

Fox Illinois River Basin TMDL

TMDL for Total Phosphorus and Total Suspended Solids

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Wisconsin Department of Natural Resources

August 17, 2023

Today's Presenter



Eric Hettler, PE
TMDL Modeler

Today's Topics

TMDLs in Wisconsin

FOXIL TMDL Project Setting

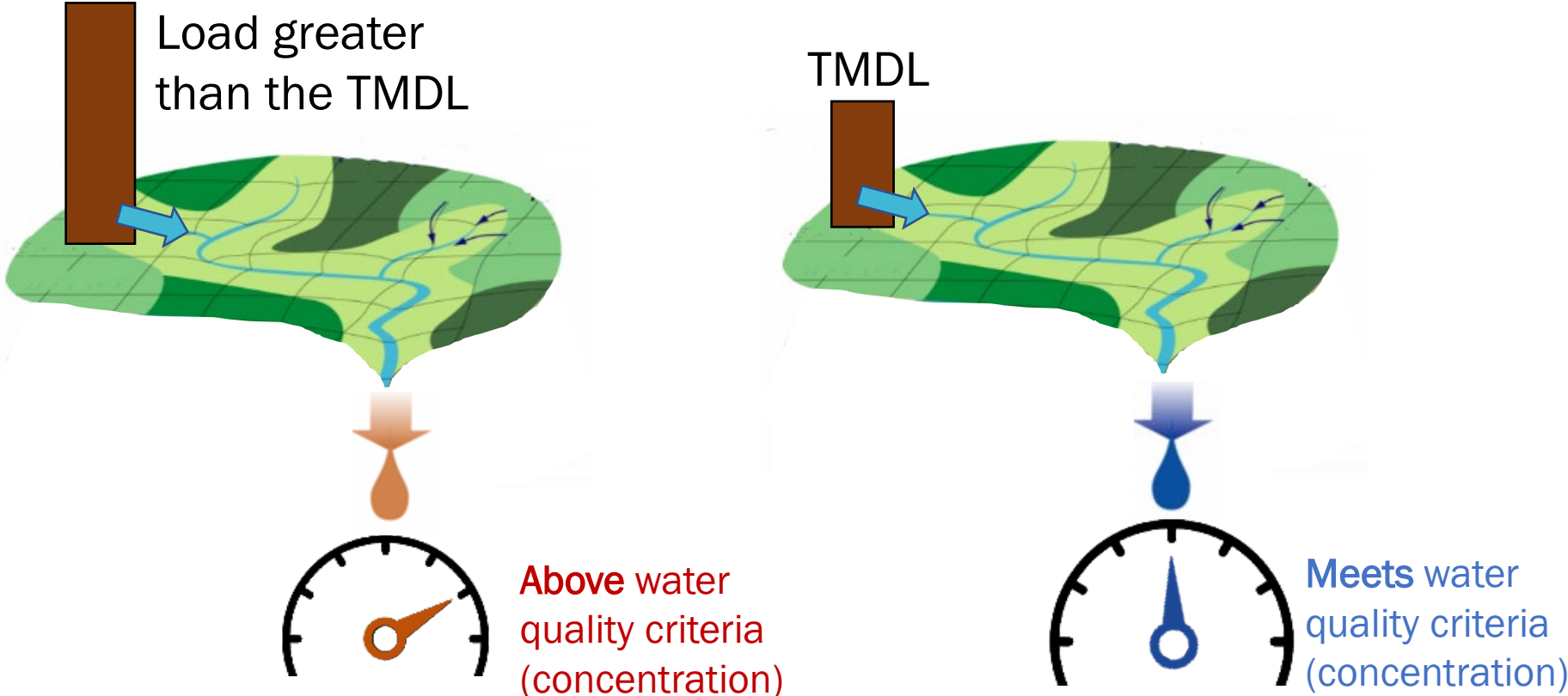
Des Plaines River in Wisconsin Characteristics

FOXIL TMDL Development

TMDLs in Wisconsin

Total Maximum Daily Load (TMDL)

TMDL: Amount of a pollutant a waterbody can receive and still meet water quality standards



Total Maximum Daily Load (TMDL)

EPA requires that waters listed as impaired on Wisconsin's 303d list have TMDLs developed

$$\text{TMDL} =$$

Load Allocation



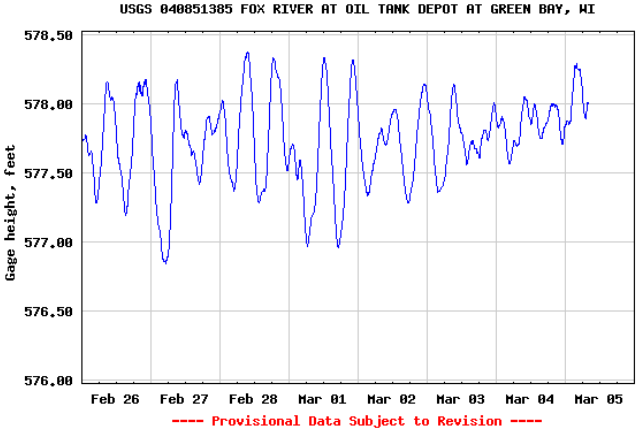
+

Wasteload Allocation



+

Margin of Safety



TMDLs for Total Phosphorus and Total Suspended Sediment



Phosphorus (TP)

Fuel excess algae growth

Decrease dissolved oxygen, harming certain fish and aquatic organisms

Decrease recreation



Total Suspended Solids – TSS

Covers rocky habitat needed by certain fish and aquatic insects



Wisconsin Phosphorus Criteria



Rivers
100 µg/L



Streams
75 µg/L



Reservoirs

- Not Stratified = 40 µg/L
- Stratified = 30 µg/L



Inland Lakes
Ranges from
15-30 µg/L



Great Lakes

- Lake Michigan = 7 µg/L
- Lake Superior = 5 µg/L

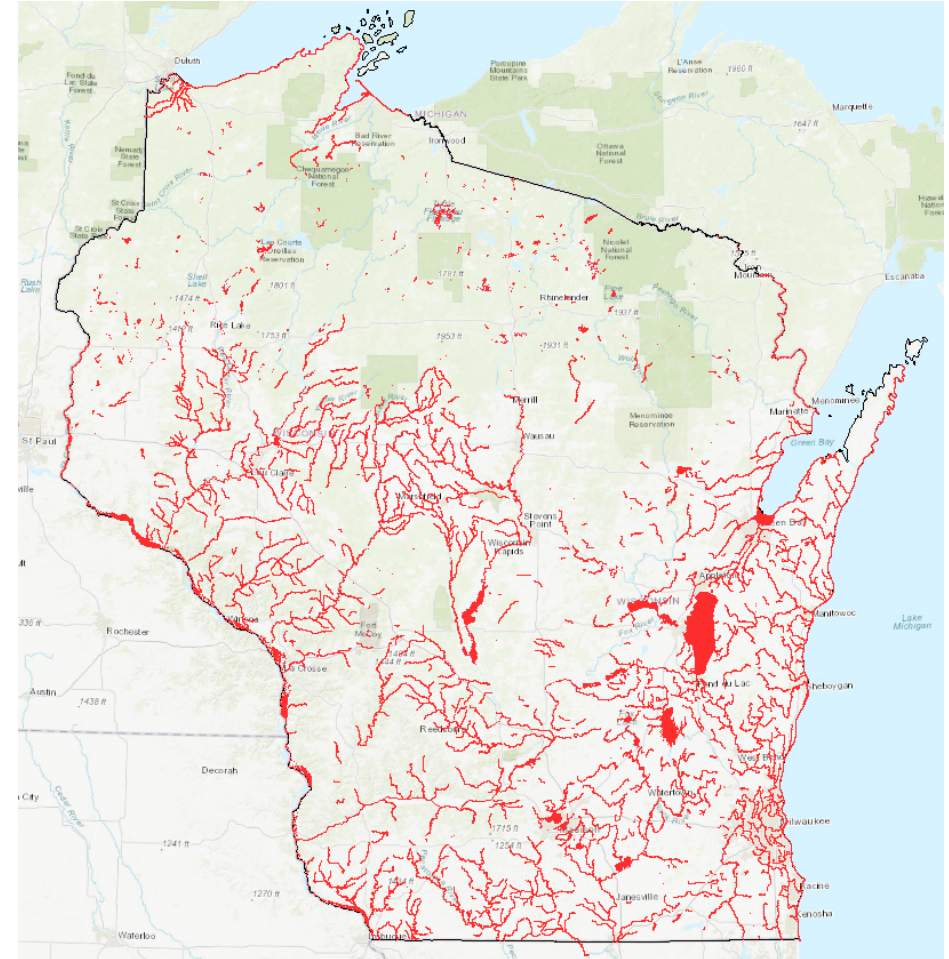
What is an Impaired Water?

Waters that do not meet designated uses or do not meet water quality criteria

2022 303(d) List:

