ADAPTIVE MANAGEMENT IN WISCONSIN

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8/30/2021

Agenda and Presentation Outline

- Overview of Adaptive Management in Wisconsin
  - Background of Phosphorus Regulations
  - Motivations for Alternative Compliance Options
  - Program History / Development of Rule Language
- "Nuts and Bolts" of Adaptive Management
  - Eligibility Conditions
  - Adaptive Management Plan Content
  - DNR/Public Review Process
  - Permitting
- Examples of Adaptive Management Projects
  - Success Stories
  - Water Quality Data
- Lessons Learned

Lower Wisconsin River, Southern Wisconsin

Who is DNR?

- DNR is the delegated Clean Water Act authority for the State of Wisconsin
- NPDES program oversees roughly 750 surface water discharges and 150 groundwater discharges (individual permits)
- Roughly 550 municipal surface water discharges
- Several large urban areas (Milwaukee is largest, ~100 MGD) and MANY small village wastewater facilities.
- Many industries including dairy, food/meat processing, and paper
- Roughly 70 staff comprise the Wastewater Program
- Interface closely with other DNR programs (Water Eval, Monitoring, etc.)

Who are the Three Amigos?

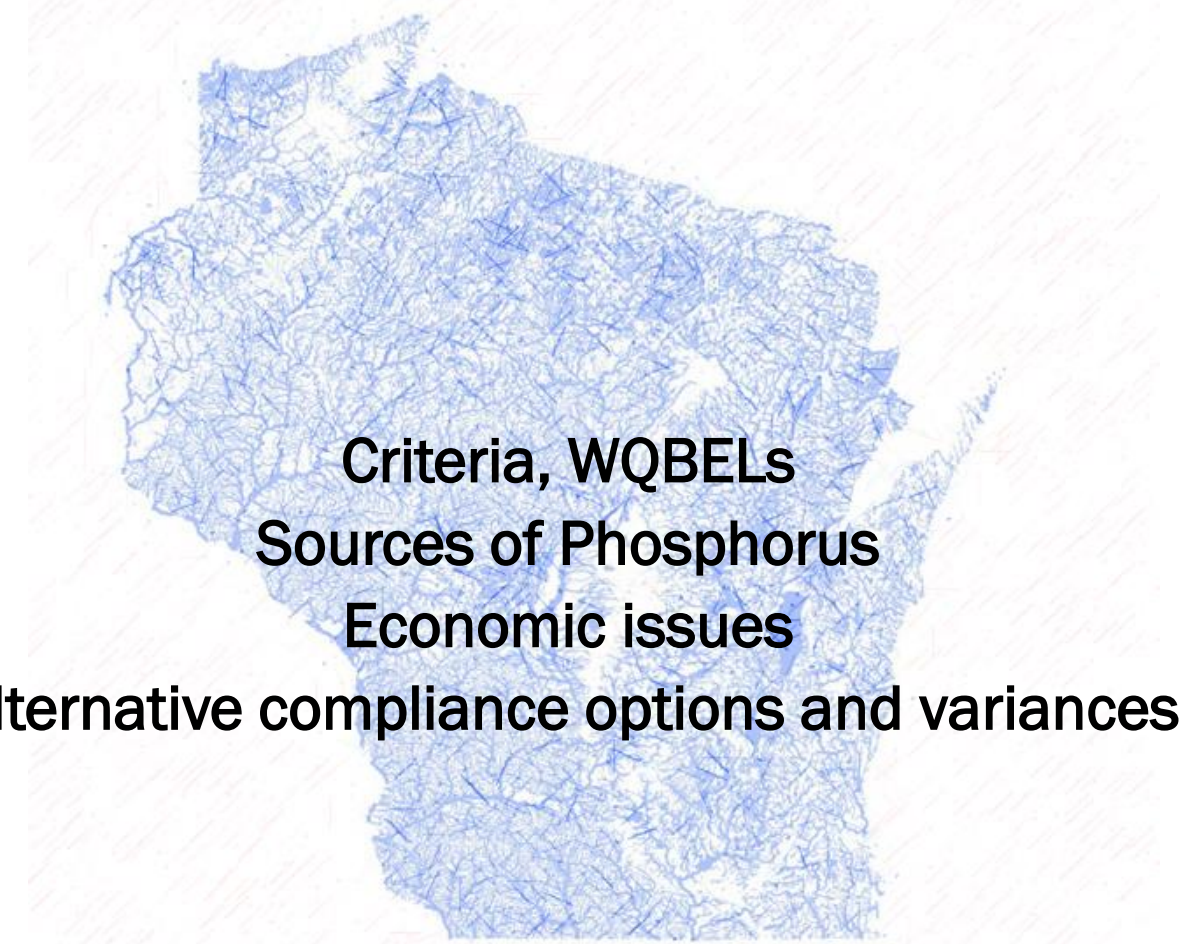
(Three Statewide Adaptive Management and Water Quality Trading Coordinators)

Andrew Craig
(Nonpoint Program)

Matt Claucherty
(Wastewater Program)

Kevin Kirsch
(TMDL/Standards Program)

Overview and Background of Phosphorus Regulation in Wisconsin



Criteria, WQBELs
Sources of Phosphorus
Economic issues
Alternative compliance options and variances

2010 Phosphorus Rule: Numeric Criteria

Rivers

100 µg/L

Streams [1]

75 µg/L

Reservoirs

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

Inland Lakes[2]

Ranges from 15-30 µg/L

Great Lakes

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

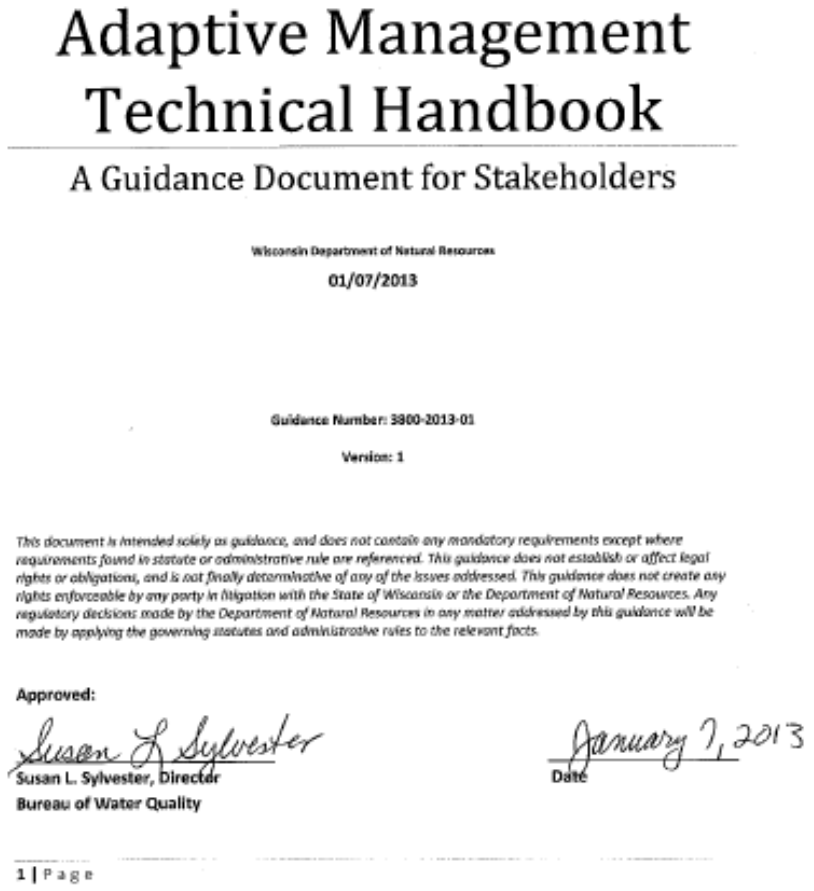
Adaptive Management (AM) Timeline

2010: Phosphorus water quality criteria and ch. NR 217, Wis. Adm. Code adopted which lays out implementation requirements for point sources.

2013: AM guidance issued by DNR.

2015 & 2016: First AM projects approved.

2020: AM guidance updated by DNR.



Adaptive Management Technical Handbook

A Guidance Document for Stakeholders

Wisconsin Department of Natural Resources

01/07/2013

Guidance Number: 3800-2013-01

Version: 1

This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations, and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Approved:

Susan L. Sylvester, Director
Bureau of Water Quality

January 7, 2013
Date

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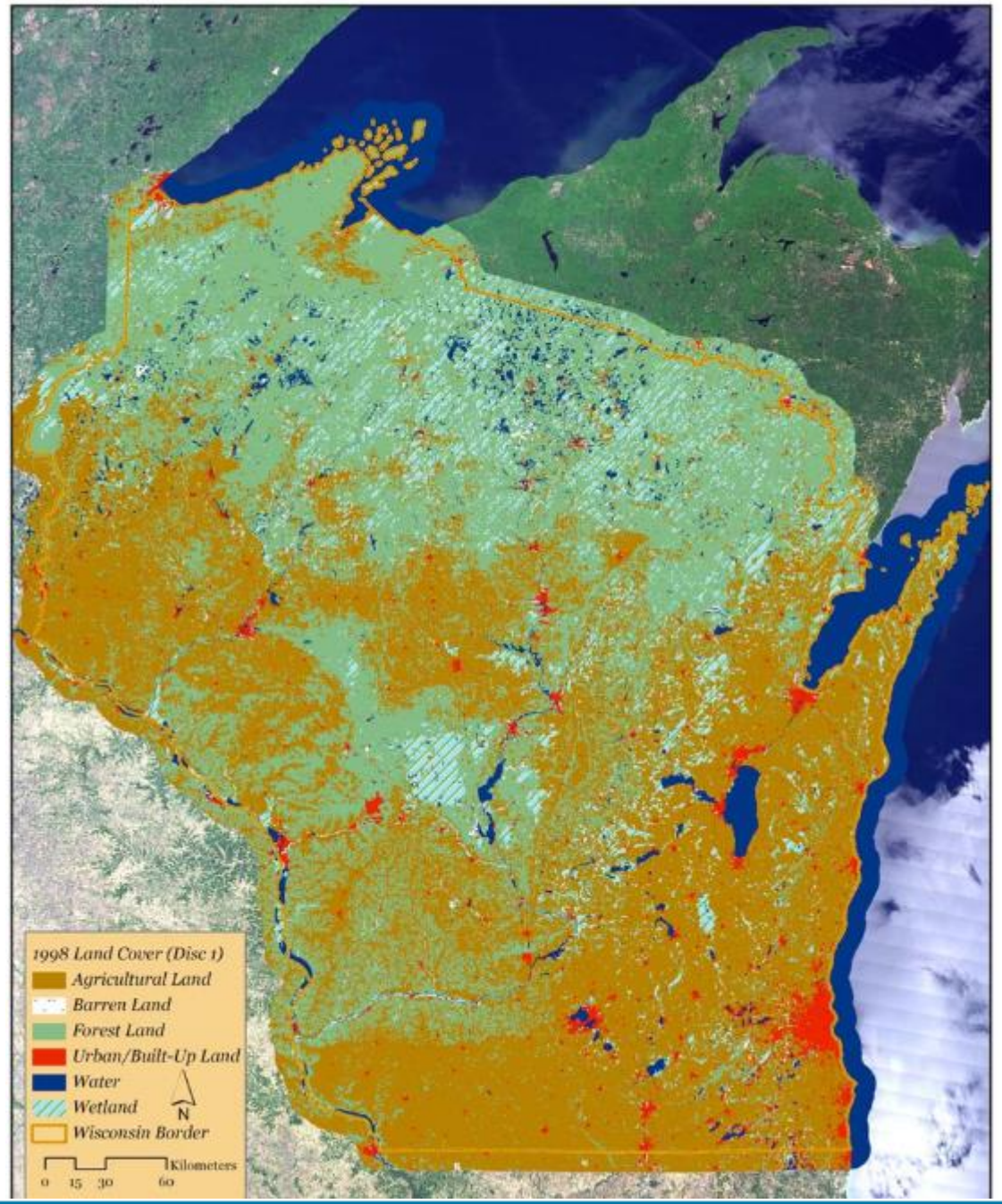
Nonpoint Phosphorus in WI

- Phosphorus loads from agricultural areas vary significantly based on the types of crops grown, soil, slope, tillage practices, and nutrient application rates.

- Manure applications have historically been based on nitrogen needs of the crop typically resulting in a build-up of phosphorus in soils.

