



Permitting Flexibilities:

A Case Study of Wisconsin's Alternative Phosphorus Compliance Options



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Statewide Phosphorus Criteria



Rivers

100 $\mu\text{g/L}$



Streams¹

75 $\mu\text{g/L}$



Reservoirs

- Not Stratified = 40 $\mu\text{g/L}$
- Stratified = 30 $\mu\text{g/L}$



Inland Lakes²

Ranges from
15-30 $\mu\text{g/L}$



Great Lakes

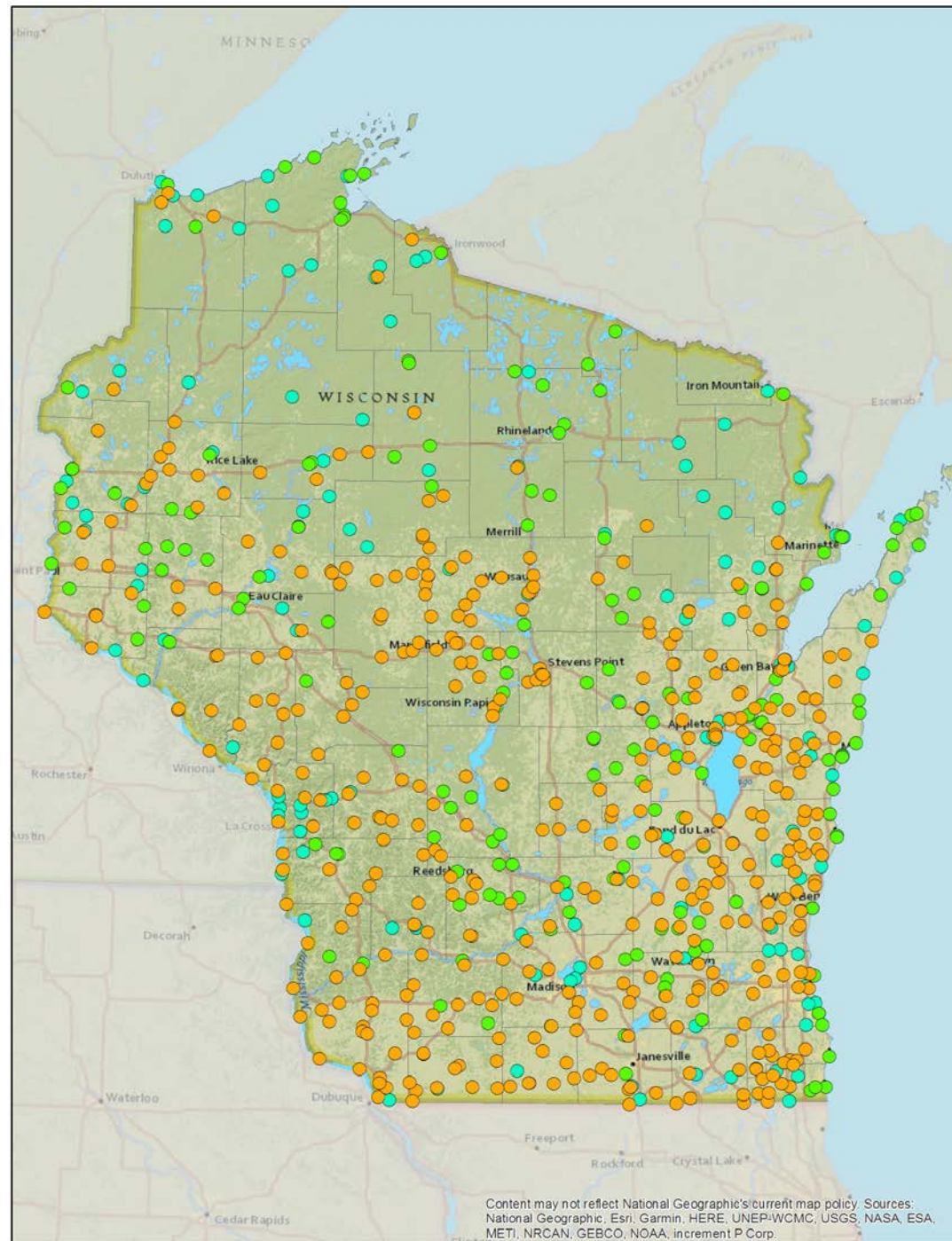
- Lake Michigan = 7 $\mu\text{g/L}$
- Lake Superior = 5 $\mu\text{g/L}$

- Growing Season Median Value (rivers & streams)
- Summer Average Value (lakes & reservoirs)



Statewide Distribution of Limits

- No Reasonable Potential (no limit)
- Blue Markers
- Limit > 0.3 mg/L
- Green Markers
- Low-level phosphorus limit
- Orange Markers