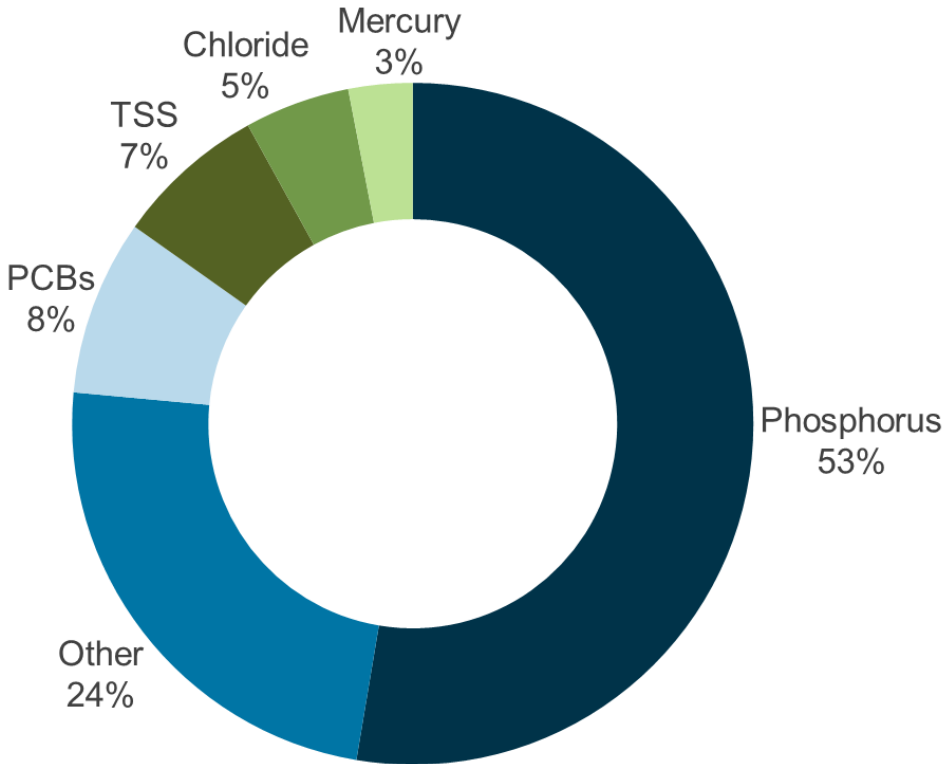
Rivers and Streams: >9,000 miles

Lakes and Impoundments: ~380

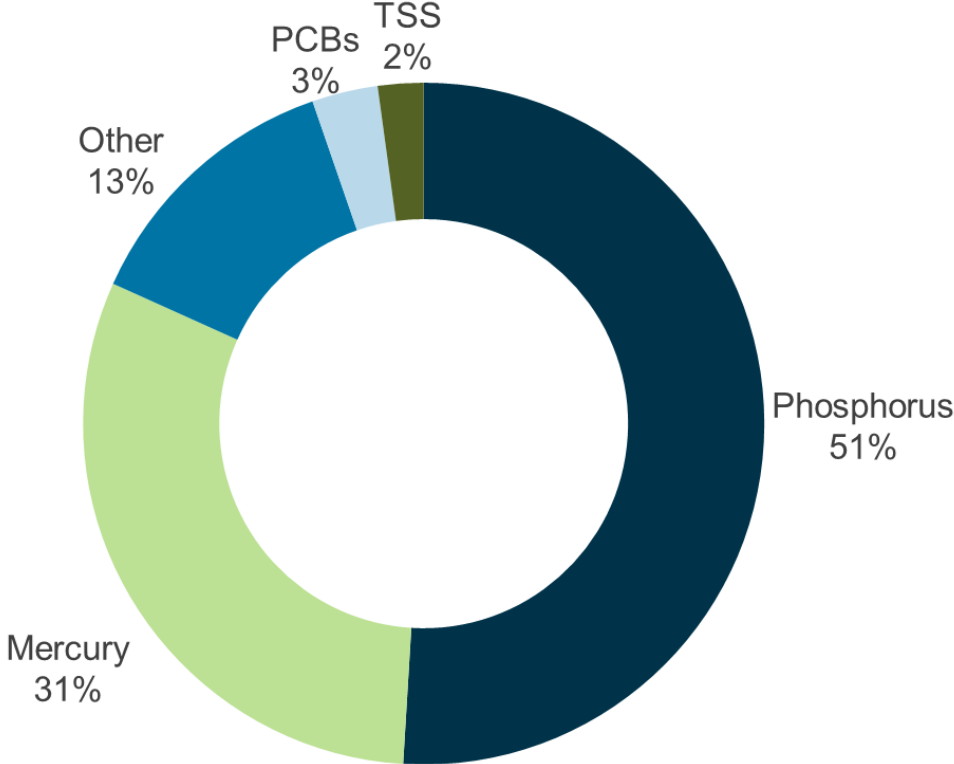


Summary of 2022 List

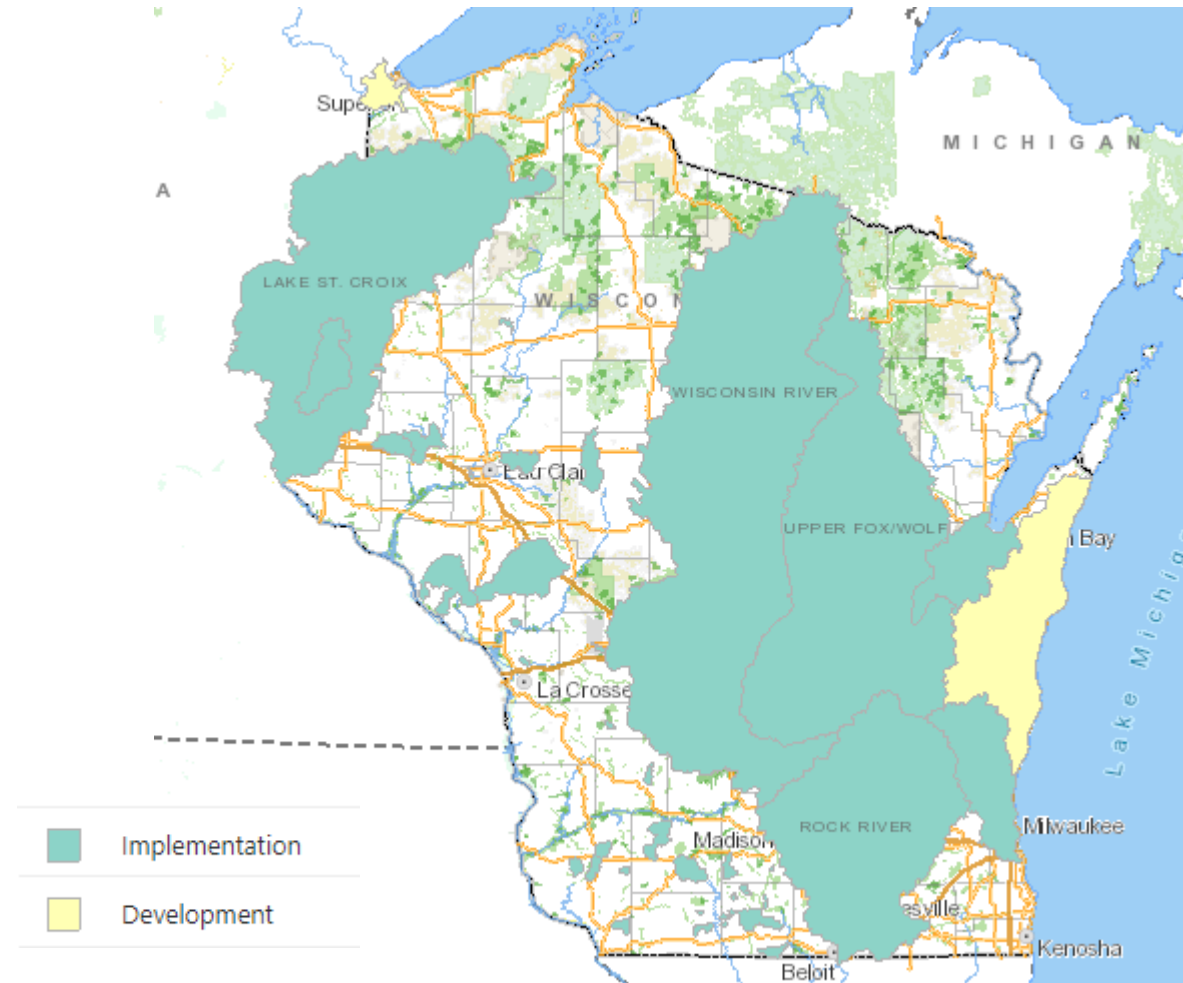
Rivers and Streams



Lakes and Impoundments

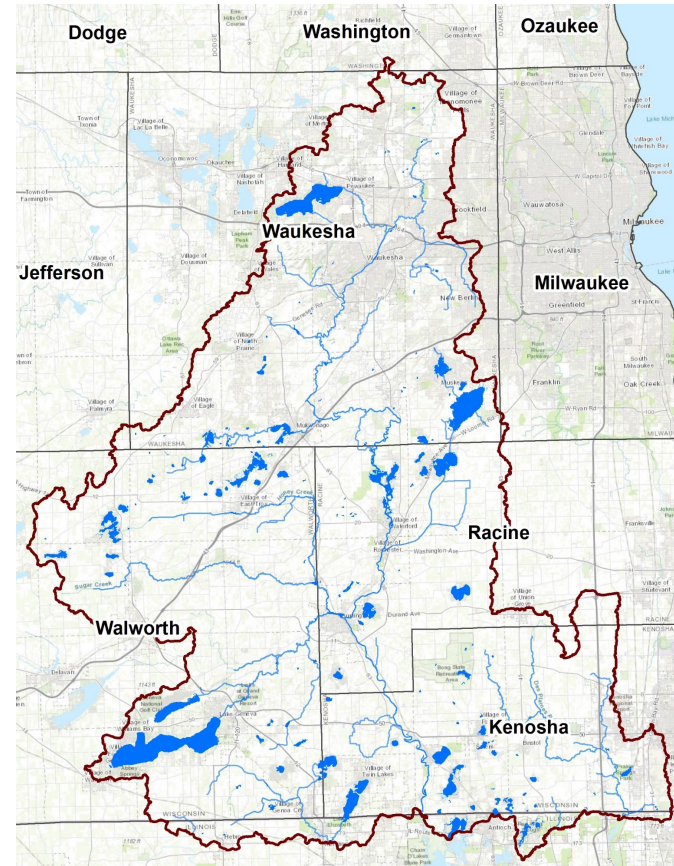
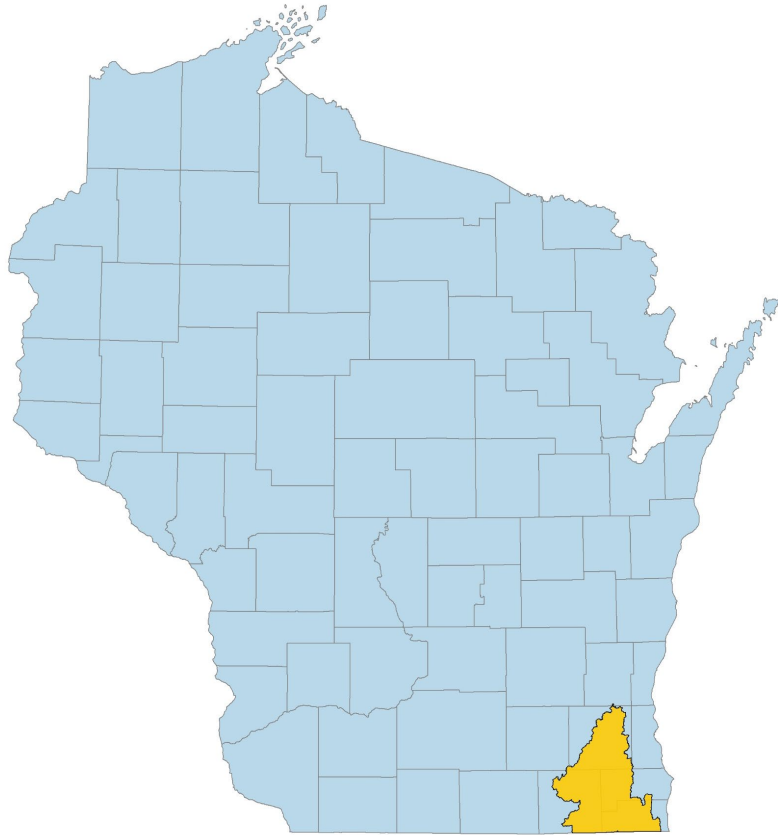


