

WATERTOWN COMPLETES DATA MANAGEMENT STUDY TO HELP WITH ADAPTIVE MANAGEMENT PLANNING

Wisconsin Wastewater Operators Association
2013 Annual Conference



SYMBIONT

Agenda

- Why are we talking about this?
- What are we talking about?
- What to consider?
- Where to go from here?

Why are we talking about this?

- 2010 Code changes added water quality concerns to WPDES permits.
- NR 102 contains water quality values.
- NR 217 contains implementation details
- In addition, TMDL calculations allocate mass for phosphorus and suspended solids.
- NR 217 contains flexibility on how to achieve WPDES permit limit. Adaptive Management is one of many options available in the AD MIN code to achieve permit compliance.
- Data management will be critical to good planning.

To illustrate what we are talking about

- Prior to 2010:
 - Significant dischargers often had a technology based limit for TP of 1 mg/L.
 - Some received a variance if they used Bio-P.
 - Dischargers below 150 Lbs/year were exempt
- Now
 - Water quality needs to be considered
 - The lower between the TBEL and the WQBEL governs
 - No one is exempt

Some examples of recent permits

- Holmen, WI received notification of a potential limit of 0.075 mg/L
 - This is more than 13 x lower than a limit of 1.
- Oakdale (pop 297) potential limit of 0.075 mg/L
 - Oakdale was exempt under the old code
- Roberts (pop 1,658) potential limit of 0.040 mg/L
 - One of the more restrictive limits in the country.

How water quality data is used.

