



# Water Quality Trading & Adaptive Management Overview

# Training Opportunities

Webinar 1. Overview

Webinar 2. Finding and Quantifying Credits

Webinar 3. Developing a Plan

Webinar 4. Implementing and Verifying Offsets



# Agenda

9:05-9:40      Trading and Adaptive Management  
Overview

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9:40-10:10    How to Evaluate Trading and Adaptive  
Management

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10:10-10:15    Funding

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10:15-10:30    Questions

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# Available Guidance

## Adaptive Management Technical Handbook

Released: 01/07/2013

<http://dnr.wi.gov/topic/SurfaceWater/AdaptiveManagement.html>

(topic keyword: "adaptive management")

## Implementing Water Quality Trading in WPDES Permits

Released: 08/21/2013

## Water Quality Trading How-To Manual

Released: 09/09/2013

<http://dnr.wi.gov/topic/SurfaceWater/WaterQualityTrading.html>

(topic keyword: "water quality trading")

# Excess Phosphorus Contributes to....



Recreational  
Impairments



Harmful Algal  
Bloom  
Occurrences



Decreases  
Property  
Values

# Protecting Wisconsin's Waters

- Every permit reissued after December 1, 2010 is evaluated for P limits
- Limits are set equal to criteria if receiving water exceeds criteria
- Time will be given for facilities to comply with these limits
  - Up to 9 years available
- Several compliance options exist including trading and adaptive management

P Criteria <small>NR 102.06</small>			
Rivers: 100 ug/L	Streams: 75 ug/L	Reservoirs: 30-40 ug/L	Lakes: 15-40 ug/L

# Compliance Options Available

- Minor operational changes to the treatment system
- **Water quality trading**
- **Adaptive management**
- Construct significant new or upgraded treatment
- Change industrial processes (industrial facilities)
- Water quality standards variance

# What is Trading and Adaptive Management?

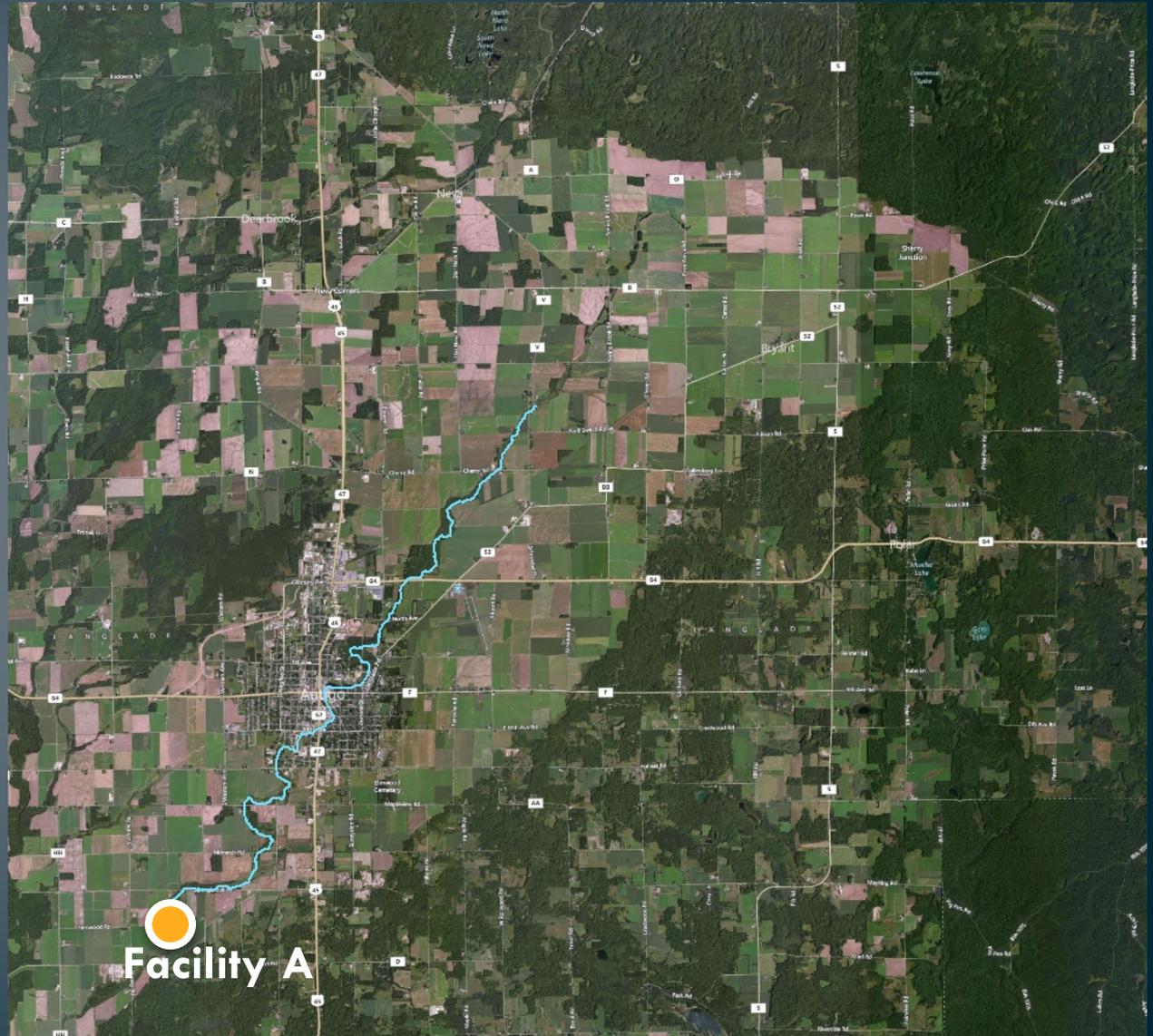
- Allows point sources to take credit for phosphorus reductions made within their watershed to comply with permit requirements
- Create partnerships to achieve water quality goals in the most economically feasible manner possible
- Voluntary permit compliance option

# A Closer Look at Water Quality Trading

- End of pipe pollutant offset
- Water quality trading is an exchange of pollutant reduction credits (i.e. “credits”)
- A buyer with a high pollutant control cost can purchase pollutant reduction or treatment from a willing seller
  - Sellers can include other points sources, including permitted MS4s, and nonpoint sources such as private landowners and non-permitted MS4s.
- Buyer applies credits towards compliance with a permit limit

# Example:

- Facility A has a phosphorus WQBEL equal to 0.075 mg/L. They need offset 250 lbs of P/mo to comply.