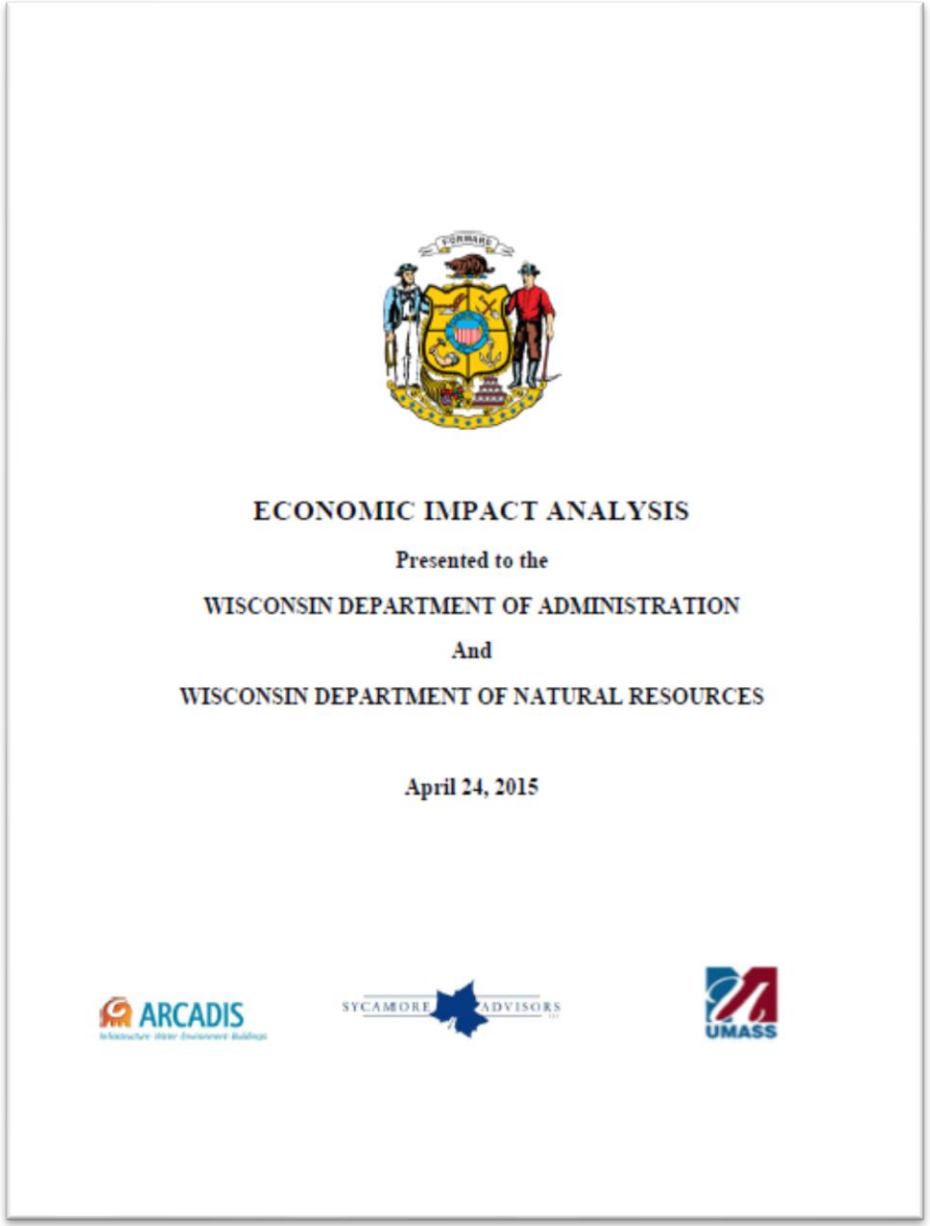
- Ch. NR 151, Wis Adm. Code, Subchapter II contains Wisconsin's nonpoint performance standards. Adopted in **2002** and updated again in **2010**.

NR 151.02 Sheet, rill and wind erosion performance standard.
NR 151.03 Tillage setback performance standard.
NR 151.04 Phosphorus index performance standard.
NR 151.07 Nutrient management.
NR 151.08 Manure management prohibitions.



Economics of Phosphorus

- 60% of all surface water dischargers initially received a WQBEL equal to the criterion
- Tertiary filtration is typically required to achieve these low-level phosphorus limits
- Filtration is expensive: $4,000,000 median cost to meet a low-level phosphorus limit
- Nonpoint source offsets offer a lower-cost solution
- Wisconsin has worked to develop alternative compliance and variance options that rely on nonpoint source offsets
- These include Water Quality Trading, Adaptive Management, and a Multi-discharger Variance for phosphorus



