Fox Illinois River Basin TMDL

A Framework for Surface Water Quality Improvement

February 15, 2023

Online Webinar

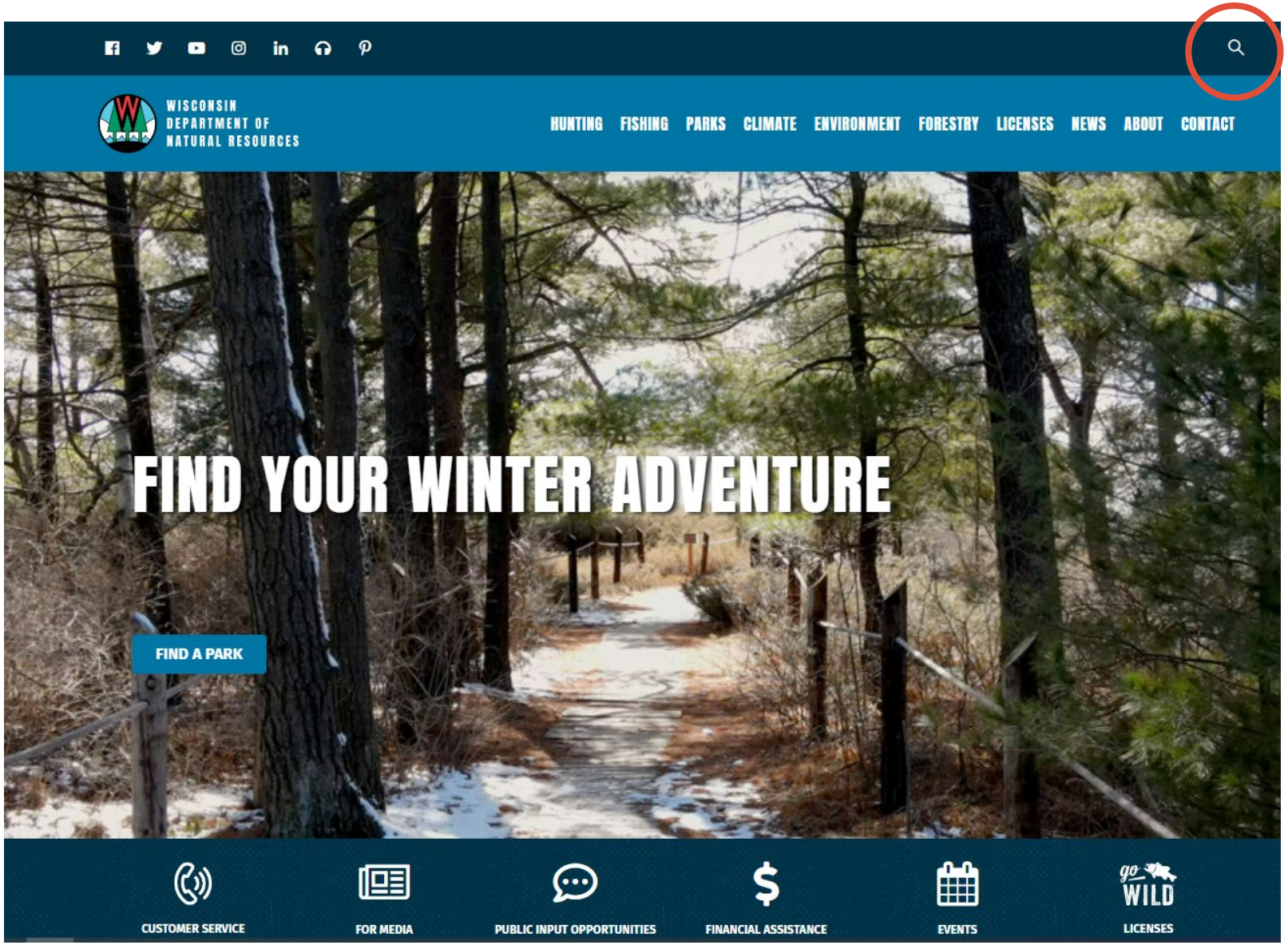
Today's Format

- Introductions
- Presentation covering TMDL process, Fox Illinois River Basin TMDL background, and water quality monitoring
- Panel to address questions

- Both the recorded presentation and slides will be available on the DNR website

https://dnr.wi.gov/topic/TMDLs/FoxIllinois.html

or search "Fox Illinois River TMDL"



dnr.wi.gov

Click magnifying glass and type “Fox Illinois River TMDL” into the search bar

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

HUNTING FISHING PARKS CLIMATE ENVIRONMENT FORESTRY LICENSES NEWS ABOUT CONTACT

» TOPIC » TMDLS

FOX ILLINOIS RIVER BASIN TMDL

A FRAMEWORK FOR WATER QUALITY IMPROVEMENT

Fox River at Waterford

Total Maximum Daily Loads (TMDLs)

- Overview
- TMDLs In Development
- Approved TMDLs
- Implementation
- Point Source
- Nonpoint Source
- Map and Projects

For more information, contact:

Eric Hettler
TMDL Modeler
Water Quality Program

GovDelivery Sign-up

Subscribe to receive updates about the Fox Illinois River Basin TMDL.

What are TMDLs?

The amount of pollutant a waterbody can receive and still meet water quality standards

Total Maximum Daily Load =

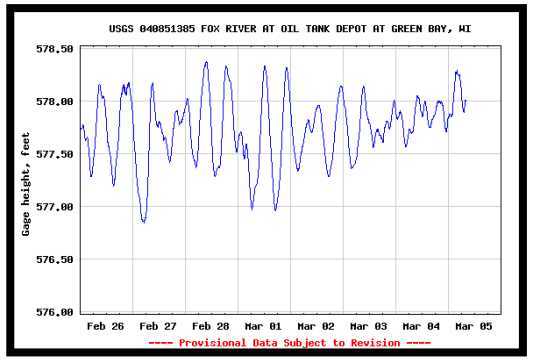
Load Allocation

+

Waste Load Allocation

+

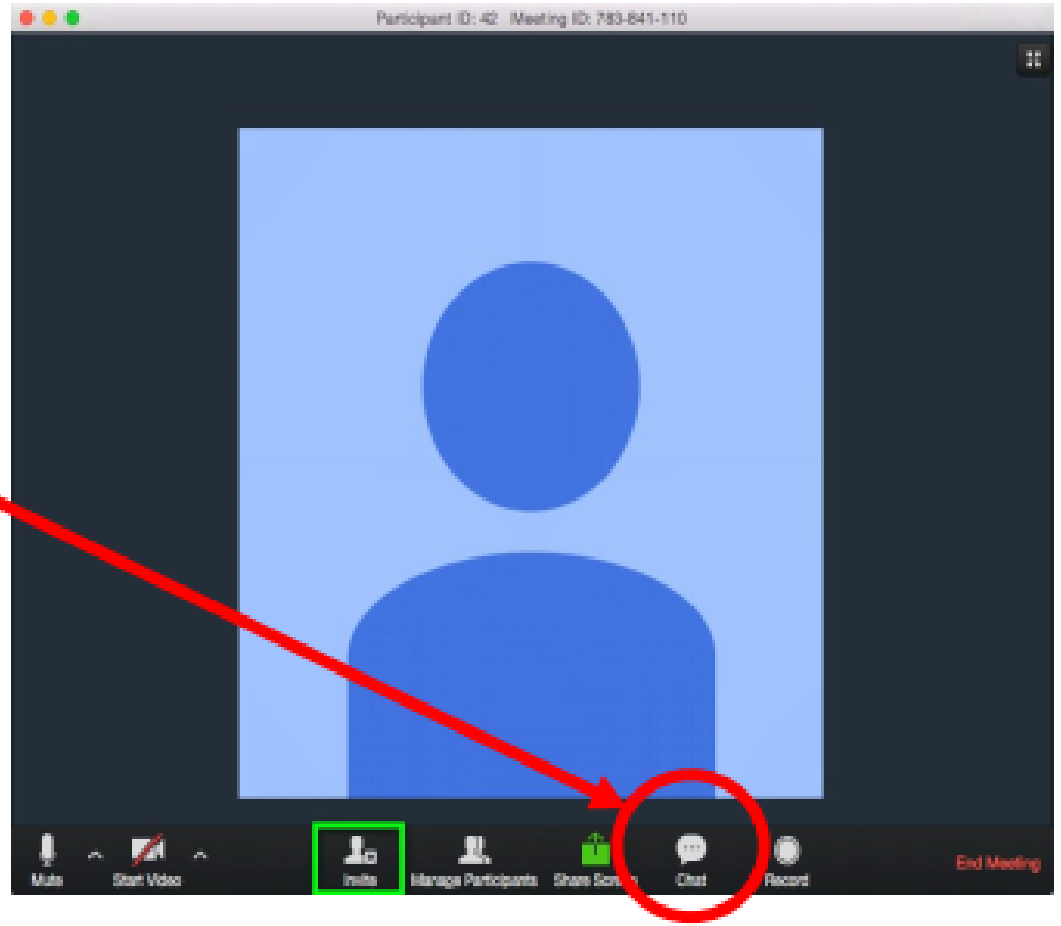
Margin of Safety



Zoom

Click **Chat** in the meeting controls.

NOTE: If don't see controls, tap screen and they will pop up.



Today's Presenters

Kevin Kirsch
Statewide TMDL Coordinator

Eric Hettler, PE
TMDL Modeler

Rachel Sabre
Monitoring Coordinator

DNR Project Team and Sector Leads

Project Coordination: Eric Hettler[1] & Kevin Kirsch[1]

Monitoring: Rachel Sabre[1]

Wastewater: Nick Lent[1] & Nicole Krueger[1]

Stormwater: Samantha Katt[2] & Pete Wood[2]

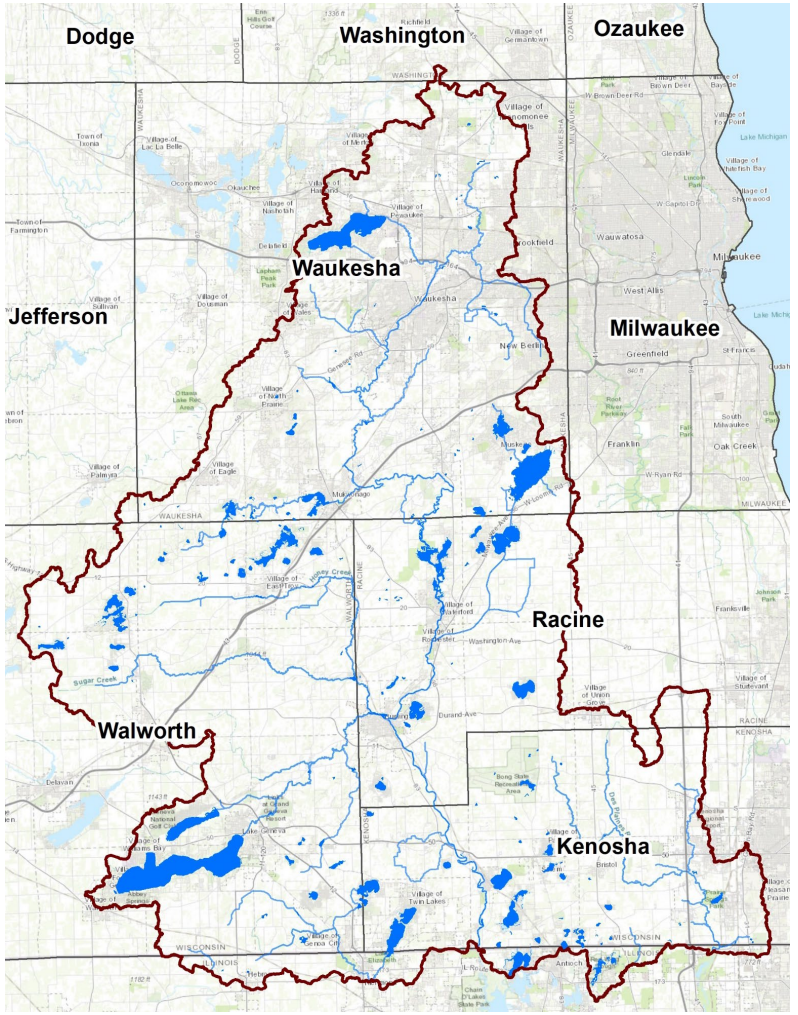
Agriculture & Urban Nonpoint: Jesse Bennett[2]

Modeling: Eric Hettler[1]

1. Water Quality (WY)
2. Watershed Management (WT)

Key Partners in the TMDL Development Process

SEWRPC
Serving the counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha

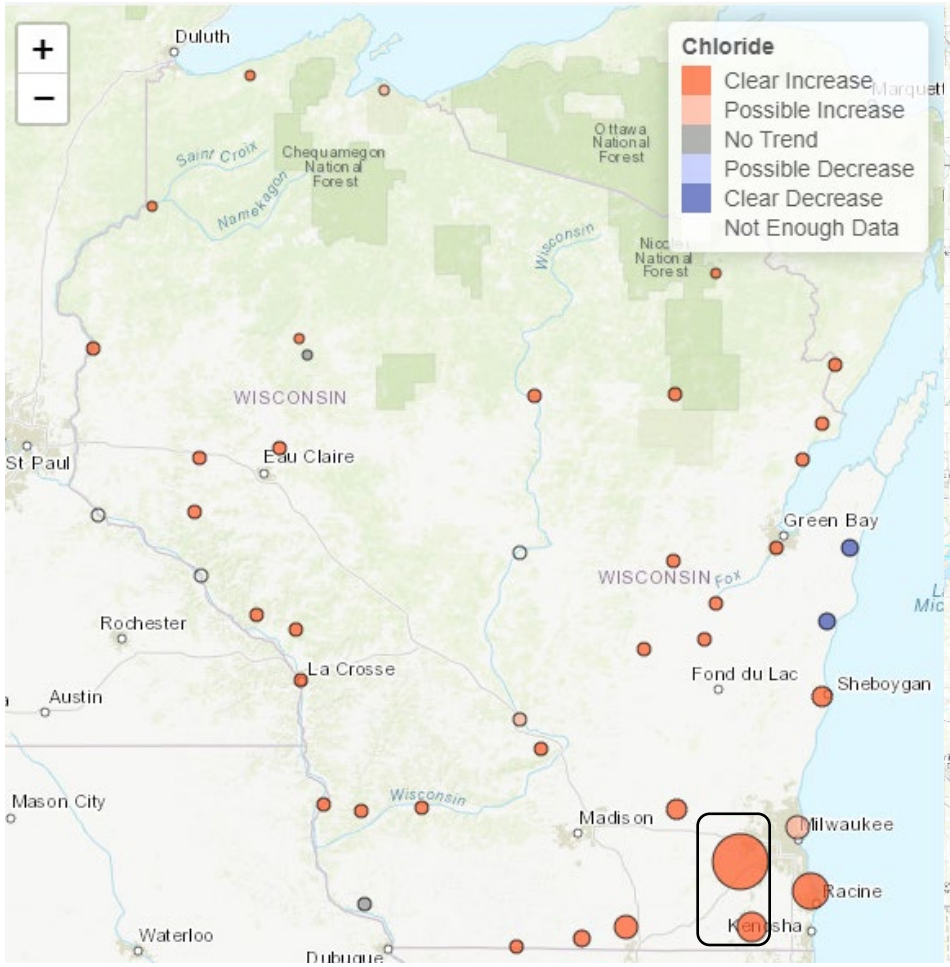


Pollutants covered by FOXIL TMDL

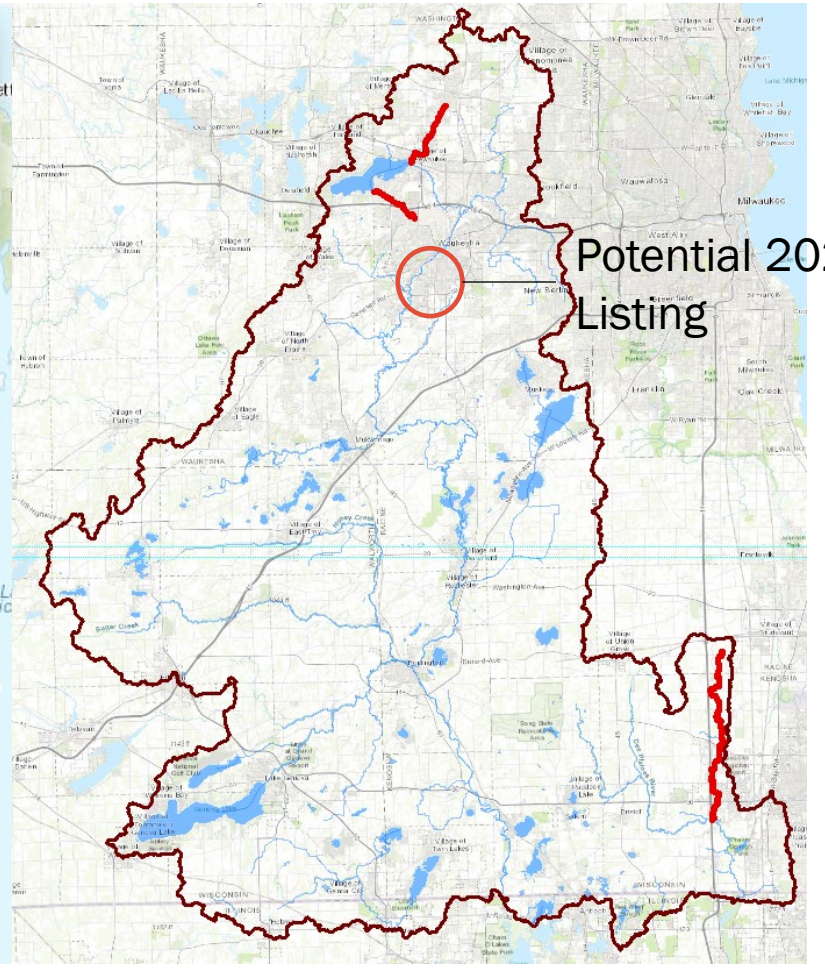
The TMDL will address impairments caused by:

- Total Phosphorus
- Sediment / Total Suspended Solids (TSS)

We will be exploring the inclusion of chlorides



High chloride concentrations



Chloride impairments

Presentation Outline

- TMDL Overview
- Fox Illinois River Basin (FOXIL) TMDL Background
- FOXIL TMDL Monitoring
- FOXIL TMDL Next Steps

TMDL Overview

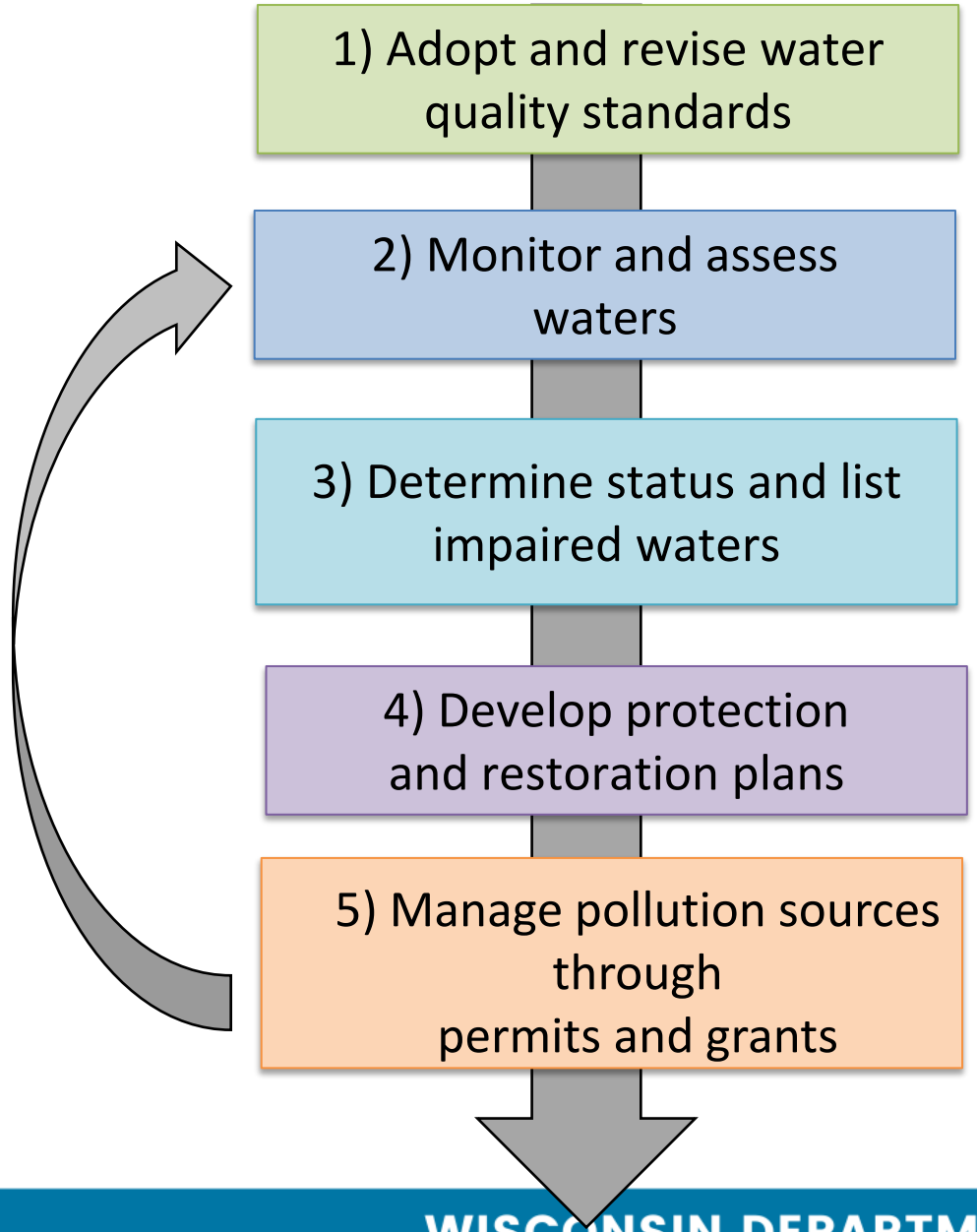
Clean Water Act

- TMDL development and implementation is part of the Clean Water Act

- Federal Law
  - Established in 1972
  - Amended in 1977

- Goal of “fishable, swimmable waters”

Clean Water Act



→ TMDL Development

→ Ongoing TMDL Implementation

Process Overview

Water Quality Standards

Foundation of assessment and restoration process

Designated uses and water quality criteria

Per Wis. Stat. s. 281.15 water quality standards must be adopted by rule

Designated Uses

Fish and Aquatic Life

Recreation

Public Health & Safety

Water Quality Criteria

Numeric: Dissolved oxygen, pH, bacteria, toxic substances, phosphorus, etc.

