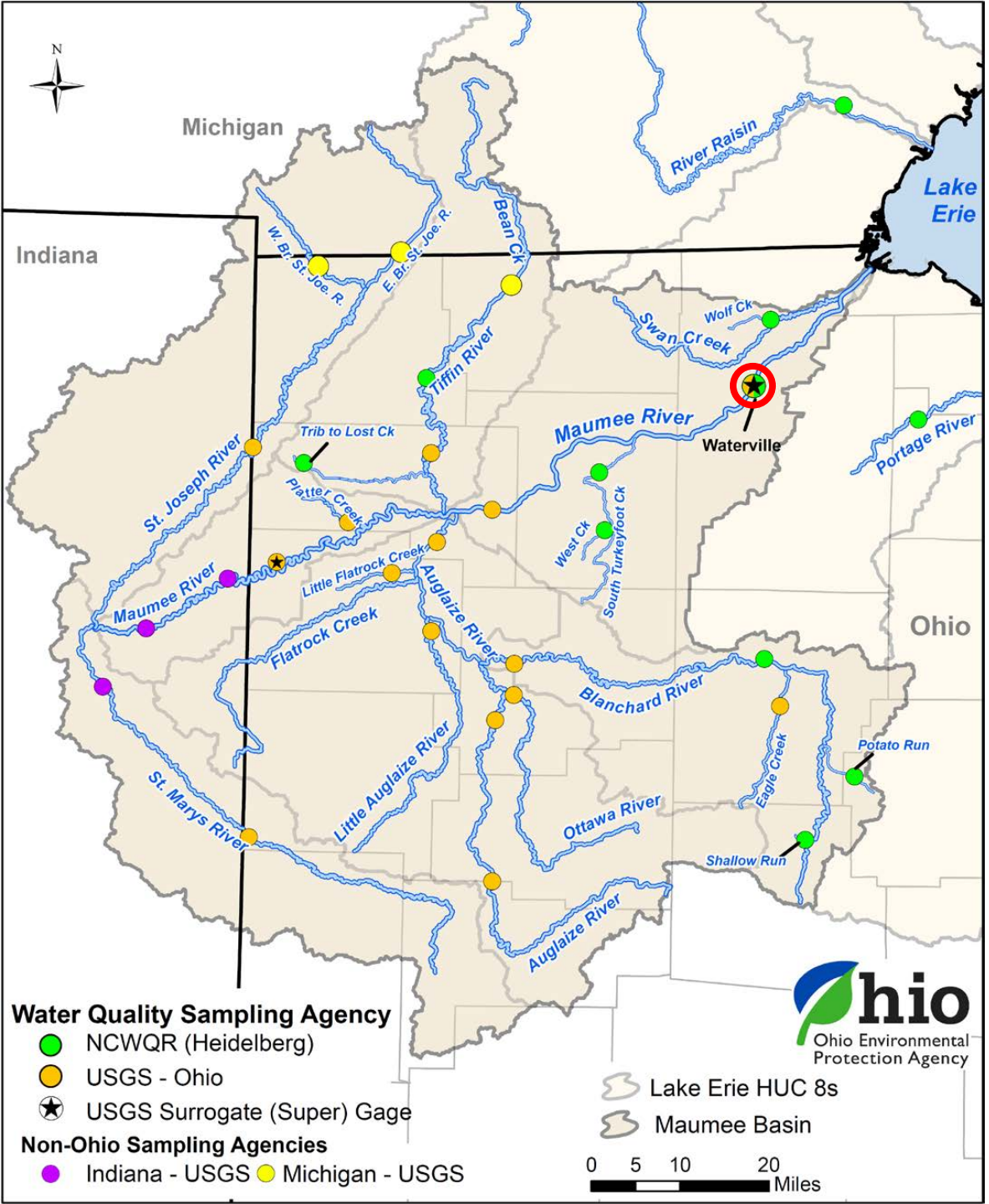
Maumee River nutrient loading

March 1 – July 31, 2020

Laura Johnson



Maumee River in Waterville

- One of 28 stations in the Maumee Watershed sampled in collaboration with other agencies
- One of 24 stations across Ohio and in Michigan as part of the Heidelberg Tributary Loading Program
- Samples are collected 3x a day*, year-round and retrieved weekly for analysis in the laboratory
- Sampled since 1975 for all major nutrients and sediments (45 years!!)