ECONOMIC IMPACT ANALYSIS

Presented to the

WISCONSIN DEPARTMENT OF ADMINISTRATION

And

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

April 24, 2015

ARCADIS

SYCAMORE ADVISORS

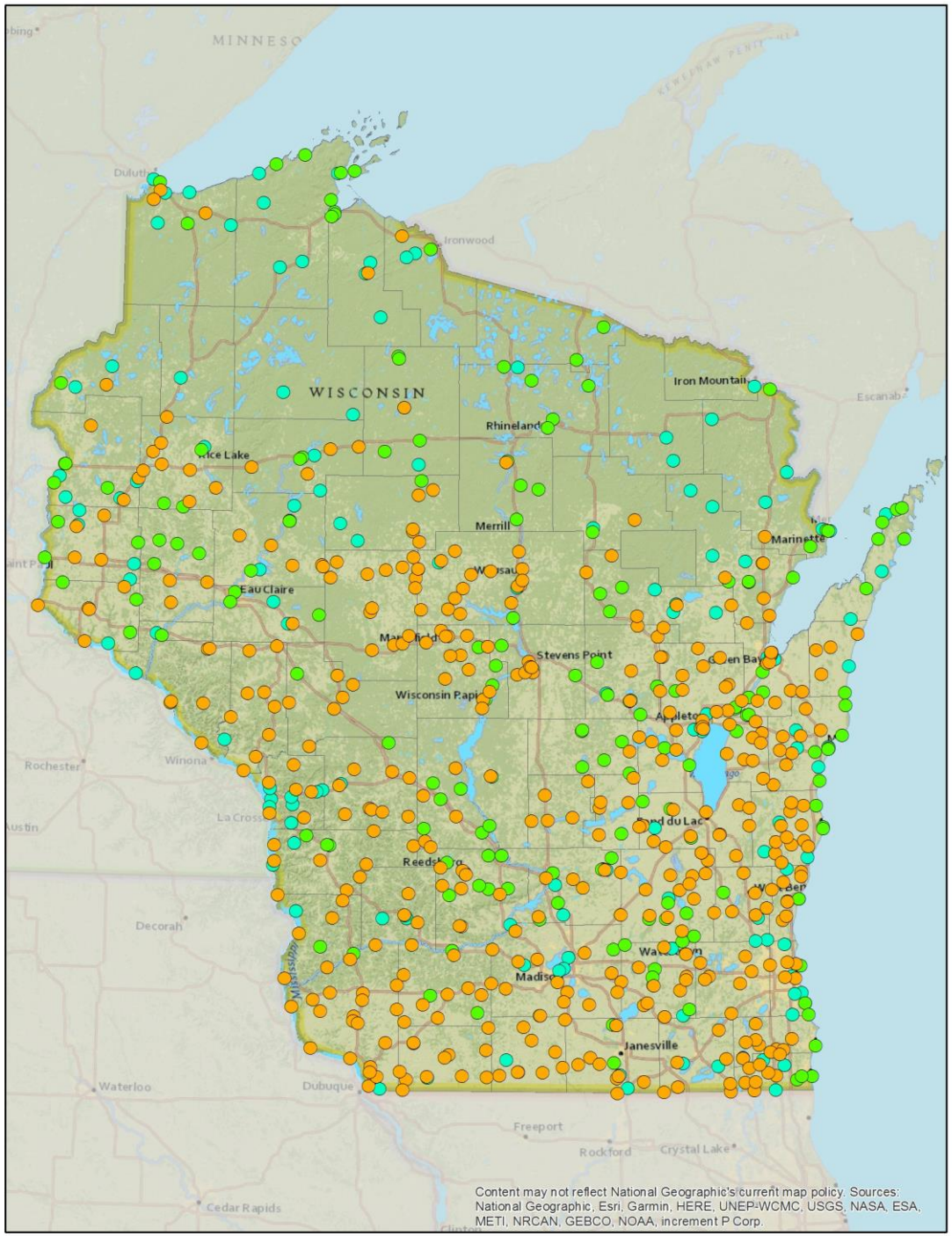
UMASS

Statewide Distribution of Limits

- No Limit Applicable
- Blue Markers

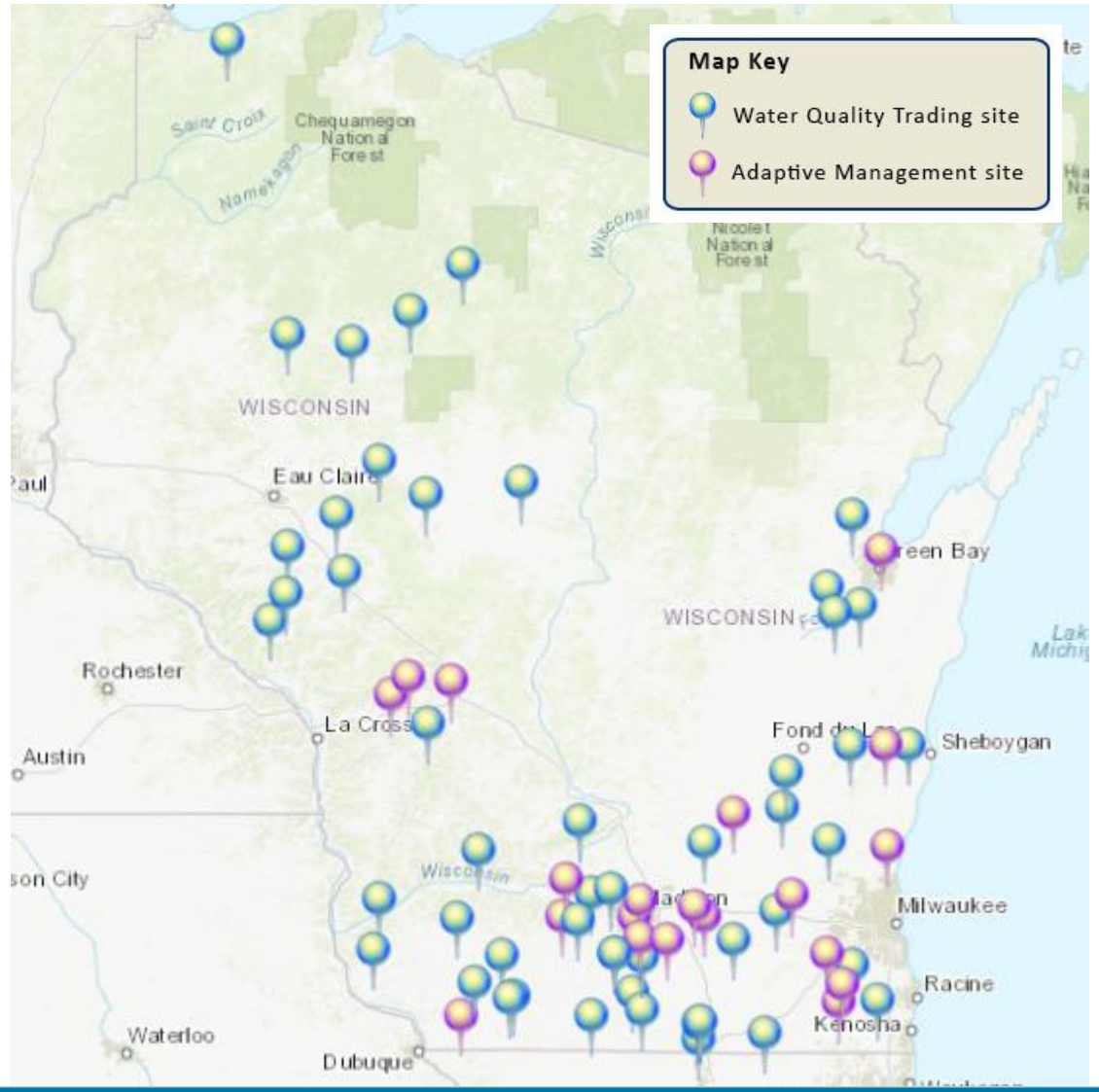
- Limit > 0.3 mg/L
- Green Markers

- Low-level phosphorus limit
- Orange Markers

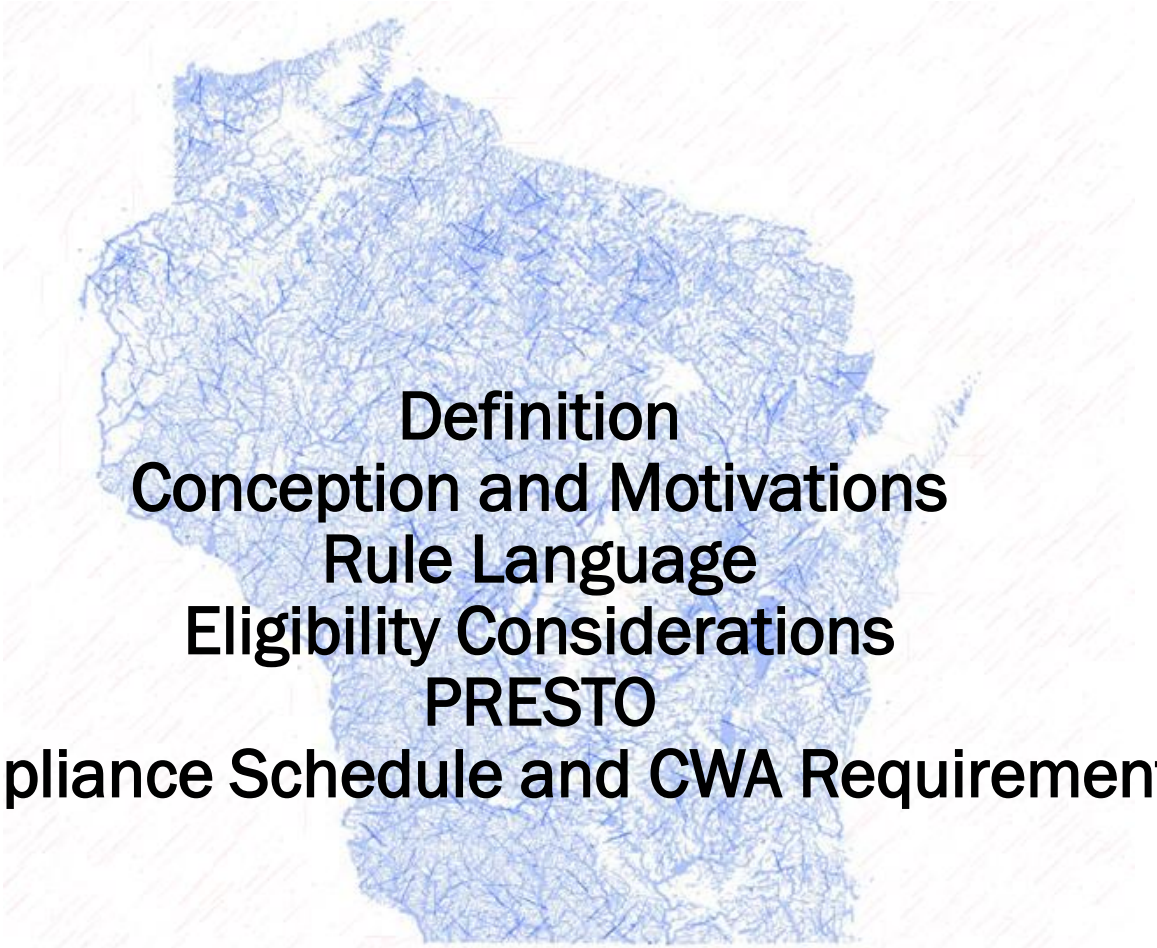


Alternative Compliance Options and Variances

- Water Quality Trading (50 facilities)
  - Direct offset of pollutant discharged
- Adaptive Management (20 facilities)
  - Long-term effort to restore water quality
- Multi-discharger Variance (130 facilities)
  - Statewide variance that uses “county payment” system at $50/lb
- Individual Phosphorus Variance (30 facilities)
  - Facility-specific pollutant minimization plans for the smallest/poorest communities



Adaptive Management (AM) Basics



Definition
Conception and Motivations
Rule Language
Eligibility Considerations
PRESTO
Compliance Schedule and CWA Requirements

Adaptive Management Basics – NR 217.18

Definition: The adaptive management option is a strategy to achieve the phosphorus water quality criteria in s. NR 102.06 in the most economically efficient manner, and as soon as possible, taking into consideration the contributions of phosphorus from point and nonpoint sources in a watershed.

This is not an off-set like in water quality trading, but rather an attainment of water quality criteria in the receiving water at the point of standards application.

Permit term following AM approval	1	2	3	4
	AM Limits: • 0.6 mg/L as a 6-month avg. • 1.0 mg/L as a monthly avg.	AM Limits: • 0.5 mg/L as a 6-month avg. • 1.0 mg/L as a monthly avg.	AM Limits: • 0.5 mg/L as a 6-month avg. • 1.0 mg/L as a monthly avg.	Final WQBEL, which can be recalculated if water quality improves or a TMDL is approved, OR the final limit can equal the AM Limit in permit term 3 if the WQC is achieved [3]

Adaptive Management Basics – NR 217.18

(2) Application

a) Exceedance of water quality criteria caused by point and nonpoint sources.

b) At least 50% of the phosphorus load is from nonpoint sources including permitted and unpermitted MS4s.

c) Documentation that the permittee will require filtration or equivalent treatment technology to achieve compliance.

d) The permittee submits an adaptive management plan

Adaptive Management Basics – NR 217.18

(3) Permit Terms and Conditions

a) Monitoring of the receiving water
b) Design and implement actions identified in approved AM plan
c) Optimize treatment system to control phosphorus
d) Reporting requirements
e) Progression of interim effluent limits – 0.6 mg/L, 0.5 mg/L and calculation of final limit.

Note: Statutory provisions made by the legislature during the budget process expanded adaptive management to include TSS and expanded it to a third permit term allowing for a total compliance period of 20-years. NR 217 has not been updated yet to reflect those changes.

Key Considerations for Dischargers

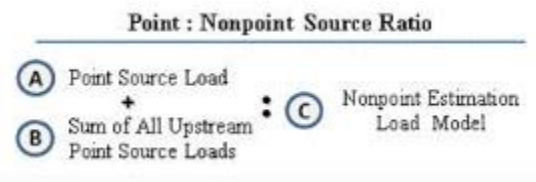
- Is the facility prepared to meet the required interim limits of 0.6 and 0.5 mg/L for total phosphorus?
- Can in-stream monitoring be preformed regularly?
- Is the facility prepared to coordinate with partners?
- What are the estimated costs?
- Consider the long-term commitment (10 – 20 years)

Eligibility Requirements

1. Receiving water exceeding the WQC
2. NPS contribute >50% of P load or NPS must be controlled
3. Filtration or equivalent technology required to meet site-specific limits

Pollutant Load Ratio Estimation Tool (PRESTO)

Modeling tool developed to support AM, PRESTO provides a summary of point and nonpoint phosphorus loads, landcover, modeled stream flow, natural community type, and delineates watershed.



Note: Nonpoint phosphorus loads are calculated using Wisconsin-specific regression export coefficients and multiple regression analysis. Point sources load derived from measured data.

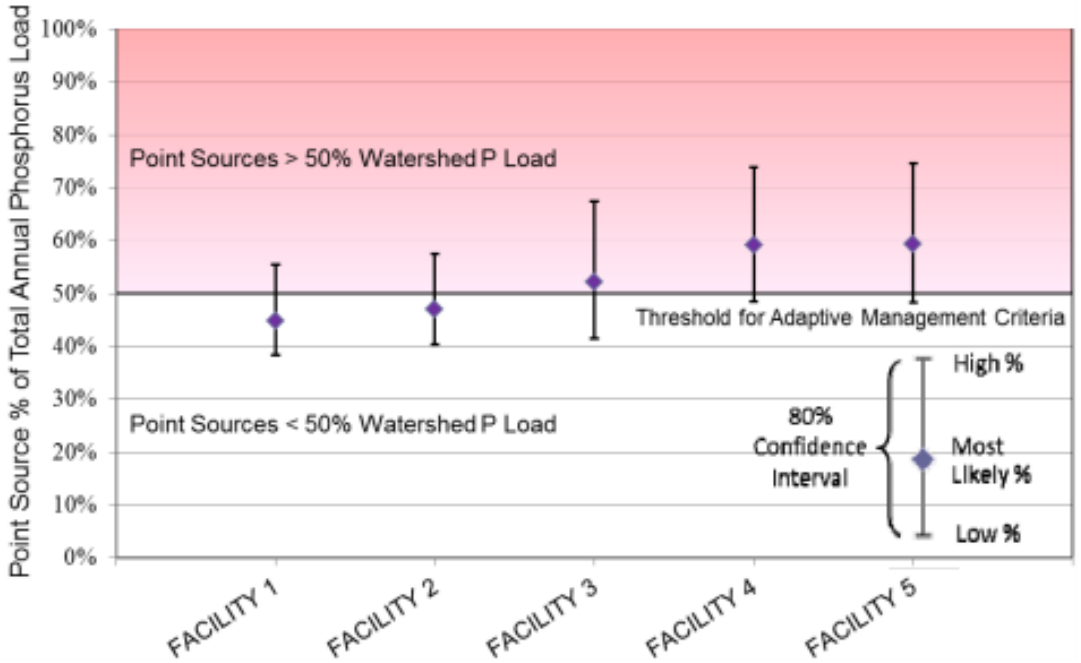


***Figure 2**: Comparison of facilities to Adaptive Management Eligibility Threshold*

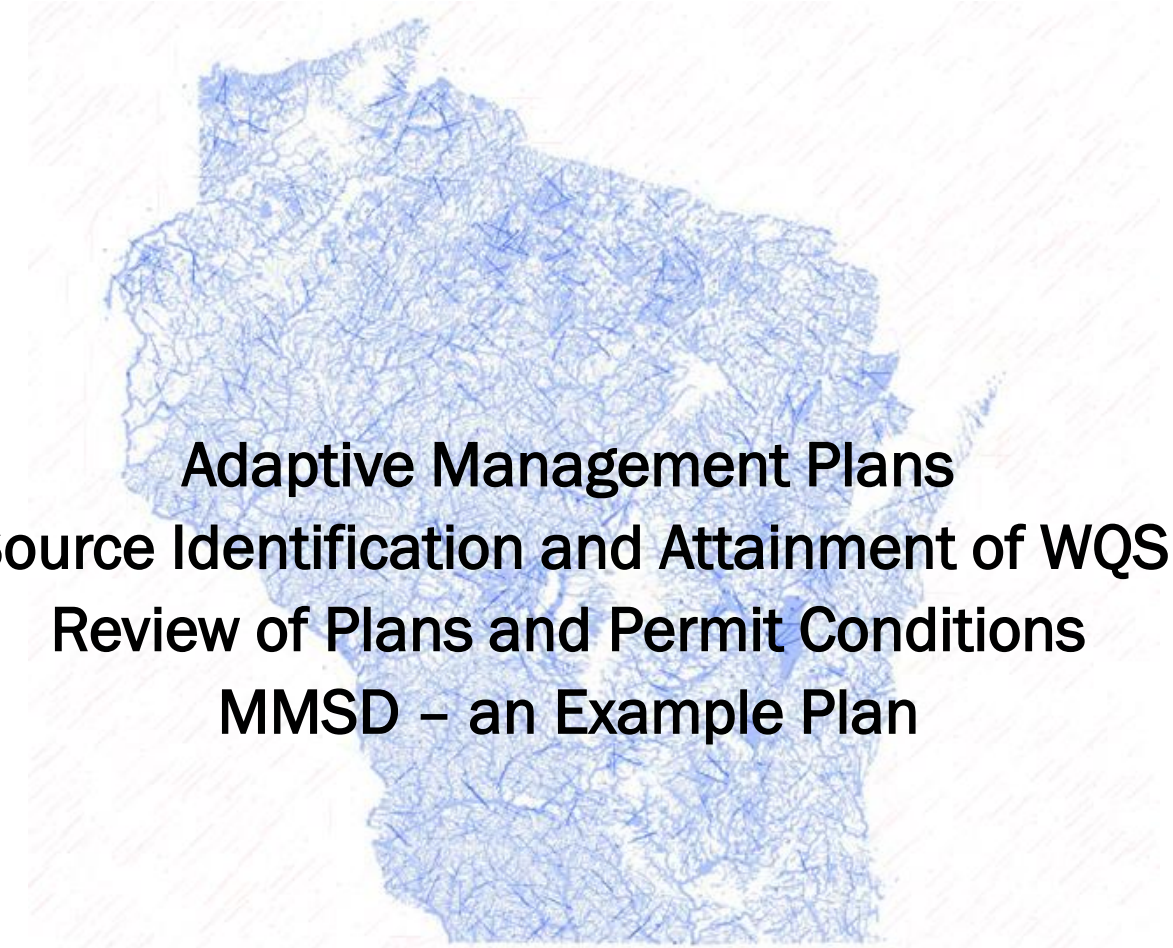
Compliance with the Clean Water Act

- DNR and EPA Region 5 staff worked together closely on the adaptive management option
- MOA between EPA and DNR clarify some key points regarding adaptive management implementation in permits:
  - Adaptive Management is a compliance schedule
    - Annual timestep for AM reporting
    - Compliance must be achieved “as soon as possible”
  - The WQBEL must remain on the table
    - The permit must contain the final WQBEL and define under what conditions it becomes effective
    - Minimum offset must be specified

Addendum to the
National Pollutant Discharge Elimination System
Memorandum of Agreement between the
U.S. Environmental Protection Agency, Region 5
and the
Wisconsin Department of Natural Resources

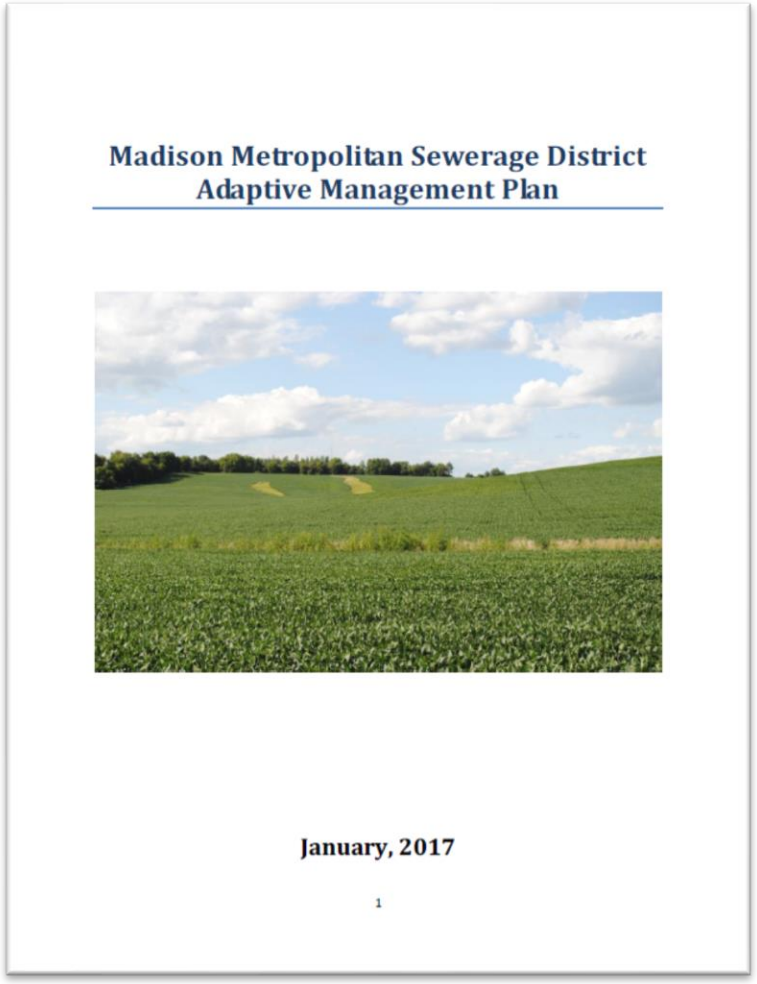
The U.S. Environmental Protection Agency (EPA), Region 5, and the Wisconsin Department of Natural Resources (WDNR) enter into this Addendum to their National Pollutant Discharge Elimination System (NPDES) Memorandum of Agreement to ensure that Wisconsin permits which implement ss. NR 217.14(2) and 217.18 *Wisconsin Administrative Code* (*Wis. Adm. Code*), and the fact sheets that accompany such permits, are prepared in conformance with all NPDES requirements including 40 C.F.R. §§ 122.44(d), 122.45(d), 122.47, 124.8, and 124.56. EPA retains its authority to review and object to specific proposed and draft permits in accordance with Section 402(d)(2) of the Clean Water Act, 33 U.S.C. § 1342(d)(2), for any of the grounds set forth in 40 C.F.R. § 123.44(c).