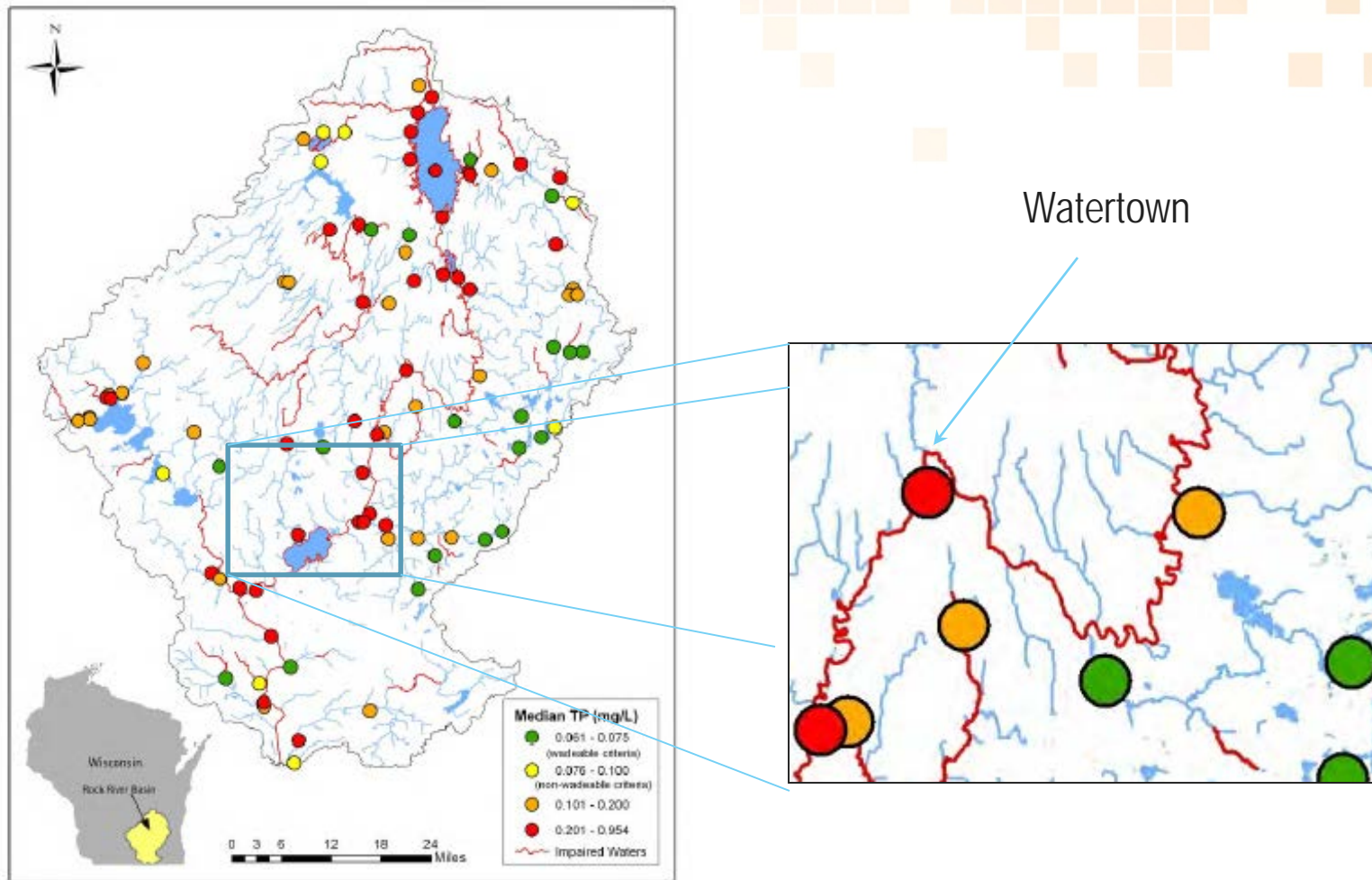
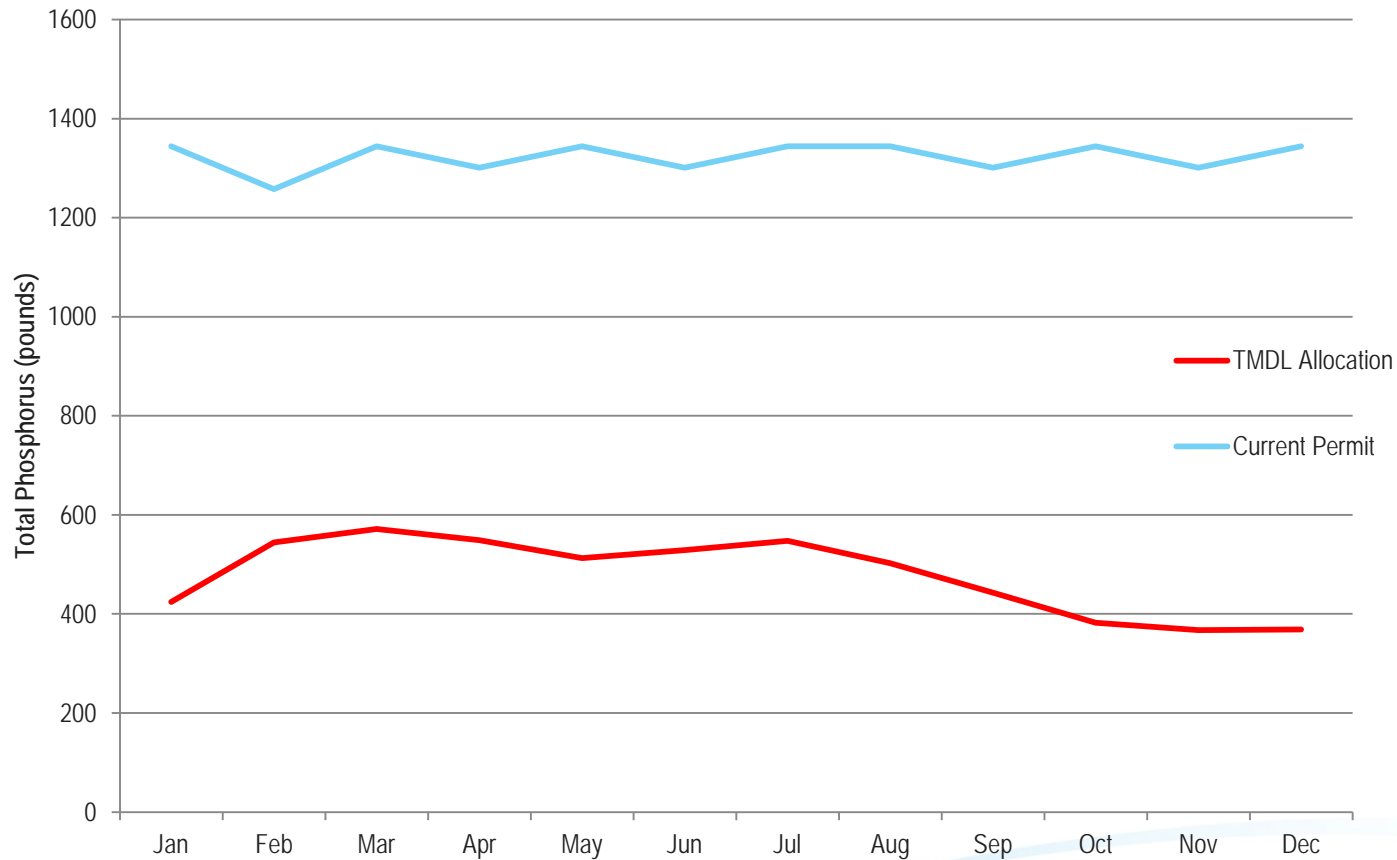


