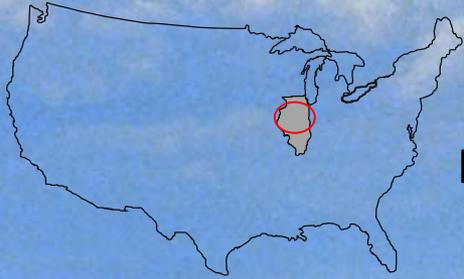


Conservation Practice Effectiveness and Application for Water Quality Improvements in Agricultural Subwatersheds of the Mackinaw River, Illinois, USA



Presented by Maria Lemke, The Nature Conservancy



28 million acres of land in Illinois are agricultural (80% of total land area)

Krista Kirkham, Ashley Maybanks, Adrienne Marino, The Nature Conservancy
David Kovacic, Mike Wallace, University of Illinois; William Perry, Illinois State University
Jackie Kraft, McLean County SWCD; Terry Noto, CSC, LLC

Situation: High levels of nitrate-nitrogen are exported from farmlands to rivers and streams from agricultural tiles

4.7 million hectares of subsurface drainage in Illinois (12 million acres)



Illinois contributes 16.8% of the nitrogen and 12.9% of the phosphorus to the Gulf of Mexico

(Alexander et al., 2008)

A photograph of a white fertilizer tank on a blue trailer in a field, with a green tractor in the background.

