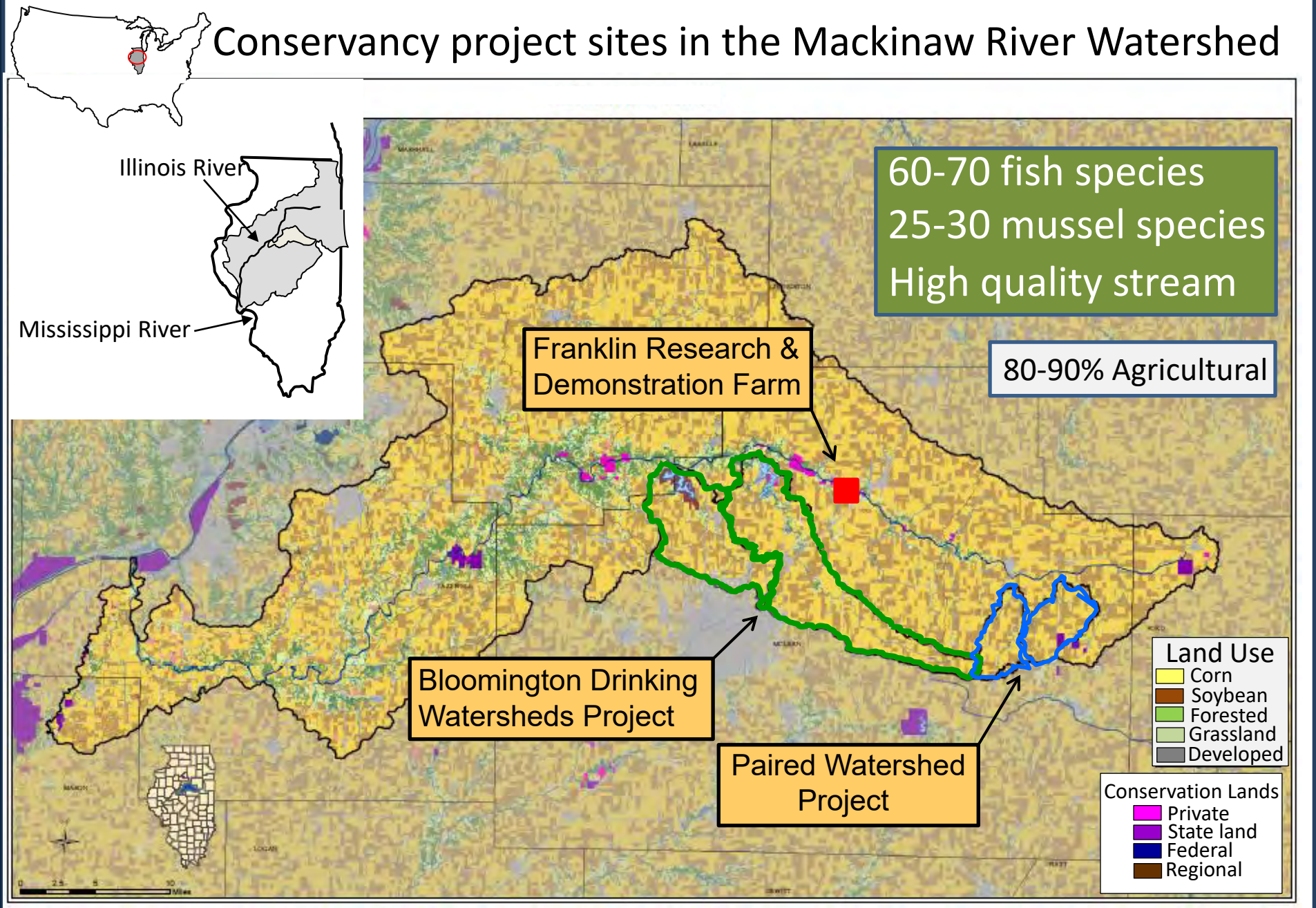
Bloomington Drinking Watersheds Program

Maria Lemke, Director of Conservation Science
Krista Kirkham, Aquatic Ecologist
Adrienne Marino, Water Quality Program Manager

The Nature Conservancy
Protecting nature. Preserving life.