https://lakeerie.ohio.gov/Portals/0/Expanded_load_monitoring_report_2019-10-31.pdf

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TP = DRP + TPP

Total bioavailable P is the portion of P available to algae that doesn't settle between Waterville and the lake

TBP = DRP + 0.08*(TPP)

Total Bioavailable P

Dissolved Reactive P

Total Particulate P

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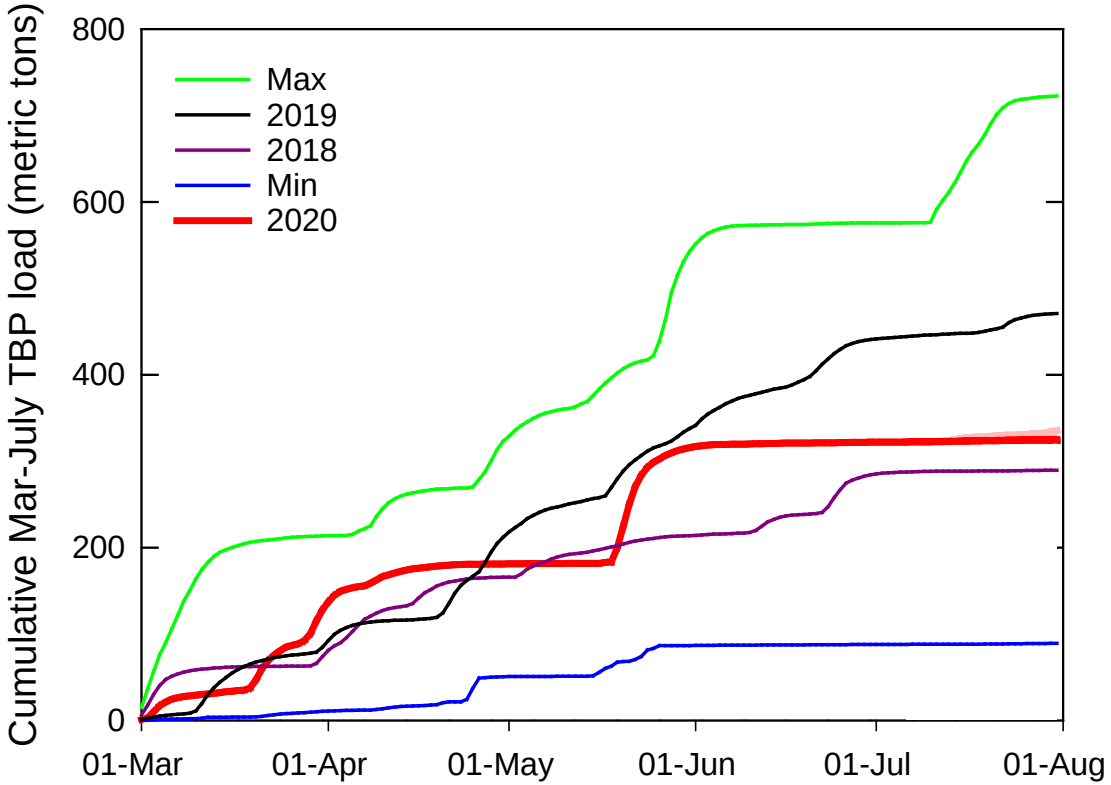
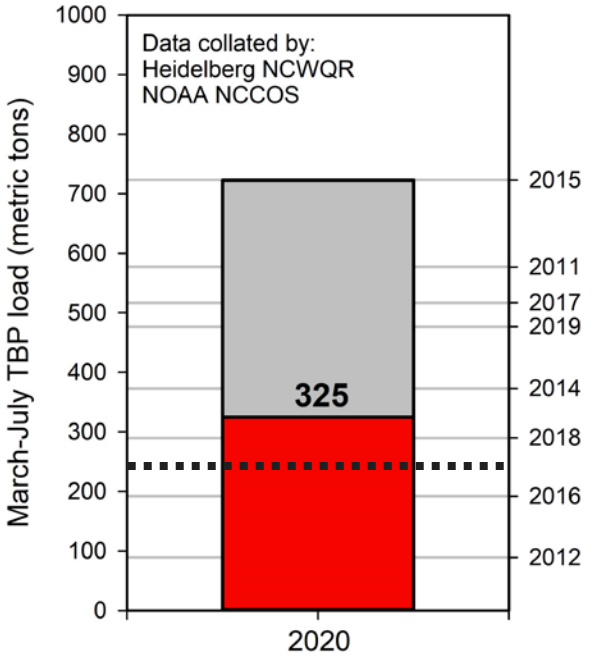
Total bioavailable phosphorus at the Maumee River in Waterville