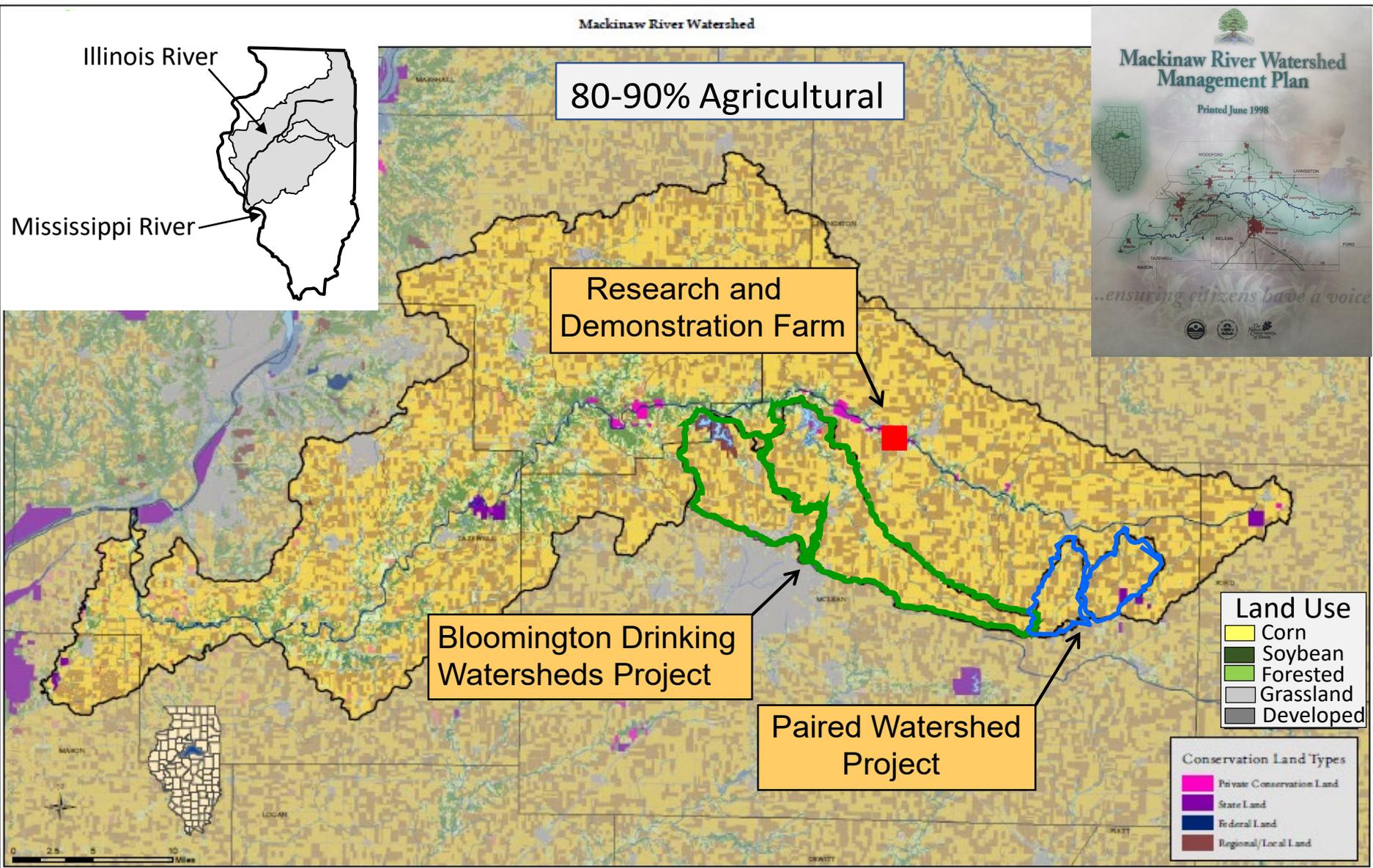
2015

ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY



Mackinaw River Watershed

60-70 fish species
25-30 mussel species
High quality stream



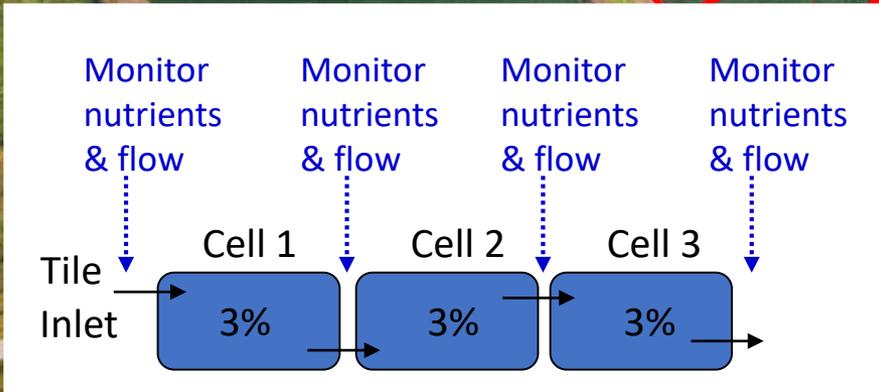
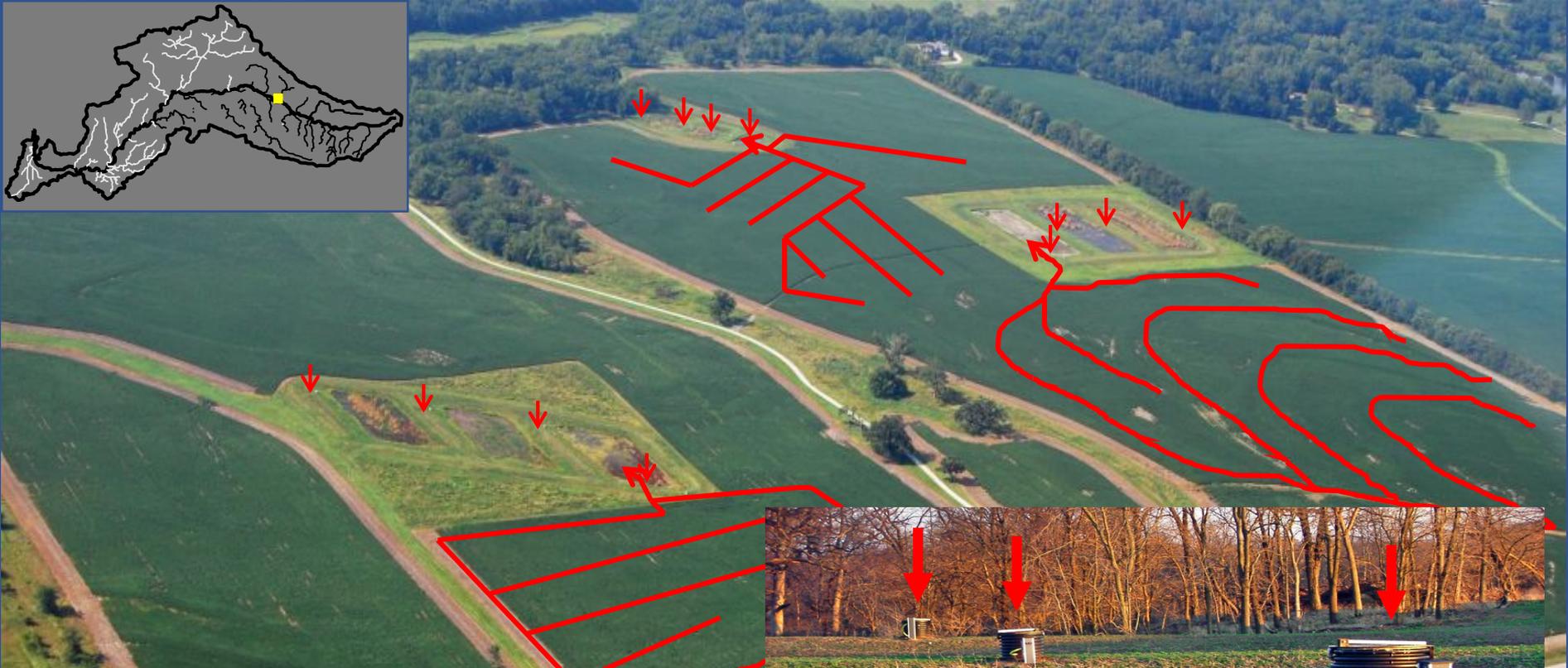
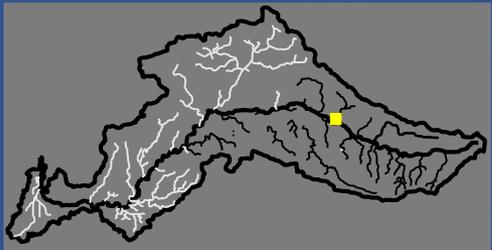
Paired Watershed Project Results: 1999-2006



- *Outreach works*
- *No nutrient/suspended sediment reduction*
- *No impact on hydrology or biota*