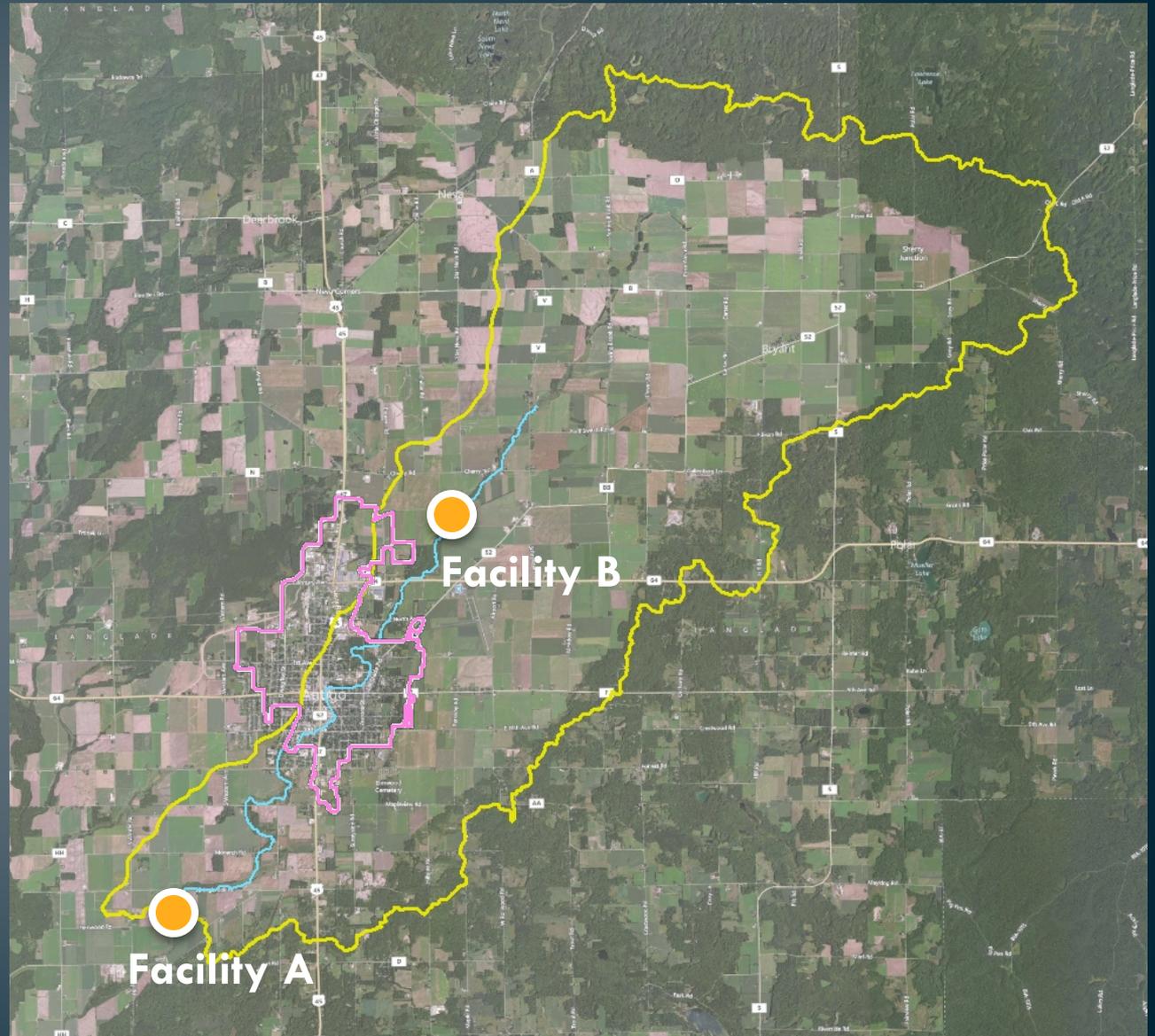
# Example:

- Facility A has a phosphorus WQBEL equal to 0.075 mg/L. They need offset 250 lbs of P/mo to comply.
- Facility B adds treatment to comply with their own permit limits and is able to sell 100 lbs of P/mo to Facility A.



# Example:

- Facility A has a phosphorus WQBEL equal to 0.075 mg/L. They need offset 250 lbs of P/mo to comply.
- Facility B adds treatment to comply with their own permit limits and is able to sell 100 lbs of P credit/mo to Facility A.
- Facility A also works with a non-permitted urban area to implement a series of practices in the watershed to buy 150 lbs of P credit/mo.



# Keys to Trading

- Trade ratio is required to quantify credits to ensure trades result in water quality improvement
  - Minimum trade ratio is 1.2 : 1 for point to nonpoint source trades
  - Minimum trade ratio is 1.1 : 1 for point to point source trades
- Geographic extent
  - Trades should occur upstream of credit user
  - If downstream trades occur, they should occur within same HUC-12
    - Additional trade ratio factor apply
- Timing
  - Practices must be established and effective before they generate credit
  - Typically cannot take credit for past practices