Narrative: “no objectionable deposits,” “substances…shall not be harmful to humans, fish, plants, or other aquatic life.”

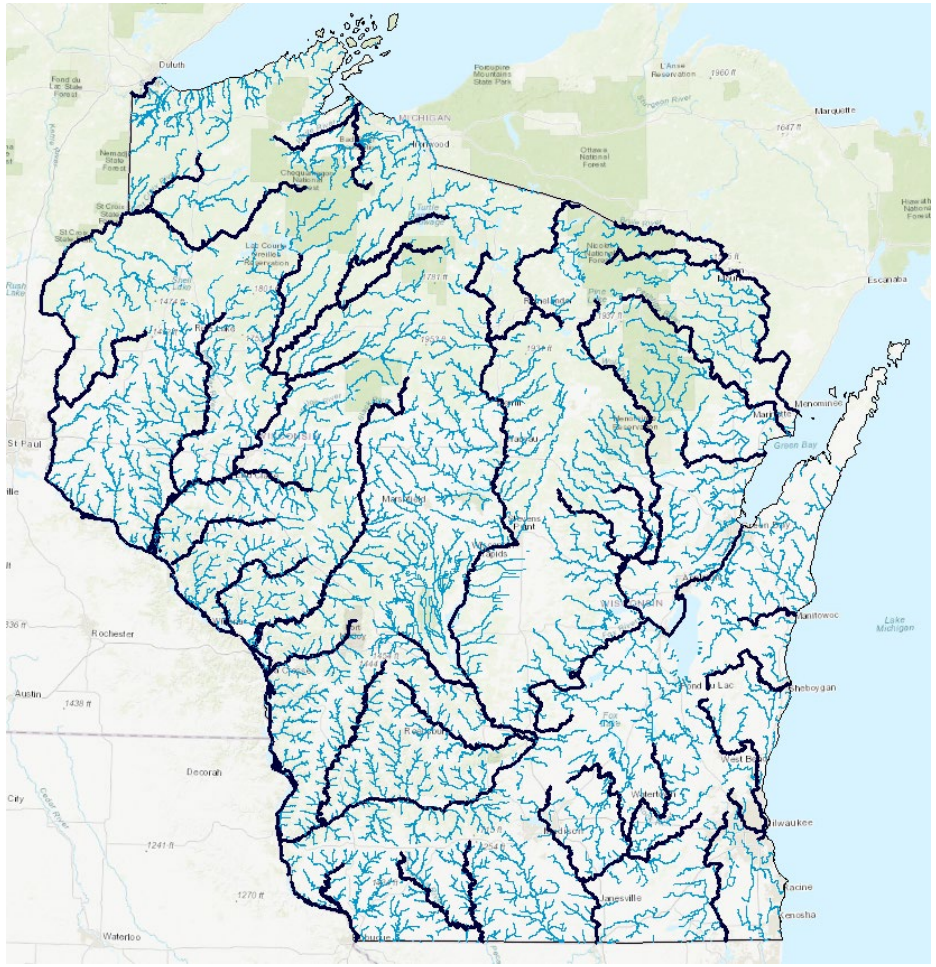
Phosphorus Criteria: NR 102.06

Rivers: 100 µg/L

Defined in NR 102.06(3)(a)

Streams: 75 µg/L

All unidirectional flowing waters not in NR 102.06(3)(a)



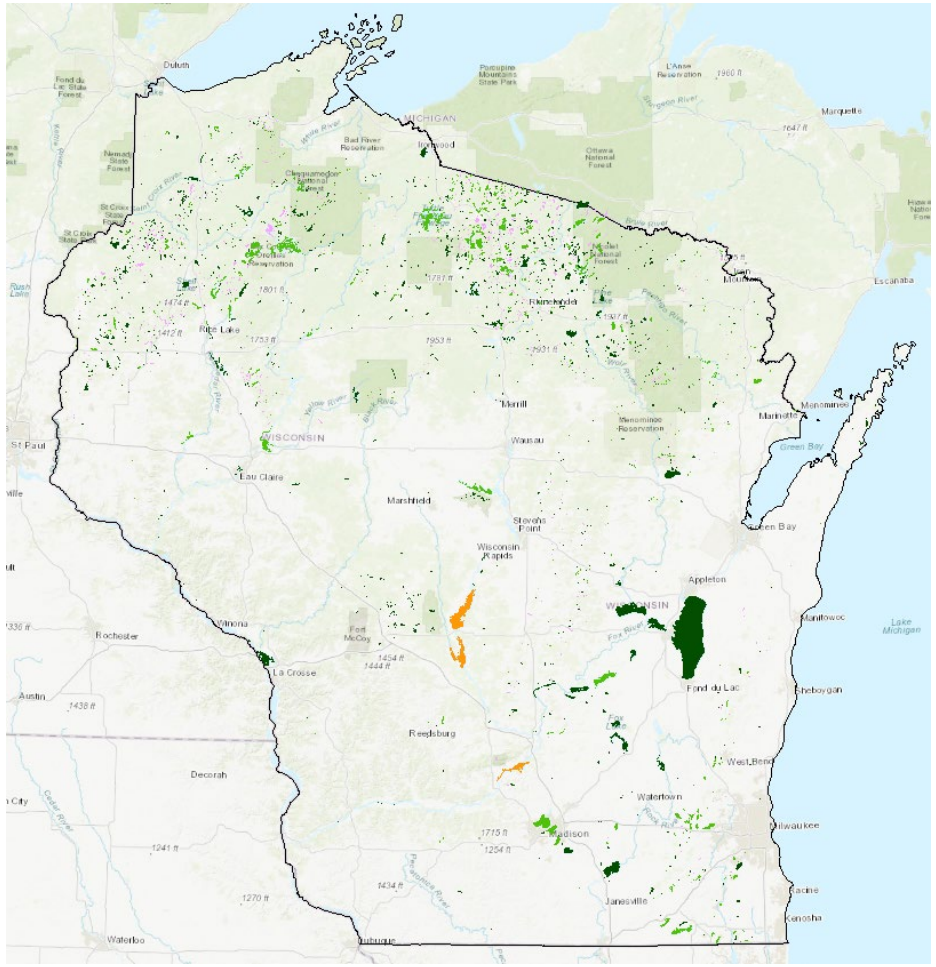
Phosphorus Criteria: NR 102.06

Stratified Reservoir: 30 µg/L

Not Stratified Reservoir: 40 µg/L

Inland Lakes: 15-40 µg/L

Exclusions: Ephemeral streams, wetlands, limited aquatic life, lakes and reservoirs <5 acres

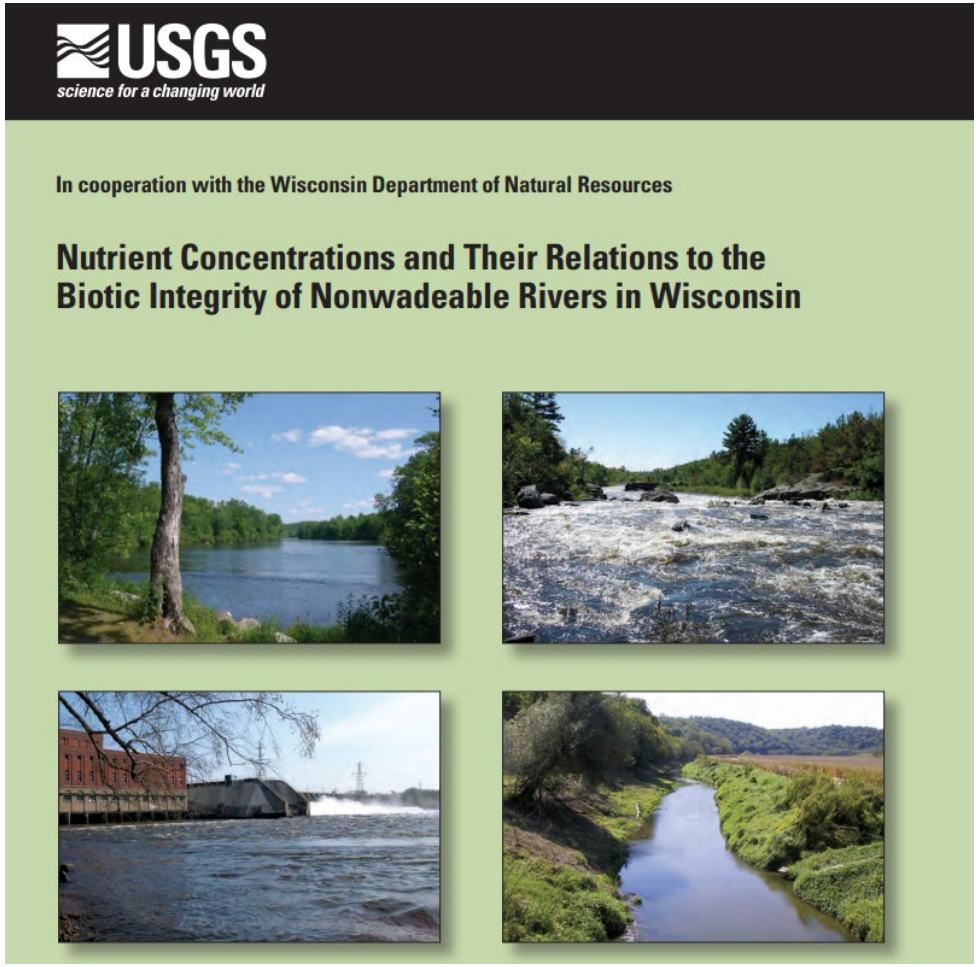


Total Suspended Solids Targets

Narrative standard

Translated to numeric target (methodology based on USGS Professional Paper 1754)

Range of 10 mg/L to 15 mg/L; average of 12 mg/L.



Process Overview

Assessment & Listing

Impaired waters do not meet water quality standards

States are required to develop an ***Impaired Waters List***

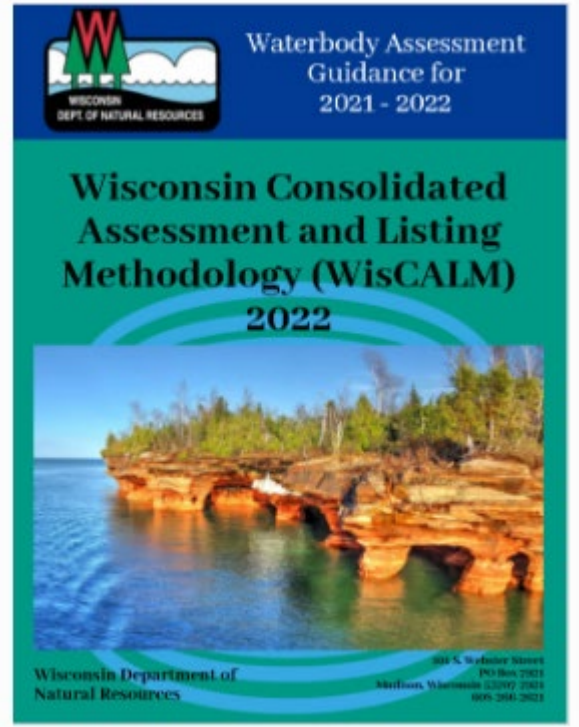
WISCONSIN'S CONSOLIDATED ASSESSMENT AND LISTING METHODOLOGY (WISCALM)

Every two years, Sections 303(d) and 305(b) of the Clean Water Act require states to publish a list of all waters not meeting water quality standards.

The Process is laid out in WISCALM:

https://dnr.wisconsin.gov/topic/SurfaceWater/WisCALM.html

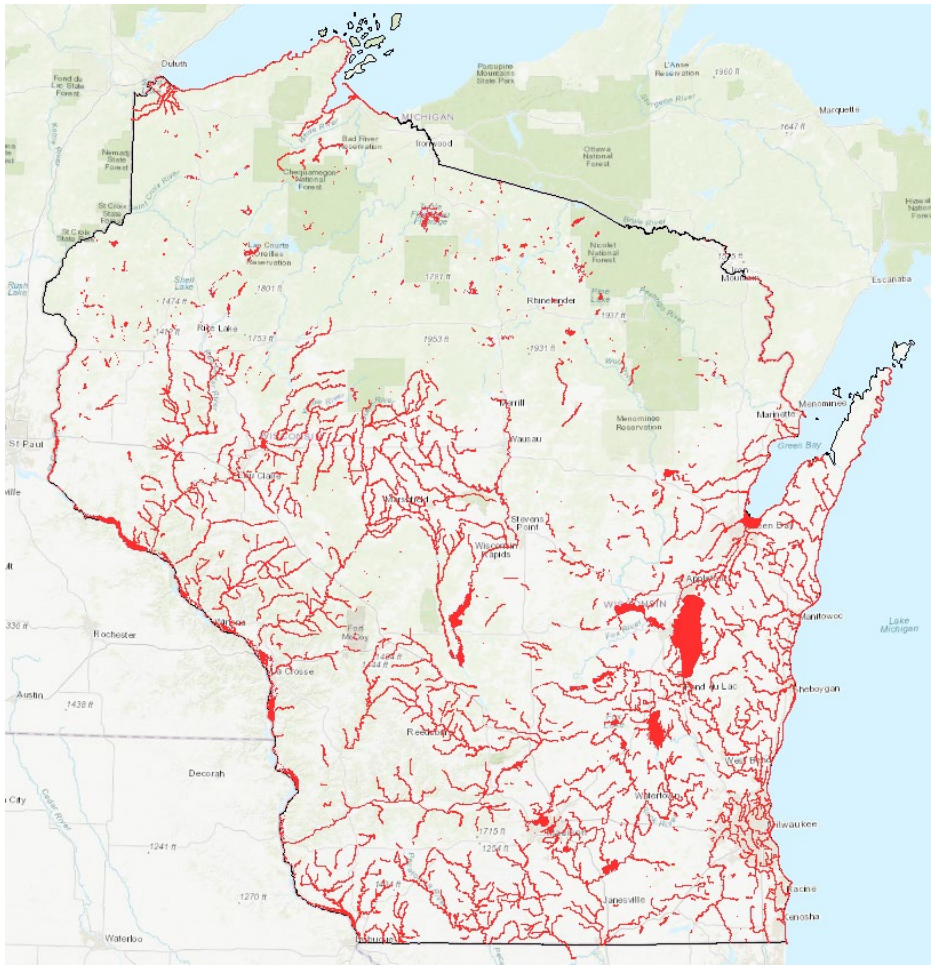
Or search "WISCALM"



Ashley Beranek
Water Quality Program

What is an Impaired Water?

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

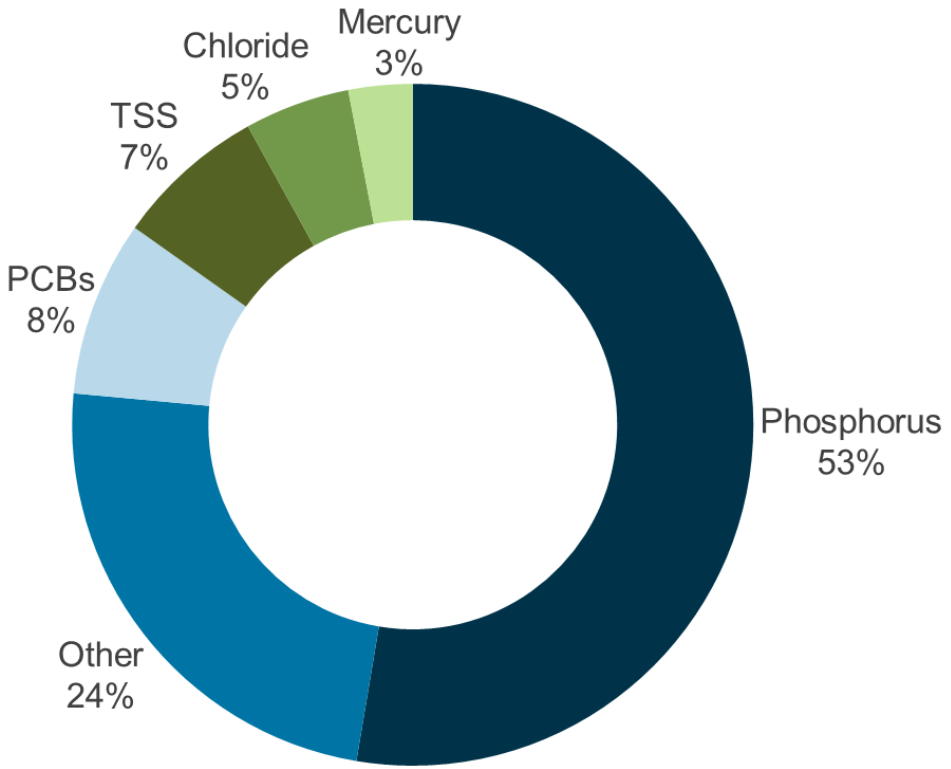


2022 303(d) List:

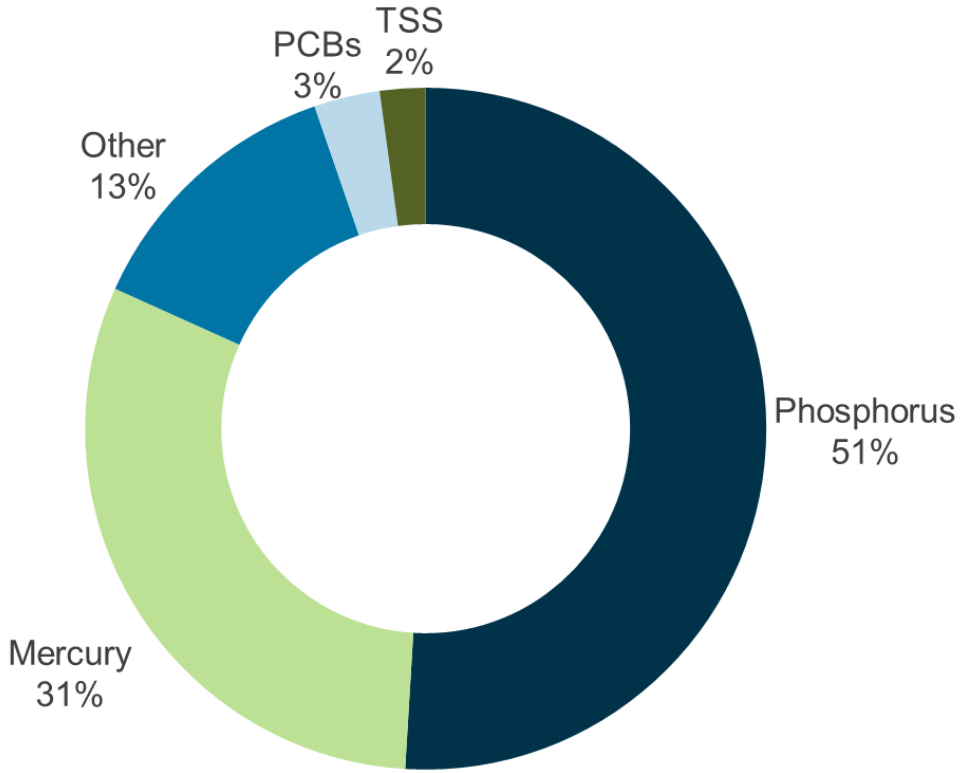
- Rivers and Streams: >9,000 miles
- Lakes and Impoundments: ~380

Summary of 2022 List

Rivers and Streams



Lakes and Impoundments



Process Overview

Restoration

Total Maximum Daily Loads (TMDLs)

Nine-Key Element Plans

Other restoration efforts

Watershed Restoration Activities in Wisconsin

- TMDL Implementation
- TMDL Development
- Active Nine Key Element Plans

What are TMDLs?

