December 16th: Agriculture Nonpoint Source Subcommittee

Illinois Nutrient Management Strategy Working Group

Morning Agenda:

10:00 am — Noon: Long Standing, New, and Emerging Programs/Practices

- ***10:00 am — 10:40 am Long Standing Programs Panel (***Steve Chard***,** *Bureau Chief, Illinois Department of Agriculture – Moderator***)**
  - ***Soil and Water Conservation Districts Initiatives*** *(Lonnie Wilson – AISWCD**)***
  - ***Illinois Department of Natural Resources, CREP Enhancements and other Initiatives*** *(James Herket – IDNR)*
  - ***USDA-Natural Resources Conservation Service*** *(Kerry Goodrich –NRCS)*
- ***10:40 am — 11:10 am New Programs***
  - ***Illinois Council of Best Management Practices Initiatives (***Jean Payne—IFCA, Howard Brown—GROWMARK, Inc., and Dan Schaefer—CBMP***)***
- ***11:10 — 12:10 Emerging Programs***
  - ***Wetland Restoration (***Doug Blodgett **–** *TNC**)***
  - ***Illinois Buffer Partnership Program (***Debbie Fluegel **–** *Trees Forever**)***
  - ***Watershed Scale BMP's (***Maria Lemke **–** *TNC**)***

LUNCH

- 12:10 pm to 1:00 pm
- Lunch in the IFB cafeteria
- We will be eating in a private dining room

1:00 pm — 1:30 pm Lunch Talk - The Balance and tradeoffs between Regulatory and Voluntary Programs (Dr. Jonathan Coppess***,*** *University of Illinois****)***

Afternoon Agenda

1:30 pm — 3:30 pm Agricultural Subcommittee working meeting

Facilitated Discussion:

- ***1:30 — 2:15 Discuss balance between regulatory and voluntary approaches***
- ***2:15 — 3:20 Prioritization of BMPs for inclusion in Scenario Analyses and nutrient reduction strategy:***
  - 1. Crop production strategies
  - 2. Sediment loss strategies
  - 3. Livestock/Feedlot production strategies
  - 4. Drainage water management strategies
  - 5. Riparian management strategies

- **3:20 pm Select Dates to create Doodle Poll for Future Meetings**

The balance between regulatory and voluntary approaches:

- Key question on each step: **Does each regulatory approach facilitate the type of changes we are looking for?**
  - reducing nutrients in surface waters (improving local conditions for water quality and biodiversity)
  - Reducing nutrients in the Gulf of Mexico
  - Does action: improve conditions, degrade conditions, or offer no benefit?

- Fertilizer record keeping requirement
  - Similar to USDA private applicator pesticide record (regulatory requirement for a restricted use pesticide) amount applied, area, crop, rate, date

- Licensed Fertilizer Applicators (Indiana)
  - Similar to pesticide applicator program – (licensing by state, education by extension)
    - Complete a test/training
    - Following appropriate rates
    - Interpreting soil test information
    - How to calculate rate
    - Safety
    - Calibration
    - Environmental protection BMPs

- Prescription Approach (required to apply fertilizer)
  - Prescription written by credentialed individual. Options include:
  - Build off an existing program, like certified crop advisor,
  - Start your own, build into licensed applicator process

- Consolidated nutrient management plan (SWCD,NRCS, extension). Could include:
  - Soil sampling
  - Limits on levels of nutrients maintained in field
  - Practices needed to achieve target: eg. Tillage practices, buffers, cover crops, etc.
  - Existing programs include:
    - Comprehensive Nutrient Management Plan (Federal Farm Bill participants)
    - Waste Management Plan (Livestock Mgmt. Act)
    - Nutrient Management Plant (NPDES permits for CAFOs)

- Mandatory practice changes:
  - Prohibit application on Frozen ground
  - Prohibition on Fall application of N
  - Required cover crops

OTHER IDEAS?

Prioritization of BMPs for inclusion in Scenario Analyses and Nutrient Reduction Strategy:

- 1. Crop production strategies
- 2. Sediment loss strategies
- 3. Livestock/Feedlot production strategies
- 4. Drainage water management strategies
- 5. Riparian management strategies

Scenario Analysis

- costs per acre for various practices
- estimate each fully applied practice for N or P
- then combine for N or P to reach 20 or 45%
- finally, combine N and P scenarios together

Costs per acre

	Practice/Scenario	Cost Per Acre	Notes
In-field	Reduce tillage	-$16	Eliminate one pass of heavy equipment, no change in yield
	No P fertilizer on 12.5 million ac of CS fields with soil test P above maintenance level for average of 6 years	-$15	Cost of six years of P fertilizer averaged over 20 years.
	Cover crops on corn/soybean tile-drained acres	$29	Aerial applications of cereal rye
	Cover crops on corn/soybean non-tiled acres	$29	Aerial applications of cereal rye
Edge-of-field	Bioreactors on 50% of tile-drained land	$17	Upfront costs of $133 per acre
	Wetlands on 25% of tile-drained land	$60	5% of farmland out of production Major cost is land ($11,000)
	Buffers on all applicable crop land (reduction only for water that interacts with active area)	$294 per buffer acre	Land costs plus $50 planting, $10 yearly maintenance
Land use change	Perennial/energy crops equal to pasture/hay acreage from 1987	$86	Less profit compared to corn-soybean rotation
	Perennial/energy crops on 10% of tile-drained land	$86	Less profit compared to corn-soybean rotation

Example Statewide Results for N

	Practice/Scenario	Nitrate-N reduction per acre (%)	Nitrate-N reduced (million lb N)	Nitrate-N Reduction % (from baseline)	Cost ($/lb N removed)
	Baseline		410		
In-field	Reducing N rate from background to the MRTN (10% of acres)	10	2.3	0.6	-4.25
	Nitrification inhibitor with all fall applied fertilizer on tile-drained corn acres	10	4.3	1.0	2.33
	Split (50%) fall and spring (50%) on tile-drained corn acres	7.5 to 10	13	3.1	6.22
	Fall to spring on tile-drained corn acres	15 to 20	26	6.4	3.17
	Cover crops on all corn/soybean tile-drained acres	30	84	20.5	3.21
	Cover crops on all corn/soybean non-tiled acres	30	32	7.9	10.62
Edge-of-field	Bioreactors on 50% of tile-drained land	40	56	13.6	1.38
	Wetlands on 25% of tile-drained land	40	28	6.8	5.06
	Buffers on all applicable crop land (reduction only for water that interacts with active area)	90	36	8.7	1.63
Land use change	Perennial/energy crops equal to pasture/hay acreage from 1987	90	10	2.6	9.34
	Perennial/energy crops on 10% of tile-drained land	90	25	6.1	3.18
Point source	Point source reduction to 10 mg nitrate-N/L		14	3.4	3.04
	Point source reduction in N due to biological nutrient removal for P		8	1.8	

Example Statewide N Scenarios

Name	Combined Practices and/or Scenarios	Nitrate-N (% reduction)	Total P (% reduction)	Cost of N Reduction ($/lb)	Annualized Costs (million $/ year)
N1	MRTN rate, all spring N application, cover crops 70% tile-drained & 45% non-tiled, bioreactors 50%, wetlands 25%, all ag streams have buffers	45	20	3.71	690
N2	MRTN rate, all spring N application, cover crops 100% tile-drained & 70% non-tiled, bioreactors 50%, perennial crops non-tiled, point source to 10 mg nitrate-N/L	45	33	4.30	800
N3	MRTN rate, cover crops 100% tile-drained & 70% non-tiled, wetlands 25%, perennial crops non-tiled, all ag streams have buffers, point source to 10 mg nitrate-N/L	45	24	4.51	838
N4	MRTN rate, all spring N application, cover crops 5% tile-drained, bioreactors 50%	20	0.3	1.99	163
N5	MRTN rate, cover crops 35% tile-drained, bioreactors 50%	20	2	2.00	162
N6	MRTN rate, cover crops 75% tile-drained, 55% non-tiled	20	8	4.62	382

Example Statewide Results for P

	Practice/Scenario	Total P reduction per acre (%)	Total P reduced (million lb P)	Total P Reduction % (from baseline)	Cost ($/lb P removed)
	Baseline		37.5		
In-field	Convert 1.8 million acres of conventional till eroding >T to reduced, mulch or no-till	50	1.8	5.0	-16.60
	P rate reduction on fields with soil test P above the recommended maintenance level	7	1.9	5.0	-97.50
	Cover crops on all corn/soybean acres	30	4.8	12.8	130.40
	Cover crops on 1.6 million acres eroding>T currently in reduced, mulch or no-till	50	1.9	5.0	24.50
Edge-of-field	Wetlands on 25% of tile-drained land	0	0	0.0	
	Buffers on all applicable crop land	25-50	4.8	12.9	11.97
Land use change	Perennial/energy crops equal to pasture/hay acreage from 1987	90	0.9	2.5	102.30
	Perennial/energy crops on 1.6 million acres>T currently in reduced, mulch or no-till	90	3.5	9.0	40.40
	Perennial/energy crops on 10% of tile-drained land	50	0.3	0.8	250.07
Point source	Point source reduction to 1.0 mg total P/L (majors only)		8.3	22.1	10.22

USLE method

Example Statewide P Scenarios

Name	Combined Practices and/or Scenarios	Nitrate-N (% reduction)	Total P (% reduction)	Cost of P Reduction ($/lb)	Annualized Costs (million $/year)
P1	No P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, buffers on all applicable lands, point source to 1.0 mg TP/ L	7	45	-4.50	-75
P2	No P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on all CS, point source to 1.0 mg TP/L	29	45	29.20	490
P3	No P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on 87.5% of CS, buffers on all applicable lands, perennial crops on 1.6 million ac >T, and 0.9 million additional ac.	38	45	36.30	615
P4	No P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, buffers on 80% of all applicable land	6	20	-24.00	-181
P5	No P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, point source to 1.0 mg TP/L on 45% of discharge	0	20	-24.10	-180
P6	No P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on 1.6 million ac eroding >T and 40% of all other CS	11	20	10.40	78

Example Statewide N & P Scenarios

Name	Combined Practices and/or Scenarios	Nitrate-N (% reduction)	Total P (% reduction)	Cost of Reduction ($/lb)	Annualized Costs (million $/year)
NP1	MRTN, fall to spring, bioreactors 50%, wetlands 25%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, buffers on all applicable lands, point source to 1.0 mg TP/L and 10 mg nitrate-N/L	35	45	**	258
NP2	MRTN, fall to spring, bioreactors 50%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on all CS, point source to 1.0 mg TP/L and 10 mg nitrate-N/L	45	45	**	683
NP3	MRTN, fall to spring, bioreactors 15%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on 87.5% of CS, buffers on all applicable lands, perennial crops on 1.6 million ac >T, and 0.9 million additional ac.	45	45	**	711
NP4	MRTN, fall to spring N, bioreactors 35%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, buffers on 80% of all applicable land	20	20	**	-9
NP5	MRTN, fall to spring N, bioreactors 30%, wetlands 15%, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, point source to 1.0 mg TP/L and 10 mg nitrate-N/L on 45% of discharge	20	20	**	41
NP6	MRTN, fall to spring N, no P fert. on 12.5 million ac above STP maintenance, reduced till on 1.8 million ac conv. till eroding > T, cover crops on 1.6 million ac eroding >T and 40% of all other CS	24	20	**	151

- What BMP practices should be included in nutrient reduction strategy (and ultimately scenario analysis)?
- What target year for intermediate goal should be selected?

1. Crop Production Strategies

- Fall to Spring N application on tile drained acres
- Cover crops on corn and soybean tile drained acres
- Cover crops on corn and soybean non- tiled acres
- No P fertilizer on fields with soil test P above the recommended maintenance level (12.5 million acres)
- Perennial crops on all corn and soybean tile drained acres
- Perennial crops on corn and soybean non- tiled acres

2. Sediment Loss Strategies

- Convert 1.8 million acres of conventional till eroding > T to reduced, mulch, or no-till
- Cover crops on 1.6 million acres eroding >T currently in reduced, mulch or no-till
- Stream bank erosion practices
- Perennial/energy crops on 1.6 million acres eroding >T currently in reduced, mulch or no-till

3. Livestock Production and Feedlot Strategies

- Incorporation of manure applications
- No application of manure on frozen ground
- No fall application of manure

4. Drainage Water Management Strategies

- Bioreactors on tile drained acres
- Wetlands on tile drained acres
- Tile water level management

5. Riparian Management Strategies

- Wetland restoration
- Buffers on applicable cropland
- Buffers on Ag streams

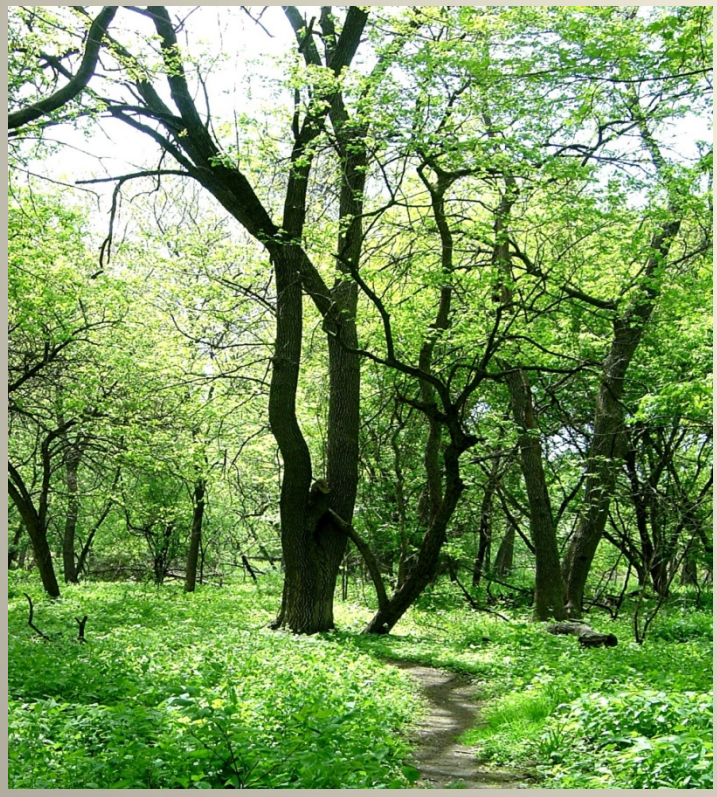
Meeting Dates

- Double Meeting with Working Group meeting?
  - January 15th
  - February is full
  - March 19th
  - April 16th
- Long Day Meeting?
- Other Ideas

Illinois Conservation Reserve Enhancement Program (CREP)

Illinois CREP Program

CREP is a voluntary incentive based initiative designed to provide long term environmental benefits by restoring, enhancing and protecting eligible environmentally sensitive lands within the Illinois and Kaskaskia River Watersheds for the proposes of improved water quality and sustainable wildlife habitats