Conservancy project sites in the Mackinaw River Watershed



***2008 study found that tributary streams and tile drains were nitrogen sources over 10 mg/L**

Mackinaw Drinking Watersheds Project

Innovative partnerships:

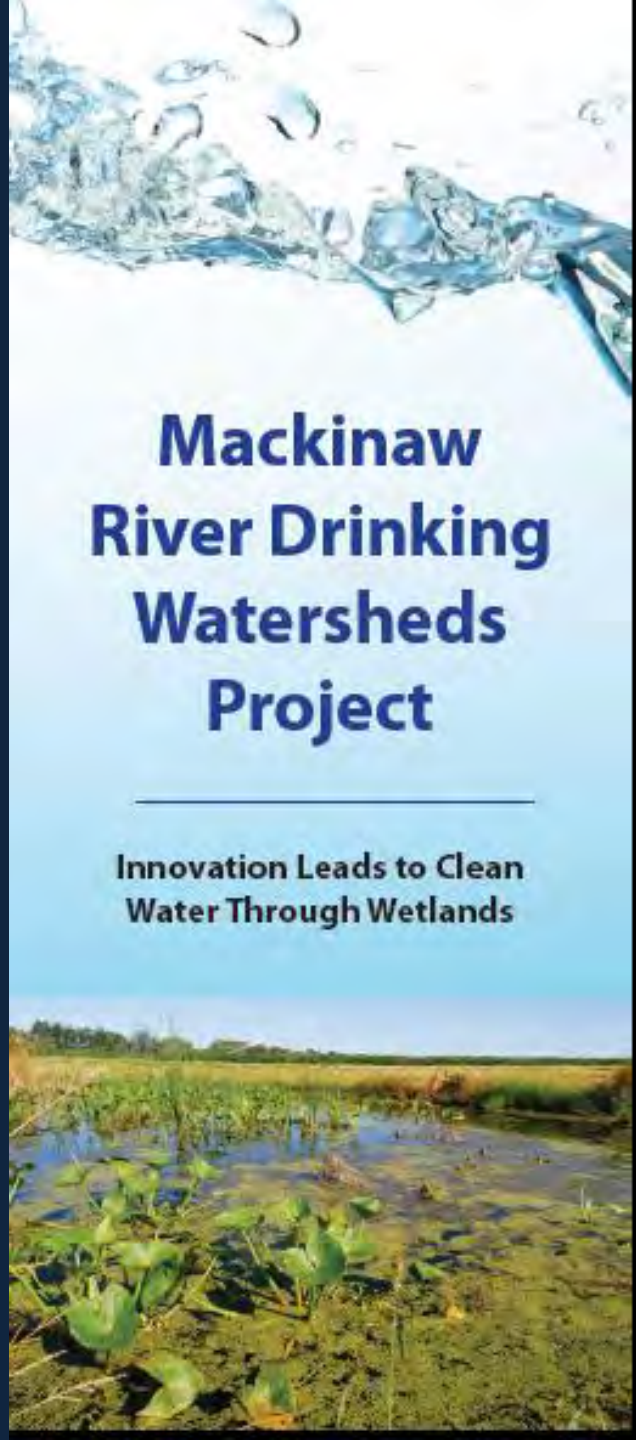
- The Nature Conservancy
- City of Bloomington, IL
- Environmental Defense Fund
- NRCS
- SWCD
- FSA
- Conservation Strategies Consulting, LLC
- University of Illinois
- Illinois State University
- Local farmers and landowners

Long-term goals:

- Reduce nitrate loading to Lake Bloomington, the source of water for 80,000 people in Bloomington, Illinois

- Implement constructed tile-drainage treatment wetlands and improved nitrogen management practices at scale throughout the watershed

- Develop a Water Fund for the City of Bloomington that includes analyses for sustainable funding and measures for effective conservation



Outreach

Mackinaw Wetlands

Drinking Watershed Project

SPRING 2011

SPECIAL POINTS OF INTEREST:

- What is this project?
- Feature: Franklin Demonstration and Research Farm
- Frequently Asked Questions
- Lady Landowner Meeting
- Franklin Demonstration Farm and Evergreen Equestrian site Open House

GOT QUESTIONS?

Contact:
McLean County SWCD
402 N. Kays Dr
Normal, IL 61761
309-452-0830

For more information:
http://mcleancountyswcd.com/

What is the Drinking Watershed Project?