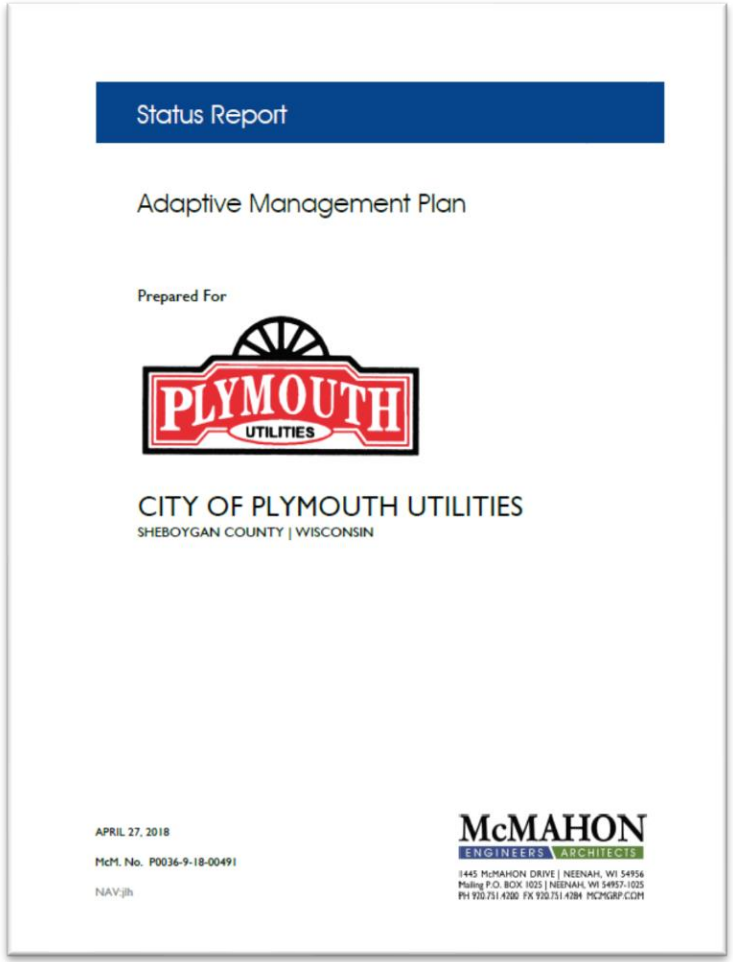
Adaptive Management “Nuts and Bolt”

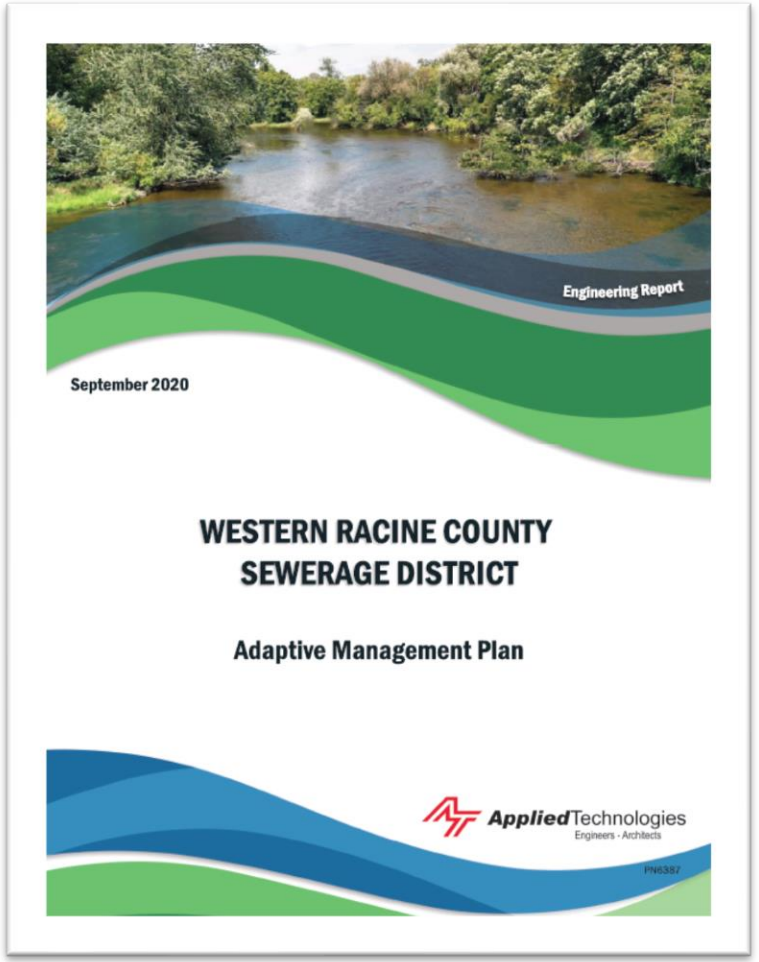


Adaptive Management Plans
Source Identification and Attainment of WQS
Review of Plans and Permit Conditions
MMSD – an Example Plan

Required Under NR 217.18: Adaptive Management Plans

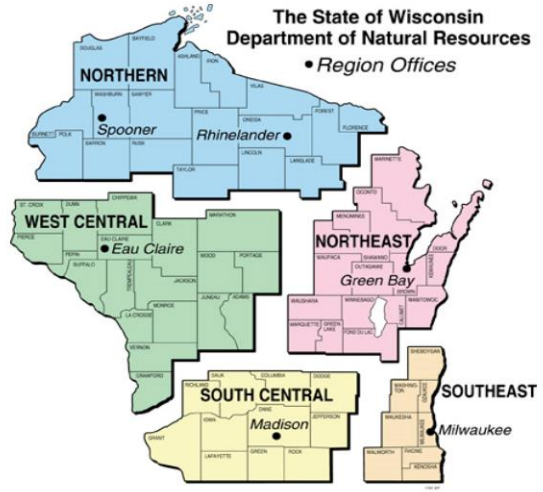






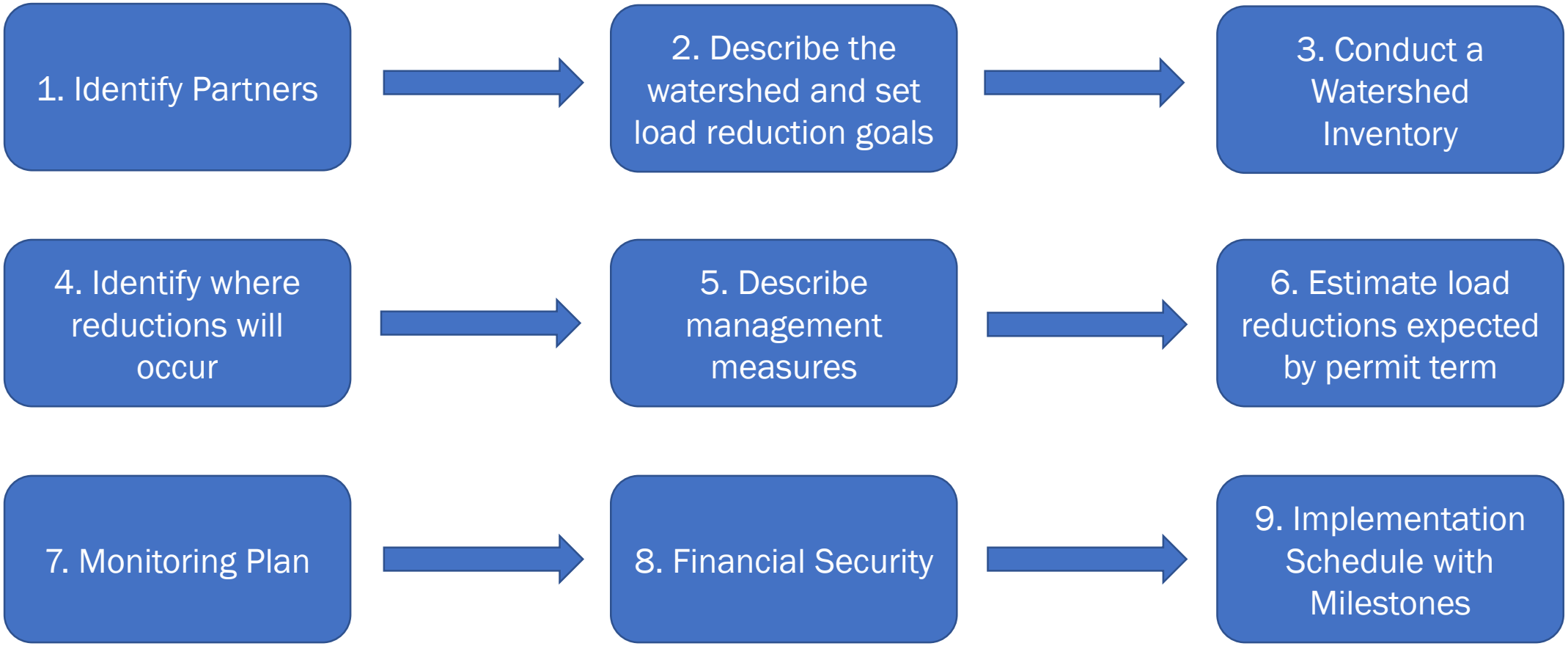
Adaptive Management Plan Development & Review

- Plan development starts with a municipality and (typically) a consulting firm
- DNR regional coordinators help steer the process
  - Verify eligibility
  - Agree to adaptive management action area
  - Review “Adaptive Management Request Form”
  - Answer questions, convey expectations
  - Conduct final review, provide a conditional approval letter



- Other DNR staff may become involved: NPS Staff, Biologists, etc.
- Statewide coordinators: complex projects and EPA interface
- EPA reviews adaptive management plans & permits

Adaptive Management Plan – Key Components



1. Identify Partners

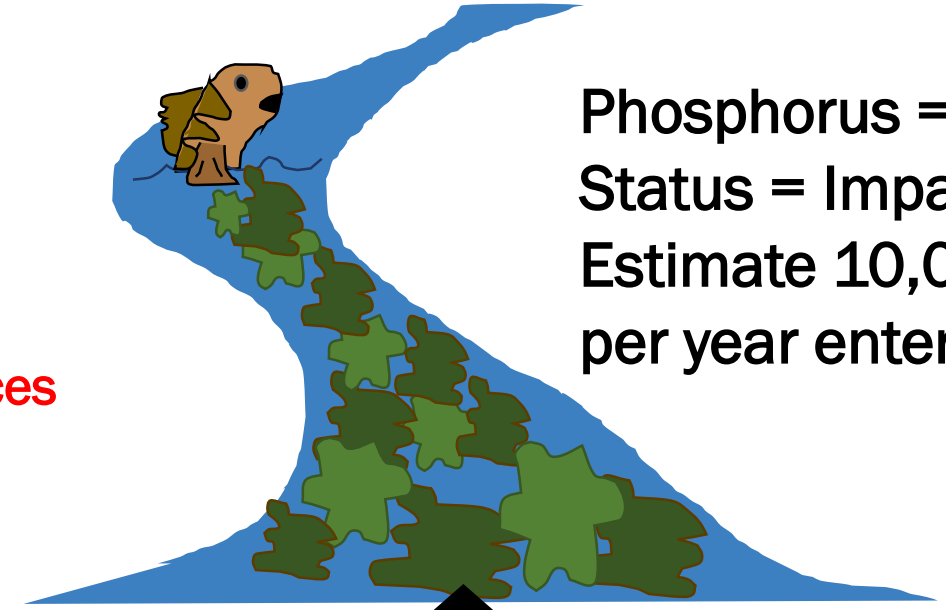
- NR 217.18(2)(d)3. **AM Plans Must Include: "***Identification of any anticipated partners… including the partner's level of support for the plan."*
- Partners are often essential for adaptive management plans
- Facilities may leverage the resources of other organizations
- Ability to partner vary depending on hydrology, location, interest, etc.
- Letters of support are required for core AM partnerships
- "Adaptive Management Actions" are limited to the permittee and partners identified in the AM plan

Source Area Identification and Attainment of Water Quality Criteria

- Similar to a total maximum daily load, AM address pollution from many different sources with the goal of attaining water quality criteria.