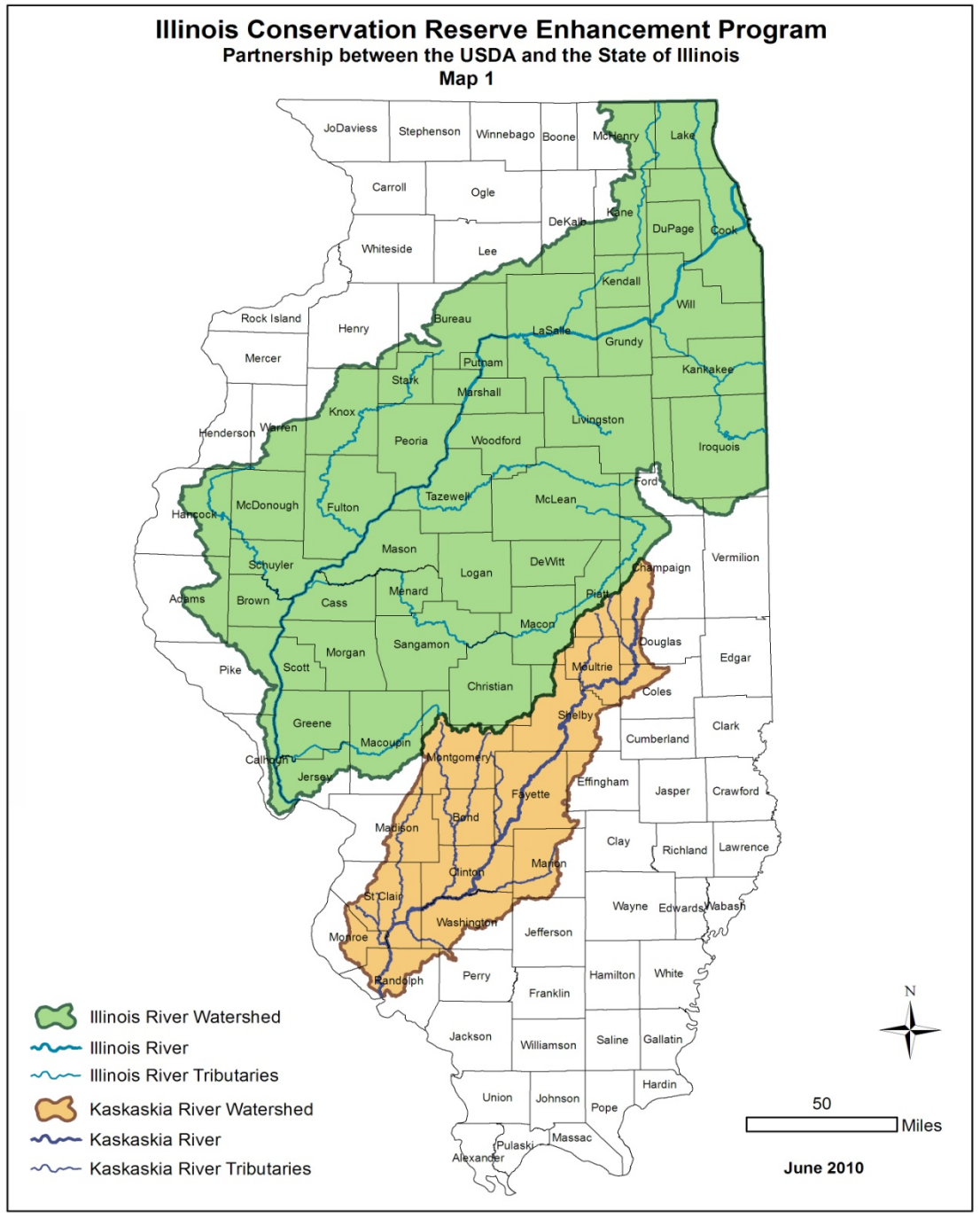


- Provides for voluntary agreements with landowners to convert cropland to a wildlife friendly practice

- Restores floodplains, erodible acreage adjacent to the floodplain and farmed wetlands

- Illinois' program is uniquely designed to address water quality issues and loss of critical habitat for threatened and endangered species and other species in need of conservation

Eligible CREP area



CREP Goals

Reduce Sedimentation by 20%

Reduce Nutrients by 10%

Increase Populations of Waterfowl, Shorebirds, and Grassland Birds by 15%

Increase Native Fish & Mussel Stocks in the Lower Reaches by 10%

Help reduce nitrogen loading to Mississippi River and Gulf of Mexico

Multi-Agency Delivery System

- Farm Service Agency (FSA)
- Natural Resources Conservation Service (NRCS)
- Lewis and Clark CC and NGRREC
- Soil and Water Conservation Districts (SWCDs)
- The Illinois Department of Natural Resources (IDNR)
- The Illinois Department of Agriculture (IDOA)
- Illinois Environmental Protection Agency (IEPA)

Enrollment Options

15 Year Federal CRP/CREP Contract (Federal contract)

Federal contract + 15 Year State Easement;

Federal contract + 35 Year State Easement;

Federal contract + Permanent State Conservation Easement

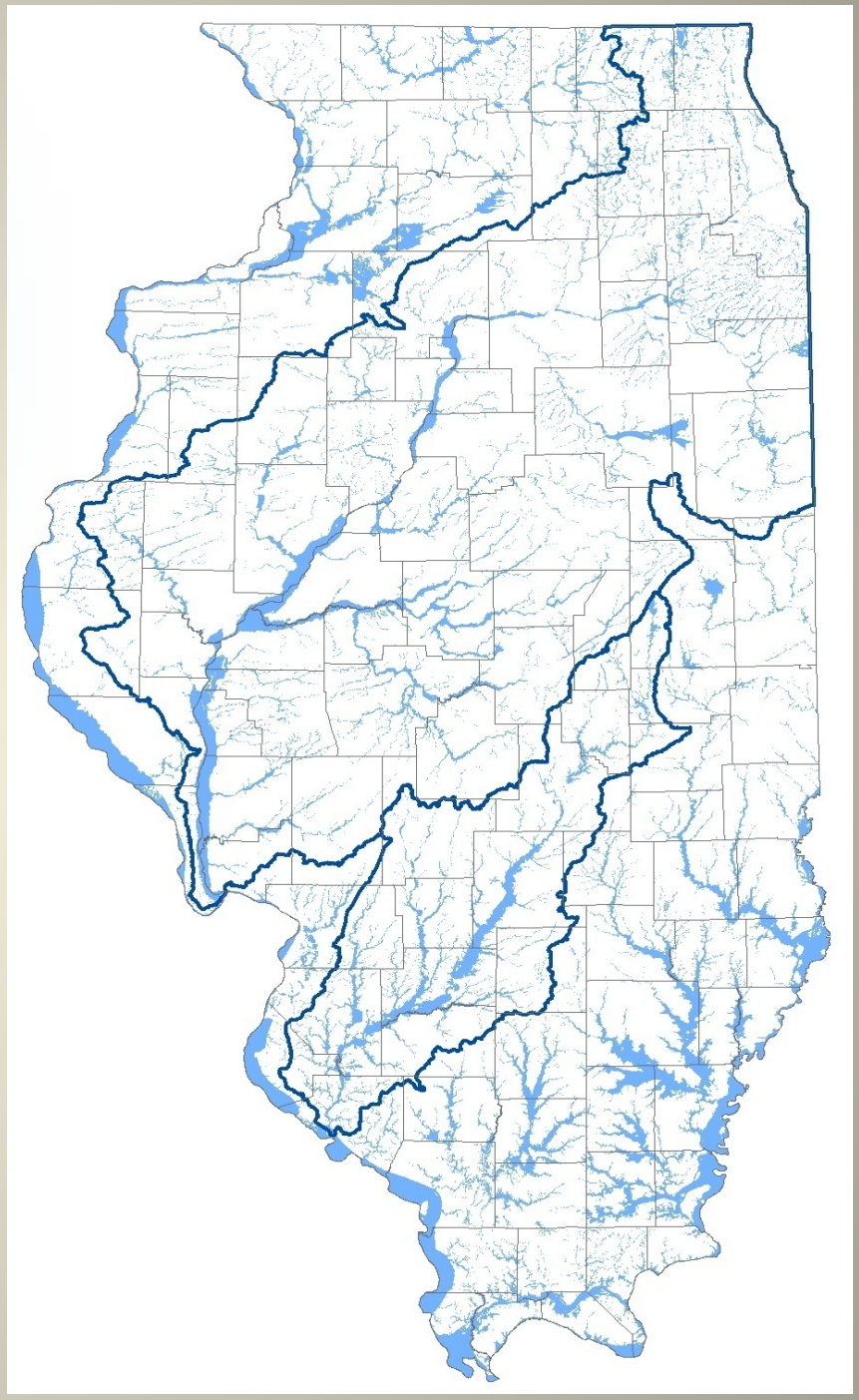
Eligible Practices

for Riparian Areas (100 yr floodplain)

CP3A Hardwood Tree Planting
CP4D Permanent Wildlife Habitat
CP9 Shallow Water Areas for Wildlife
CP11 Vegetative Cover-Trees-Already Established
CP12 Wildlife Food Plot
CP21 Filter Strip
CP22 Riparian Buffer (Cropland or Marginal Pastureland)
CP23 Wetland Restoration
CP25 Rare and Declining Habitat

100-Year Floodplain

- Use of Federal Emergency Management Agency (FEMA) maps.



Eligible Practices

For Land with a weighted EI ≥ 8

CP2 Permanent Native Grasses

CP3 Tree Planting

CP3A Hardwood Tree Planting

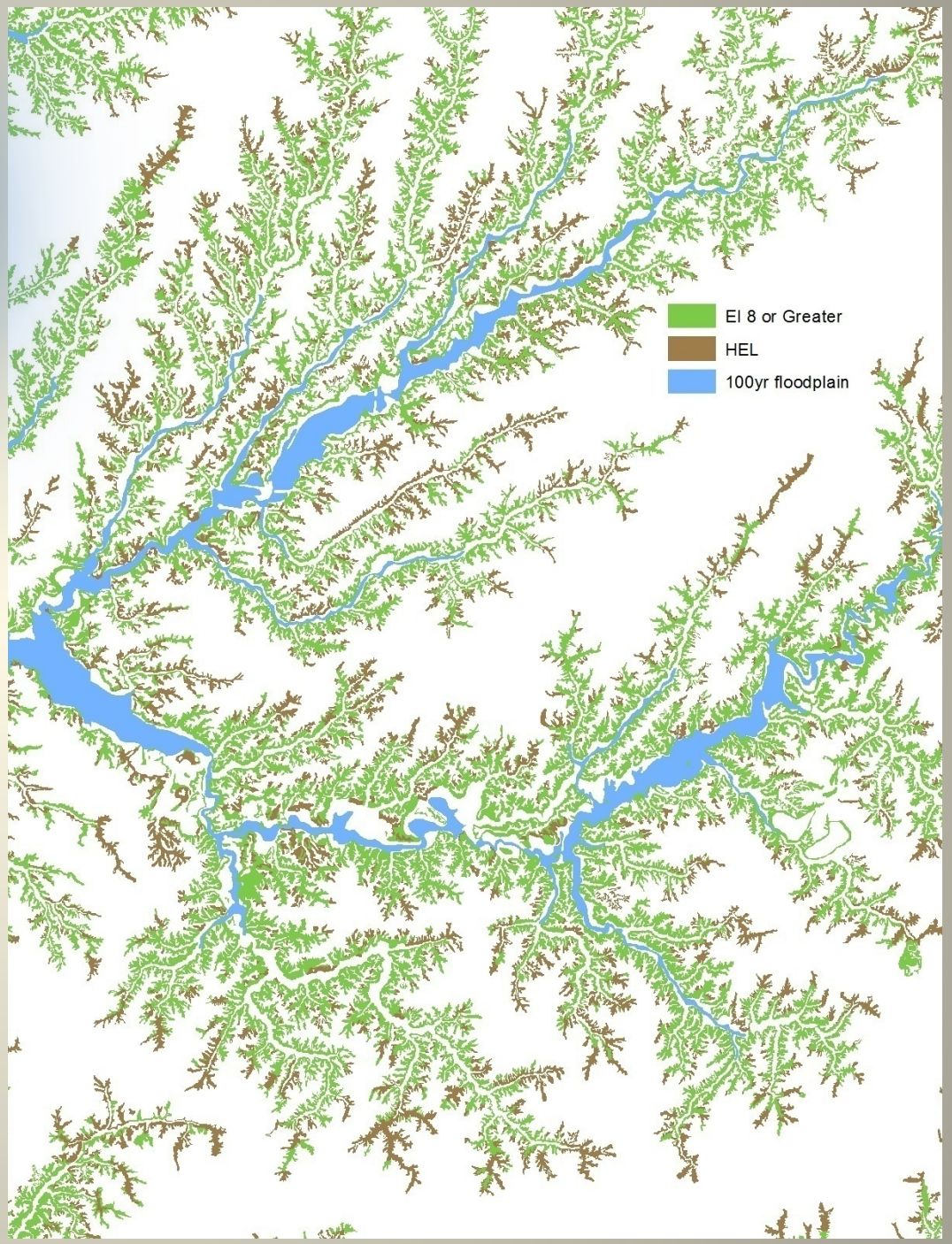
CP4D Permanent Wildlife Habitat

CP12 Wildlife Food Plot

CP25 Rare and Declining Habitat

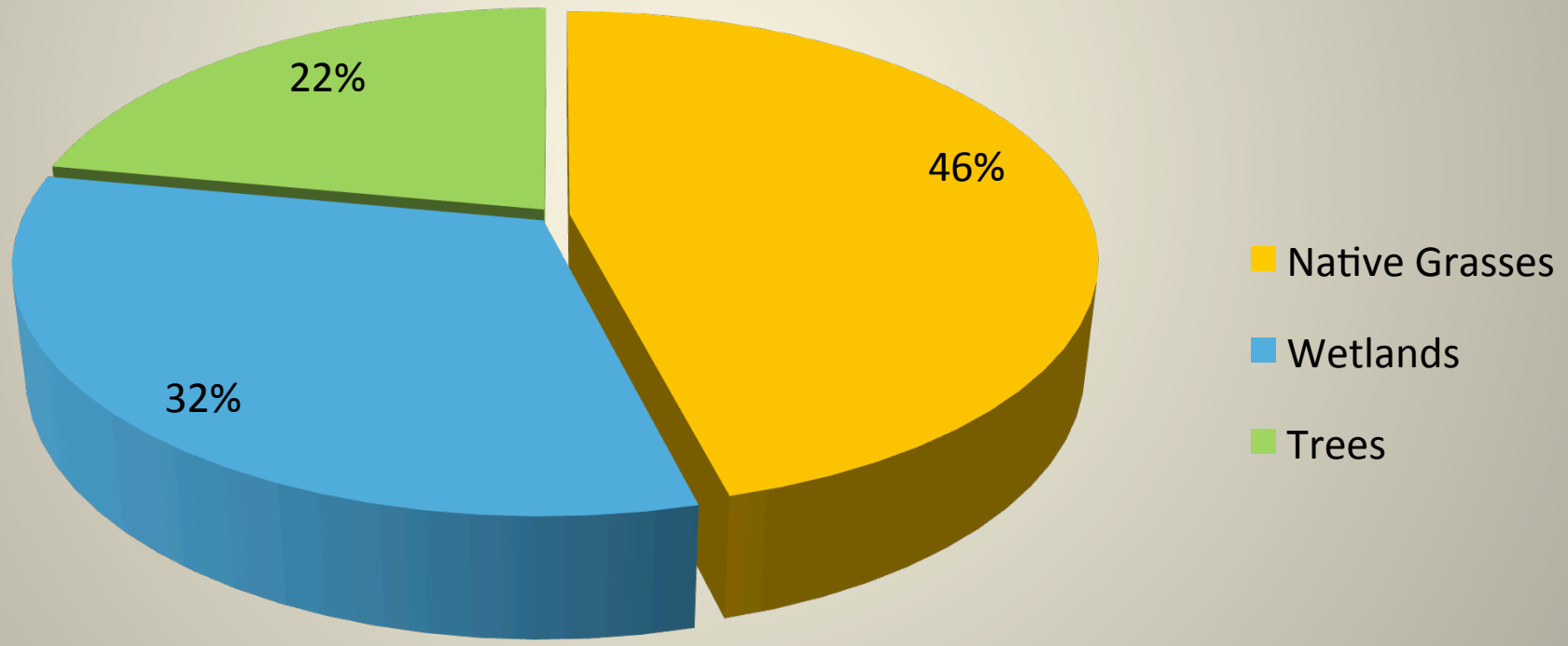
Soils Determination

- Soils with an Erodibility Index of 8 or greater
- Soils classified as Highly Erodible Land



Types of Practices Enrolled

142,500 acres enrolled in CREP Conservation Practices



Additional Acres

BONUS for permanent easement commitments!

