



United States Department of Agriculture



Regional Conservation Partnership Program



*December 11, 2018
Northeast Midwest Institute Briefing*



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Today's Topics

- About NRCS
 - Organizational Structure
 - Approach
- RCPP 101
 - Overview
 - RCPP Process
 - Best Practices
 - To date project numbers
- RCPP In the Upper Midwest



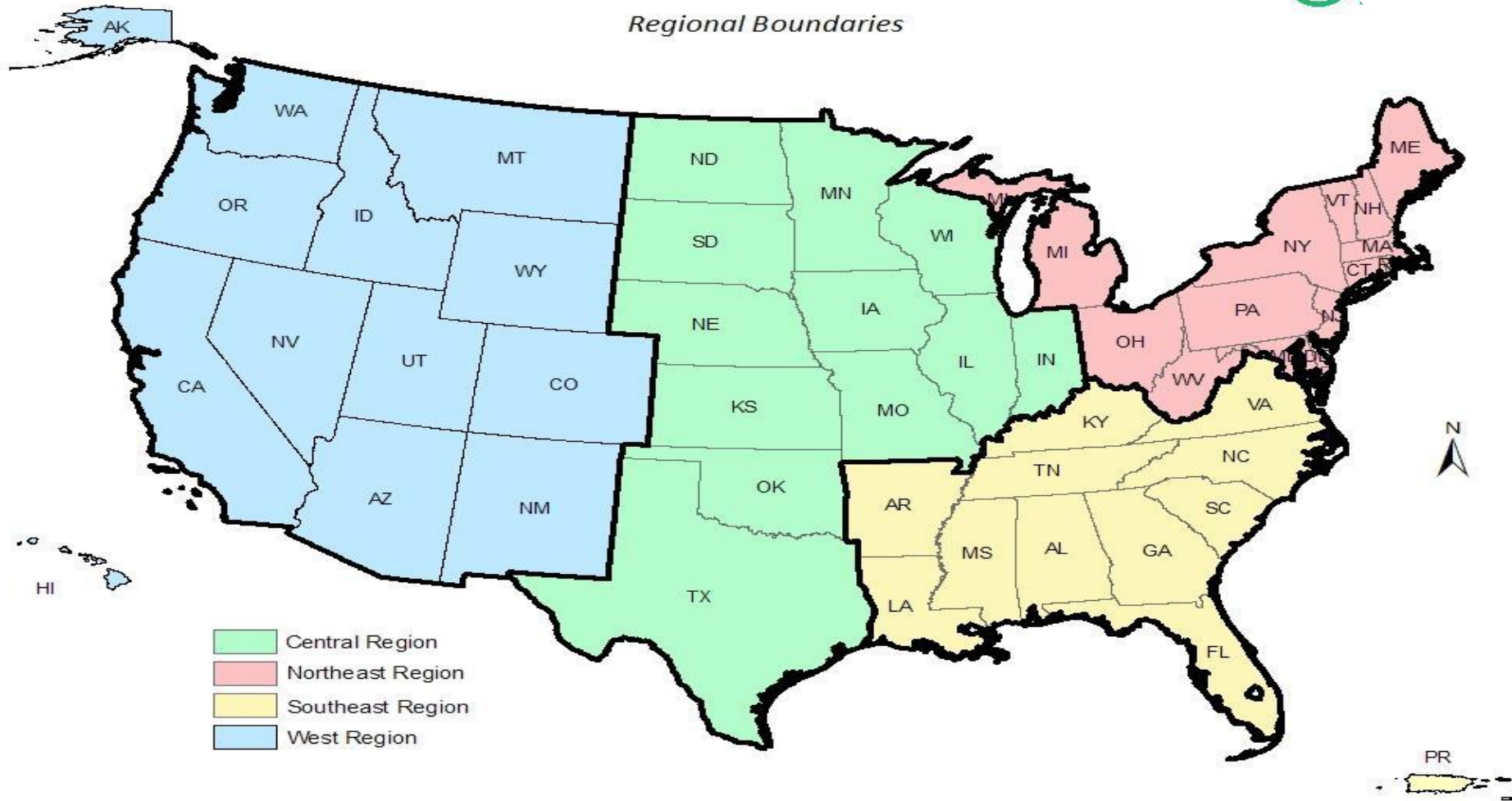


About NRCS



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Map Date - June 2012
Map Source - Regional Conservationists Office

- Approx. 11,000 employees, only 600 in Washington, DC area
- Network of nearly 3,000 field offices
- Conservation professionals working with farmers, ranchers, landowners, and partners





NRCS Approach

70% of land in the lower 48 states is privately owned.

NRCS combines locally-led solutions with science and research; landowner stewardships; partnerships; and proven conservation practices to produce results for agriculture and the environment.






RCPP 101



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A photograph showing two men in a rural field. The man on the left wears a tan baseball cap with an 'NR' logo, glasses, and a blue and white plaid shirt. He is holding a clipboard and a white sheet of paper. The man on the right wears a tan baseball cap with a circular logo, a dark blue polo shirt with a small green logo, and khaki pants. He is pointing at the paper. They are standing in a field of green crops. In the background, there are trees and a power line. To the right, the front of a white tractor with a red frame is visible.

RCPP empowers local organizations and communities to demonstrate the importance of strong public-private partnerships in delivering solutions to natural resource challenges.

Regional Conservation Partnership Program

- Provides partners the opportunity to direct NRCS Programs through a unique partnership
- Encourages innovative, locally driven conservation
- Increases investment through partner contributions to the shared conservation mission
- Reaches out to new participants for NRCS Programs



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Regional Conservation Partnership Program



Identify Programs Used in Project



EQIP

Environmental Quality Incentives Program



CSP

Conservation Stewardship Program



ACEP

Agricultural Conservation Easement Program



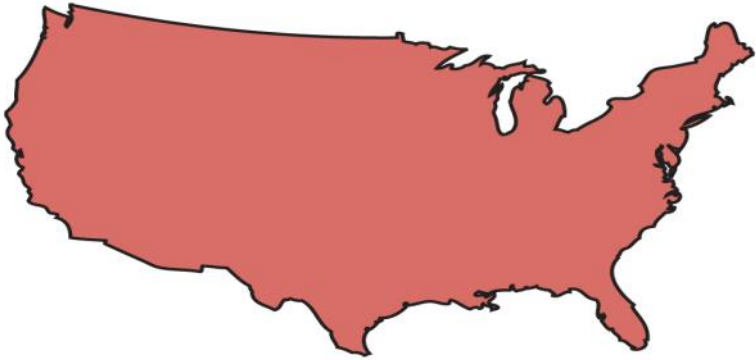
HFRP

Healthy Forests Reserve Program

WATERSHED PROTECTION AND FLOOD PREVENTION ACT
Public Law 83-566



Select One of Three RCPP Funding Pools



National – 40%



State – 25%



Critical Conservation Area (CCA) - 35%





Identify Natural Resource Concerns

The project should “...achieve specific, measurable natural resource results.”

- Excess/Insufficient Water/Drought
- Water quality degradation
- Soil quality degradation
- Inadequate habitat for fish and wildlife (and invertebrates)
- Air quality impacts
- Degraded Plant Condition (specific to certain CCA only)
- Energy
- Climate Change



RCPP Best Practices



Successful RCPP projects demonstrate four characteristics.

- Participation
- Innovation
- Contribution
- Solutions



RCPP by the Numbers



RCPP with a quick breakdown:

- RCPP has awarded 399 agreements from FY 2014-2018
- Resource Concern most often addressed:
 - Water Quality
- Projects in all 50 States and 1 US Territory
- Most impactful projects are well defined in geographic scope, monetary ask and contributions, and have measurable, achievable outcomes.





RCPP in the Upper Midwest

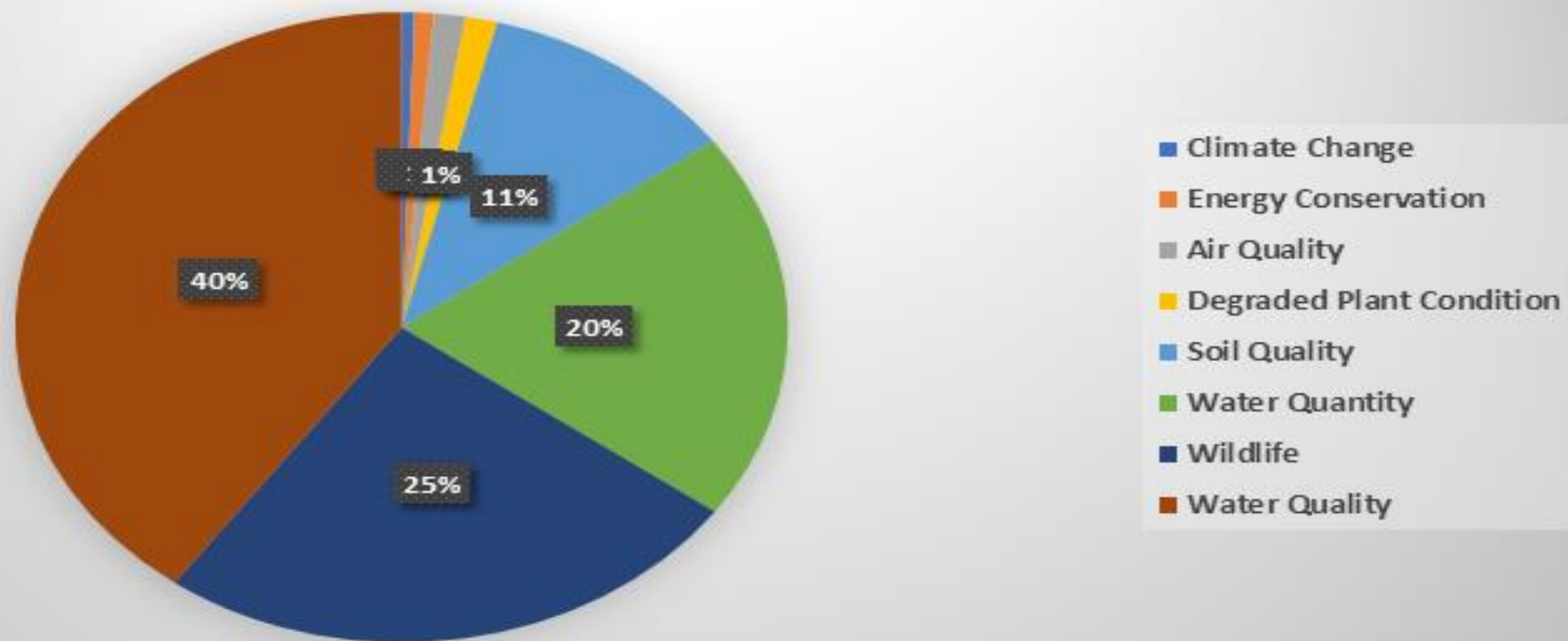


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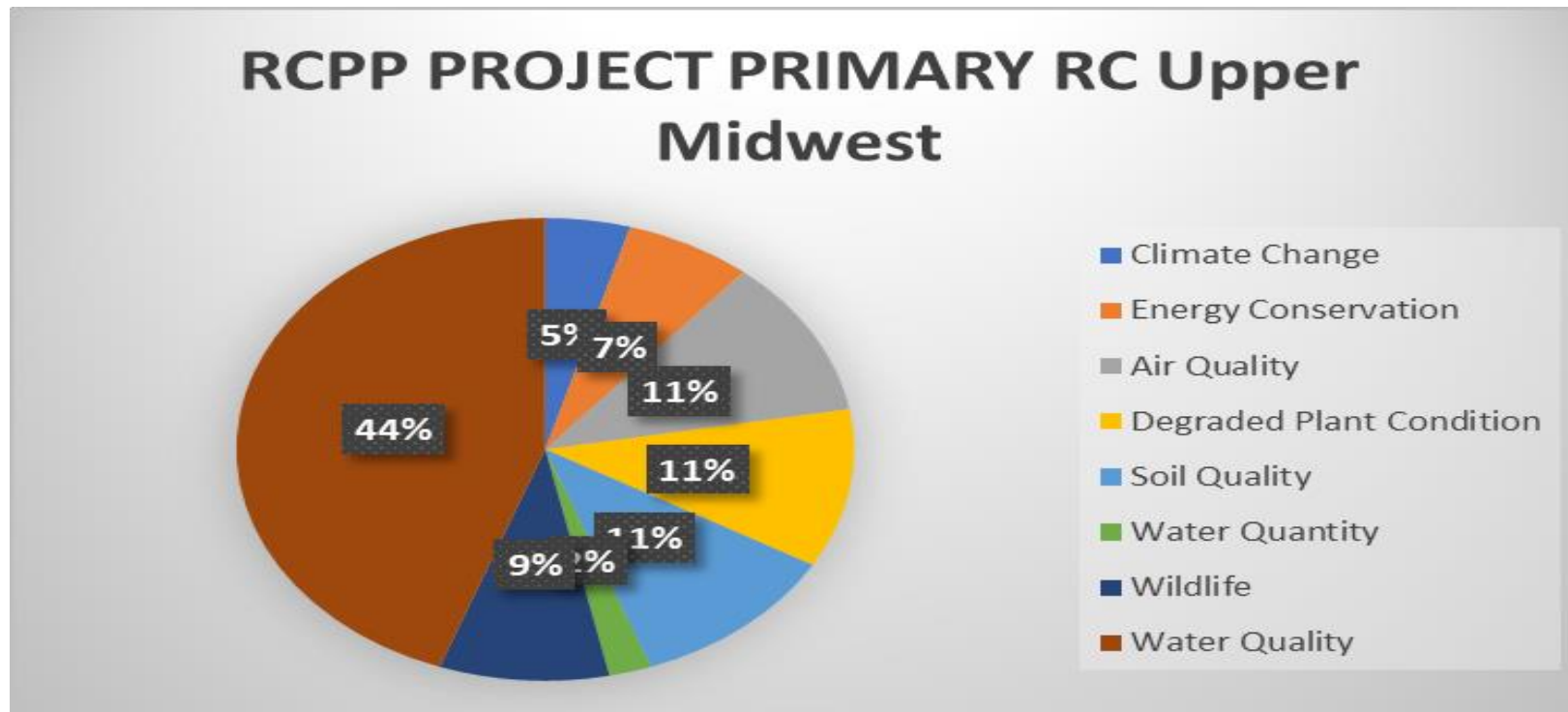
RCPP Primary Resource Concern Percentage of Projects