Figure 5. Median growing-season total phosphorus concentrations at 93 sampling stations in the Rock River Basin.

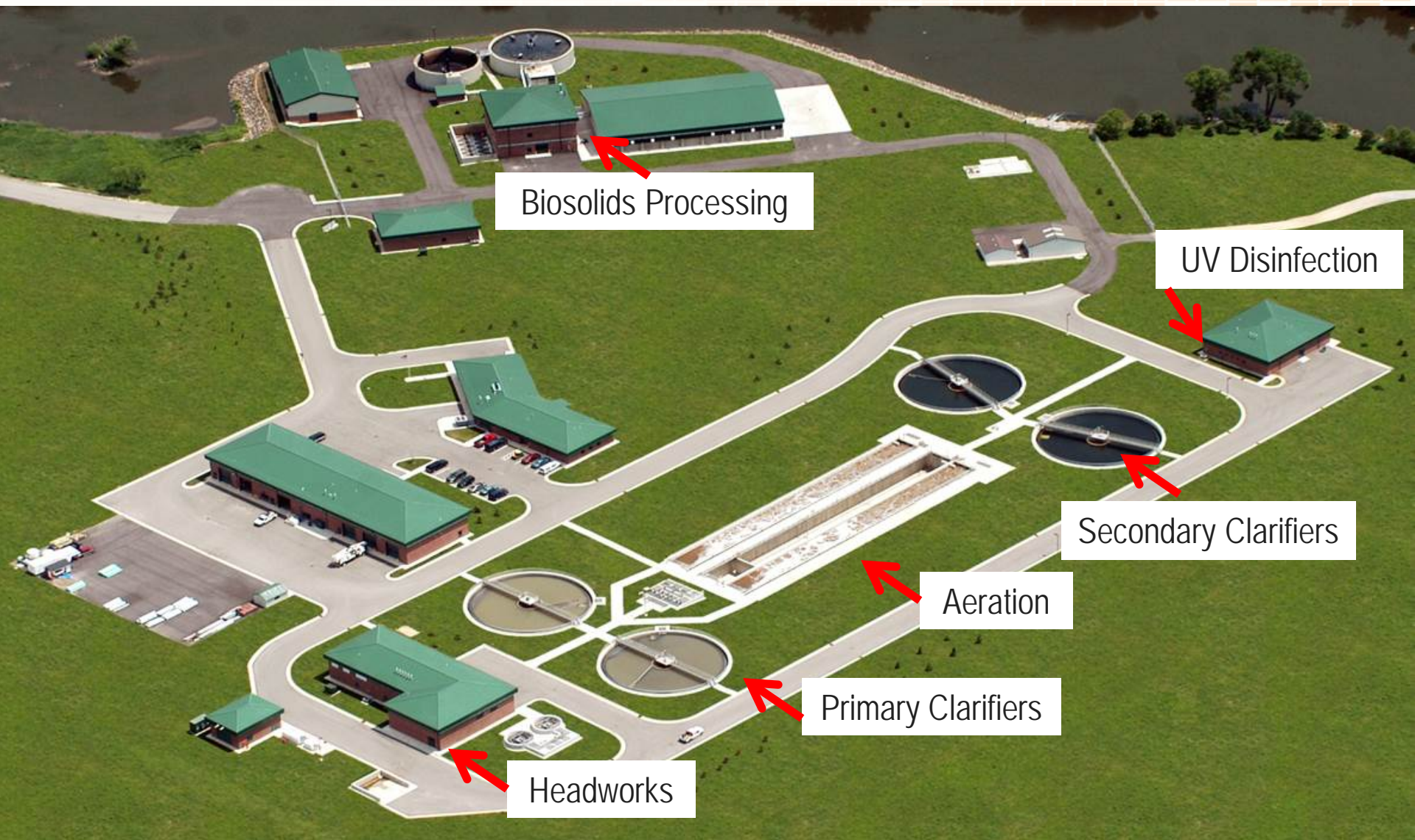
How is Watertown affected?