- The amount of pollutant a waterbody can receive and still meet water quality standards

Total Maximum Daily Load =

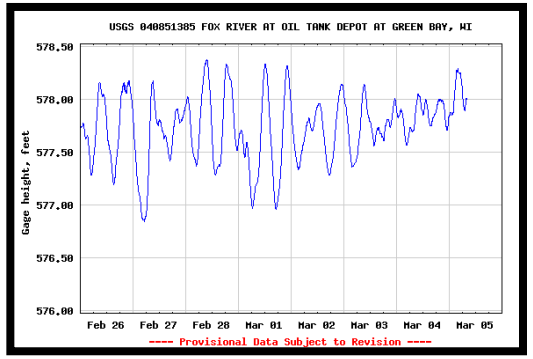
Load Allocation

+

Waste Load Allocation

+

Margin of Safety



Fox Illinois River Basin TMDL

Project Setting

FOXIL TMDL Project Extents and Counties

Primary Counties

Waukesha: 333 mi² (57% of county)

Walworth: 331 mi² (57% of county)

Kenosha: 218 mi² (79% of county)

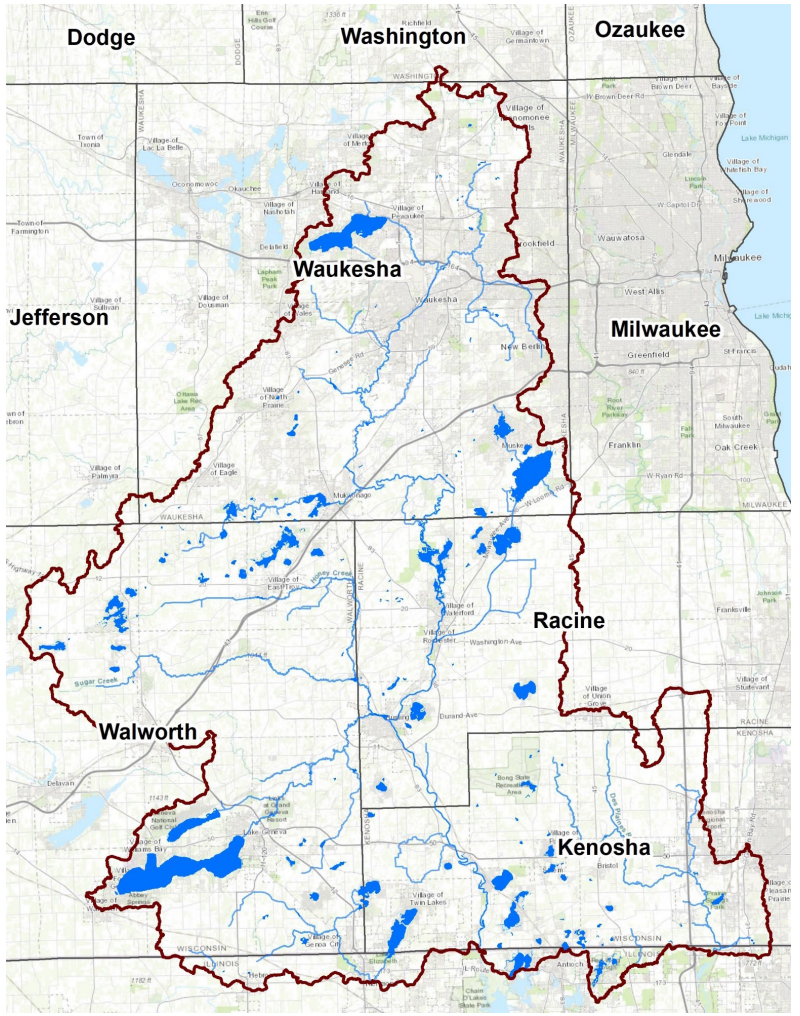
Racine: 175 mi² (52% of county)

Minor Counties

Jefferson: 1.5 mi² (0.3 % of county)

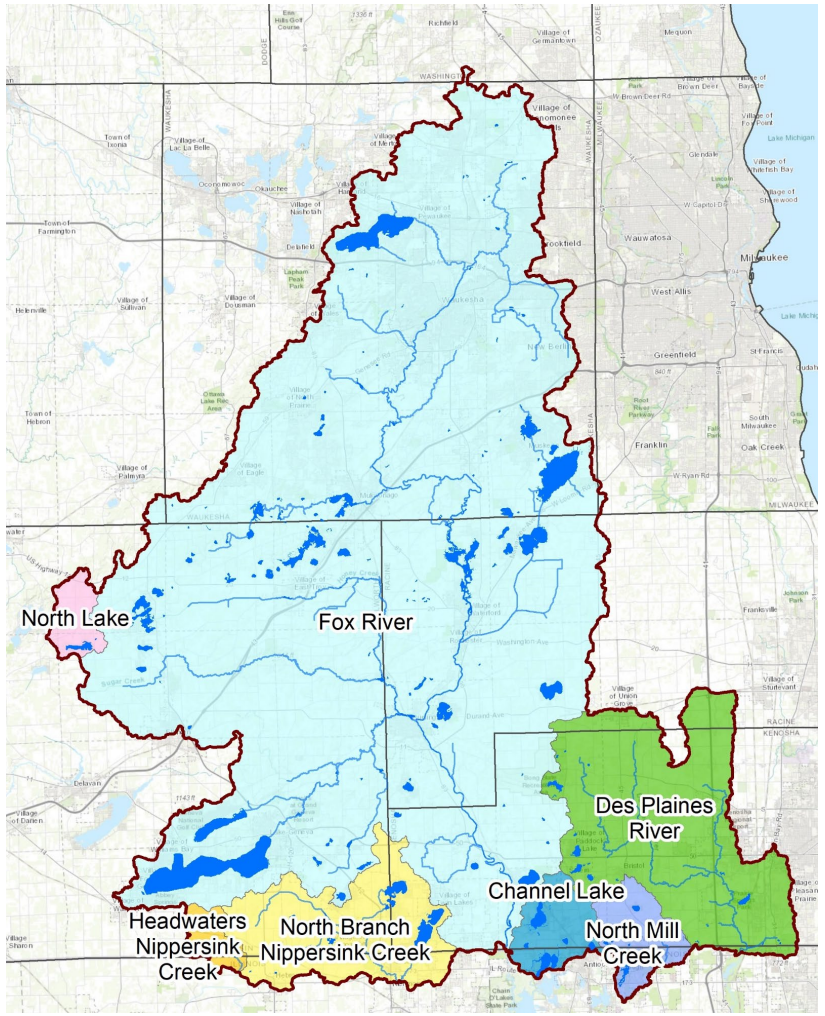
Washington: 0.4 mi² (0.2 % of county)

Milwaukee: 0.3 mi² (0.1 % of county)



FOXIL TMDL Watersheds

- Fox River
- Des Plaines River
- Headwaters Nippersink Creek
- North Branch Nippersink Creek
- North Lake
- Channel Lake
- North Mill Creek