One of the most essential things in life is a clean water supply. The Mackinaw Drinking Watersheds Project is focused on reducing nitrate levels in the City of Bloomington's water supply. High levels of nitrates in the water supply are a public health issue and contribute to poor tasting water. This project focuses on promoting: (1) the CRP Farmable Wetlands Program (CP-39), which is a voluntary, incentive based program to construct small wetlands in strategic locations and (2) adaptive nitrogen management practices in the farmlands that surround Money and Six Mile creeks. These small wetlands are specifically designed to intercept and treat tile-drained runoff from farmlands upstream from water supply reservoirs and the Mackinaw River; thus, providing benefits to the local community's drinking water, the Mackinaw River, and ultimately the Gulf of Mexico. These wetlands have a strong record of success both in Illinois and Iowa agricultural watersheds, reducing nitrate levels by 40-90%. Typically, they are small wetlands (1-3 acre pool size), and are constructed to be approximately 1-2 feet in depth below the drainage tile level. These wetlands are designed NOT to interfere with cropland drainage.

Wetland Tour at Franklin Family Demonstration Farm in the Mackinaw River Watershed

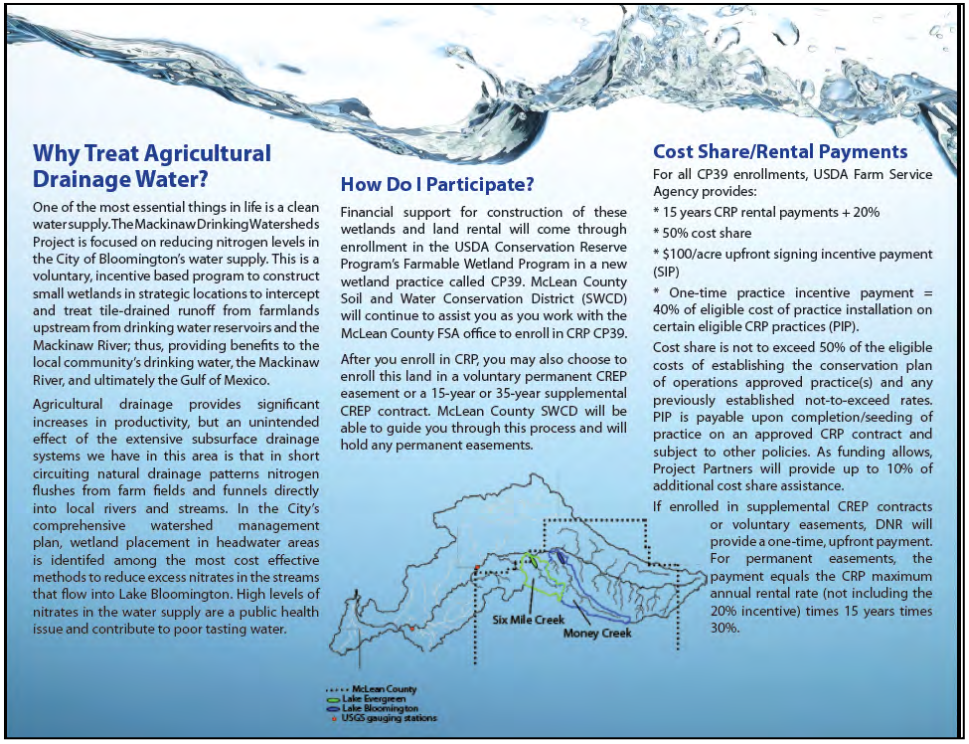
Franklin Family Research and Demonstration Farm

Lexington, Illinois

The Franklin Family Research and Demonstration farm is a 250-acre farm where farmers and others can learn firsthand about cutting-edge conservation practices that benefit agricultural production and nature.

As this site, The Nature Conservancy and partners are measuring how large wetlands need to be in order to effectively reduce nutrients from agricultural runoff. Because the Conservancy believes it is important to balance the economic needs of farmers with ecology, the effects on farm income of implementing such methods will be carefully evaluated.

Currently, an open house is scheduled for June 13, 2011. Additional details will be coming soon, or call the McLean County SWCD for further information.



Why Treat Agricultural Drainage Water?

One of the most essential things in life is a clean water supply. The Mackinaw Drinking Watersheds Project is focused on reducing nitrogen levels in the City of Bloomington's water supply. This is a voluntary, incentive based program to construct small wetlands in strategic locations to intercept and treat tile-drained runoff from farmlands upstream from drinking water reservoirs and the Mackinaw River; thus, providing benefits to the local community's drinking water, the Mackinaw River, and ultimately the Gulf of Mexico.

Agricultural drainage provides significant increases in productivity, but an unintended effect of the extensive subsurface drainage systems we have in this area is that in short circuiting natural drainage patterns nitrogen flushes from farm fields and funnels directly into local rivers and streams. In the City's comprehensive watershed management plan, wetland placement in headwater areas is identifed among the most cost effective methods to reduce excess nitrates in the streams that flow into Lake Bloomington. High levels of nitrates in the water supply are a public health issue and contribute to poor tasting water.