Figure 1: Monthly Total Phosphorus Allocations for Watertown from the Rock River Basin TMDL



Some facts about Watertown

- Population is 23,936
- Sanitary Sewer System 110 miles of piping ranging from 8" to 60"
- New WWTP built in 2003 at a cost of \$24,000,000
 - Design flow 5.2 MGD, 3.0 MGD average daily flow
 - Activated sludge with an Anoxic Selector
 - No biological phosphorus removal because we co-settle Waste Activated Sludge in our Primary Clarifiers.
 - Chemical addition used to meet a 1 mg/L permit limit.



Biosolids Processing

UV Disinfection

Secondary Clarifiers

Aeration

Primary Clarifiers

Headworks

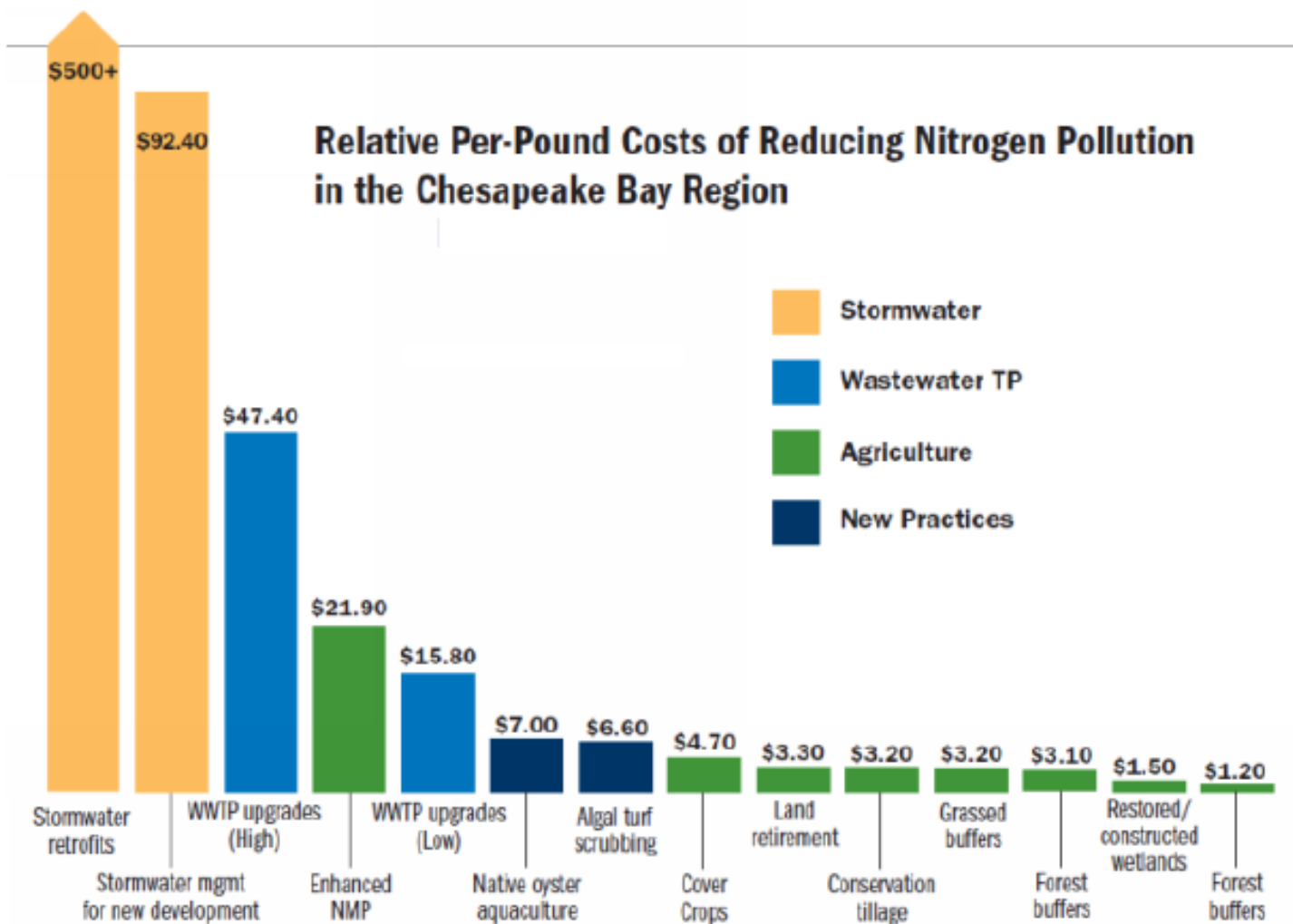
The cost of compliance

- Cost estimates to comply with new projected permit limits
 - If the plan is to treat the current average - \$6,000,000
