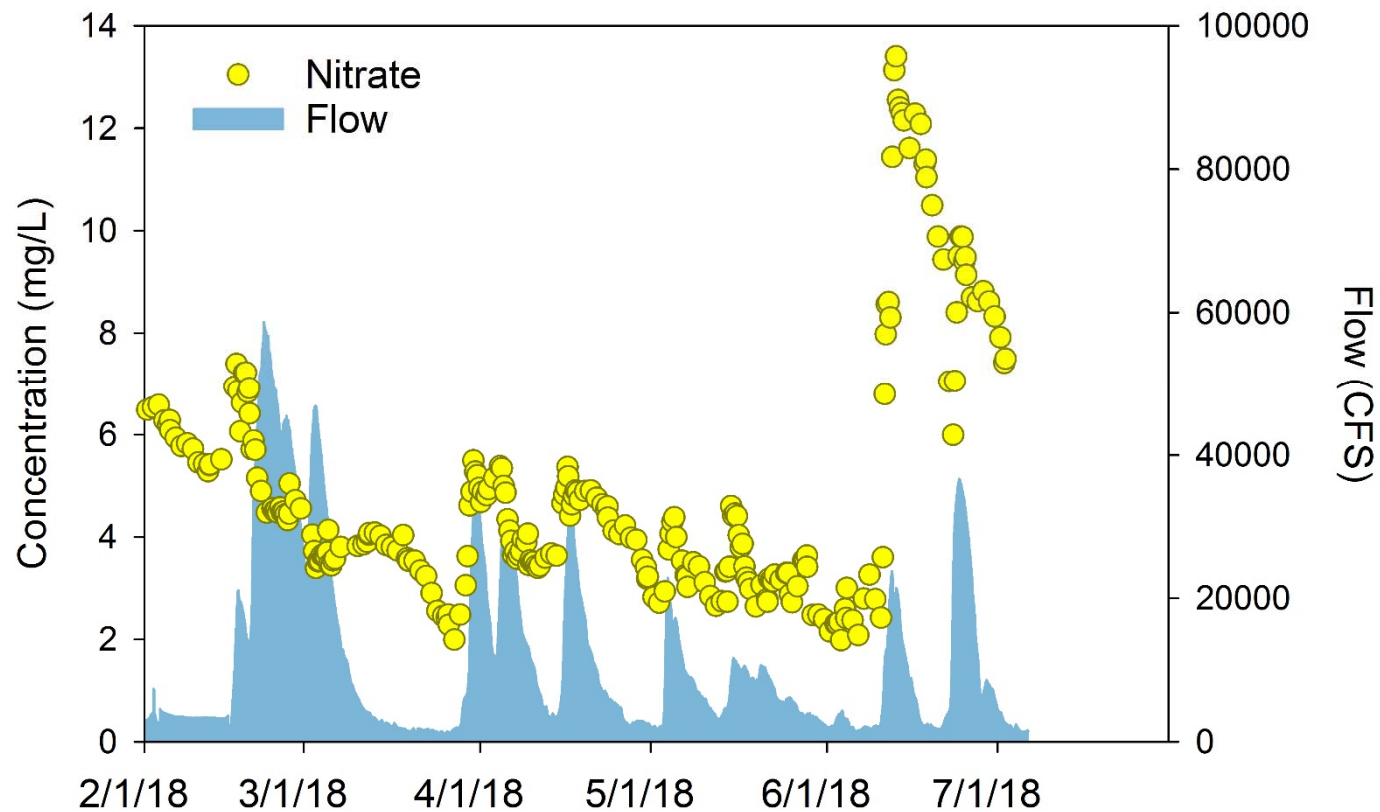
Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