FOXIL TMDL Project Selection

DNR TMDL Prioritization Framework

2013 Vision for Implementing the CWA Section 303(d) Impaired Waters Program Responsibilities

FOXIL TMDL Project Selection

DNR TMDL Prioritization Framework

⬇

Poor Aquatic Ecosystem Health

+

High phosphorus concentrations

+

Presence of point sources

2013 Vision for Implementing the CWA Section 303(d) Impaired Waters Program Responsibilities

FOXIL TMDL Project Selection

DNR TMDL Prioritization Framework

↓

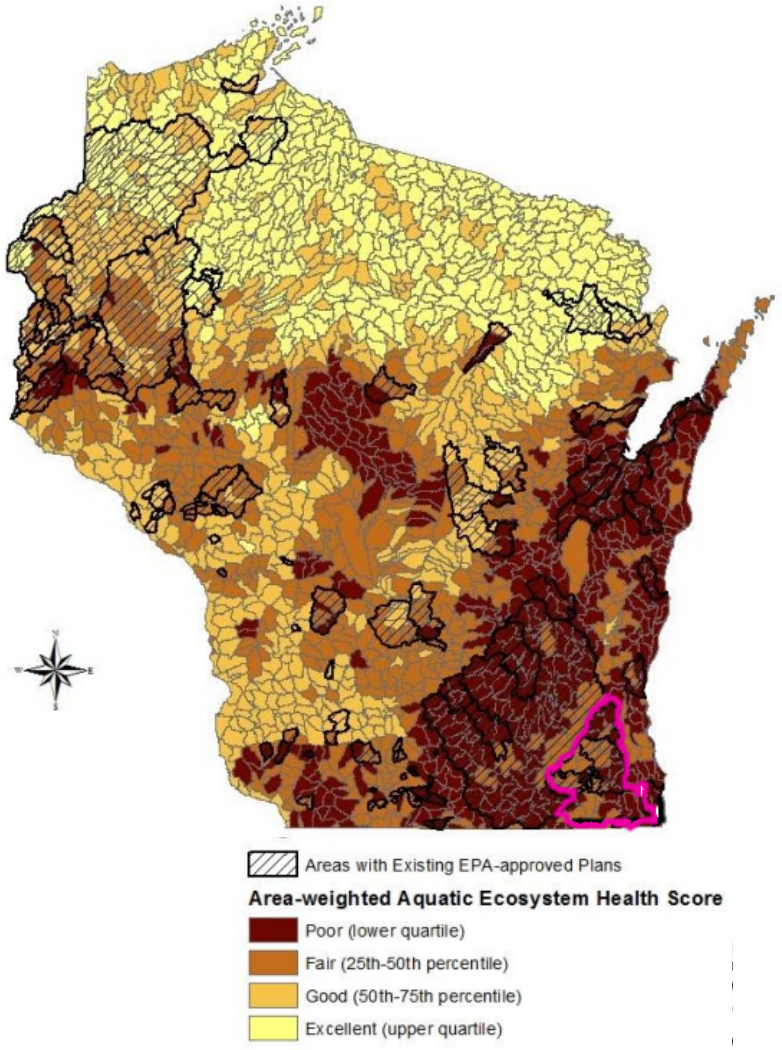
Poor Aquatic Ecosystem Health ✓

\+

High phosphorus concentrations

\+

Presence of point sources



FOXIL TMDL Project Selection

DNR TMDL Prioritization Framework

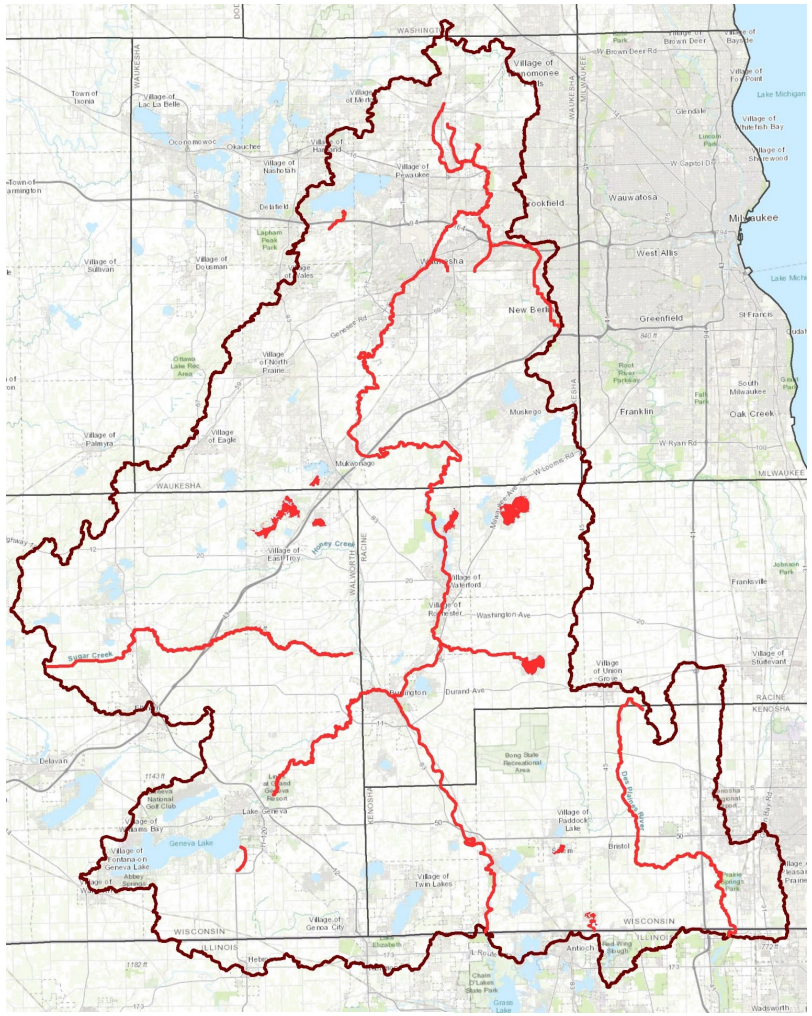
Poor Aquatic Ecosystem Health

+

High phosphorus concentrations

+

Presence of point sources



TP Impairments

FOXIL TMDL Project Selection

DNR TMDL Prioritization Framework

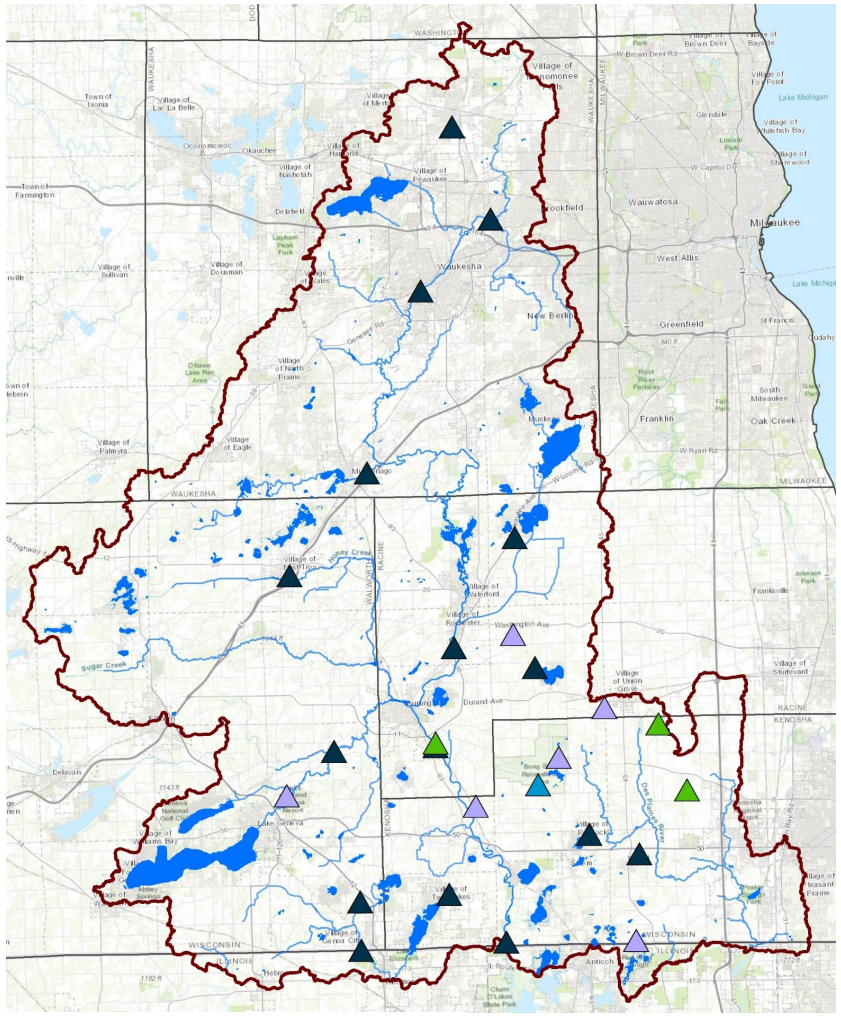
Poor Aquatic Ecosystem Health

+

High phosphorus concentrations

+

Presence of point sources



FOXIL TMDL Project Selection

DNR TMDL Prioritization Framework

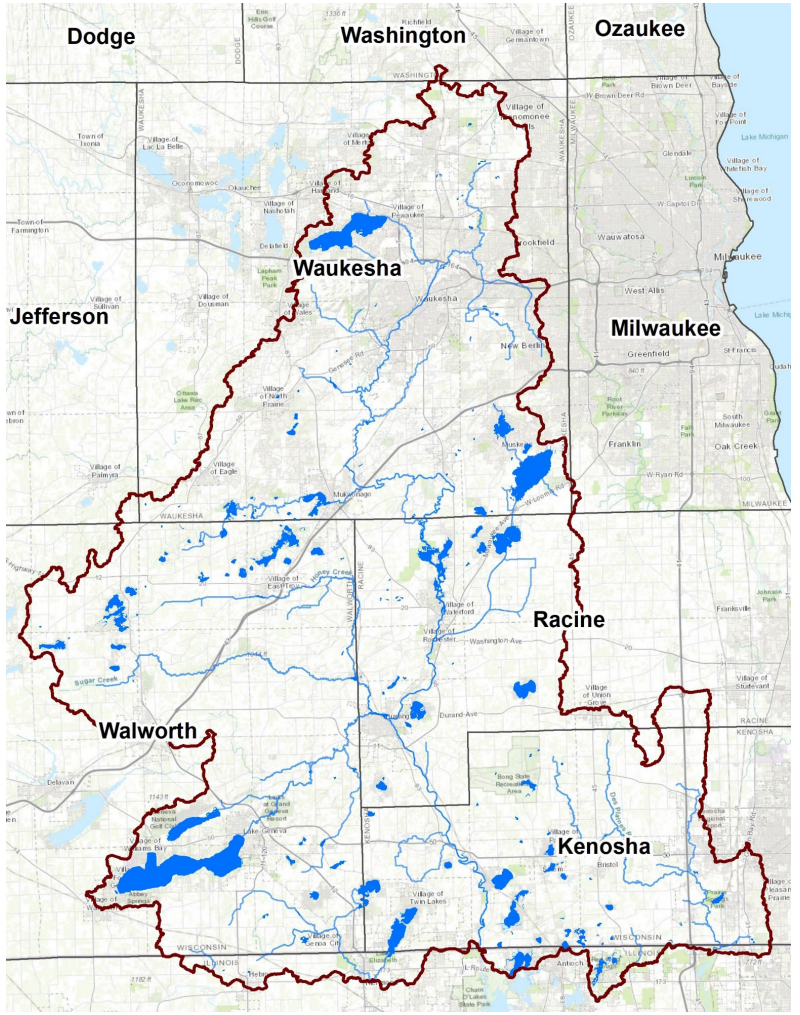
Poor Aquatic Ecosystem Health ✓

+

High phosphorus concentrations ✓

+

Presence of point sources ✓



FOXIL TMDL Project Boundary

TP Impairments – 303(d) List

River and Stream Impairments

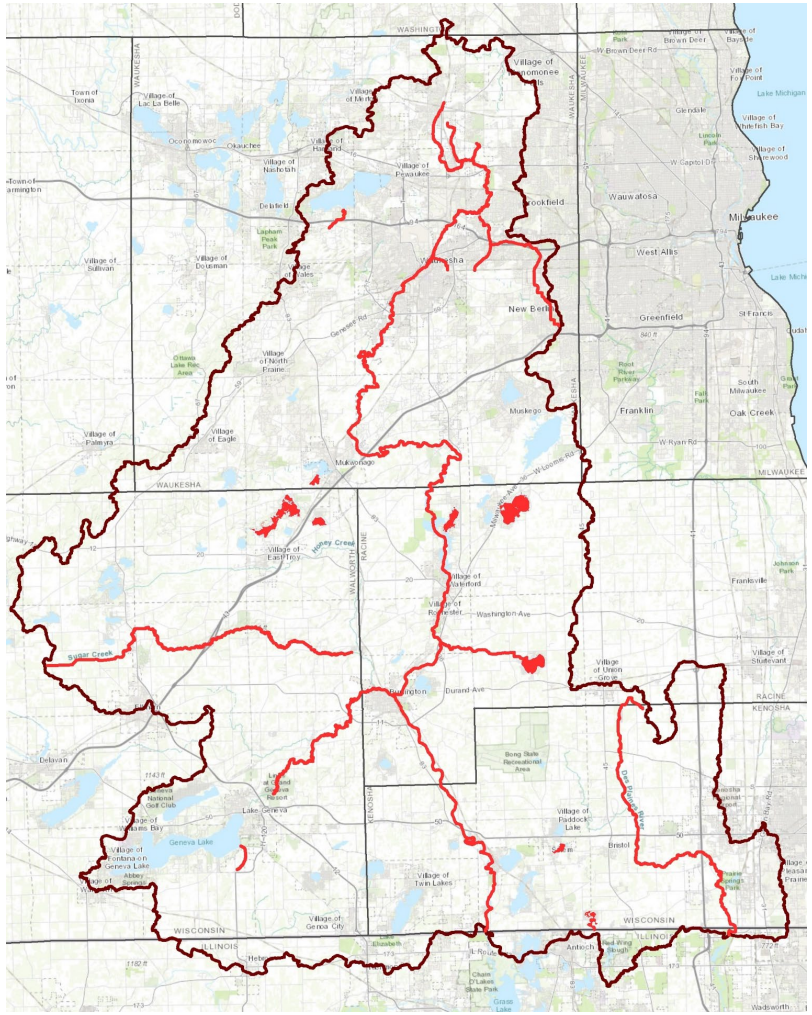
11 named streams/rivers

~170 stream miles

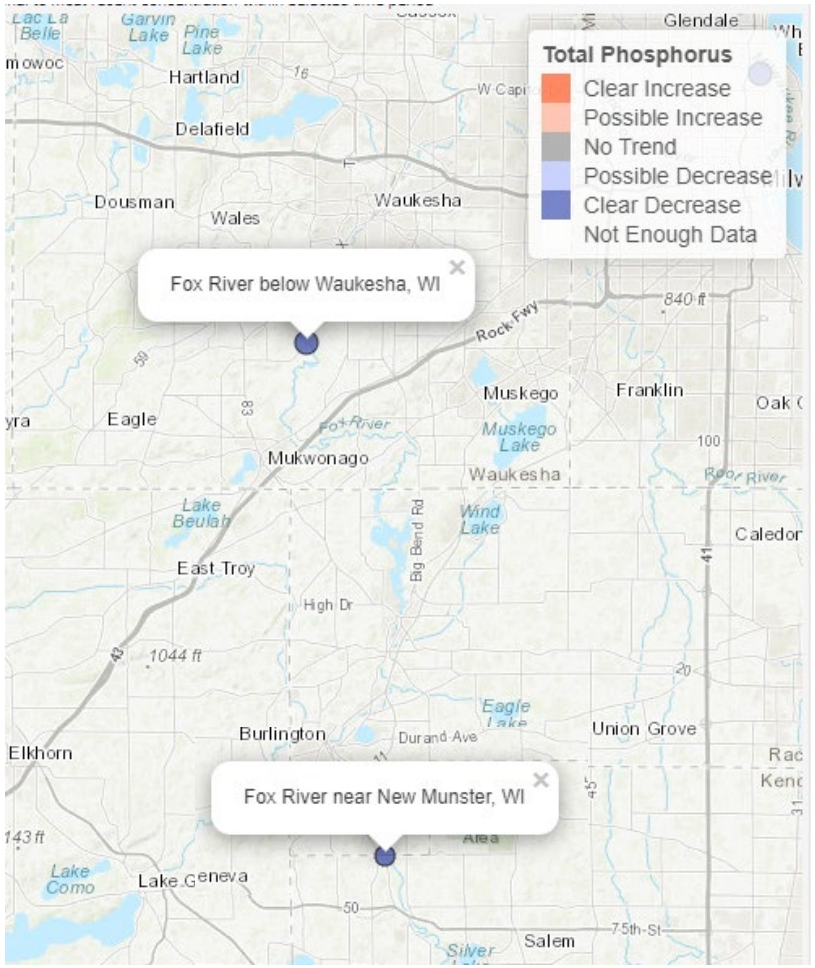
Lake Impairments

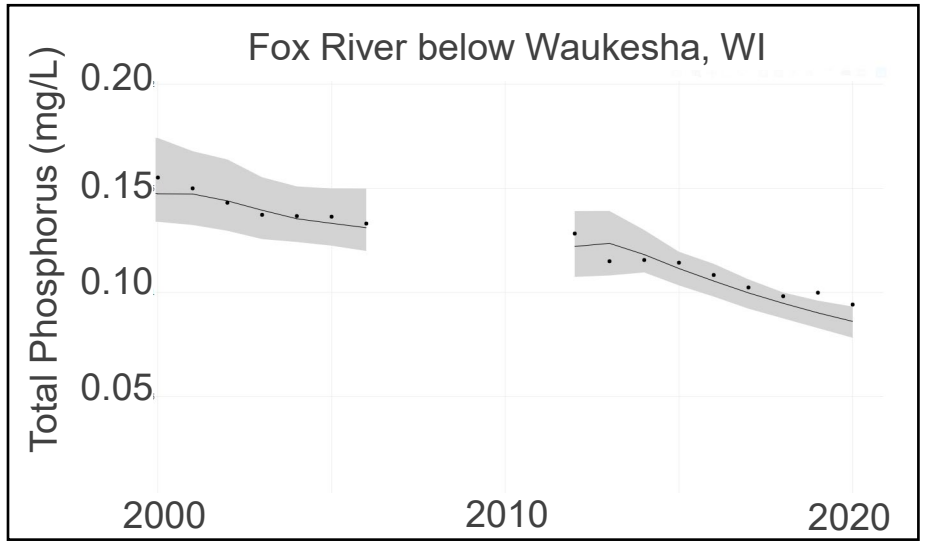
9 lakes

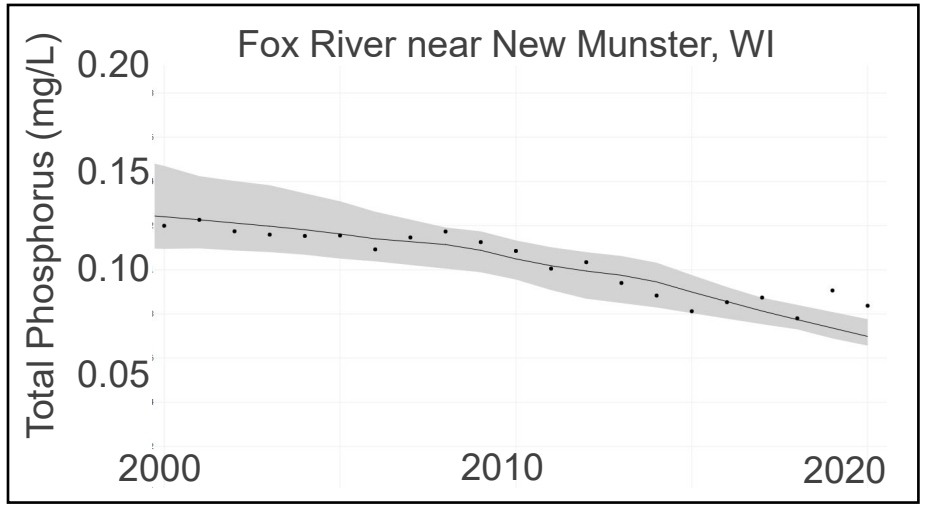
1 impoundment (Fox River)



Total Phosphorus Long-Term Trends







TSS Impairments – 303(d) List

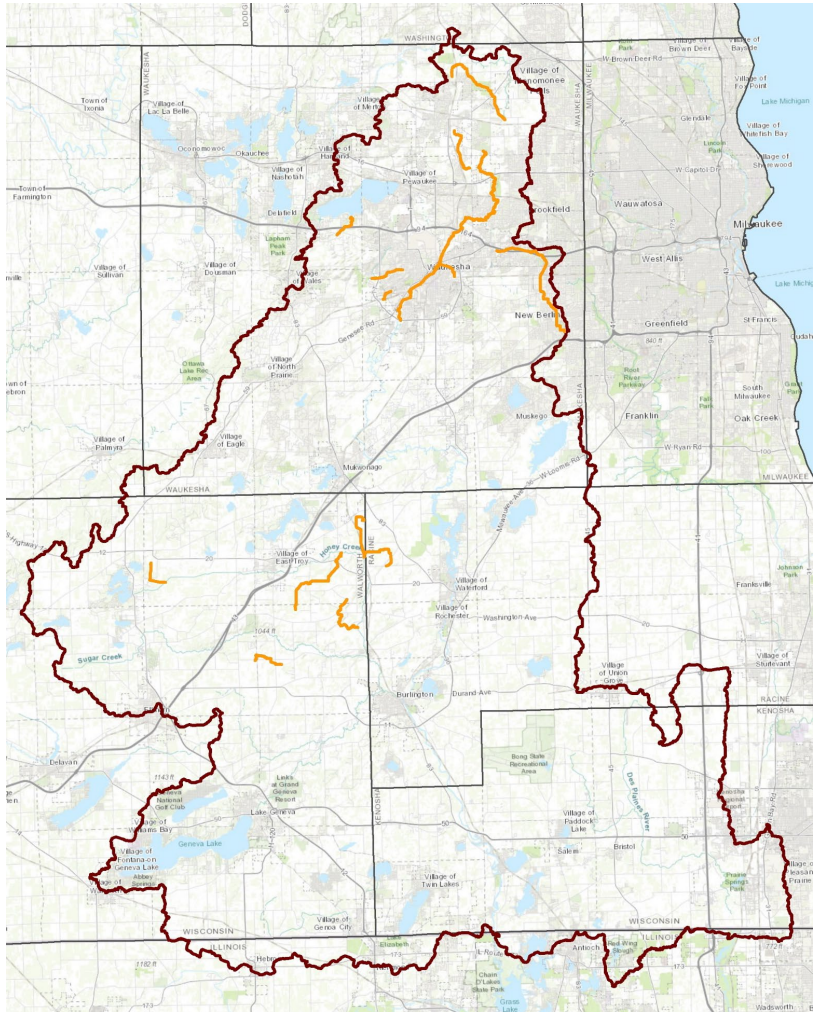
River and Stream Impairments

7 named streams/rivers

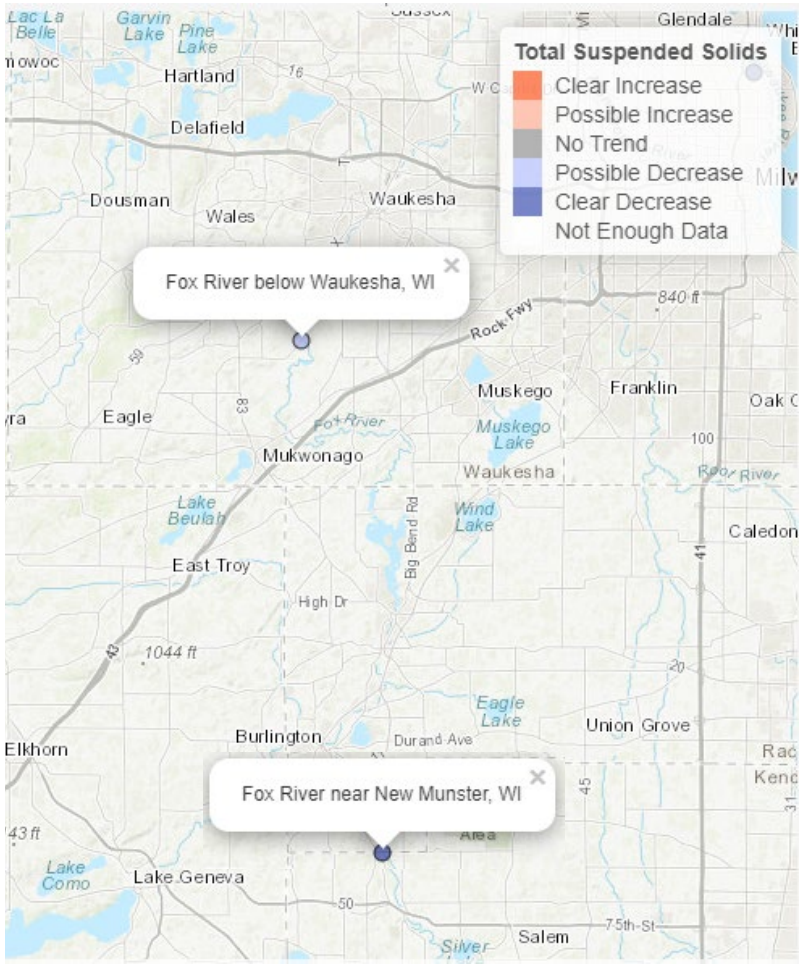
~55 stream miles

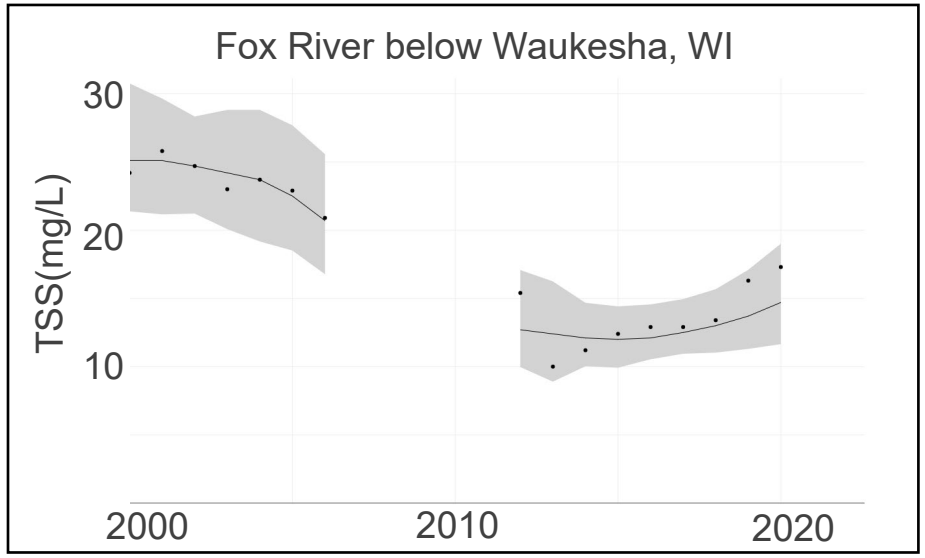
Lake Impairments

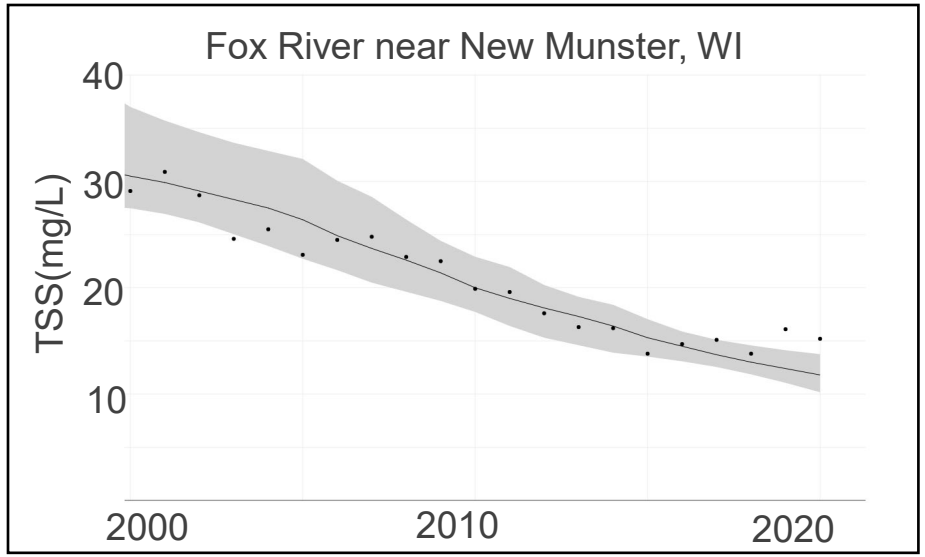
1 impoundment (Fox River)



TSS Long-Term Trends

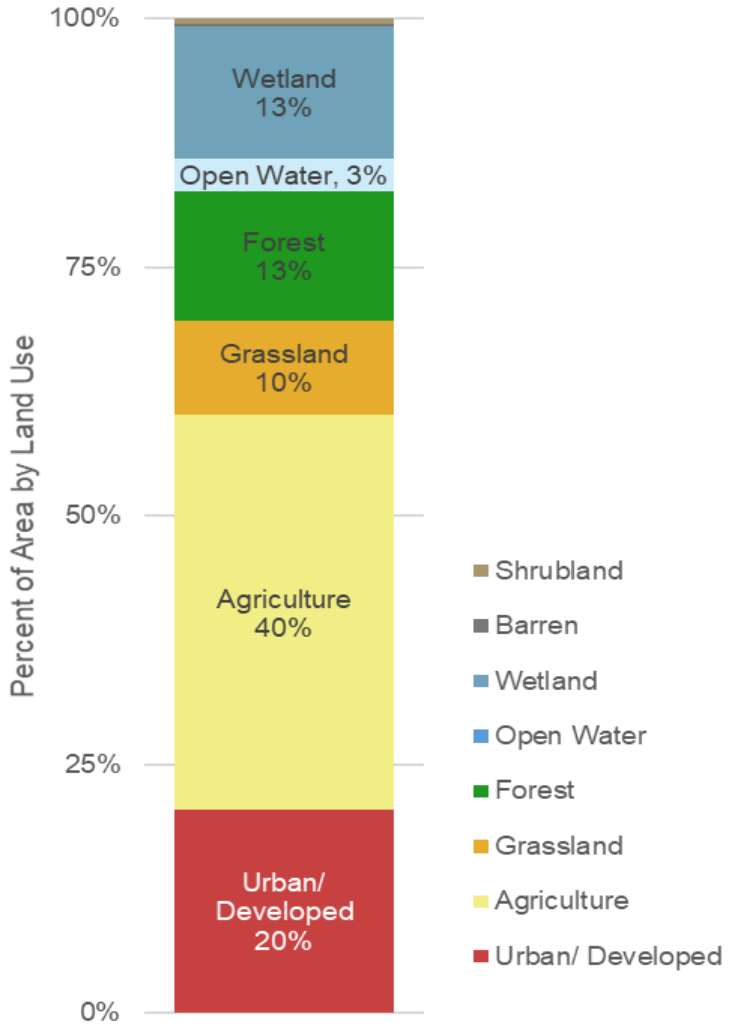


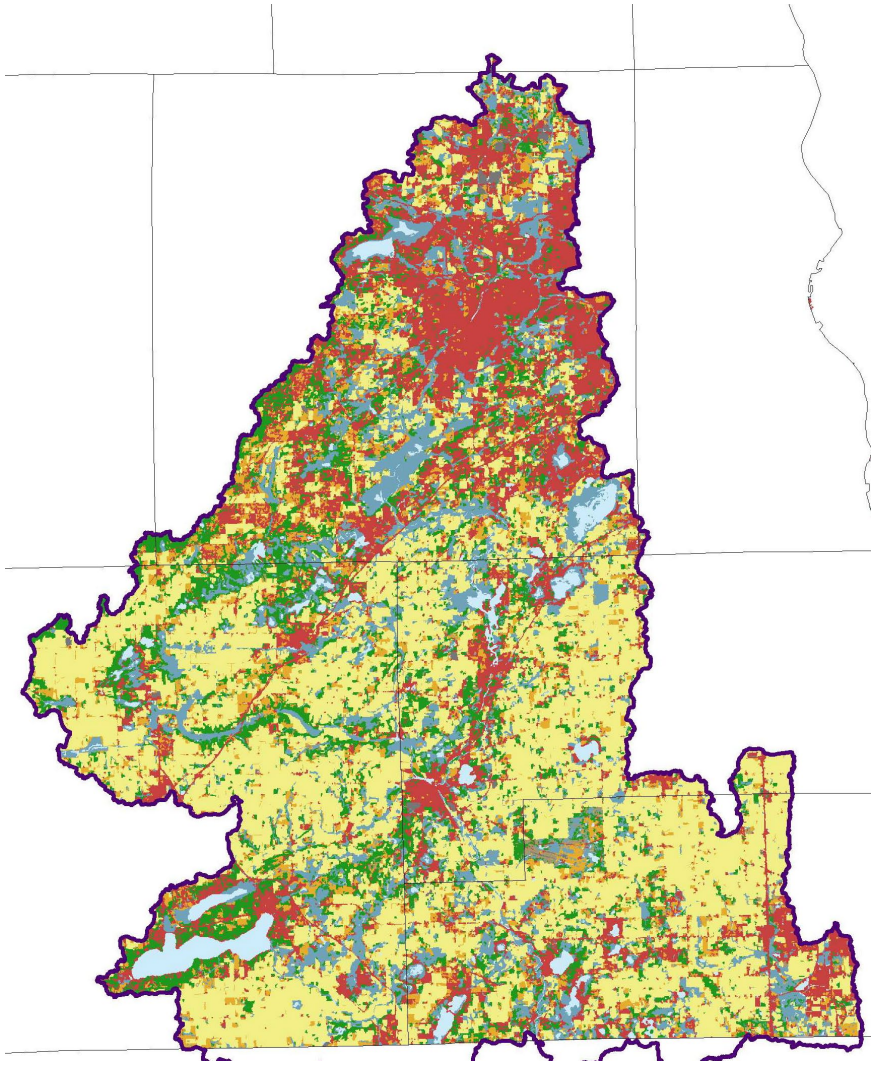




Basin Characteristics

Land Use (Wiscland 2)





WPDES Permits

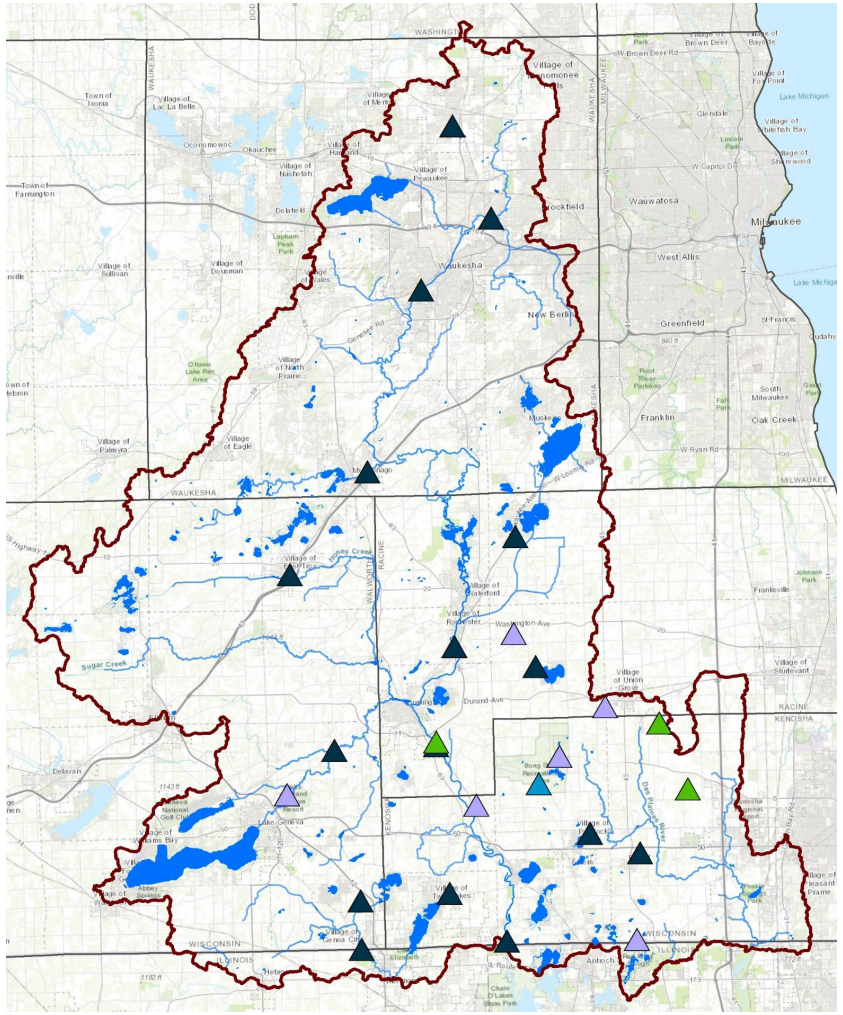
16 Municipal facilities

1 State facility

6 Private facilities

3 Industrial facilities

Notes:
Count includes City of Waukesha WWTF
Count excludes one permit that is under a groundwater permit