 - If the plan is to treat all flow (30 MGD) - \$30,000,000
- Cost estimates based on using Membranes
- Cost estimates are capital only.
- Operating costs including chemical are not included but would be significant and above current levels.
- Increased solids production not included as well.

Flexibility in NR 217

- Treatment
- Nutrient Trading
- Watershed approach – Adaptive Management
- Local variance

Why adaptive management?



Source: World Resources Institute

January 2010

What are BMP's - Agricultural

Farm BMPs are designed to prevent sediments and nutrient from running off the land into waterways.

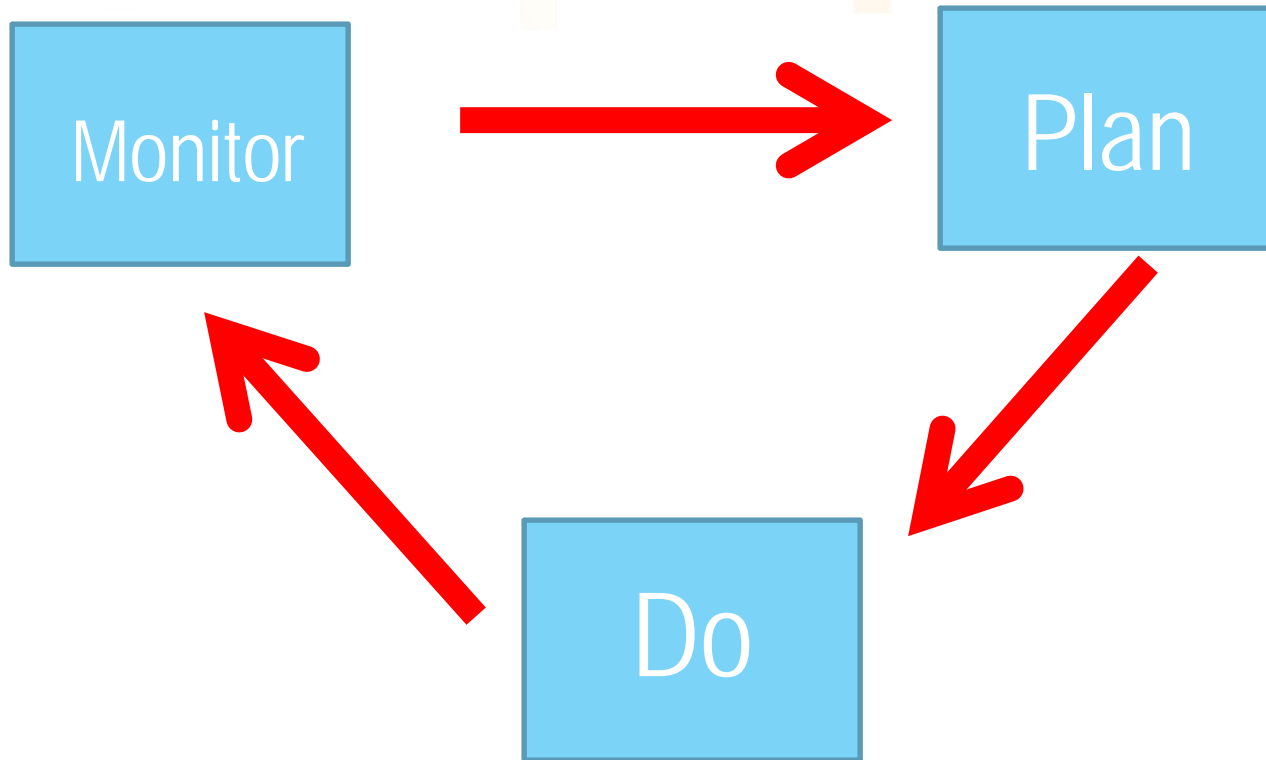
- Nutrient management
- Integrated pest management
- Conservation tillage
- Cropping patterns
- Manure management
- Streambank fencing
- Stormwater management
- Riparian vegetative buffers