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



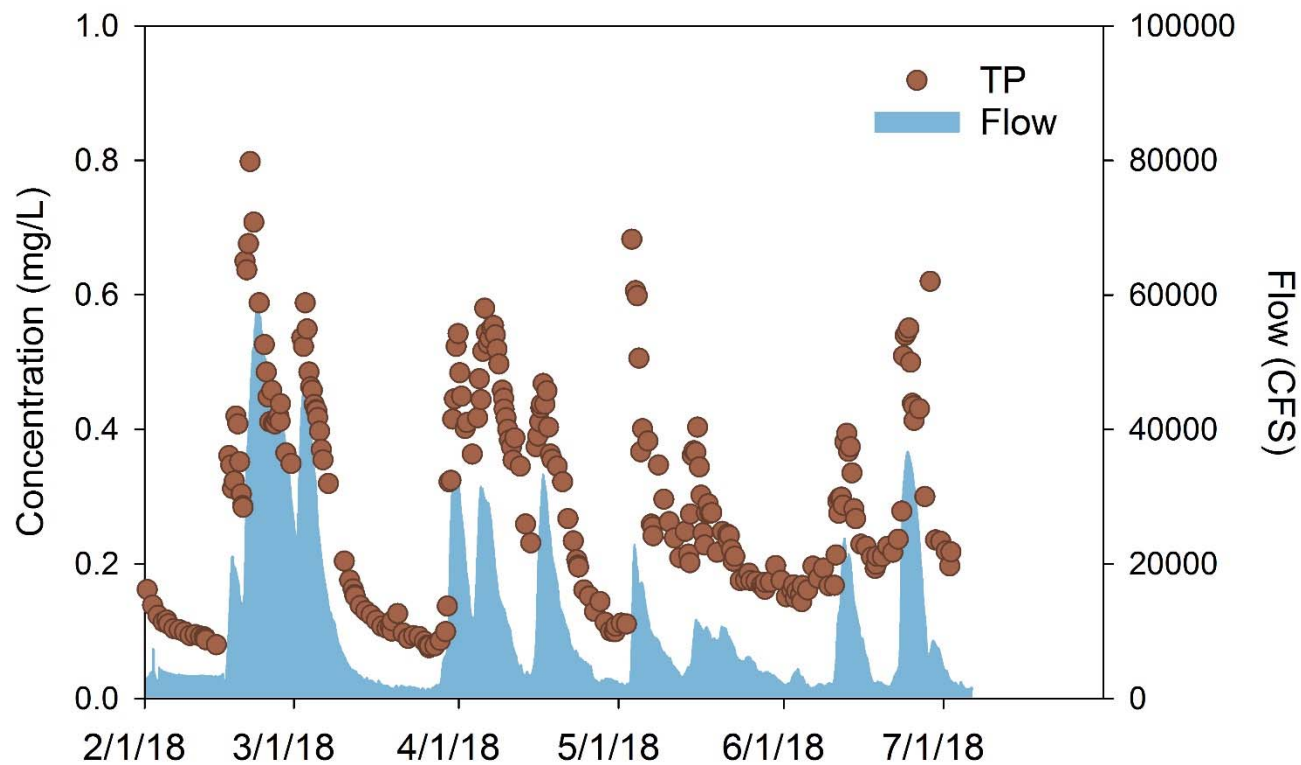
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Nitrate-N ($\text{NO}_{2+3}\text{-N}$) Maumee River in Waterville *March 1 – July 5, 2018*



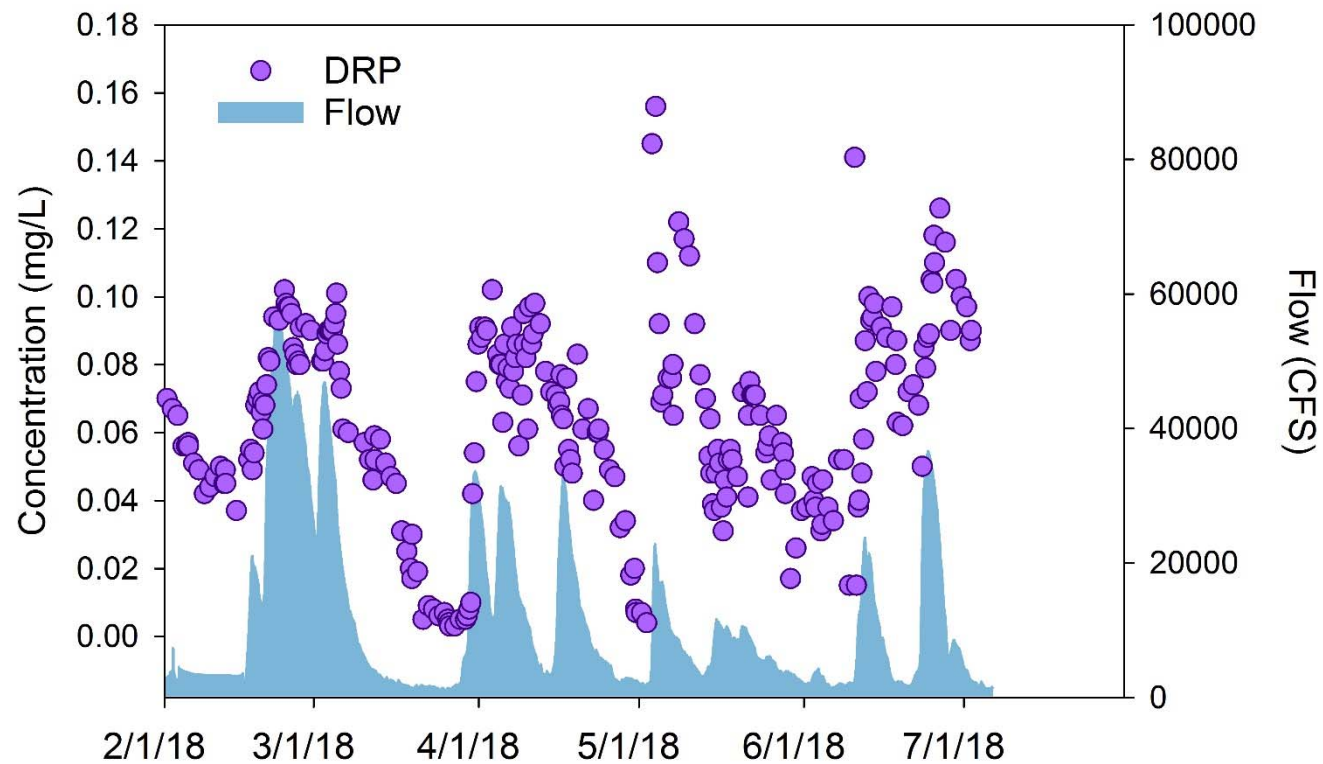
Total Phosphorus Maumee River in Waterville