- DNR approved AM plans have been submitted to EPA and approved by EPA as “alternative restoration plans” to address impaired waters.

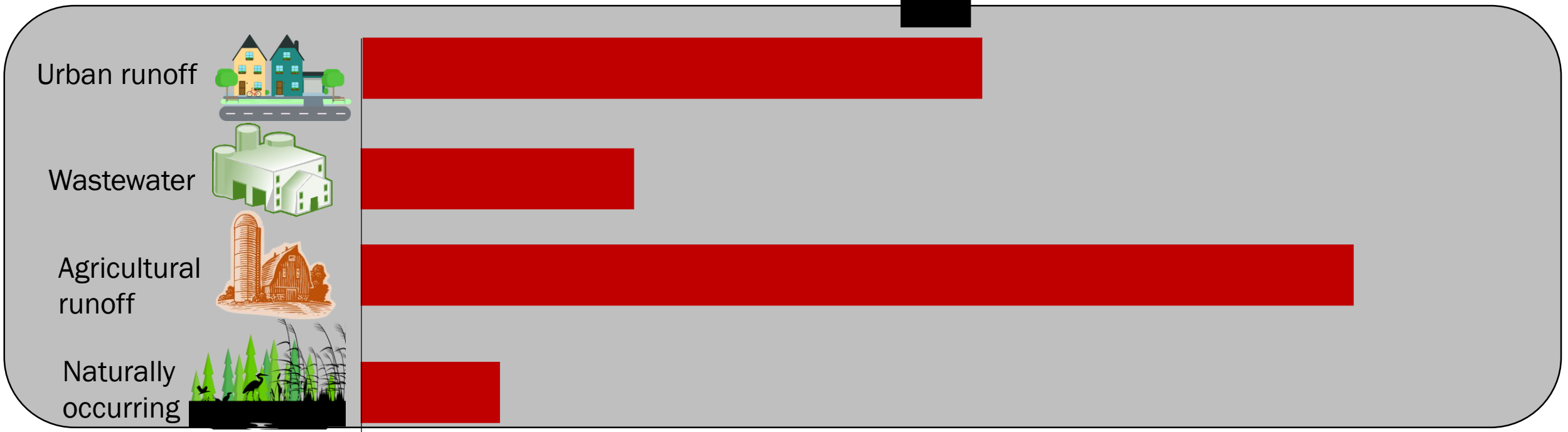
Waterbody: Stream
Pollutant: phosphorus
Water Quality Criteria: 75 µg/L



Phosphorus = 150 µg/L
Status = Impaired
Estimate 10,000 lb. of TP per year enters the stream.

1) Describe watershed and identify sources

Uses watershed surveys, models, TMDL results, watershed assessments, and monitoring data.



Waterbody: Stream
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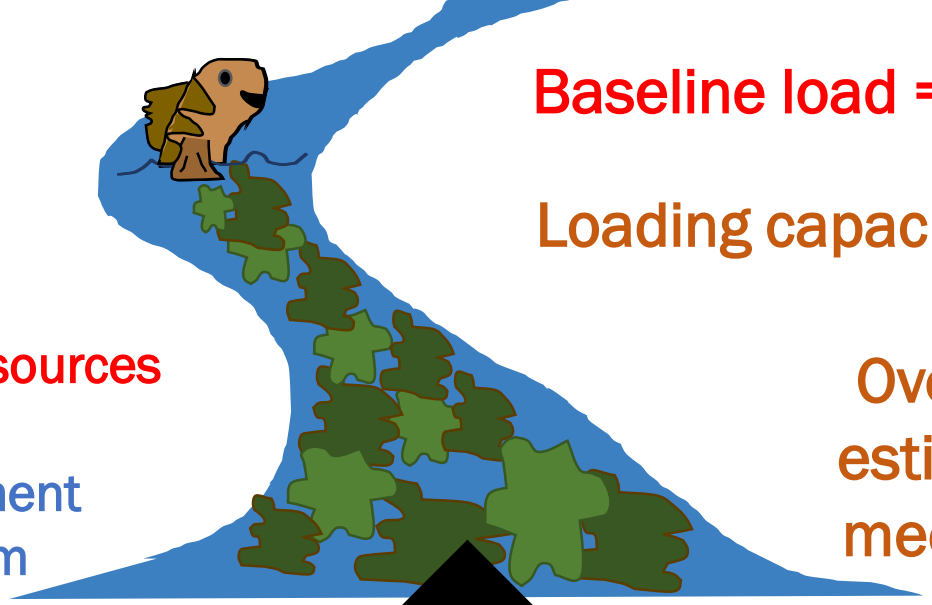


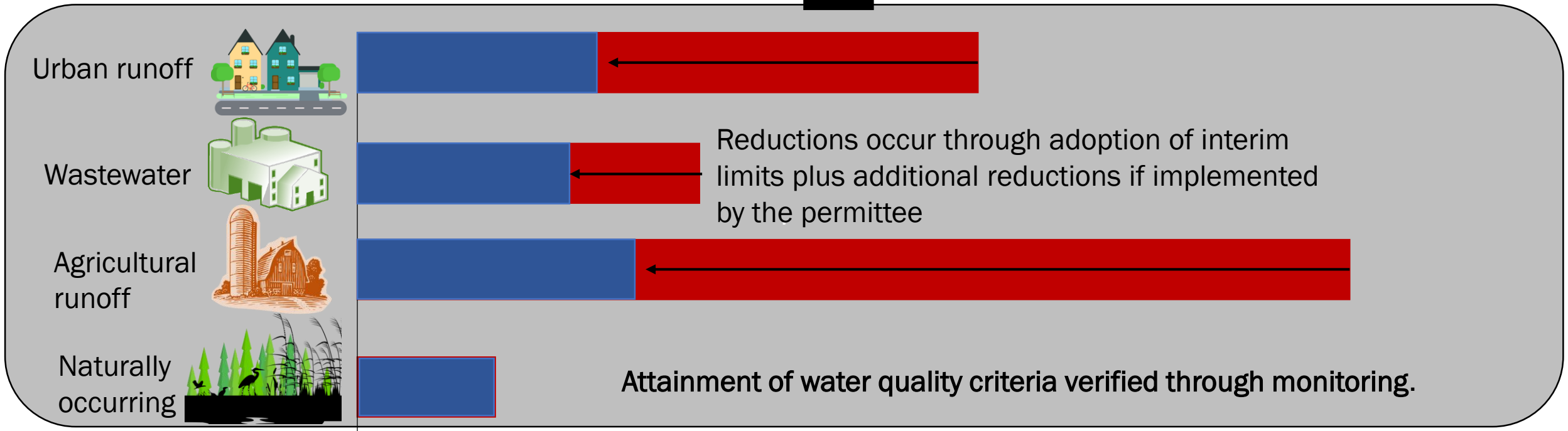
Baseline load = 10,000 lb of P per year

Loading capacity = 3,000 lb per year

1) Describe watershed and identify sources
2) Set load reduction goals
3) Identify and implement management measures during each permit term

Overall, 70% reduction is estimated to be needed to meet water quality criteria

3,000 lb of P per year



5. Describe Management Measures

- Specific types of practices must be identified
- Must address phosphorus/TSS sources identified in watershed inventory
- Must demonstrate that practices will be adequate to achieve goals

NR 217.18(2)(d):

The permittee has submitted an adaptive management plan that identifies specific actions to be implemented that will achieve compliance with the applicable phosphorus criterion in s. NR 102.06 through verifiable reductions of phosphorus from point and nonpoint sources in the watershed.

Table 3-7. Example Implementation Scenario to Achieve Phosphorus Reduction Goals by Permit Term

BMP Type	Calculated Average Phosphorus Reduction (lbs per BMP acre per year)	Term 1 - 25%		Term 2 - 70%		Term 3 - 95%		Term 4 - 100%	
		BMP Acres	Phosphorus Reduction, lbs/yr	Cumulative BMP Acres	Phosphorus Reduction, lbs/yr	Cumulative BMP Acres	Phosphorus Reduction, lbs/yr	Cumulative BMP Acres	Phosphorus Reduction, lbs/yr
Conservation Reserve Program (CRP)	3	47	142	132	397	179	538	189	567
Cover Crops/Residue Tillage/Nutrient Management Planning	0.2	989	198	2,768	554	3,757	751	3,955	791
Nutrient Management Planning Only	0.8	1,439	1,151	4,028	3,222	5,466	4,373	5,754	4,603
Critical Area Plantings	41	22	911	62	2,551	84	3,461	89	3,644
Filter Strips/Vegetated Buffers	15	67	1,000	187	2,799	253	3,799	267	3,999
Food Plot	3	15	46	43	128	58	174	61	183
Forage and Biomass Plantings	4	72	289	202	809	274	1,098	289	1,155
Grassed Waterways	31	6	172	16	482	21	654	22	689
Grazing	1	136	136	381	381	517	517	544	544
New Seeding/Vegetative Wetland Buffer	3	43	129	121	362	164	491	172	517
Pollinator Habitat	2	49	97	136	272	185	369	194	389
Wetland Complexes	9	71	637	198	1,785	269	2,422	283	2,549
TOTAL			4,907		13,741		18,648		19,630

6. Estimate load reduction expected by permit term

Table 3-6. Phosphorus and TSS Reduction Goals by Permit Term

Permit Term	Phosphorus (lbs/year)	TSS (lbs/year)	% of Total Action Area TMDL Reduction
1	4,727	985,935	25%
2	13,238	2,760,618	70%
3	17,965	3,746,553	95%
4	18,911	3,943,740	100%

7. Monitoring Plan

- At a minimum, monitoring in the receiving water must track progress towards meeting the criterion.

- Monitoring efforts must be consentient with Wisconsin's assessment and listing methodology to demonstrate the criterion has been obtained.

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

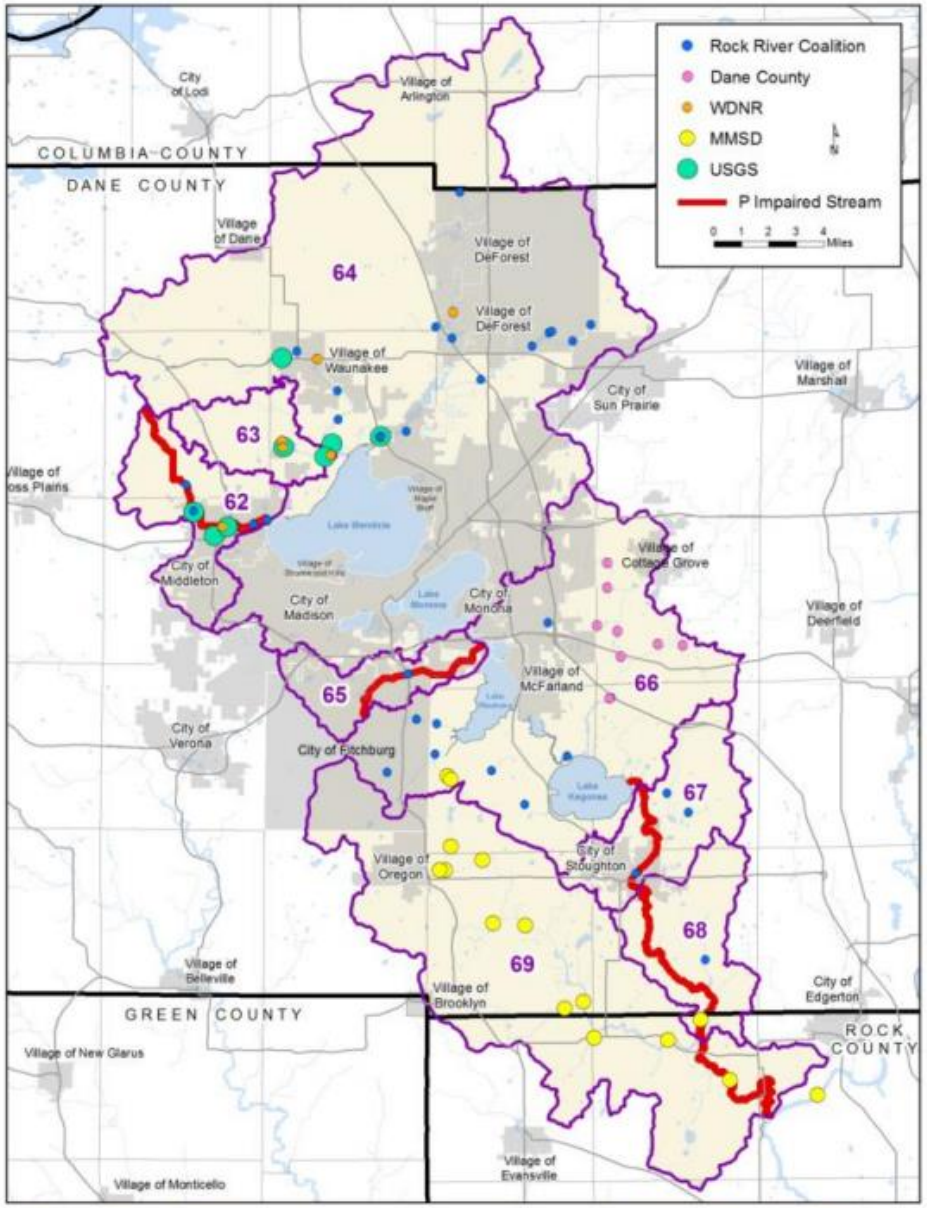


Figure 15: Active Water Quality Monitoring Locations in the Yahara Watershed. Compiled by Mike Sorge (DNR) and others using data from multiple sources. Map prepared by Dane County LWRD, January, 2017.