March 1 – July 1, 2020

projected to July 31 with data from the NWS Ohio River Forecast Center





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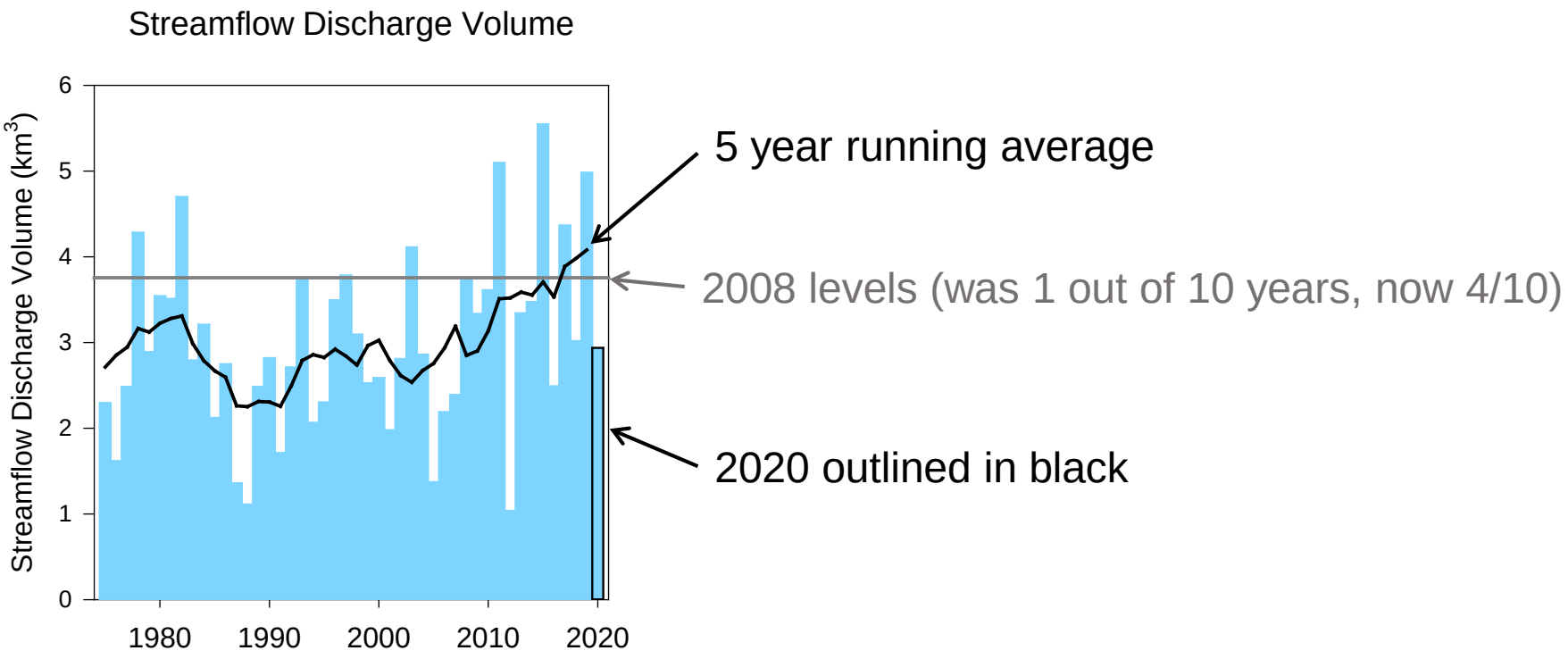
Maumee River in Waterville
March-July streamflow discharge volume



