

# MMSD Watershed Adaptive Management Pilot Project

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- **Melissa Malott-Clean Wisconsin**

Presented at the 2012 Government Affairs Seminar





# Presentation at a Glance

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- **Regulatory background**
- **Compliance strategies**
- **Anticipated costs**
- **Opportunities and challenges**
- **Dane County perspective**
- **Clean Wisconsin perspective**





# Phosphorus Regulations

- **NR 102-numeric water quality criteria**
- **NR 151-runoff management (PI)**
- **NR 217-implementation framework for point sources**
- **Rock River TMDL**

## Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin

Columbia, Dane, Dodge, Fond du Lac, Green, Green Lake, Jefferson, Rock, Walworth, Washington, and Waukesha Counties, Wisconsin

July 2011

Prepared for:

U.S. Environmental Protection  
Agency  
Region 5  
77 W. Jackson Blvd.  
Chicago, IL 60604

Wisconsin Department of  
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Prepared by:

CADMUS  
A TETRA TECH COMPANY

# Rock River TMDL

- **Approved by EPA in September, 2011**
- **Addresses impairments caused by TP and TSS**
- **Reductions required from all sources**
- **For the Yahara Watershed:**
  - **Nonpoint**
  - **MS4s (stormwater) (25)**
  - **Other point sources (7)**



# Potential P Reduction Approaches

- **Traditional-treatment and/or control**
- **Water quality trading**
- **Adaptive management**
- **Combination**



# Traditional Compliance Approaches

- **Independent actions**
- **Discharge-“end of pipe”  
focused solutions**
- **Expensive**



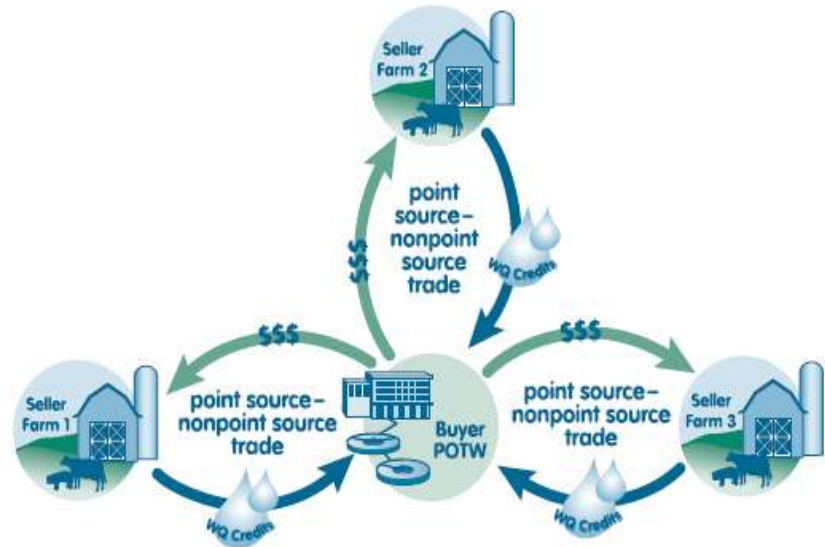
# What would this look like for MMSD?

- **Build complex and expensive technology**
- **Resource intensive**
- **Large carbon footprint**



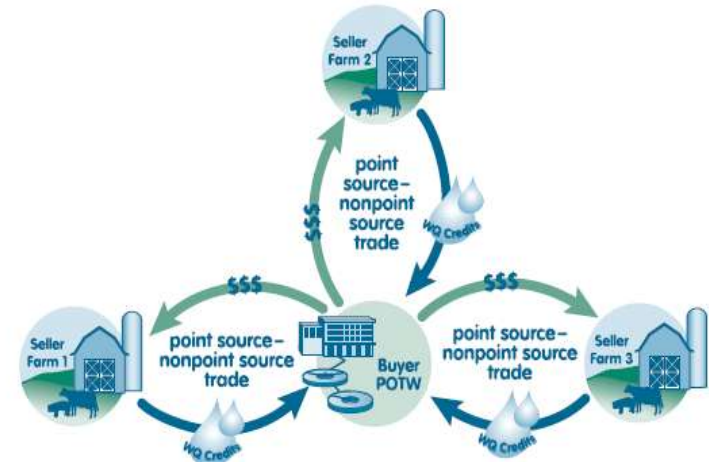
# Water Quality Trading

- Discharge focused
- Different sources have different control costs
- Transfer of \$
- WDNR has developed a draft trading framework
- Some important issues yet to be resolved



# Watershed Adaptive Management

- Watershed based solutions
- Pool resources and invest in lower cost solutions
- High level of flexibility
- Application has to be made by an NR 217 regulated facility





# Wisconsin Watershed Adaptive Management Option

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- **Goal-achieve WQC:**
  - **Economically-avoid filtration**
  - **As soon as possible**
  - **Consider both point and nonpoint contributions**
  
- **Conditions**
  - **Proposed WQBEL will require filtration or equivalent technology**
  - **Exceedance caused by both point and nonpoint**
  - **Sum of nonpoint & MS4 at least 50% of total load**
  - **WDNR approved implementation plan**

# Adaptive Management Basics

## Things to consider

- **Do you qualify?**
  - Filtration required?
  - P source distribution?
- **Geographic scope**
- **Partnerships**
- **Load reductions**
- **Targeting considerations**
- **Cost and allocation**
- **Administration**

**A TMDL can be helpful**



# Two Important DNR Documents

## Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges

January 3, 2012

Guidance Number: 3800-2011-02

Edition Number: 1

*This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rules are referenced. This guidance does not constitute 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 statute and administrative rules to the relevant facts.*

APPROVED:

  
Susan Sylvestre, Director  
WDNR Bureau of Water Quality

  
Date

**presto**  
Pollutant Load Ratio  
Estimation Tool

User Manual  
Version 1.00  
December 2011



**Project Team**

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# MMSD Nutrient Reduction Evaluation

## 9 different scenarios

- TP alone (3)
- TP + TN (6)