How Do I Participate?

Financial support for construction of these wetlands and land rental will come through enrollment in the USDA Conservation Reserve Program's Farmable Wetland Program in a new wetland practice called CP39. McLean County Soil and Water Conservation District (SWCD) will continue to assist you as you work with the McLean County FSA office to enroll in CRP CP39.

After you enroll in CRP, you may also choose to enroll this land in a voluntary permanent CREP easement or a 15-year or 35-year supplemental CREP contract. McLean County SWCD will be able to guide you through this process and will hold any permanent easements.

Cost Share/Rental Payments

For all CP39 enrollments, USDA Farm Service Agency provides:

* 15 years CRP rental payments + 20%
* 50% cost share
* $100/acre upfront signing incentive payment (SIP)
* One-time practice incentive payment = 40% of eligible cost of practice installation on certain eligible CRP practices (PIP).

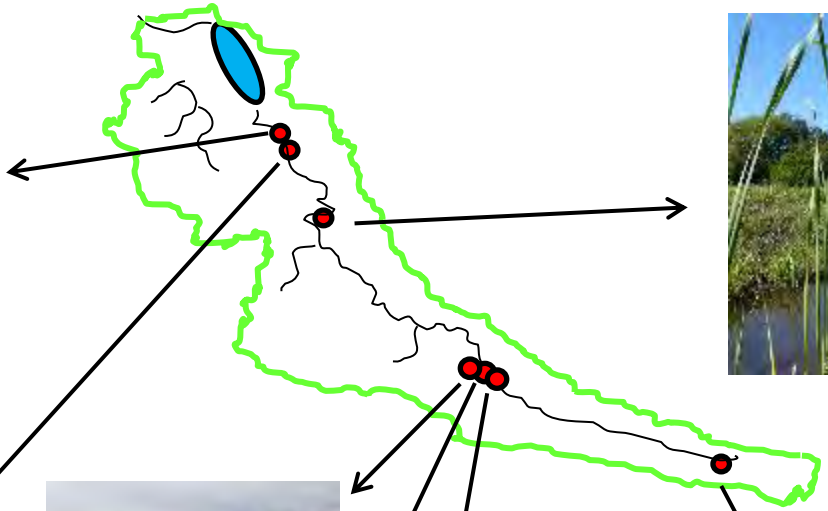
Cost share is not to exceed 50% of the eligible costs of establishing the conservation plan of operations approved practice(s) and any previously established not-to-exceed rates. PIP is payable upon completion/seeding of practice on an approved CRP contract and subject to other policies. As funding allows, Project Partners will provide up to 10% of additional cost share assistance.

If enrolled in supplemental CREP contracts or voluntary easements, DNR will provide a one-time, upfront payment. For permanent easements, the payment equals the CRP maximum annual rental rate (not including the 20% incentive) times 15 years times 30%.

- Started with newsletters and brochures to landowners in watersheds (SWCD, TNC)
- Eventually became one-on-one outreach for constructed wetlands, partnership with local ag retailer for nitrogen study

CRP CP-39: Farmable Wetlands Program (2013-2016)

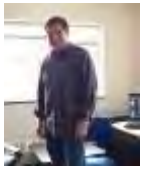
- 50% cost-share
- 40% practice incentive payment
- $100/acre signing incentive payment
- CRP annual soil rental payments + 20%



Funding: USDA-NRCS Conservation Innovation Grant (2012-2016)