Currently →2.87 km^3 *(or 766 billion gallons)*
Projected →2.94 km^3 *(or 785 billion gallons)*

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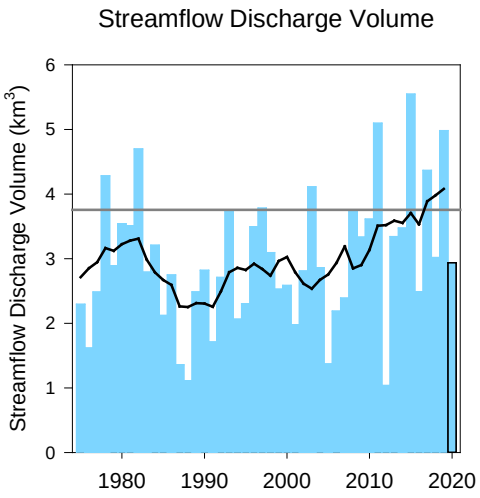
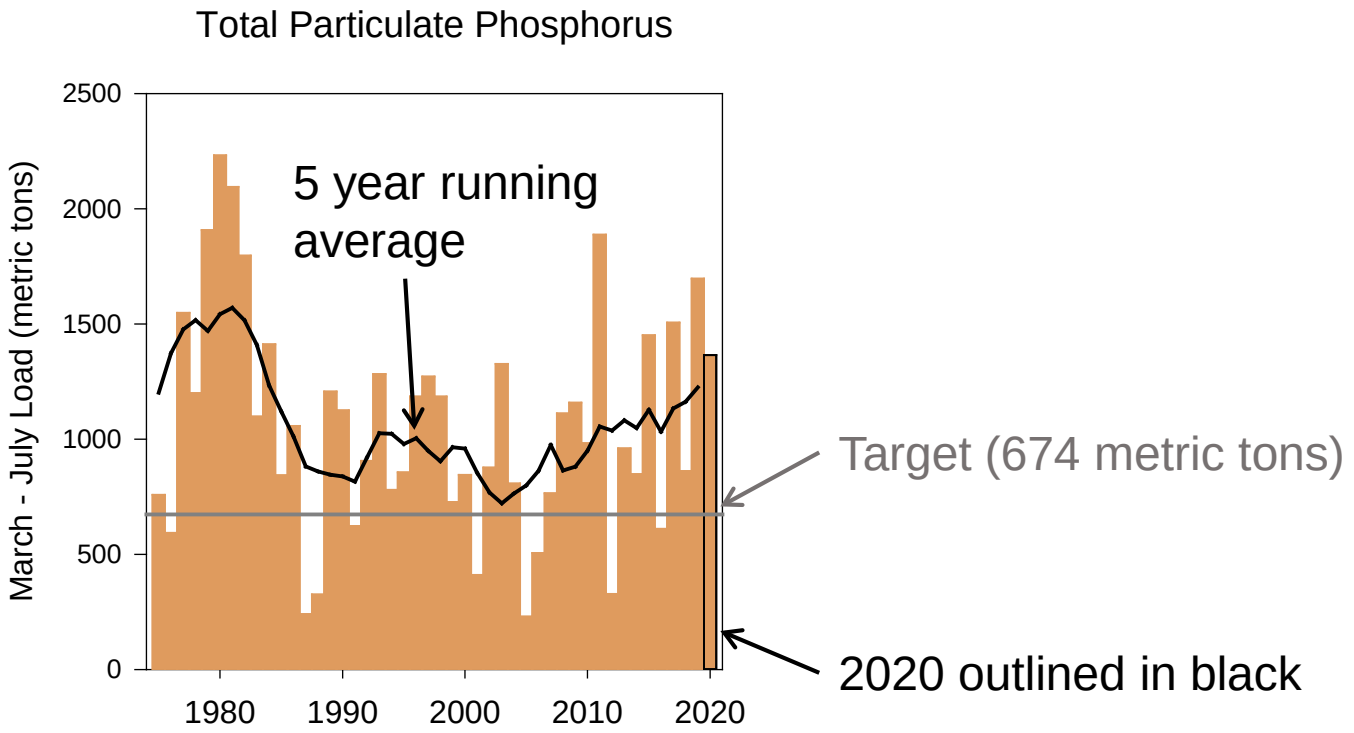
Maumee River in Waterville
March-July loads