Impaired Waters and TMDLs in Wisconsin



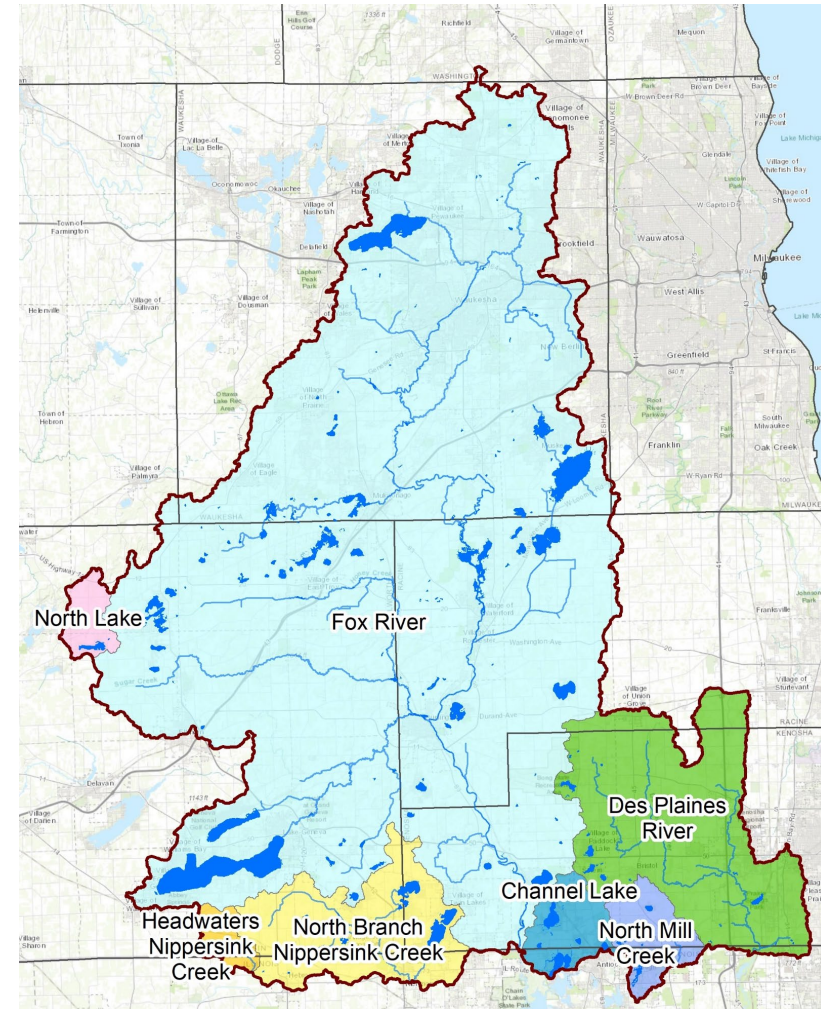
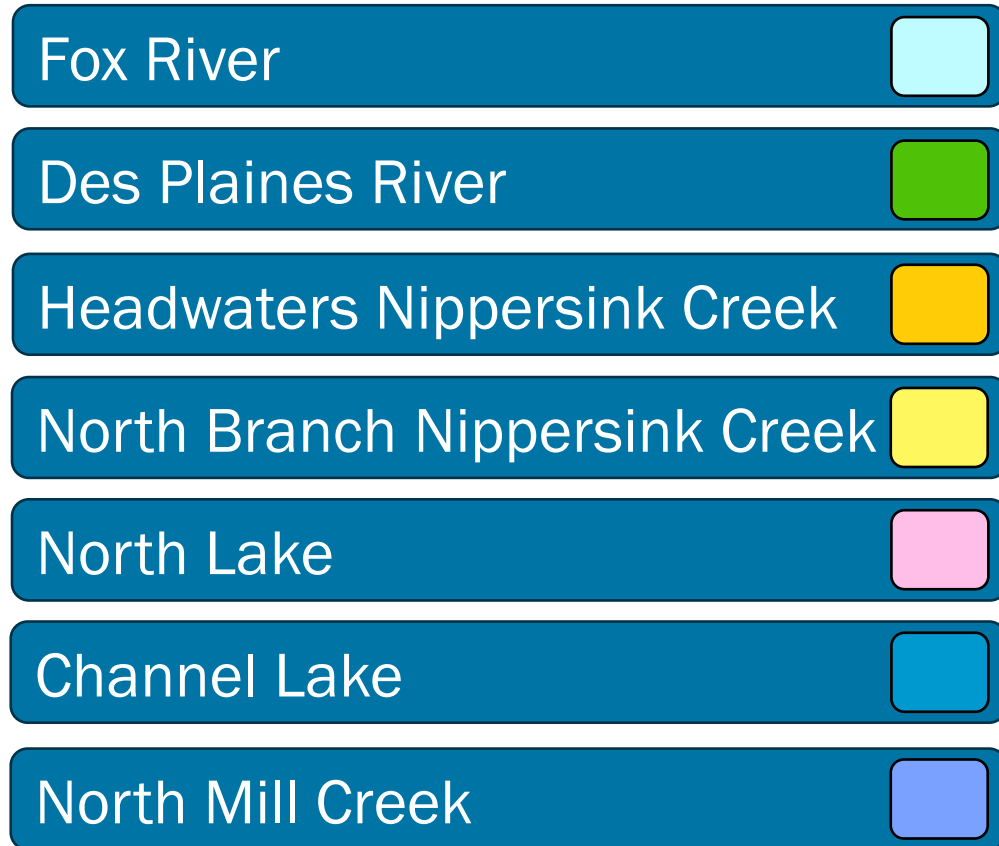
FOXIL TMDL Project Setting

FOXIL TMDL Project Extents and Counties



Primary Counties: Waukesha, Walworth, Kenosha, Racine

FOXIL TMDL Watersheds



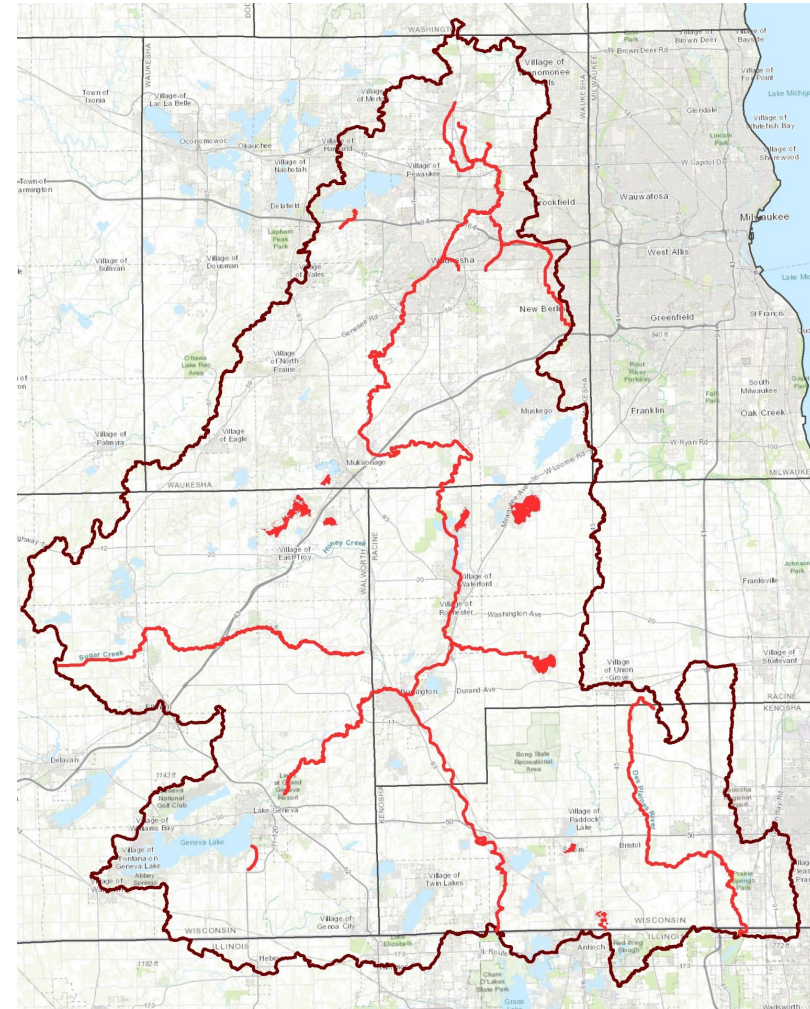
TP Impairments – 303(d) List

River and Stream Impairments

11 named streams/ivers
~170 stream miles

Lake Impairments

9 lakes
1 impoundment (Fox River)



TSS Impairments – 303(d) List

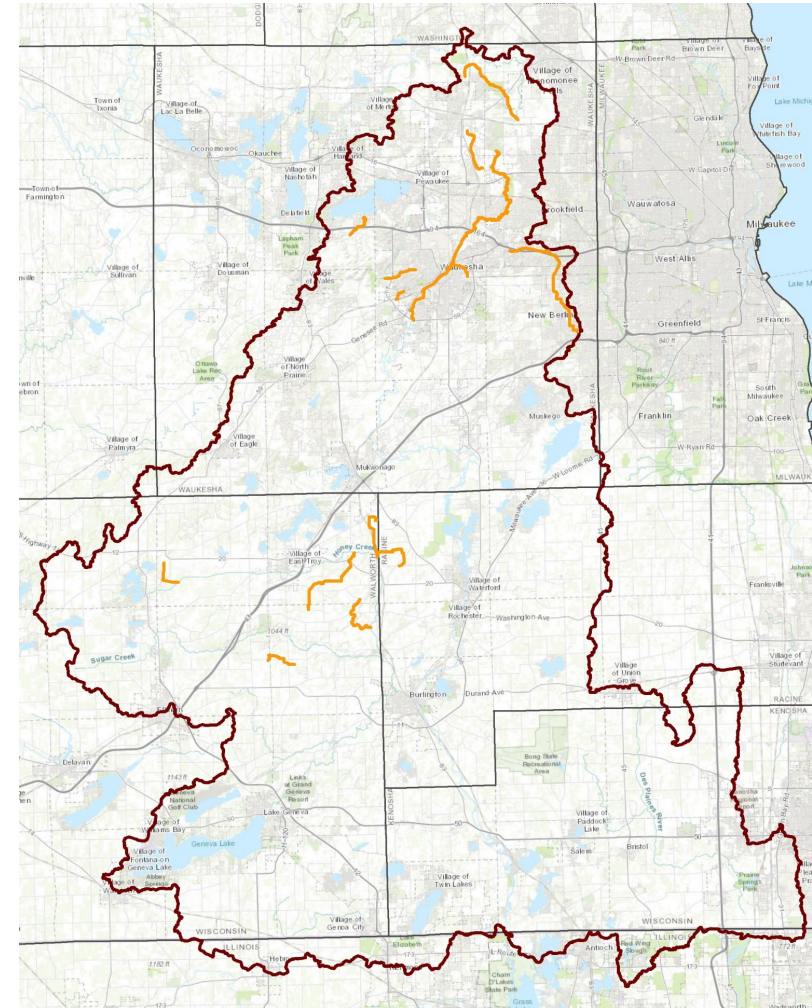
River and Stream Impairments

7 named streams/ivers

~55 stream miles

Lake Impairments

1 impoundment (Fox River)