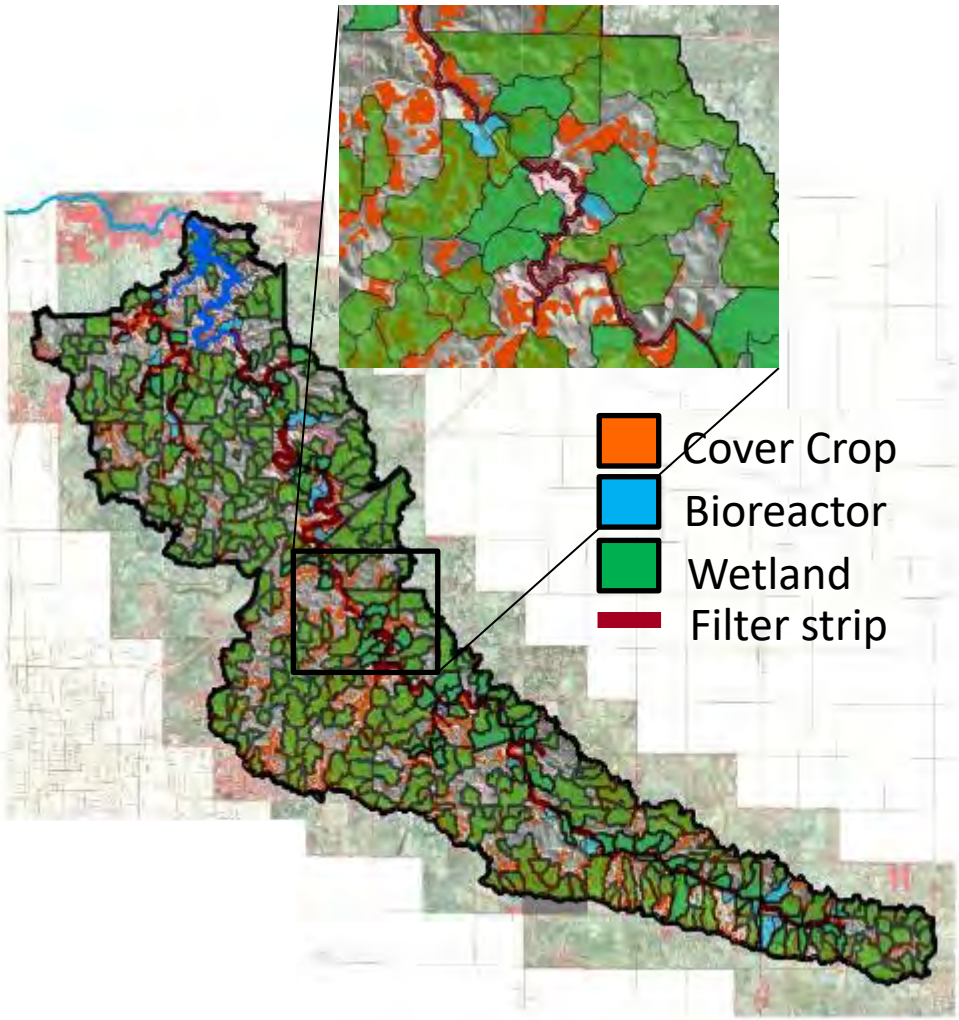
Watershed Mapping

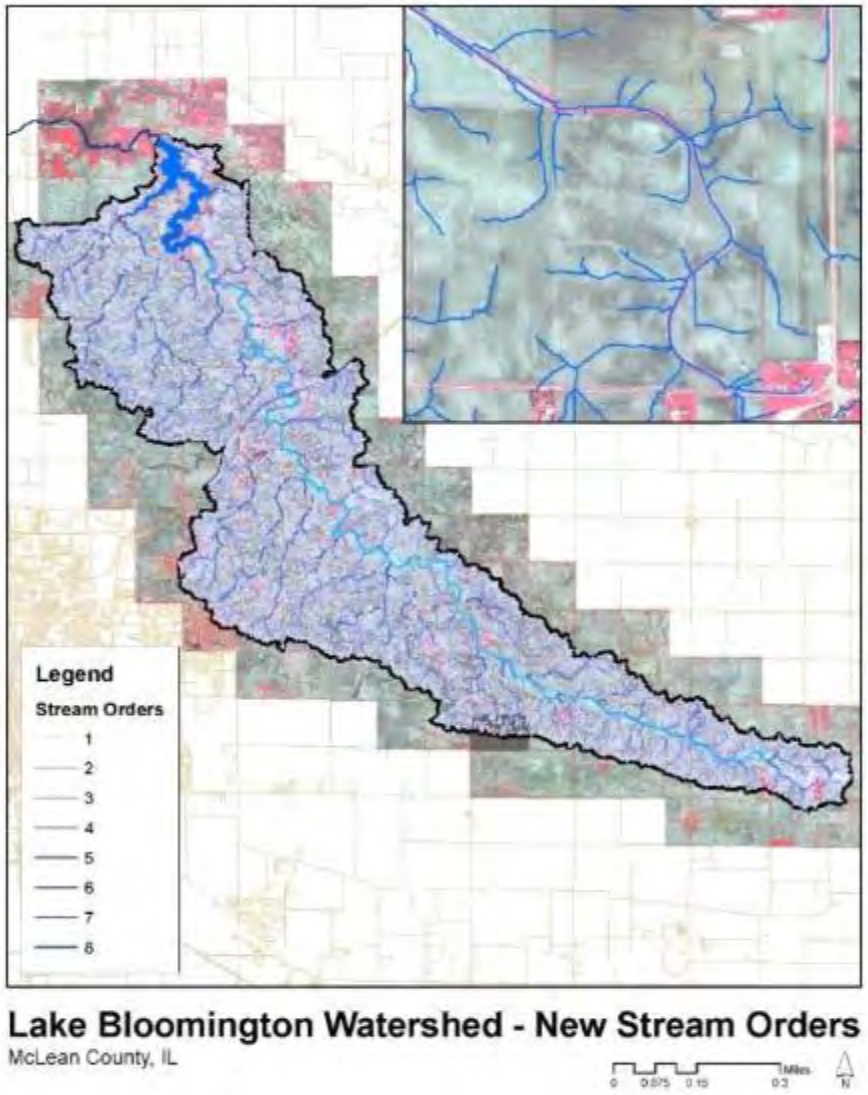
Miran Day
(California Polytechnic State University)