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RCPP By Resource Concern for Upper Midwest



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Top 20 Practices of RCPP of Identified States

NRCS RCPP PRACTICE NAME (EQIP and CStP Practices Funded via RCPP)	IA	IL	MN	WI	Grand Total
Cover Crop	2135	383	261	205	2984
Residue and Tillage Management, No-Till	281	148	78	4	511
Early Successional Habitat Development/Management	1		113	239	353
Cropland Annual Payment	5	75	40	175	295
Forest Stand Improvement	4	207	23	21	255
Nutrient Management	71	153	25	3	252
Underground Outlet	156	13	80	3	252
Brush Management	11	176		4	191
Water and Sediment Control Basin	46	7	66		119
Conservation Cover	50	1	12	41	104
Terrace	93	6	2		101
Pasture Annual Payment	5	35	15	45	100
Mulching		7	38	49	94
Subsurface Drain	33	6	45	6	90
Prescribed Grazing	9		33	45	87
Fence	32		23	30	85
Grassed Waterway	22	15	21	24	82
Critical Area Planting	12	4	26	36	78
Streambank and Shoreline Protection			4	72	76
Forage and Biomass Planting	30	11	13	13	67



The heart of RCPP is about empowering local project sponsors to design and deliver solutions that benefit natural resources where they live and work.



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WATER QUALITY TARGETING SUCCESS STORIES

*How to achieve measurably cleaner
water through U.S. farm conservation
watershed projects*

MICHELLE PEREZ, PhD



WORLD
RESOURCES
INSTITUTE

WRI.ORG



**Michelle Perez, PhD
Water Initiative Director**

**December 11, 2018
NEMWI Congressional Briefing on
RCPP**

**2203 Rayburn House Office
Building**

**Thanks to Walton Family Foundation & McKnight
Foundation**

**Download report at:
“AFT water success”**

Targeted watershed projects

Traditional approach: Solves individual farm water quality problems but may not be enough to solve in-stream water quality problems

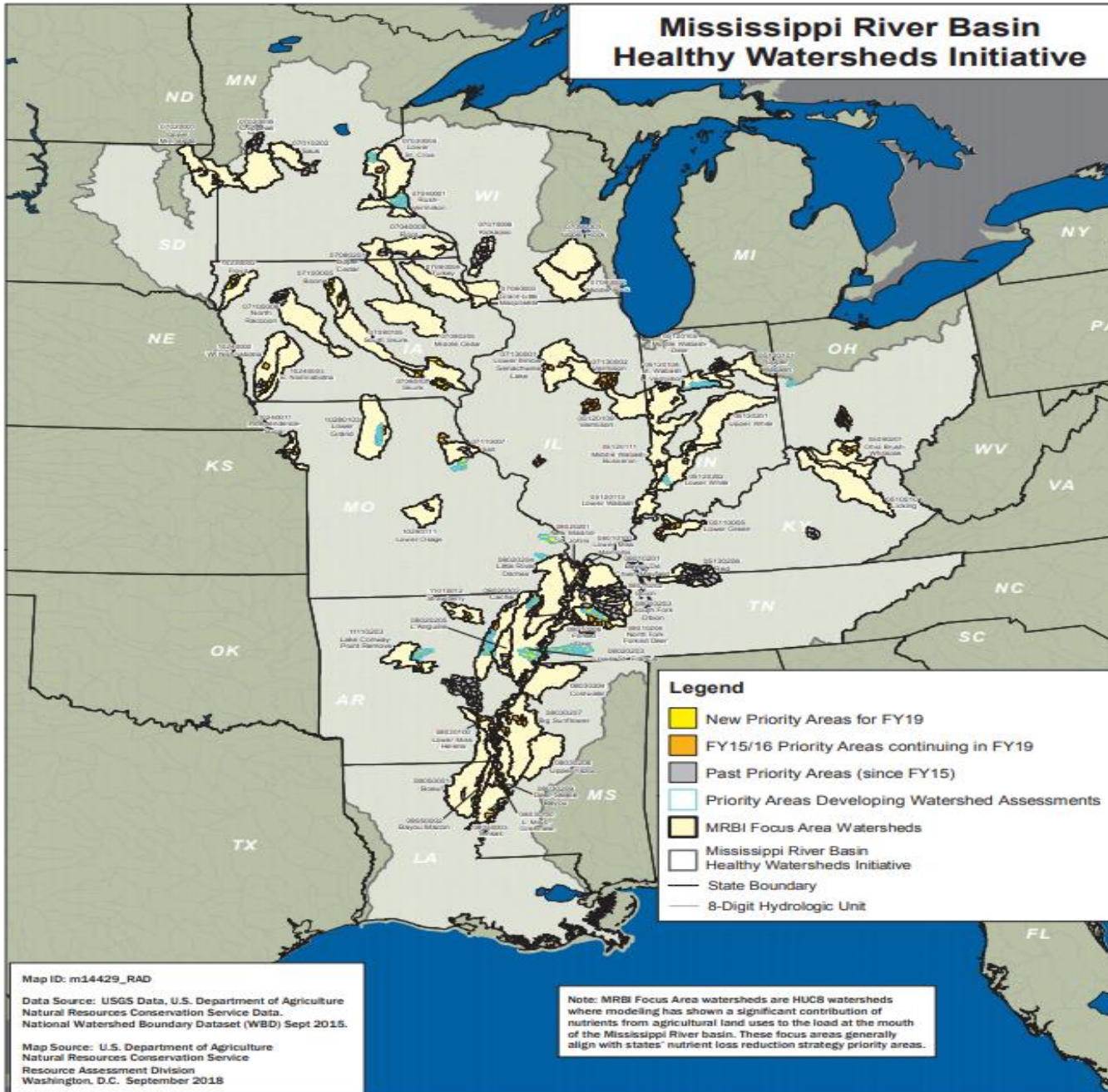
Projects that target priority areas to clean up streams: Achieves amount of the right practices in right locations & has in-stream monitoring to document changes



Farm conservation contracts

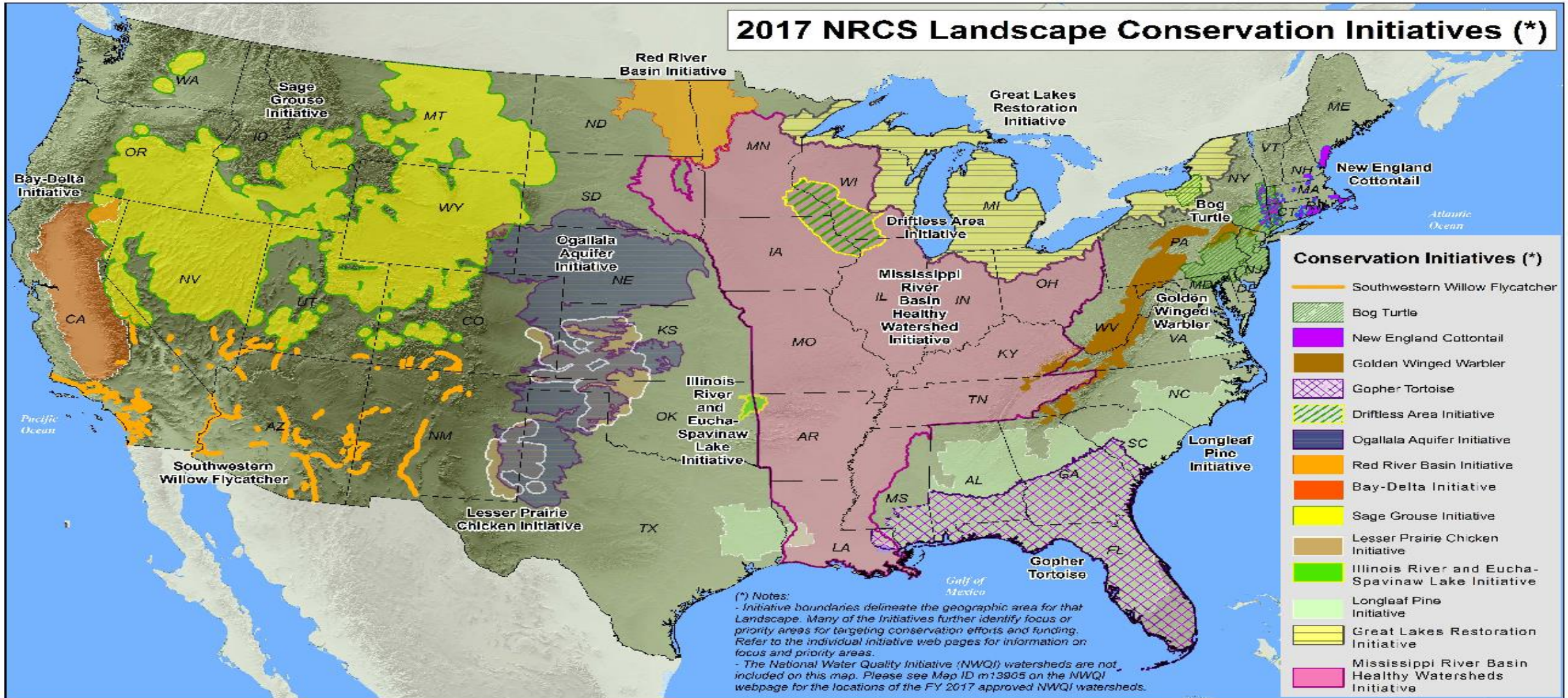
American Farmland Trust

Mississippi River Basin Healthy Watersheds Initiative



Mississippi River Basin Healthy Watersheds Initiative (MRBI)

2017 NRCS Landscape Conservation Initiatives (*)



Recent NRCS shifts towards “outcomes-oriented conservation” is excellent

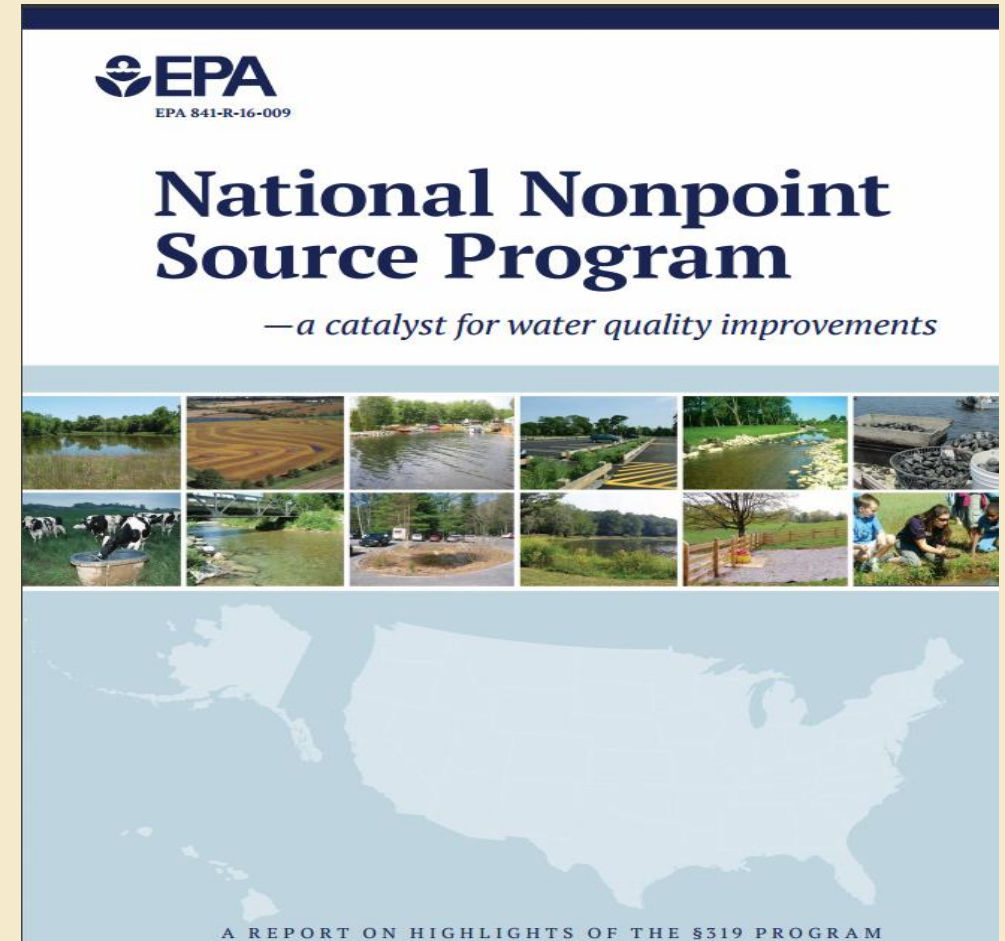
- **MRBI** encouraged projects to monitor water quality at edge-of-field, small watershed, large watershed (Tier 1, 2, & 3)
- **RCPP** prioritizes projects that achieve and measure “environmental, social, & economic outcomes”