Landowners who enroll in the permanent easement option have the opportunity to offer other acres adjacent to the eligible cropland at the same time the cropland is enrolled in the State easement

Additional acres must be adjacent to the cropland enrolled in the permanent easement or on the opposite side of the stream if immediately adjacent to the stream

Enrollment of additional acres allows for permanent protection of contiguous land corridors along the rivers and streams

Reasons For Additional Acres

To allow enrollment of other CRP sign-ups to complete corridors that meet local or state watershed and habitat objectives

To allow for consistent management of property across the whole piece owned;

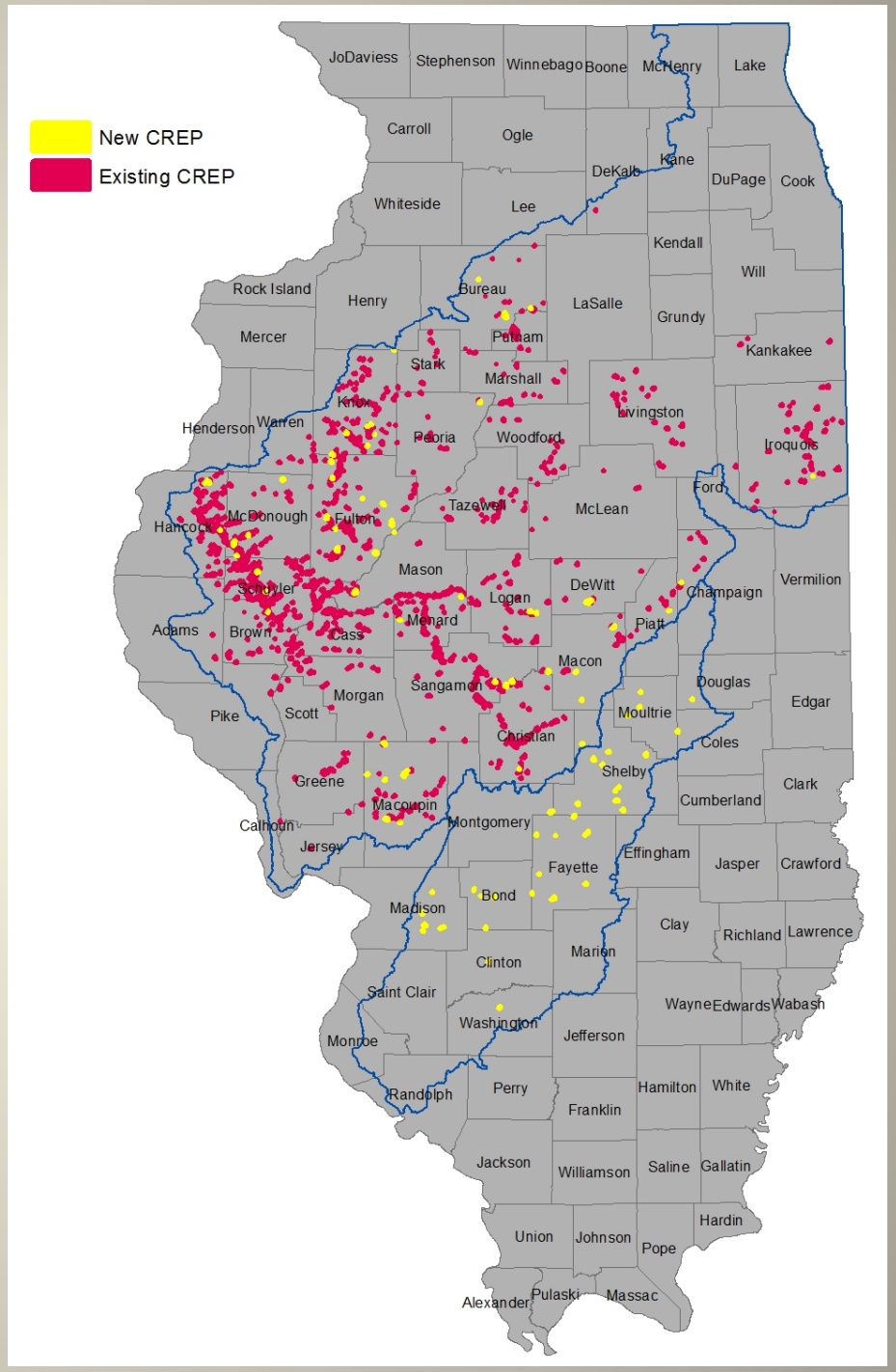
To meet 20-acre minimum requirement for permanent easements

Additional acres are subject to Review and Approval Process

Where are the CREP easements located?

More than 1200 landowners have enrolled in State CREP since 1989 with easements totaling 85,000 Acres

The average size of a State CREP easement is 66 acres



Why is CREP important?

With over 90% of land in Illinois privately owned, programs like CREP are essential to effectively address important environmental issues

Sedimentation and nutrients in the rivers and streams are reduced, while creating and enhancing critical habitat for fish and wildlife populations

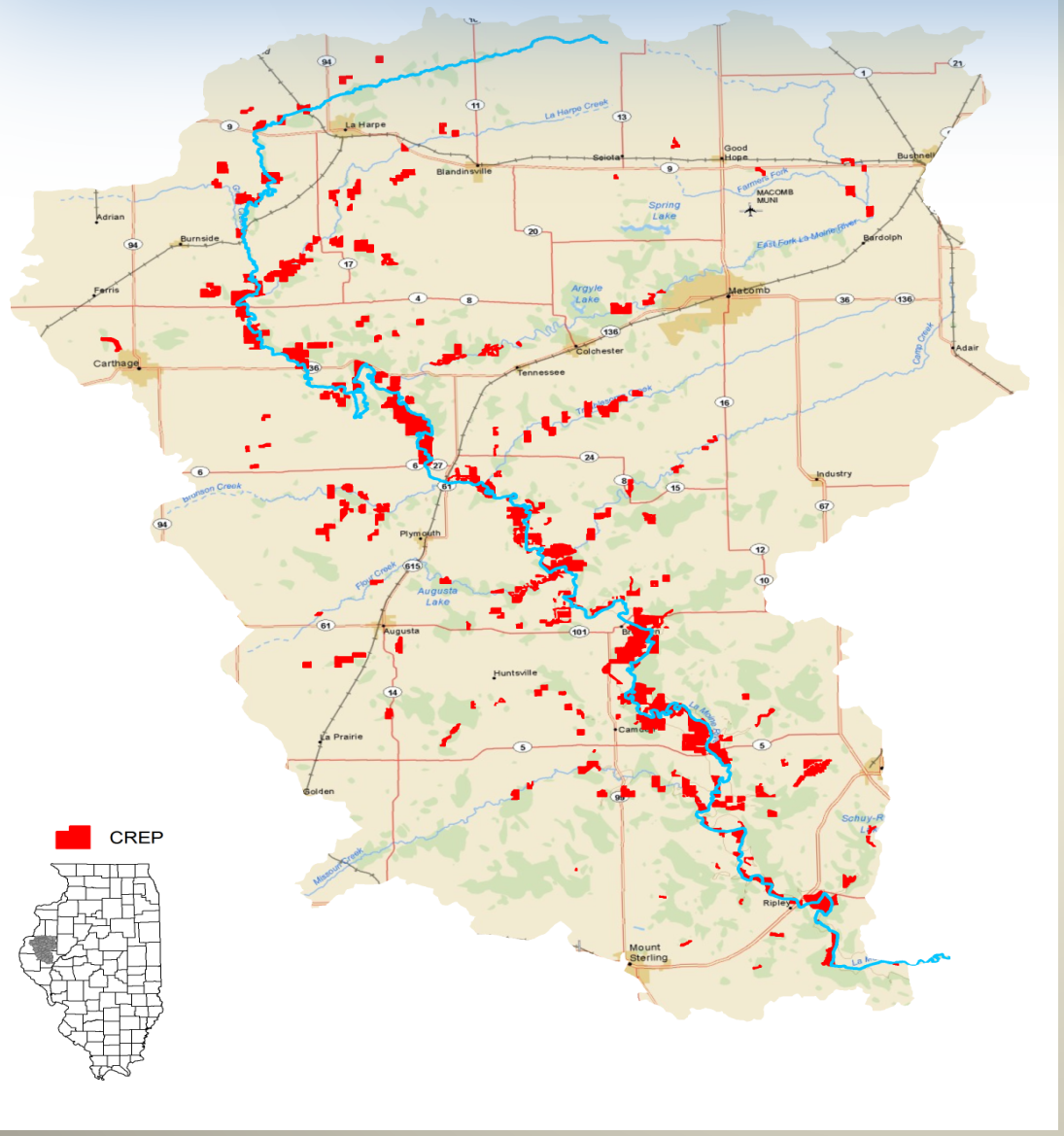
Landowner Benefits

- No agricultural production costs on marginal farm land
- Retain Ownership
- Timber harvest allowed with a Forestry Management Plan
- Improved water quality and fish and wildlife habitat
- Possible Tax Reduction
- Hunting, fishing, and other recreational activities allowed

Illinois CREP Program

- Eligible landowners in the Illinois and Kaskaskia Watersheds
- USDA Farm Bill Program
- State offers 15yr, 35yr or permanent easement options
- Permanent easements allow for an additional acres option
- Improved water quality and wildlife habitats

Model For Success



More than **18,000 acres** have been enrolled in the LaMoine River Watershed alone, securing long-term protection along a **53-mile** stretch on both sides of the river

NRCS Programs and Initiatives Related to the Nutrient Strategy

Kerry I Goodrich
State Resource Conservationist
USDA-NRCS Champaign, Illinois
December 16, 2013

NRCS History & Mission

- Established in 1936 as SES
  - Watch over nations soil resources
- Changed to SCS then NRCS as mission grew
  - Watch over nations natural resources (SWAPA)
- Conservation Technical Assistance (CTA) – Conservation Planning
  - Focus is on identification of resource concerns and standards to maintain, enhance, and restore natural resources
  - Delivery system through voluntary financial assistance & conservation districts

Practice Standards

- Since 1936, NRCS has developed over 160 individual practice standards used to solve resource concerns
- Practice standards fall into 3 main categories:
  - structural,
  - vegetative, and
  - management

Conservation Practice Physical Effects (CPPE)

- Identifies physical effects on soil, water, air, plants and animals for each conservation practice
  - +/- 0 to 5
  - Positive or negative from none to substantial
- In relation to water:
  - Reduced nutrients & organics to surface & groundwater
  - Reduced erosion & sediments
  - Reduced temperature
  - Reduced pathogens

Effects on Water Quality

- Examples of standards affecting WQ include:
  - Structural
    - Terraces
    - Water & sediment control basins
    - Grade stabilization structures
    - Grassed waterways
    - Stream bank stabilization practices
    - Manure lagoons
  - Vegetative
    - Grassed waterways
    - Filter strips
    - Cover crops
    - Forest/herbaceous riparian buffers
  - Management
    - Crop rotation
    - Conservation tillage
    - Nutrient management
    - Prescribed grazing
    - Drainage water management

NRCS Programs & WQ

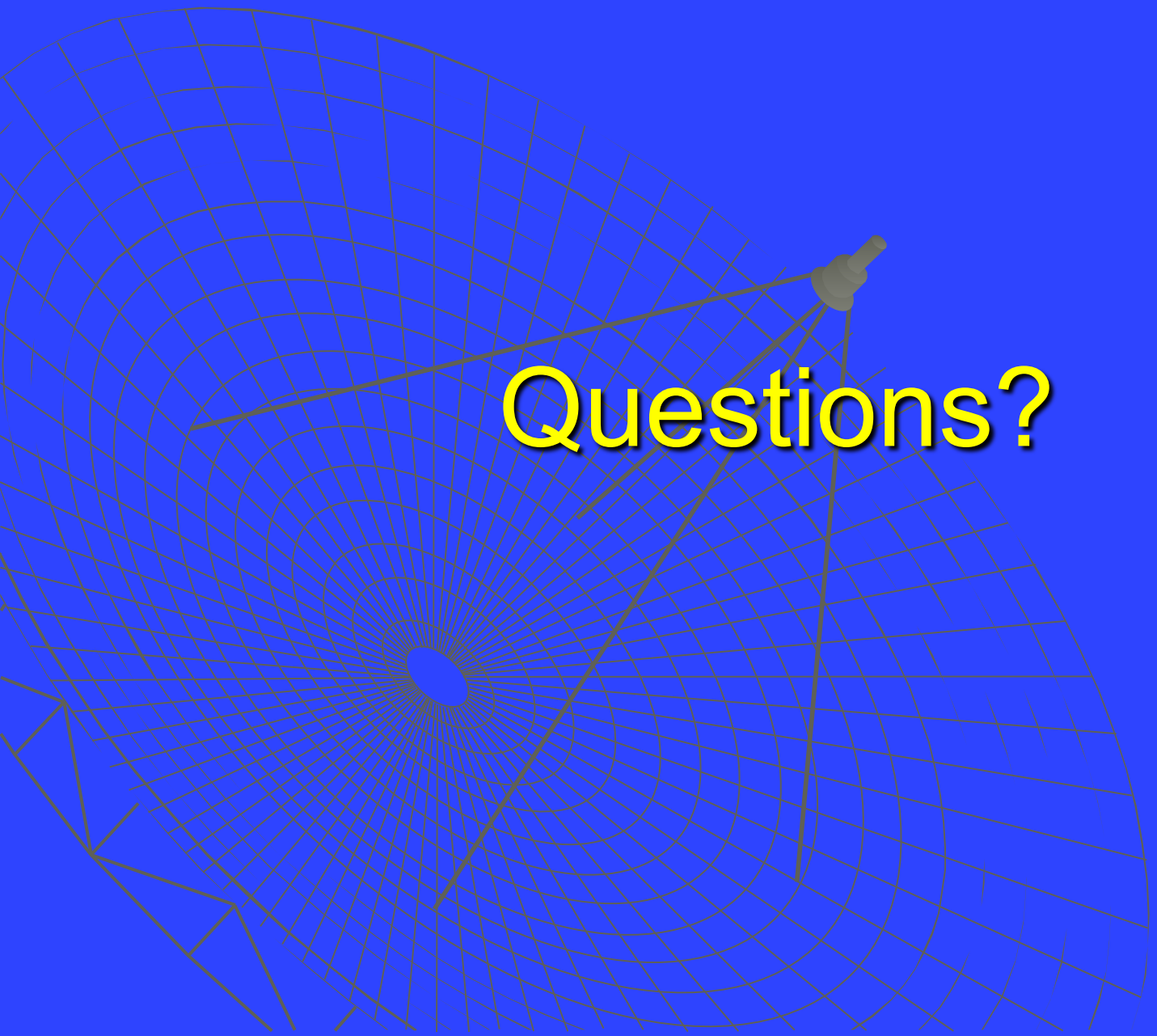
- NRCS provides financial assistance to help landowners implement conservation practices through several legislated programs:
  - Environmental Quality Incentive Program (EQIP)
    - Applicants apply for financial assistance to implement conservation practices in conservation plans
    - Conservation Activity Plans (CAP)
      - Developed by Technical Service Providers (TSP's)
      - CNMP, GMP, FMP, IWMP
      - 2 new plans this year (NMP, PBP)
    - Some funding pools
      - General
      - Livestock
      - Forestry
    - Applications are ranked based on environmental benefits
      - Highest ranked applications are funded with available funds

NRCS Programs & WQ

- EQIP Funding Continued
  - Initiatives
    - Mississippi River Basin Healthy Watersheds Initiative (MRBI)
      - Lower Illinois (Big Bureau Creek, Senachwine Creek)
      - Vermillion River (Indian Creek)
    - National Water Quality Initiative (NWQI)
      - Douglas Creek – St Clair Co.
      - Crooked Creek - Richland, Wabash, Edwards, Lawrence Counties
      - Lake Vermillion – Vermillion Co.
    - Driftless Area Landscape Conservation Initiative (DALCI)
      - Jo Daviess, Carrol, Stephenson, & Winnebago Counties
  - Conservation Innovation Grants (CIG)
    - For demonstration of innovative technology
    - Example is a CIG with TNC in Bloomington that has installed paired wetlands and are monitoring their ability to capture nutrients in surface runoff and from drain tiles

NRCS Programs & WQ

- Conservation Security/Stewardship Program (CSP)
  - Reward producers for good stewardship and willingness to adopt advanced technology
- Agricultural Water Enhancement Program (AWEP)
  - Irrigation upgrade projects in Mason, Tazewell, Cass, Menard, and Logan counties (Ended)
- Easement Programs
  - Wetland Reserve Program (WRP)
  - Grassland Reserve Program (GRP)
  - Farm & Ranchland Protection Program (FRPP)
  - Healthy Forest Reserve Program (HFRP)
  - Assist Farm Service Agency with the Conservation Reserve Program (CRP)



Questions?

AGRICUTURAL NONPOINT SOURCE SUBCOMMITTEE

Monday, December 16

Illinois Farm Bureau

State Cost-Share Programs

Conservation Practices Program (CPP) - Purpose

- Provide cost-share assistance to eligible landowners.
- For constructing conservation practices that conserve soil and protect other natural resources.

One out of every four cropland fields are experiencing either ephemeral or gully erosion. These agricultural lands are the target of the Conservation Practices Program.