Currently →1360 metric tons
Projected →1366 metric tons

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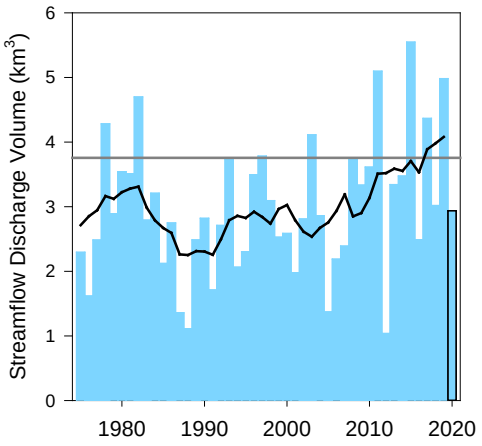
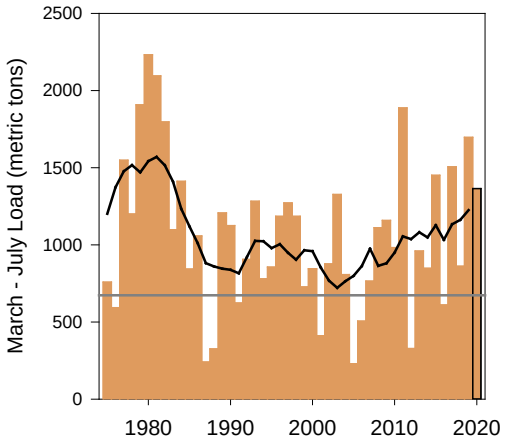
Maumee River in Waterville
March-July loads