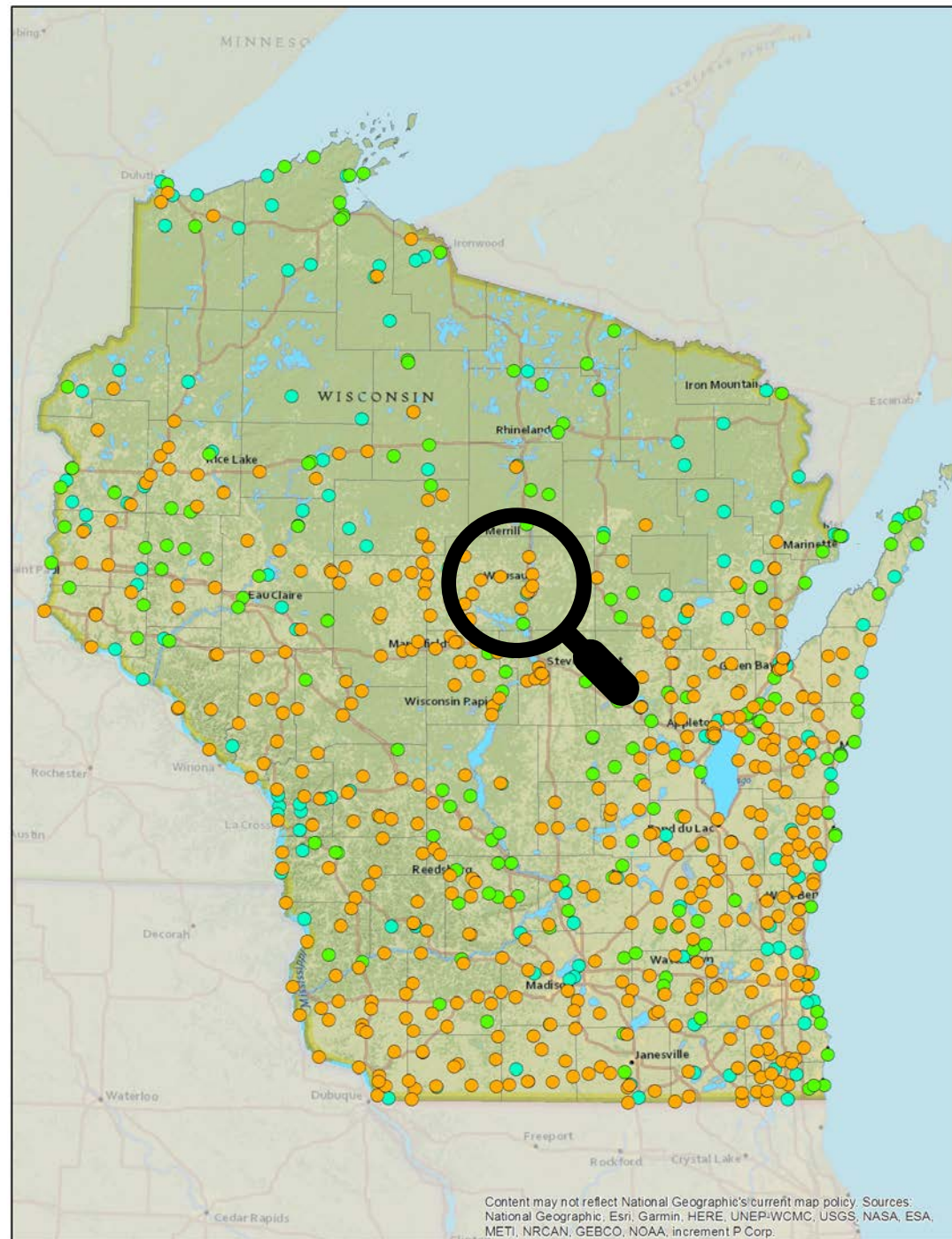
Options for Compliance

- Compliance schedule (7-9 years)
 - codified in Ch. NR 217 Wis. Adm. Code
- Major facility upgrade
 - (generally requires filtration)
- Water quality trading
- Adaptive management
- TMDL Development / New WQBEL data
- Regionalization, land-based treatment, outfall relocation
- Variance options (*not* compliance)



Statewide Distribution of Limits

- No Limit
Applicable
- Blue Markers
- Limit > 0.3 mg/L
- Green Markers
- Low-level
phosphorus limit
- Orange Markers



Marathon Water and Sewer Department

- Issued a phosphorus WQBEL in 2012:
 - 0.075 mg/L & 0.225 mg/L
- Facility Stats:
 - 0.29 MGD Average
 - 0.35 MGD Design
 - Activated sludge with BPR
 - Final Clarification
- Prior Limits:
 - 1.0 mg/L TBEL