CPP Eligible Practices

- Contour Farming

- Contour Strip cropping or Buffer Strips

CPP Eligible Practices

- No Till and Strip Till

- Cover and Green Manure Crops

CPP Eligible Practices

- Grassed Waterway

- Diversions

CPP Eligible Practices

- Terraces

- Water and Sediment Control Basin

CPP Eligible Practices

- Grade Stabilization Structures

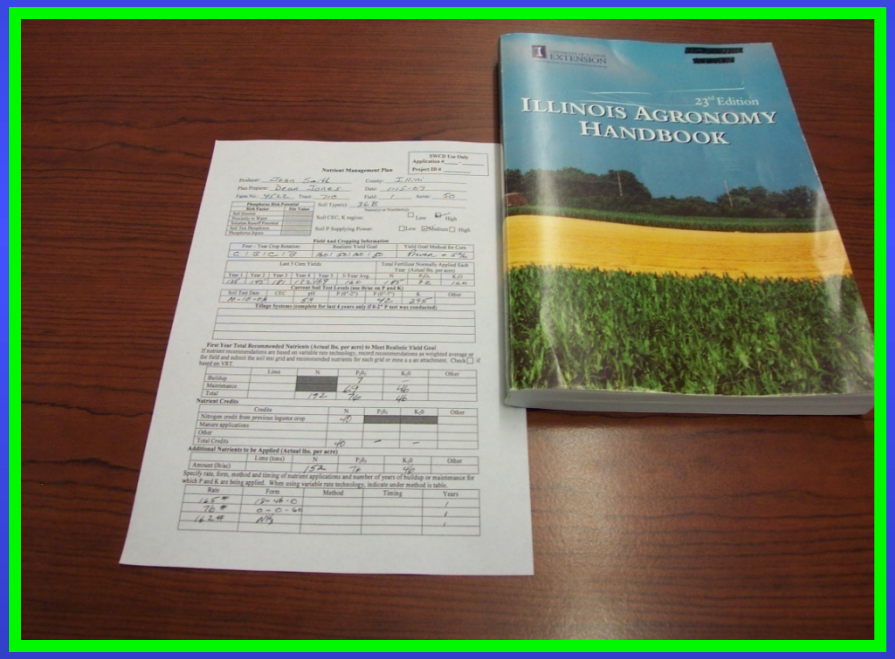
CPP Eligible Practices

- Filter Strips

- Temporary Seeding

Nutrient Management

- Nutrient Management Planning



- NMP Implementation

Water Well Decommissioning

- Sealing Abandoned Water Wells

Streambank Stabilization & Restoration Program Eligible Practices

- Low-cost Streambank Stabilization Techniques

Stream Barbs

Rock and Pool Riffles

Cost-share Administration

- Administered locally through County Soil and Water Conservation Districts (SWCDs).
- Each SWCD receives an allocation with which to cost-share with landowners.
- Each SWCD will prioritize and select eligible projects. Provides up to 60% cost-share for CPP, with higher rates in special watersheds.
- SSRP (streambank) practices are cost-shared at 75%.
- Technical assistance provided at no cost for all practices.

IDOA Cover Crop Initiative

Overview

Cover Crops vs. Structural BMP's

– Adoption of cultural practices like cover crops can provide environmental and economic production benefits on many more acres for significantly lower program cost

IDOA Cover Crop Initiative

Overview

Renewed Interest

- Growers and Landowners show renewed interest in learning about the benefits
- They are starting to plant limited acres of cover crops
- Research, new cover crop varieties, management techniques

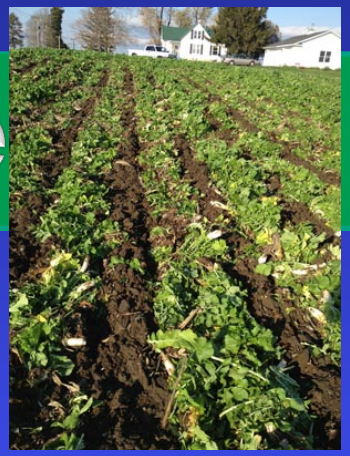
IDOA Cover Crop Initiative

Benefits

Reduction of…

- Runoff
- Soil Erosion
- Nitrate Leaching
- Soil Compaction
- Soybean Cyst Nematodes
- Weed Pressure

IDOA Cover Crop Initiative



Benefits

To Improve…

- Nutrient Cycling
- Soil Structure
- Organic Matter
- Carbon Sequestration
- Wildlife Habitat
- Water Quality

IDOA Cover Crop Initiative

Objectives

- Increase adoption of Cover Crops throughout Illinois
- Provide leadership in dissemination of information to agricultural community + general public on cover crop benefits
- Partner with USDA-NRCS and SWCD's to showcase environmental & economic benefits of Cover Crops
- Illinois Stewardship Alliance & American Farmland Trust

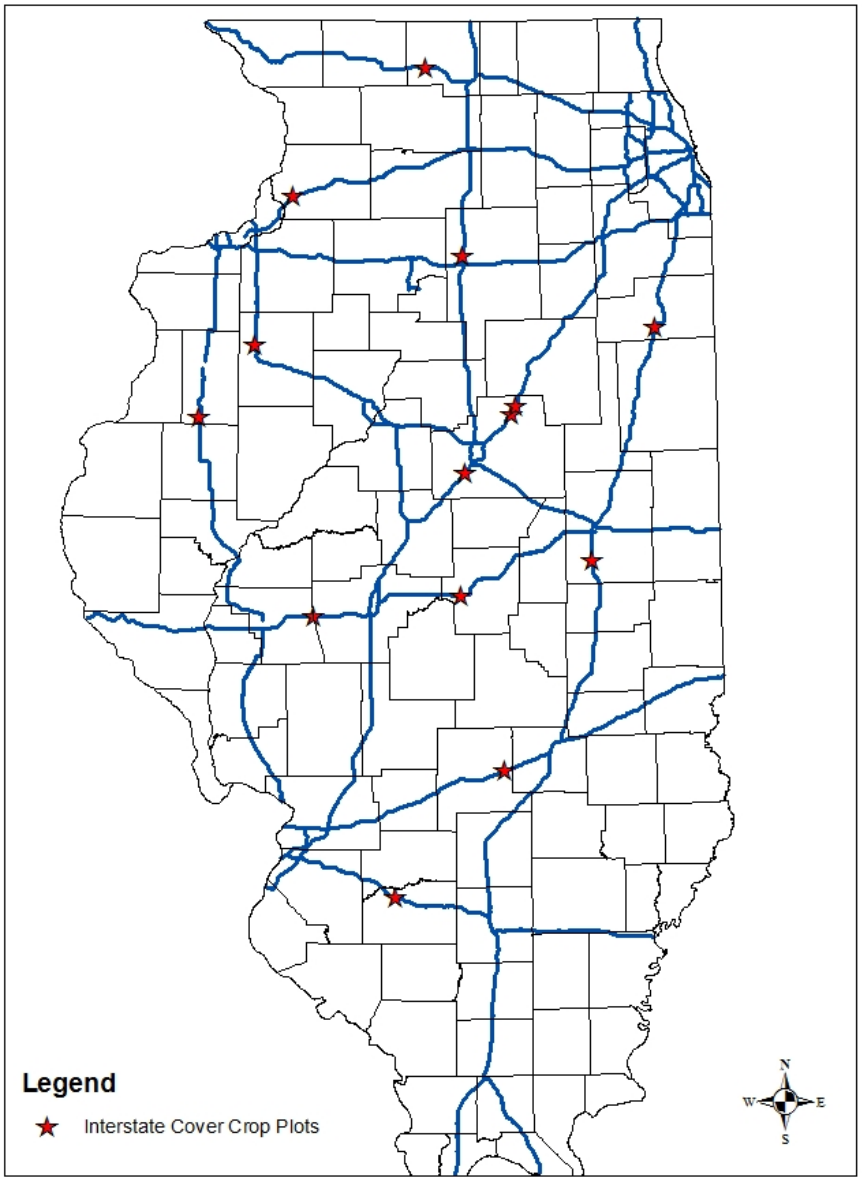
IDOA Cover Crop Initiative

Interstate Plots

- 2 sites along US 20 and US 67

- 14 sites selected throughout Illinois
- 3 year project (2013-2015)
- In all, sites total at least 500 acres
- Signage to include website

Illinois Department of Agriculture Cover Crop Initiative



Illinois Department of Agriculture

Division of Natural Resources
Bureau of Land and Water Resources

Lawrence
County SWCD

Jon Buchanan
Shane Thacker

COVER CROPS

Demonstration Project

covercrops.illinois.gov

IDOA Cover Crop Initiativ

Website

covercrops.illinois.gov

- Network Mission
- Resources
- Research
- Business Directory
- Universities
- Plot Information
- Grower Testaments
- MCCC Decision Tool
- Agencies/ Organizations
- Events

CONSERVATION CROPPING

2014 SEMINARS

Managing your inputs for healthy soils...

1-DAY SEMINAR AGENDAS

Select the location closest to you. For more information visit ccswcd.com and click on CCS logo or contact your local USDA Service Center.

JANUARY 28th MENDOTA, IL

8:30-8:50am.....Registration, Refreshments & Exhibitors
8:50–9am.....Welcome & Opening Remarks
9–9:20am....."Why Cover Crops Make Sense For the World & Illinois,"Mr. Howard Buffett (webcast)
9:20–10am.....Roger Windhorn, NRCS - Soil Health
10–10:15am.....Networking Break & Refreshments
10:15–12:15pm...Cover Crop Sessions with Cade Bushnell, Steve Berger, and Dave Robison
12:15–1pm.....Networking Lunch (included with registration) & Exhibitors
1–2:00pm.....Ron Olson, "Balanced Crop Nutrition for High Yields"
2–3:00pm.....Ken Ferrie, "Managing Nitrogen loss w/ Cover Crops"
3–3:30pm ....."Unlock the Secrets in the Soil "– Ivan Dozier, NRCS State Conservationist
3:30–5:00pm.....Speaker Meet & Greet, Exhibitors, Attendees & Refreshments

Mendota Civic Center
1901 Tom Merwin Dr., Mendota
Marty McManus (309) 738-7227

FEBRUARY 27th MT. VERNON, IL

8:15-8:45am.....Registration, Refreshments & Exhibitors
8:45–9am.....Welcome & Opening Remarks
9–9:20am....."Why Cover Crops Make Sense For the World & Illinois," Mr. Howard Buffett (webcast)
9:20–10am.....Cover Crop Systems, Hans Kok, Professor & Researcher
10:00–10:15am....Networking Break & Refreshments
10:15–10:45am...Conservation Tillage Concurrent Sessions A) No-Till & Nutrient Efficiency, Terry Wyciskalla B) Weed Management, Tom Eubank, Mississippi State C) Cyst-Nematodes in No-till Systems, Fred Beane & Phil Krieg
10:50-11:25am.....Repeat Concurrent Sessions A, B & C
11:25-11:55am.....Water Quality Innovation Sessions A) Economics of Tiling in So. Illinois B) Drainage Water Mgt., Ruth Book, NRCS C) Cover Crops in Nutrient Retention & Scavaging, Jon Schoonover, SIU Carbondale
12:00–1pm.....Networking Lunch (included with registration) & Exhibitors
1–3:00pm.....A) Cover Crops 101 & 201, Ron Althoff B) Local Farmer Panel Discussion
3–3:30pm ....."Unlock the Secrets in the Soil" – Ivan Dozier, NRCS State Conservationist
3:30–5:00pm.....Speaker Meet & Greet, Exhibitors, Attendees & Refreshments

Holiday Inn Convention Center
222 Potomac Blvd. Mt. Vernon
Gary Albers (618) 476-7230

Take Aim At No-Till

With The Best Tips, Ideas And Techniques From No-Till Experts And Your Fellow Farmers

The 22nd annual National No-Tillage Conference offers more than 100 cutting-edge, money-making sessions over 4 days, delivering insightful learning and unlimited networking with the best of the no-till community.

We're aiming to make the annual meeting of the no-till nation even better in 2014!
More Classrooms! More Roundtables!
See you January 15 to 18 in the Land of Lincoln!

22nd Annual National No-Tillage Conference

Springfield, Ill. • Jan. 15-18, 2014

An Honest No-Till Education

COMPLETE COVERAGE

Offering an outstanding lineup of more than 40 no-till farmers and educators from around the globe...

- ✔ The most comprehensive agenda of no-till topics in the ag industry
- ✔ Time-tested techniques to expand your no-till cropping income
- ✔ New strategies for protecting your income throughout 2014
- ✔ Fully guaranteed to offer new no-tilling ideas and strategies
- ✔ A chance to learn from the leading no-tillers across the country

COMPLETE FOCUS

Featuring in-depth coverage of everything from equipment modifications to no-till fertility to soil-building strategies...

- ✔ Improving soil biology
- ✔ N, P & K fertility strategies
- ✔ Cover-cropping systems
- ✔ Planter & drill refinements
- ✔ Precision technology payoffs
- ✔ Water-management strategies
- ✔ Strip-till opportunities
- ✔ No-till weed control
- ✔ Increasing no-till wheat yields

COMPLETE IMMERSION

An extremely valuable 22-year-old "think tank" for success-minded no-tillers, planned by no-tillers like you, seeking the best income-expanding strategies available today...

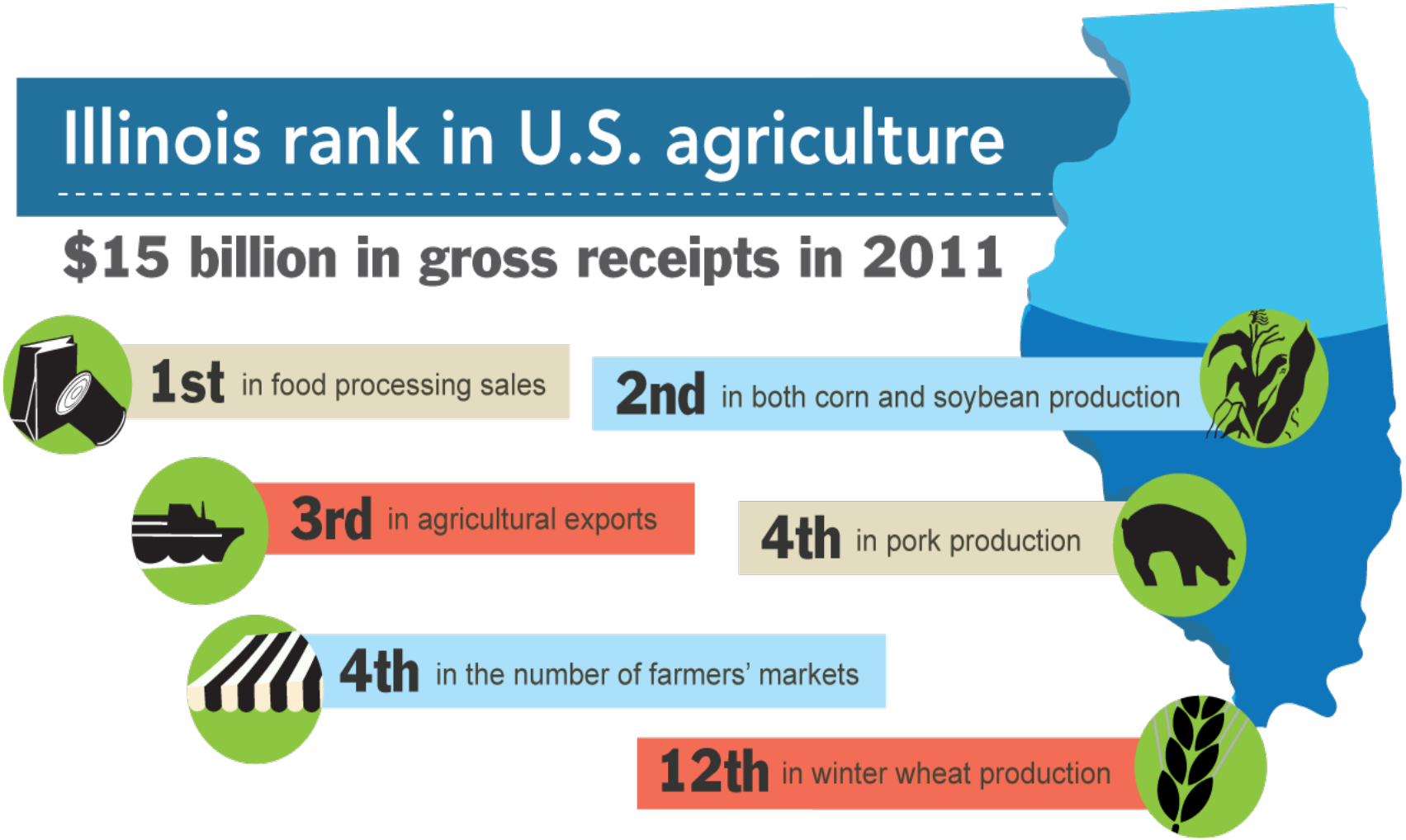
- ✔ 8 No-Till General Sessions with 17 practice-changing presentations
- ✔ 29 — Yes, 29! — No-Till Classrooms
- ✔ 78 No-Till Roundtables
- ✔ Special breakfast, luncheon and dinner banquets with more great no-till info
- ✔ Numerous education credits for both pesticide recertification