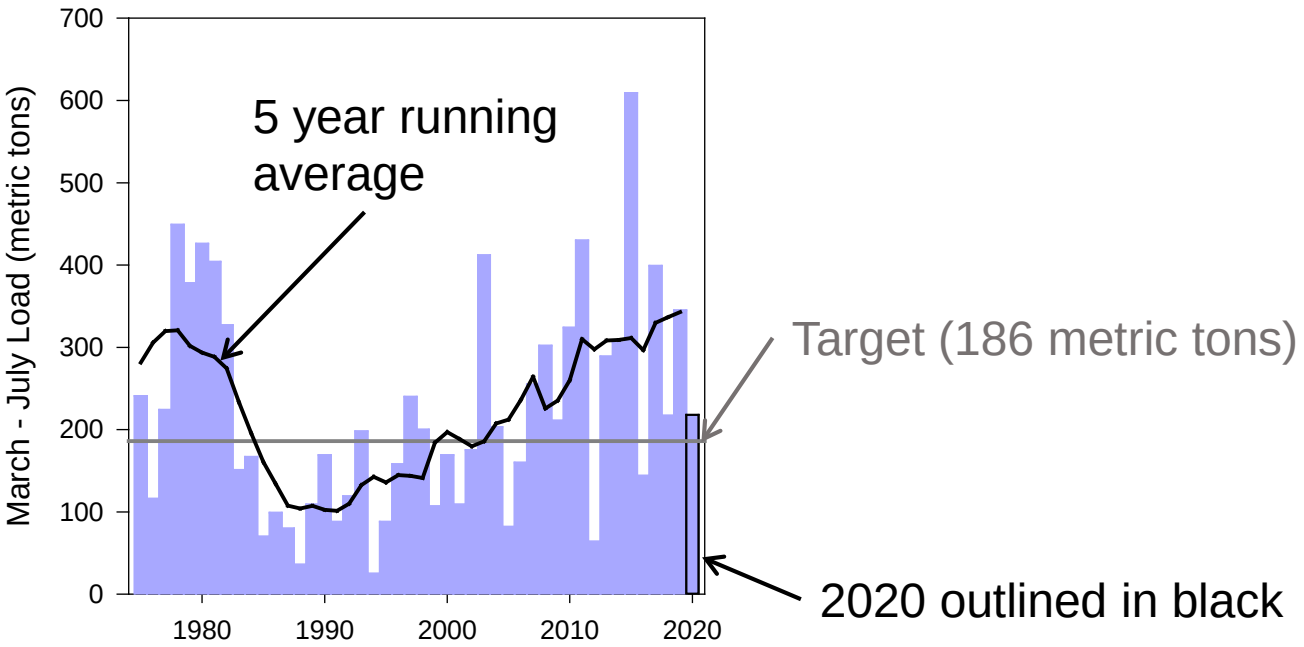
Streamflow Discharge Volume



Total Particulate Phosphorus



Dissolved Reactive Phosphorus



Currently →216 metric tons
Projected →218 metric tons

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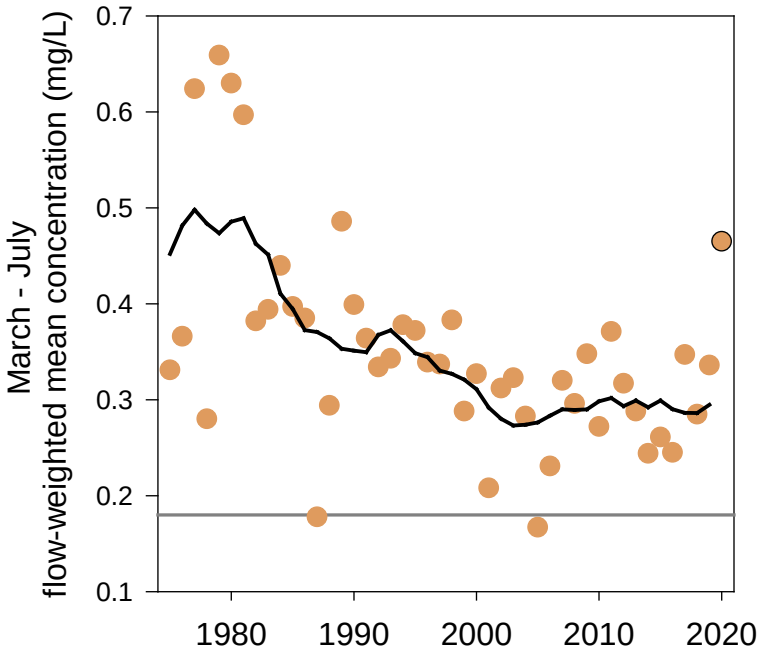
Maumee River in Waterville
March-July flow-weighted mean concentrations