**TMDL Target: 0.13 mg/l TP**

- Filtration required
- \$78 Million total PW cost

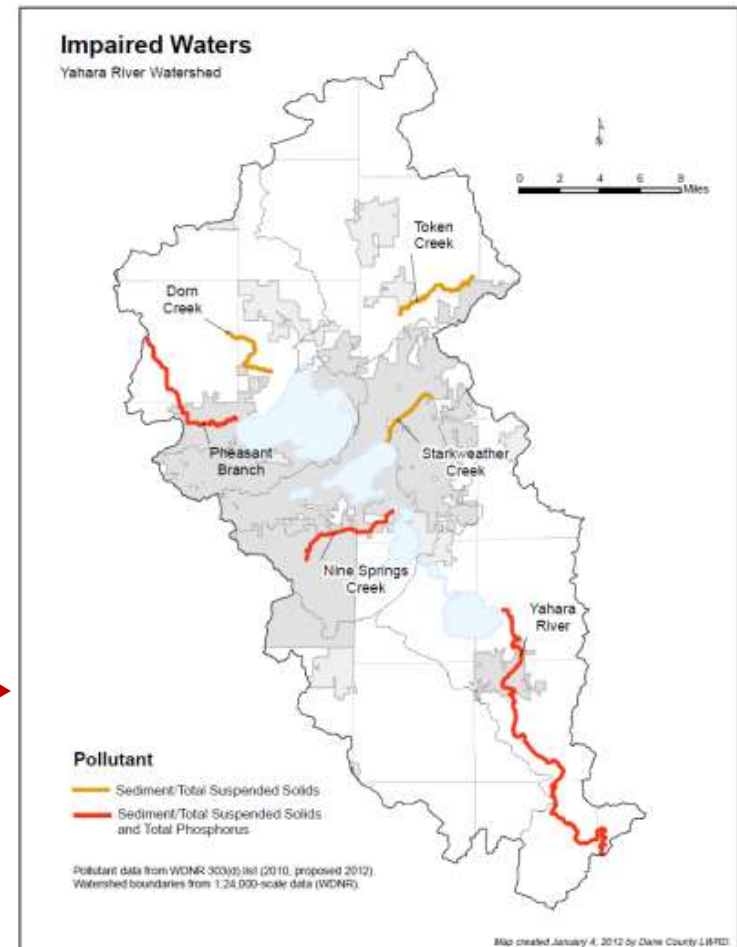


# MMSD Geographic Scope

- **Rock River TMDL**
- **Upstream from control point**



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# Rock River TMDL-Stormwater Dischargers (MS4s) With Outfalls in the Yahara Watershed

## Cities

**Fitchburg  
Madison  
Middleton  
Monona  
Stoughton  
Sun Prairie**

## Villages

**Cottage Grove  
DeForest  
Maple Bluff  
McFarland  
Shorewood Hills  
Waunakee**

## Towns

**Blooming Grove  
Bristol  
Burke  
Cottage Grove  
Dunkirk  
Dunn  
Madison  
Middleton  
Pleasant Springs  
Westport  
Windsor**