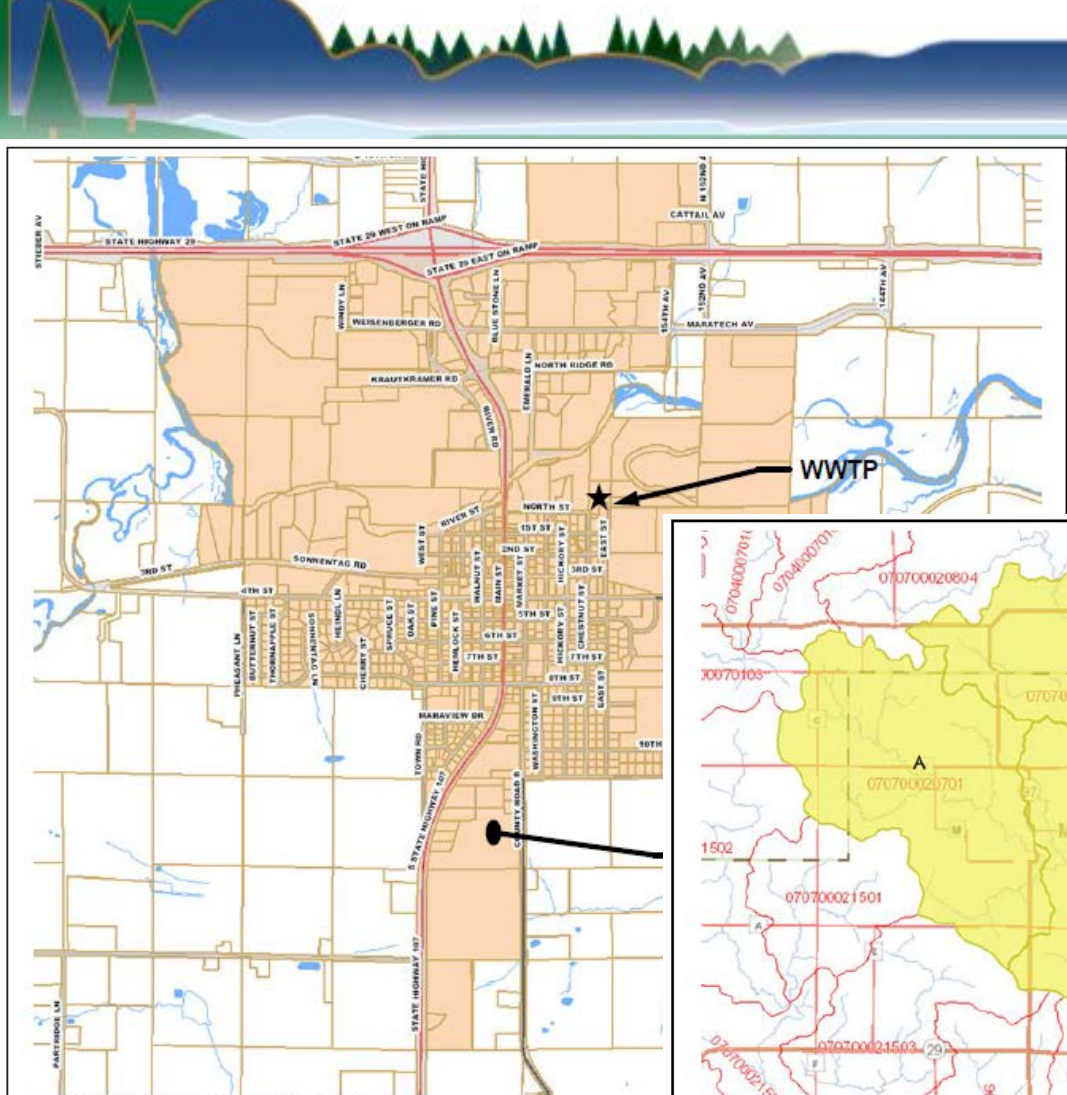


Figure 1.02-1 Sewer Service Area and WWTP Location

Community Stats:
Population=1524
Households = 505

Receiving Water:
Big Rib River = 146 ug/L
Flow = 380 cfs

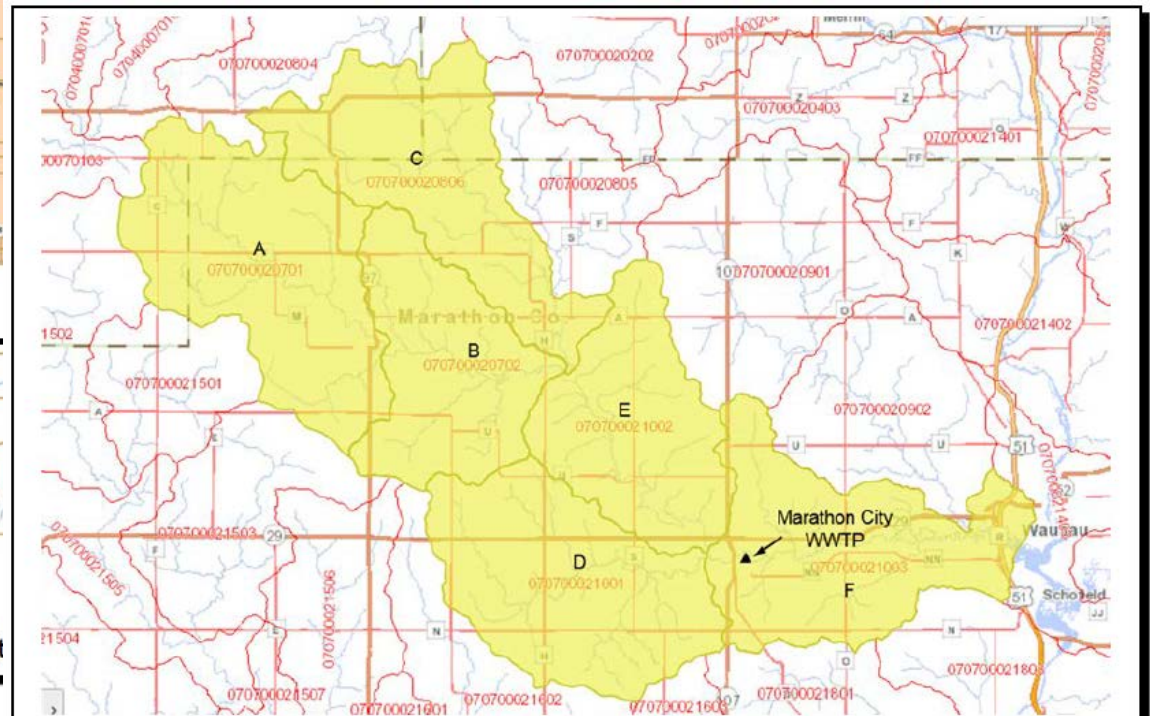


Figure 6.03-8 HUC 12 Watersheds in Potential AM Action Area



Planning Process: 1st Permit Term

- Year 1: Limit issued
- Year 2: Operation and Needs Evaluation
- Year 3: Preliminary Compliance Alternatives Plan
- Year 4: Final Compliance Alternatives Plan
- Year 5: Permit reissuance – updated schedule reflects compliance decision