# Trade Ratio

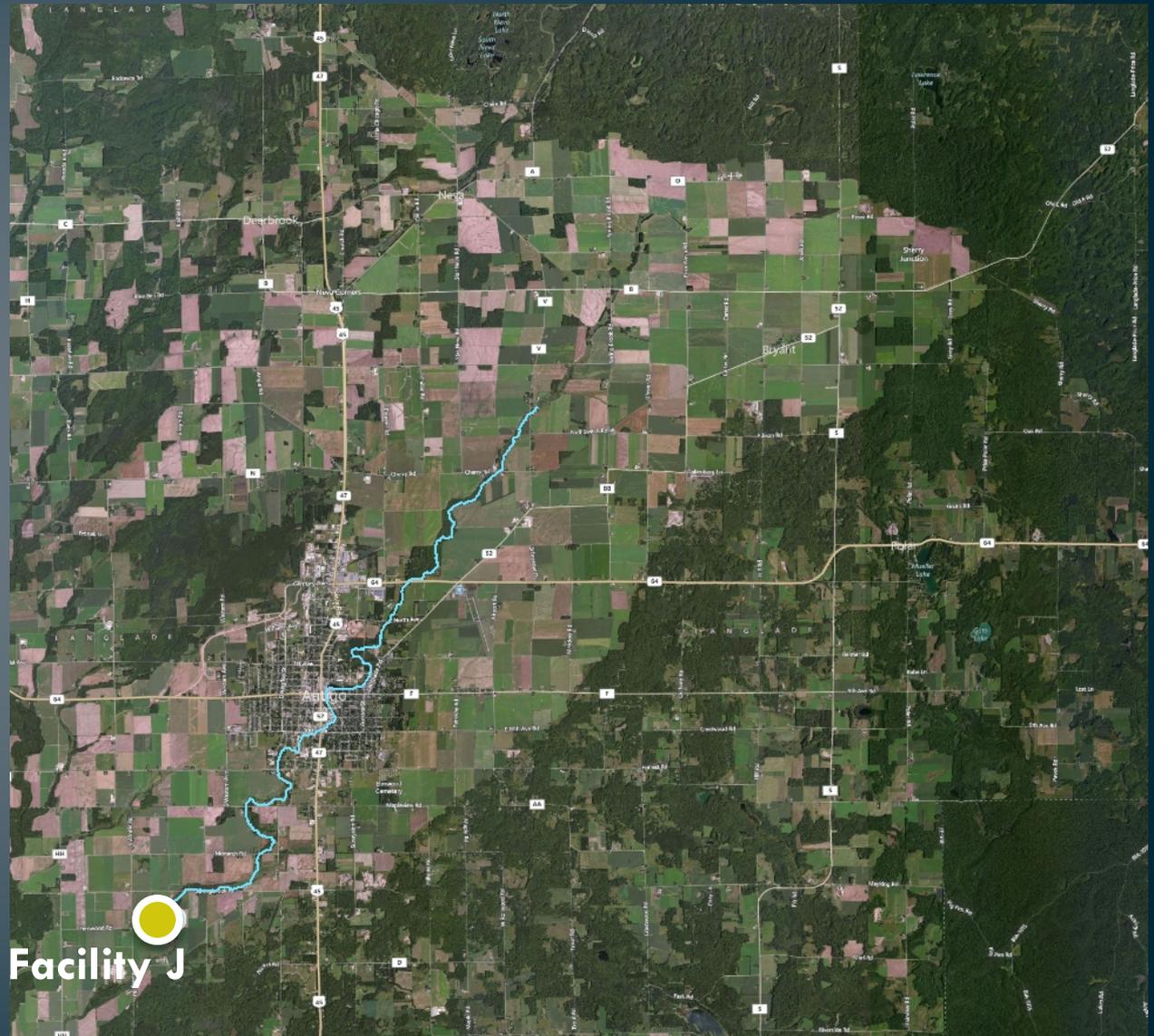
- **Uncertainty**
  - Based on effectiveness and ease of verification of the management practices employed.
- **Delivery (distance between generator and user)**
  - Not necessary if within same HUC 12
- **Downstream factor**
  - Applies if credit generator is downstream of the point of standards application
- **Equivalency (form of pollutant)**
  - Not necessary with phosphorus
  - Not yet specified for N and TSS (sediment)

# A Closer Look at Adaptive Management

- Compliance option focusing on water quality improvements
- Allows point sources to work with other sources of phosphorus in the watershed
- Goal: To reduce overall phosphorus loads so that **water quality criteria** can be attained
- NR 217.18, Wis. Adm. Code

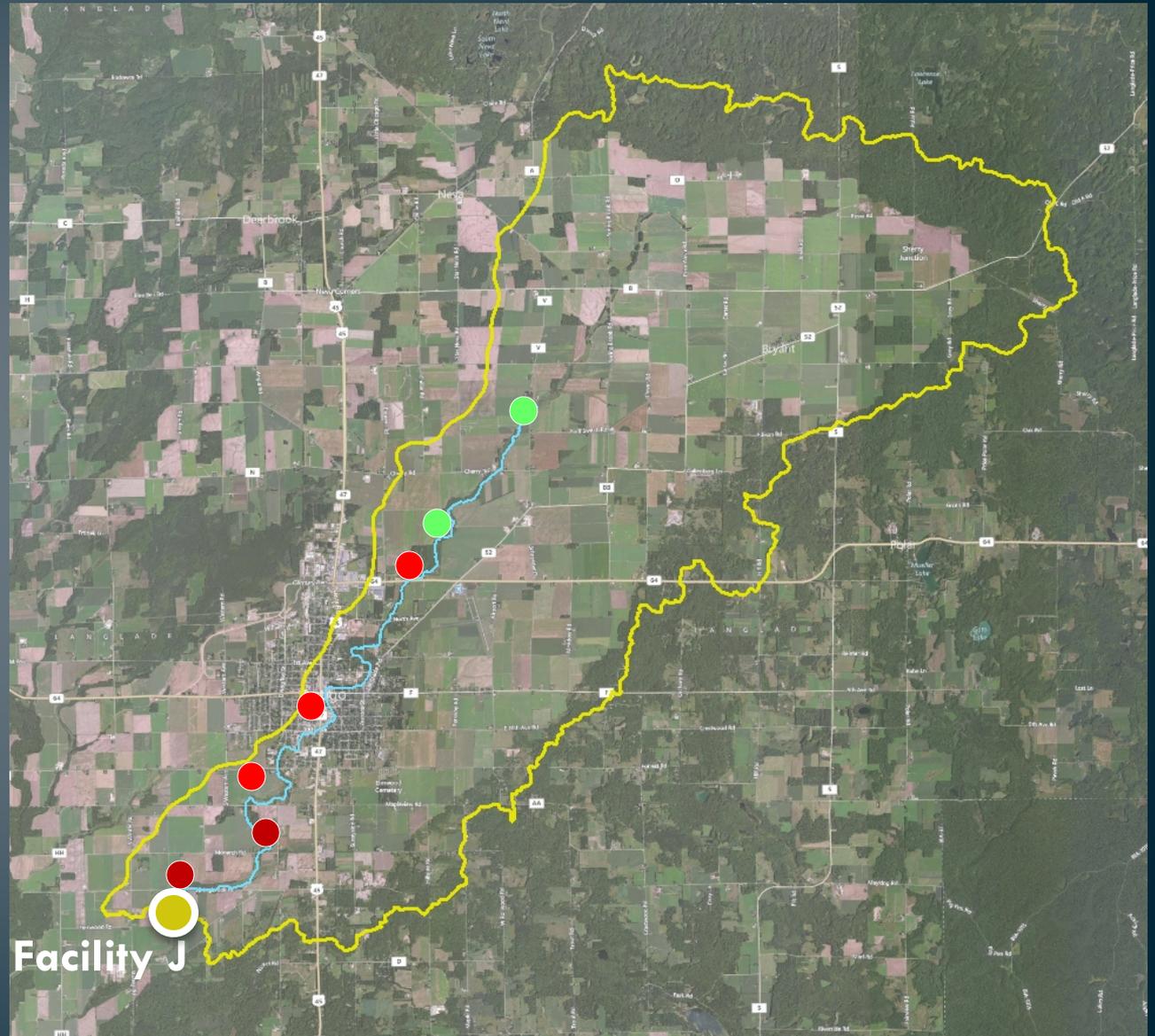
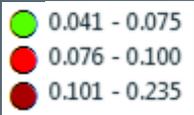
# The Concept:

- Facility J has a phosphorus WQBEL equal to 0.075 mg/L.