## Others

**Dane County  
UW-Madison**



# Rock River TMDL-Additional Point Sources With Outfalls in the Yahara Watershed

## WWTPs

Arlington

MMSD

Oregon

Stoughton

## Others

MG&E

Middleton-Tiedemann Pond

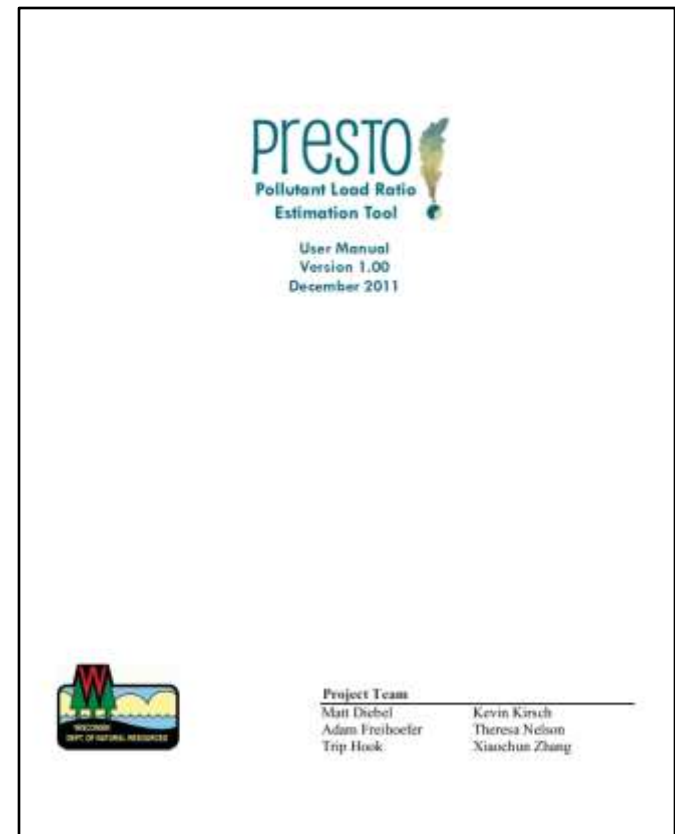
DNR-Nevin Fish Hatchery



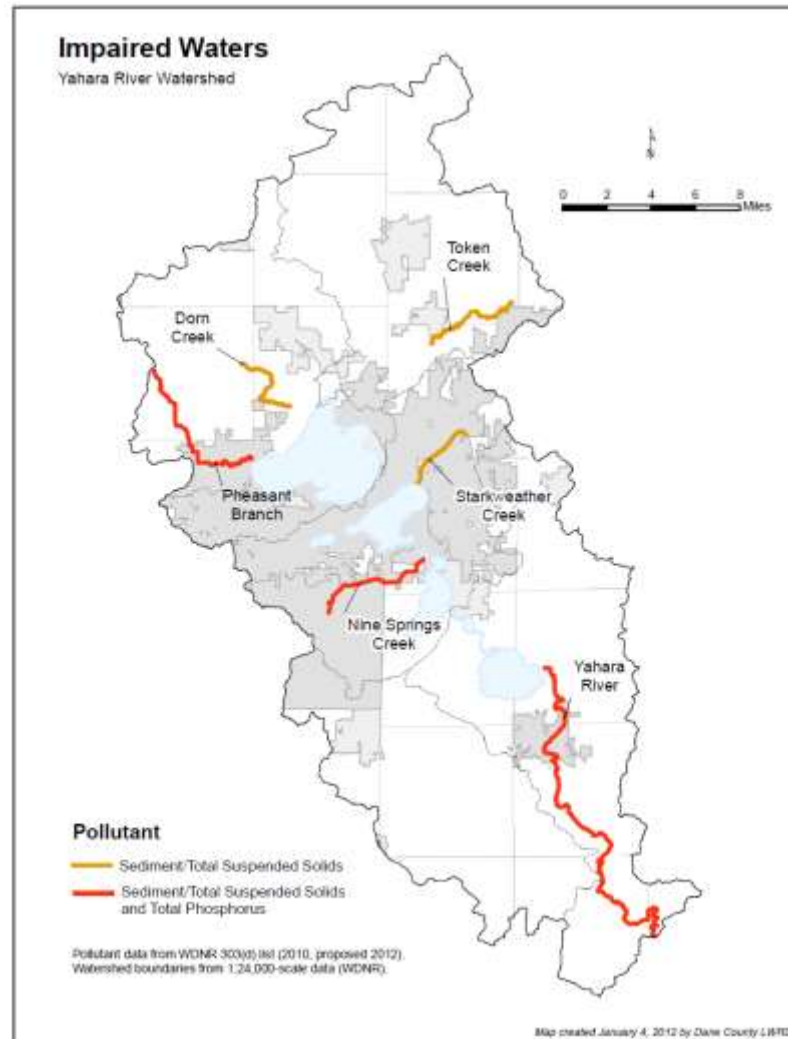


# Determining Loads

- **TMDL**
- **PRESTO**
  - **Pollutant Load Ratio Estimation Tool**
  - **Relative contribution of point and nonpoint P loads**
  - **Google-WDNR and PRESTO**

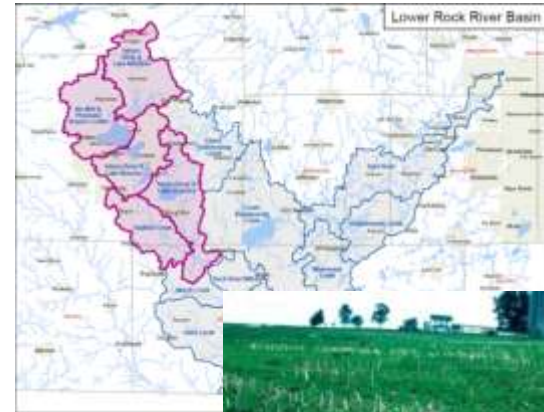


# Targeting Considerations



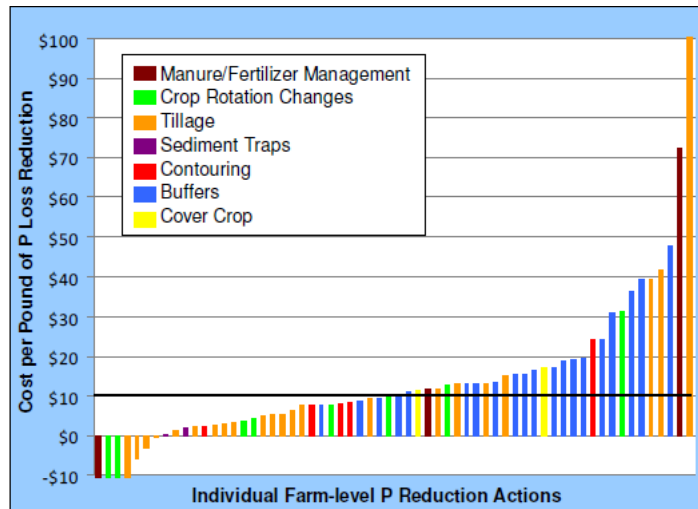
# MMSD-Yahara Watershed Adaptive Management Cost Estimate

- **TMDL used to calculate total watershed load reduction**
- **Costs calculated with input from Dane County Land and Water Resources**
- **Proportional assignment of costs**