Des Plaines River Watershed Characteristics

Des Plaines Watershed in Wisconsin

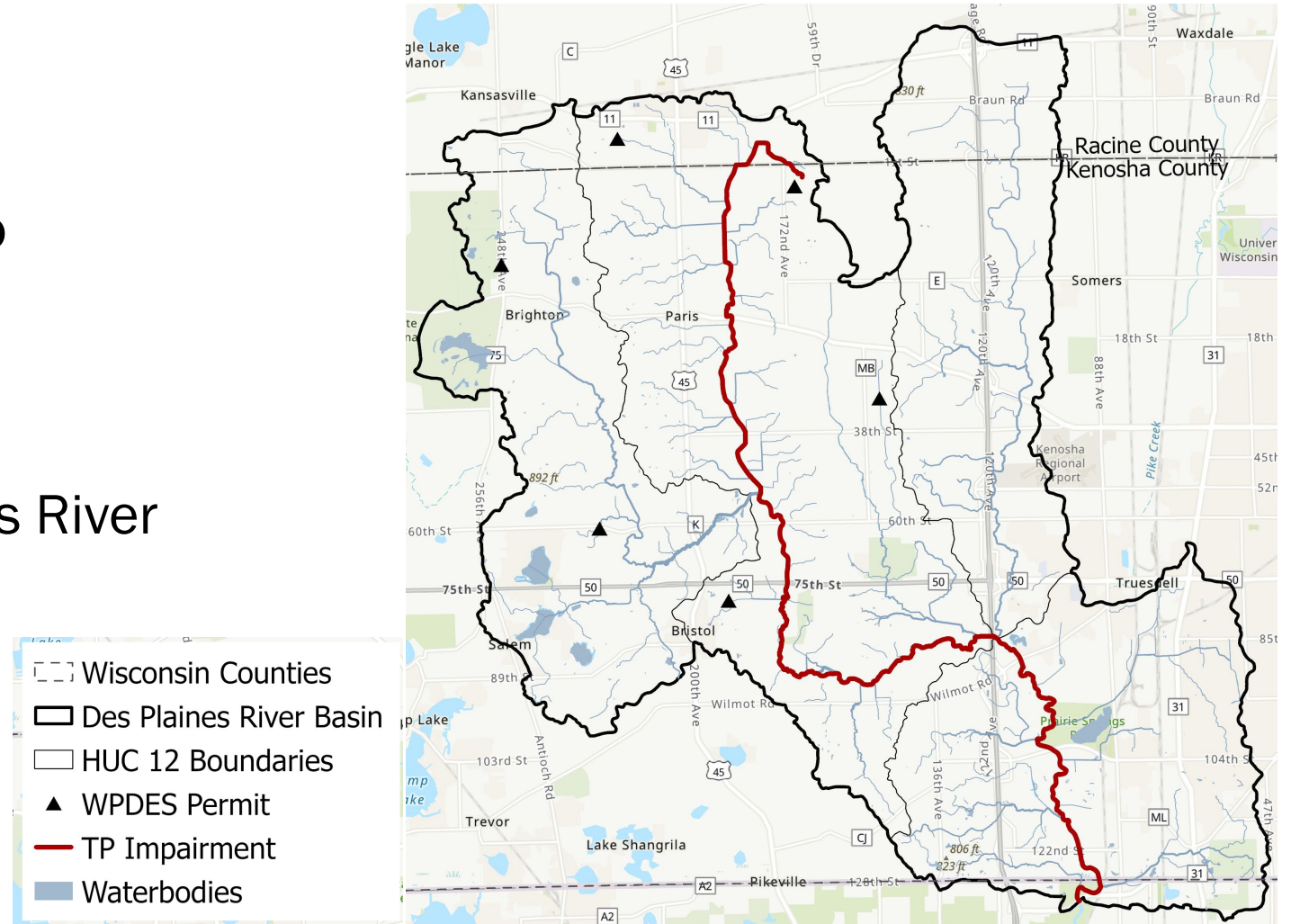
Characteristics

121 square miles across two counties

4 HUC 12s watersheds

TP Impairment in Des Plaines River

6 WPDES permits



Des Plaines Watershed

Main Land Use Categories

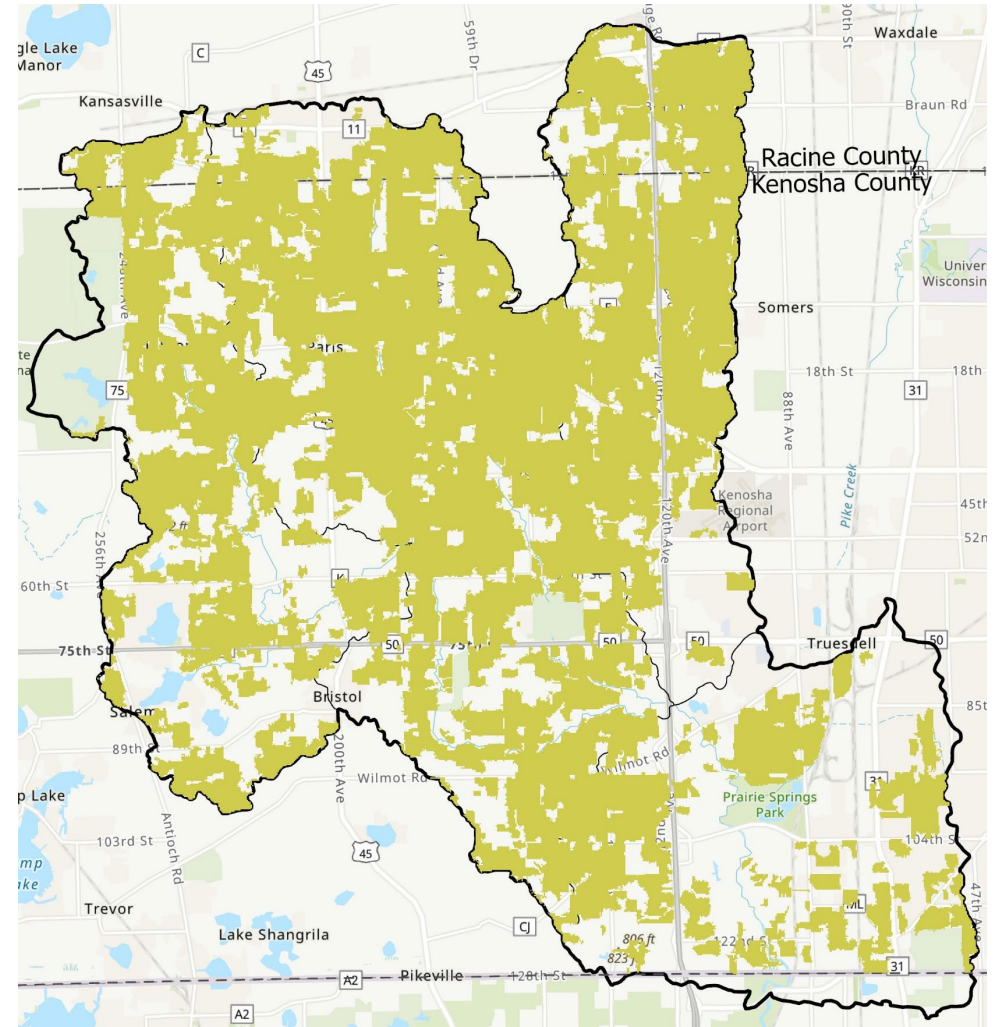
Cropland: 58%

Cash Grain: 83%

Dairy Rotation: 11%

Continuous Corn: 4%

Potato/Vegetable: 3%



Des Plaines Watershed

Main Land Use Categories

Cropland: 58%

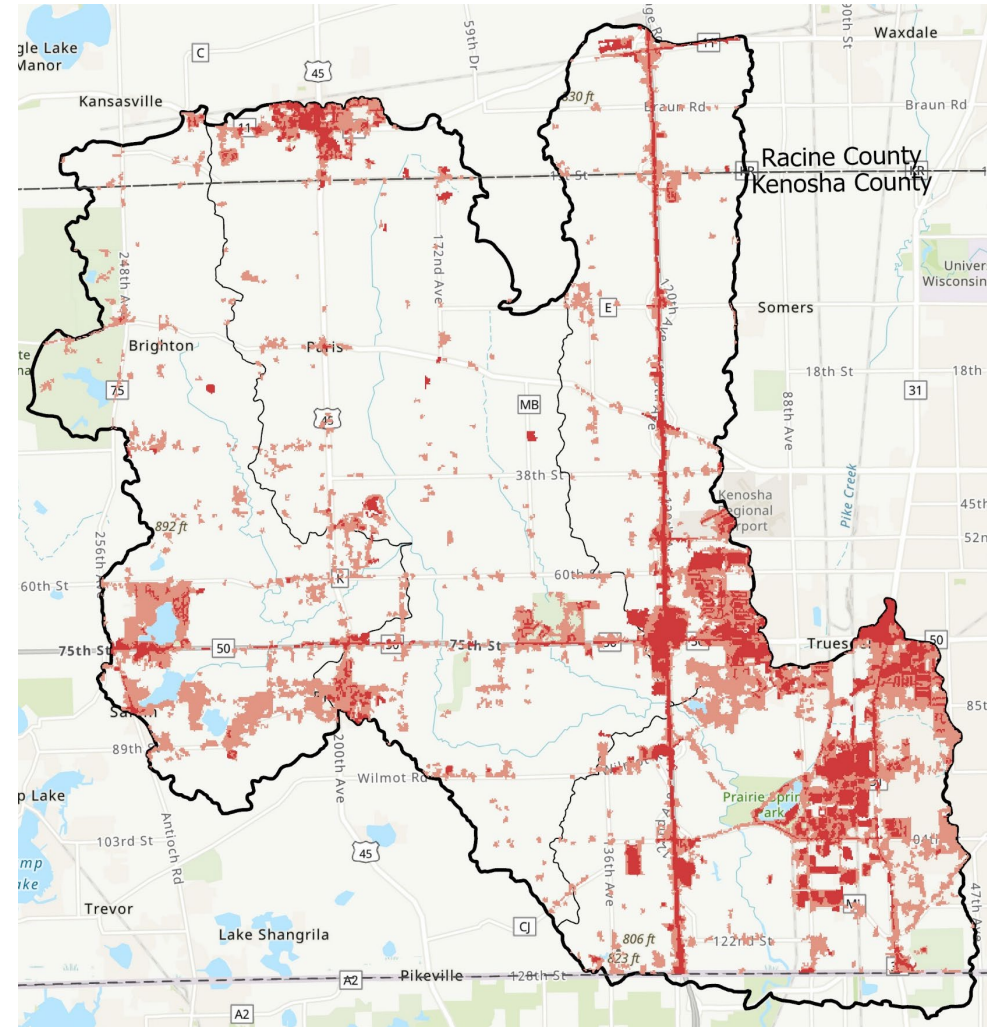
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Developed Lands: 16%



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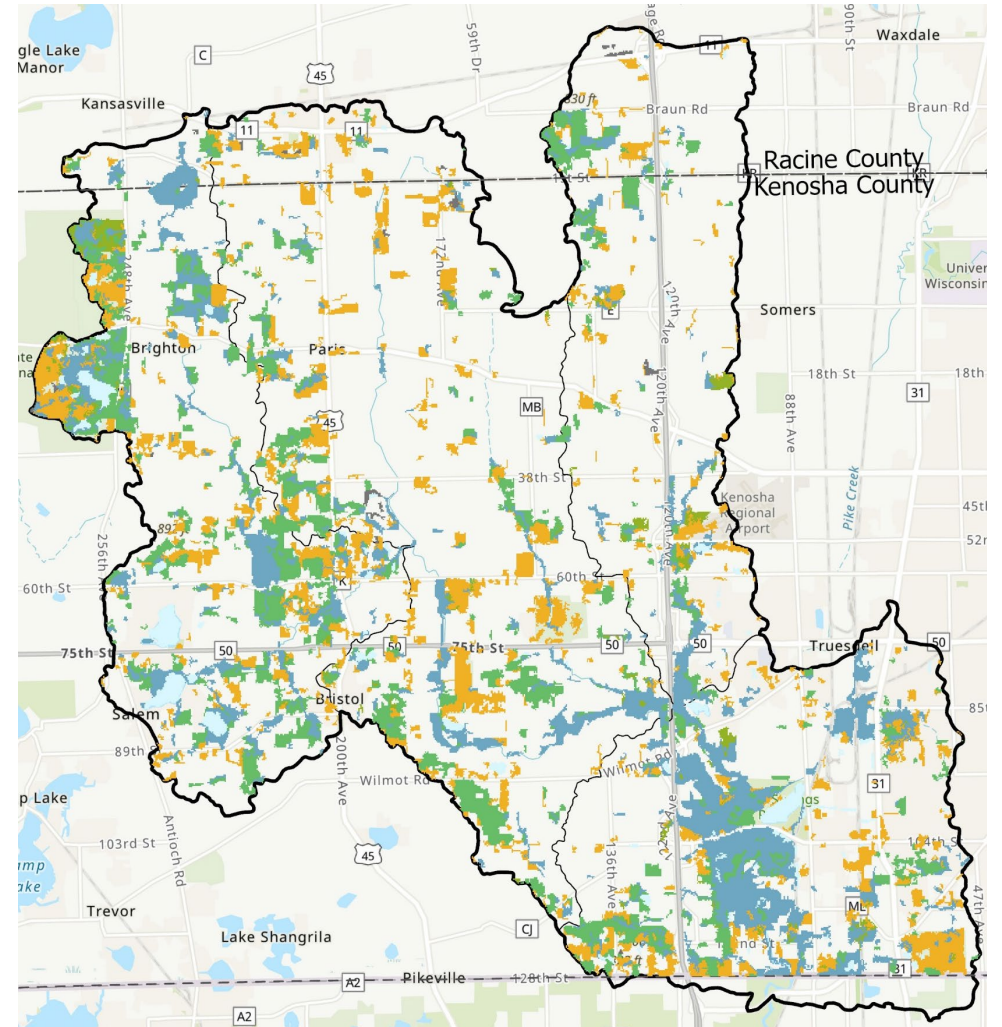
Potato/Vegetable: 3%