*Need to better retain runoff,
especially from tile drainage*

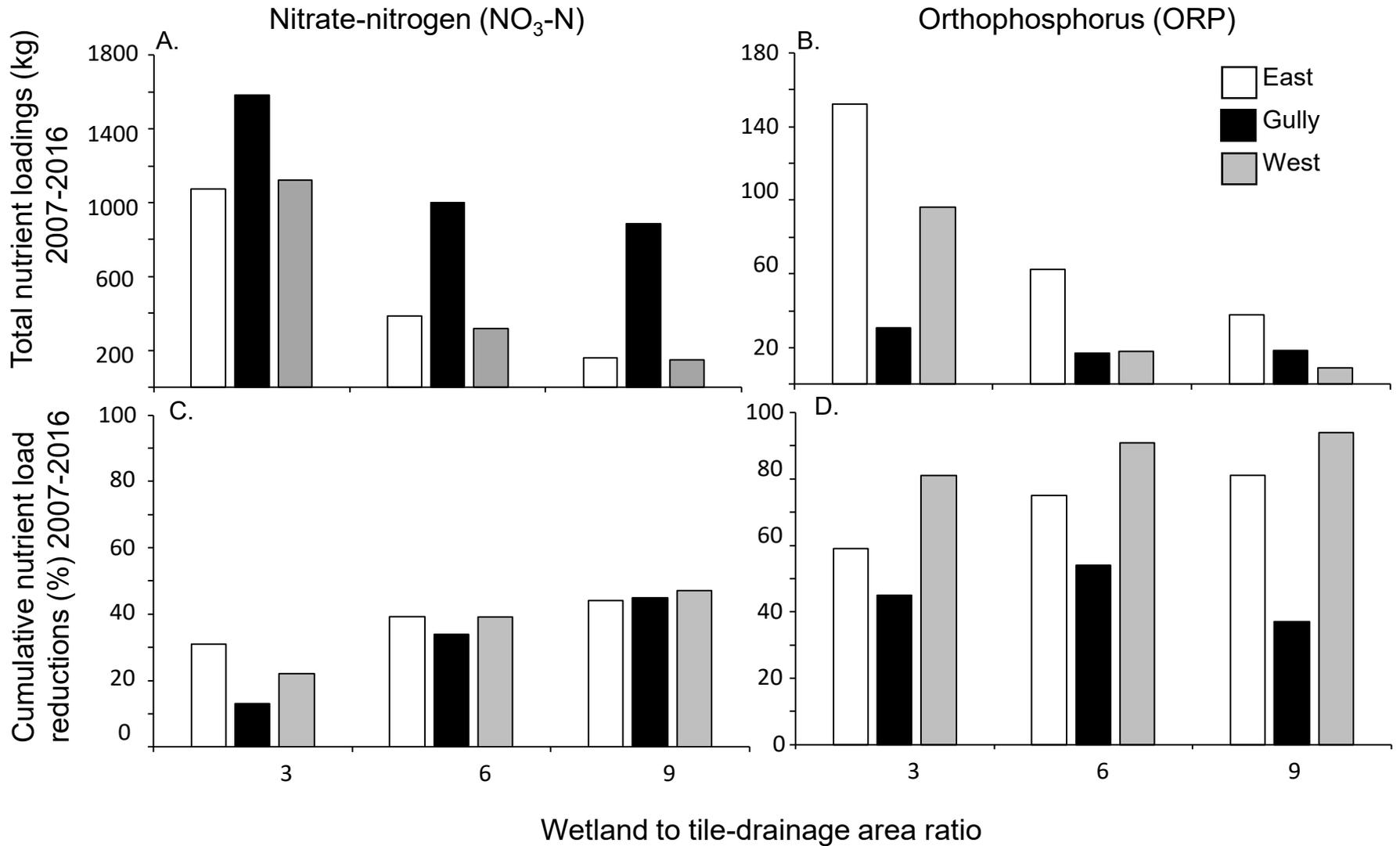


6%

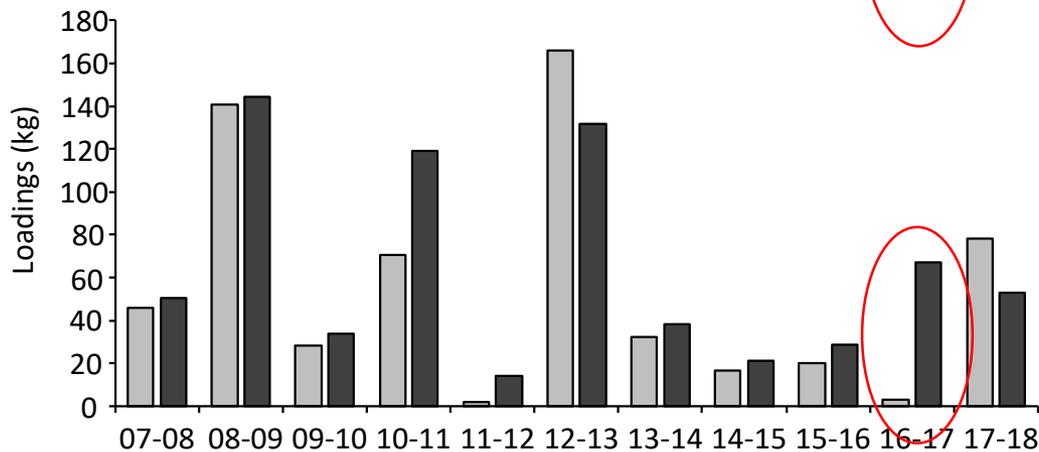
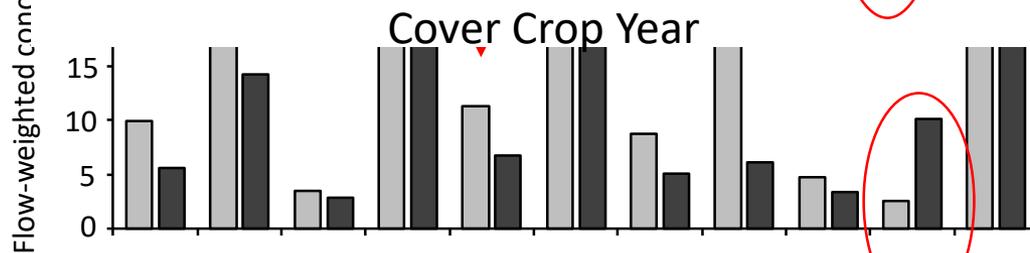
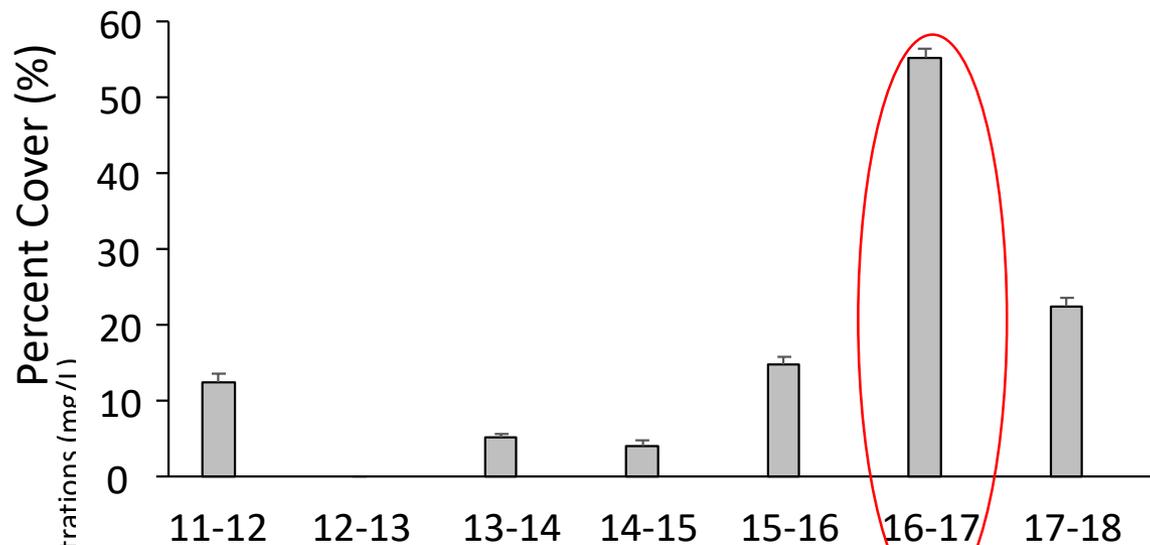
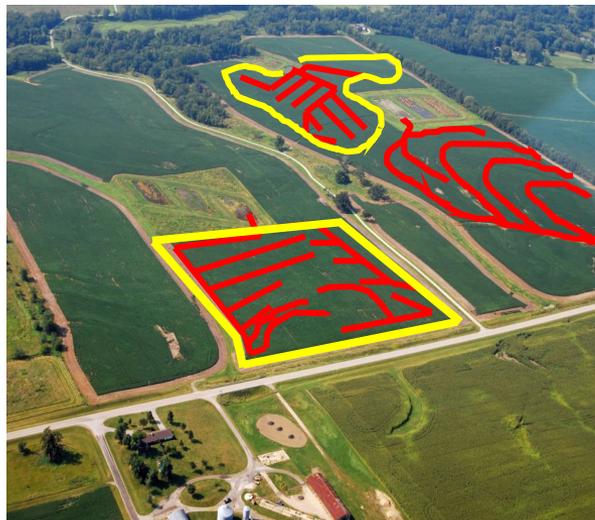
9%

What size of wetland is most effective at reducing nutrients in tile runoff?

10-year Monitoring Results