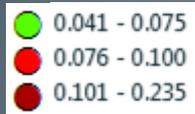
# The Concept:

- Facility J has a phosphorus WQBEL equal to 0.075 mg/L.
- The receiving water is exceeding the phosphorus criteria.



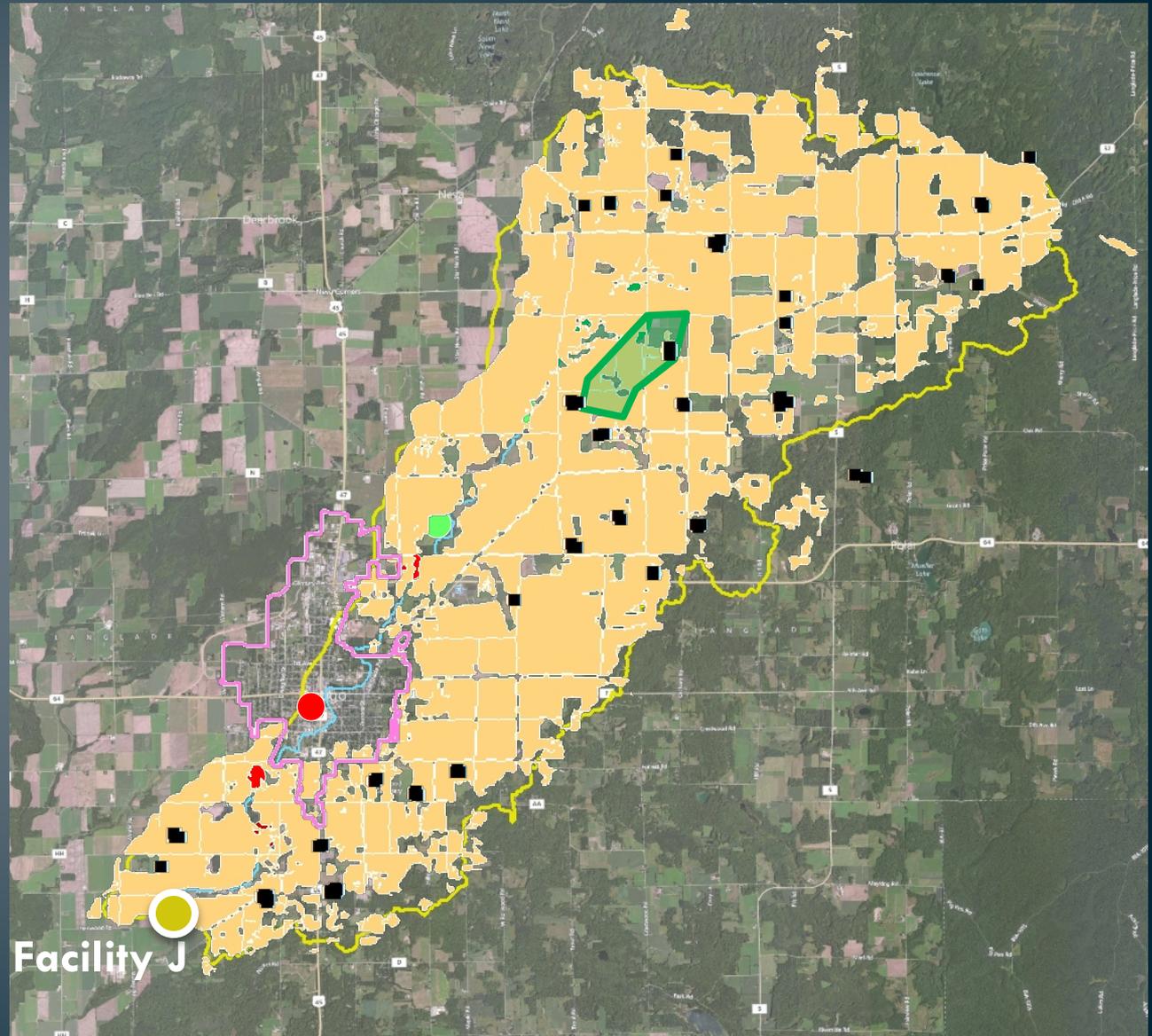
# The Concept:

- Facility J has a phosphorus WQBEL equal to 0.075 mg/L.
- The receiving water is exceeding the phosphorus criteria.



- A watershed plan is developed to improve water quality and reduce sources of P from:

- Barnyards
- Urban areas
- Cropland
- Natural features
- Other



# Keys to Adaptive Management

- Adaptive management has a 10-15 year project life
- Less restrictive interim limits are included in permit instead of the restrictive WQBEL
- In-stream monitoring required
- Adaptive management can be rolled over into water quality trading if insufficient water quality improvements are demonstrated

Permit term  
1

• 0.6 mg/L

Permit term  
2

• 0.5 mg/L

Permit term  
3

• Revised  
WQBEL

# Comparing Adaptive Management to Trading

	Adaptive Management	Trading
<b>Pollutants Covered</b>	TP (and possibly TSS)	All pollutants except BCCs
<b>End Goals</b>	Attaining the water quality criteria	Offsetting the limit
<b>Offsets</b>	No trade ratios	Trade ratios apply
<b>Timing</b>	Implemented throughout the permit term	Generating credits as they can be used
<b>In-Stream Monitoring</b>	Required	Not required
<b>Level of Documentation Needed</b>	General watershed information	Field-by-field documentation

# Benefits of Adaptive Management

- Time
  - Don't have to generate credits as they can be used
  - More restrictive WQBELs will be included in third permit term if water quality improvements not demonstrated
- Flexibility
  - Can adjust plans as you gain more experience
  - Flexibility in quantifying offset requirements and interim success
  - Can always switch to a different option if AM doesn't work, including trading
- Ancillary environmental benefits such as wellhead protection, flood retention, riparian improvement and habitat.

# Benefits of Trading

- Certainty
  - A “1, 2, 3” process- calculate the offset, do the offset, and meet your limit
  - Compliance not dependent on criteria attainment
- Potential pollutants
  - Can look at both TSS and P trades
- Experience
  - Trading has already been done in Wisconsin and in other states
- Ancillary environmental benefits such as wellhead protection, flood retention, riparian improvement and habitat.