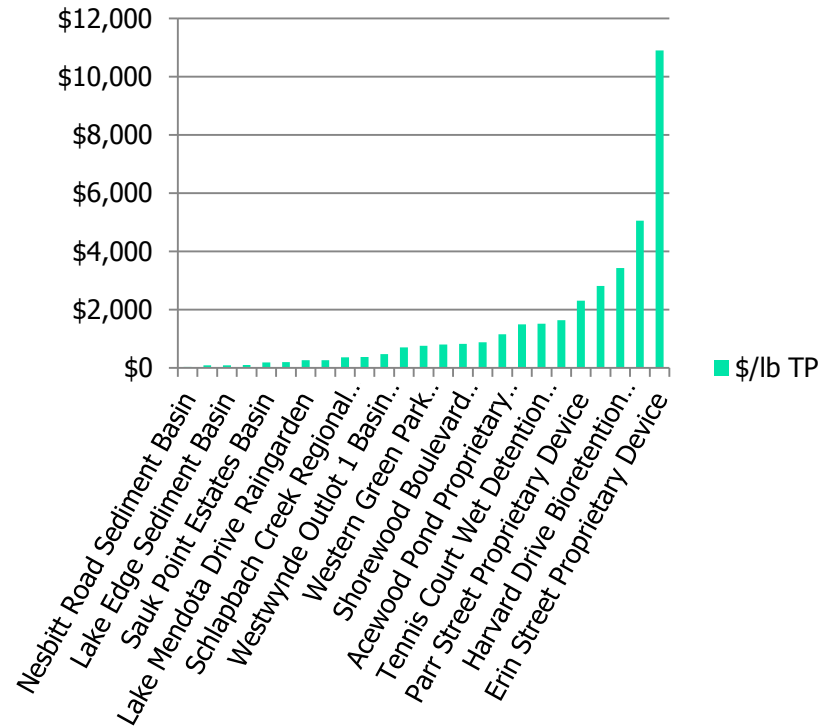


# A Wide Range of BMPs and Costs

## Iowa ag BMP Pilot Project

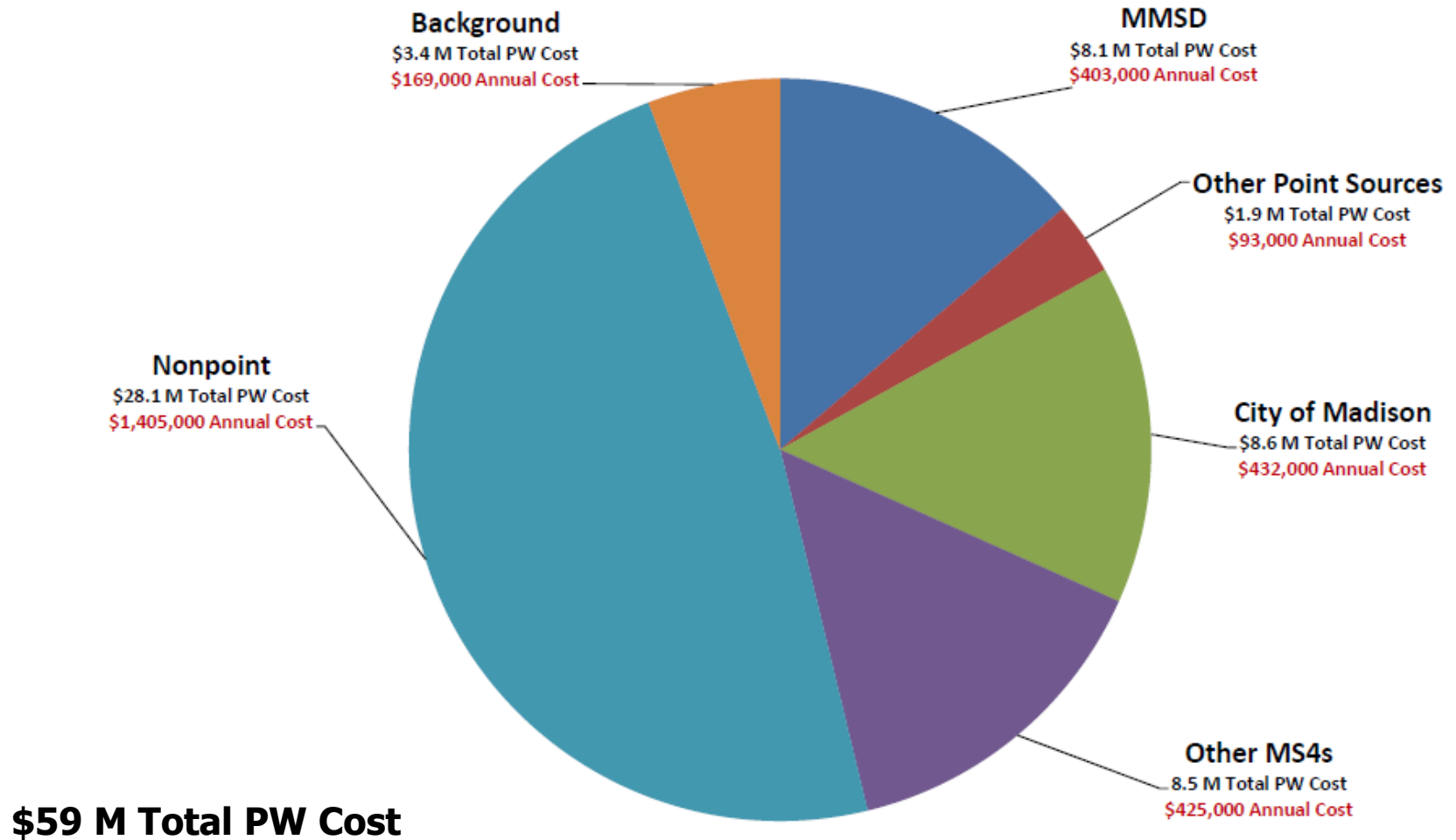


## Urban Water Quality Grant Practices



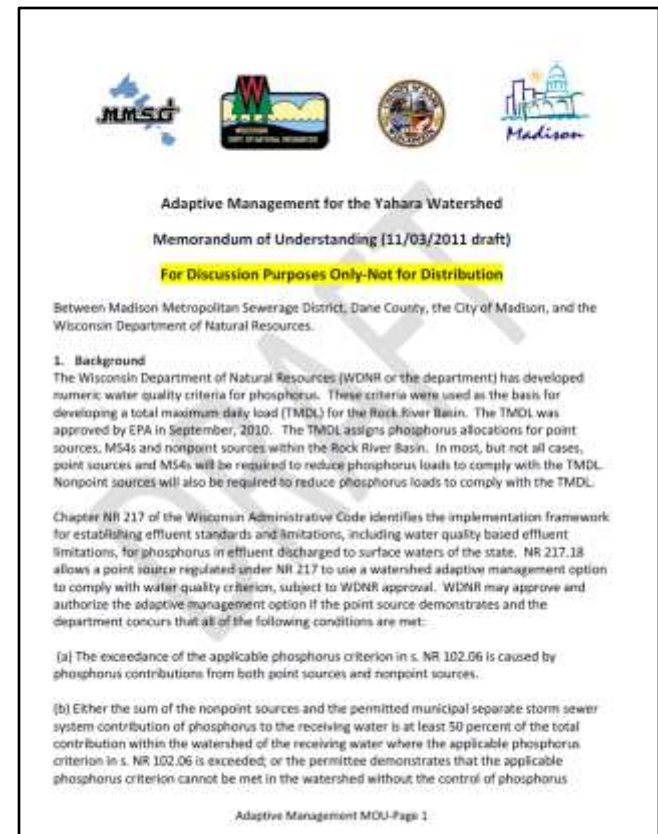
# What is the Potential Price Tag For Adaptive Management?