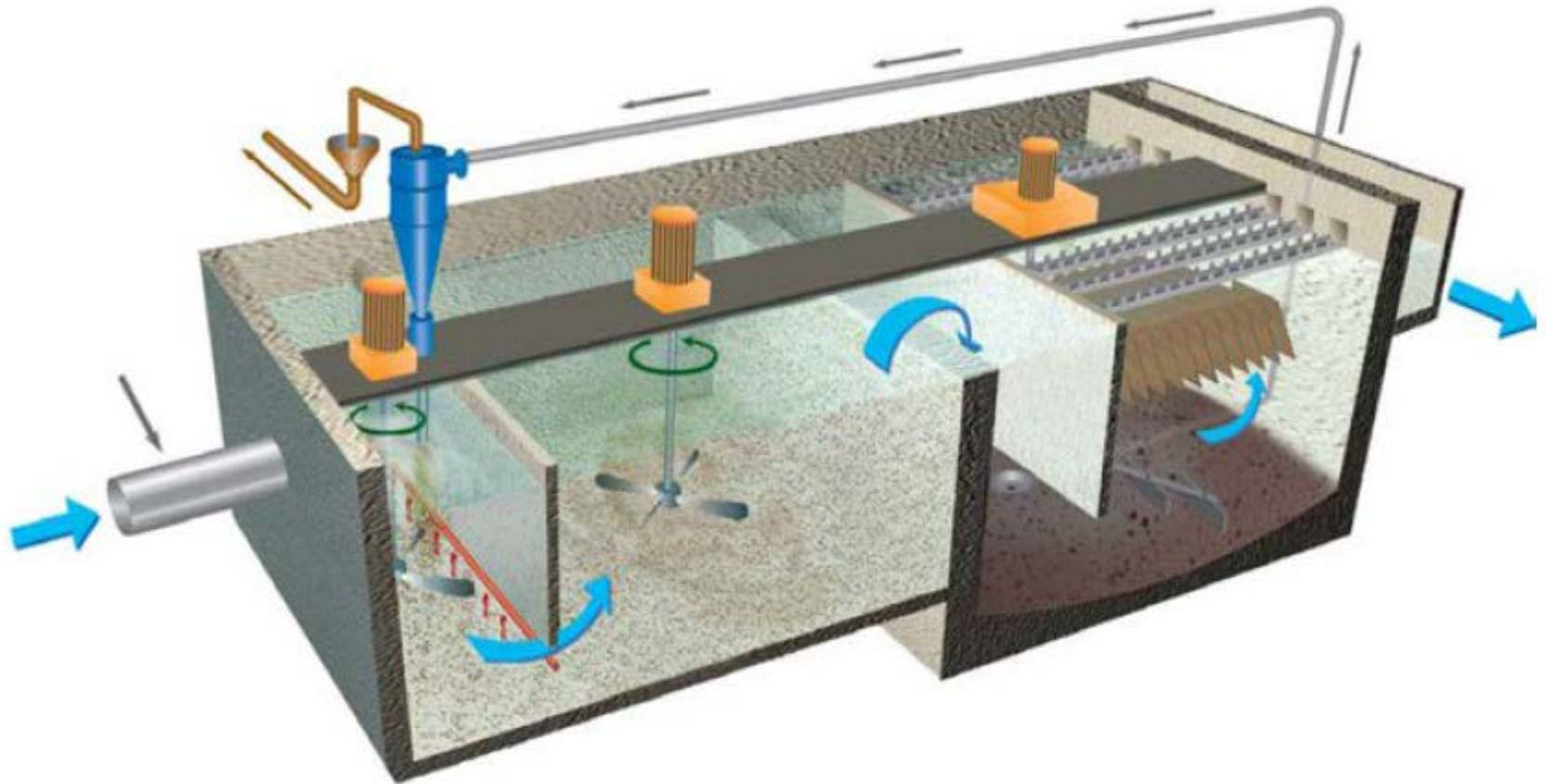
Planning Outcomes

- Year 2 Outcomes:
 - Optimization / minor upgrades unable to meet WQBEL
 - Source reduction unlikely to have a major impact
- Year 4 Outcomes:
 - Filtration required, costs estimated
 - Watershed approaches viable

Reporting By:



Facility Upgrade: Tertiary Filtration

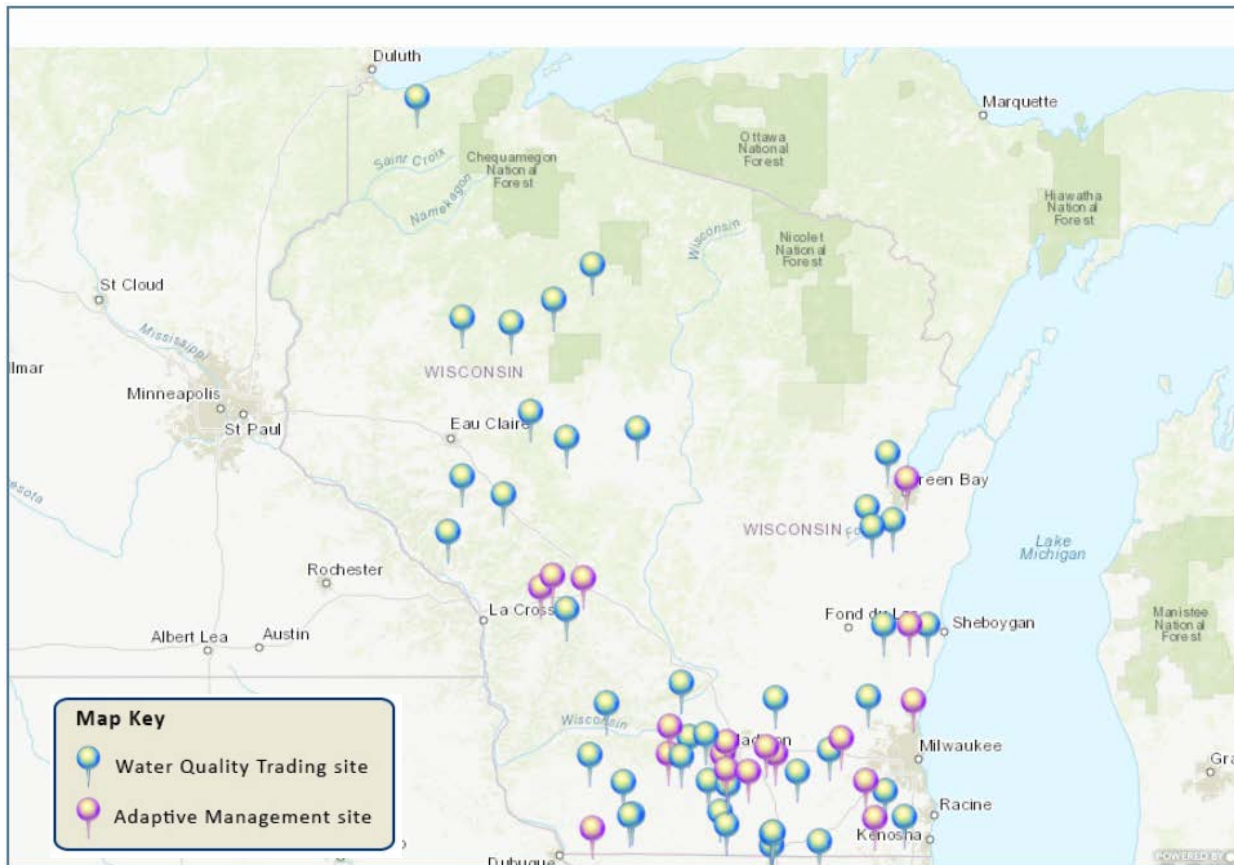
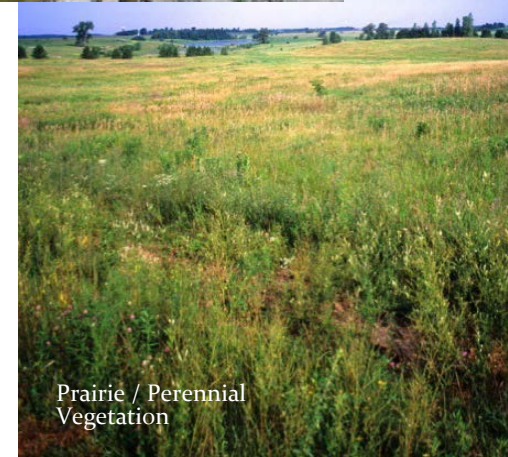