# How options fit into example compliance schedules

## Steps of a Compliance Schedule

## Phase

1. Operational Evaluation Report
2. Compliance alternatives, source reductions, and improvements status
3. Preliminary compliance alternatives plan



Preliminary Feasibility

*Up to 3 years*

- 
4. Final compliance alternatives plan
  5. Progress report on plans & specifications



Reissuing Permit

*Permit Reissuance*

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6. Final plans and specifications
  7. Plant Upgrade
  8. Status report
  9. Status report
  10. Achieve compliance



Implement AM/WQT in lieu of a facility upgrade



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# Evaluating Water Quality Trading and Adaptive Management

Kevin Kirsch, PE

Wisconsin Dept. of Natural Resources



# Overview

- Examine role of liability, risk, and uncertainty
- Evaluation of partners and credit generators
- Key evaluation steps for adaptive management and trading
- Closer look at adaptive management
- Closer look at trading
- Summary

# State Regulatory Underpinnings

- **Water Quality Trading**

- s. 283.84, Wis. Stats.
- Guidance Documents

- **Adaptive Management**

- NR 217
- Guidance Documents

There are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns- the ones we don't know we don't know.”

— [Donald Rumsfeld](#)

Disclaimer: This presentation is based on current guidance and regulatory requirements.

# Guidance Documents

*Guidance for Implementing Water Quality Trading in WPDES Permits  
A Water Quality Trading How To Manual*

<http://dnr.wi.gov/topic/SurfaceWater/WaterQualityTrading.html>

(topic keyword: “water quality trading”)

*Adaptive Management Technical Handbook*

<http://dnr.wi.gov/topic/SurfaceWater/AdaptiveManagement.htm>

(topic keyword: “adaptive management”)

# Evaluation of Treatment Options

- Cost – Benefit Analysis
- Timing and cost of facility upgrades
- Advancements in treatment technology
- Management of liability, risk, and uncertainty



# Definitions

- **Liability**: the state of being legally responsible for something; the state of being liable for something
- **Risk**: possibility of loss or injury; the chance of loss or the perils to the subject matter of an insurance contract and the degree of probability of such loss
- **Uncertainty**: something that is doubtful or unknown; not exactly known, definite, or fixed



# Liability

- The shift of permit requirements from the permittee to another entity is not allowed under the legal framework of the Clean Water Act or EPA's Water Quality Trading Policy.
- Contractual remedies are allowed such as financial penalties for failure to generate credits; however, this may require additional financial incentives to entice credit generators to assume this liability.

Note: difference between failure to generate credits and failure to install and maintain practices.

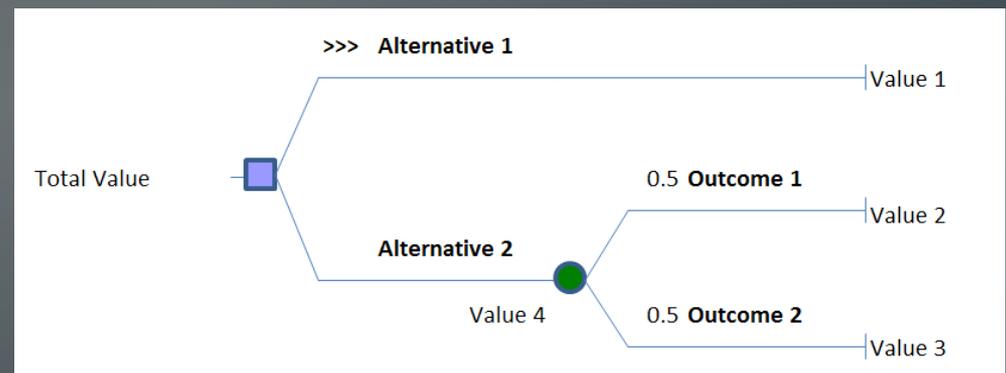
# Risk

- DNR has attempted to reduce risk through the guidance. Additional methods can be employed to reduce risk associated with failure of practices to generate nonpoint reductions.
  - Clear procedure for what happens if practices fail.
  - Establish reserve pool of credits (trading) or install additional practices (AM).
  - Pay for practices only after installed.
  - Use NRCS standards and work with LCDs or crop consultants.
  - Allow flexibility for producers to meet requirements; do not be overly prescriptive in practice selection.



# Uncertainty

- DNR guidance attempts to reduce uncertainty.
  - Example: Trade Ratio
  - Example: Minimum reductions in adaptive management
- Evaluate your options using the most accurate data you can obtain and make conservative assumptions.



Example Decision Tree

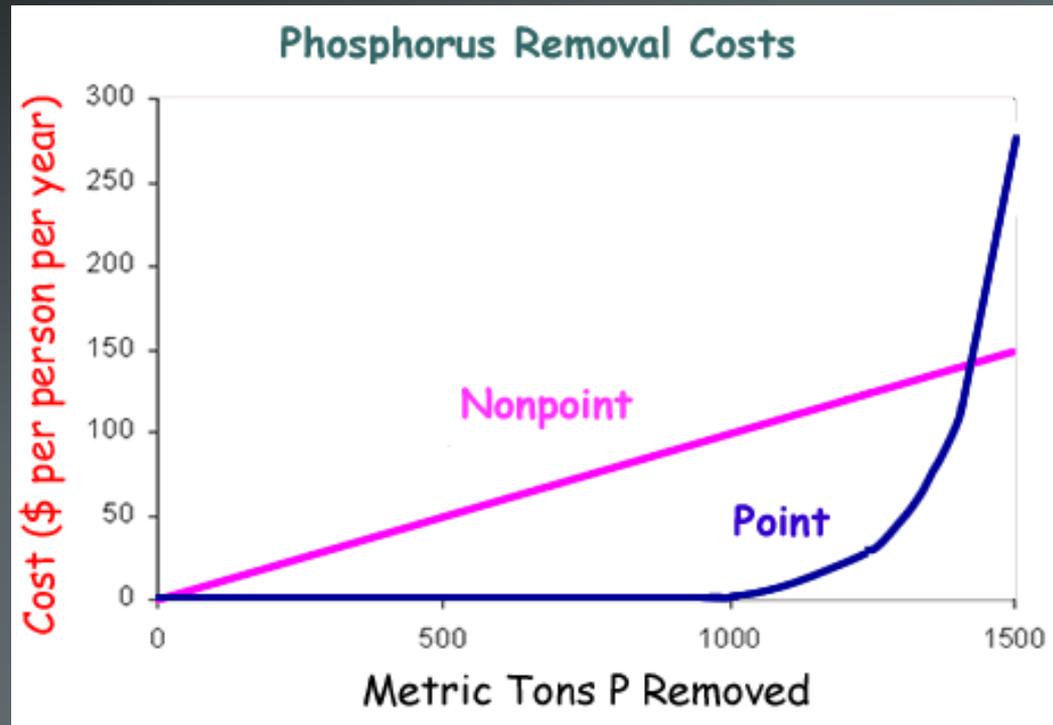
# Keys to Evaluating Trading and Adaptive Management

1. Must be economically viable and the savings must offset any potential risk.
2. Point source(s) must be willing to spend money throughout the watershed, not just in the municipal service area.
3. Partners and credit generators must be available to help develop/implement adaptive management or generate credits.