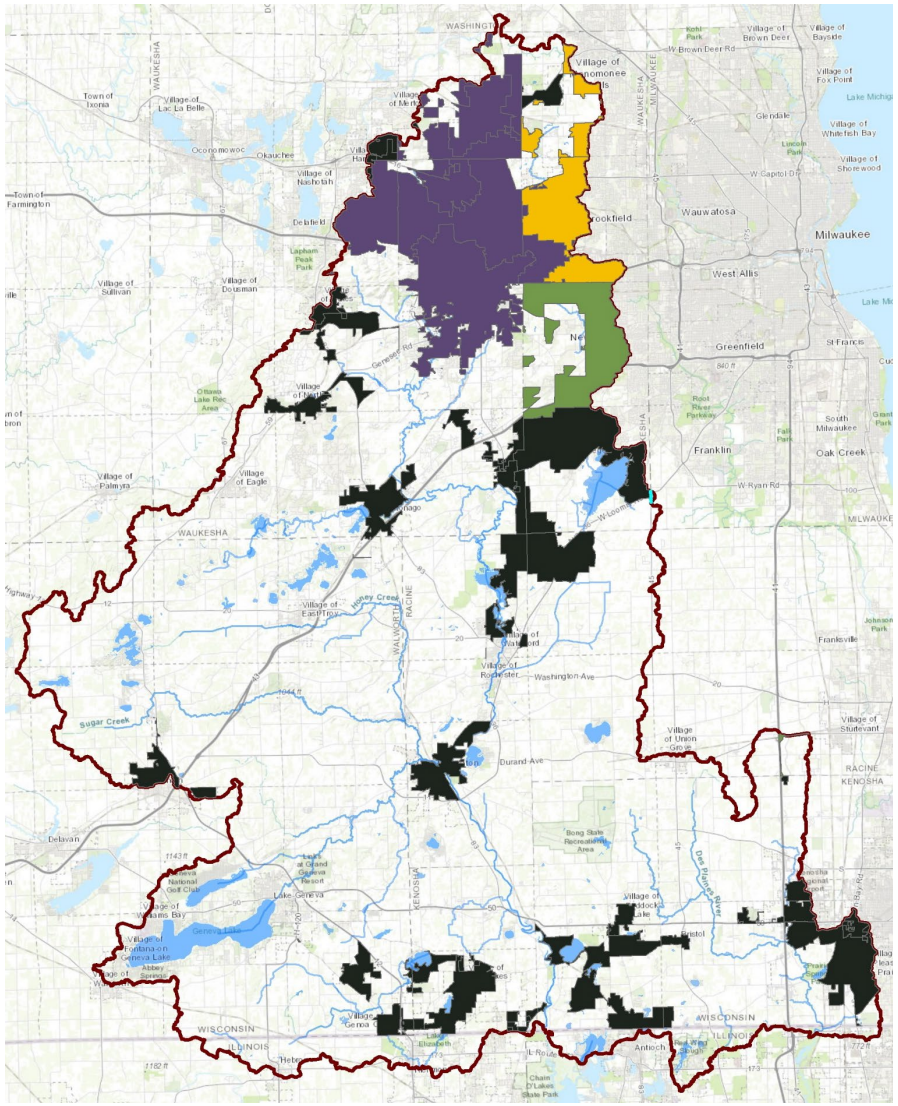
Stormwater Permits

S050105
Upper Fox River Watershed Group MS4 Permit

S050059
Root River Group MS4 Permit

S065404
Menomonee River Watershed-Based MS4 Permit

S050075
Storm Water Municipal General Permit

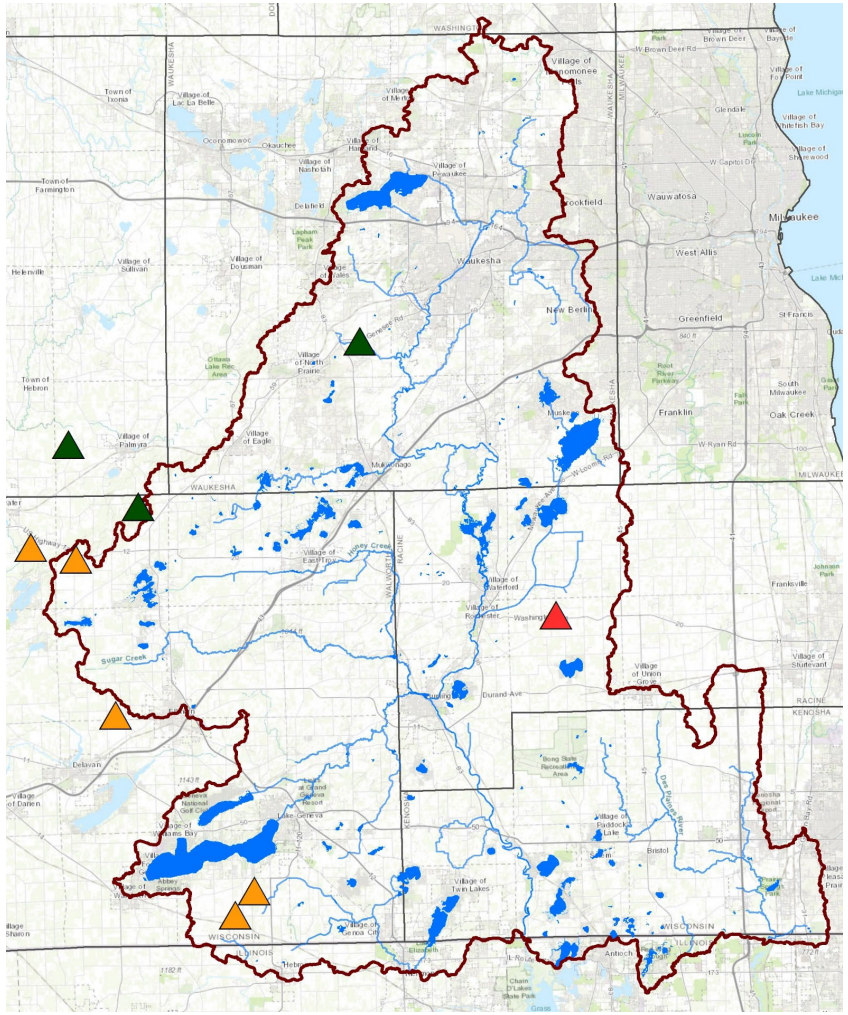


CAFO Permits

Dairy (4)

Chickens (1)

Ducks (1)



Additional Considerations

Existing Watershed Restoration Activities

Adaptive Management

Adaptive Management Plan
City of Burlington

MUKWONAGO ADAPTIVE MANAGEMENT PLAN

WESTERN RACINE COUNTY SEWERAGE DISTRICT

Adaptive Management Plan

MDV & WQT

The Village of East Troy

VILLAGE OF EAST TROY

MDV Watershed Plan

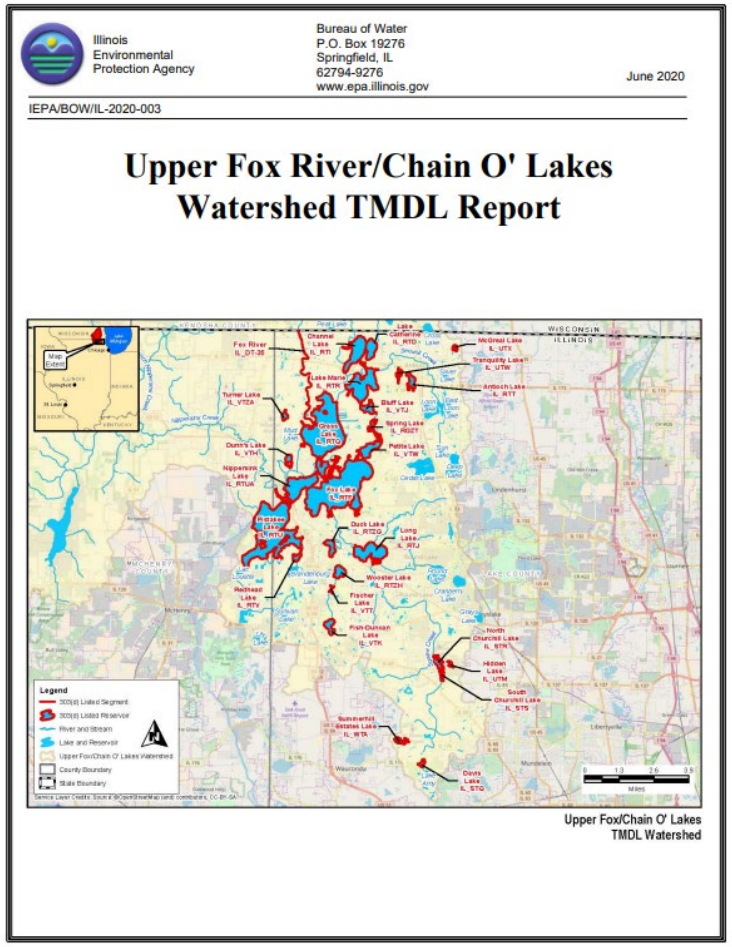
TOWN OF NORWAY SANITARY DISTRICT NO. 1

Water Quality Trading Plan

9 Key Element Plans

NORTH MILL CREEK-DUTCH GAP CANAL WATERSHED-BASED PLAN

Illinois Chain O’ Lakes TMDL



Illinois Environmental Protection Agency

Bureau of Water
P.O. Box 19276
Springfield, IL
62794-9276
www.epa.illinois.gov

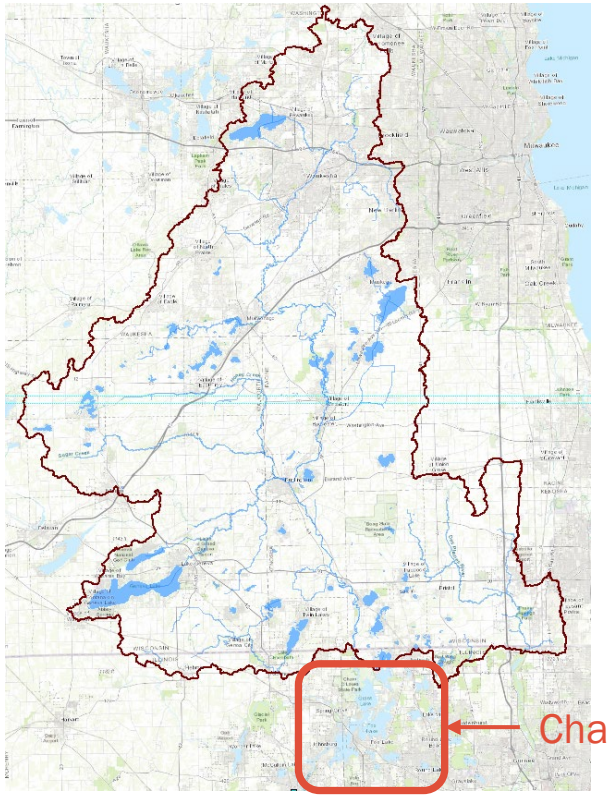
June 2020

IEPA/BOW/IL-2020-003

Upper Fox River/Chain O' Lakes Watershed TMDL Report

Upper Fox/Chain O' Lakes TMDL Watershed

Approved by EPA in 2020



FOXIL TMDL Monitoring

FOXIL TMDL Chemistry Monitoring

- Total Phosphorus
- Total Suspended Solids
- Dissolved Orthophosphate

DNR Monitoring Plan

December through March

Single chemistry sample (3 sites)
Single flow using ADCP (9 sites)

April through November

Bi–Weekly Chemistry Sampling Events (3 sites)
Single Flow using ADCP (9 sites)

Long Term Trend Sites

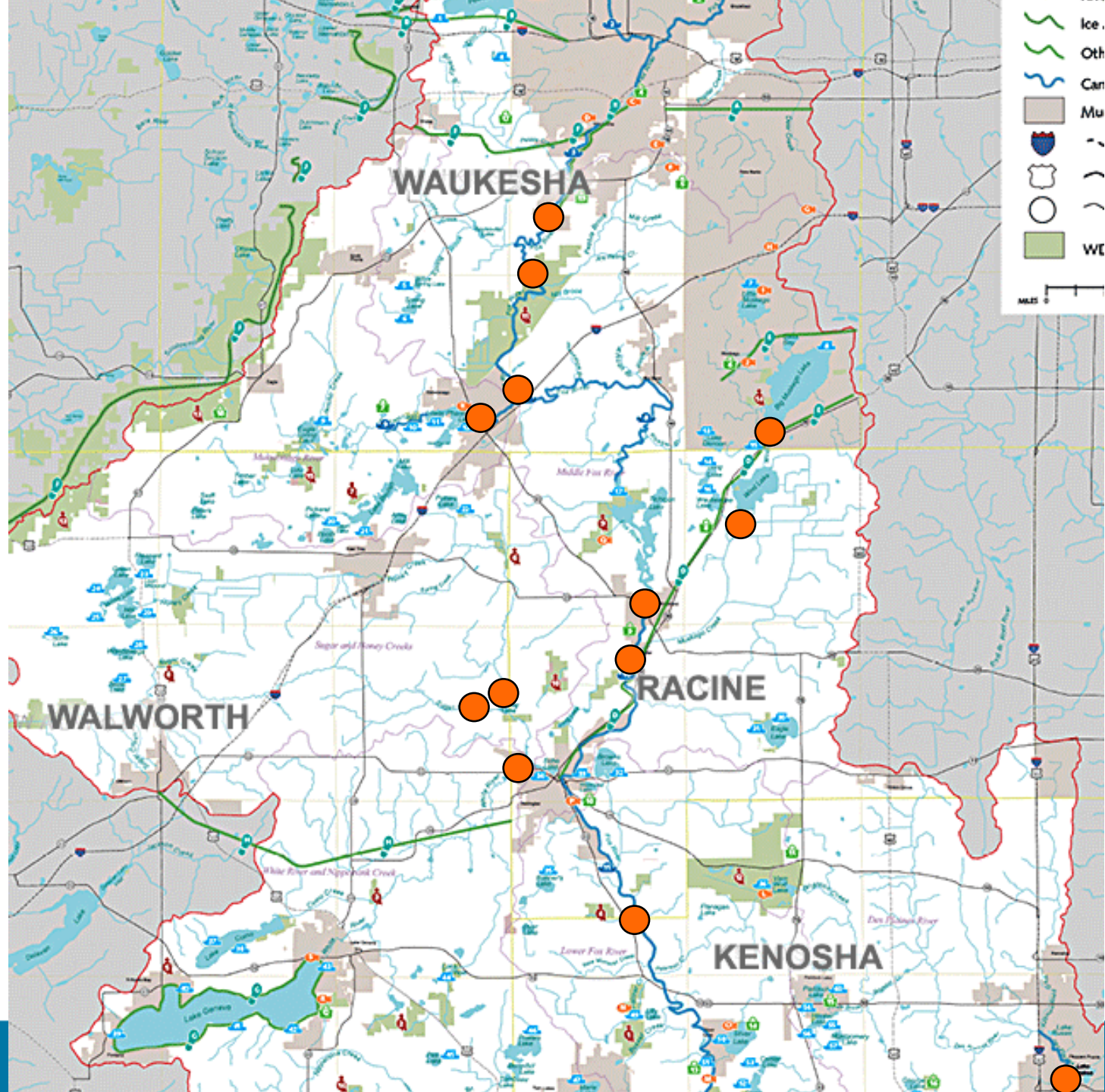
Complete monthly sampling protocol (2 sites)
Single Flow using ADCP at Hwy I site

Pressure Transducers

Install and Survey Initially (5 sites)
Download and Survey before and after; every 6 months minimum
Remove and Survey at end of project

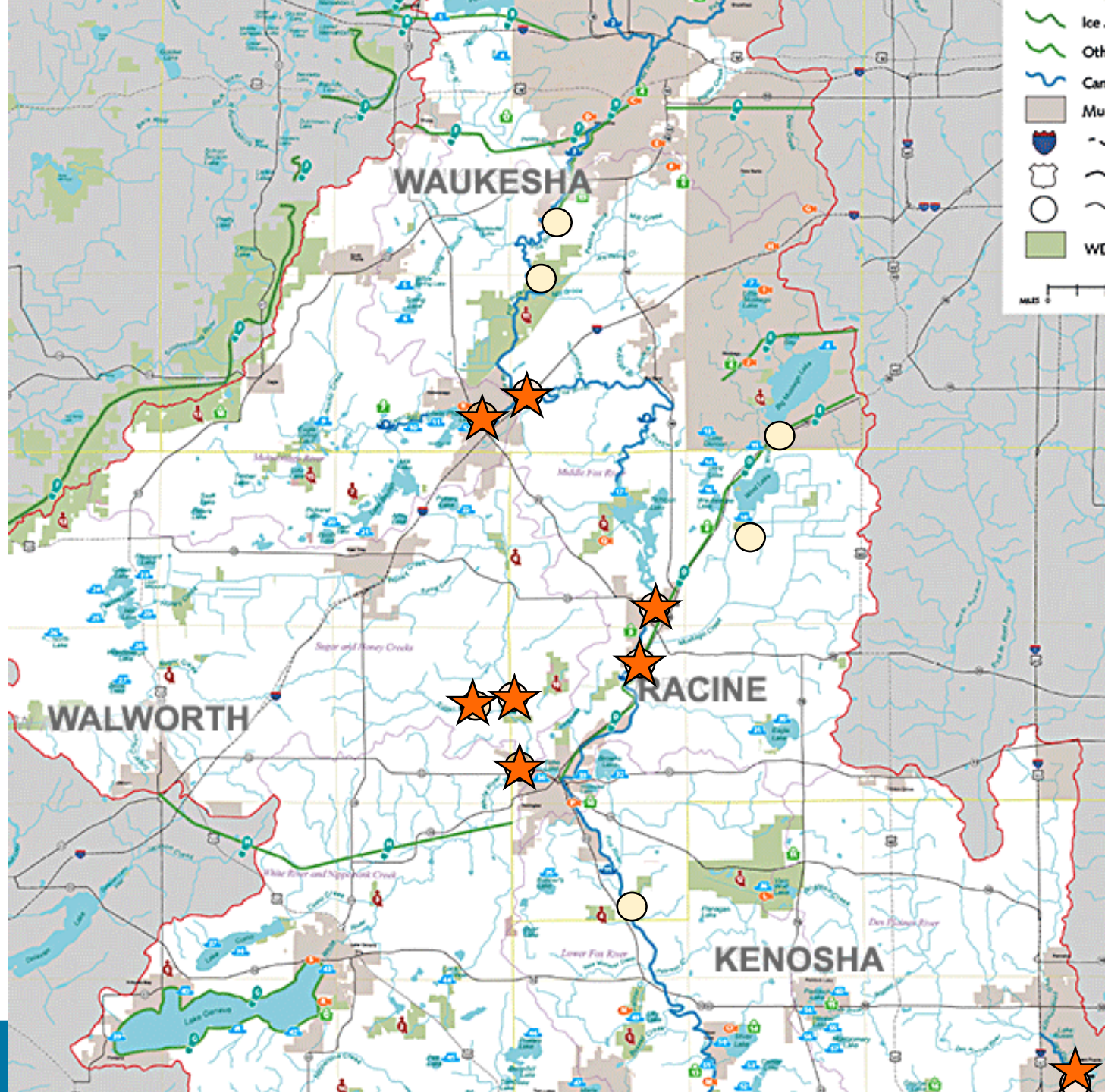
Monitoring

- 13 Total Monitoring Sites
  - *Fox at Waukesha*
  - *Fox at CTH I*
  - *Fox at CTH ES*
  - *Mukwonago at Hwy 83*
  - *Muskego Canal*
  - *Wind Lake Canal*
  - *Fox at Waterford*
  - *Fox at Case Eagle Park* *(originally Hwy D)*
  - *Honey Creek at Hwy DD*
  - *Sugar Creek at Potter*
  - *White River at Hwy 36/11*
  - *Des Plaines River at CTH ML*