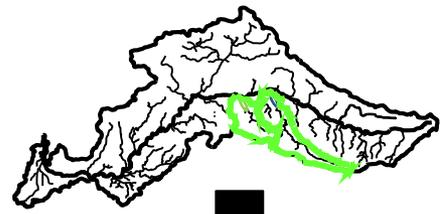
Winter Cover Crops



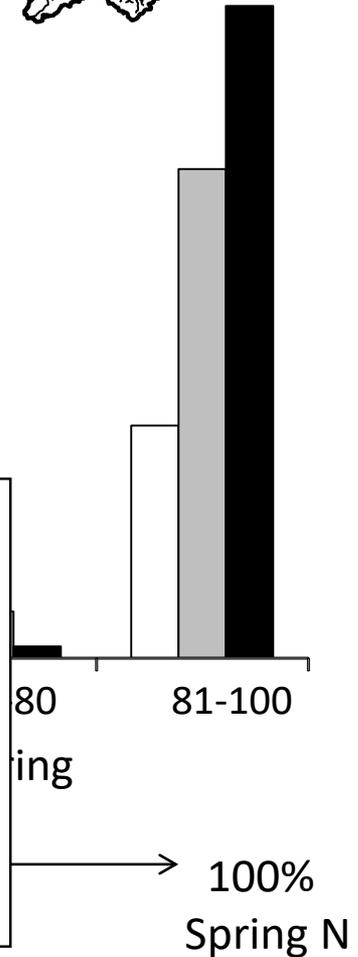
Infield Conservation Practices: Spring Nitrogen Application

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

- Total reduction 87,705 pounds applied N (22% reduction)
- Reduction in N loss of 8,963 pounds to the watershed
- No net loss in income