**Yahara Watershed Adaptive Management Cost Estimates  
(Point Sources at Current Phosphorus Loads)**



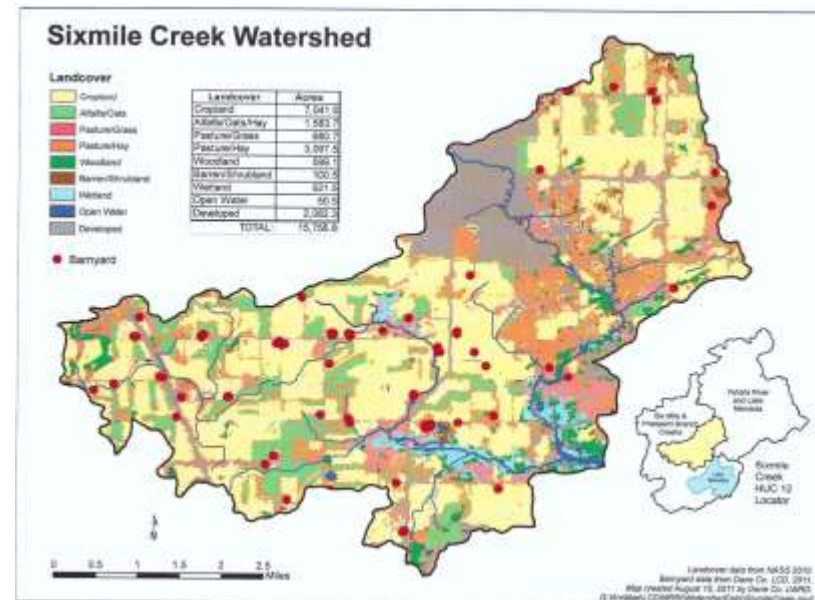
# How is MMSD Moving Forward?

- Test drive thru a pilot project
- MOU:
  - Brief background information
  - Regulatory considerations
  - Pilot project goals
  - How success is measured
- Multiple parties



# Adaptive Management Pilot Project

- **Strategic location**
- **4 year duration**
- **~ \$3 million cost**
- **All participants contribute \$**





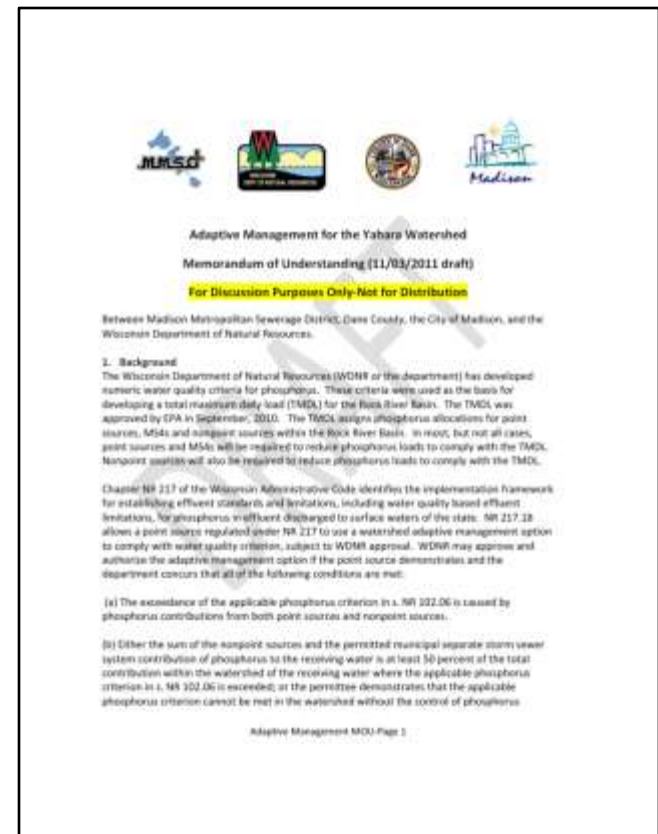
# Pilot Project-Estimated Costs

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Entity	Total Cost	Annual Cost	Entity	Total Cost	Annual Cost
Blooming Grove, Town	\$11,500	\$3,800	Shorewood Hills, Village	\$5,600	\$1,900
Bristol, Town	\$10,300	\$3,400	Stoughton, City	\$0	\$0
Burke, Town	\$28,600	\$9,500	Sun Prairie, City	\$15,900	\$5,300
Cottage Grove, Town	\$15,900	\$5,300	Waunakee, Village	\$27,400	\$9,100
Cottage Grove, Village	\$6,000	\$2,000	Westport, Town	\$23,600	\$7,900
Deforest, Village	\$21,000	\$7,000	Windsor, Town	\$33,900	\$11,300
Dunkirk, Town	\$0	\$0			
Dunn, Town	\$15,900	\$5,300	MMSD	\$380,600	\$126,900
Fitchburg, City	\$53,700	\$17,900	Oregon	\$56,900	\$19,000
Madison, City	\$408,100	\$136,000	Stoughton	\$14,200	\$4,700
Madison, Town	\$14,600	\$4,900	Arlington	\$800	\$300
Maple Bluff, Village	\$4,500	\$1,500	Middleton-Tiedemann	\$12,300	\$4,100
McFarland, Village	\$18,500	\$6,200	DNR-Nevin	\$2,700	\$900
Middleton, City	\$59,400	\$19,800	MGE	\$400	\$100
Middleton, Town	\$11,900	\$4,000			
Monona, City	\$21,600	\$7,200	Background	\$159,600	\$53,200
Pleasant Springs, Town	\$0	\$0	Nonpoint	\$1,326,400	\$442,100

# What Has Gone Well?

- **Relationships/Collaboration**
  - **Regulatory agencies**
  - **County**
  - **Consultants**
  - **Environmental groups**
  - **NGO's**
  - **MS4s**
- **Developing cost estimates and funding expectations**
- **Data rich environment**
- **Messaging**