8. Financial Security

- AM plans are required to address funding and financial feasibility

NR 217.18(2)(d)(4):

A demonstration that the permittee has the ability to fund and implement the plan either individually, or in conjunction with other permittees and nonpoint sources, or other partners, including municipal and county governments, in the watershed.

9. Implementation Schedule with Milestones

- Different types of milestones may exist
- Examples: landowner contacts, acres in perennial cover, WQ response parameters
- All AM plans must include pollution load reductions as milestones

	Stream Reach								
	62	63	64	65	66	67	68	69	Total
Year	Pounds of P Reduction per Year								
2017	1830	513	8333	704	2187	13	369	4576	18,524
2018	1830	513	10416	704	2916	13	369	4576	21,336
2019	2746	615	12499	1056	4374	13	461	5720	27,483
2020	3203	718	14582	1232	5103	13	645	8008	33,503
2021	3661	820	16665	1408	5832	15	737	9152	38,290
2022	4118	923	18748	1584	6561	17	829	10296	43,076
2023	4576	1025	20832	1760	7290	19	922	11440	47,862
2024	5034	1128	22915	1936	8019	20	1014	12583	52,648
2025	5491	1230	24998	2112	8748	22	1106	13727	57,434
2026	5949	1333	27081	2288	9477	24	1198	14871	62,221
2027	6406	1435	29164	2464	10206	26	1290	16015	67,007
2028	6864	1538	31247	2640	10935	28	1382	17159	71,793
2029	7322	1640	33330	2816	11664	30	1474	18303	76,579
2030	7779	1743	35414	2992	12393	31	1567	19447	81,365
2031	8237	1845	37497	3168	13122	33	1659	20591	86,152
2032	8694	1948	39580	3344	13851	35	1751	21735	90,938
2033	9152	2050	41663	3520	14580	37	1843	22879	95,724
2034	9152	2050	41663	3520	14580	37	1843	22879	95,724
2035	9152	2050	41663	3520	14580	37	1843	22879	95,724
2036	9152	2050	41663	3520	14580	37	1843	22879	95,724

Yahara WINS AM Plan Development

- Large in scale with many partners.
- Plan was completed in January of 2017.
- Required extensive DNR review, drafting of an MOU, and lots of negotiation. DNR point source staff, nonpoint staff, TMDL staff, and attorneys were involved.
- Reminder that this is simply not a pollutant load reduction exercise but rather attainment of water quality criteria.

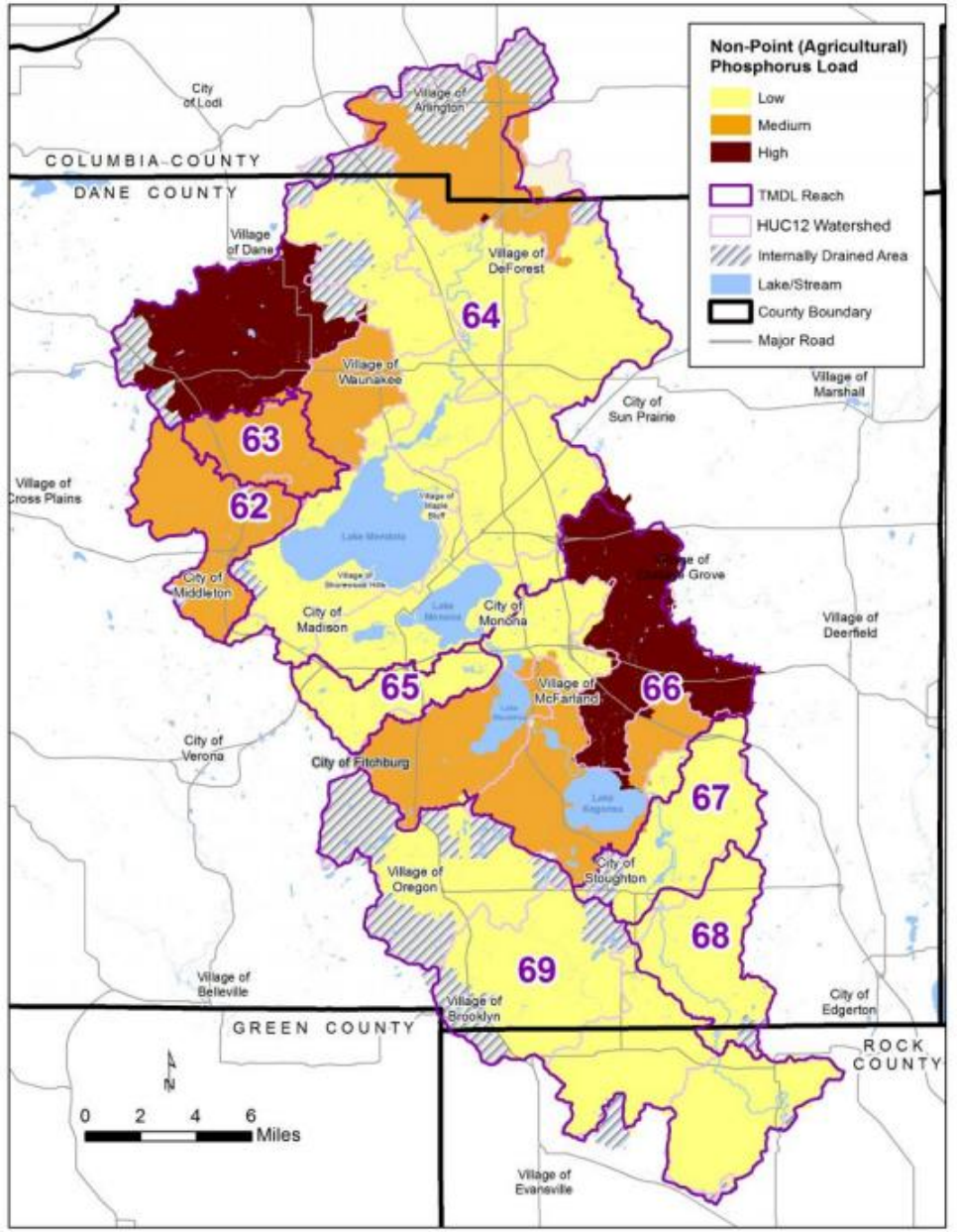
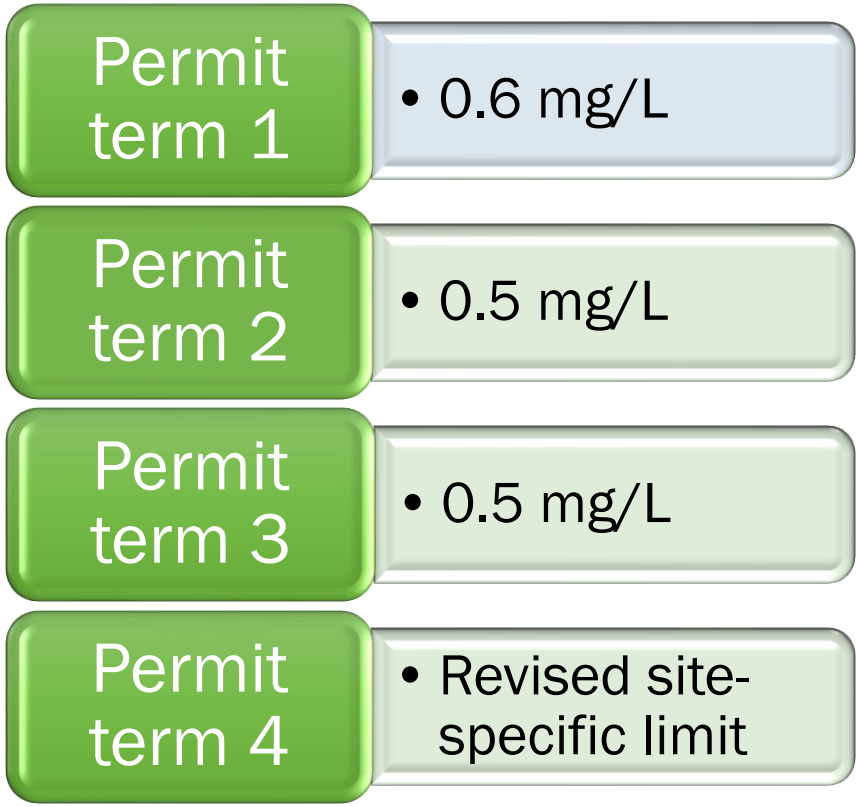


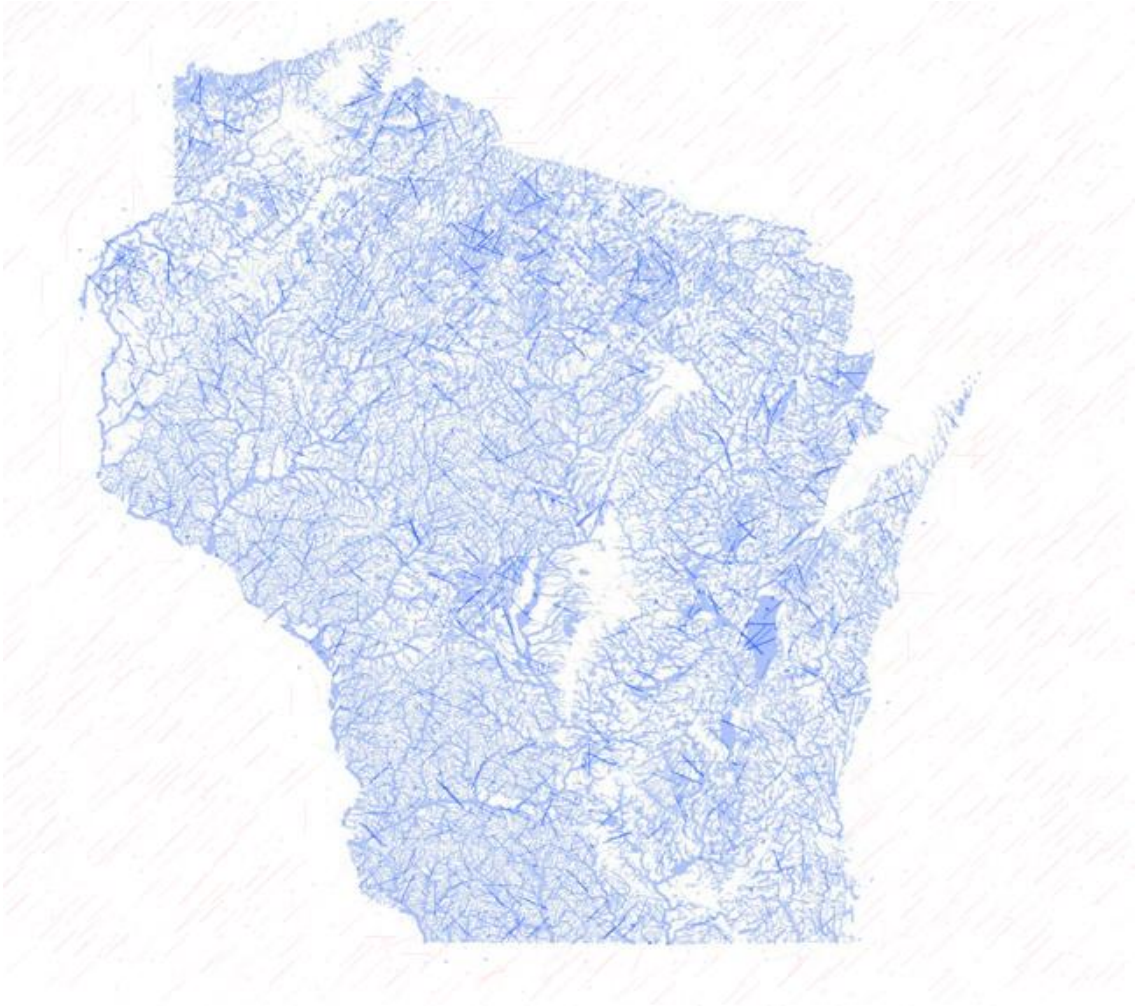
Figure 10: Relative Distribution of Nonpoint Phosphorus Loads by Stream Reach

What is Included in an AM Permit?