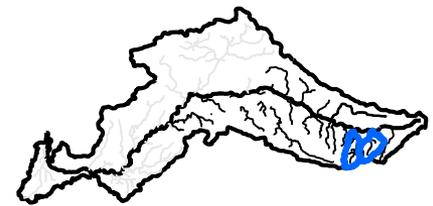


nt to
20

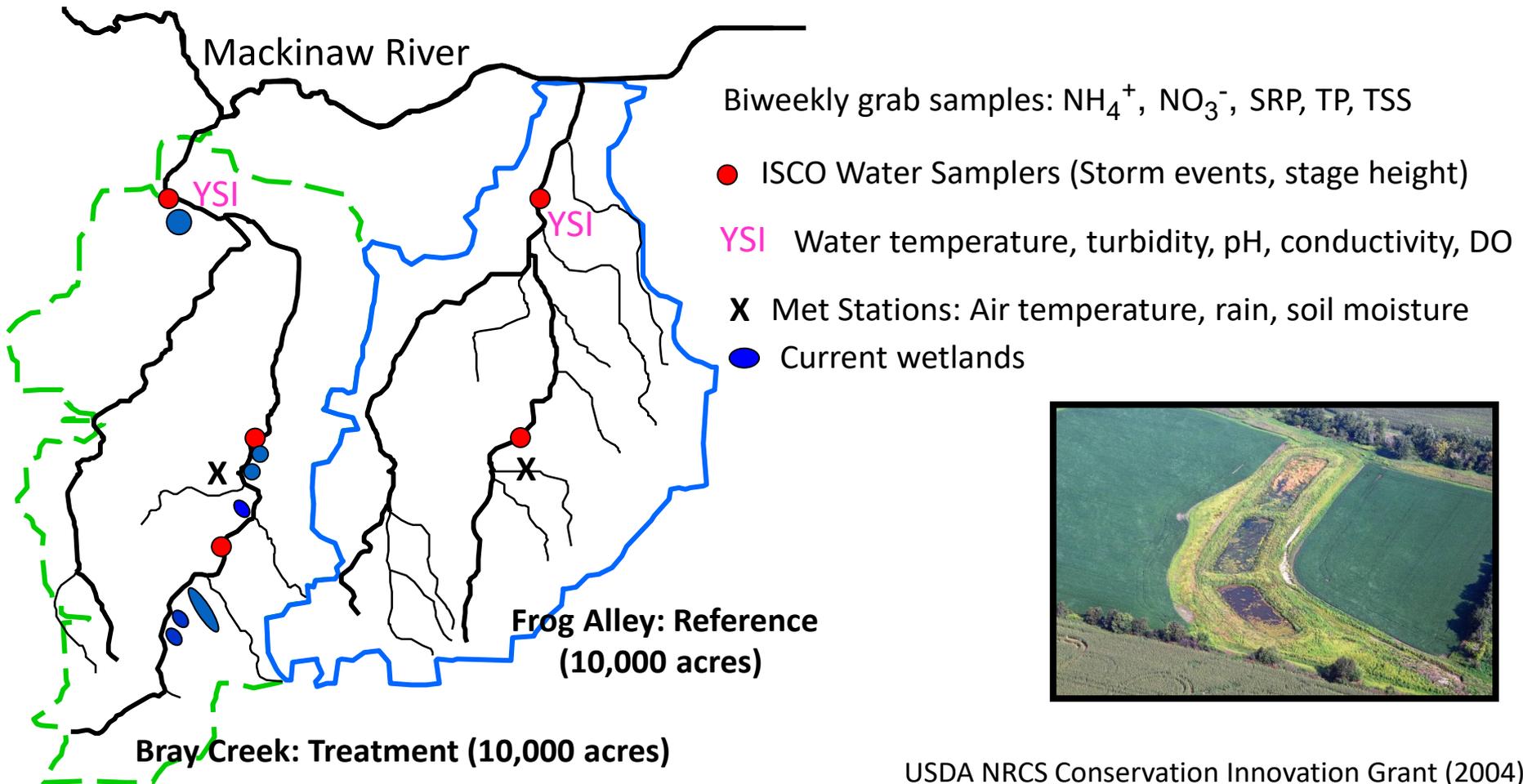


Illinois Environmental Protection Agency (319 Program)
Funding: Two years to McLean County SWCD (2016-2018)
Goal: Transition 3000 acres from fall to spring N application
Represents: 7% of the watershed (an estimated 3000 acres are already spring-applied)
Results: **2100 acres**