Source: Veolia

Figure 6.03-3 Schematic of ACTIFLO® Process

Water Quality Trading

- 35 Dischargers Statewide
- Agricultural Phosphorus Offsets
- Must offset load in excess of WQBEL to meet water quality standards





Water Quality Trading

Credit Need: 700 lbs/yr

Upstream Area: ~210,000 acres (320 mi²)

Partners: County LCD, Agronomists, CAFOs

BMP	Average Phosphorus Credit (Credit/acre/yr)	Total Phosphorus Trade Credit (lb/yr)	Acres Installed	20-Year Present Worth Cost ¹	Present Worth Cost per Phosphorus Trade Credit
Buffer Strips	2.0	100	50	\$99,000	\$54
Cover Crops	0.5	200	400	\$314,000	\$98
Cropping, Tillage, and In Field Conservation Practices	0.83	400	480	\$236,000	\$44
Total ²		700	930	\$649,000	\$56
Total with administration costs				\$780,000	

¹Costs are 2016 basis and do not include cost-sharing or grants. Costs include maintenance and renewal at the end of the BMP life. Discount rate = 4.125 percent.

²Phosphorus trade credits adjust the TP removed based on the trade ratios.

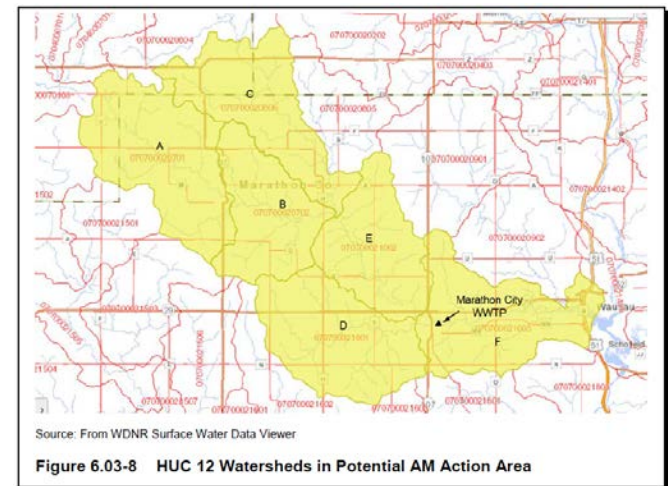
Table 7.05-4 Present Worth Costs for WQT BMPs

Adaptive Management

Label	HUC-12	HUC-12 Name	Area (acres)	Total Nonpoint Phosphorus Load (lbs/year)
A	70700020701	Beaver Creek-Black Creek	33,734	7,810
B	70700020702	Drewek Creek-Black Creek	22,480	4,680
C	70700020806	Baldwin Creek-Big Rib River	27,957	8,800
D	70700021001	Scotch Creek	30,071	12,000
E	70700021002	Pine Creek-Big Rib River	23,395	7,330
F	70700021003	Kennedy Creek-Big Rib River	29,802	6,410

Table 6.03-6 Potential Action Area and PRESTO Results

- 18 Dischargers Statewide
- Agricultural Phosphorus Offsets
- A plan to restore the receiving water
- Achievable interim limit applied for up to four permit terms





Period	TMDL Sampling Data 2010-2013	PRESTO 2009-2011	Village Sampling Data 2012-2015
WWTP Loads			
Projected Future Flow (MGD)	0.29	0.29	0.29
Concentration (mg/L)	0.8	0.8	0.8
Load (lbs/year)	706	706	706
Big Rib River Load			
Location	Rib Falls	Upstream of Outfall	Upstream of Outfall
Annual Average Flow (MGD) ¹	229	not provided	245
Average Concentration (mg/L) ²	0.096	not provided	0.146
Estimated Load (lbs/year)	66,900	114,000	108,900
Scotch Creek			
Flow (MGD)	28		
Concentration (mg/L)	0.114		
Load (lbs/year)	9,717		
Total Existing Load (lbs/year)	77,300	115,000	110,000
Allowable River Load			
Flow (MGD) ³	257	257	245
Concentration (mg/L)	0.075	0.075	0.075
Load (lbs/year)	58,700	58,700	56,000
Needed Load Reductions (lbs/year)	18,600	56,300	54,000

¹ The river flow for the TMDL Sampling Data is based on average flows over the sampling period at the Rib Falls USGS station. The river flow for the Village Sampling Data is based on average flows other the sampling period at the Rib Falls USGS station plus the preliminary Scotch Creek estimated flow for the TMDL.