EPA-State

Section 319 Success Stories

- EPA & States reported 674 restored waterbodies (405 written success stories) – about half involve ag
- EPA requires States & Local Watershed Partners to:
 - **TARGET** - Develop a 9-element watershed-based plan
 - **MONITOR** - Develop a recommended in-stream monitoring program: paired watershed, upstream/downstream, or before/after



Research questions & methods

- **Impetus questions:** Have recent watershed projects achieved instream monitored success? If so, how'd they do it?
- **Methods**
 - Literature reviews
 - Interviews with NRCS staff, farm conservation & water quality experts
 - Emails to conservation community
 - In-depth interviews with 2 to 5 leaders per project & review of their project documents
- **Overarching questions:** How can the agency's federal conservation programs be more successful in improving water quality and how can those positive impacts be documented?

First major finding



It was really hard to find any watershed projects with instream monitored success:

1. **Mississippi River Basin Healthy Watersheds Initiative (MRBI)** – published two write-ups about 3 successes
2. **Great Lakes Partnership Initiative (GLRI)**
3. **Gulf of Mexico Initiative (GOMI)**
4. **Chesapeake Bay Watershed Initiative (CBWI)**
5. **Illinois River Eucha-Spavinaw Initiative (IRESI)**
6. **Bay Delta Initiative (BDI) in California** – Walker Creek Project featured in the report
7. **National Water Quality Initiative (NWQI)**

Likely challenges with watershed projects & why we don't know

- **Monitoring programs not in place? Or is it a natural lag time problem?** 41 of 100 MRBI projects said they'd do instream water quality monitoring
- **Monitoring program design or implementation challenges?** Some project leaders at Leadership for Midwestern Watersheds meetings say they're struggling with monitoring & many don't know what quantifying outcomes means & want more guidance
- **Is it a reporting challenge?** Projects aren't reporting to NRCS & NRCS isn't asking for results?
- **If past is prologue, this stuff is hard** - Gale et al (1993) & Osmond et al (2012) reveal how difficult it is to achieve & detect instream improvements

AFT-WRI report found 6 projects with monitored water quality success

Projects	Watershed (ac) & HUC size	Topography	Major crops / land uses
California Walker Creek	27,000 (~HUC12)	Rolling hills to flat flood plains	Almond, walnut, alfalfa
Oklahoma Honey Creek	55,000 in OK (3 HUC12s)	Rolling hills	Beef pasture, broilers, cropland
Iowa Hewitt Creek	25,000 (HUC12)	Rolling hills, some tile drains	Corn-soybeans; confined beef, dairy, & swine
Wisconsin Pleasant Valley Branch 1 & 2	12,300 (half HUC12)	Ridge tops, steep slopes, valley bottoms	Corn-soybeans, alfalfa, pasture
Indiana Shatto Ditch	3,300 (fraction HUC12)	Relatively flat, all tile drained	Corn-soybeans & broilers

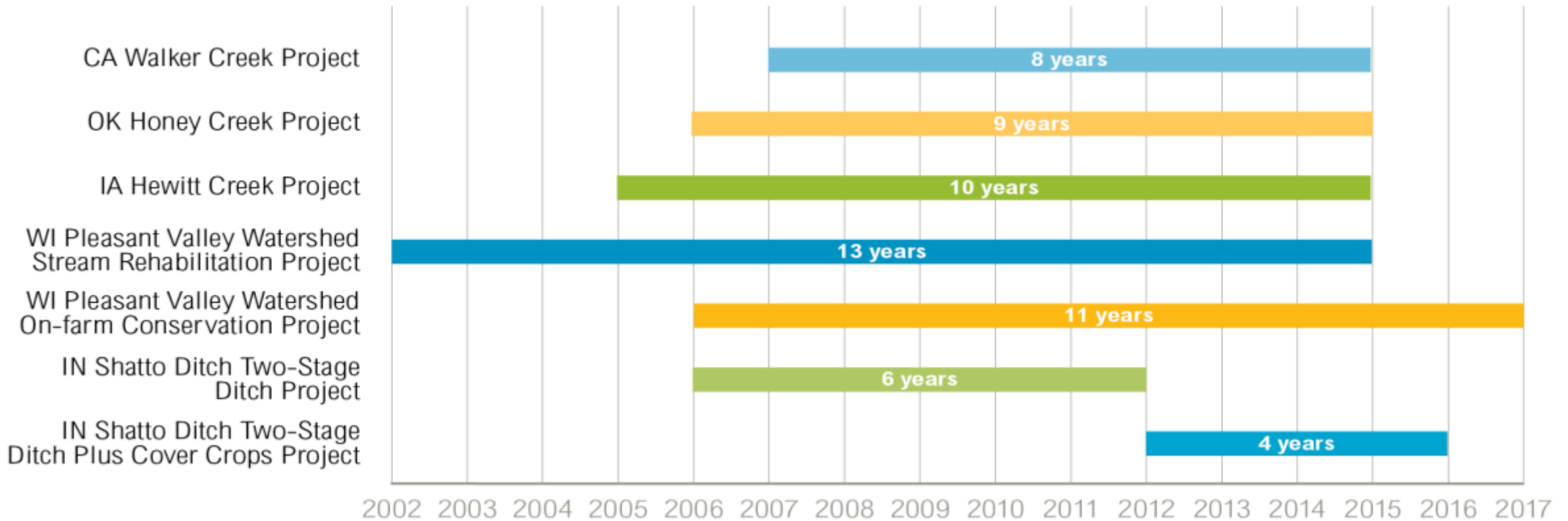
Project	Successes
California Walker Creek	Achieved no Chlorpyrifos pesticide exceedance for 3 years & no Ceriodaphnia toxicity for 5 years = Management Plan complete!
Oklahoma Honey Creek	Proposed removal of stream from impaired list for <i>E.coli</i> (51% reduction). Load reductions in nitrate, total phosphorus, & Enterococcus by 35, 28, & 34% compared to control watershed.
Iowa Hewitt Creek	<p>Documented a 60% decrease in turbidity & 40% decrease in total phosphorus concentrations.</p> <p>Quantified social and economic outcomes—e.g., created a "watershed community" and documented increased farmer profitability.</p>
Wisconsin Pleasant Valley 1	Proposed removal of stream from impaired list for stream for sediments (50% decrease in fine sediment) & increased trout populations 70 to 100%).
Wisconsin Pleasant Valley 2	Reduced total phosphorus storm event loads by 55% compared with control watershed.
Indiana Shatto Ditch	Documented 80% reduction in nitrate-N loss from tile drains from watershed-scale sampling.

Famers & Districts are key project leaders

- **Farmer leadership** - Very important to three projects (CA, OK, IA) to lead and design project & encourage farmer participation
 - CA Colusa Glenn Subwatershed Program
 - OK Watershed Advisory Group
 - IA Hewitt Creek Watershed Council
- **Local conservation districts** – Three projects (CA, WI-1, WI-2) relied on districts for outreach, education, & technical services to design & implement project
 - CA Glenn County Resource Conservation District
 - WI-1 Dane County Land Conservation Division
 - WI-2 Dane County Land Conservation Division

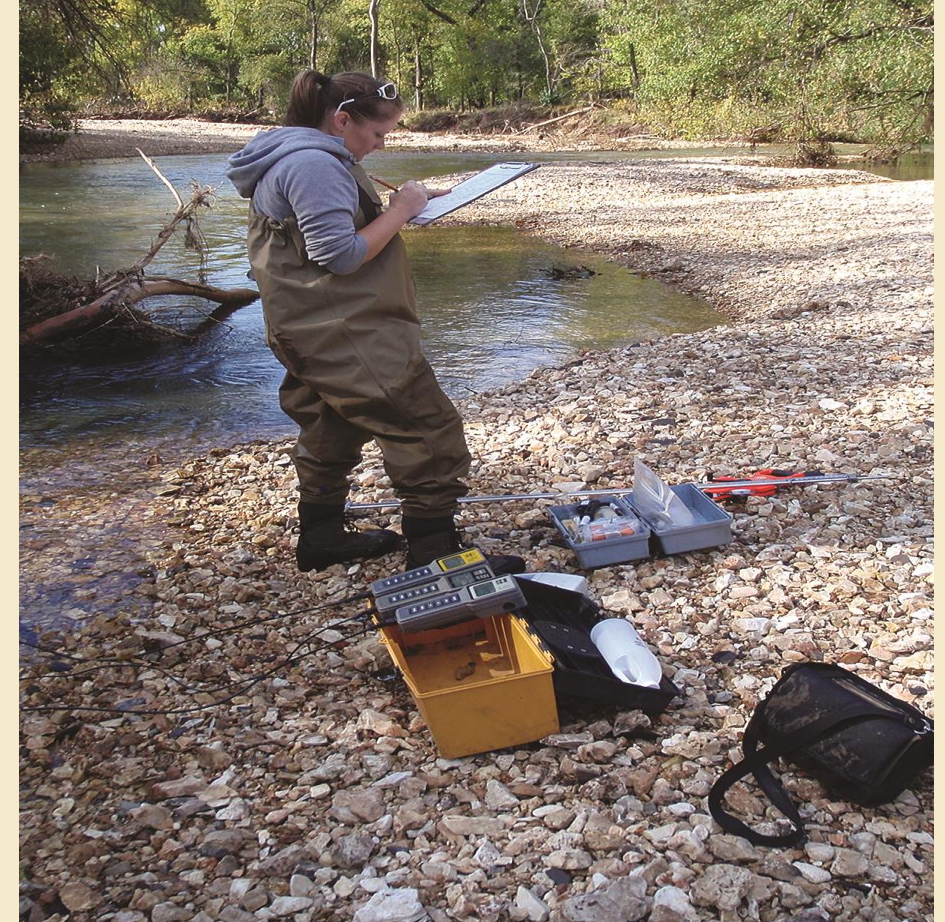


Project duration can be long requiring sustained staff support & resources



Recommendations for Congress

- Increase financial & technical assistance for USDA's RCPP and the EPA's 319 programs
- Require USDA to provide guidance to the RCPP project leaders on how to collect environmental, social, and economic outcomes
- Require USDA to report on outcomes quantification progress
- Fund a research effort to better understand how much of a “critical mass” of conservation adoption or an “intensity” of treatment of each priority acre is needed before projects can expect to achieve measurable improvements in water quality (because only a few project can include water quality monitoring)





Measuring environmental, social, & economic outcomes in the Upper Macoupin Creek RCPP Project, IL

Michelle Perez, PhD
December 11, 2018
NEMWI Congressional Briefing

Thanks to Walton Family Foundation, McKnight Foundation,
Mosaic Foundation, & USDA NRCS RCPP

AFT RCPP Team



Jen Filipiak, Midwest
Director

(Project lead since 2016
pre-proposal & 2014
MRBI projects)



Michelle Perez, PhD,
Water Initiative
Director

(MEP lead since
2016)



Kris Reynolds,
Deputy Midwest
Director

(Project lead since
2017)



Emily Bruner, PhD,
Conservation
Manager

(Joined 2018)

Announcement for Public Funding for RCPP



“RCPP is an innovative approach...to design solutions and deliver specific, measurable results.”