Developed Lands: 16%

Grasslands: 8%

Wetlands: 8%

Forest: 7%



Des Plaines Watershed

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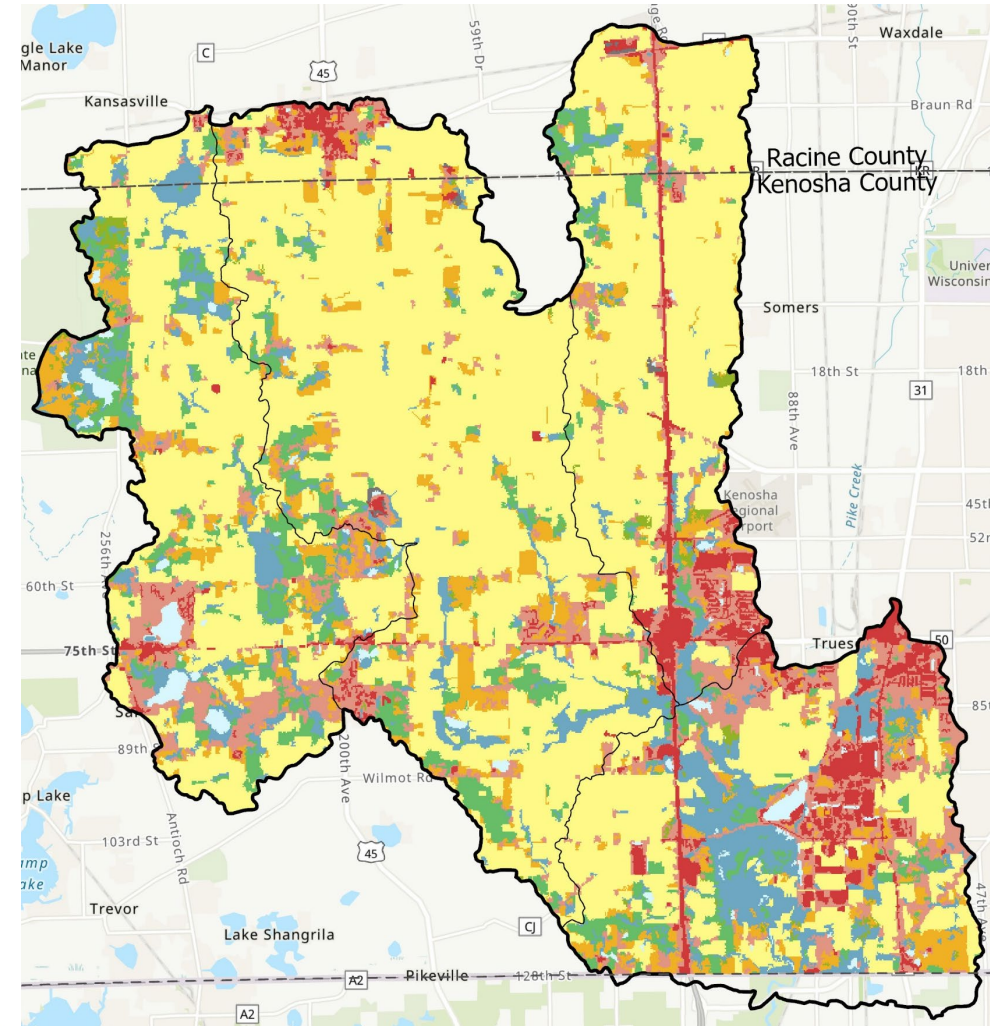
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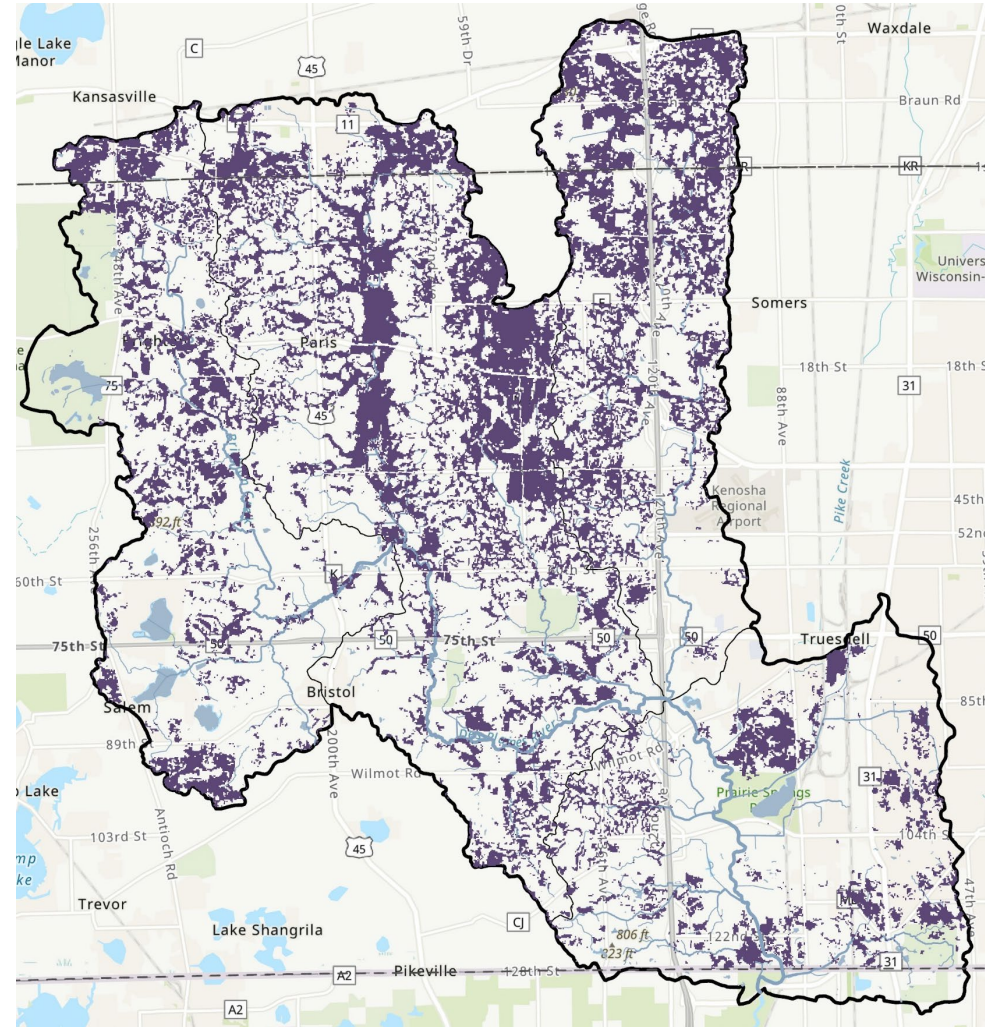
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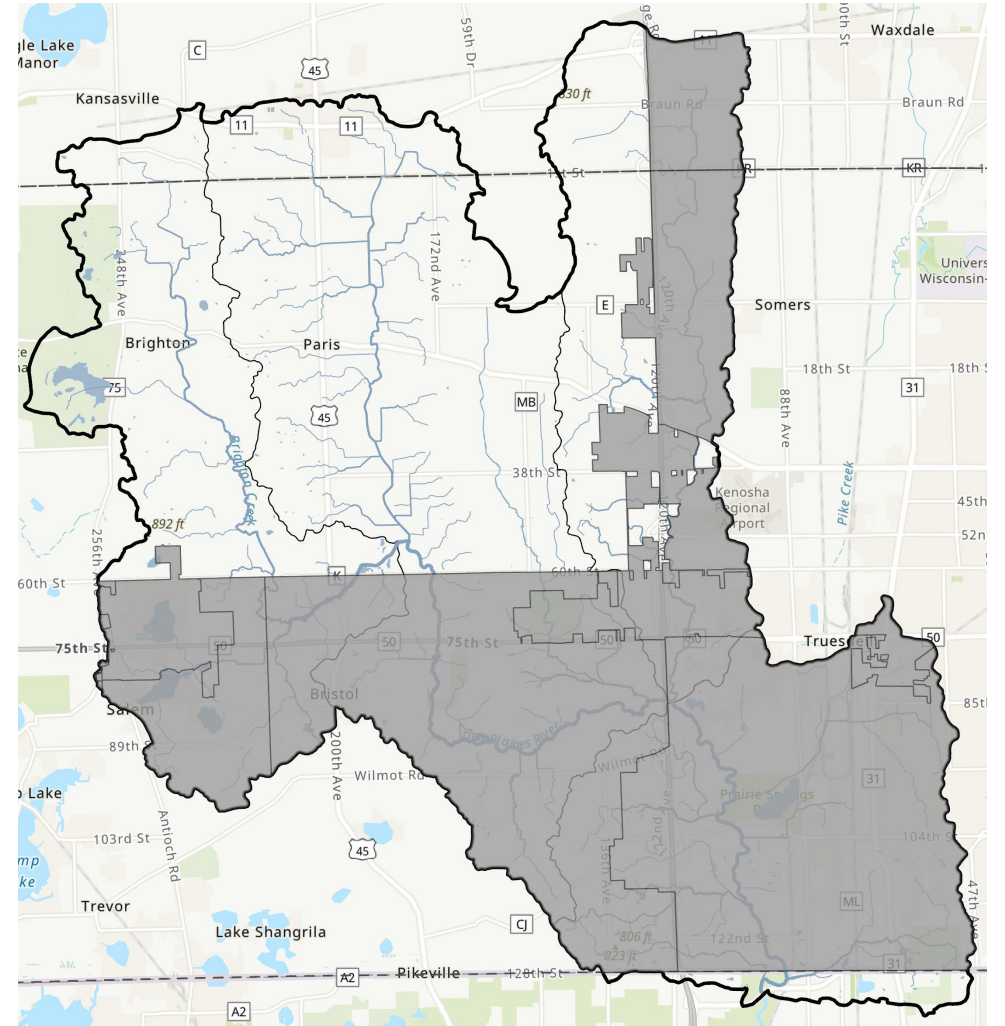
Des Plaines Tile Drainage