Paired Watershed Project

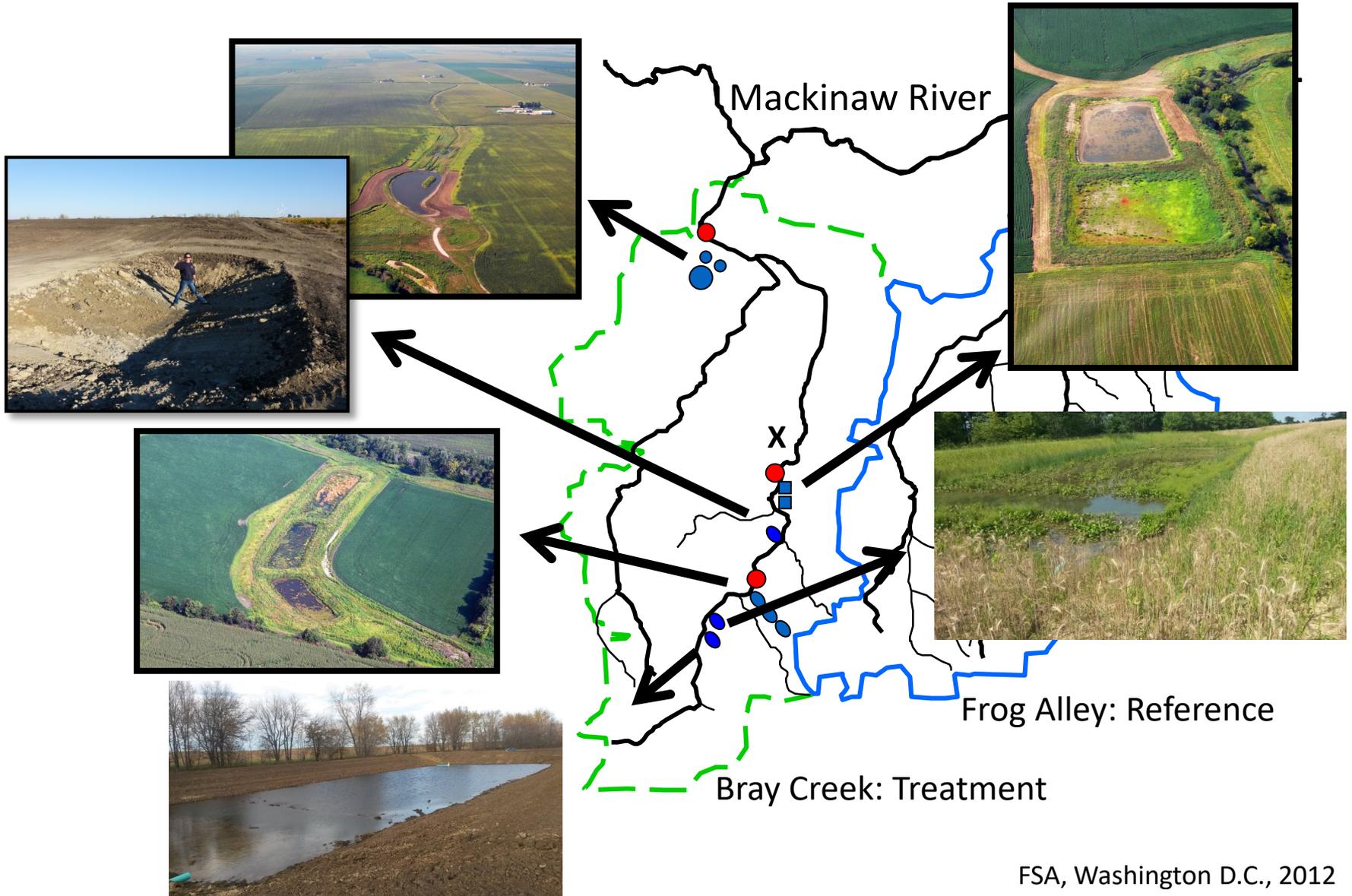


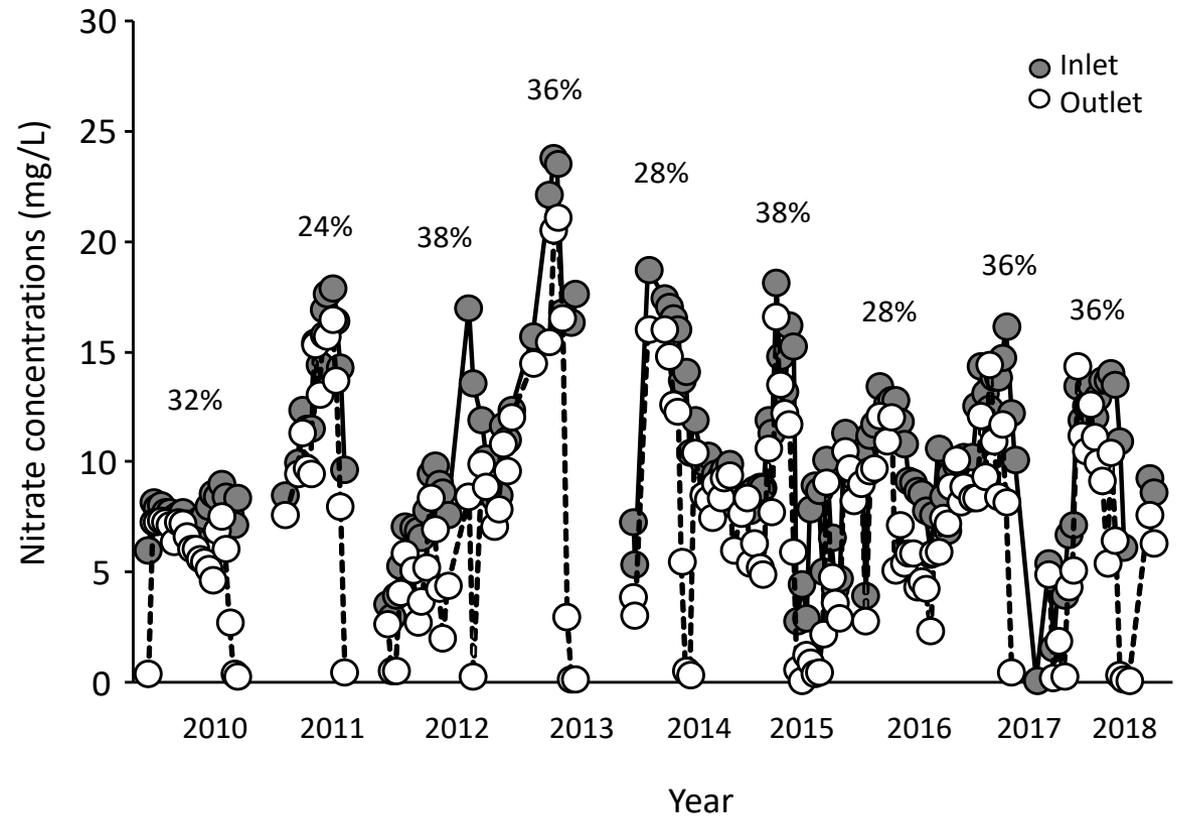
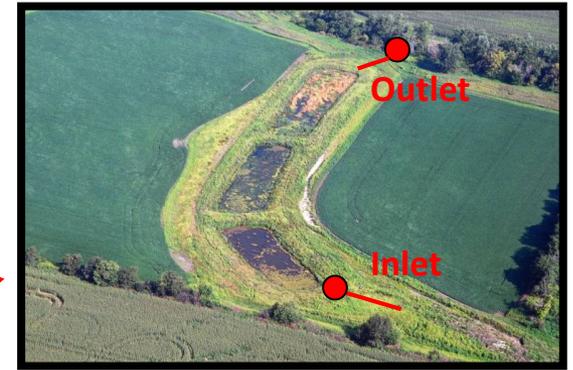
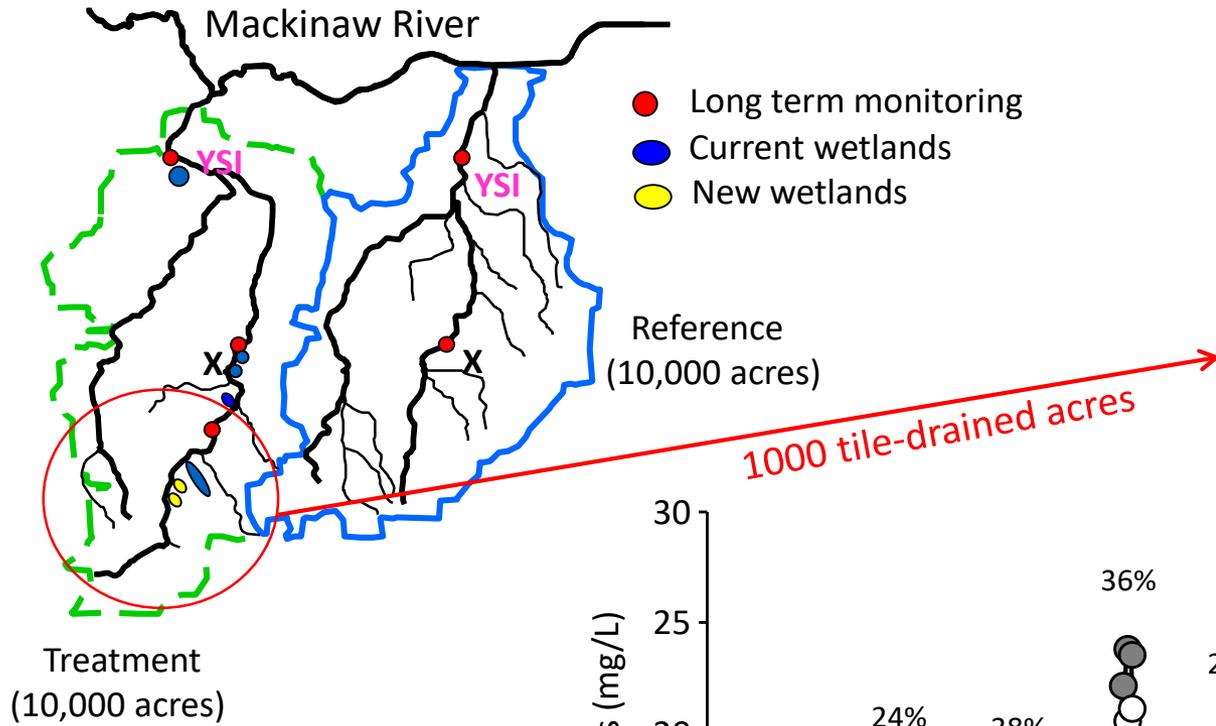
Question: How well do wetlands work to improve water quality, hydrology, and biodiversity at the watershed scale?