“Through RCPP, NRCS seeks to achieve:

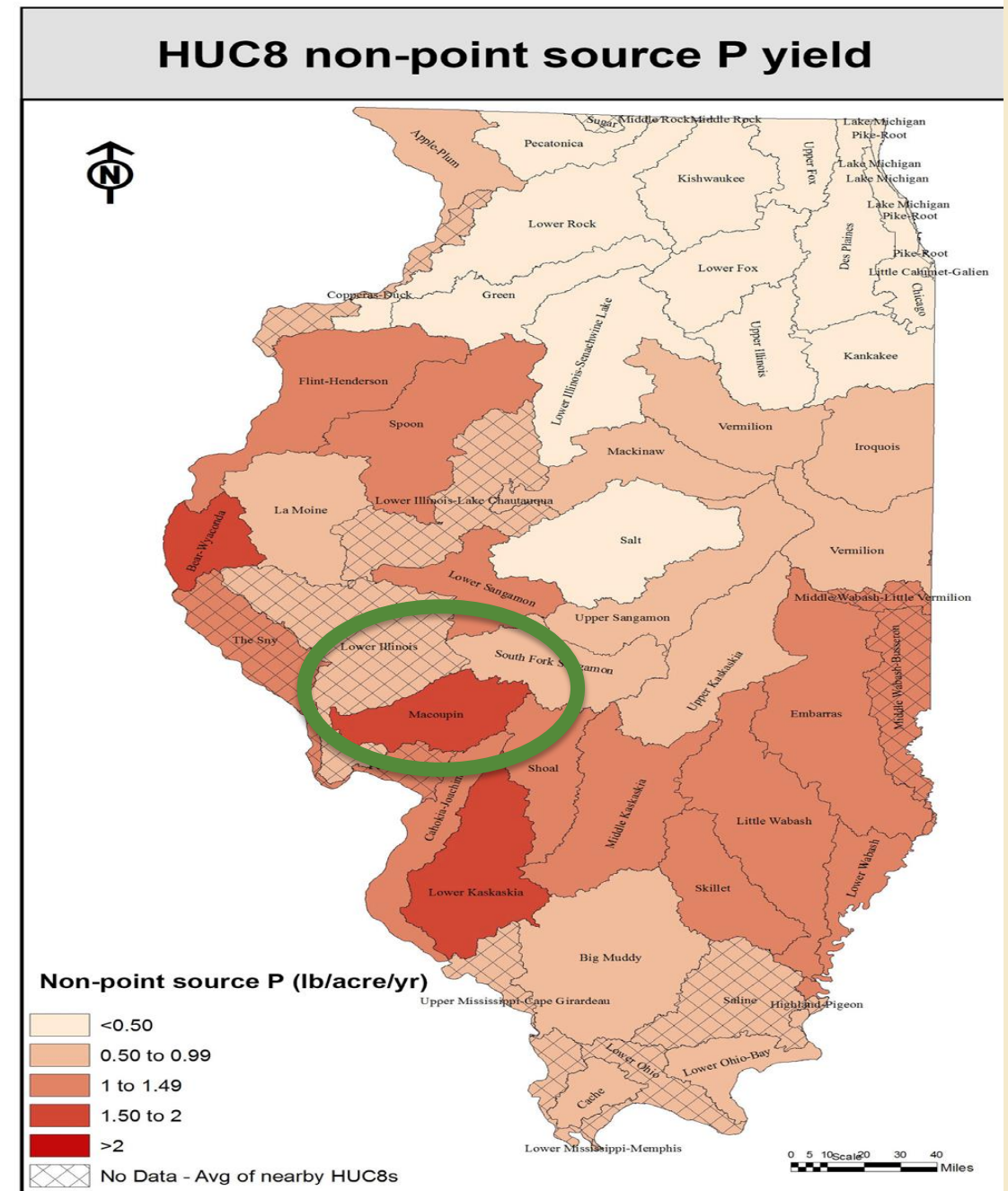
1. Solutions. Investing in projects that generate near-term results that are measurable from environmental, economic, and social perspectives.”

Why this watershed?

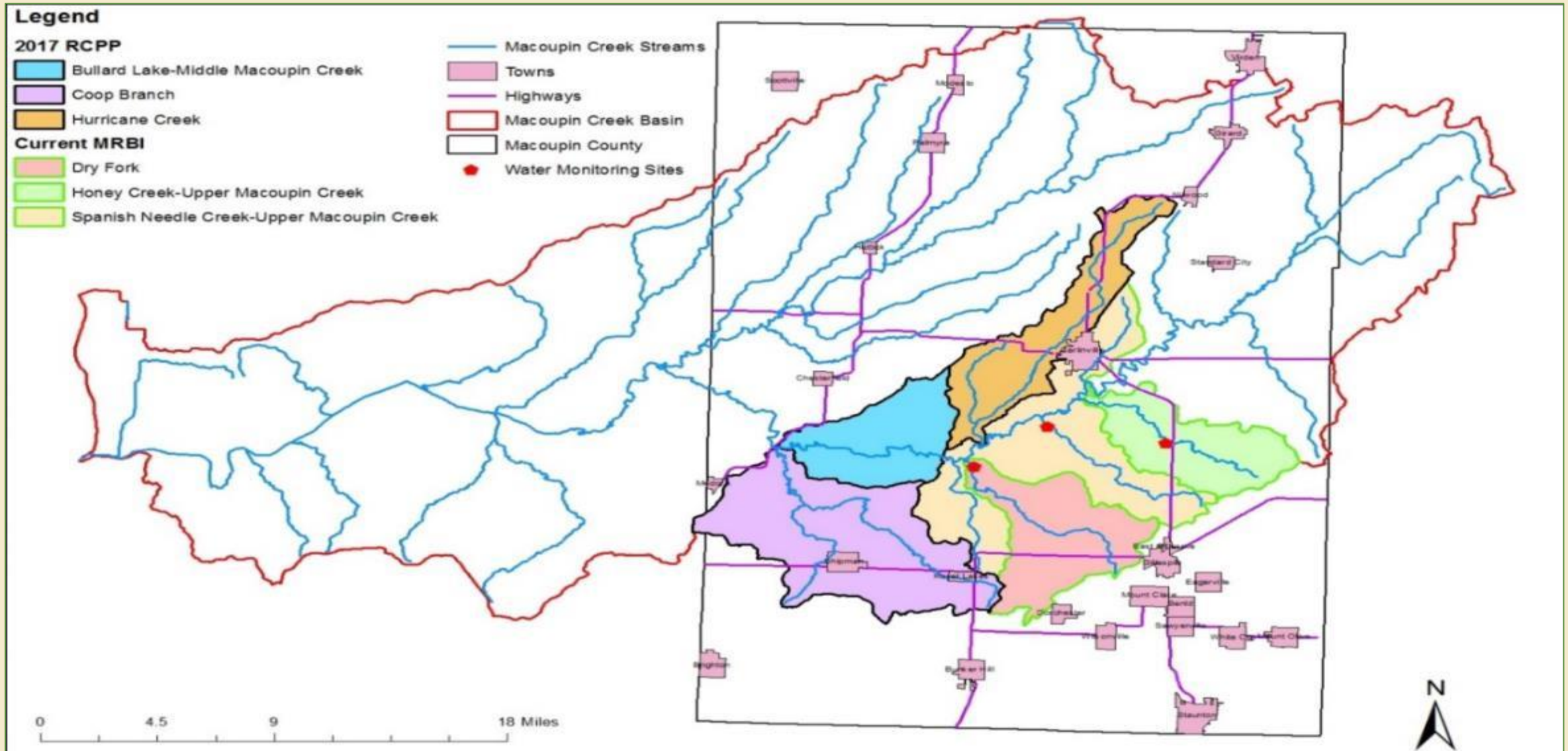
Macoupin Creek (HUC8) Watershed:

- One of 3 highest P-yielding watersheds in Illinois
- > 2 lb P/ac/yr average watershed losses
- 617,000 acres

(Source: IL NRS report. Figure 6.1)



Project area: 6 HUC12s within Macoupin Watershed (HUC8)



Measurement and Evaluation Plan for the Upper Macoupin Creek
Regional Conservation Partnership Program Project

Version 3 – March 2018

Prepared by American Farmland Trust for sharing with the UMC Partnership on April 5, 2018



Members of the Upper Macoupin Creek Watershed Partnership

American Farmland Trust
Blackburn College
CHS Shipman
City of Gillespie
City of Carlinville
Environmental Tillage Systems
Illinois Corn Growers Association
Illinois Department of Agriculture
Illinois Department of Natural Resources
Illinois Environmental Protection Agency
Illinois Stewardship Alliance
Illinois Soybean Association
M&M Service Company
Macoupin County Farm Bureau

Macoupin County Pork Producers
Macoupin County Soil & Water
Conservation District
McKnight Foundation
National Great Rivers Research and
Education Council
Otter Creek Quail Forever
Precision Conservation Management
The Mosaic Company Foundation
USDA Natural Resources Conservation
Service
US Geological Survey
Walton Family Foundation

UMCP MEP

- 54-pages
- Updated annually
- Table of Contents:
 - Introduction
 - Methods to measure achievement of 7 Goals
 - Next Steps
 - References
 - Tool websites
 - Appendix: 22 items

Goals of the UMC RCPP project

1. Improve awareness and understanding of the water quality issues in the UMC, the Illinois Nutrient Loss Reduction Strategy (NLRs), the benefits of improved soil health & nutrient mgt
2. Increase conservation activity in the watershed by 40%
3. Improve farmer profitability
4. Reduce ephemeral gully erosion by 50%
5. No application of commercial fertilizer or manure on snow-covered or frozen ground
6. All livestock manure will be effectively stored with no potential runoff
7. Achieve IL NLRs goals: 25% reduction in total Phosphorus loads and a 15% reduction in Nitrate-N loads

ENVIRONMENTAL OUTCOMES METHODS

Monitoring
Environmental Outcomes to Measure
Achievement of 25% P & 15% N
Reduction Goals

USGS-IL is doing instream monitoring to detect improvements in UMC stream due to the project

Upper Macoupin Creek Watershed Partnership

● USGS Project Monitoring Sites

RCPP

■ Bullard Lake-Middle Macoupin Creek

■ Coop Branch

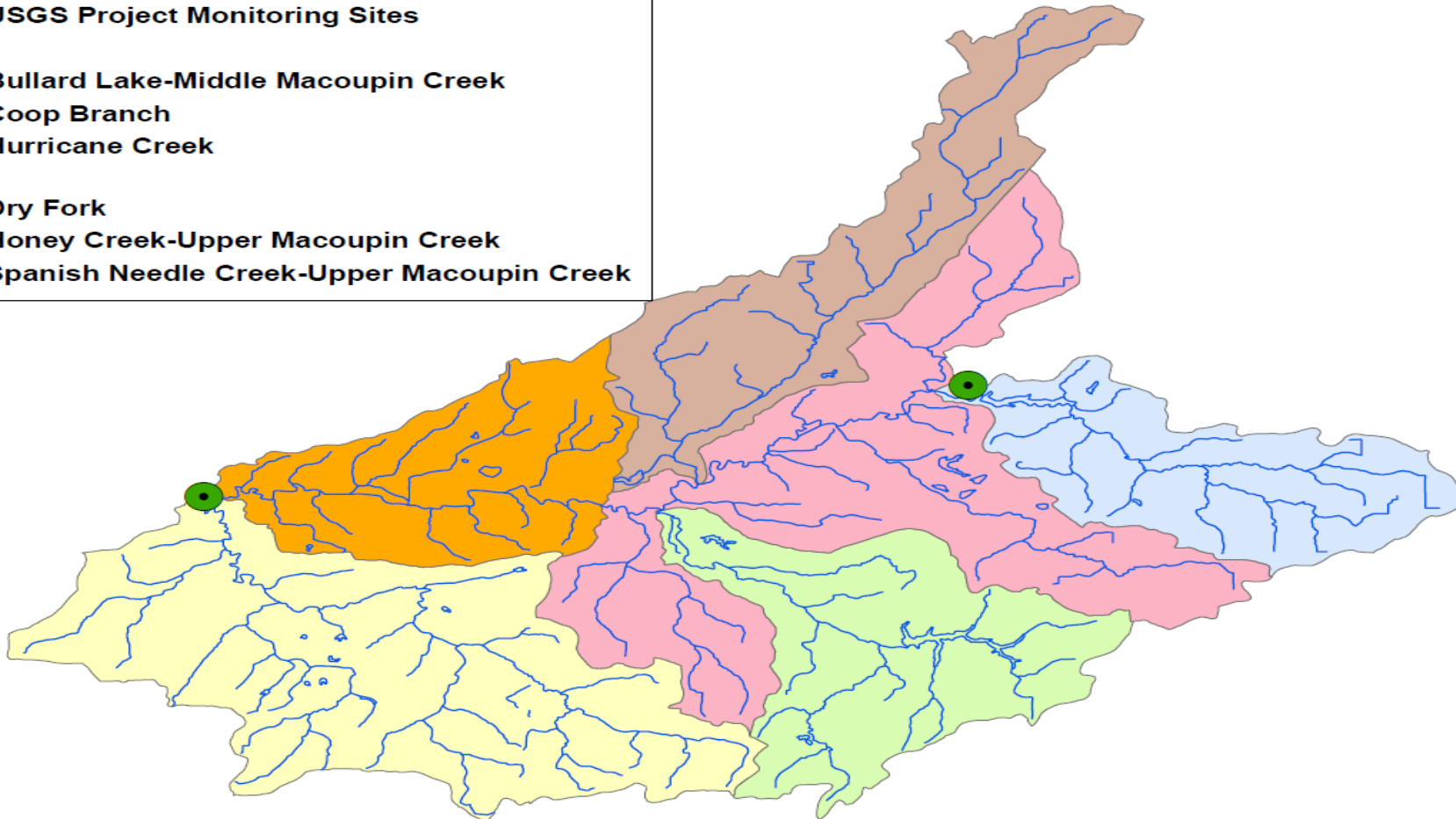
■ Hurricane Creek

MRBI

■ Dry Fork

■ Honey Creek-Upper Macoupin Creek

■ Spanish Needle Creek-Upper Macoupin Creek



- Upstream-downstream streamflow gaging stations
- Weekly & storm grab samples
- Since Jul 2017
- TP, DP, DOP, SS, & nitrate + nitrite N