Load/streamflow = FWMC

5 year running average

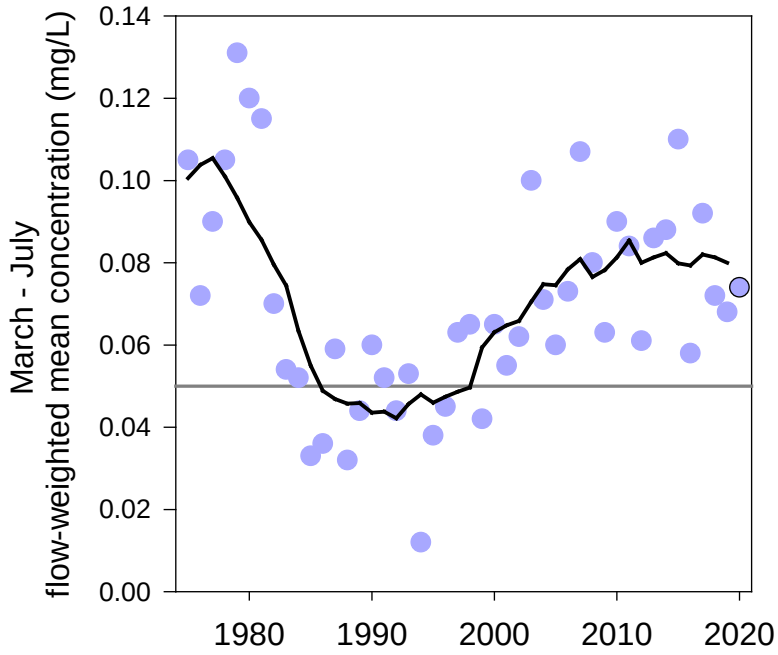
Concentration Target

Total Particulate Phosphorus



Currently → 0.47 mg/L

Dissolved Reactive Phosphorus



Currently → 0.075 mg/L

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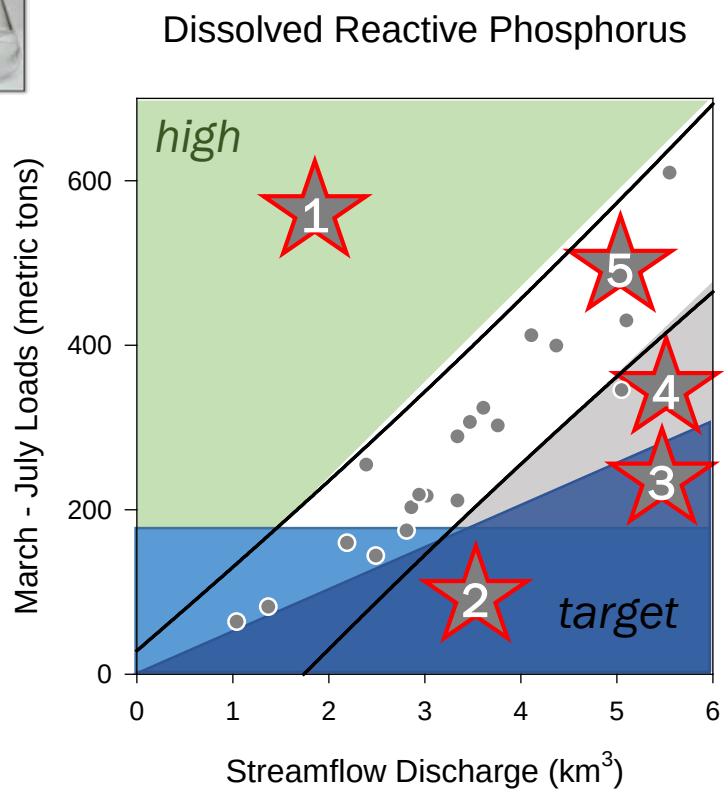
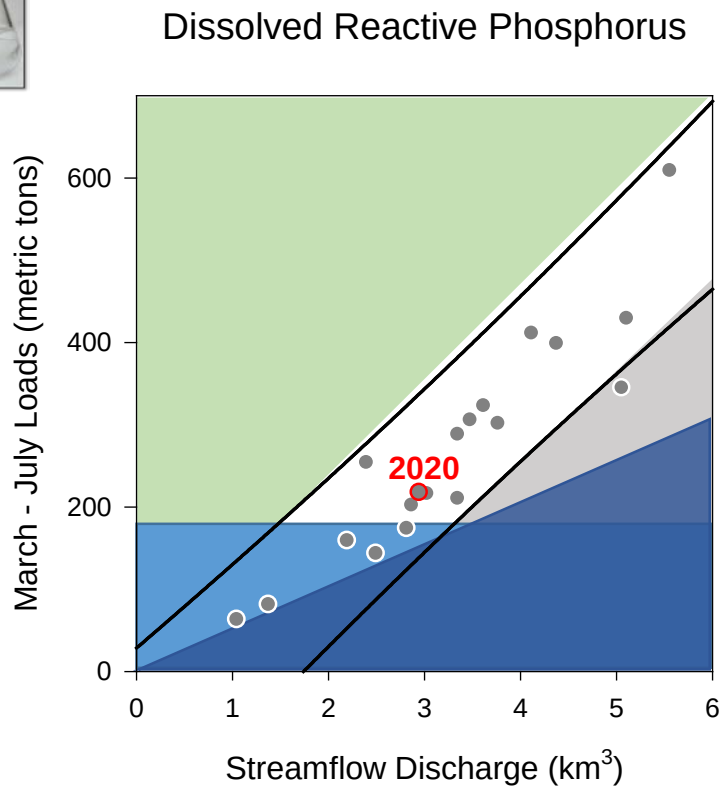
Both loads (and FWMC) are correlated with streamflow (2002-2018)
What load would we expect based on streamflow?