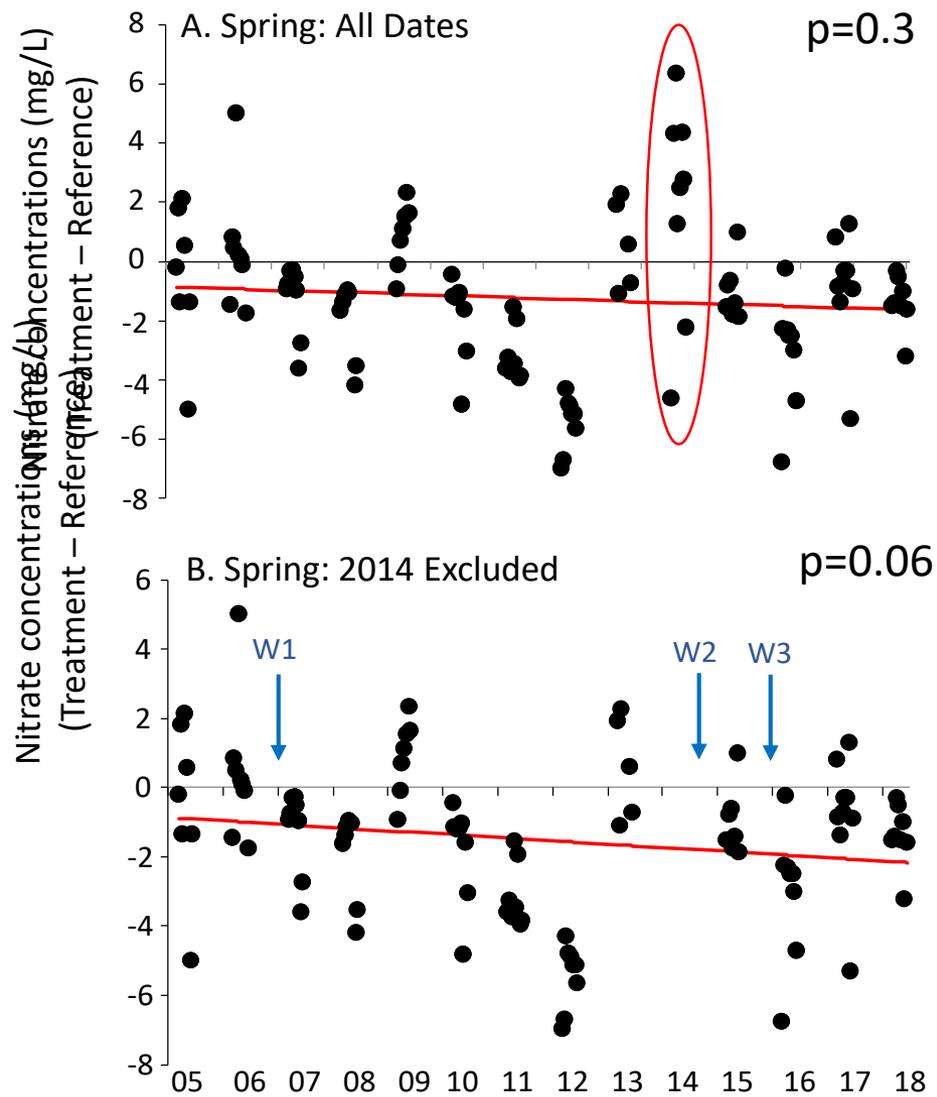


Paired Watershed Project

Quantify watershed-scale effectiveness of constructed wetlands at restoring altered hydrology and reducing nutrient and sediment transport (10,000 acre-scale)