² The mean annual average of the sampling data is used.

³ The total river flow includes the flow from the preliminary Scotch Creek estimated flow for the TMDL. For the PRESTO scenario, we assumed the same flow that was used for the TMDL Sampling Data scenario.

Table 6.03-3 Estimated Existing Phosphorus Loads

20-Year
NPV:
\$5.9M

TMDL Implications

- Wisconsin River TMDL Development
- Point source wasteload allocation greater than current WQBEL
- Credit threshold for agricultural fields
- Expanded eligible trading area
- TMDL Based Limit: 0.2 – 0.3 mg/L

Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin Final U.S. EPA Approved Report



04/26/2019

Including Adams, Clark, Columbia, Dane, Forest, Jackson, Juneau, Langlade, Lincoln, Marathon, Monroe, Oneida, Portage, Price, Richland, Sauk, Shawano, Taylor, Vernon, Vilas, Waushara, and Wood Counties, Wisconsin

Prepared For:
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Protection Agency
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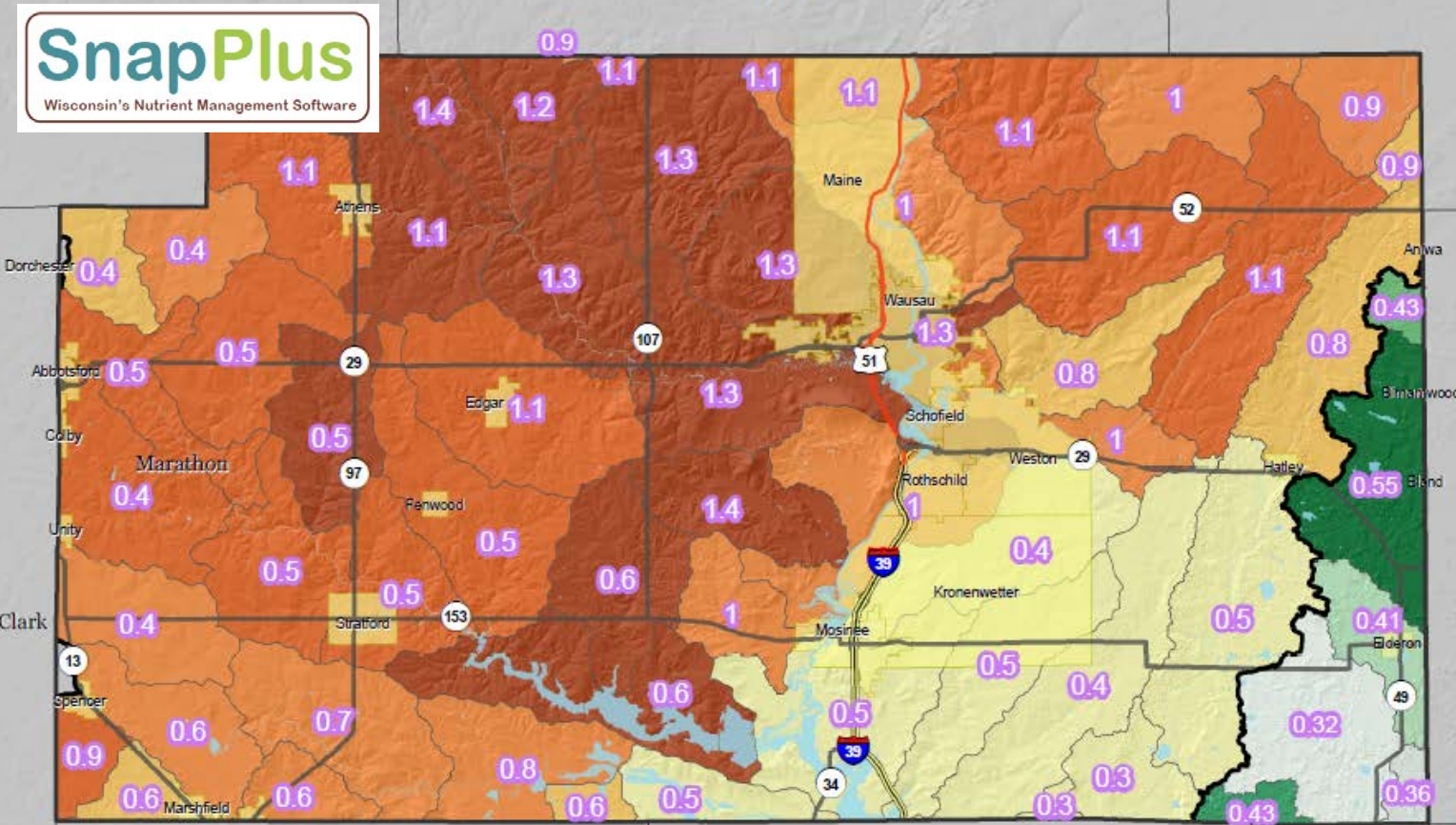


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TMDL Baseline Phosphorus Reduction MARATHON COUNTY HUC12 ANALYSIS - Site-Specific Criteria