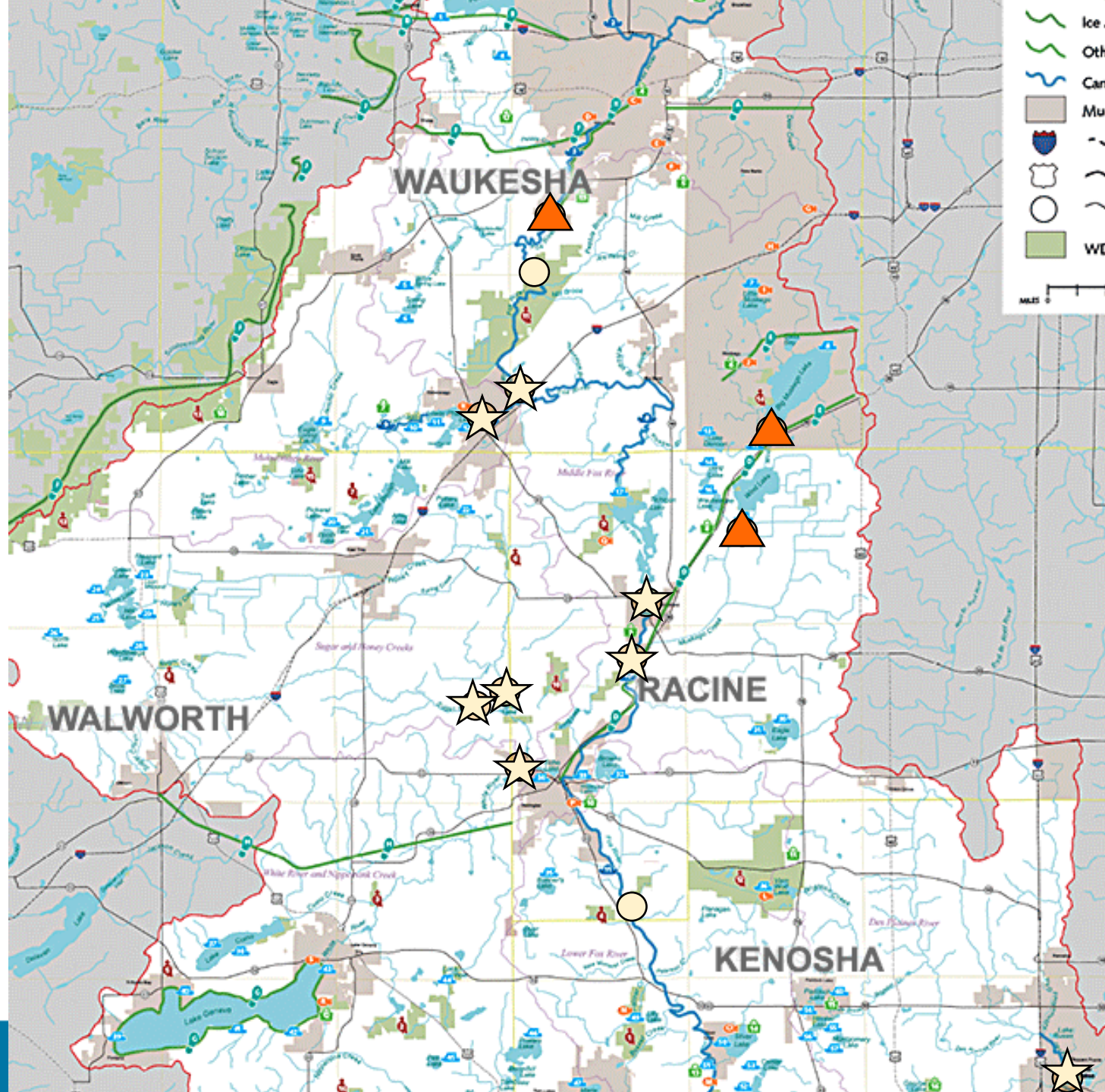
Chemistry Monitoring

- 13 Total Monitoring Sites
- ★ 8 sites monitored with EPA funding



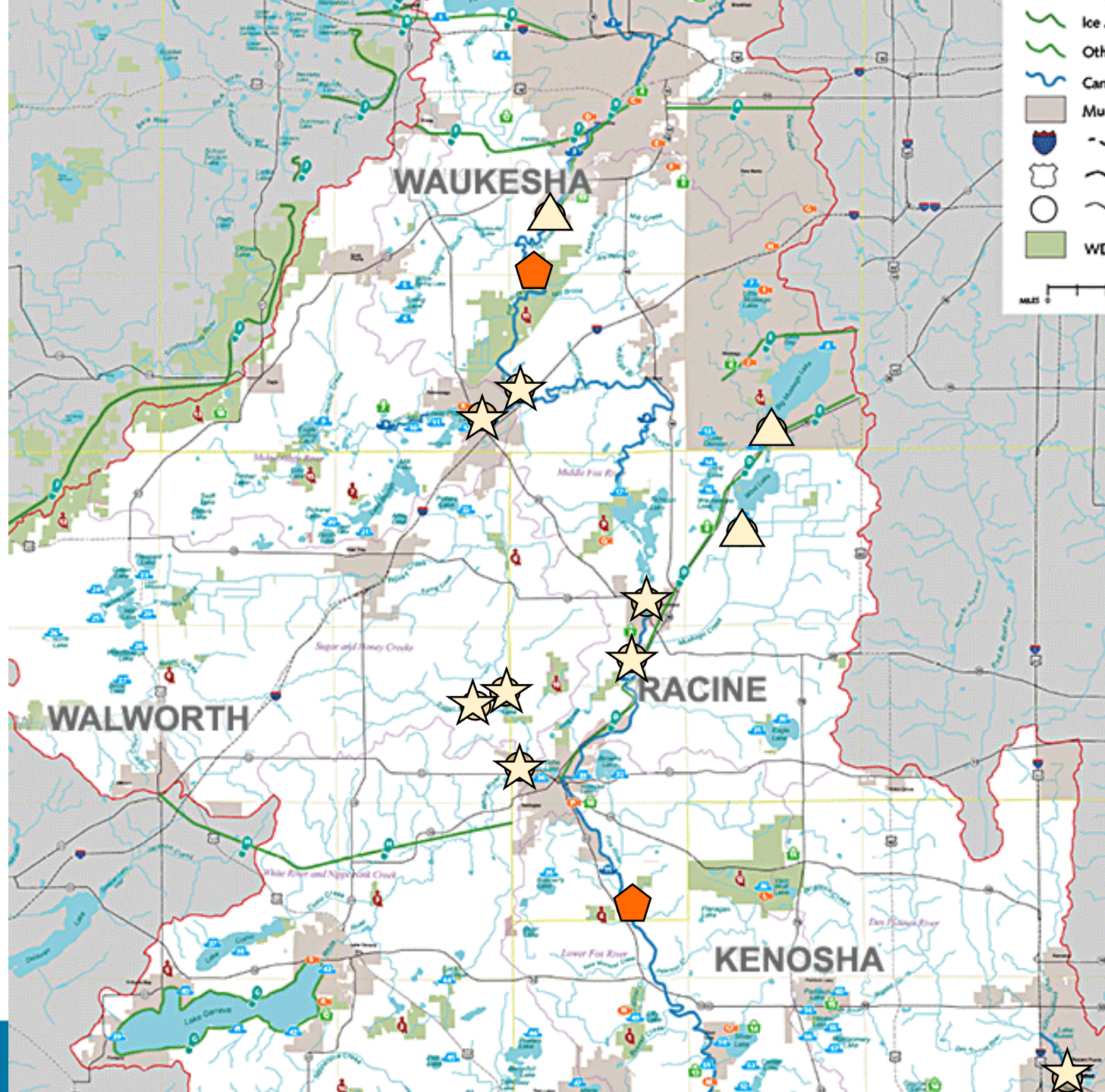
Chemistry Monitoring

- ○ 13 Total Monitoring Sites
- ☆ 8 sites monitored with EPA funding
- ▲ 3 sites monitored by DNR



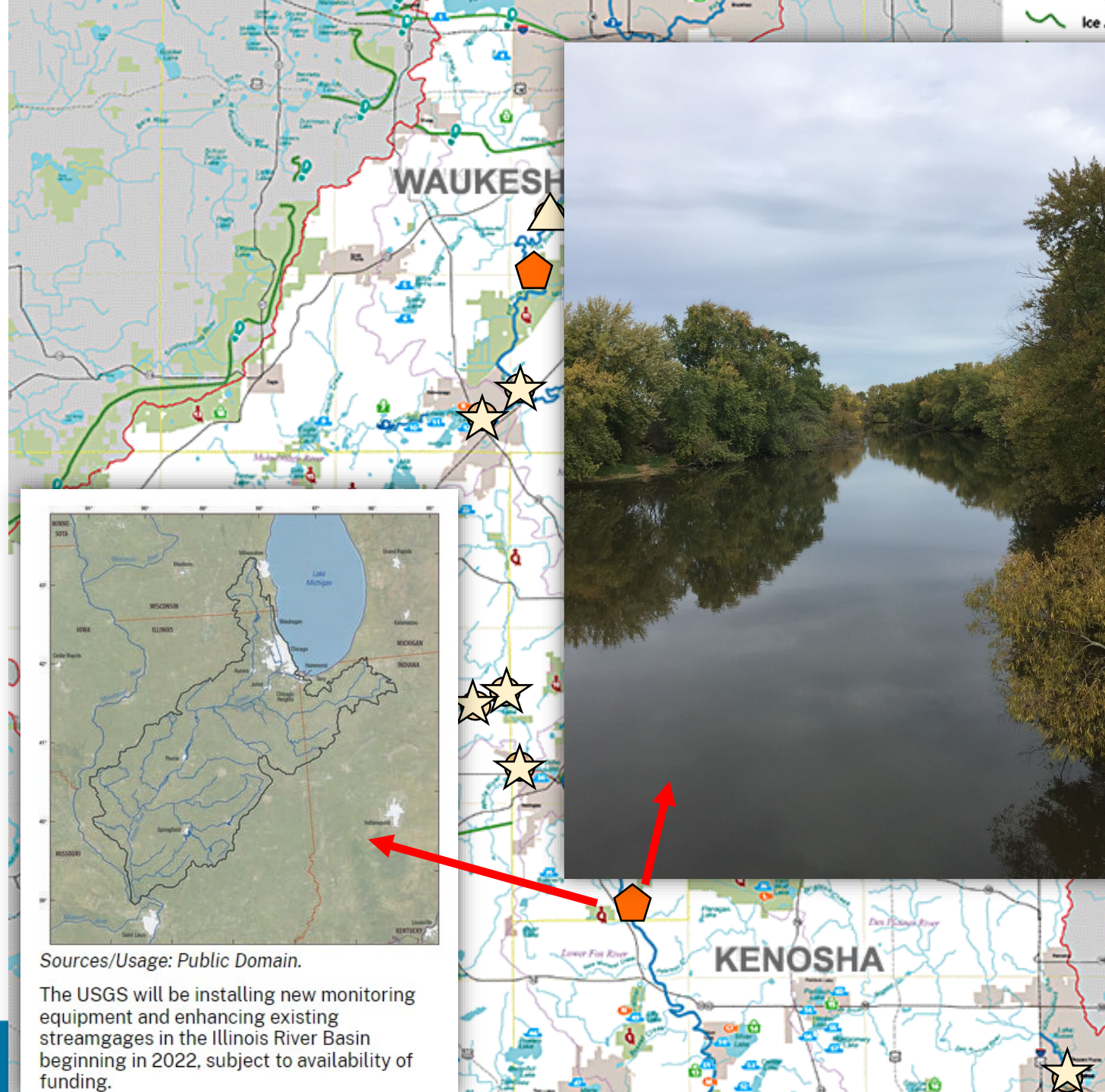
Chemistry Monitoring

- 13 Total Monitoring Sites
- ☆ 8 sites monitored with EPA funding
- △ 3 sites monitored by DNR
- ⬟ 2 Long Term Trend sites monitored by DNR



Chemistry Monitoring

- ○ 13 Total Monitoring Sites
- ☆ 8 sites monitored with EPA funding
- △ 3 sites monitored by DNR
- ⬟ 2 Long Term Trend sites monitored by DNR



Sources/Usage: Public Domain.

The USGS will be installing new monitoring equipment and enhancing existing streamgages in the Illinois River Basin beginning in 2022, subject to availability of funding.