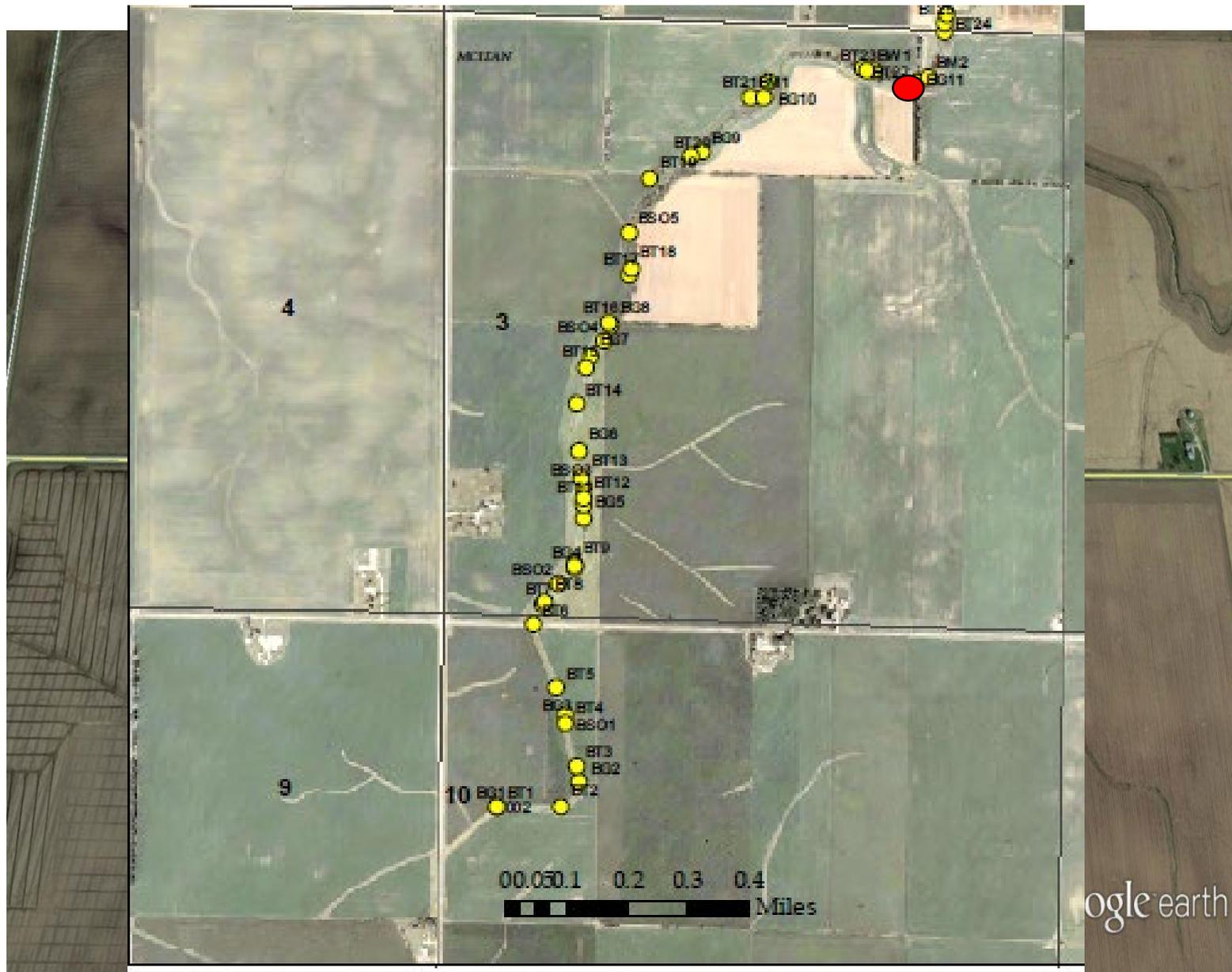






Next step: Bundle winter cover crops with wetlands

Pilot this fall (2019-2020): Cost-share cover crops up to 500 acres



Conservancy Mackinaw Team



Krista Kirkham



Jeff Walk



Adrienne Marino



Ashley Maybanks

Partners and Funding Sources

Natural Resources and Conservation Service
McLean County Soil and Water Conservation District
Farm Services Agency

University of Illinois at Champaign-Urbana
Illinois State University
California Polytechnic State University

Environmental Defense Fund
City of Bloomington, Illinois
Conservation Strategies Consulting, LLC
Midwest Streams, LLC
Brucker Crop Services, LLC
Agricultural landowners and producers

USDA-NRCS Conservation Innovation Grant Program
Illinois Environmental Protection Agency 319 Program
The Coca-Cola Company
World Wildlife Foundation
Ducks Unlimited
Walton Family Foundation
Grand Victoria Foundation
Lumpkin Family Foundation
Anne Ray Foundation
Sand County Foundation
Kellogg Foundation
Monsanto, Syngenta
Mosaic Company; DuPont-Pioneer



Tim Lindenbaum -
Photography