IT'S ALL ABOUT

MOM

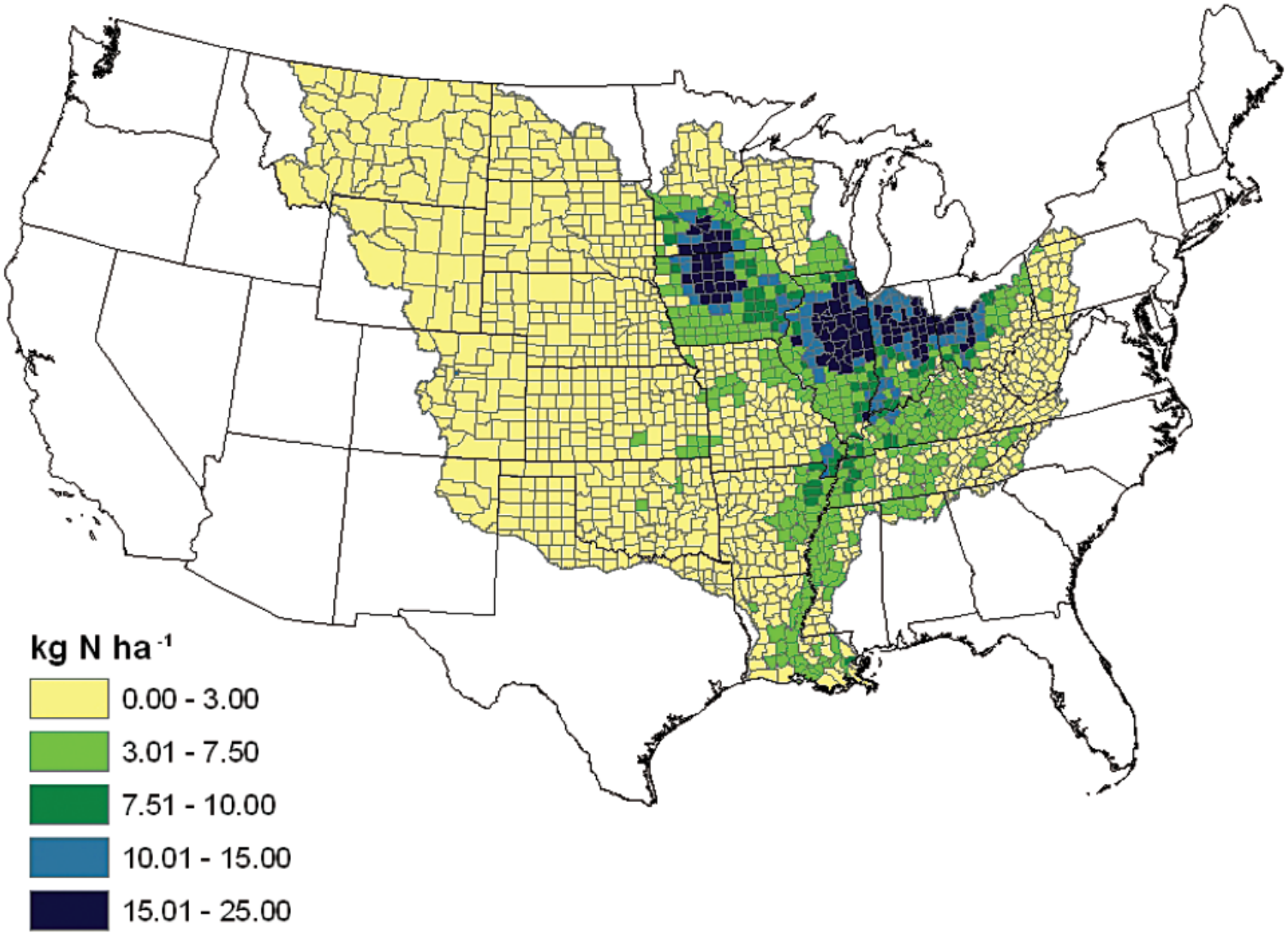
Minimize Environmental Impact
Optimize Harvest Yield
Maximize Input Utilization

Scope of the Industry



More About Illinois…..

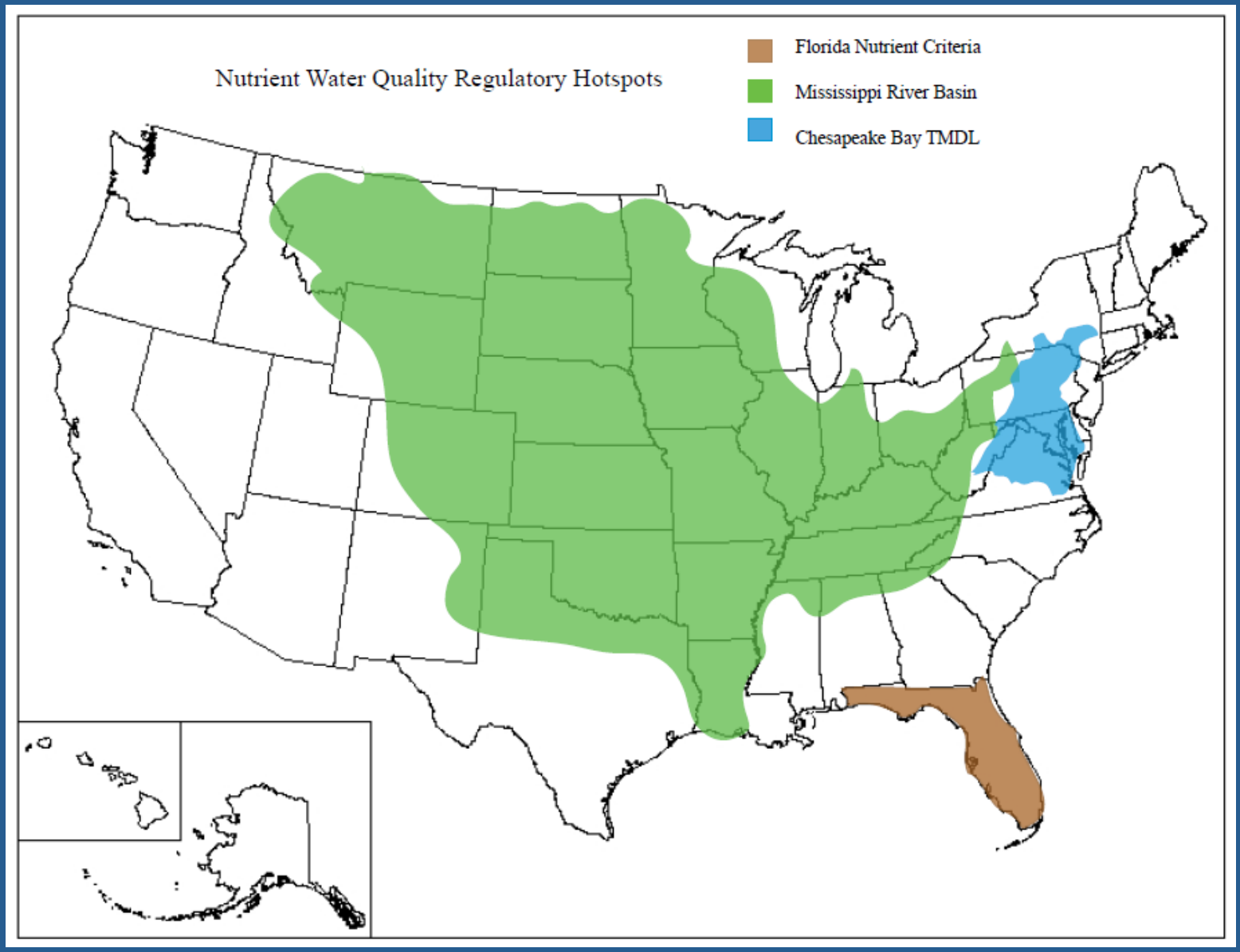
- Nearly 5 million tons of agricultural fertilizer used per year; 650 retail outlets; 13 ammonia terminals; 1 nitrogen manufacturing plant.
- 70% of nitrogen used for crops is in the form of anhydrous ammonia
- 13 million people in a mostly agricultural state



Predicted average riverine nitrate N yield, January to June, for all counties in the Mississippi River basin for the period 1997 to 2006.

David et al., 2010

Federal Programs & Litigation



* Illinois Farm Bureau
* Illinois Corn Growers Association
* Illinois Soybean Association
* Illinois Pork Producers Association
* Illinois Fertilizer & Chemical Association
* Syngenta Crop Protection
* GROWMARK
* Monsanto

What is Agriculture Doing?

1. **Met with all Nutrient Stakeholders in 2011 (Sanitary Districts, Environmental Groups, Manufacturing, Construction)**

2. **Developed KIC Program as Illinois's 4R Plan**

3. **Funded KIC with donations from ICGA, IFCA, ISA & IFB ($300,000) while working on legislation to create Nutrient Research & Education Council (NREC)**

4. **CBMP Hired Full Time Director of Nutrient Stewardship in January 2012**

KIC 2025

Keep It for the Crop by 2025

Dan Schaefer

Director of Nutrient Stewardship

CCA, CPAg

Right Source

Right Rate

Nitrogen Management System

Right Time

Right Place

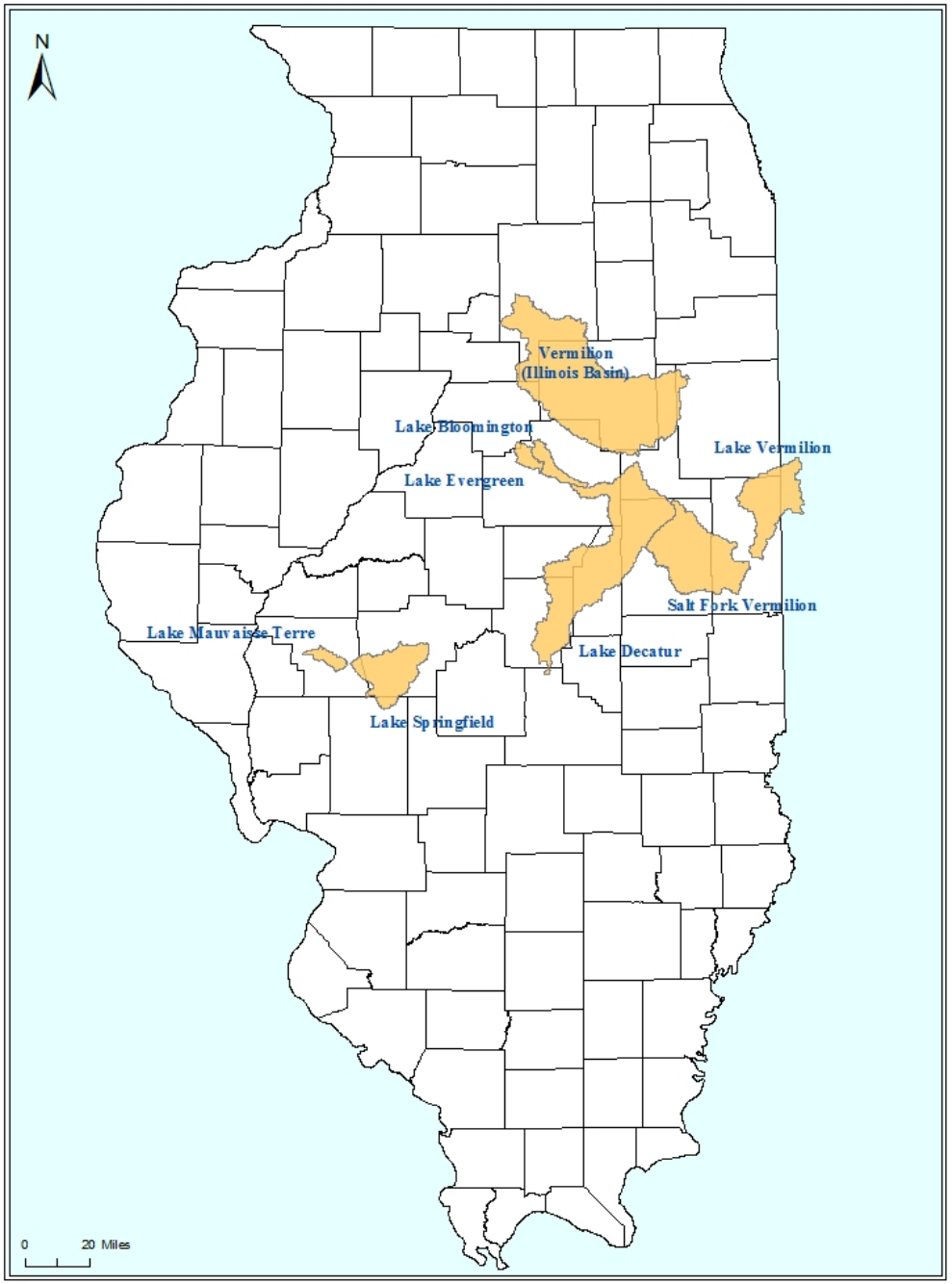
4 nutrient stewardship

Farm Progress Show – KIC Launch, September 1, 2011
Gary Hudson, IL Corn Growers President
Jean Payne, IFCA President
Lisa Bonnet, IEPA Director

KIC Priority Watersheds

Listed by Illinois EPA as being impaired due to high levels of nitrogen, phosphorus or both

Serve as drinking water supplies for major Illinois communities



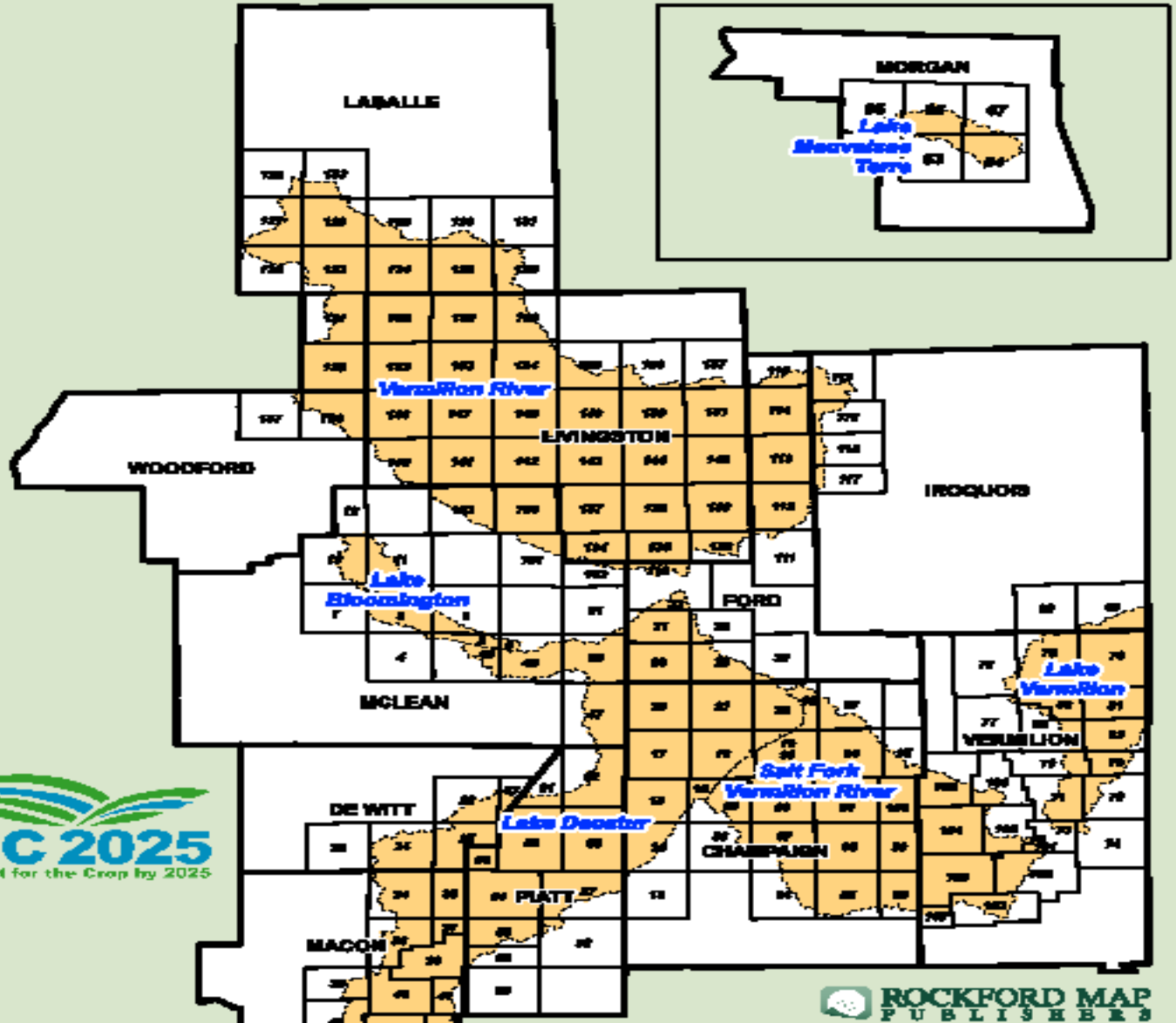
2011

KIC Includes:

- Managing Nitrogen as a System instead of an Application
- On-Farm Nitrogen Rate Trials to develop Reliable, Defensible, N Rate in the Watersheds
- NWATCH soil testing program is a nitrogen education and management tool; critical after 2012 drought
- Targeted Program in Lake Springfield with Retailers, Farmers, SWCD and CWLP to lower lake Nitrate Levels
- Promoting Cover Crops to Retain Nutrients when N Watch tests indicate high soil residual N after harvest

ILLINOIS PRIORITY WATERSHEDS

INDEX MAP

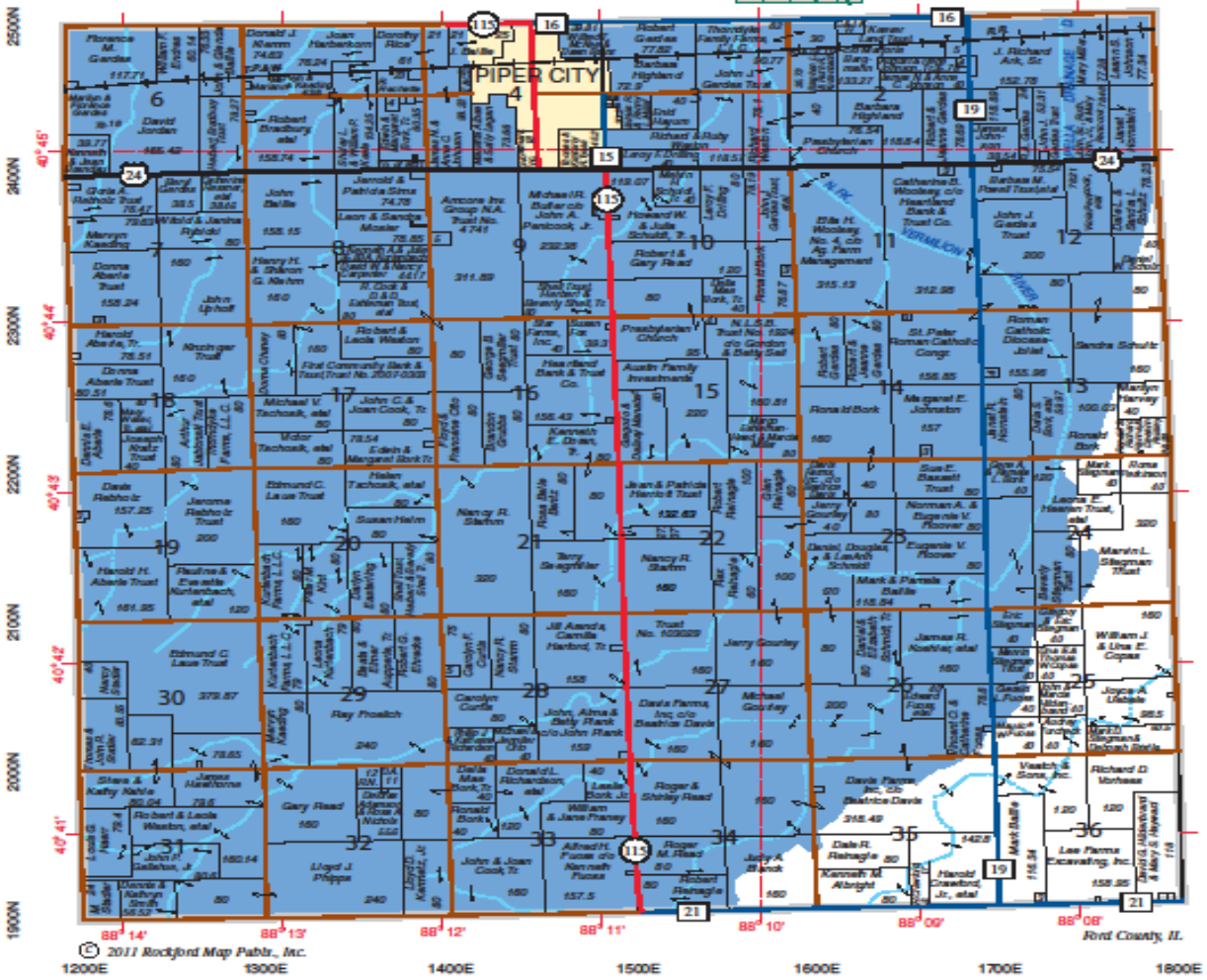


KIC 2025
Keep It for the Crop by 2025

Vermilion River

BRENTON

T.26N.-R.9E.



C-BMP
Illinois Council on Best Management Practices

4 nutrient stewardship

Illinois Discovery Farms

Illinois Discovery Farms

- Currently in the development stage; desire to be operational in 2013
- Will be developed, operated and financed by Illinois producers, agricultural organizations and agricultural industry
- Projects and protocol will be coordinated and peer reviewed by University and other states Discovery Farms
- All monitoring and testing will be done to University, Industry, and IEPA standards

Illinois Discovery Farms

- Currently in the development stage; desire to be operational in 2014 at two locations – McLean & Champaign Counties

- Projects and protocol will be coordinated and peer reviewed by University and other states Discovery Farms

- All monitoring and testing will be done to University, Industry, and IEPA standards

Studying Cover Crops

Annual ryegrass and radish
- aerial seeding 09-08-12

But How Do We Sustain Illinois Ag's Proactive Leadership to:

Minimize Environmental Impact
Optimize Harvest Yield
Maximize Input Utilization

NO
BUDGET
ILLINOIS CLOSED
DUE TO LACK
OF LEADERSHIP
DETOUR

Fertilizer Research & Education Council (FREC)

12.5 cents to FREC

12.5 cents to State General Revenue

Generated $400-500,000 per year

Decline in Research & Outreach

- Fertilizer Research & Education Council (FREC) provided $450,000 per year since 1989; Until Fund Sweeps Began in 2004
- Between 2004 – 2011 over $1.5 million swept from FREC; no funds available in 2010 and approved projects were cancelled.
- Cuts to Universities and Extension add to the challenge; loss of crop production extension advisors

Illinois Nutrient Research & Education Council

NREC serves as the foundation that for research and outreach programs that will lead Illinois agriculture into a new era of:

Enhanced nutrient optimization:
Increased crop productivity and profitability;
Environmental Responsibility

NREC Funding – Owned by Agriculture

- Establishes a statutory assessment for Nutrient Research & Education Council (private foundation). IDA assures remittance to NREC. Range of funding is 50 cents to $3.00 per ton. Minimum 50 cent assessment will provide $2 million per year. Private fund which cannot be swept.

  NREC set initial assessment at 75 cents per ton.

- 20% of NREC funds statutorily dedicated to on-farm nutrient & water quality projects

HB 5539 Bill Signing – Illinois State Fair, August 14, 2012

Illinois Nutrient Research & Education Council

How NREC Works

- In Illinois Fertilizer Act, it is now a condition of fertilizer distributor license to remit the NREC assessment:

25¢ to IDA – check made out to IDA and used to support fertilizer inspectors to assure quality, guaranteed analysis and safety.

75¢ to NREC – check sent to NREC (not for profit entity)

- Payable semi-annually based on tonnage (July 31 on spring tons, Feb 28 on fall tons)

NREC Members

NREC Members – Voting (9)

Fertilizer Industry:	Dr. Howard Brown, GROWMARK, Bloomington IL
	Ed Corrigan, Brandt Consolidated, Springfield IL
	Matt Duncan, Crop Production Services, Galesburg IL
Specialty Fertilizer:	Chris Matlock, FS Custom Turf, Bloomington IL
CCA:	Dave Creech, Helena Company, Greenup IL
IL Farm Bureau:	Dale Hadden, producer, Jacksonville IL
IL Corn Growers:	Gary Hudson, producer, Hindsboro, IL
IL Soybean Assoc:	Matt Hughes, producer, Shirley IL
IDA:	Jim Larkin, IDA

NREC Members – Non Voting (4)

Environment :	Jessica Dexter, Environmental Law Policy Center, Chicago IL
	Cindy Skrukrud, Illinois Chapter Sierra Club, Chicago IL
Research Station:	Dr. German Bollero, University of Illinois, Urbana-Champaign IL
IEPA:	Marcia Willhite, IEPA

First NREC Projects, $1.4 million:

- The Role of Cover Crops in a Corn/Soy Rotation
- Support the KIC Program
- Joint Project between Agriculture & Sanitary Districts to determine "Maximum Extent Practical" BMP for Point & Non Point
- Fund "Discovery Farms"
- Update P & K Recommendations in Illinois
- Phosphorus Application Methods & Runoff Study

Agriculture Supports the 4Rs

Right Source

Right Rate

Right Time

Right Place

We Refuse to Support the 4Ds

Deny

Defend

Delay

Duck

M.O.M.

- **M**inimize environmental impact
- **O**ptimize harvest yield
- **M**aximize input utilization

Own the Message

LAKE SPRINGFIELD PROJECT

- Purpose: To reduce agriculture's contribution of nitrate-N loading of Lake Springfield.
- Objective: To help City Water, Light, and Power deliver finished drinking water no less than 5 ppm below the drinking water standard.
- Length of Program: 3 years

C-BMP
Illinois Council on Best Management Practices

KIC 2025
Keep It for the Crop by 2025

PROGRAM PARTNERS

- Sangamon Co. SWCD
- Lincoln Land Community College
- Producers
- Ag retailers
- Springfield City Water, Light, and Power
- CBMP

C-BMP
Illinois Council on Best Management Practices

KIC 2025
Keep It for the Crop by 2025

ROCKFORD MAP PUBLISHERS

C-BMP
Illinois Council on Best Management Practices

LAKE SPRINGFIELD WATERSHED

KIC 2025
Keep It for the Crop by 2025

Compiled and Published by
ROCKFORD MAP PUBLISHERS, Inc.
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YOUR TRUSTED SOURCE FOR PARCEL MAPS AND SPATIAL DATA