Modeling Environmental Outcomes to Achieve & Measure 25% P & 15% N Reduction Goals

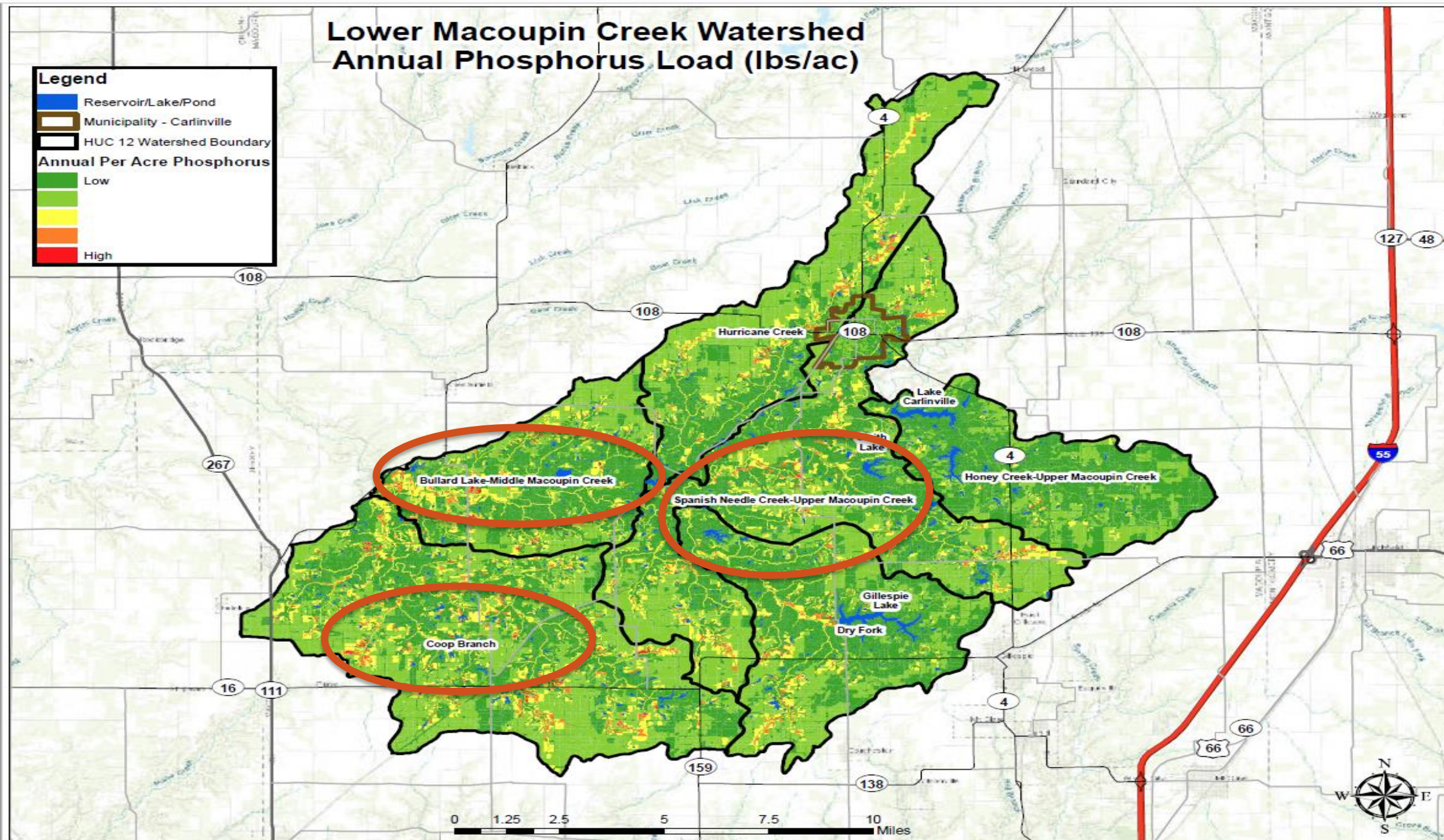
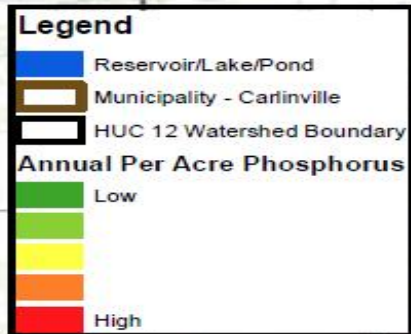
Watershed & Field Modeling by Northwater Consulting

Spatial Watershed Assessment Modeling & Measurement (SWAMM) Tool

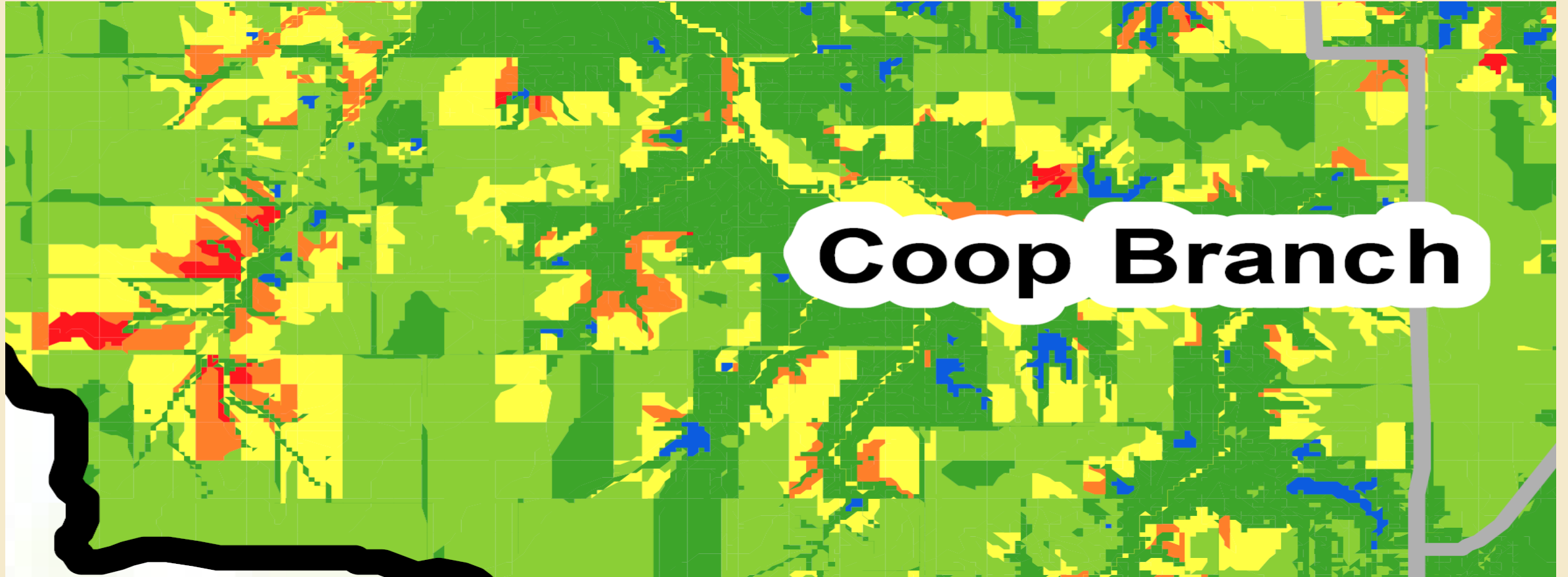
- Super-detailed landuse / landcover layer due to 5-day roadside GIS log & digitization of:
 - ◆ Each identifiable gully (12,000+), tillage, cropland, pastureland
 - ◆ Streambank erosion from road side
 - ◆ Trapping efficiency of all 1,200+ lakes, reservoirs, farm ponds & wetlands
 - ◆ Accounts for 2000+ sediment basins & other BMPs



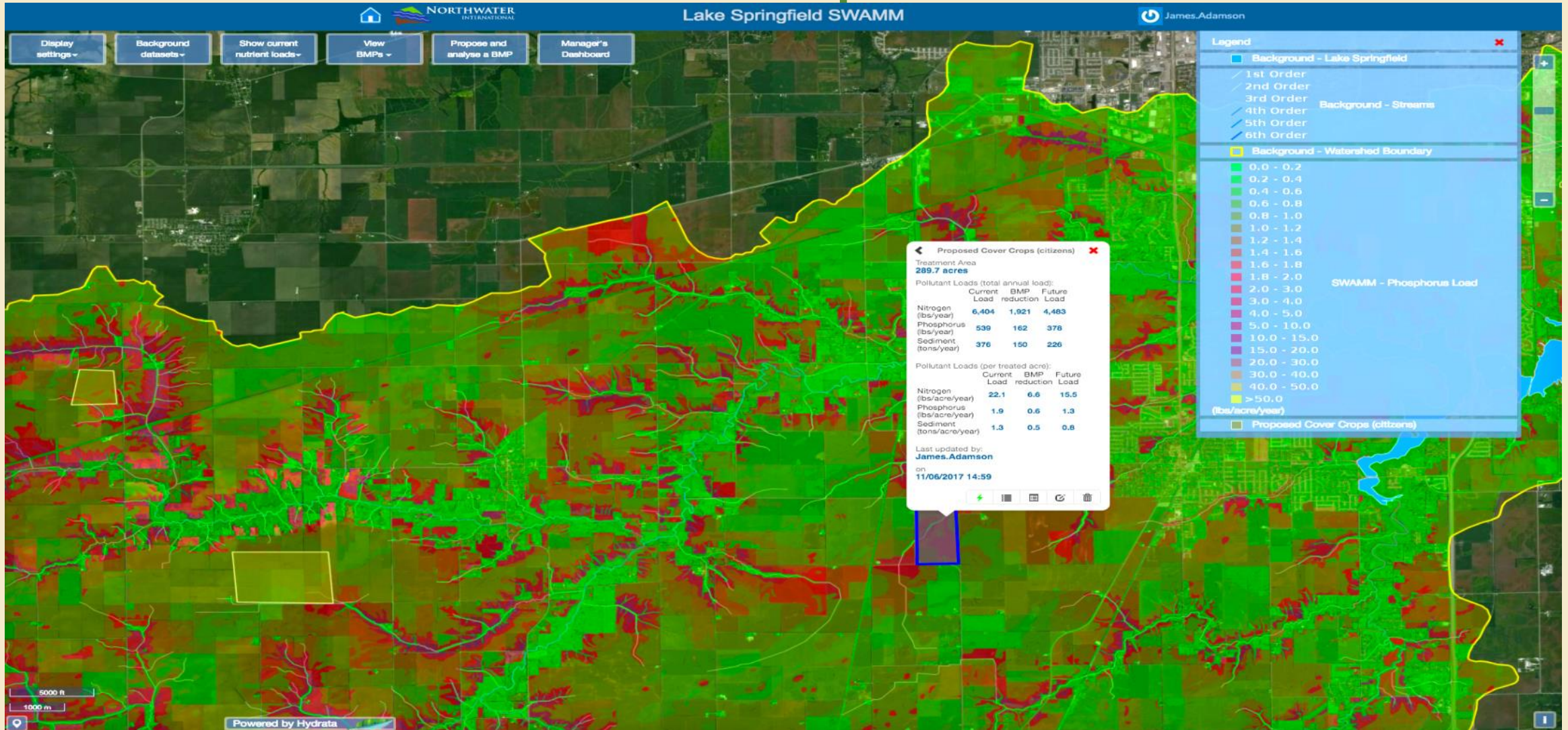
Lower Macoupin Creek Watershed Annual Phosphorus Load (lbs/ac)