Agricultural Load Allocation: lbs/acre/yr



Map Features

Roadways

- Interstate
- Federal
- State

Other

- County Boundaries
- Cities & Villages
- Lakes & Rivers

Phosphorus Reduction Analysis

Wisconsin River Watersheds

Baseline TP (lbs/ac/yr) per HUC12 (Site-Specific Criteria)

- 0.3
- 0.3 - 0.6
- 0.6 - 1.0
- 1.0 - 1.3
- 1.6

Upper Fox - Wolf Watersheds

Baseline TP (lbs/ac/yr) per HUC12

- 1.87
- 2.09
- 2.38
- 2.52
- 2.53
- 3.25

HUC12 Target TP (lb/ac/yr)

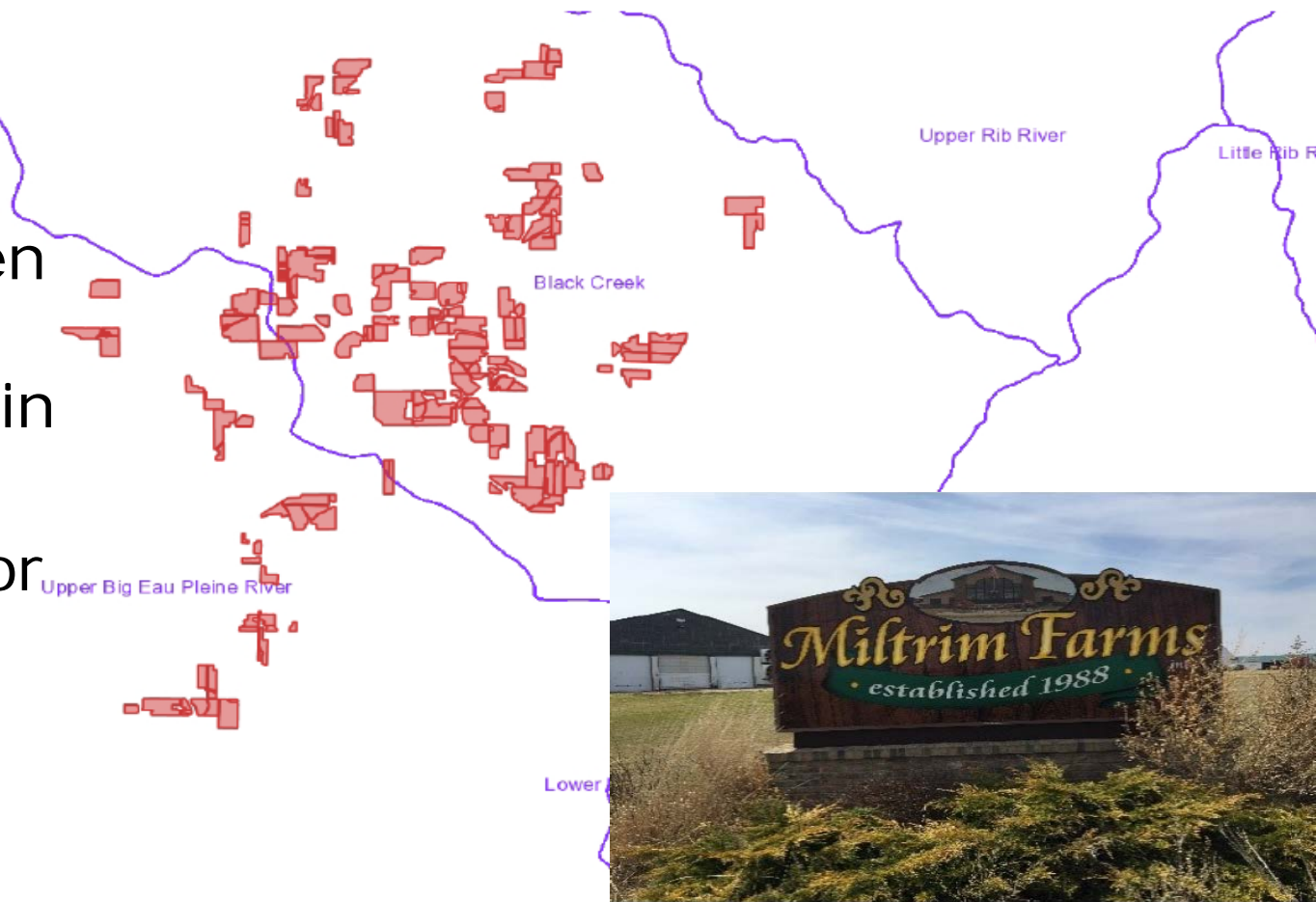
- Baseline Policy: Interim Credits

The Solution:

Cover Crops, Every Year, on ~1000 Acres

Figure 3: Location Map of MilTrim Farms Fields.

- Going beyond CAFO permit Requirements
- Binding, written agreement to install+maintain practices
- Can be used for trading in the future



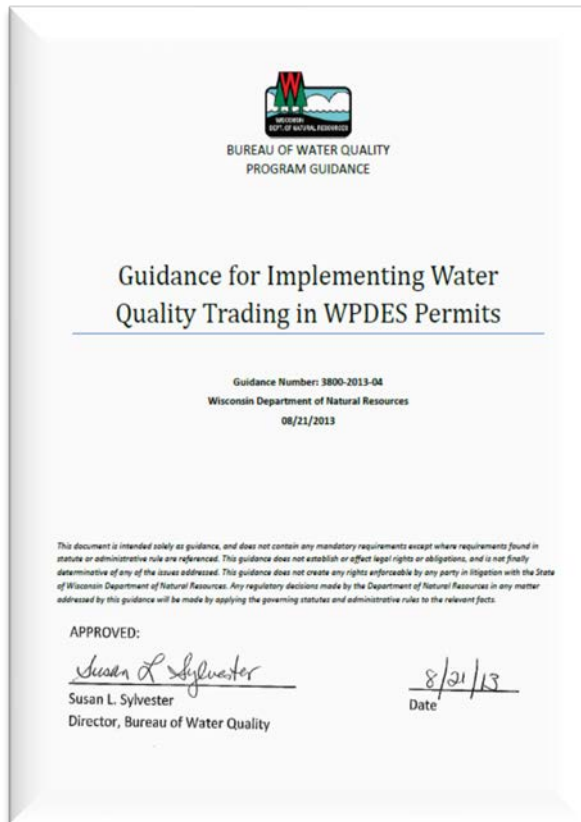
Multi-discharger Variance: A transition to trading