**If you answer no to any of these questions trading and adaptive management are not for you.**

## Optimization of Treatment Costs

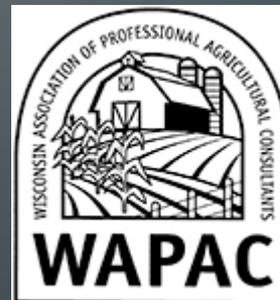
Premise behind adaptive management and water quality trading and lessons from the past.



- Optimization breakpoint for treatment.
- This graph assumes linear costs for nonpoint source control which is likely not the case and a commonly made mistake.

# Nonpoint Partners to Help Evaluate

- To avoid making wrong assumptions regarding agricultural reductions contact potential nonpoint sources early in the process.
- Use methods outlined in guidance documents or other accepted methods to calculate credits.
- Relying on nonpoint practitioners will help reduce your risk and help find potential credits/reductions.



# Technical Needs

- Build good working relationships
- Determine compliance
- Prescribe the appropriate practices to achieve reduction goals
- Survey
- Design
- Recommend the most appropriate programs (cost-share/grant)
- Oversee construction
- Certify final as/built
- Monitor O & M



Photos provided by Greg Baneck,  
Outagamie County

# Assistance for “hard” practices...

- Livestock waste storage
- Barnyard Runoff Control
- Clean water management
- Waterways
- Stormwater retention
- Silage leachate containment
- Streambank stabilization



Photos provided by Greg Baneck,  
Outagamie County

# Assistance for “soft” practices...

Cover Crops...



Conservation Tillage...



Nutrient Management...



Riparian Buffers...



Photos provided by Greg Baneck,  
Outagamie County

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# Trading and Adaptive Management with LCDs and other Nonpoint Partners

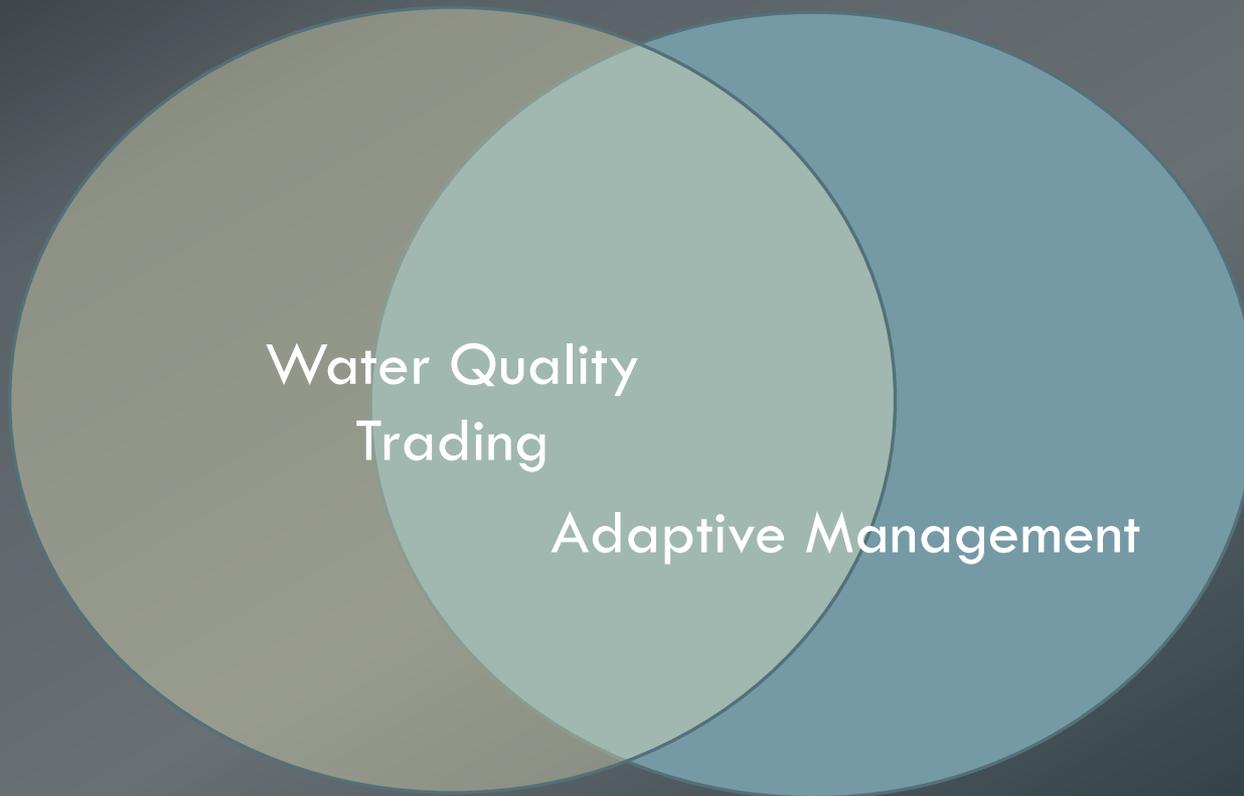
## Advantages

1. Potential funding opportunity for staff resources
2. New partnerships to achieve needed nonpoint implementation.
3. Increases awareness of LCDs and their benefits to the community
4. Outcome-driven projects

## Disadvantages

1. Takes time to establish partnerships with groups that have traditionally not worked together
2. Funding will not be immediate
3. Outcome-driven projects

# Steps for Evaluating Adaptive Management and Trading are Not Mutually Exclusive



# Evaluate NPS contributions

- Use sound scientific data and rationale
- Determine eligibility for AM and evaluate potential for nonpoint reductions based on percentages.
- PRESTO
  - Calculates basin specific average annual phosphorus loads from point and nonpoint sources