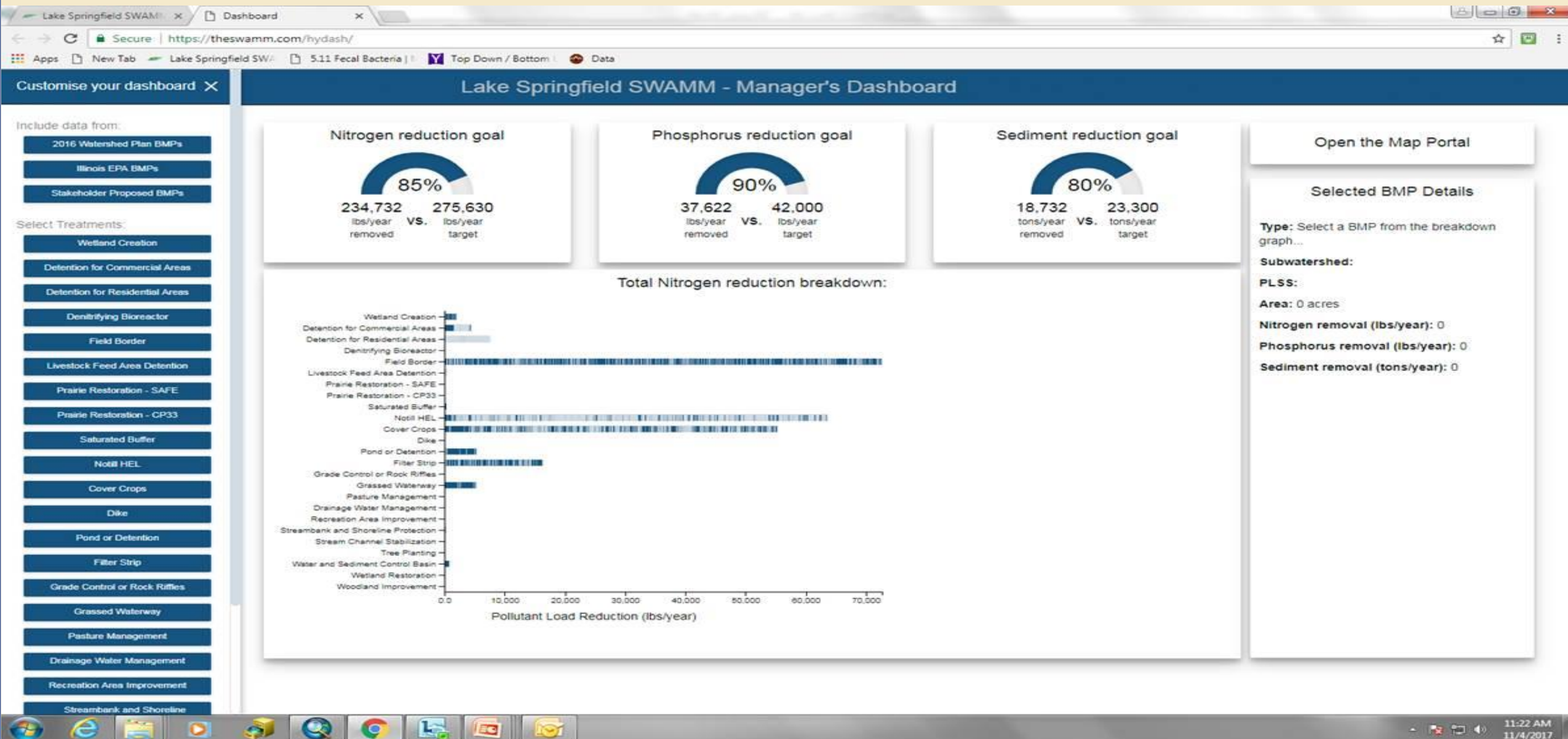
Field prioritization opportunities



Run “what if” scenarios with farmers & partners to estimate nutrient reductions from soil health & other conservation practices



Next up: SWAMM Interface

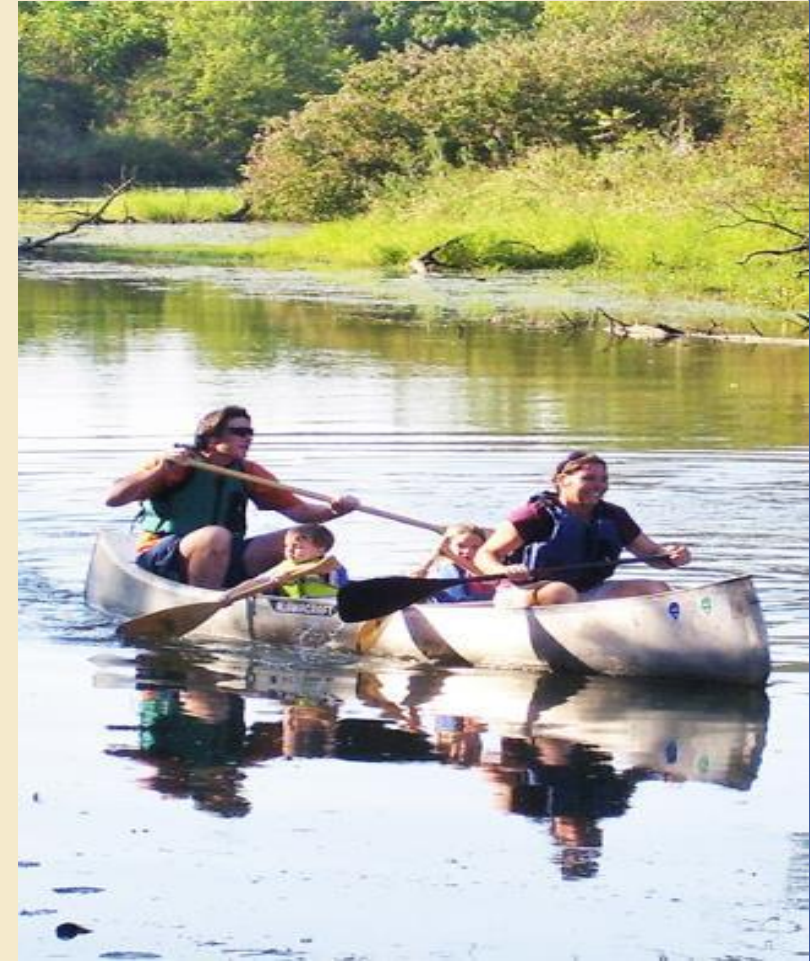


ECONOMIC OUTCOMES METHODS

One approach under consideration

To measure achievement of farmer profitability goal, use a simple economic interview of soil health practice adopters in project (ex-poste):

1. Did adoption of X practice increase your profitability?
(Y/N)
2. How did it increase your profitability?
 - a. One or more of the following costs decreased: machinery, fertilizer, seed, herbicide, diesel, time, etc.
 - b. Crop yield increased
3. Were you able to lower your N or P application rates? (Y/N)
4. If so, by how much?



SOCIAL OUTCOMES METHODS

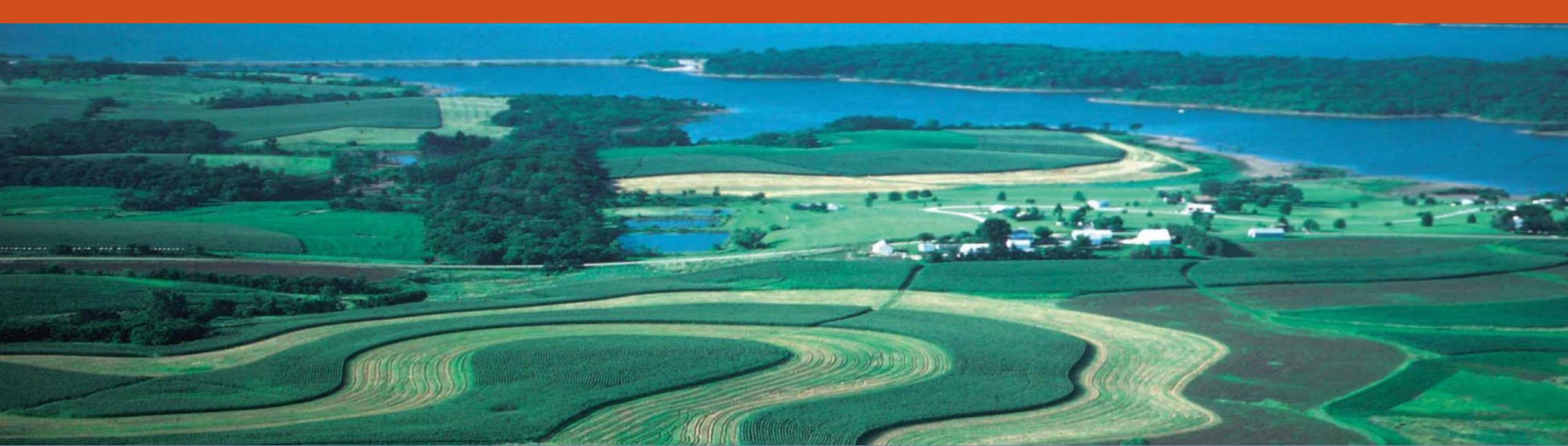
Establishing Social Indicators to Achieve Outcomes

- **Goal:** Improve awareness & understanding of water quality issues in UMC, the IL NLRs, the benefits of improved soil health & NM
- **Techniques:** in-person interviews, anonymous mailed survey, in-office handout, meeting entry & exit surveys
- We plan to track changes over time of responses to questions about the 7 social factors (SIPES, 2011) surrounding farmer conservation practice adoption: **capacity, skills, awareness, knowledge, values, beliefs, and behaviors**



Select baseline data

1. **Awareness** – *Half* of 195 farmers within Macoupin County (FSA survey) are aware of the IL NLRs & that Macoupin is a high P loss watershed
 - Glass half empty at the beginning of the project – hoping to fill it up!
2. **Knowledge**
 - Very high rates of self-reported knowledge by most farmers in SWCD interview (over 88% of 75 farmers) & Mailed survey (76% of 96 farmers) as they agreed that:
 - a. their actions have an impact on water quality &
 - b. using recommended practices can improve water quality
 - But Transect Road-Side Survey shows low usage of no till (about 2% corn & 15% soybeans) and cover crops
 - And only ¼ of FSA survey said they wanted to learn more



Saving the Land and Water that Sustains Us



Follow-up & webinar requests: mperez@farmland.org



The Impact of Conservation Programs in Improving Water Quality

Sridhar Vedachalam, Ph.D.

Northeast-Midwest Institute

Congressional Briefing
December 11, 2018

Nutrients and Algal Blooms



Cost Implications

Received: 11 June 2018 | Revised: 21 September 2018 | Accepted: 28 September 2018
DOI: 10.1002/aws2.1011



ORIGINAL RESEARCH

The impact of source water quality on the cost of nitrate treatment

Sridhar Vedachalam | Ankita J. Mandelia | Eric A. Heath

Northeast-Midwest Institute, Washington, DC

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Ankita J. Mandelia, Chesapeake Bay Foundation,
Harrisburg, PA

Funding information

Walton Family Foundation, Grant/Award Number:
2017-612

Rising nitrate levels in source waters threaten to increase the cost of delivering safe drinking water in many communities. This is especially true in the agriculture-heavy Mississippi River Basin. This study analyzed water quality and treatment cost data over 10 years at three water utilities in the basin. In each intake watershed, farm fertilizer was the largest contributor of nitrogen loading. Nitrate concentrations generally increased during the study period, resulting in increased intake exceedances above 10 mg/L. The amortized capital cost of the treatment plant typically outweighed annual operation and maintenance (O&M) costs. Furthermore, a scale effect was observed with regard to capital costs—unit cost decreased with an increase in production. Limited data on O&M costs suggest that high-intake nitrate levels contributed to higher treatment costs. This article discusses the policy implications of the findings and presents recommendations to mitigate ratepayer impacts from high nitrate levels.