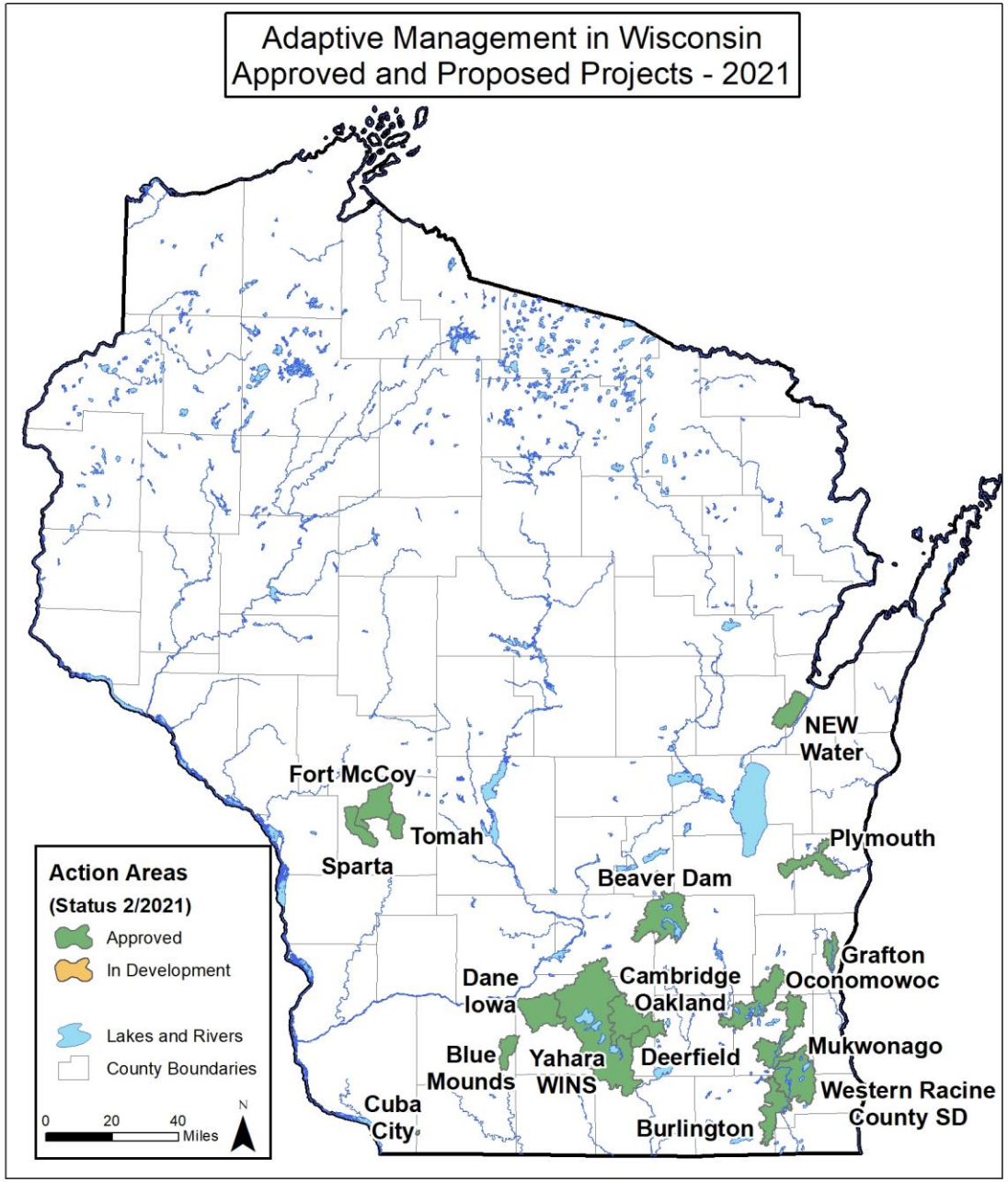
- Interim limits
- Compliance schedules for interim limits/final limit
- Actions proposed in AM plan
  - Incorporated by reference
- Monitoring Requirements
  - In-stream & effluent
- Annual reporting
  - Identify which BMPs have been installed
  - Monitoring results
  - Management updates
  - Modifications to the plan



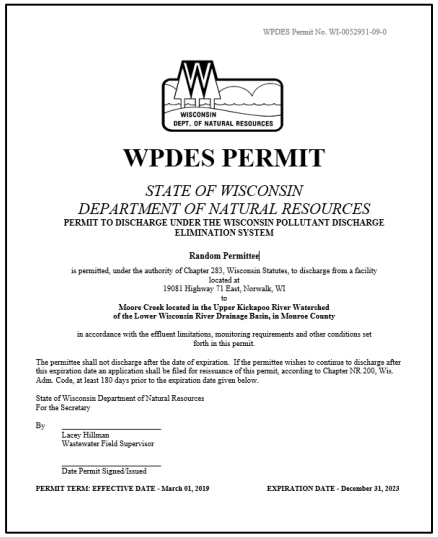
Adaptive Management Success Story



- 20 facilities are engaged in adaptive management.
- 16 adaptive management plans.
- If all AM plans are fully successful:
  - ~250,000 lbs./yr. phosphorus load reduction



Yahara Watershed Improvement Network (Yahara WINS)



WPDES Permit No. WI-0052951-09-0

WISCONSIN DEPT. OF NATURAL RESOURCES

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

Random Permittee

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
19081 Highway 71 East, Norwalk, WI
to
Moore Creek located in the Upper Kickapoo River Watershed of the Lower Wisconsin River Drainage Basin, in Monroe County

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By _____
Lacey Hillman
Wastewater Field Supervisor

_____
Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE - March 01, 2019 **EXPIRATION DATE - December 31, 2023**

OREGON

Stoughton Utilities

WISCONSIN DEPT. OF NATURAL RESOURCES

Madison Metropolitan Sewerage District

Yahara WINS

CLEAN LAKES ALLIANCE

WI LAND + WATER

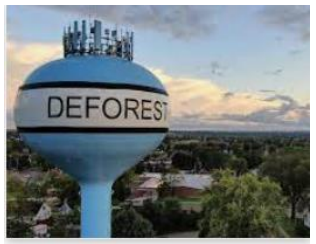
USGS science for a changing world

SAND COUNTY FOUNDATION

TOWN OF Blooming Grove

Town of BRISTOL Established 1848

Town of Cottage Grove



TOWN OF DUNKIRK

THE CITY OF Fitchburg

VILLAGE OF MAPLE BLUFF

MIDDLETON THE GOOD NEIGHBOR CITY

Village of Shorewood Hills

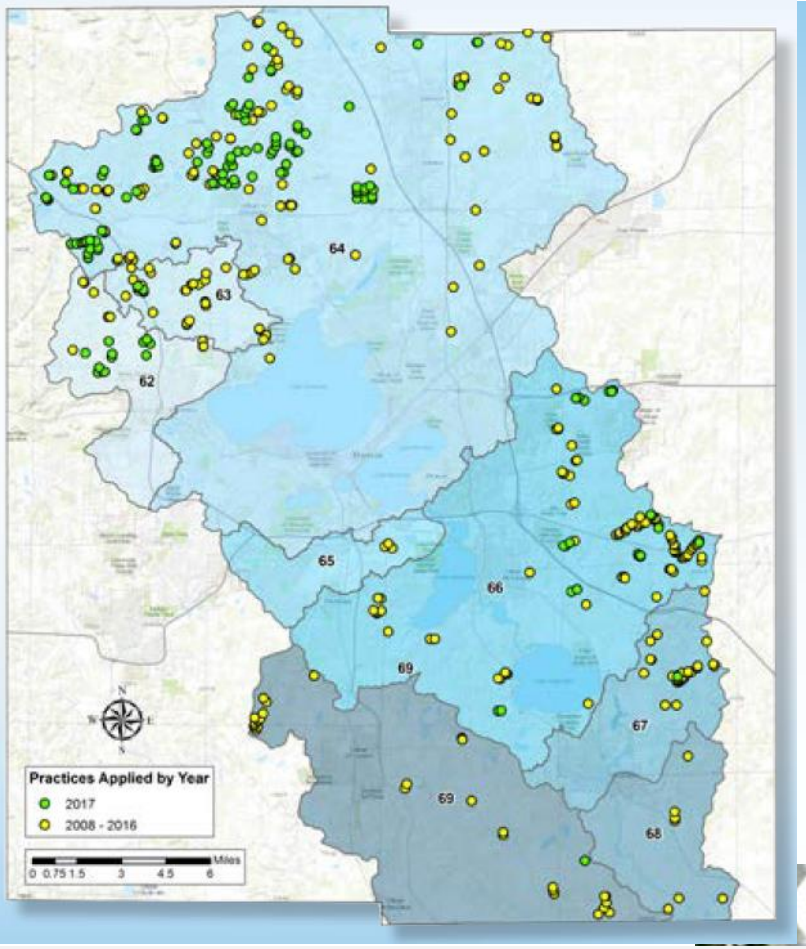
McFarland

MONONA

CITY OF Sun Prairie

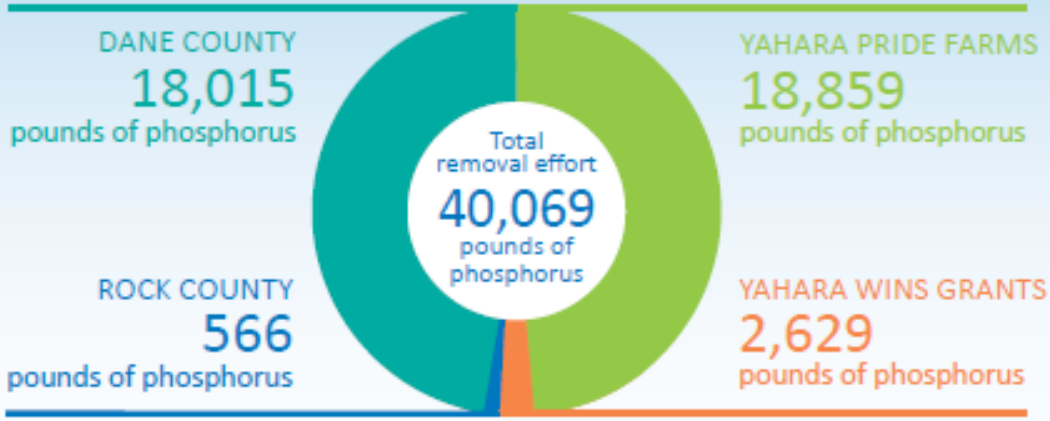
WISCONSIN

the village of Waunakee



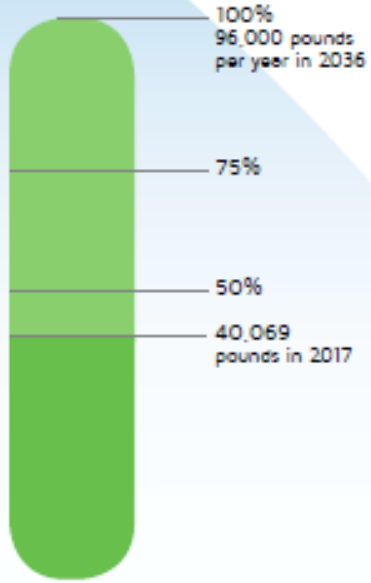
2017 Progress toward phosphorus reduction goals

Figure 1. Partners contribute to shared success



To achieve project goals, the reduction in pounds must be repeated each year with the goal of increasing reductions annually to 96,000 by 2036.

Figure 2. 2017 results



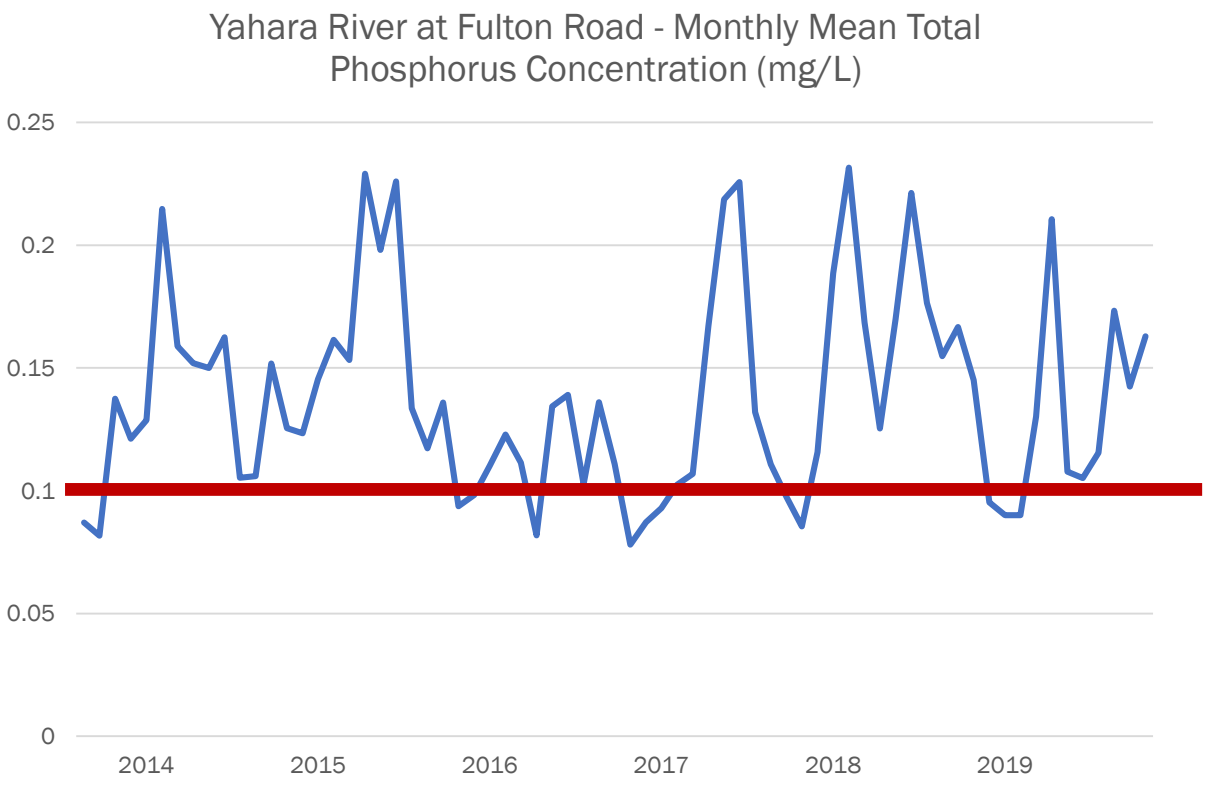
Yahara Pride Farms offers new ag programs

Thanks to the support of Yahara WINS, Dane County and other partners, Yahara Pride Farms is offering farmers in the watershed two new programs designed to minimize the risk of trying new management tools and develop practical, data-driven best management practices for long-term adoption.