Watershed  
Delineation



+

Effluent  
Aggregation



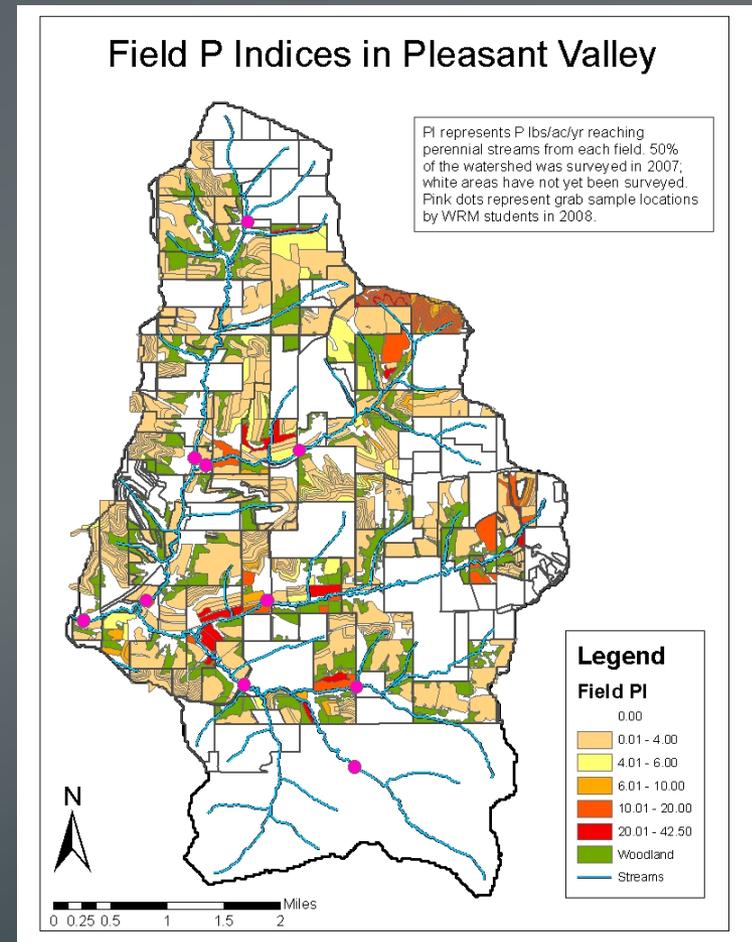
+

Pollutant  
Runoff



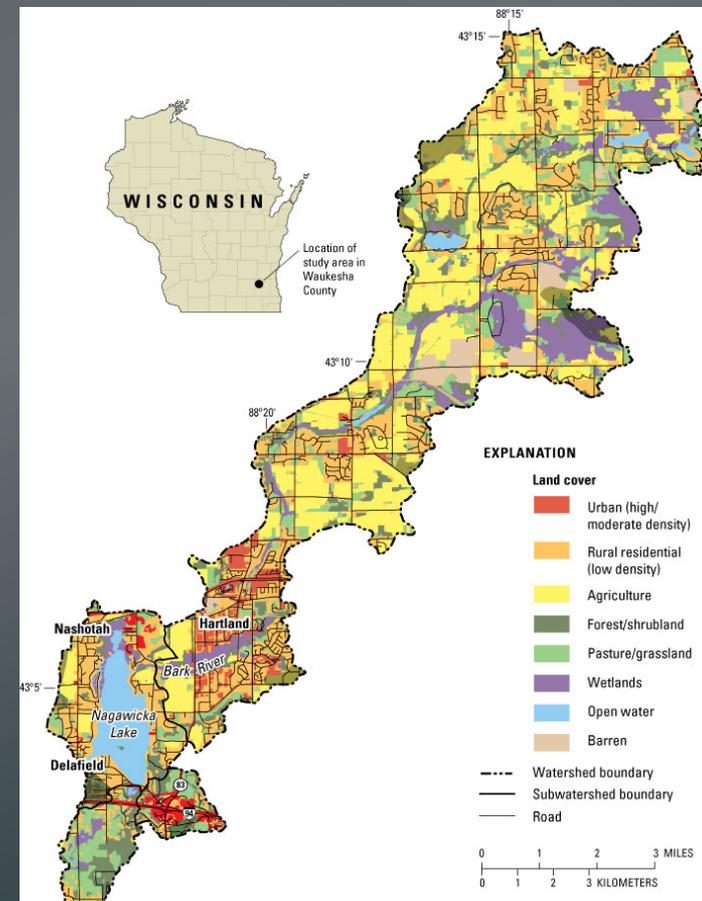
# Evaluate Nonpoint Reductions

- Conduct a watershed assessment to identify source areas.
- Estimate Load reductions for installation of practices.
- Look for complementary practices and target beneficial areas such as wellhead protection areas or fields that you spread on.



# Evaluate Geographic Setting

- Size of watershed and location of point sources relative to potential credits.
- Relative location of point of standards application.
- Assess need for downstream trading or delivery factors due to lakes or impoundments – how will this impact trade ratios or attainment of water quality standards.



# Evaluating Adaptive Management

Plan Requirements  
NR 217.18(2)(d)

## 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 WQBEL

Step 1: Identify partners

Step 2: Describe the watershed and set load reduction goals

Step 3: Conduct a watershed inventory

Step 4: Identify where reductions will occur

Step 5: Describe management measures

Step 6: Estimate load reductions expected by permit term

Step 7: Measuring success

Step 8: Financial security

Step 9: Implementation schedule with milestones

# Adaptive Management Permit Requirements

- Evaluate Impact of Interim limits.
- Evaluate minimum phosphorus reductions needed each permit term.
- Evaluate Monitoring Requirements and potential revised WQBEL.
  - NR 217.13 or TMDL derived limit
- Evaluate impact of three permit terms on facility planning and capital expenditures.

Permit  
term 1

• 0.6 mg/L

Permit  
term 2

• 0.5 mg/L

Permit  
term 3

• Revised  
WQBEL



# Advantages of Adaptive Management

- Time
  - Pollution reductions occur throughout the permit term, not prior to the permit term
  - Adaptive management is has a 10-15 year project life
- Flexibility
  - Can adjust plan as you gain more experience
  - Flexibility in quantifying offset requirements and interim success
  - Can switch to a different option if AM doesn't work, including trading
- Potentially fewer offsets required – IMPACTS RISK
  - Trade ratios, delivery ratios, credit thresholds not required
  - Using trade ratios and credit thresholds will increase likelihood of attaining water quality criteria.

# Evaluating Water Quality Trading

- Evaluate potential of point to point trades
- Evaluate optimizing treatment or only trading for a portion of needed reductions with nonpoint sources.
- Use conservative trade ratios of 2:1 to 3:1 in preliminary evaluation calculations.
- In a TMDL watershed factor in the credit threshold requirements.
  - Examine both interim and long-term credits.

# Trade Ratio – Uncertainty

Table 4. Management practices with recommended credit generation and use information.