Dr. David Kovacic
(University of Illinois)

LiDAR, GIS, and aerial infra-red data : Deve





Achievements

- Memorandum of Agreement between the City of Bloomington, Environmental Defense Fund and The Nature Conservancy regarding conservation efforts in the Lake Bloomington and Evergreen Lake watersheds.
- Developed an Agricultural Advisory Group of landowners, producers, farm managers and Soil and Water Conservation District staff to provide input on scaling up watershed practices
- Developed a strong, consistent, and enthusiastic working group for 8 years.
- Preliminary economic analyses for the cost of green versus grey infrastructure and cash-flow models for a Bloomington Water Fund
- 3000 acres (7%) in Money Creek watershed were converted to spring N application 2013-2015 (IEPA 319 grant)
- Worked with county FSA and state NRCS to add flexibility with wetland seeding and CRP transition (CP-21 to CP-39)

Lessons Learned

(1) **Partnerships are critical:** Natural Resources Conservation Service, Soil and Water Conservation District, universities, non-profit conservation organizations, agricultural retailers
   - Challenge: Declining funding to support local partners (i.e., SWCD)

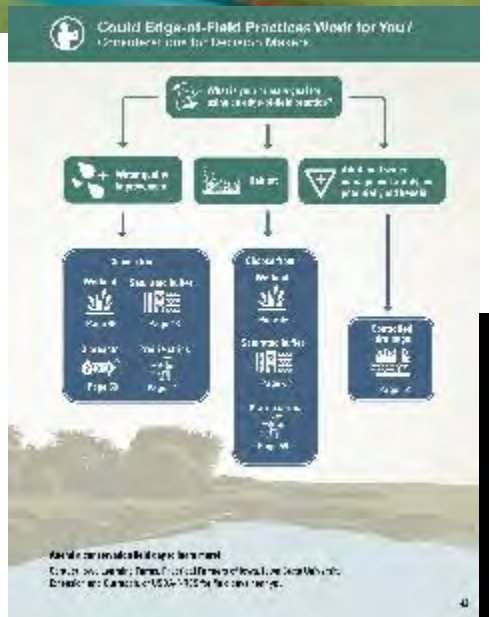
(2) **Communication:** Consistent, transparent

(3) **Monitoring is important, but expensive:** Federal and state grants, private funding (e.g., match)
   - Challenge: Keeping pace with agricultural impacts (i.e., tiling)

(4) **Leverage Farm Bill dollars for implementation**
   - Challenges: (a) Inconsistency of available programs, (b) Sign-up process is complicated and time-consuming

(5) **Engage agricultural landowners and producers:** Planning, Implementation, Outreach and Communication
   - Challenges: How to (a) engage more agricultural landowners and producers, (b) provide appropriate incentives and financial support

Working Towards Solutions



- Improve farm profitability
- Deliver information landowners need
- Incorporate conservation practices into new drainage installations and retrofits
- Build network of individuals with working knowledge of conservation drainage practices
- Provide contractors, outreach professionals, and farm managers tools to act as "technical sales force"
- Utilize NGO programs for technical and implementation assistance

ISAP

The Nature Conservancy

ILLINOIS SUSTAINABLE AG PARTNERSHIP

MERIDIAN INSTITUTE

SOIL AND WATER CONSERVATION SOCIETY

IOWA LEARNING FARMS

Thank you!