KEYWORDS

conservation, Mississippi River Basin, nitrate, treatment cost, water utility



Source Water Quality and the Cost of Nitrate Treatment in the Mississippi River Basin

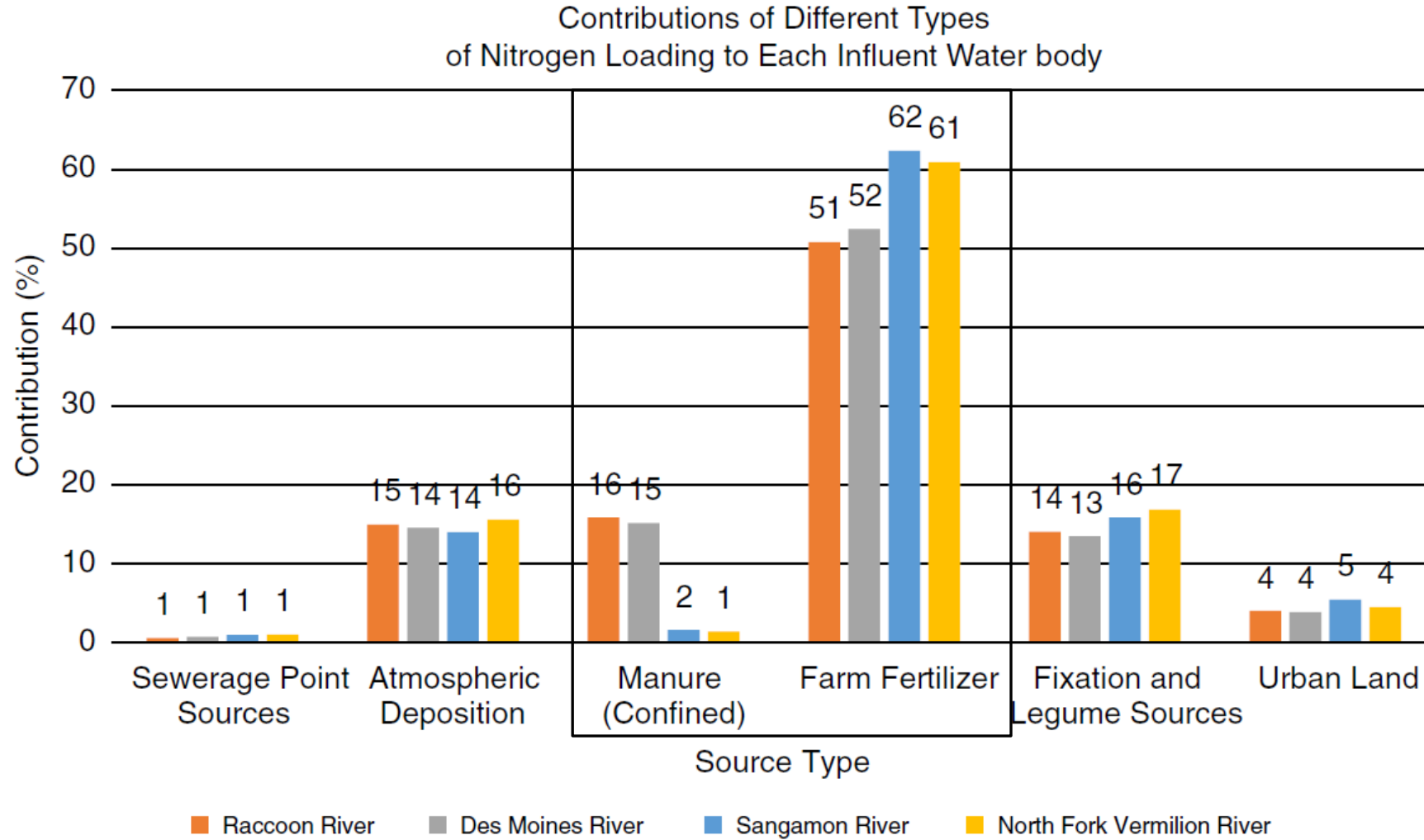
A report published by The Northeast-Midwest Institute



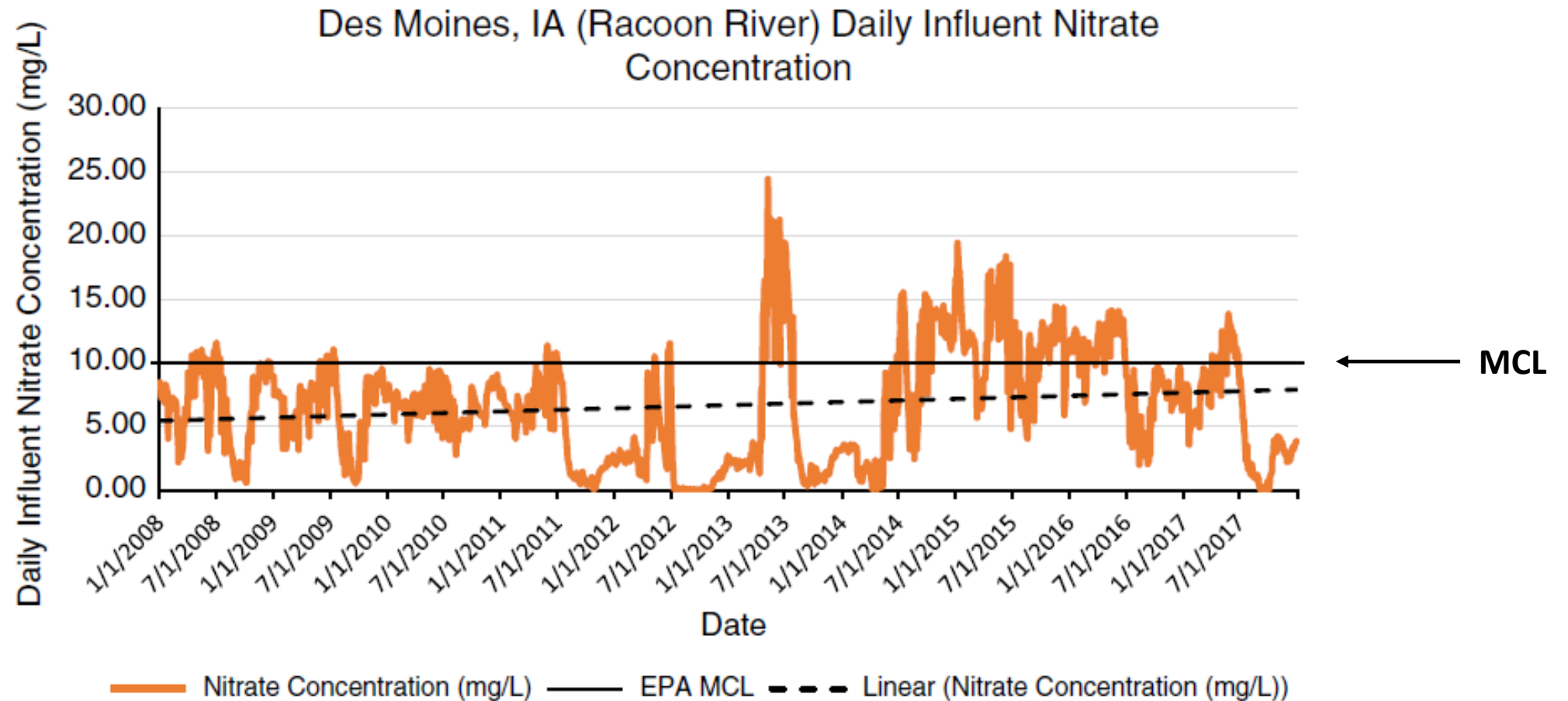
For More Information

More information about the Northeast-Midwest Institute and additional context on this report is available at www.nemw.org.

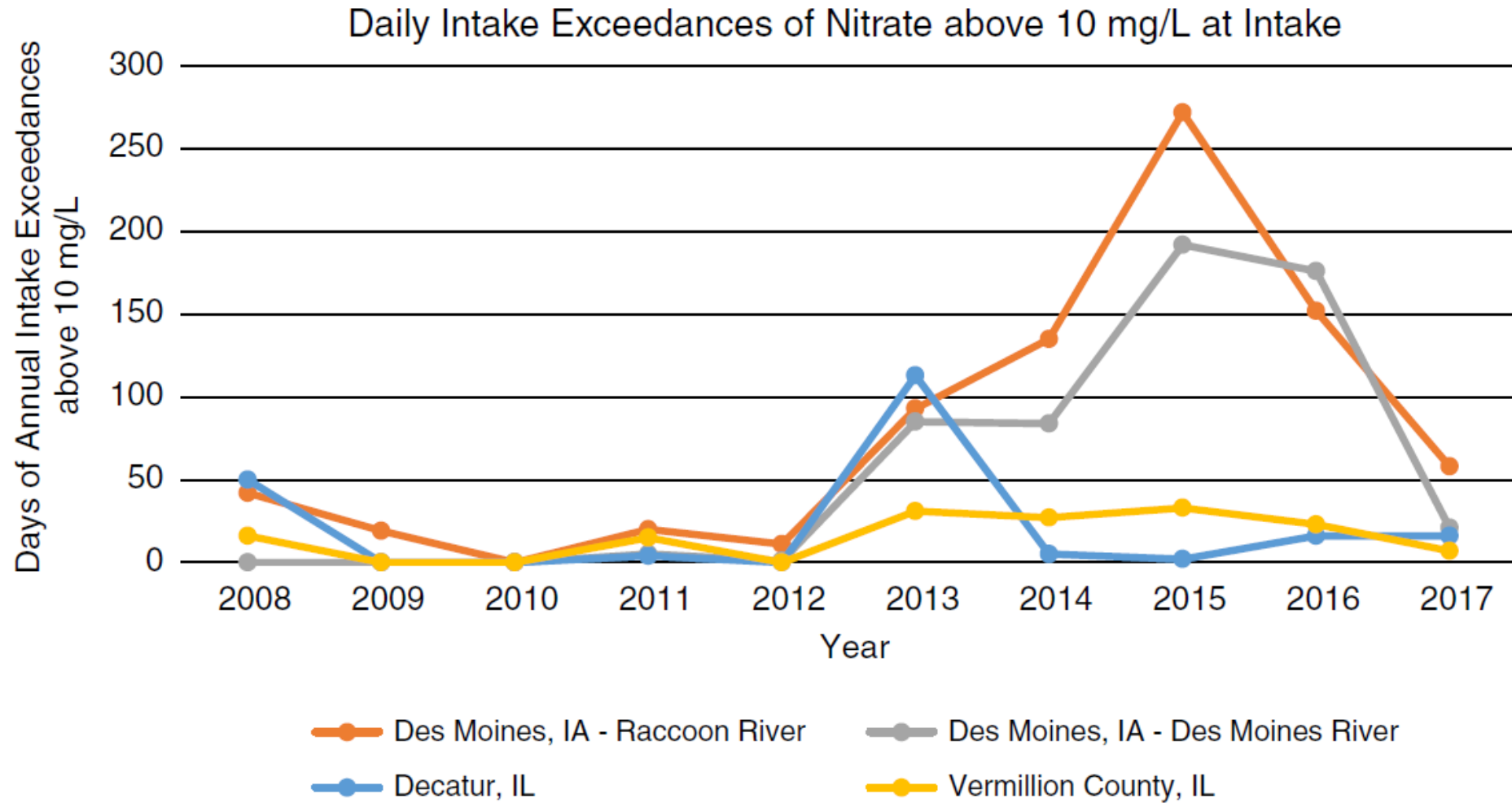
Watershed Activities



Influent Nitrate Concentrations



Nitrate Exceedances



The Role of Conservation

- Confronting several questions simultaneously
 - Addressing nutrient loss/WQ
 - Impact of voluntary programs
 - Moderate compensation to make long-lasting changes
 - Scaling up from farm- to watershed-scale



Why RCPP?