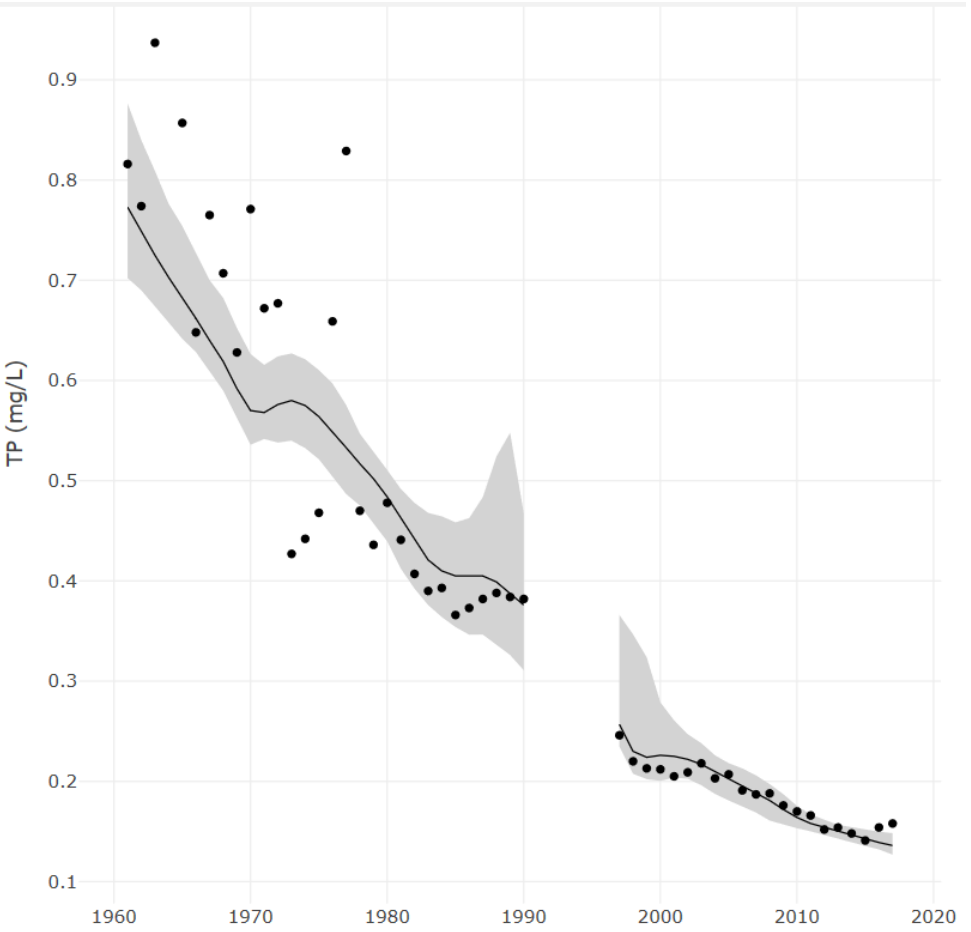
The programs include low disturbance manure injection applicator rental and a composting partnership. Details follow:

Manure Tanker Rental

Water Quality Data



TP data from lower end of the Yahara River, 2014 – 2020
Criterion (0.1 mg/L TP) shown in red line.



Long-term trend data for TP.
The Rock River near border with Illinois.

Lessons Learned

AM and Permit Compliance Schedules

Workload

Multiple Compliance and Variance Options

Geographic Issues

Downstream Waters

Response Time

Compliance Schedules and AM

+ One huge benefit for point sources is the extended compliance schedule. Each permit term has interim limits and phosphorus loads need to be addressed; however, final compliance does not have to occur in the typical 5-year time frame.

+ Some facilities use adaptive management as a bridge into water quality trading which again provides additional flexibility.

- The challenge has been with some facilities that have no intention of attaining water quality criteria and are only using AM to delay final compliance or switch to water quality trading. Some of these facilities have proposed less than stellar plans and have required a significant amount of DNR's time and energy. Plans must meet the requirements for DNR and EPA approval.

Consequences of Complexity

- Facilities with limited in-house expertise must rely on expensive consulting firms
- Creates a barrier to entry, even for facilities who can pay
- Can be difficult to sell an adaptive management strategy to municipal leadership or rate payers
- Element of uncertainty can make AM less attractive when compared with WQT

Workload Can be Significant for both Regulators and the Regulated Community

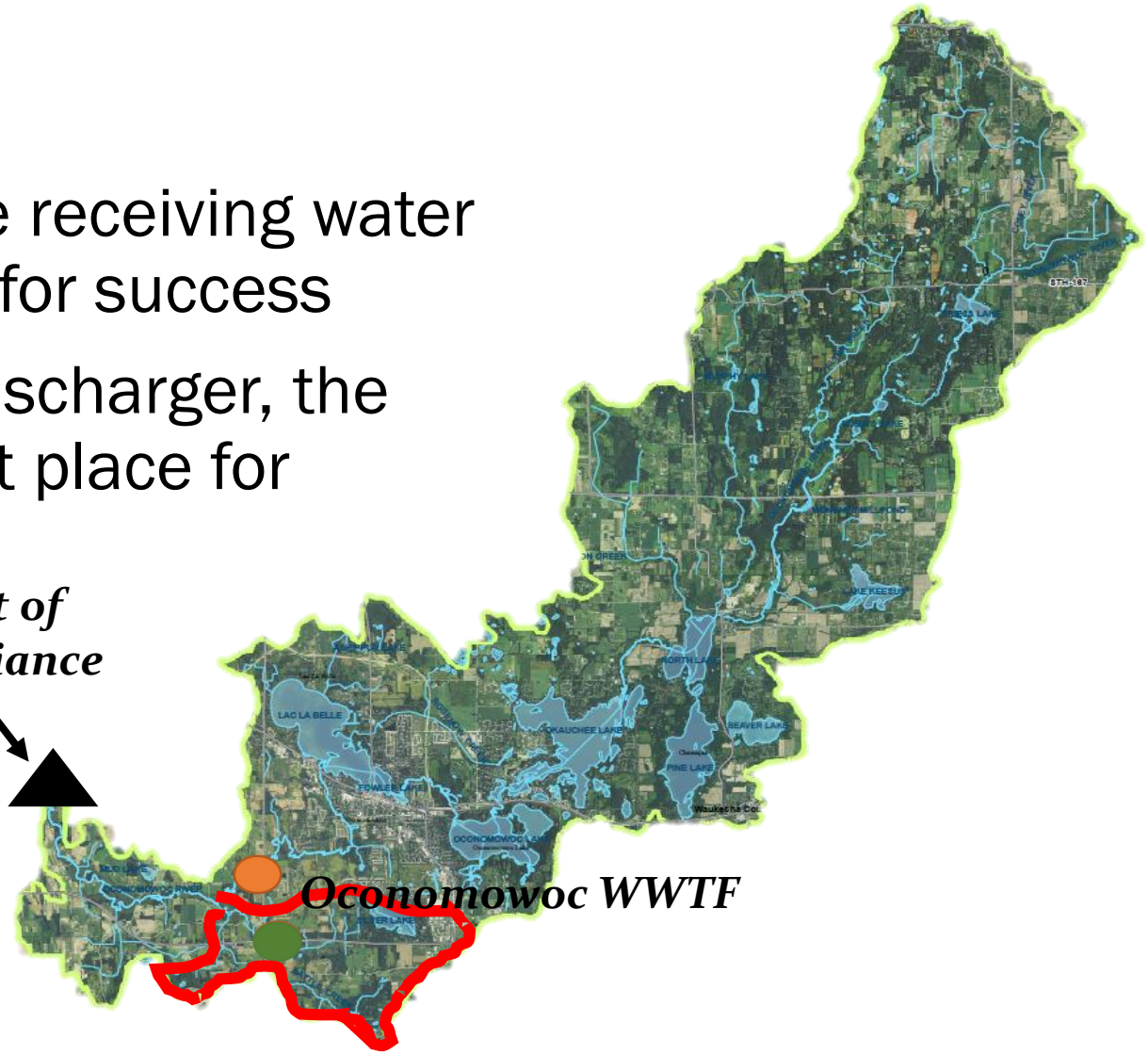
- AM plans address the whole watershed making them much more complicated than traditional facility upgrades or optimizations.

- Wastewater staff often need assistance from nonpoint agricultural staff, modeling staff, urban stormwater staff, and biologists.

- Plans often require several iterations, require review of annual reports, verification of implementation, and other tasks beyond what normally occur if a facility chooses to upgrade or optimize to meet their final limit.

Geographic Issues

- Pursuant to NR 217.18(3)(e)(4), the receiving water must meet the applicable criterion for success
- Depending on the location of the discharger, the receiving water may not be the best place for watershed work
- Typically, HUC 12 or TMDL subbasin scale is appropriate
- HUC 12 mainstem dischargers are best suited for AM



Downstream Waters and AM Targets

TMDLs are now being developed or retro-actively having added to them information related to water quality trading and AM.

Facility Name	Permit Number	Outfall Number	TMDL Subbasin	TP Wasteload Allocation (lbs./year)	Local Wasteload Allocation (lbs./year)	Max Downstream Credits (lbs./year)	Downstream Waterbody	Adaptive Management Target (µg/L)
KINGSTON WASTEWATER TREATMENT FACILITY	36421	1	14	10	58	47	Lake Puckaway	30
LARSEN WINCHESTER SD WWTF	31925	1	51	25	111	86	Lake Winnebago	17
LEACH FARMS - AURORAVILLE	52809	5	48	5	12	7	Lake Winnebago	18
LITTLE RAPIDS CORP SHAWANO SPECIALTY PAPERS	1341	2	67	1,038	6,093	5,054	Lake Winnebago	29
MANAWA WASTEWATER TREATMENT FACILITY	20869	1	81	106	560	454	Lake Winnebago	25
MAPLE LANE HEALTH CARE CENTER SHAWANO COUNTY UTILITIES WWTF	29718	1	57	79	116	37	Long Lake	71
MARION WASTEWATER TREATMENT FACILITY	20770	3	60	208	725	517	Lake Winnebago	29
MARKESAN WASTEWATER TREATMENT FACILITY	24619	1	12	189	351	162	Lake Puckaway	42
MENOMINEE TRIBAL ENTERPRISES	46868	1	55	7	13	6	Lake Winnebago	26
MENOMINEE TRIBAL ENTERPRISES	46868	3	55	0	0	0	Lake Winnebago	26
MONTELLO WASTEWATER TREATMENT FACILITY	24813	1	16	157	914	757	Lake Puckaway	21
NESHKORO WASTEWATER TREATMENT FACILITY	60666	2	23	23	133	110	Lake Winnebago	24
NEW LONDON WASTEWATER TREATMENT	24929	1	71	1,038	6,093	5,054	Lake Winnebago	27

Note: Stream and river criteria are expressed as a median of monthly samples collected between May and October. For reservoirs and lakes, the criteria are expressed as a mean of monthly samples collected between June and September.

Response Time (Modeled vs. Monitored)

- The premise of AM is that pollutant reductions will result in improvements in water quality; however, those reductions often must reach a certain threshold to even be picked-up by water quality monitoring and some waterbodies may have a delay in response due to legacy phosphorus in the sediments and internal loadings.

- This is very much waterbody specific and varies based on annual rainfall and runoff.

- For AM plans, modeling can be used to show progress; however, final compliance still requires monitoring.

Key Differences: Montana vs Wisconsin

Program Piece	Wisconsin	Montana
Regulatory controls over nonpoint sources	☑	
Permitting variance option	☑	Limited*
Numeric phosphorus criteria	☑	
Interpreting narrative standards by measuring response variables		☑
Interpreting numeric standard by measuring instream nutrient concentrations	☑	

** Variances per Circular DEQ-12B were eliminated in 2021 by SB358; however, individual water quality variances are still available under 75-5-320, MCA*

DEQ MONTANA


ANY
QUESTIONS?

CONNECT WITH US

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"WILD WISCONSIN: OFF THE RECORD"

https://dnr.wisconsin.gov/topic/Wastewater/AdaptiveManagement.html