>40% of cropped lands are drained by tiles

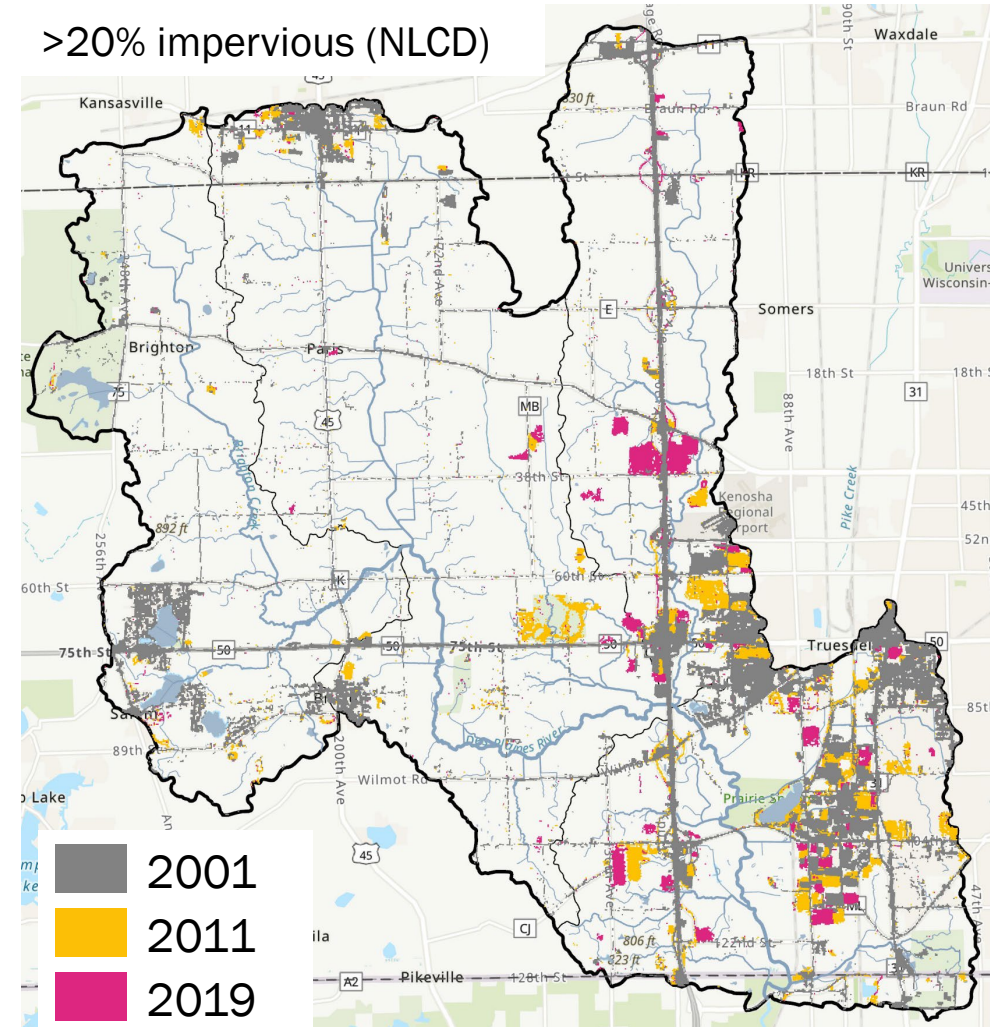
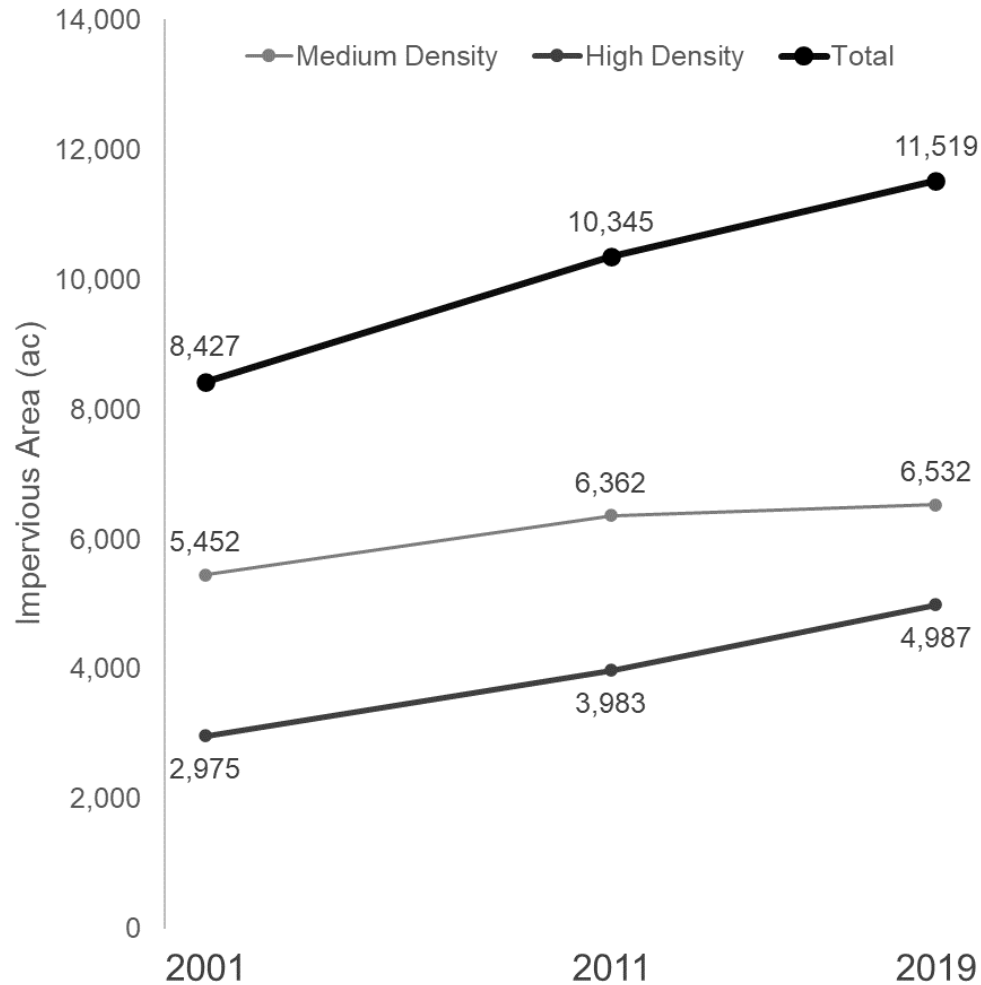


Des Plaines MS4s

8 MS4 permittees
7 Cities and Villages
1 Township



Des Plaines Impervious Surfaces



Des Plaines River TP Water Quality

Water Quality Monitoring

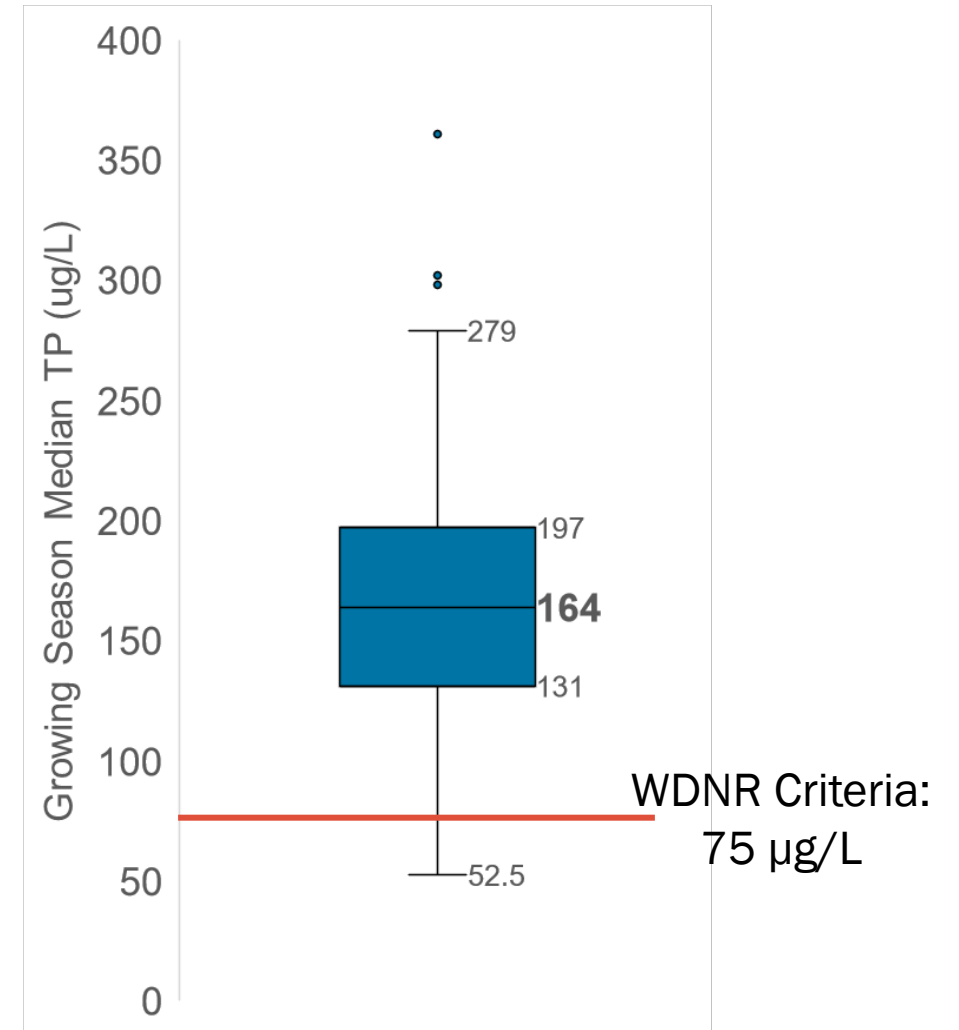
Des Plaines River at 122nd Street

February 2020 to May 2022

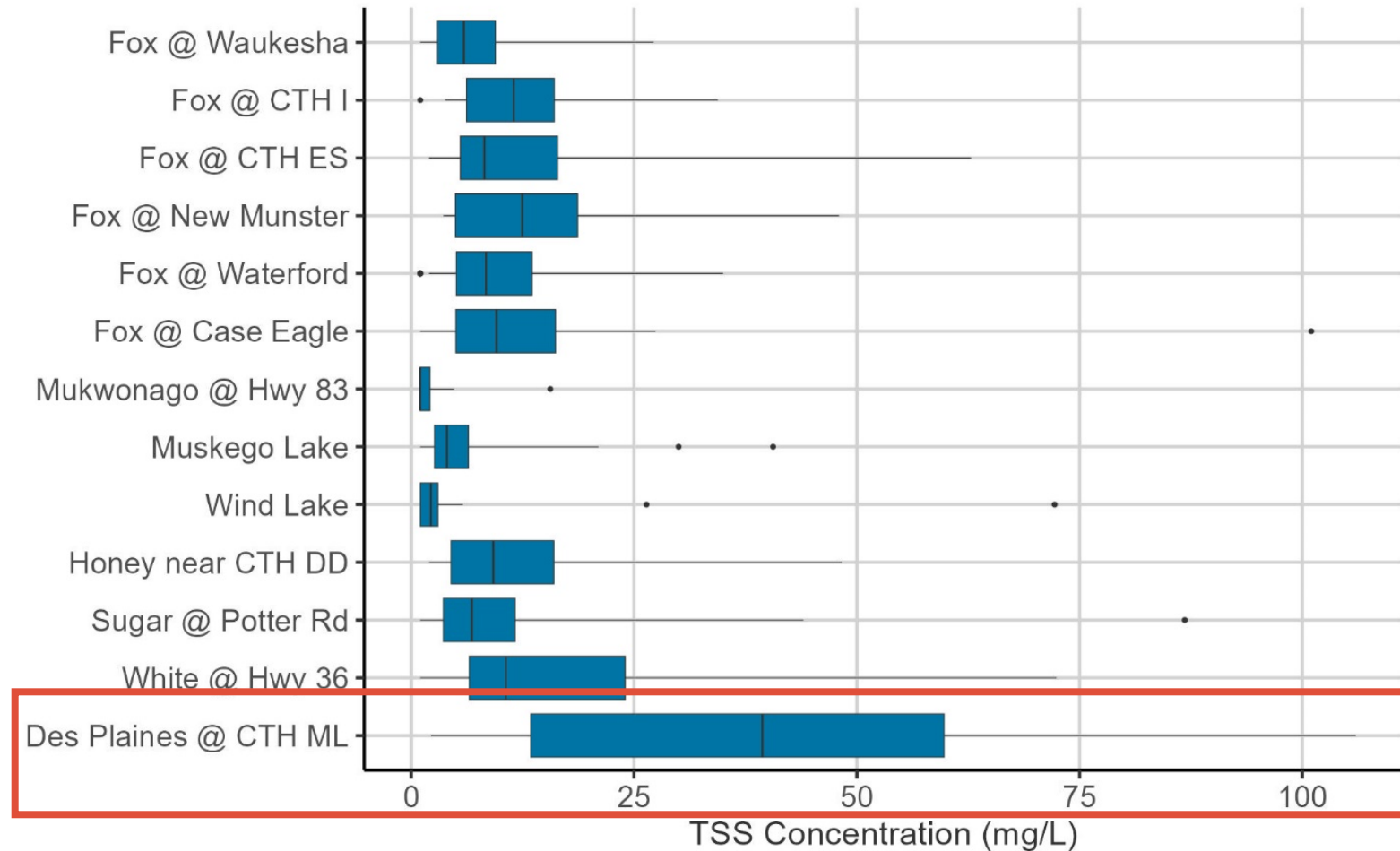
37 Samples

Growing Season Median: 164 $\mu\text{g/L}$

Growing Season May 1st through October 31st



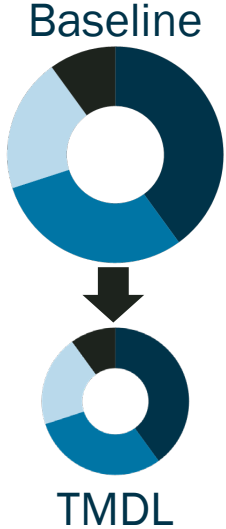
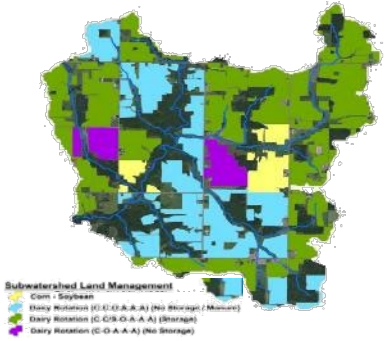
Des Plaines River TSS Water Quality