Contact: kkirkham@tnc.org

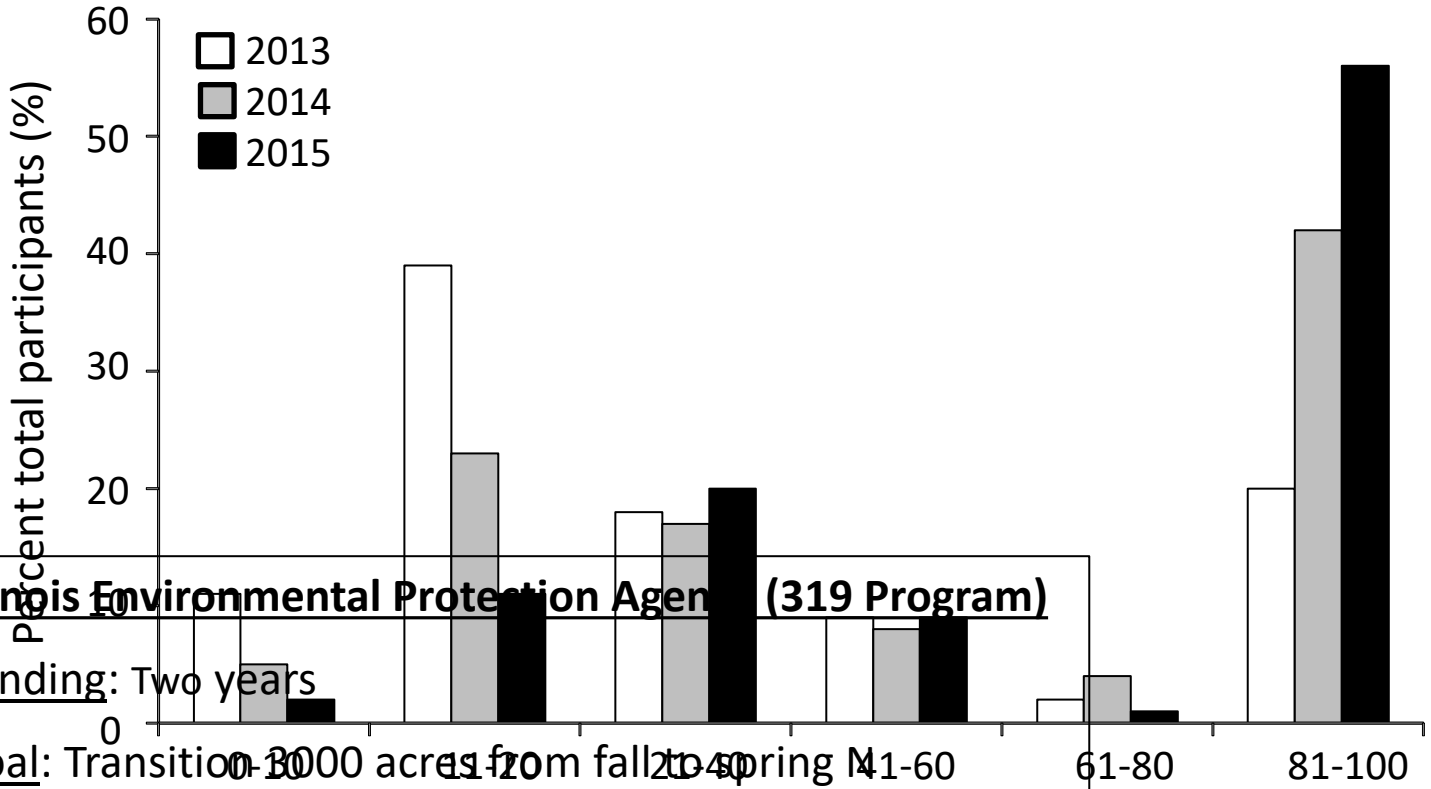
Lemke, A. M., Kirkham, K. G., Marino, A. L., Wallace, M. P., Kovacic, D. A., Bohnhoff, K. L., Kraft, J. R., Linsenbigler, M., & Noto, T. S. (2020). Accelerating implementation of constructed wetlands on tile-drained agricultural lands in Illinois, United States. In J. A. Delgado, C. J. Gantzer, & G. F. Sassenrath (Eds.), *Soil and water conservation: A celebration of 75 years* (pp. 172–178). The Soil and Water Conservation Society.