FOXIL TMDL Stage & Flow Monitoring

Continuous Stage

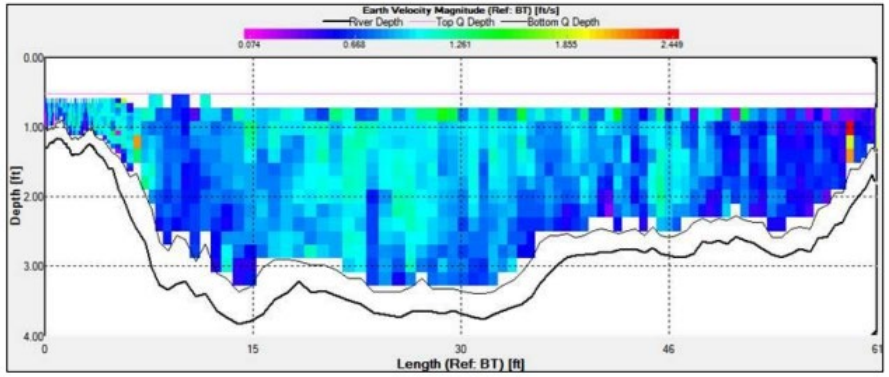
Water level data logger

Source: Onset Brands

Periodic Flow

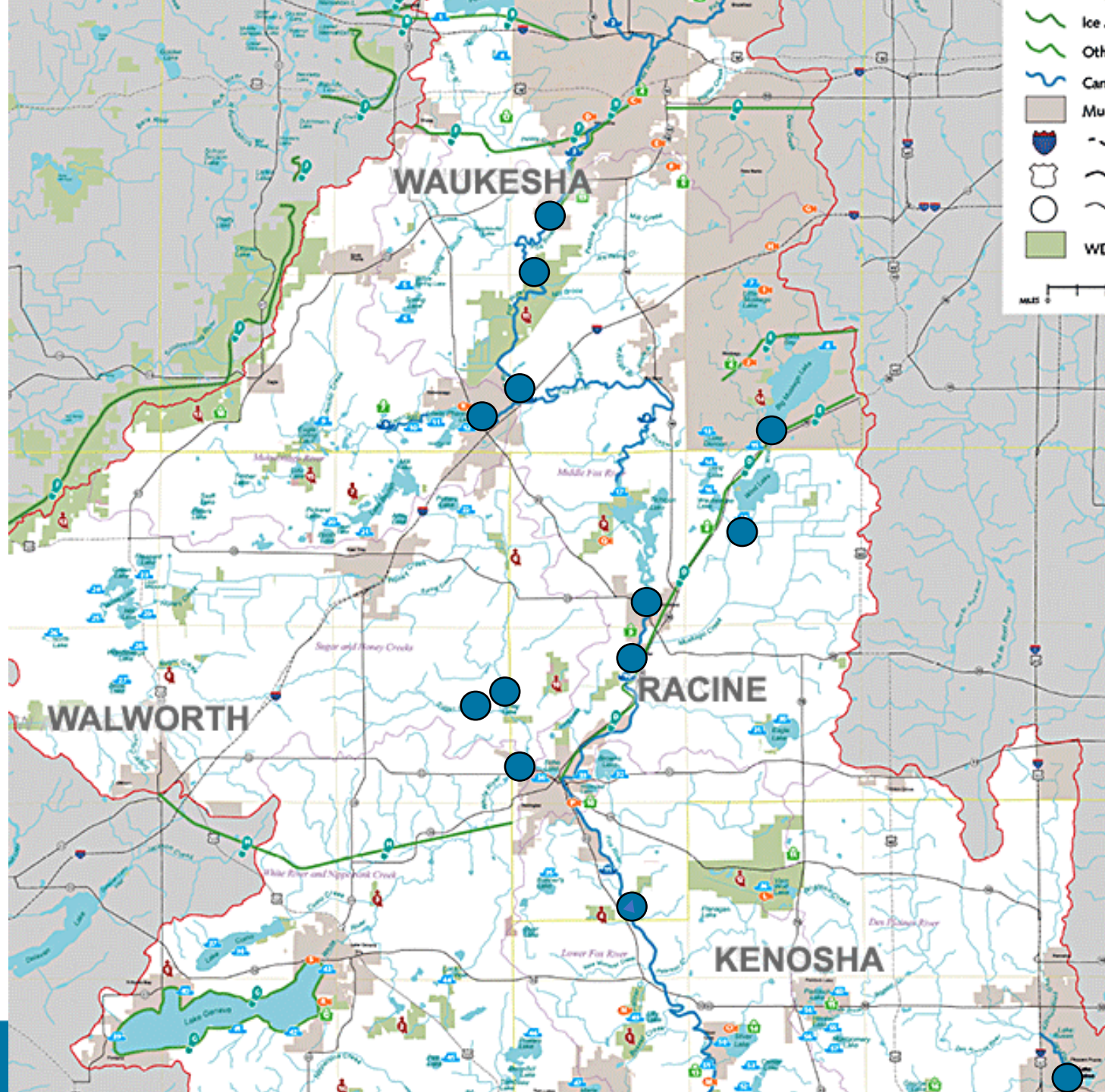
Acoustic Doppler Current Profiler

Source: Teledyne Marine



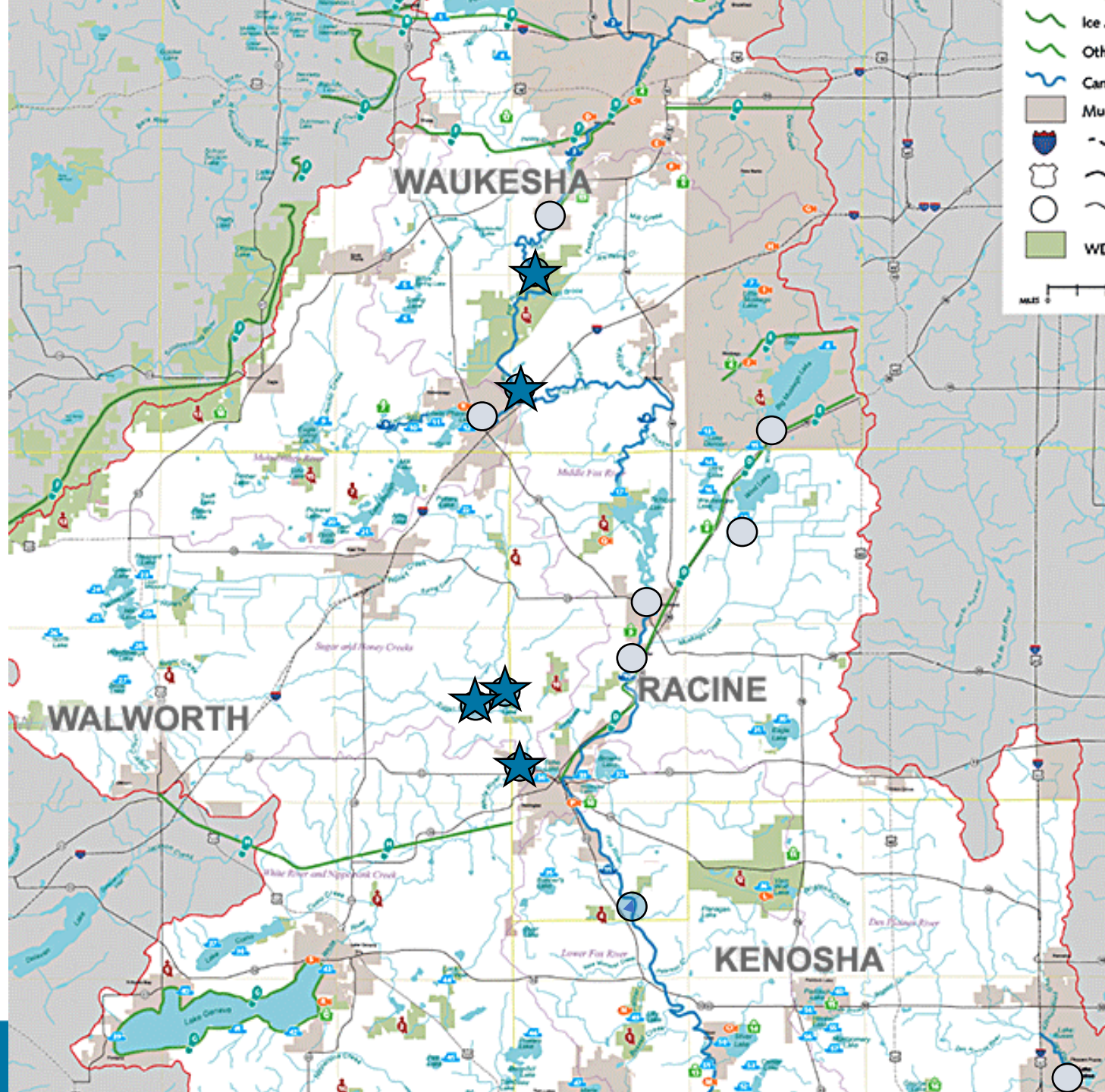
Flow Monitoring

- 13 Total Monitoring Sites



Flow Monitoring

- 13 Total Monitoring Sites
- ★ 5 sites Pressure Transducers maintained by DNR

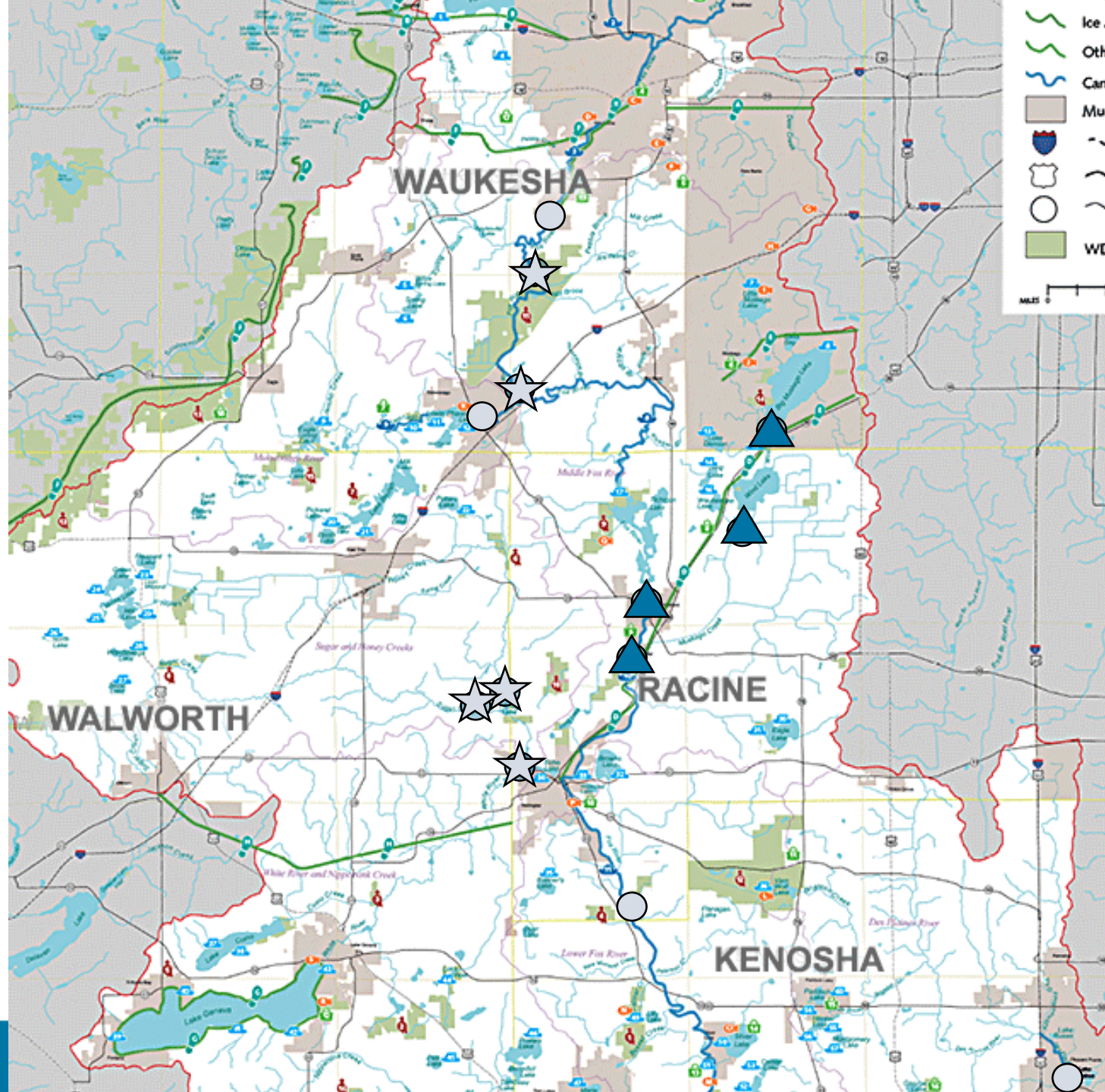


Flow Monitoring

- 13 Total Monitoring Sites
- ★ 5 sites Pressure Transducers maintained by DNR

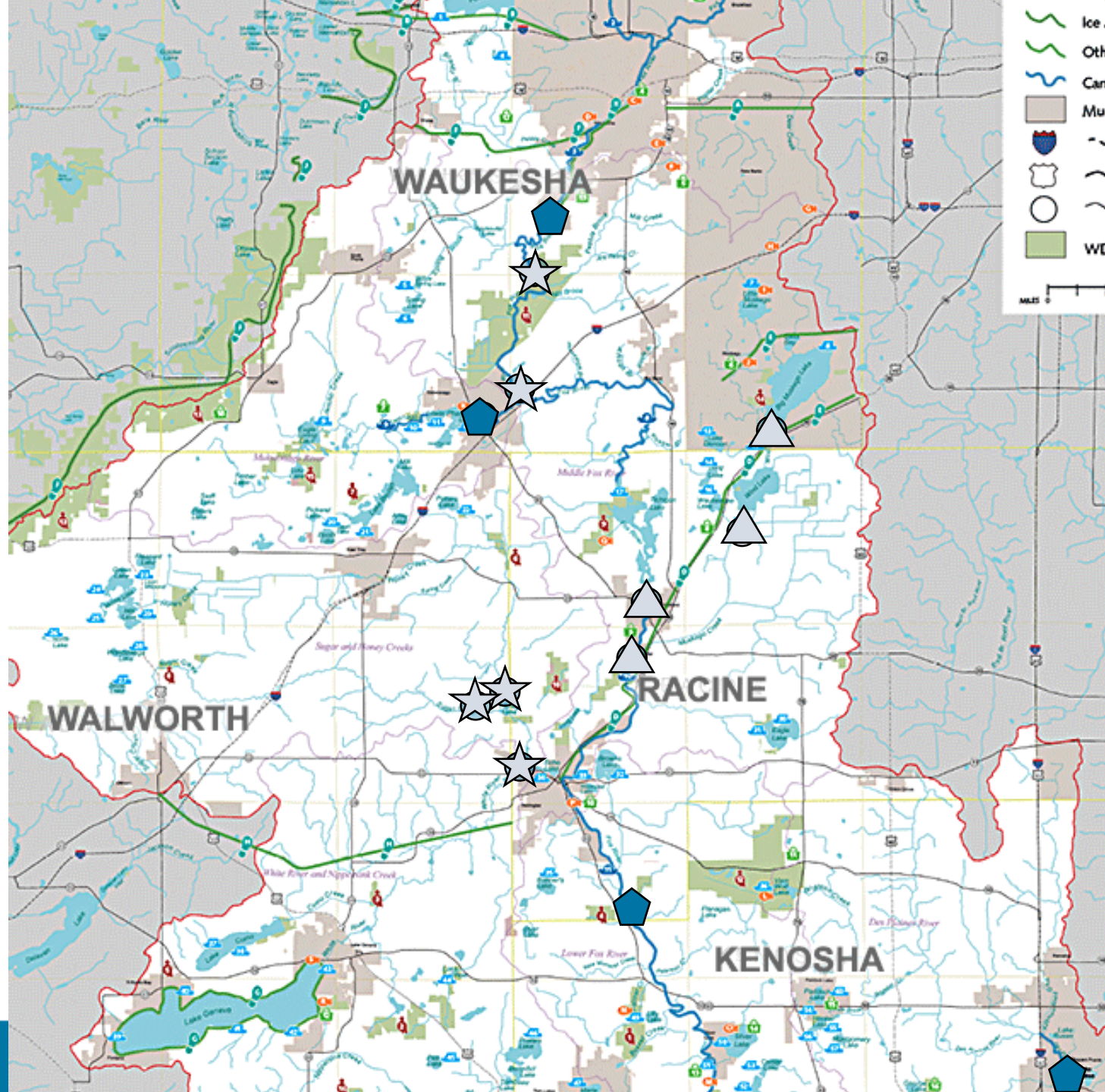
Flow Monitoring

- 13 Total Monitoring Sites
- ☆ 5 sites Pressure Transducers maintained by DNR
- ▲ 4 sites USGS Stage data



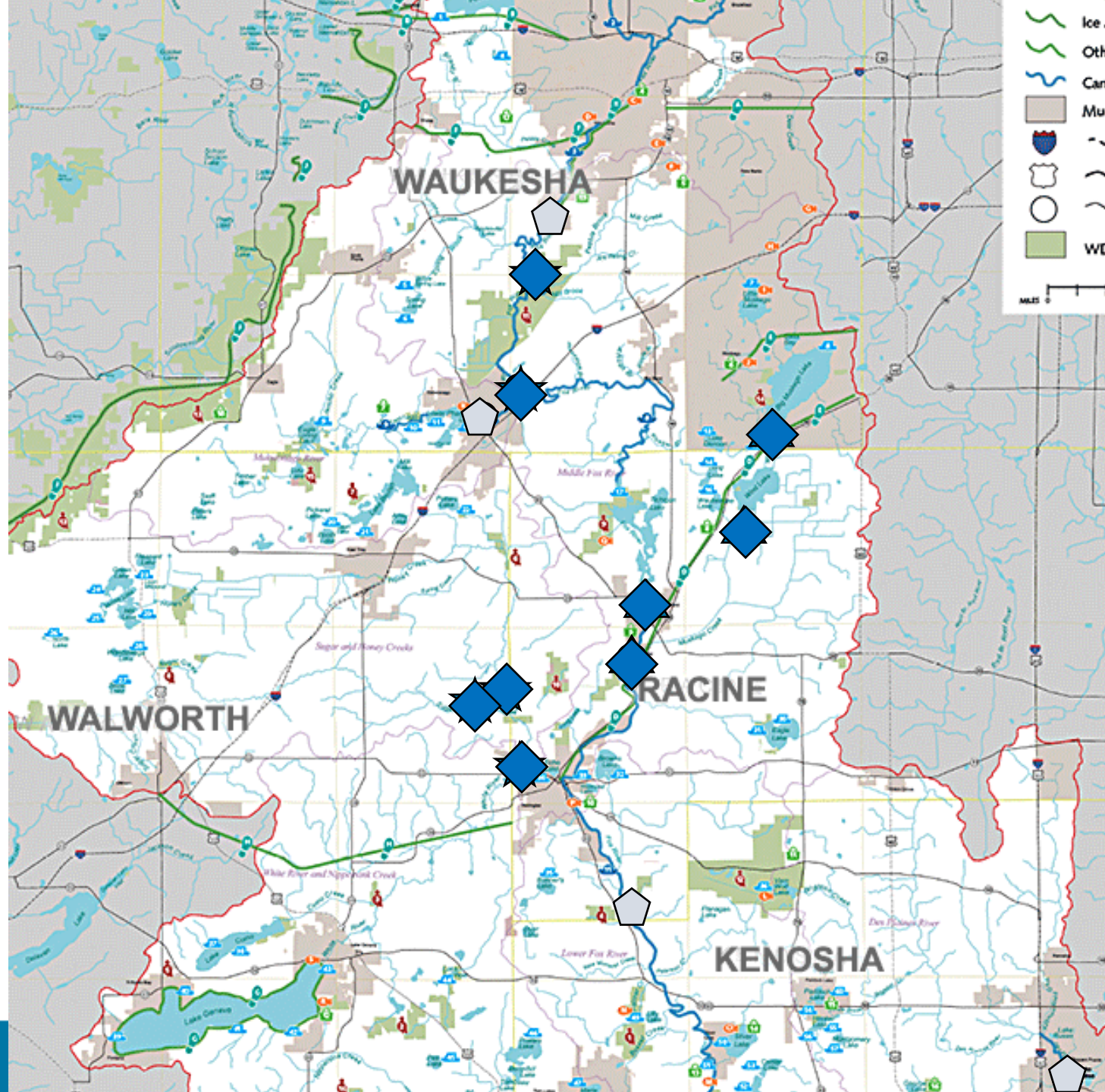
Flow Monitoring

- 13 Total Monitoring Sites
- 5 sites Pressure Transducers maintained by DNR
- 4 sites USGS Stage data
- 4 sites USGS Gage sites



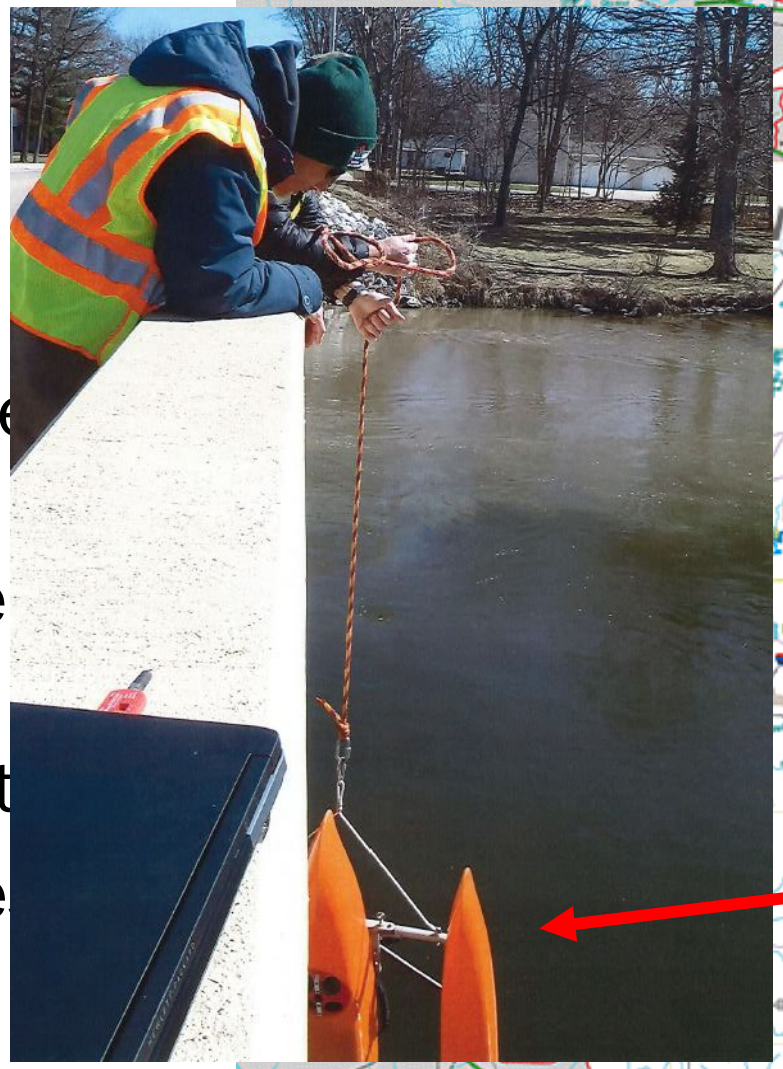
Flow Monitoring

- 13 Total Monitoring Sites
- 5 sites Pressure Transducers maintained by DNR
- 4 sites USGS Stage data
- 4 sites USGS Gage sites
- 9 sites ADCP Flow by DNR



Flow Monitoring

- 13 Total Monitoring Site
- ☆ 5 sites Pressure Transducers maintaine by DNR
- △ 4 sites USGS Stage dat
- ⬠ 4 sites USGS Gage site
- ◆ 9 sites ADCP Flow by DNR



DNR Monitoring Team

- Mike Shupryt
- Mike Sorge
- Craig Helker
- Arthur Watkinson
- Michelle Soderling
- Amanda Schmitz
- Mica Kromrey
- Sarah Fanning
- Camille Bruhn
- Kim Kuber
- Holly Stagemann
- Loretha Jack
- Breanna Crane
- Jim Amrhein
- Tim Asplund
- Rachel Sabre