FOXIL TMDL Development

Total Phosphorus and Total Suspended Solids

TMDL Development Overview



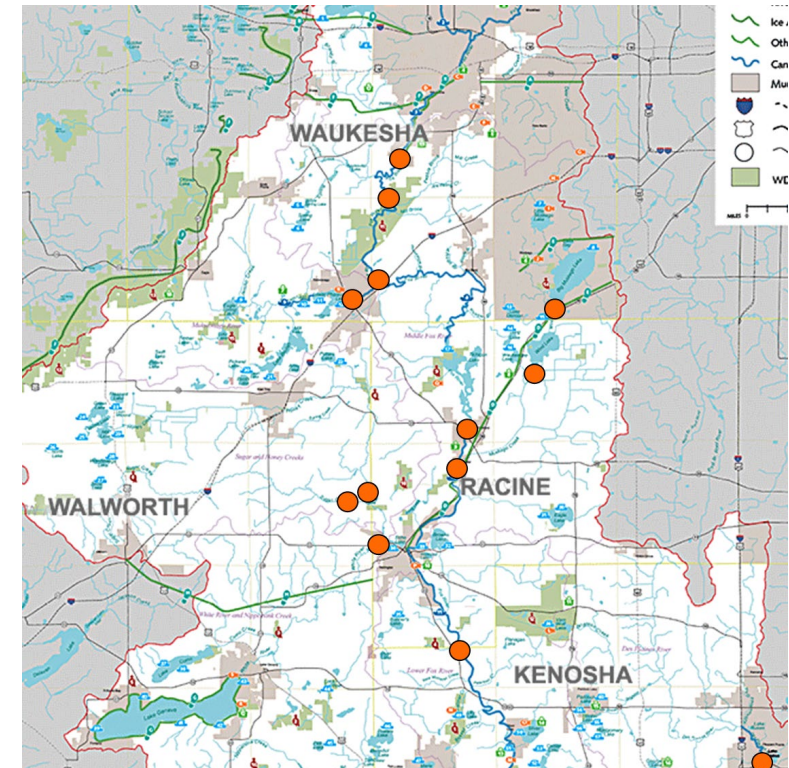
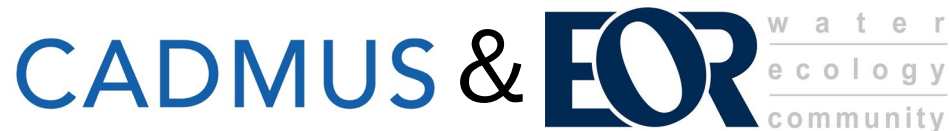
Completed Phase: Monitoring



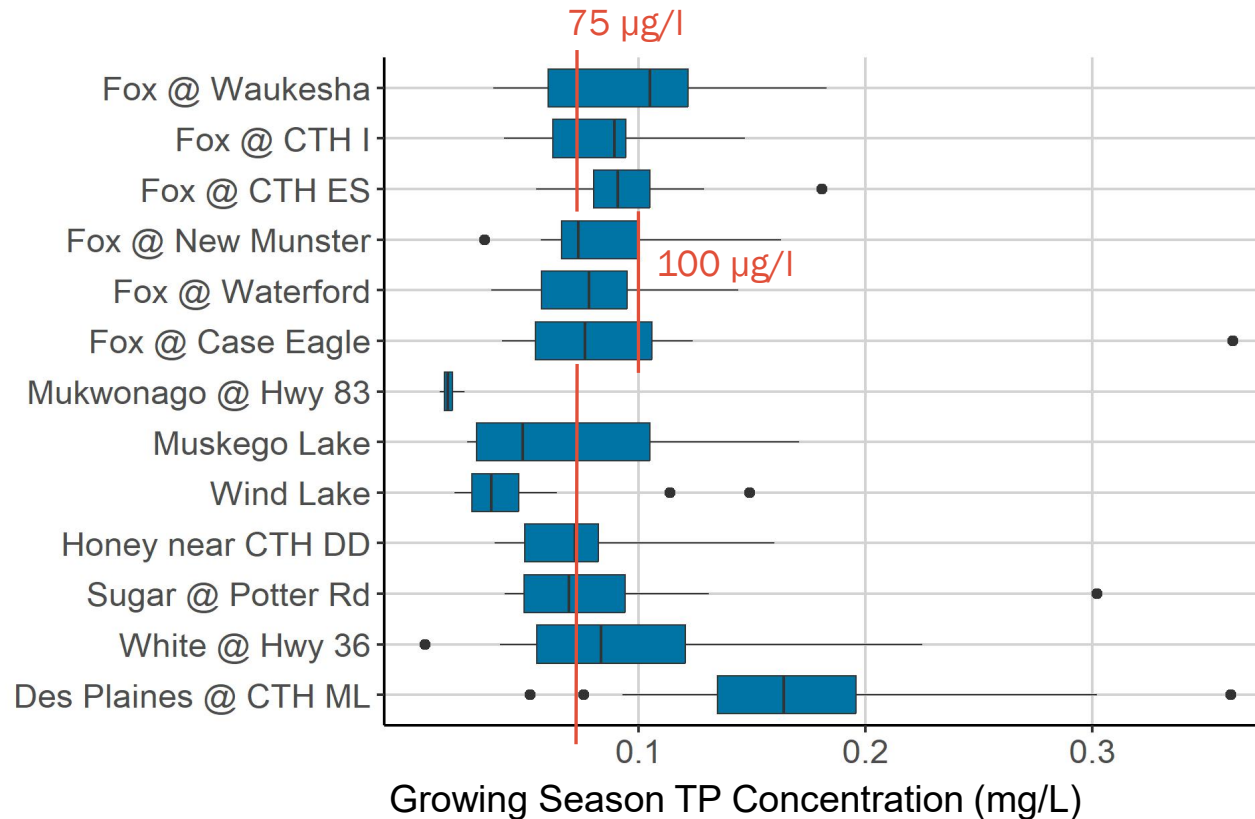
Monitoring Sites: 13 total

- *Chemistry (TP, TSS, Ortho-P)*
- *Flow (Stage and Discharge)*

Dates: late-2019 through mid-2022



Completed Phase: Monitoring



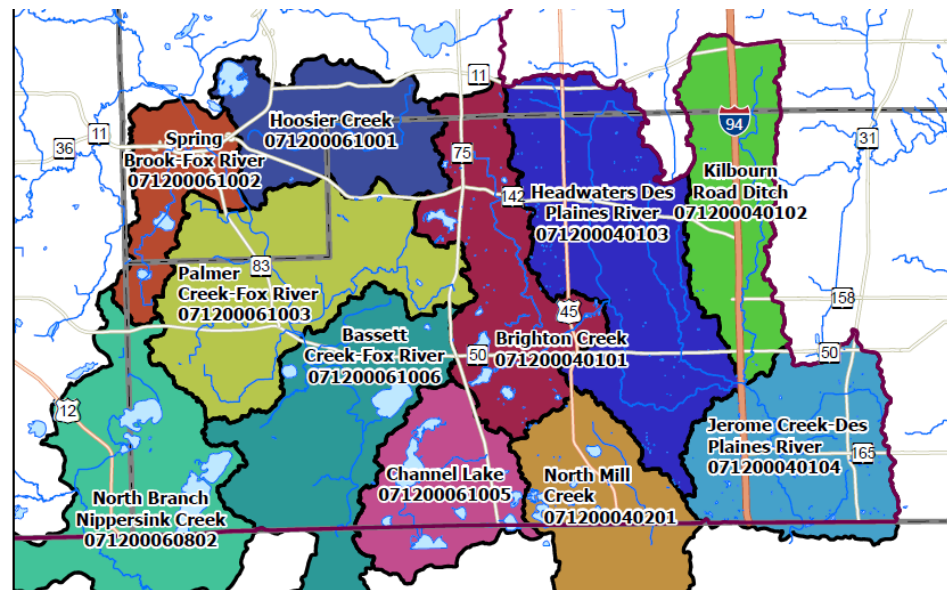
Current Phase: Conceptualization



Agricultural Surveys

- Summarize agricultural practices in HUC 12s
- Sent to County Conservationists in December 2022, responses in February and March

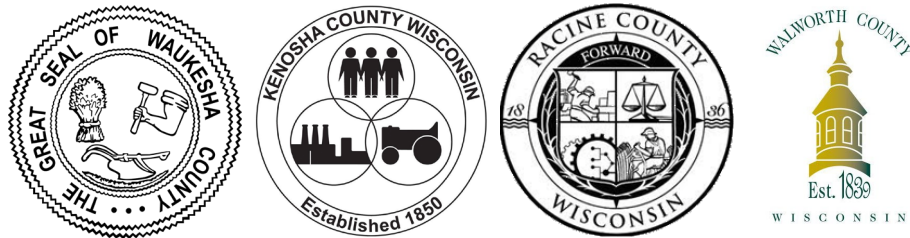
Fox-Des Plaines TMDL:
Agricultural Land Management Questionnaire for
Kenosha County