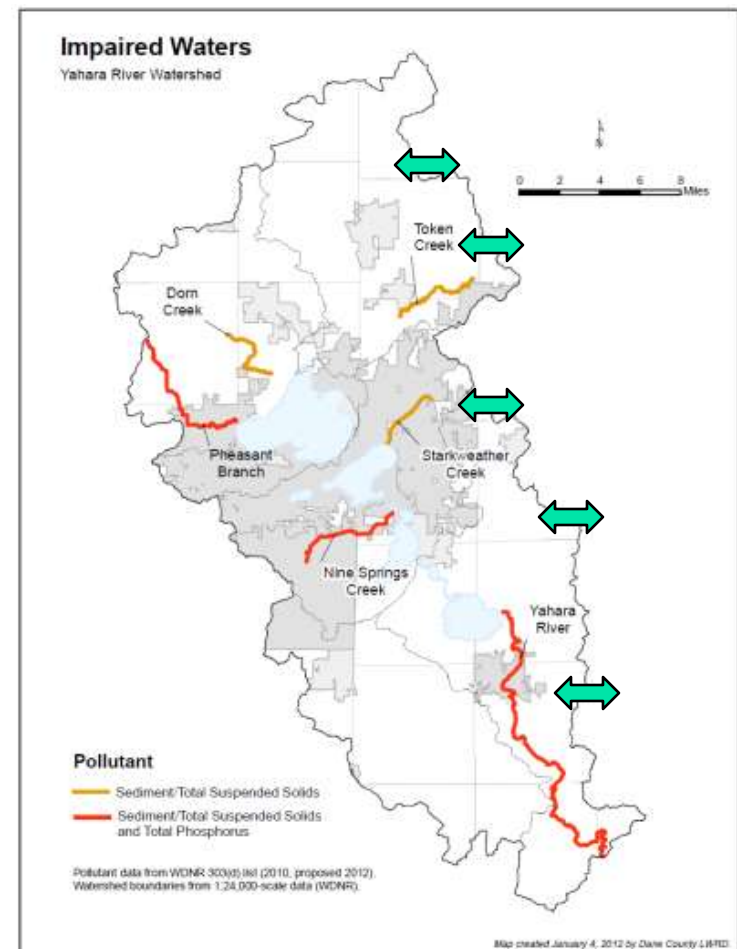
# Challenges?

- **Being the first**
- **Learning new languages**
- **Overcoming “fairness” concerns**
- **Investing \$ outside of municipal boundaries**
- **Technical issues**
  - **“Bubble” MS4s**
  - **Watershed based permitting**
  - **Interim limits for POTWs**
  - **Effluent dominated stream**
- **Requirements associated with different funding sources**



# Bubble MS4s

- **MS4s with stormwater discharges to multiple watersheds**
- **Looking for a single solution**
- **Possible solutions include:**
  - **Expanding the geographic scope**
  - **Water quality trading**



# Dane County as a Broker for Adaptive Management

- **What Has Gone Well?**
- **Challenges?**
- **“Take Away” Lessons**





# What Has Gone Well?

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- **Draft Working Agreement**
  - Partnerships
  - Pollutant Baselines (point/nonpoint)
  - Evaluation Procedures
  - Identification of Pilot Project Area

# Partnerships

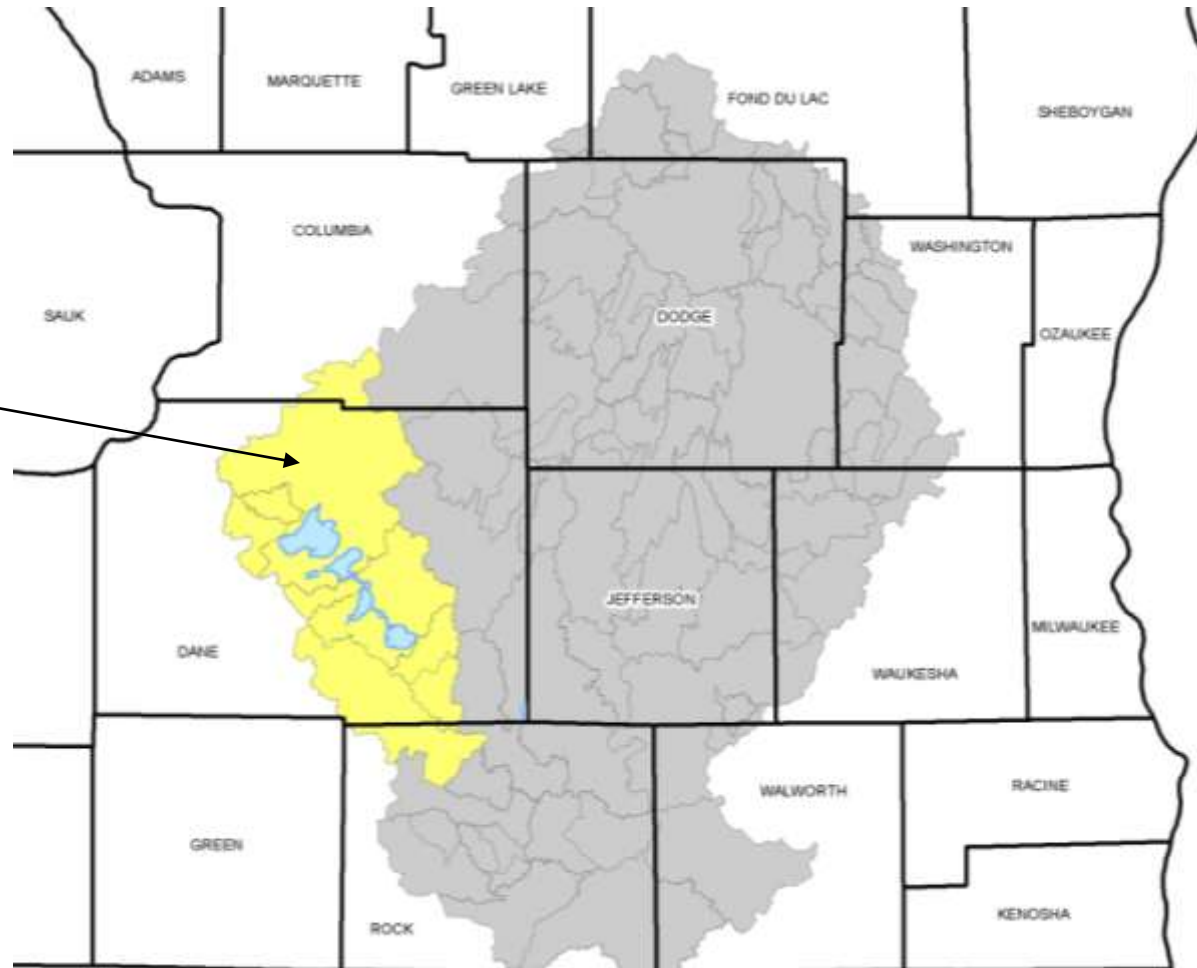
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- **Federal, State & Local Government**
- **Point Source**  
(ex. Waste Water Treatment Plants, Municipal Stormwater MS4)
- **Agricultural Landowners/Producers**
- **Non-profit Organizations**  
(ex. Sand County Foundation, Clean Lakes Alliance)