FOXIL TMDL Development: Next Steps

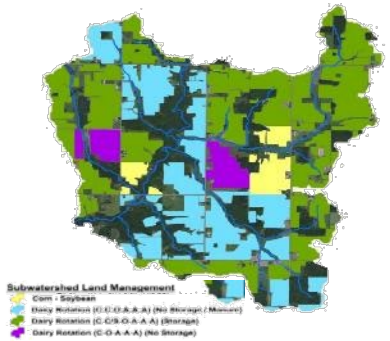
TMDL Development Overview

Monitoring
Conceptualization

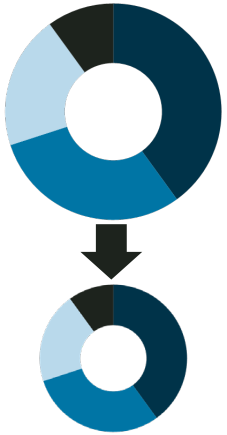
Modeling

Allocations

Implementation



Baseline

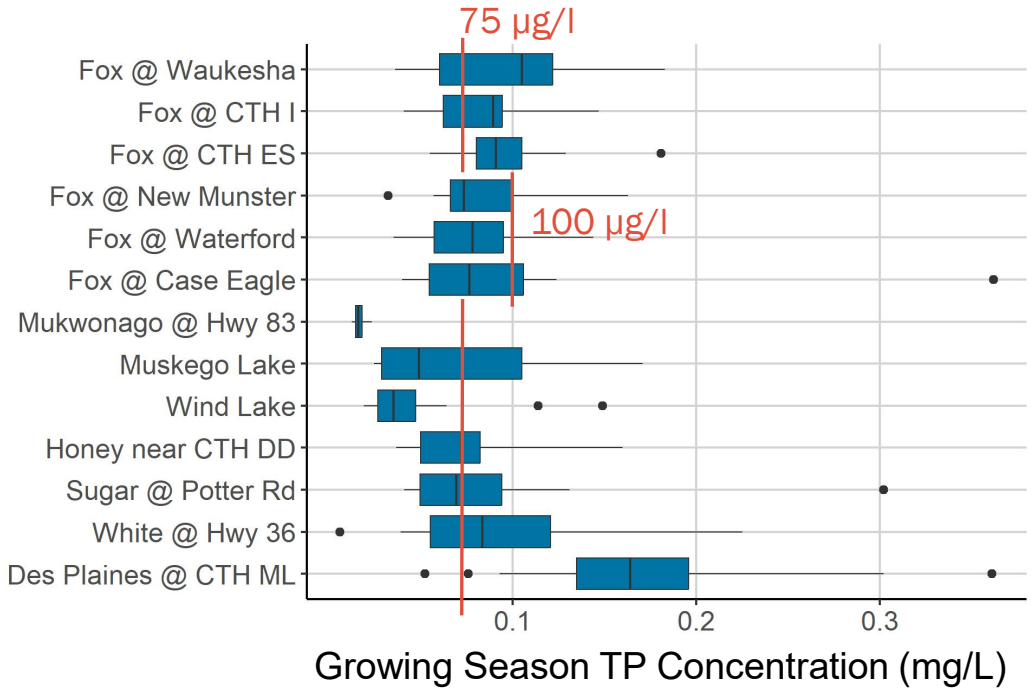


TMDL

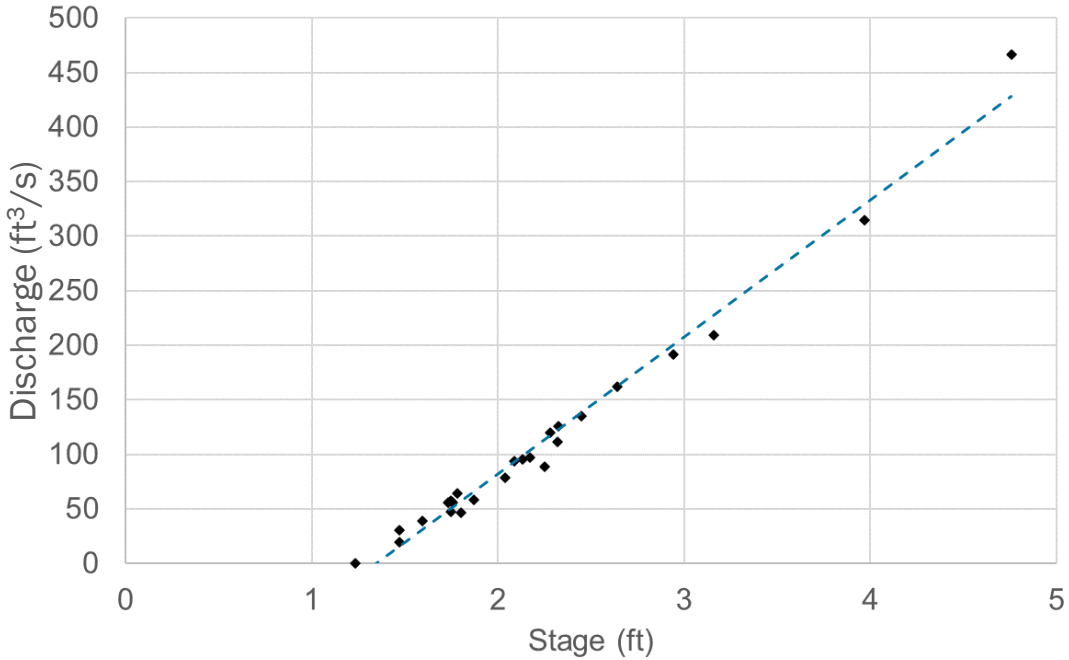
TMDL Process: Monitoring

Monitoring
Conceptualization | Modeling | Allocations | Implementation

Water quality data

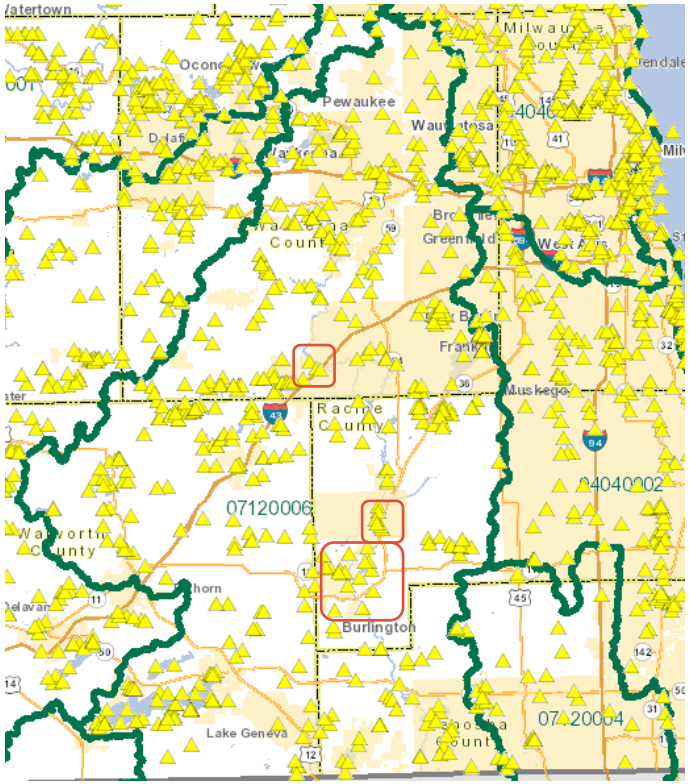


Stage and discharge data



TMDL Process: Monitoring

Monitoring
Conceptualization | Modeling | Allocations | Implementation



Supplemental Monitoring Data

>1000 TP samples

>600 TSS samples

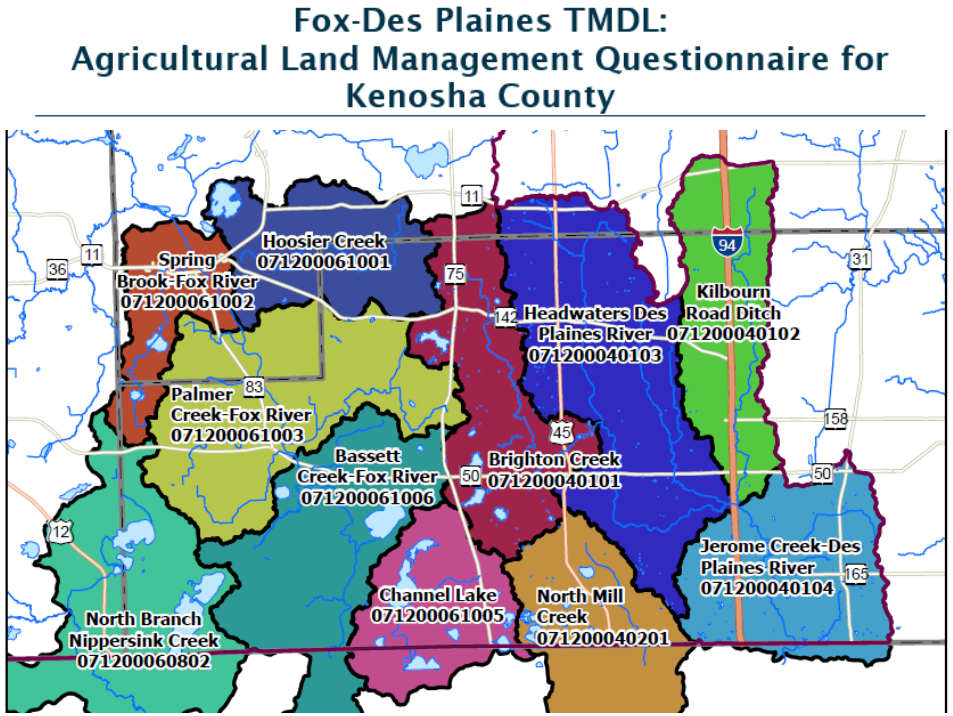
3 adaptive management projects

TMDL Process: Conceptualization

Monitoring | **Conceptualization** | Modeling | Allocations | Implementation

Agricultural Surveys

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

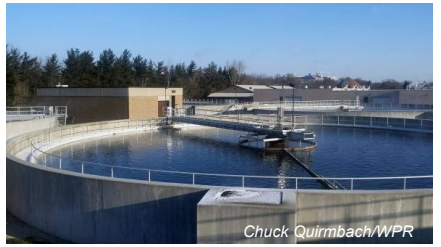


TMDL Process: Conceptualization

Monitoring | **Conceptualization** | Modeling | Allocations | Implementation

County Conservationists

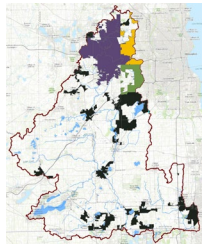
Treatment Plant Operators



MS4 Permittees

SEWRPC

Serving the counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha



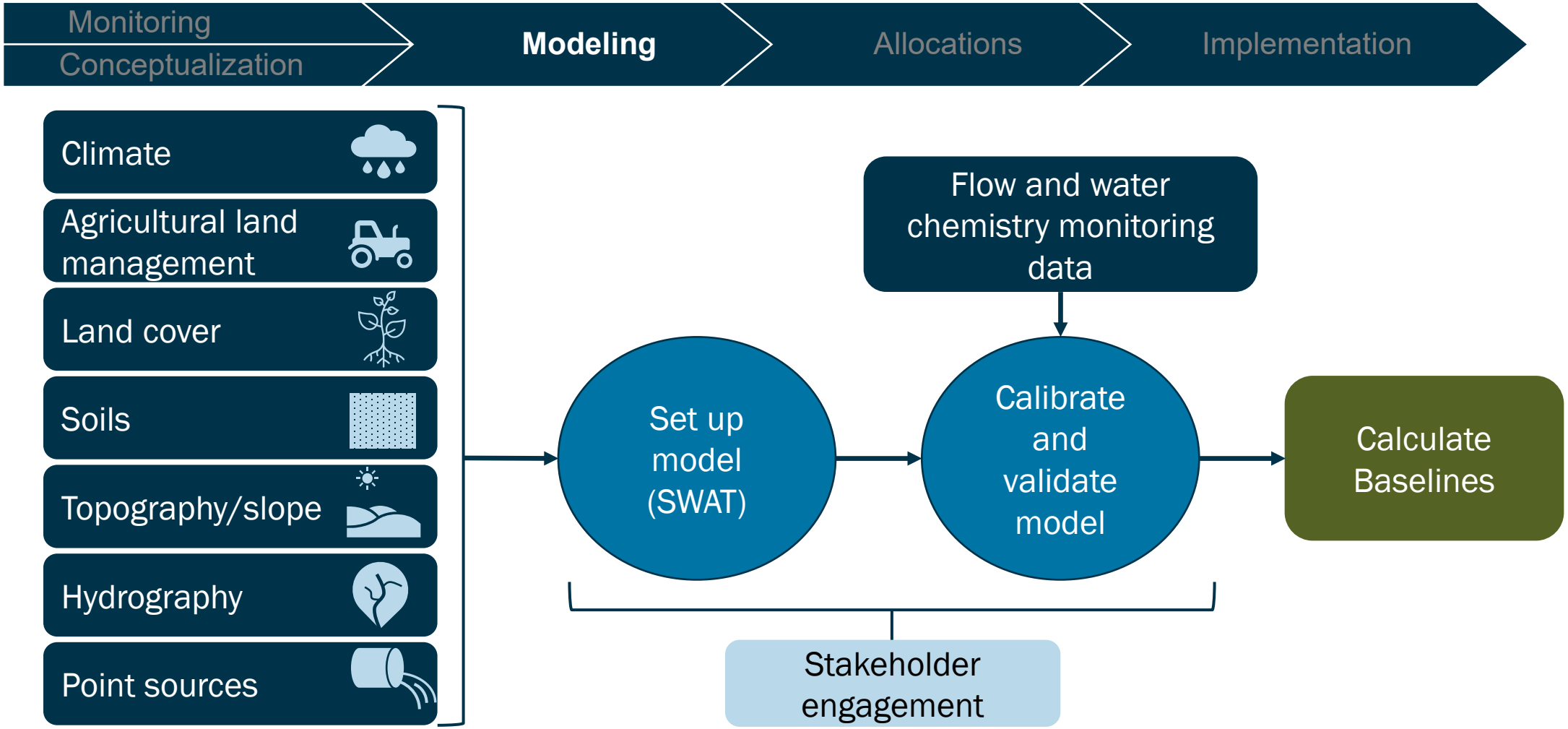
Additional Stakeholder Groups

FOX RIVER STUDY GROUP

Watershed Protection Committee Of Racine County

"Healthy Soil is Sustainable Agriculture"

TMDL Process: Watershed Modeling



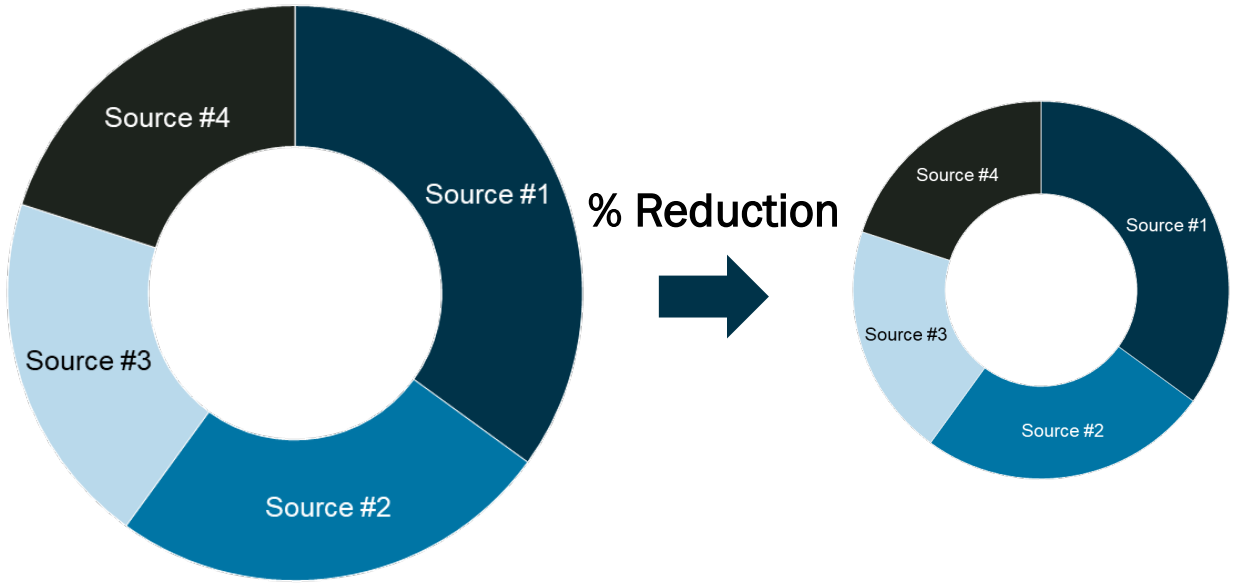
TMDL Process: Allocations

Monitoring / Conceptualization → Modeling → **Allocations** → Implementation

Baseline Load
Model

Allowable Load
Criteria and Flows

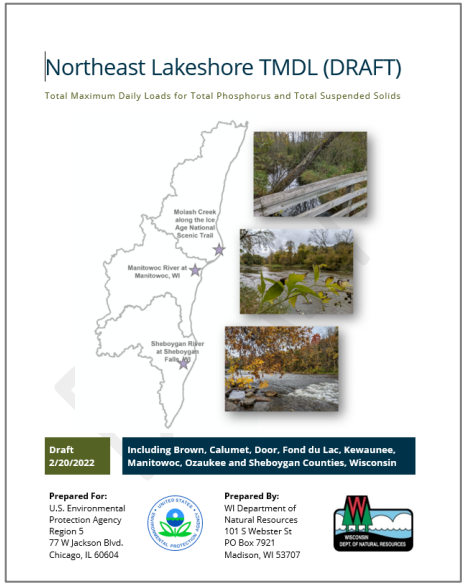
Reduction



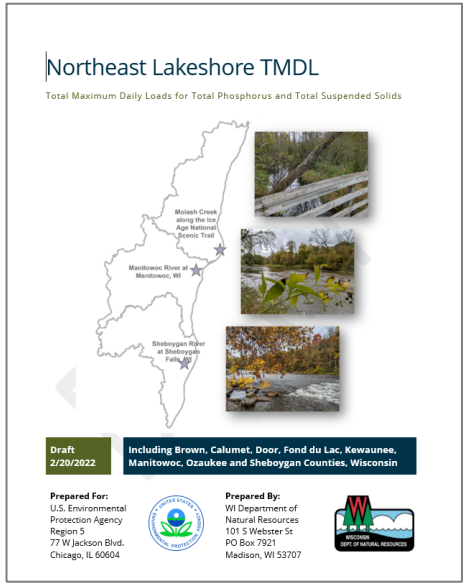
TMDL Process: Allocations

Monitoring
Conceptualization
→ Modeling → **Allocations** → Implementation

Monitoring
Modeling
Allocations



Webinar & **Public Comment Period**



TMDL Process: Implementation

Monitoring / Conceptualization → Modeling → Allocations → **Implementation**

Incorporate TMDL waste load allocations into permit limits

- Municipal and Industrial Wastewater
- Permitted Municipal Storm Sewer Systems
- CAFO Production Areas

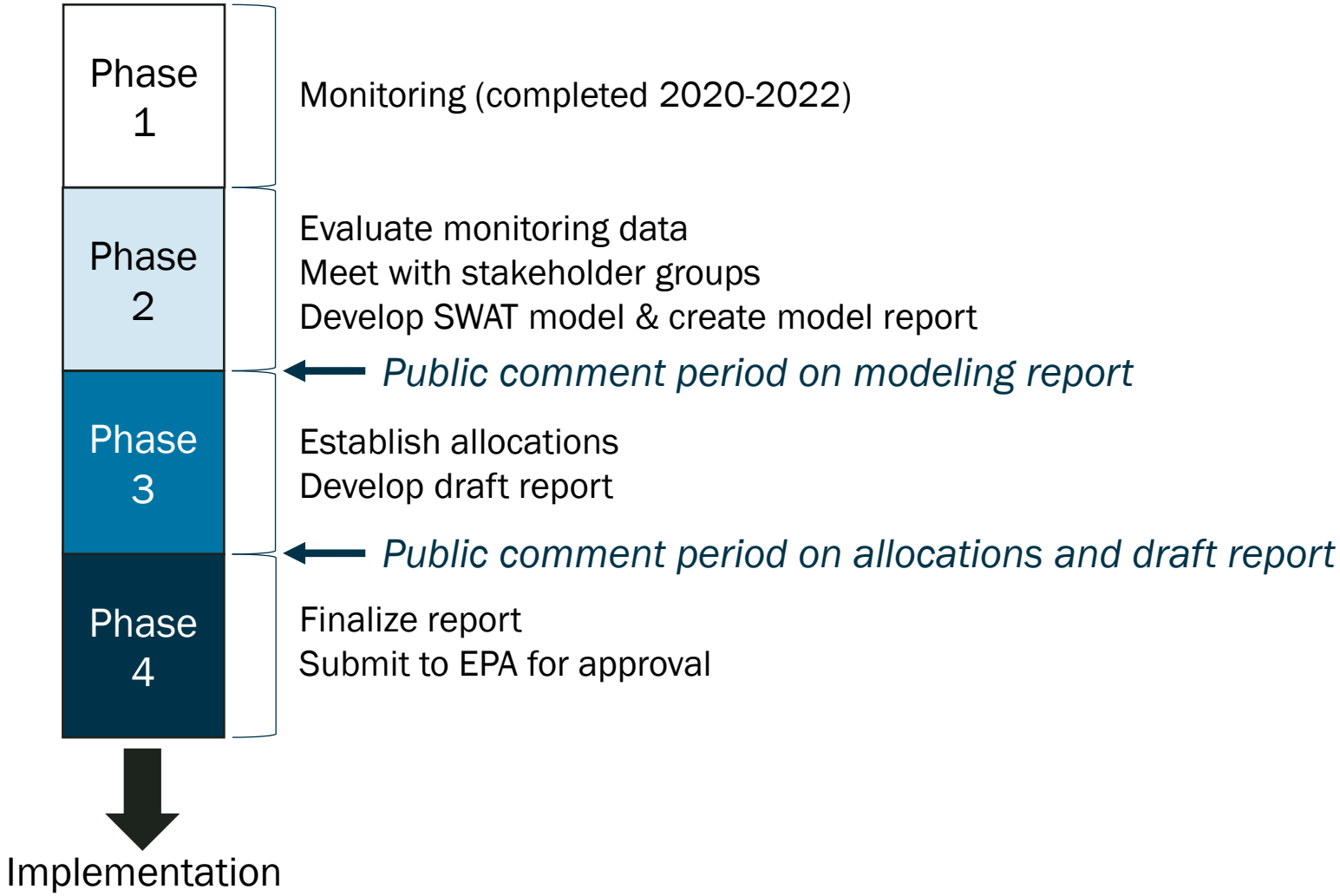
TMDL Process: Implementation

Monitoring / Conceptualization → Modeling → Allocations → **Implementation**

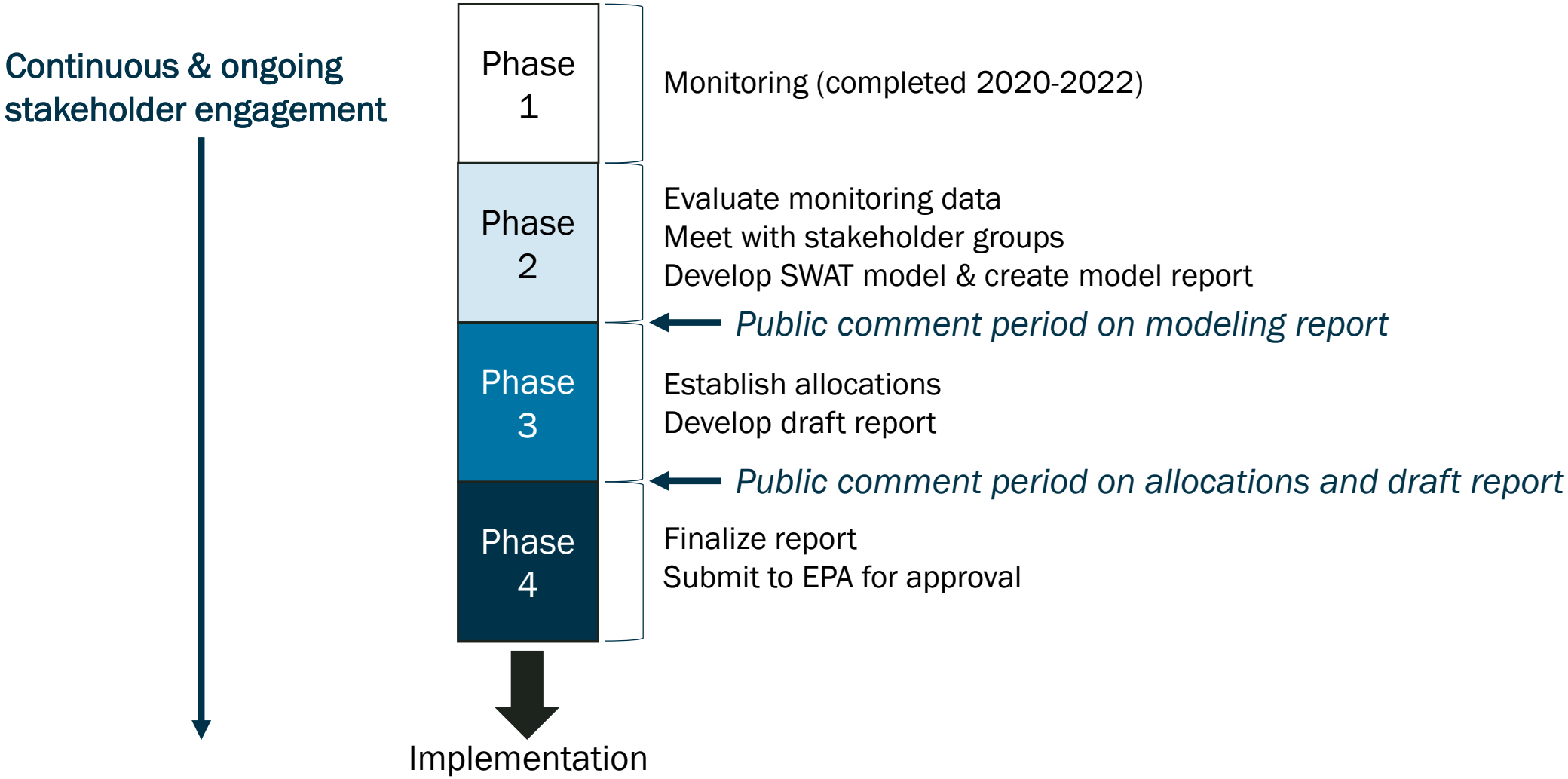
Work with county staff and other partners to implement agricultural land management practices

- Edge-of-Field Targets: Use SnapPlus to estimate baseline conditions and edge-of-field targets
- Prioritization: Use available resources to put extra effort towards high loading watersheds/areas

Summary of Next Steps



Summary of Next Steps



DNR Project Team

Project Coordination: Eric Hettler & Kevin Kirsch

Monitoring: Rachel Sabre

Wastewater: Nick Lent & Nicole Krueger

Stormwater: Samantha Katt & Pete Wood

Agriculture & Urban Nonpoint: Jesse Bennett

Modeling: Eric Hettler

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Subscribe to GovDelivery on the FOXIL Website:

https://dnr.wisconsin.gov/topic/TMDLs/FOXIL

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OFF THE RECORD"