Current Phase: Conceptualization



County Conservationists



Treatment Plant Managers



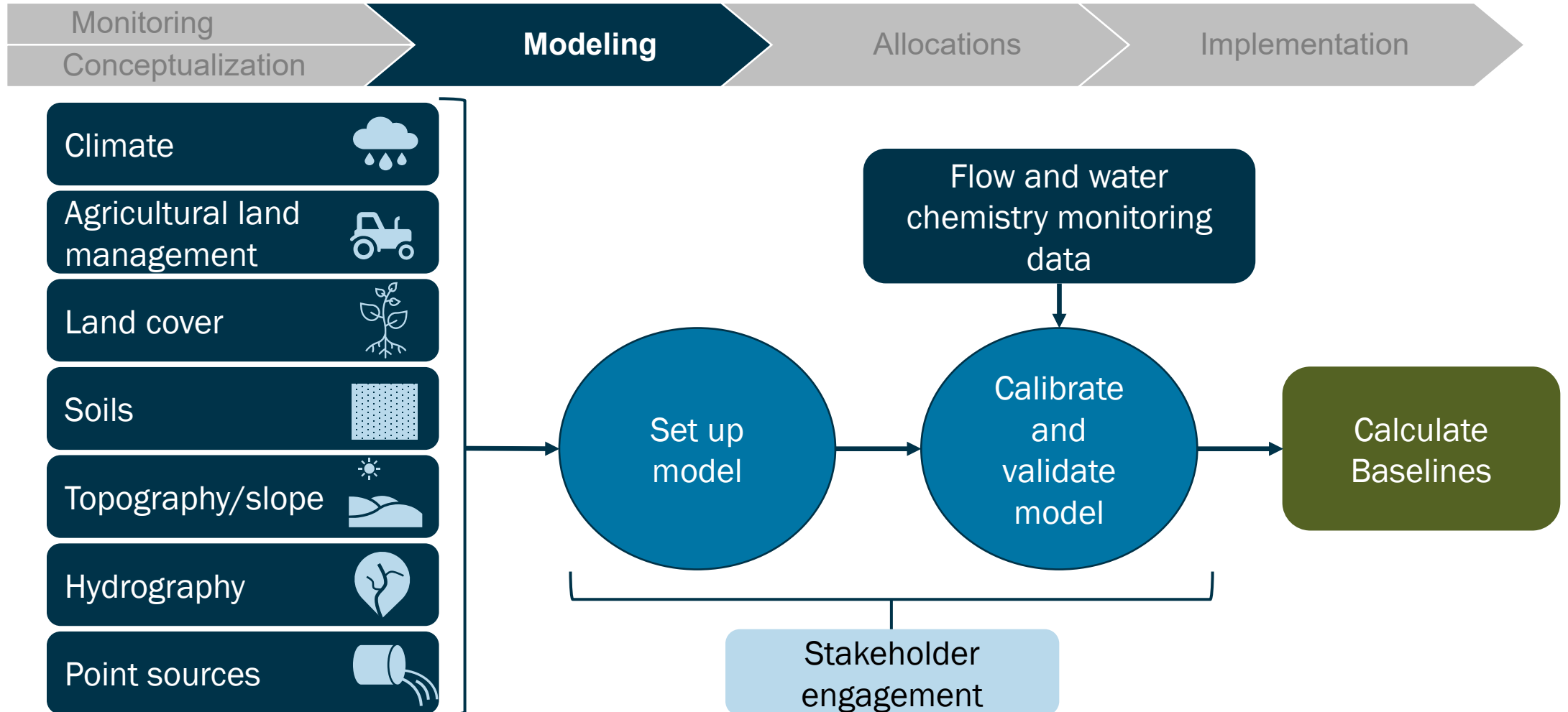
MS4 Permittees & Municipalities



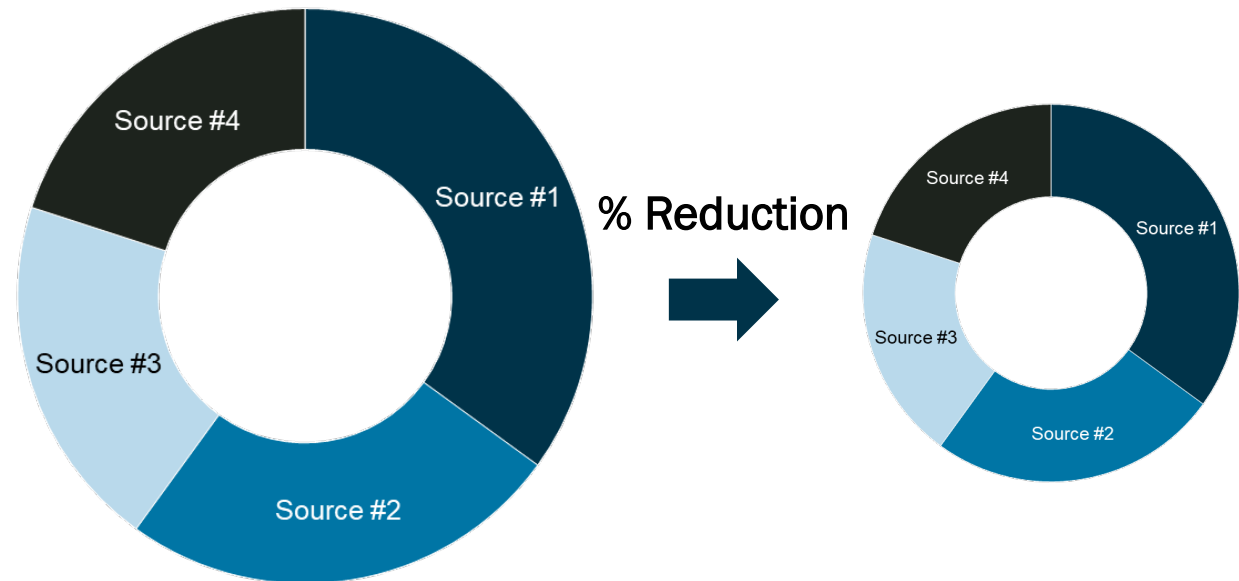
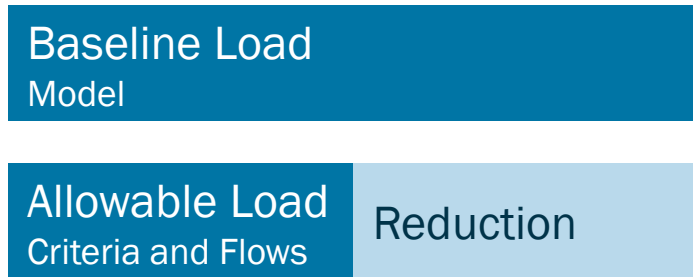
Additional Stakeholder Groups



Future Phases: Watershed Modeling



Future Phases: Allocations



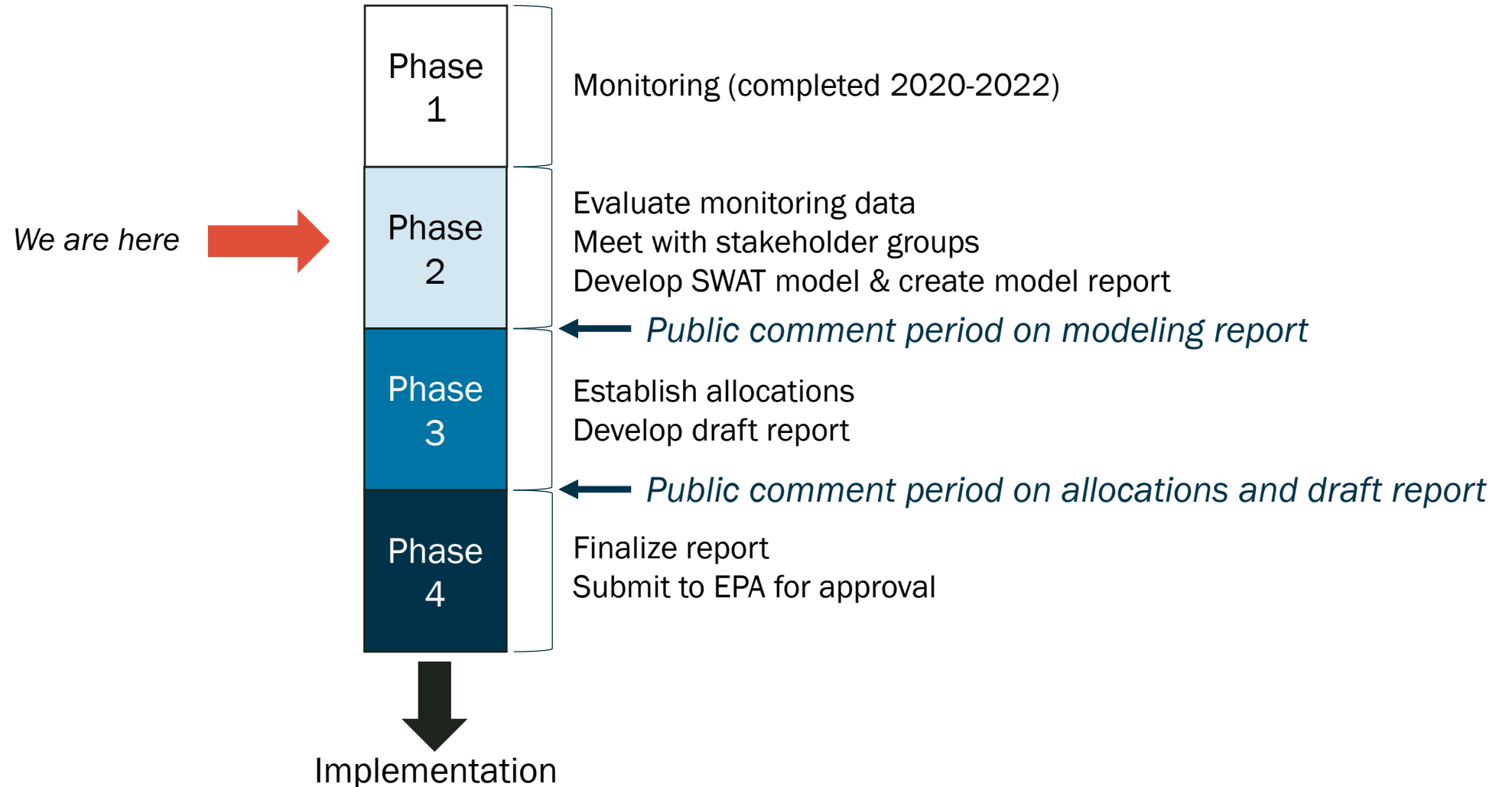
TMDL Process: Implementation



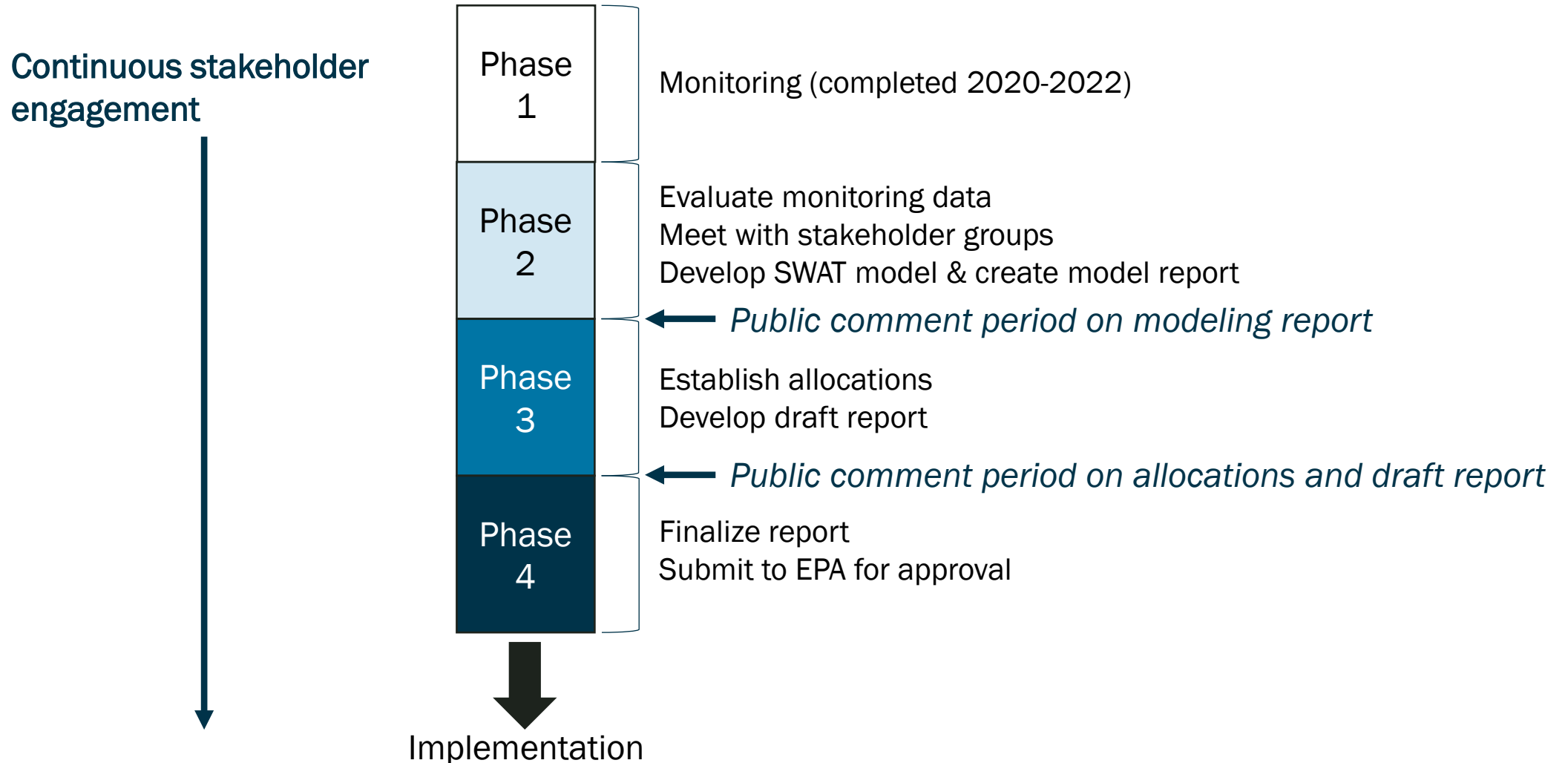
Framework for Implementing Management Practices

- Incorporate TMDL wasteload allocations into permit limits
- Provide additional support and context for existing implementation plans
- Prioritize high-loading watersheds & locations

Summary of Next Steps



Summary of Next Steps



Staying Connected

dnr.wisconsin.gov/topic/TMDLs/FOXIL

or search for

“Fox Illinois TMDL” on dnr.wi.gov

1. Subscribe to GovDelivery email list for updates

 [Subscribe to receive updates about the Fox Illinois River Basin TMDL.](#)

2. Watch the Kickoff Webinar, which was held on Feb. 15

PAST WEBINARS

▲ Project Introduction Webinar - Feb. 15, 2023

A public informational webinar was held to introduce the DNR-led water quality study titled “Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Fox Illinois River Basin.” This informational webinar provided an overview of the TMDL development process, the TMDL study area and the results of the initial monitoring efforts.

- Recorded presentation: [Project Introduction Webinar](#)
- [Webinar presentation slides](#)

CONNECT WITH US

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OFF THE RECORD"