What are BMP's - Urban



What does an adaptive management program look like?



What is in a plan?

NINE STEPS TO DEVELOPING AN ADAPTIVE MANAGEMENT PLAN:

<u>STEP</u>	<u>DESCRIPTION</u>
Step 1 Identify Major P Contributors	Use modeling and/or monitoring; data sources can include TMDLs, web tools like the PRESTO model, and county conservationists
Step 2 Identify Funding Partners	Partner with other permittees, municipalities, funding partners, DNR, etc.
Step 4 Describe Management Measures	Identify strategies for reducing P, with installation and maintenance activities; see examples below
Step 5 Identify Where Reductions Will Occur	Create an "action area" map including locations of your facility, proposed reduction strategies, monitoring, and potential future strategies (where applicable)
Step 6 Estimate Load Reductions Expected from Strategies	Employ models (SNAP-PLUS, SWAT, SLAMM, SPARROW, etc.) to estimate expected P load reductions
Step 7 Monitoring	Collect effluent and in-stream samples; using the monitoring results with modeling, show the expected water quality improvements and BMP effectiveness
Step 8 Financial Security	Show how project costs will be funded (costs may include installation, maintenance, and monitoring of BMPs; outreach and education)
Step 9 Implementation Schedule and Milestones	Provide a detailed implementation schedule to be put into your permit; annual reporting to DNR is required

Where data management is important

- The results of nutrient modeling will only be as good as the data.
- GIS application provide the best means to gather, manage, and monitor.
- Better data leads to better model results.
- Better model results leads to better forecasting.