r4 nutrient stewardship

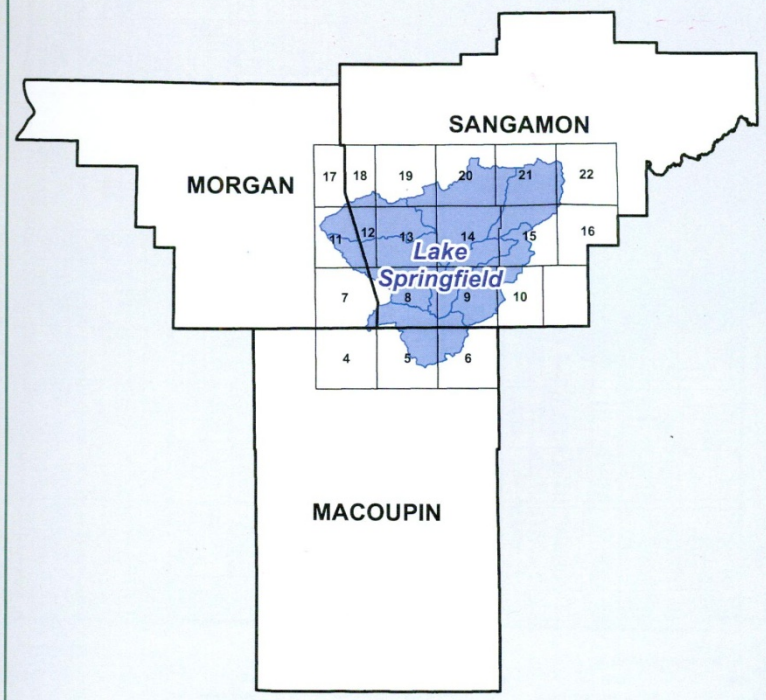
LAKE SPRINGFIELD WATERSHED

KIC 2025
Keep It for the Crop by 2025

ROCKFORD MAP PUBLISHERS

LAKE SPRINGFIELD WATERSHED

INDEX MAP



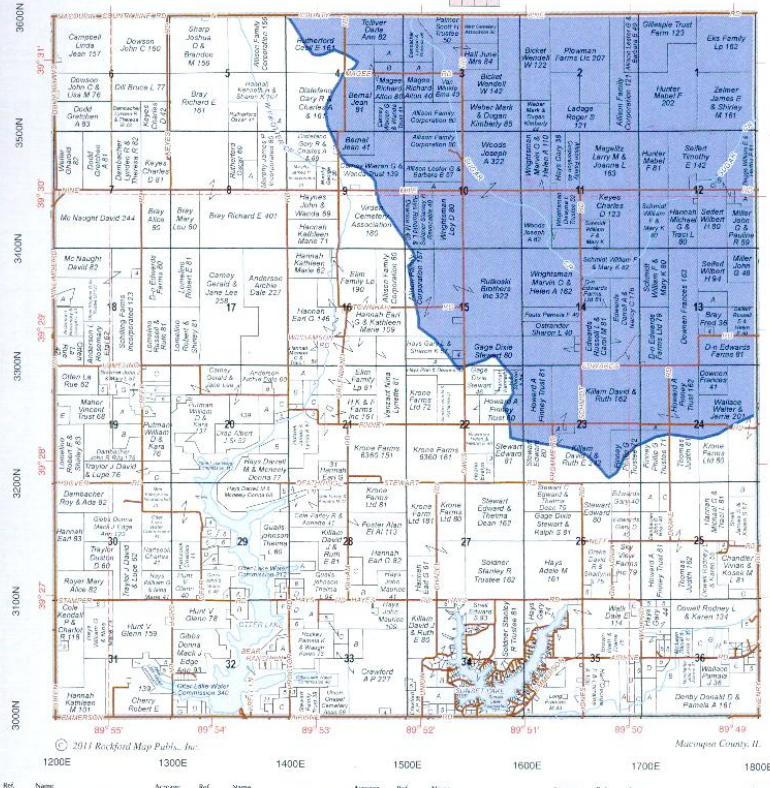
KIC 2025
Keep It for the Crop by 2025

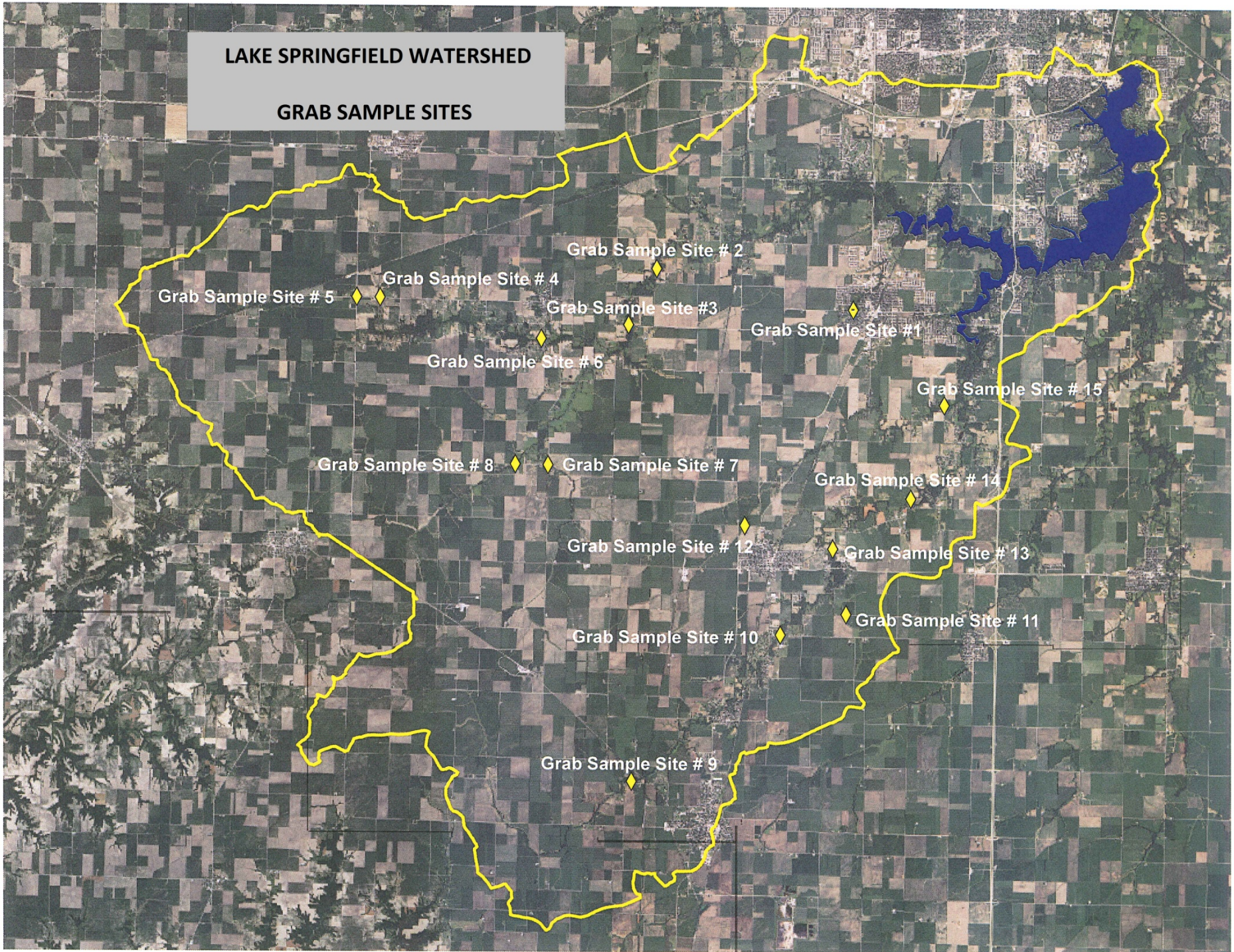
ROCKFORD MAP PUBLISHERS

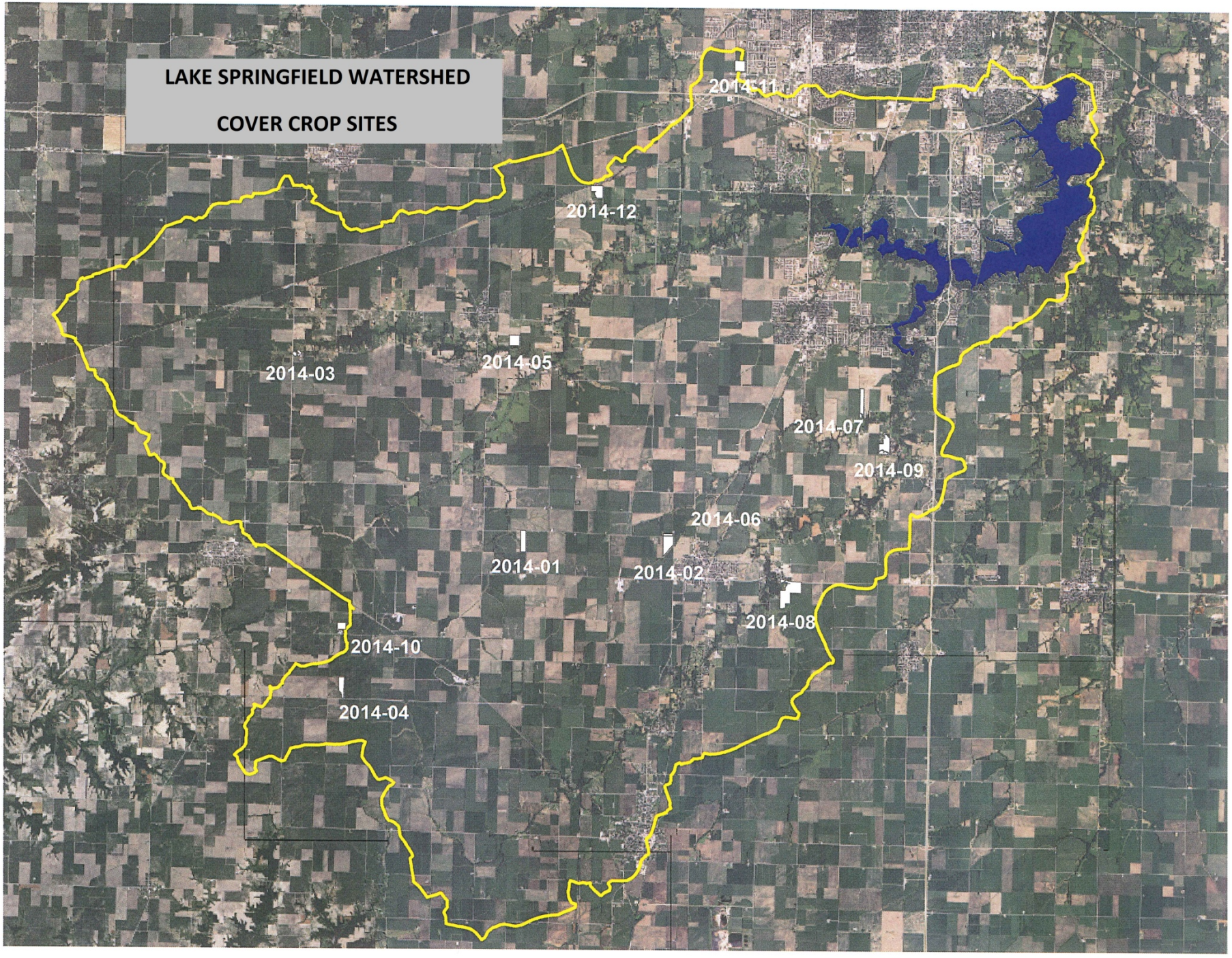
Lake Springfield

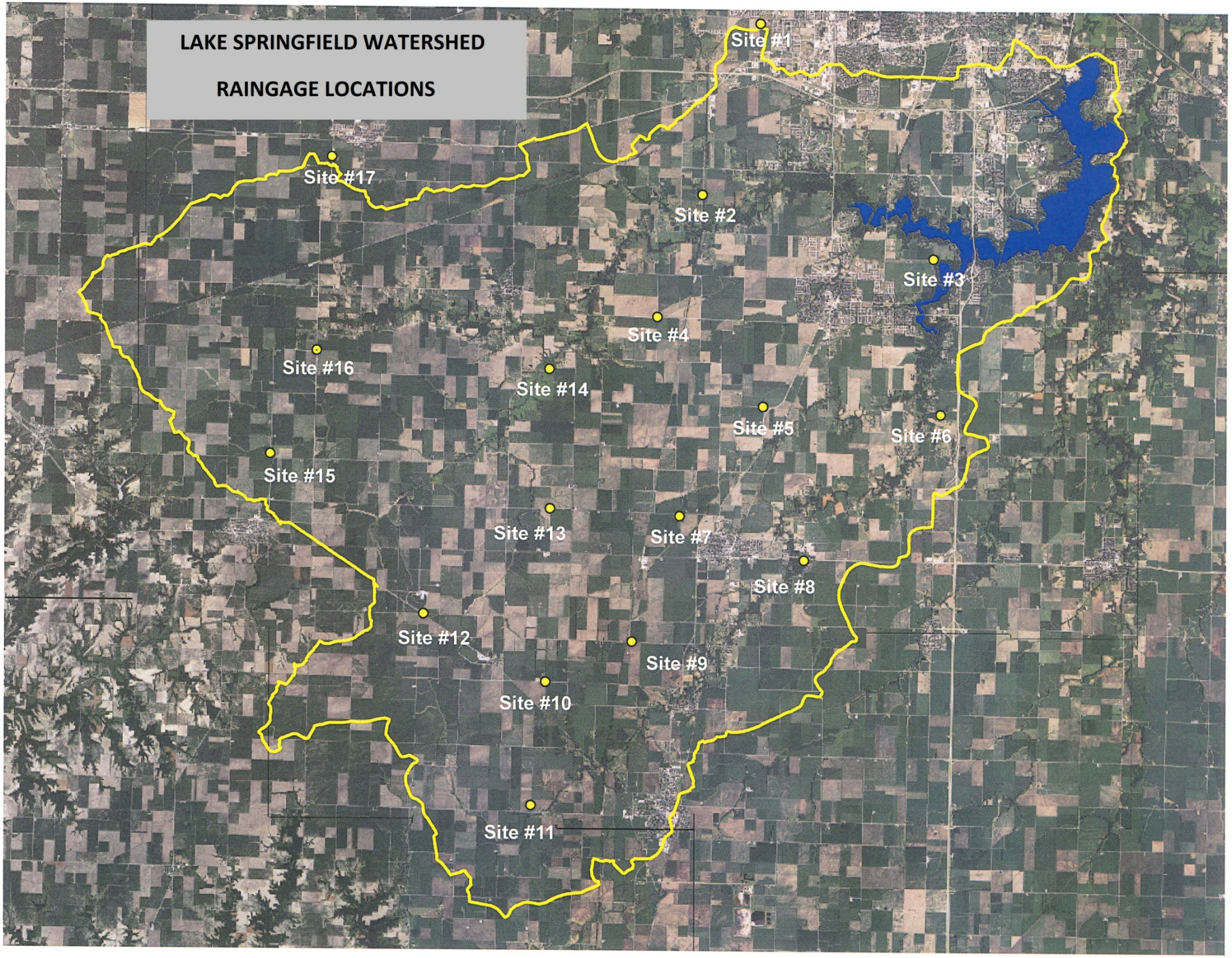
NORTH OTTER

T.12N.-R.7W.




LAKE SPRINGFIELD WATERSHED
GRAB SAMPLE SITES
Grab Sample Site # 2
Grab Sample Site # 4
Grab Sample Site # 5
Grab Sample Site #3
Grab Sample Site #1
Grab Sample Site # 6
Grab Sample Site # 15
Grab Sample Site # 8
Grab Sample Site # 7
Grab Sample Site # 14
Grab Sample Site # 12
Grab Sample Site # 13
Grab Sample Site # 11
Grab Sample Site # 10
Grab Sample Site # 9

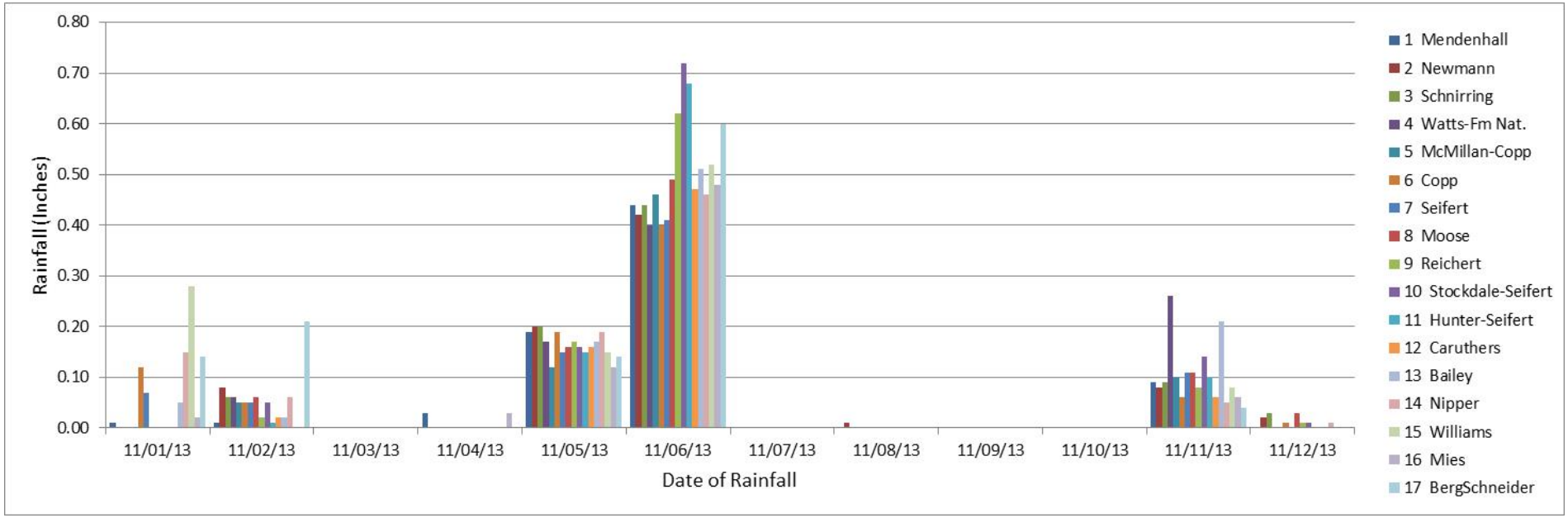

LAKE SPRINGFIELD WATERSHED
COVER CROP SITES
2014-11
2014-12
2014-03
2014-05
2014-07
2014-09
2014-06
2014-01
2014-02
2014-08
2014-10
2014-04


LAKE SPRINGFIELD WATERSHED
RAINGAGE LOCATIONS
Site #1
Site #2
Site #3
Site #4
Site #5
Site #6
Site #7
Site #8
Site #9
Site #10
Site #11
Site #12
Site #13
Site #14
Site #15
Site #16
Site #17

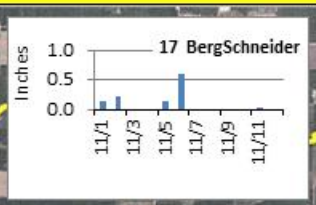
Rain Gauge Sites

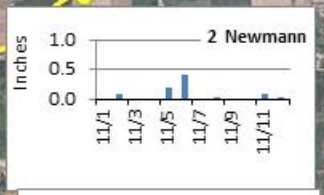
Lake Springfield Watershed Project
Logged Rainfall 11/1/2013 to 11/13/2013

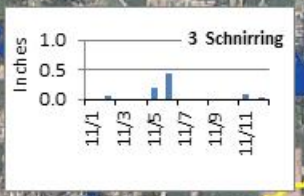
	Mendenhall	Newmann	Schnirring	Watts-Fm Nat.	McMillan-Copp	Copp	Seifert	Moose	Reichert	Stockdale-Seifert	Hunter-Seifert	Caruthers	Bailey	Nipper	Williams	Mies	BergSchneider
	1 Mendenha	2 Newmar	3 Schnirri	4 Watts-Fm Na	5 McMillan-Cor	6 Cor	7 Seifert	8 Moos	9 Reichert	10 Stockdale-Sei	11 Hunter-Sei	12 Caruth	13 Bai	14 Nip	15 Willian	16 M	17 BergSchneider
11/01/13	0.01	0.00	0.00	0.00	0.00	0.12	0.07	0.00	0.00	0.00	0.00	0.00	0.05	0.15	0.28	0.02	0.14
11/02/13	0.01	0.08	0.06	0.06	0.05	0.05	0.05	0.06	0.02	0.05	0.01	0.02	0.02	0.06	0.00	0.00	0.21
11/03/13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/13	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
11/05/13	0.19	0.20	0.20	0.17	0.12	0.19	0.15	0.16	0.17	0.16	0.15	0.16	0.17	0.19	0.15	0.12	0.14
11/06/13	0.44	0.42	0.44	0.40	0.46	0.40	0.41	0.49	0.62	0.72	0.68	0.47	0.51	0.46	0.52	0.48	0.60
11/07/13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/08/13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/09/13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/10/13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/11/13	0.09	0.08	0.09	0.26	0.10	0.06	0.11	0.11	0.08	0.14	0.10	0.06	0.21	0.05	0.08	0.06	0.04
11/12/13	0.00	0.02	0.03	0.00	0.00	0.01	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00

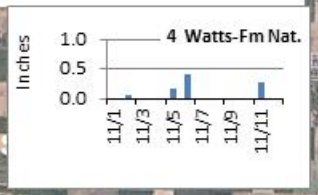


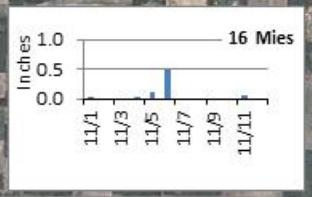
Lake Springfield Watershed Project
Rain Gauge Locations

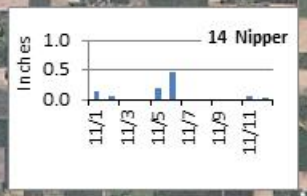


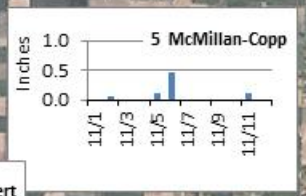


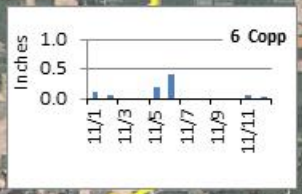


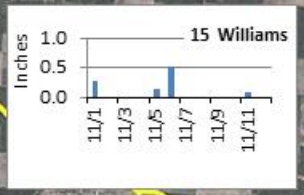


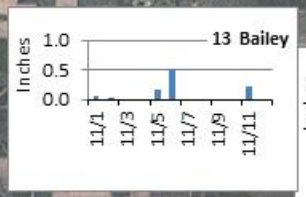


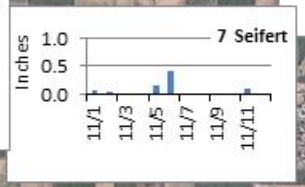


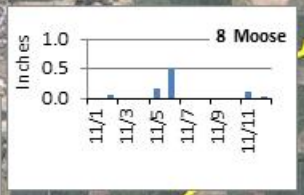


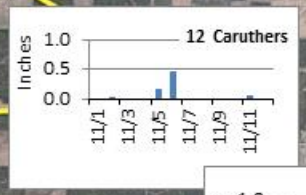


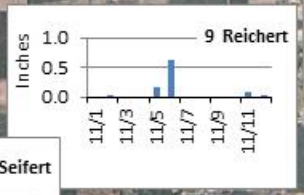


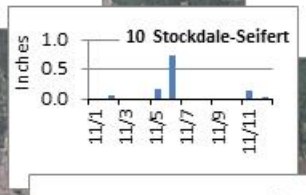


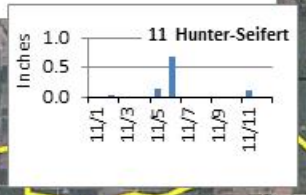












N Rate Studies for 2014

- 6 N Rate Trials (6 rates x 3 reps)
- 2 N Rate x Timing Trials (5 rates x 3 reps x 2 times)
- 12 Cover crop sites
- 24 N-WATCH Locations (2/Cover crop location)
- Other N-WATCH sites

C-BMP Illinois Council on Best Management Practices

GROWMARK AGRONOMY SM

KIC 2025 Keep It for the Crop by 2025

CONTACT INFORMATION

On-Farm Discovery Trials

Dan Schaefer, Illinois CBMP

dschaefer@illinoiscbmp.org

Discovery Trial Design

Dr. Emerson Nafziger, Crop Sciences

ednaf@illinois.edu

Watershed Projects

Dr. Howard Brown, Illinois CBMP

hbrown@growmark.com

For more information:

N Mgt. Systems

M.O.M.