## What Has Gone Well?

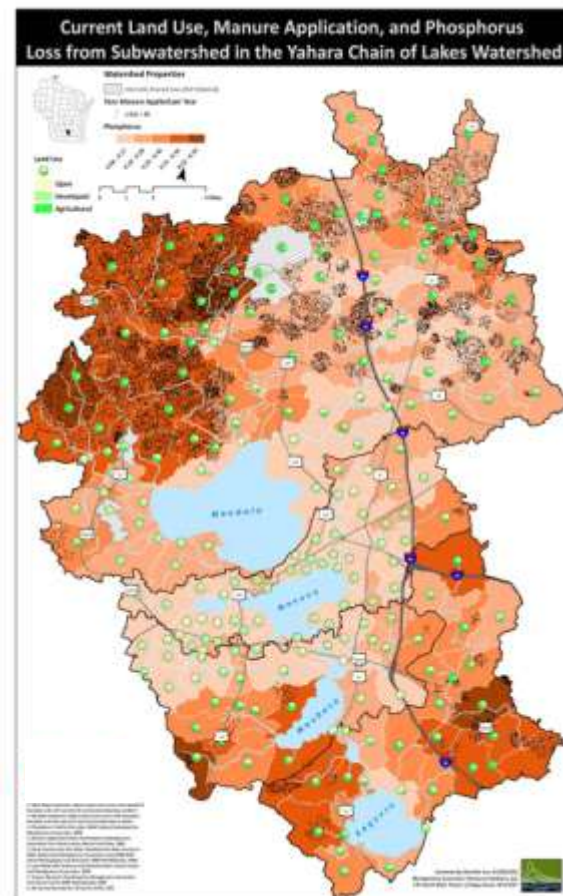
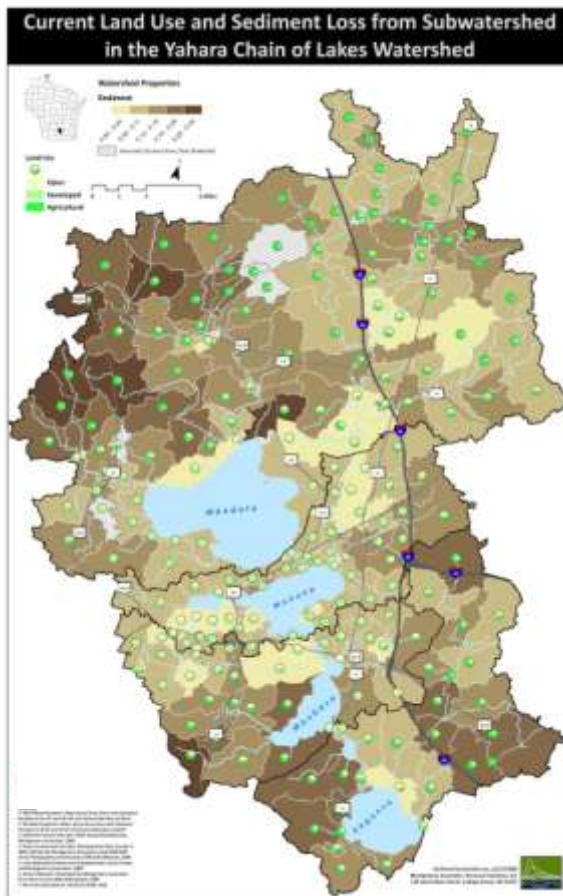
# Pollutant Baselines – Rock River TMDL

Yahara River  
Basin




## What Has Gone Well?

# Pollutant Baselines - SWAT



# What Has Gone Well?

## Pollutant Baselines - SNAP



### SNAP-Plus

Wisconsin's Nutrient Management Planning Software


<b>Home</b>	<h3>SNAP-Plus Nutrient Management Software</h3> <p><b>SNAP-Plus</b> is a Microsoft Windows® based Nutrient Management Planning software program designed for the preparation of nutrient management plans in accordance with Wisconsin's Nutrient Management Standard Code 590. The program is available for download from the "Current Version" link. Updates are released periodically to add new features and bug fixes.</p> <p><b>SNAP-Plus</b> will calculate:</p> <ul style="list-style-type: none"><li>• Crop nutrient (N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O) recommendations for all fields on a farm taking into account legume N and manure nutrient credits consistent with University of Wisconsin recommendations</li><li>• A RUSLE2-based soil loss assessment that will allow producers to determine whether fields that receive fertilizer or manure applications meet tolerable soil loss (T) requirements.</li><li>• A rotational Phosphorus Index value for all fields as required for using the P Index for phosphorus management.</li><li>• A rotational P balance for using soil test P as the criteria for phosphorus management.</li></ul>	<h3>Important News</h3> <hr/> <p><b>October 27, 2011</b> A <u>new public release</u> of Snap-Plus is available.</p> <hr/> <p><b>January 11, 2011</b> Instructions for using the <u>new Auto Calculation Option</u>.</p> <hr/> <p><b>January 11, 2011</b> Tips for <u>speeding up SnapPlus</u>.</p>
<b>Downloads</b>		

<a href="#">Current Version</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>

SNAP-Plus is produced by the



SNAP-Plus is supported by:



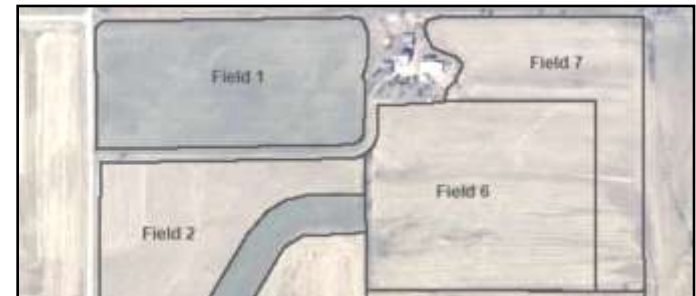
# What Has Gone Well?