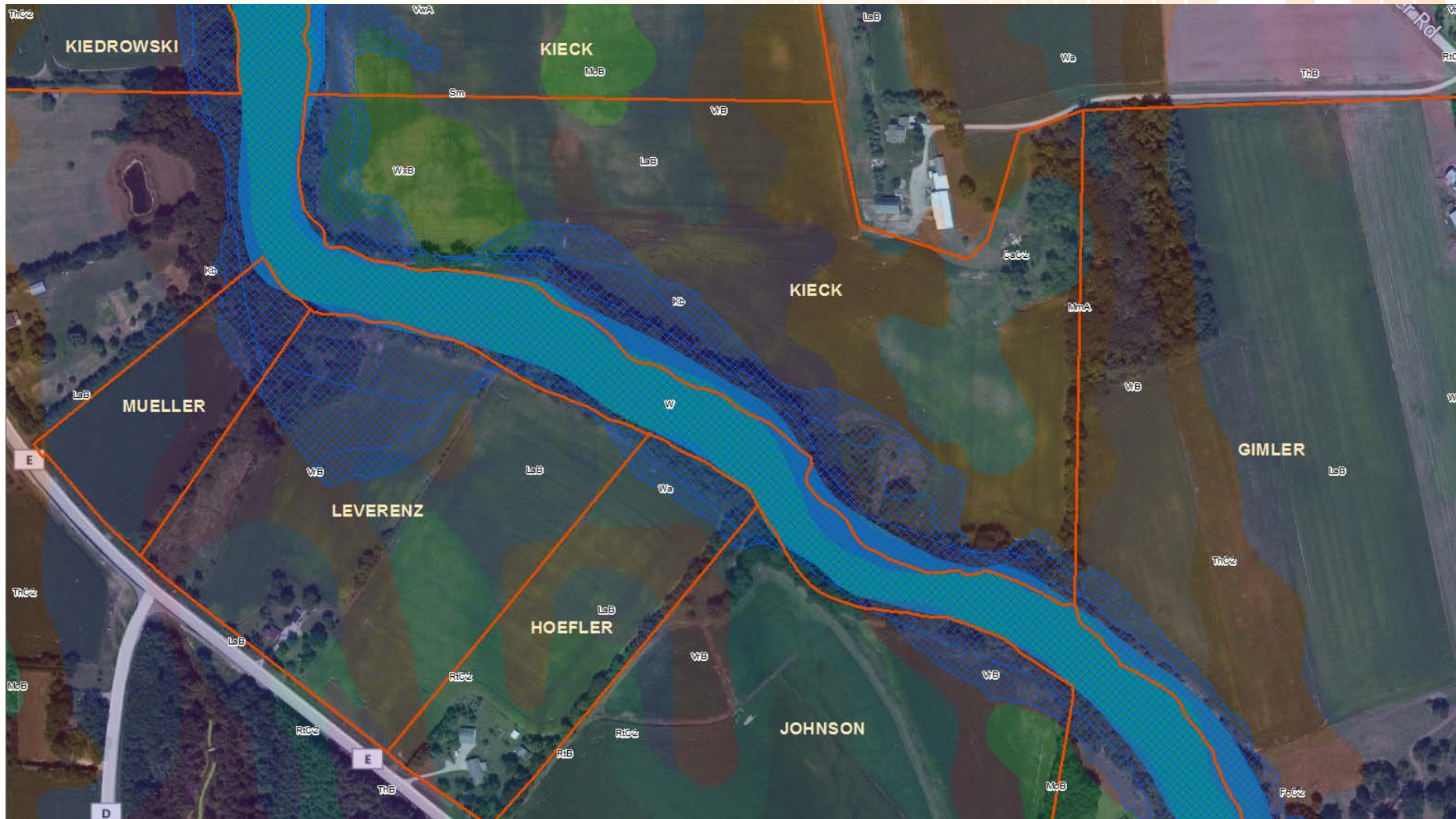
The Watertown example

- An investigation regarding the data sources for an adaptive management plan was completed.
- Data from the following sources would likely be needed:
 - Federal
 - State
 - County
 - City

What kinds of data?

- Water Quality
- WPDES permit
- Soil types
- Property Owners
- Land topography
- Urban storm water

Consider how to use the data



Consider how to use the data



So what do you need to know?

- If you qualify, adaptive management is a viable option that has some risks.
- Data management is critical to a solid plan
- The better the data, the better the plan, the greater the chance of success.

Conclusion

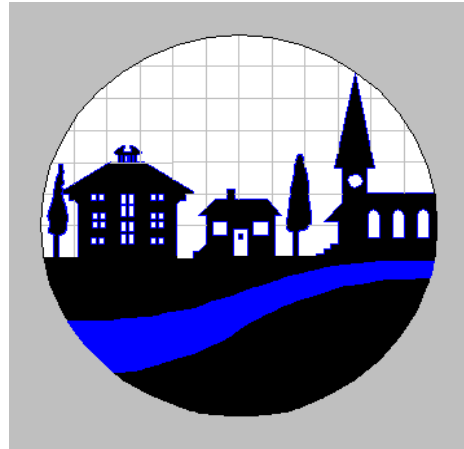
- You have choices ...

Treatment vs. watershed planning

- Be prepared, know your options.

Acknowledgement

- Special thank you to the City of Watertown for their participation with this project.



Thank you!

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