Management Practice	Uncertainty Factor <sup>1</sup>	Applicable Technical Standard	Method for Calculating Pollutant Load Reductions	Notes	
<u>Nutrient Management and supporting practices:</u>	2 (3)	NRCS 590	SNAP-Plus or equivalent model results compared to baseline	An approved NMP is required with any of the listed supporting practices. All supporting practices receive the same uncertainty factor as the NMP.	
Tillage Options				An uncertainty factor of 2, instead of (3), may be used when documentation can be provided through historic cropping records or soil testing that nutrient levels are stable or dropping, an indication of adherence to the NMP.	
Mulch Till	2 (3)	NRCS 345			
No Till	2 (3)	NRCS 329			
Riparian Filter Strip (edge of field)	2 (3)	NRCS 393			An uncertainty factor of (3) is required if fields are not brought into compliance with NR 151.02 and NR 151.04, Wis. Adm. Code.
Grassed Waterway	See Notes	NRCS 412			No application of manure, biosolids or industrial wastes allowed on snow-covered or frozen ground or on fields with high groundwater or tile drainage.
Cover Crop	2 (3)	NRCS 340		A crop or livestock producer engaged in a trade agreement must have all fields under an approved NMP, not just fields engaged in the trade.	
Other practices simulated in SNAP-Plus	2 (3)			Use of <b>grassed waterways</b> on fields in support of nutrient management and other supporting practices lowers the uncertainty factor to 1.5.	
<u>Production Area Practices</u>			University of Wisconsin Barnyard Tool APLE or equivalent modeling method		
Diversion	2	NRCS 362			
Roof Runoff Structure	2	NRCS 558			
Vegetated Treatment System	4	NRCS 635			
Constructed Wetland	4	NRCS 656			
Sediment Control Basin	2	NRCS 350	RUSLE2	For agricultural runoff control.	
<u>Streambank Stabilization and Shoreline Protection</u>			Contact WDNR to discuss project and develop a method to quantify impact of stabilization. Appropriate methods include NRCS regression calculation.	For livestock producers, streambank stabilization must be accompanied by riparian fencing or other controls to prevent destruction of streambanks.	
Without aquatic habitat restoration	3	NRCS 580 NRCS 382			
With aquatic habitat restoration	2	NRCS 580 NRCS 395			

# Quantifying Credits



<b>Home</b>
<b>Downloads</b>
<a href="#">Version 1.132</a>
<a href="#">User Manual</a>
<a href="#">Database Tools</a>
<b>News &amp; Help</b>
<a href="#">Installation Details</a>
<a href="#">Recent Program Changes</a>
<a href="#">Training Opportunities</a>
<a href="#">Answers (FAQ)</a>
<a href="#">Known Problems</a>
<a href="#">Helpful Links</a>
<b>Contact &amp; Links</b>
<a href="#">Contact Information</a>
<a href="#">NRCS 590 Standard</a>
<a href="#">UWEX publication A2809</a>
<a href="#">WI Phosphorus Index</a>
<a href="#">RUSLE2 Info</a>
<a href="#">Soil and Restriction Maps</a>

## SnapPlus 2.0 is now available

SnapPlus 2.0 has been released on August 5, 2013 at [snapplus.wisc.edu](http://snapplus.wisc.edu). We encourage SnapPlus users to use the new version as it has many improvements including the new A2809 nutrient recommendations. The new version will convert existing version 1 farm databases for use in SnapPlus 2.0 without modifying it. Existing SnapPlus version 1.132 farm databases will continue to work in version 1, but with the old A2809 recommendations.

## Important News

August 5, 2013  
SnapPlus Version 2.0 is available at <http://snapplus.wisc.edu>.

SNAP-Plus is produced by the



SNAP-Plus is supported by:



# Summary to Evaluating Trading and Adaptive Management

1. Must be economically viable and the savings must offset any potential risk.
2. Point source(s) must be willing to spend money throughout the watershed, not just in the municipal service area.
3. Find partners and credit generators to develop/implement adaptive management reductions or generate credits.
4. **Go in with a positive “we are all in it together” approach; finger pointing will not get us anywhere.**

**Coming together is a beginning; keeping together is a process; working together is success.**

**~Henry Ford**



# Funding Adaptive Management & Trading Projects

# Funding Needs

- Administration
  - Staffing, contract development, etc.
- BMP implementation
- BMP maintenance
- Outreach & education
- Modeling
- Technical assistance
- Compliance checks
- Effluent monitoring
- In-stream monitoring\*



# Funding Opportunities for Trading & Adaptive Management

- Funding from permittees
- Federal grant opportunities
  - EQIP, CSP, WRP, GRP, WHIP, FRPP, CTA, Great Lake Restoration Initiative, Driftless Area Landscape Conservation Initiative, Mississippi Healthy Watersheds Initiative, & others!
- State grant opportunities
  - River and lake protection management grant, river and lake planning grant, lake classification grant, land acquisition stewardship, stream bank protection program, & others!
- Private funding may also be available

GLRI WRP  
SWRM WLI/FPP  
CWFP  
EQIP

# Funding Restrictions

- Some funding sources cannot be used towards WPDES permit compliance, such as TRM & NOD, or have other restrictions associated
  - Review restrictions of individual funding sources
- Additional guidance in development

What reduction will be included in WPDES permit?

- Trading specifies full reduction needed to comply with WQBEL
- Adaptive management specifies a minimum P reduction required
  - Additional work may occur beyond this minimum and funded through TRM

# Clean Water Fund Pilots

- Pilots are available for municipalities to pay for AM/WQT projects
- Funds can be used for hard practices, soft practices, monitoring needs, consultant needs (including LCD staffing needs), etc.
- Hard practices must be included in plan to be eligible for pilot funds
- To receive funding in 2015, must submit a **Notice of Intent to Apply** by 12/31/13

Visit [dnr.wi.gov](http://dnr.wi.gov), search “**Environmental Improvement Fund**”

# Questions?

Location	Contact Information	DNR Office/Email
Statewide coordinators	Amanda Minks, Kevin	<a href="mailto:Amanda.Minks@Wisconsin.gov">Amanda.Minks@Wisconsin.gov</a>
	Kirsch, Mike Hammers	<a href="mailto:Kevin.Kirsch@Wisconsin.gov">Kevin.Kirsch@Wisconsin.gov</a>
		<a href="mailto:Mike.Hammers@Wisconsin.gov">Mike.Hammers@Wisconsin.gov</a>
Northern District	Lonn Franson	<a href="mailto:Lonn.Franson@Wisconsin.gov">Lonn.Franson@Wisconsin.gov</a>
Southern District- West	Amy Schmidt	<a href="mailto:Amy.Schmidt@Wisconsin.gov">Amy.Schmidt@Wisconsin.gov</a>
Southern District- East	Sharon Gayan, Karen	<a href="mailto:Sharon.Gayan@Wisconsin.gov">Sharon.Gayan@Wisconsin.gov</a>
	Nenahlo	<a href="mailto:Karen.Nenahlo@Wisconsin.gov">Karen.Nenahlo@Wisconsin.gov</a>
Eastern District	Keith Marquardt	<a href="mailto:Keith.Marquardt@Wisconsin.gov">Keith.Marquardt@Wisconsin.gov</a>
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<http://dnr.wi.gov>

keywords: “adaptive management”, “water quality trading”