- Trading not immediately viable
- Eligible for MDV
- Employed third-party watershed offset
- Sufficient to meet s. 283.16(6)(b) variance offset requirements
- Annual reductions:
1st Year: 1000 lbs/yr
End of project term:
5000 lbs/yr



For More Information, Visit Our Website:

<https://dnr.wisconsin.gov/topic/Wastewater/WaterQualityTrading.html>



Multi-discharger Phosphorus Variance

What is a multi-discharger variance?

A MULTIDISCHARGE VARIANCE (MDV) IS...

- A time extension for point sources facing restrictive phosphorus limits to comply with limits
- An opportunity for point sources to make meaningful strides towards water quality improvements in a more economically effective manner
- Approved on a case-by-case basis and implemented in a WPDES permit

A MDV IS NOT...

- An individual variance pursuant to s. 283.15
- A final compliance option for point sources
- Water quality trading or adaptive management
- Permanent

What the MDV requires:

A point source is responsible for evaluating its compliance options such as facility upgrades, water quality trading, adaptive management, and, potentially, a phosphorus MDV. If a facility meets the eligibility requirements and requests the MDV, the WPDES permit will, upon approval, be modified or reissued with the following requirements:

1. **Reductions of effluent phosphorus:** Point sources are required to reduce their phosphorus load each permit term. Interim limitations will be included in the permit based on current effluent quality, opportunities for optimization, and other site-specific considerations.
2. **Implement a watershed project:** Point sources must implement one of the following watershed project options to help reduce nonpoint source of phosphorus pollution:
 - Enter into an agreement with DNR to implement a project to offset the amount of phosphorus their discharge exceeds the target value.
 - Enter into a DNR-approved agreement with a third party to implement a project to offset the amount of phosphorus their discharge exceeds the target value.
 - Make payments to county LCDs of \$50 per pound times the number of pounds of phosphorus their discharge exceeds the target value.

The approval determination must be re-evaluated each permit reassessment of the MDV project timeline. The legal requirements of the MDV determination as well as general implementation procedures can be found in s. 283.16, Wis. Stat.

MDV APPROVAL & DURATION

EPA approved the MDV on February 6, 2017, which is effective until February 5, 2027. Permit terms and conditions that reflect the MDV cannot extend beyond the term of the variance expiration date. Several options are available to extend the current MDV approval to encompass the full time period allotted in s. 283.16, Wis. Stat., including:

- Seeking EPA approval on updated MDV packages, and
- Providing a compliance schedule after MDV expiration.

The Department will continue to work with EPA and stakeholders to pursue these options to maximize the duration of the MDV as necessary and appropriate. Section 283.16, Wis. Stat., authorized the DNR to seek MDV approval for up to 3 permit terms.

ELIGIBLE POINT SOURCES:

A point source must meet all of the following to request a MDV:

- Must be an existing facility
- Requires a major facility upgrade to comply with their phosphorus WQBELs
- Meets the primary and secondary substantial indicators
- Agrees to reduce its phosphorus load during the variance timeline
- Implements a watershed project to help curb nonpoint source phosphorus pollution

An eligibility quiz is available online to help point sources make this determination.

ACRONYMS

DNR, Wisconsin Department of Natural Resources
DOA, Wisconsin Department of Administration
EIA, Economic Impact Analysis
LCD, Land and Water Conservation Department
MDV, Multi-Discharger Variance
WPDES, Wisconsin Pollutant Discharge Elimination System
WQBEL, Water quality-based effluent limit

Tools for Adaptive Management and Water Quality Trading

[Subscribe to phosphorus rule updates.](#)

The following resources may assist you in developing adaptive management and water quality trading plans. Questions may be submitted to [Amy Caple](#).

Guidance documents

- [Adaptive Management Handbook \(pdf\)](#)
- [Water Quality Trading How-To Manual \(pdf\)](#)
- [Implementing Water Quality Trading in WPDES permits \(pdf\)](#)

A [webinar series](#) is available to discuss specific components of the guidance documents.

Quantifying nonpoint source pollution loads & reductions

Nonpoint source pollution reductions are typically quantified through modeling.

- [Table of management practices and models \(pdf\)](#)

Provides a list of practices and recommended models to quantify resulting reductions from various management practices.

Plans should recommend a quantification method if a model or tool is not listed, or if an alternative quantification method is preferred in lieu of the recommended model listed in guidance. Additional guidance available in the adaptive management handbook. Questions related to modeling may be submitted to [Kevin Kirsch](#).

Calculation of pollutant reductions

- Pollutant reductions from streambank stabilization projects should be calculated using site-specific measurements, soil test nutrient concentrations, and the [NRCS Erosion Estimator \(excel\)](#).

Pollution Load Ratio Estimation Tool

The [Pollution Load Ratio Estimation Tool \(PRESTO\)](#) is a statewide GIS-based tool that compares the average annual phosphorus loads originating from point and nonpoint sources within a watershed. This model is used to help determine adaptive management eligibility by quantifying the ratio of point to nonpoint sources in a watershed, and can also provide an indication of the potential for nonpoint trading credits within a watershed.

Surface waters

- [Atlas data, webinars, reports](#)
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