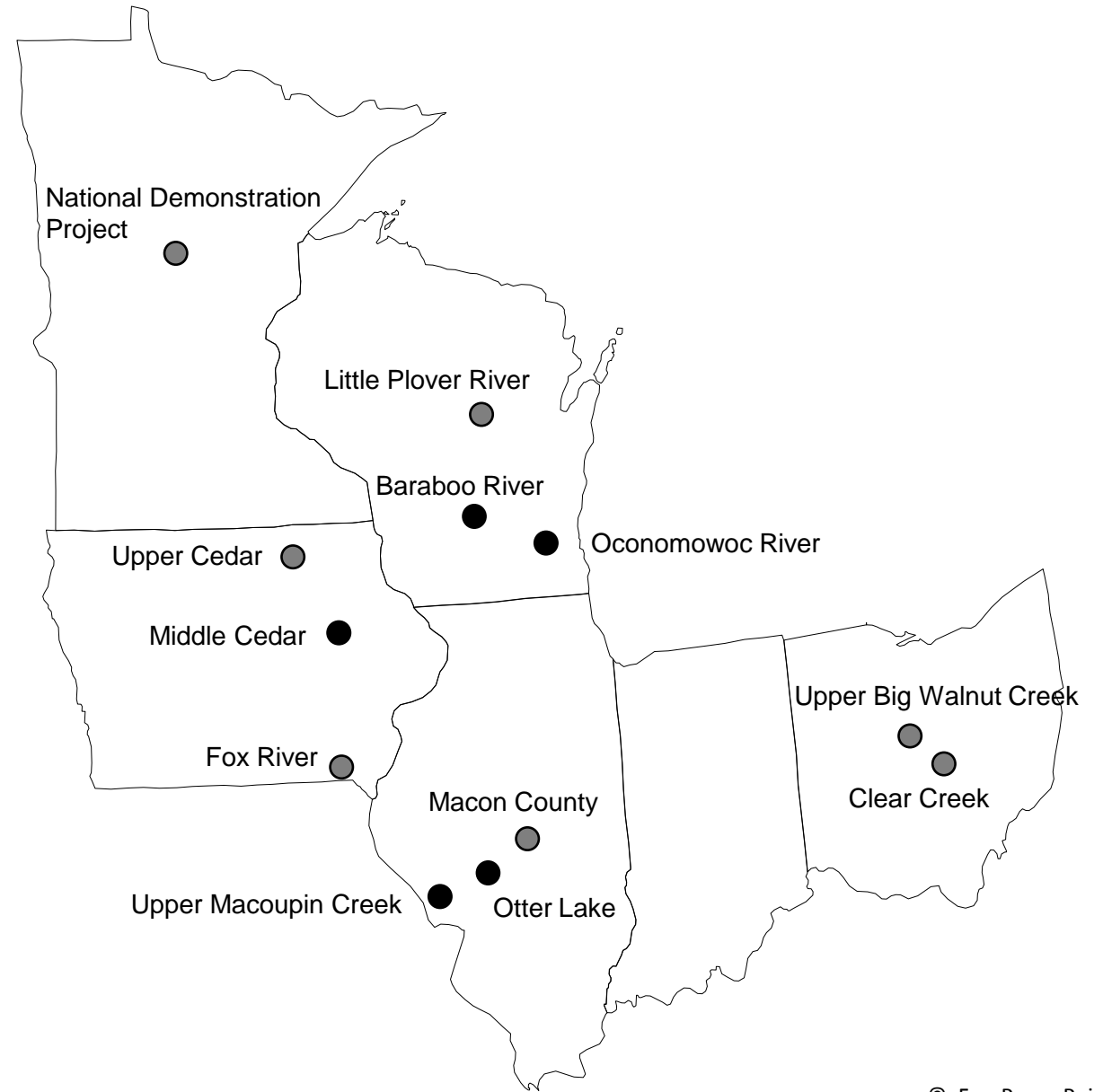
- A structure for collaborative engagement
- Stakeholders with divergent interests come together
- Monitoring is emphasized
- Potential to form community bonds that outlast program length

RCPP in the Mississippi River Basin

- Projects across six states: 48
 - Objectives relating to water quality: 29
- A few shared projects across states
- WI, IA, IL lead # of WQ-related RCPP projects



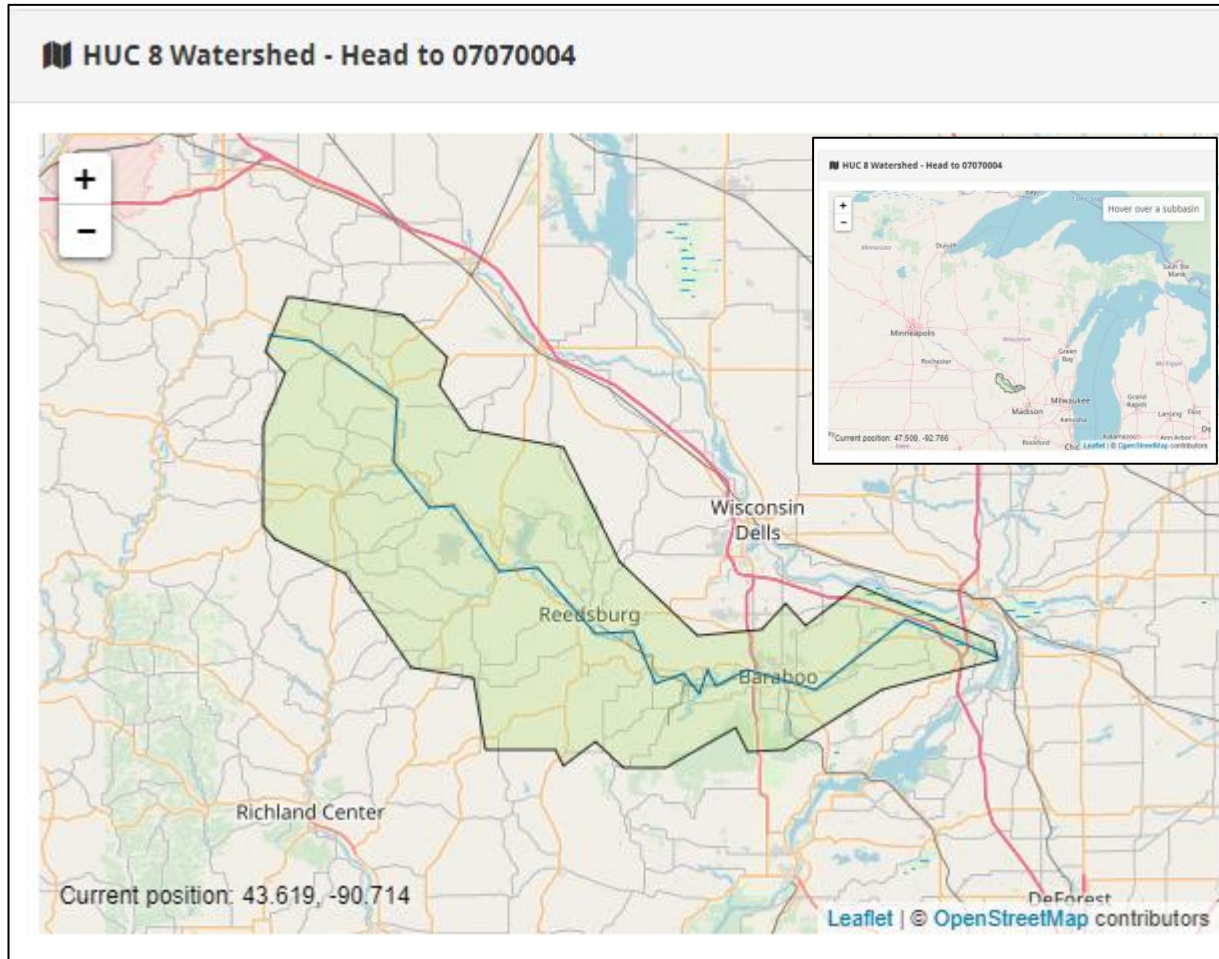
Project Locations



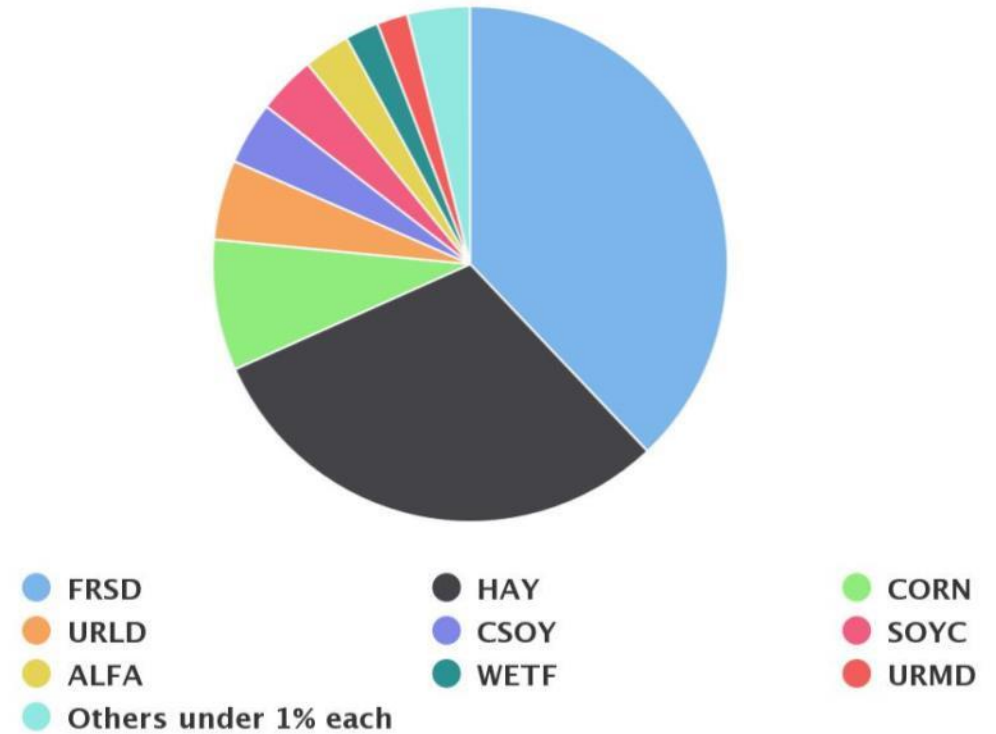
Research Plan

- Identify RCPP projects in the Region
- Gather RCPP project documents – proposals and updates
 - NRCS federal and state offices (FOIA)
 - Directly from stakeholders
- Evaluate documents and engage with project leaders
- Interview project leaders and others
- Simulate land-use and climate change scenarios
 - Hydrology and Water Quality System (HAWQS)

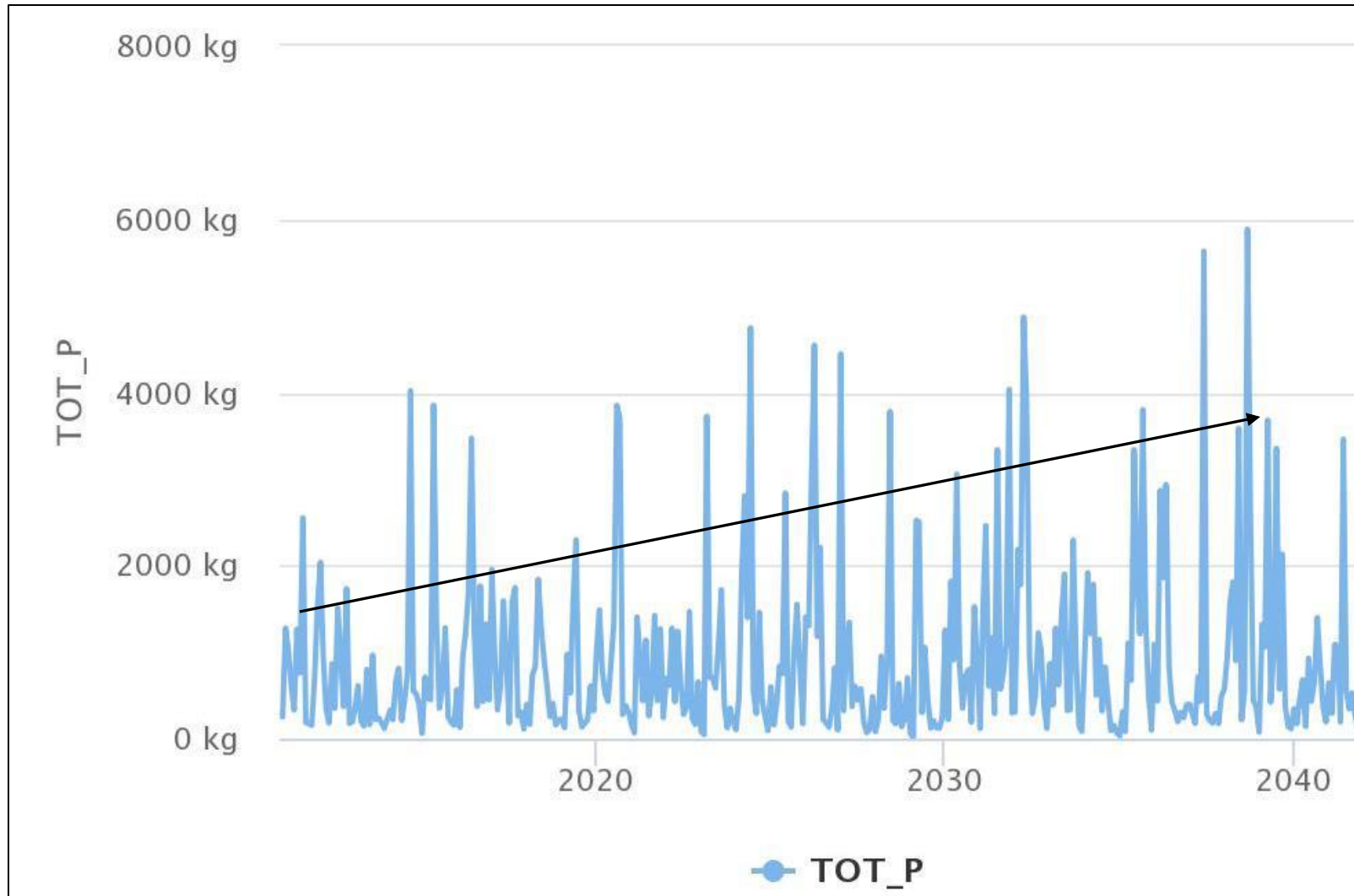
HAWQS Model



Default land use distribution



Climate Change Scenarios



Expected Findings

- Conservation approaches adopted
 - What worked, what didnt?
- Project implementation strategy
 - Monitoring plans and results*
- Expected and achieved outcomes
- Challenges encountered
- Water quality in future scenarios



Thank You

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