Lemke, A. M., Kirkham, K. G., Wallace, M. P., VanZomeren, C. M., Berkowitz, J. F., & Kovacic, D. A. (2022). Nitrogen and phosphorus removal using tile-treatment wetlands: A 12-year study from the midwestern United States. *J Environ Qual*, 1–14. https://doi.org/10.1002/jeq2.20316


Science and Technology
Edge-of-field
Messenger
Improved Water Quality
In-field
Efficient process
Financing

Practice Effectiveness: Spring Nitrogen Application

Changes in nitrogen management practices (rate, timing, form, and placement)



Illinois Environmental Protection Agency (319 Program)

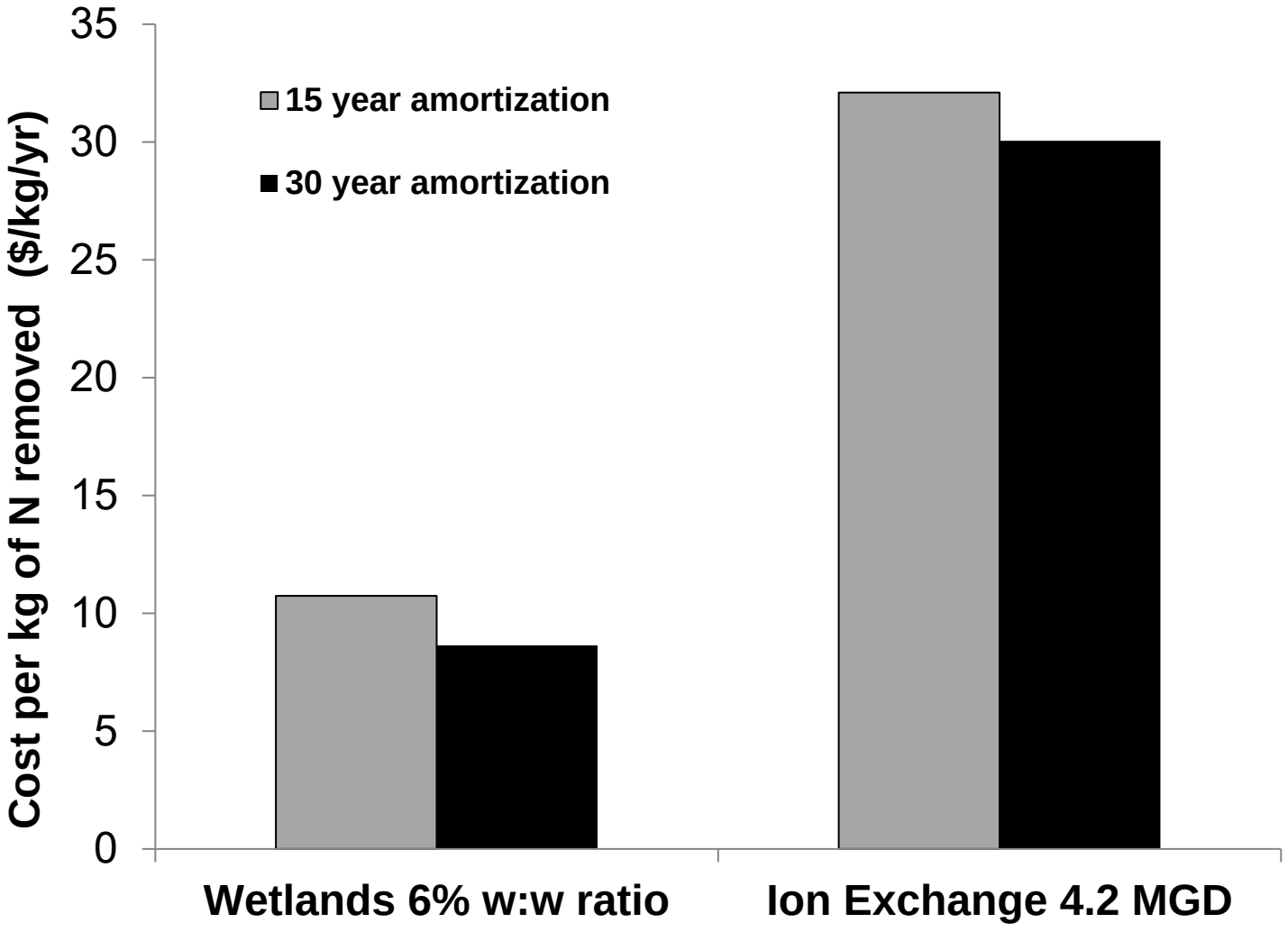
Funding: Two years

Goal: Transition 3000 acres from fall to spring N application

Represents: 7% of the watershed (an estimated 3000 acres already spring-applied)

The Opportunity

Preliminary economic analyses show that wetlands could be much more cost-effective than constructing and managing an ion exchange system to treat nitrates



*Based on Research and Demonstration Farm Wetland Data – by R.E. Heimlich