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

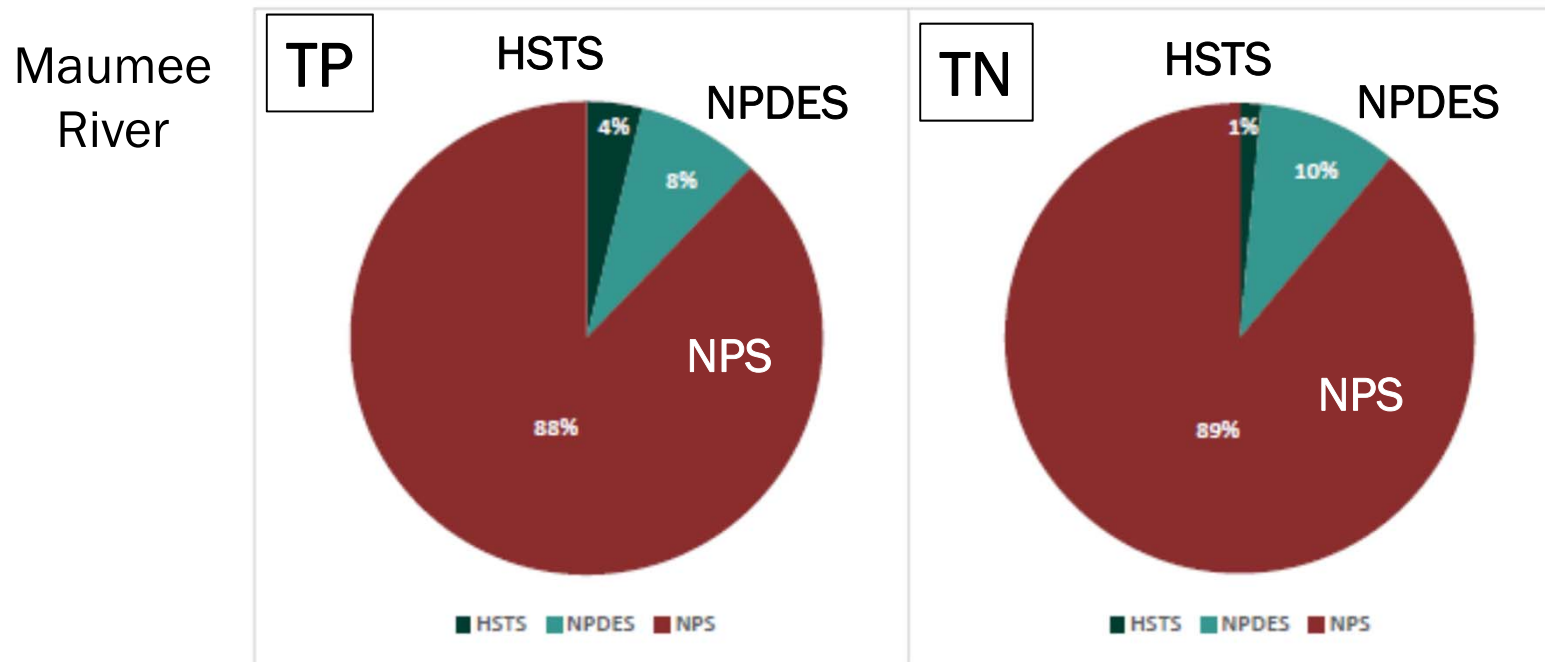
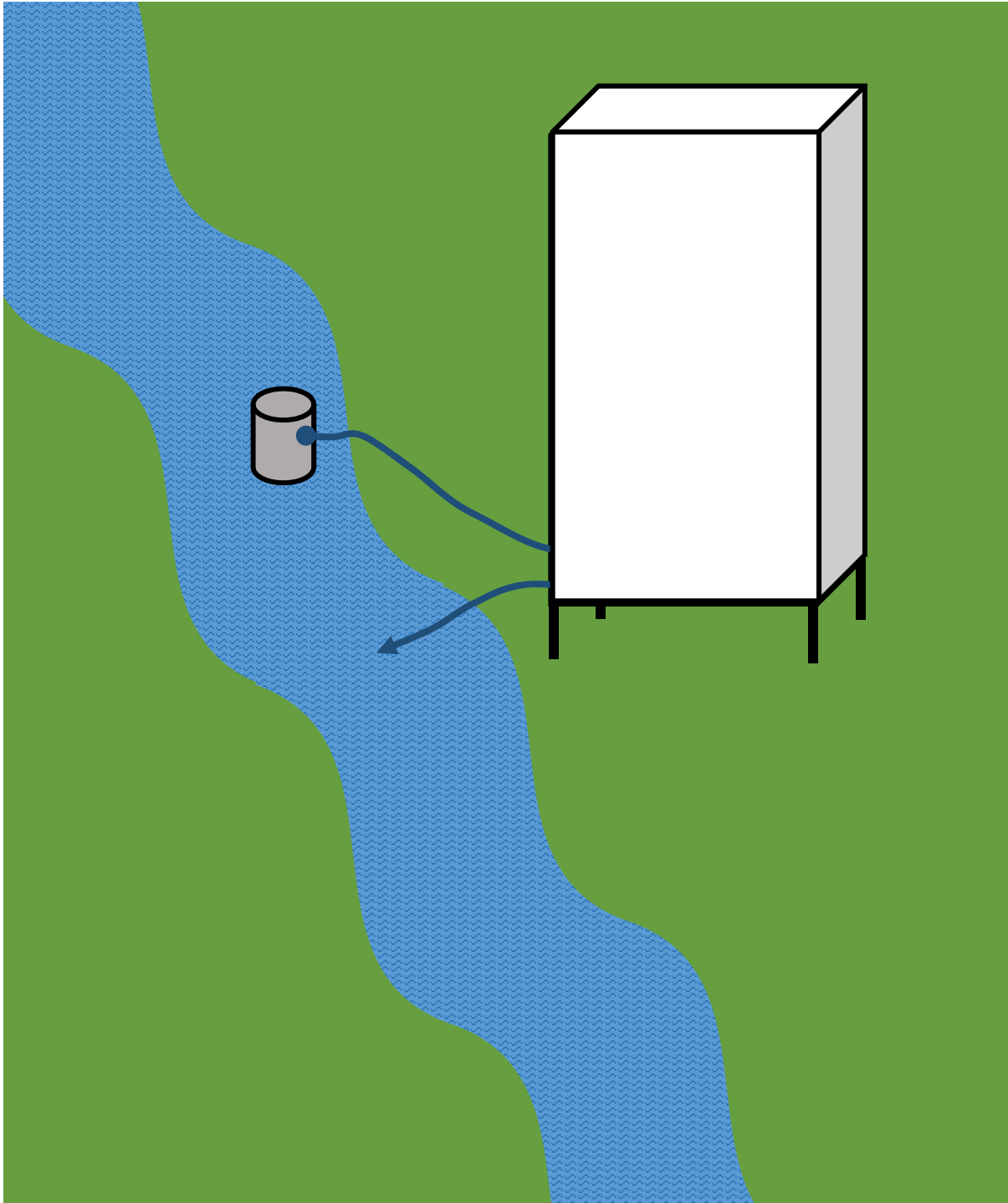


Figure 10 — Proportion of total phosphorus and nitrogen load from different sources for the Maumee watershed, average of 5-years (wy13-wy17).



- We sample the Maumee River at Waterville, Ohio
- 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