## Evaluation Procedures

### USGS Monitoring Stations



### SNAP Plus - Compliance by Calculation

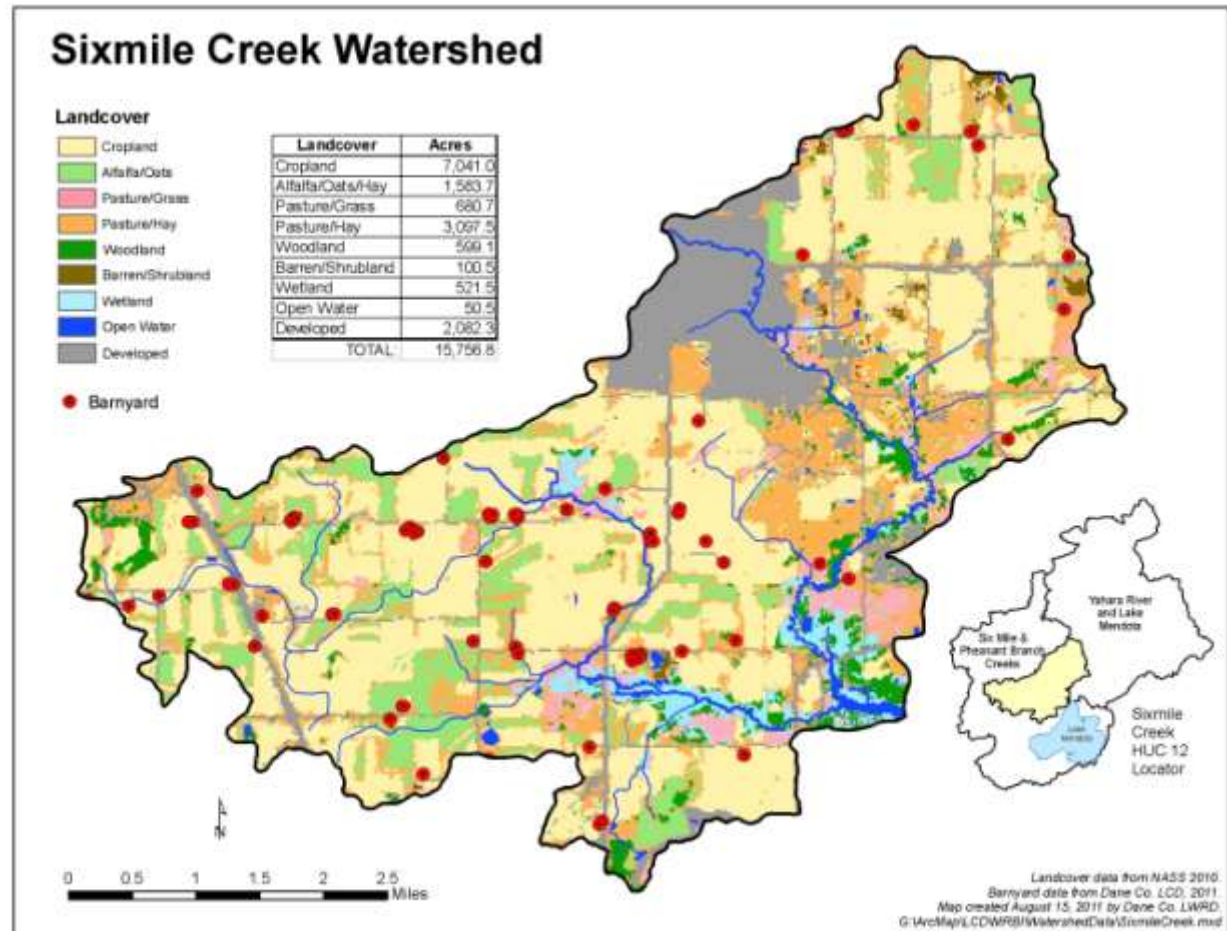


A screenshot of the SNAP Plus software interface. The window title is "Snap Plus 1.118.1". The interface includes a "Farm Name" field, a "Farm Address" field, and a "Farm Narrative" text area. There are also fields for "Farm ID", "Phone #1", "Phone #2", "Fax", and "Email". A "Select criteria for the field location of this farm" section contains a list of criteria with checkboxes. A "Select any crops you might grow on this farm" section contains a list of crops with checkboxes. The interface is designed for data entry and management.

## What Has Gone Well?

# Identification of Pilot Project Area

Dorn-Sixmile Creek  
Adaptive  
Management  
Pilot Area





# Challenges

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- **Integration of Multiple Programs**
- **Monitoring and Evaluation**
- **Agricultural Landowner/Producer**

# Integration of Multiple Programs

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- **USDA**  
(ex. EQIP, CREP, CRP, MRBI)
- **State**  
(NR151, ATCP 50, TRM)
- **County**  
(conservation service delivery)

# Monitoring & Evaluation

- **Point Source vs. Nonpoint**
- **Baseline Monitoring**
- **Interim Monitoring**
- **Post Project Monitoring**
- **Stream vs. Lake Monitoring**



# Agricultural Landowner/Producer

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- **Voluntary**
- **Incentive Package**
- **Permit Length**



# “Take Away” Lessons

- **Adaptive Management Cannot Start at the Flip of a Switch**



- **Track Record of Success for Partnership**
- **Need Total Community Buy-in**
- **Trust within the Partnership is Required**