1. Higher than normal
2. Below the target
3. Below the concentration target, but not the load target
4. Lower than normal (e.g., 2019)
5. As expected (in normal range)

Both loads and FWMC are correlated with streamflow (2002-2018)



5 As expected (in normal range)

2020 expected → 230 metric tons

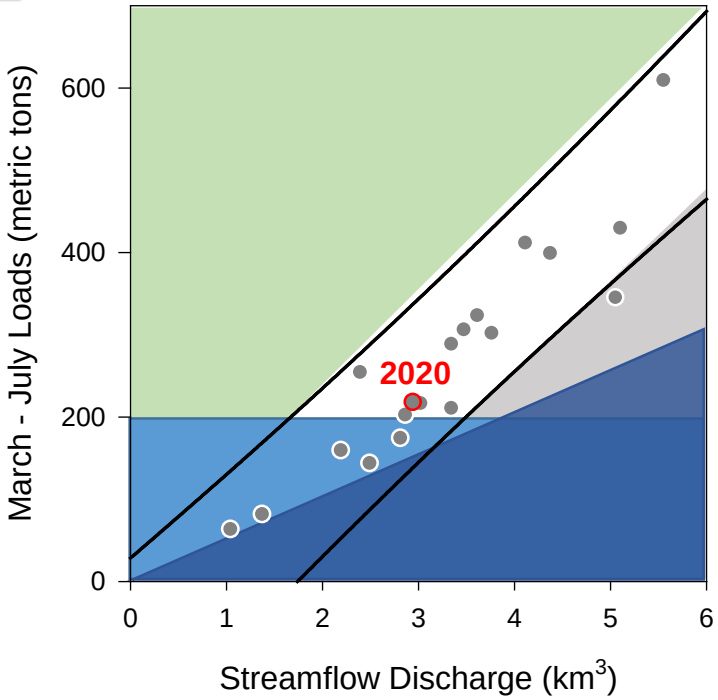
(between 130 and 330 metric tons)

2020 observed → 216 metric tons

TPP is higher than expected based on streamflow

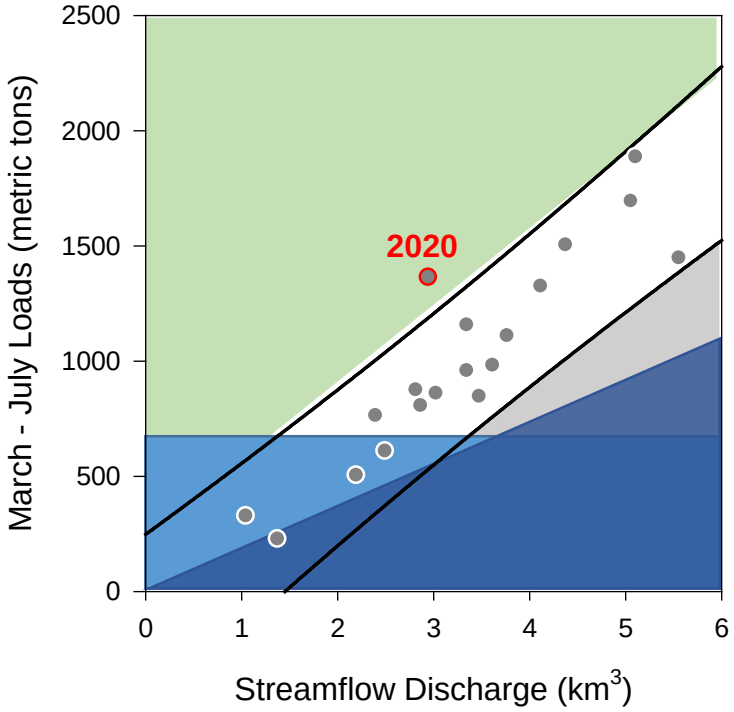
1 Higher than normal

Dissolved Reactive Phosphorus



2020 expected → 230 metric tons
2020 observed → 216 metric tons

Total Particulate Phosphorus



2020 expected → 832 metric tons
(between 502 and 1162)
2020 observed → 1360 metric tons

Conclusions

- Streamflow discharge was ~average (2.94 km^3) this year compared to 2002-2018 (3.2 km^3), though lower than the current 5 year running average
- DRP loads were lower than the 5 year running average, but very similar to 2018 and within the normal range based on 2002-2018
- TPP loads were higher than the 5 year running average, and higher than expected based on 2002-2018
- Since 2002, P loads have had unique years where loads are lower or higher than expected, but there are no detectable downward trends

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Thanks!

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