N-WATCH

Lake Springfield Project

Visit:

www.illinoiscbmp.org

C-BMP
Illinois Council on Best Management Practices

KIC 2025
Keep It for the Crop by 2025

MOM

Minimize Environmental Impact
Optimize Harvest Yield
Maximize Input Utilization

NITROGEN MANAGEMENT SYSTEM

NITROGEN MANAGEMENT SYSTEM

N WATCH

N Management System

Our Message

Managing N as a system, not an application.

It's about losing less N and utilizing more.

It's about acountability, and profitability

It's about **M**inimizing environmental impact by **O**ptimizing yield and **M**aximizing N utilization.

C-BMP
Illinois Council on Best Management Practices

KIC 2025
Keep It for the Crop by 2025

WHAT THE FUTURE BRINGS

- Improvement in harvest yields
- Improved N use efficiency
- Improvement in water quality

City Water, Light & Power
Springfield, Illinois

C-BMP
Illinois Council on Best Management Practices

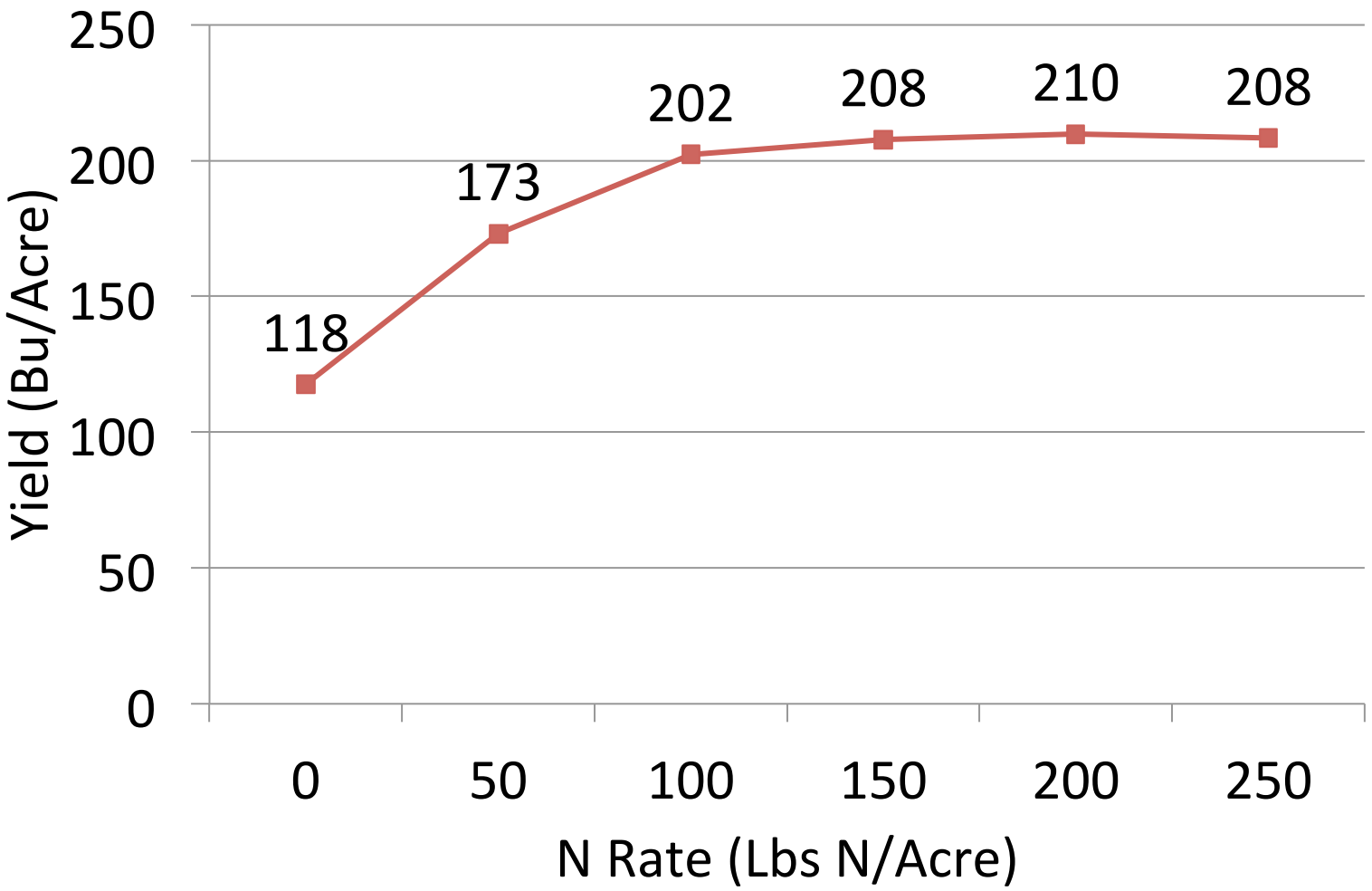
KIC 2025
Keep It for the Crop by 2025

Visit Illinoiscbmp.org
"Crop production, environmental protection both achievable."
Crop production, environmental protection both achievable
By MARK DAVID and ERIC DAVIDSON
CROPS
Continued from C-1
The News-Gazette
Sunday, January 22, 201
Opinions Editor Jim Dey: 217-351-5369; jdey@news-ga

N Rate Study

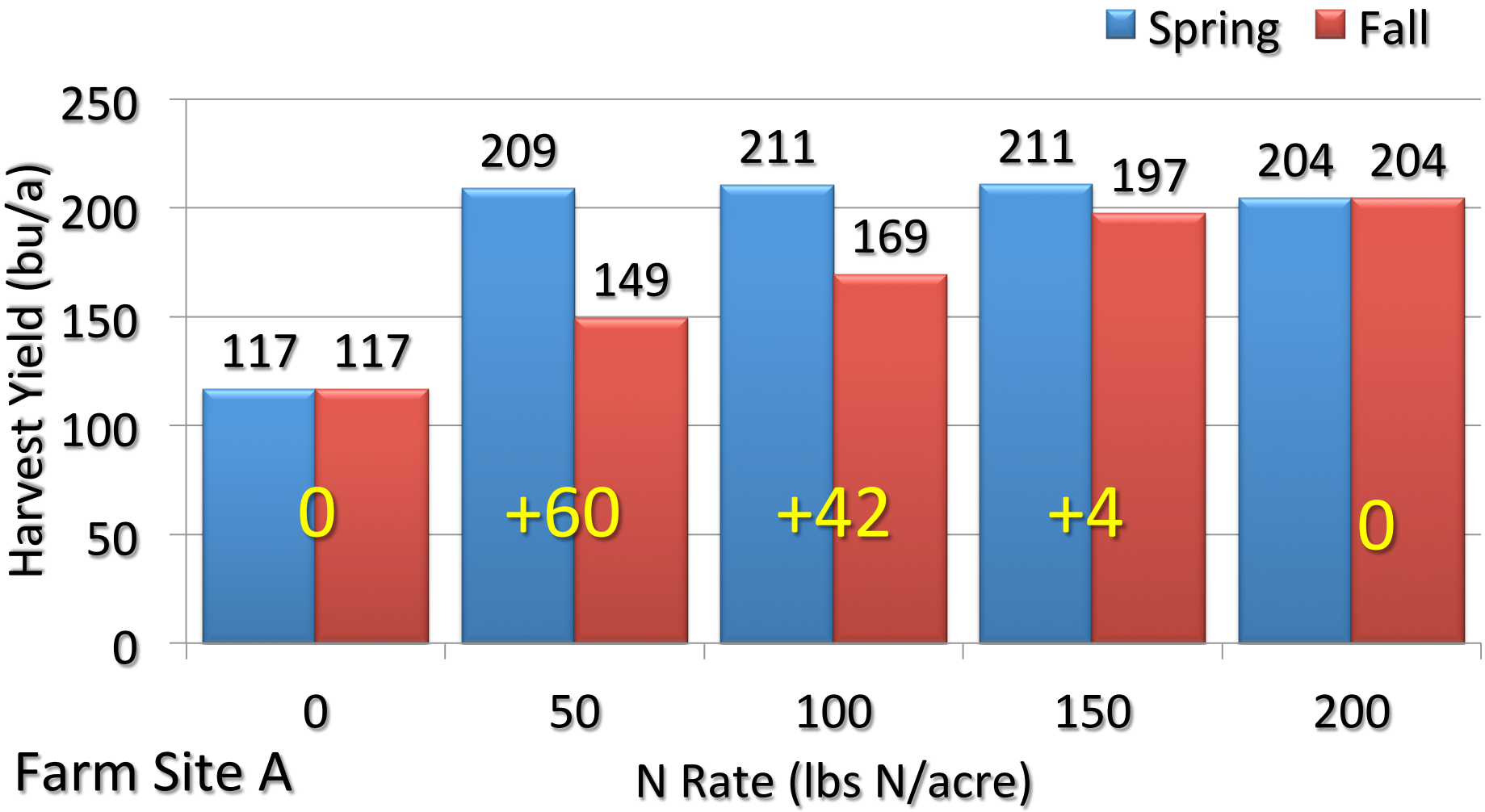
Source:

Applied:



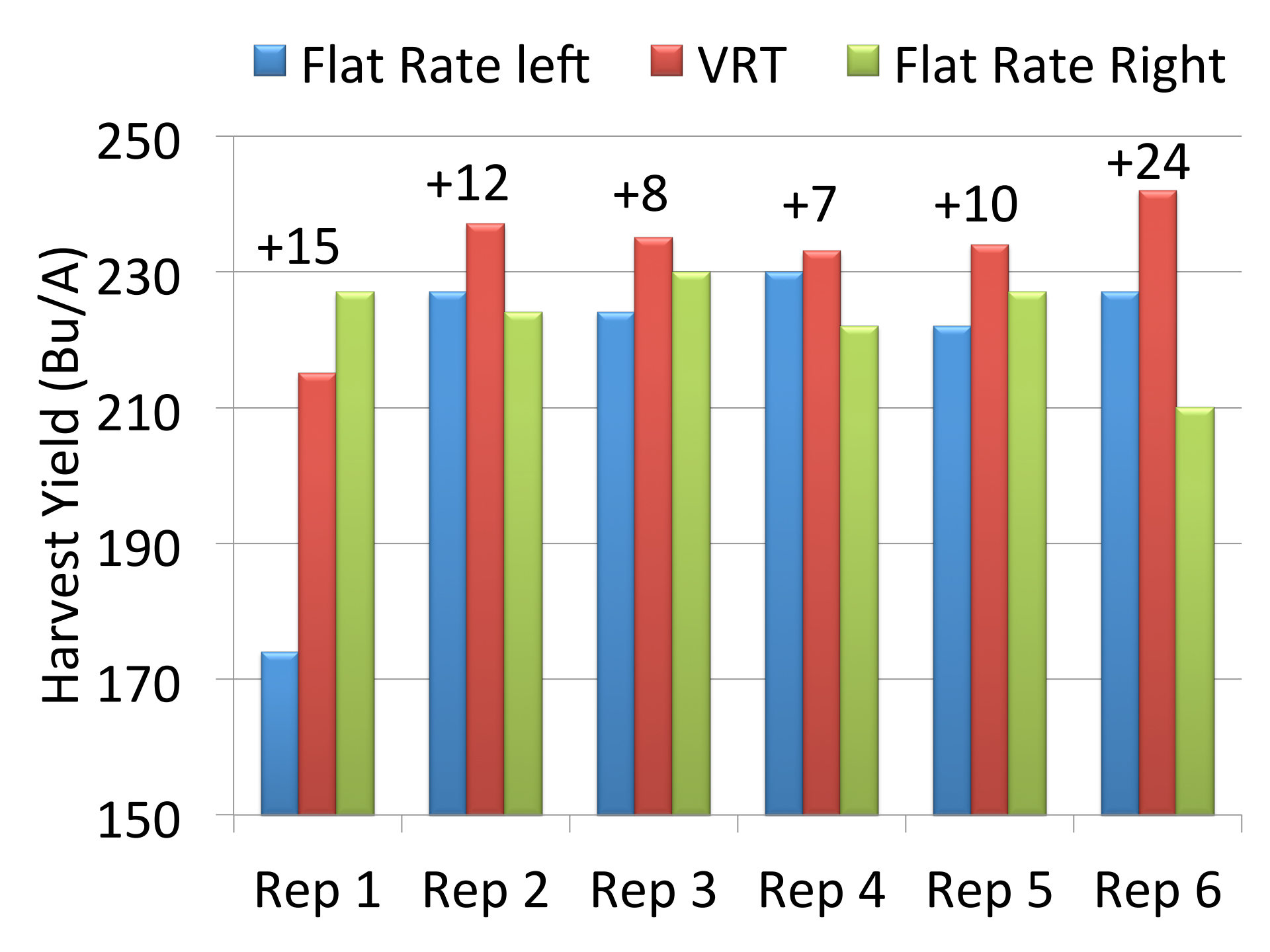
Anhydrous Ammonia: Fall vs. Spring Appl.

Dan Schaefer, 2009



Farm Site A

VRT – Nitrate-N
Vs.
Flat Rate


Flat Rate left
VRT
Flat Rate Right
250
230
210
190
170
150
Harvest Yield (Bu/A)
+15
+12
+8
+7
+10
+24
Rep 1
Rep 2
Rep 3
Rep 4
Rep 5
Rep 6

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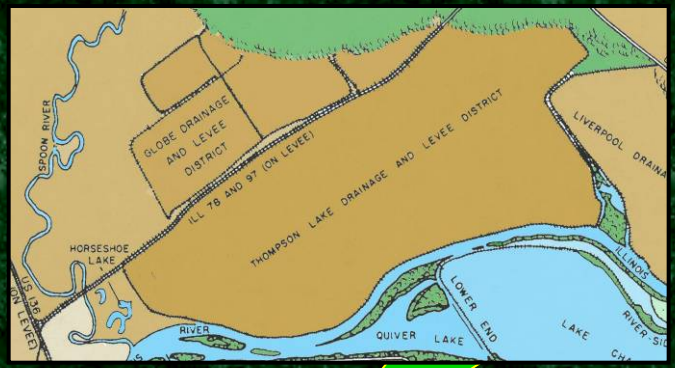
1919

An Overview of The Nature Conservancy's **Emiquon Project**

by K. Douglas Blodgett



2007

for the
Illinois Nutrient Reduction Strategy
Agricultural Nonpoint Source Subcommittee
16 December 2013, Bloomington, IL

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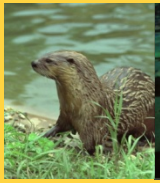
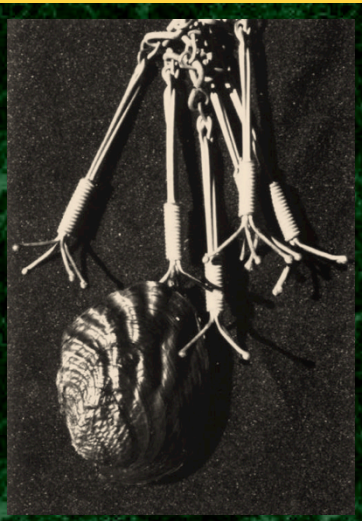
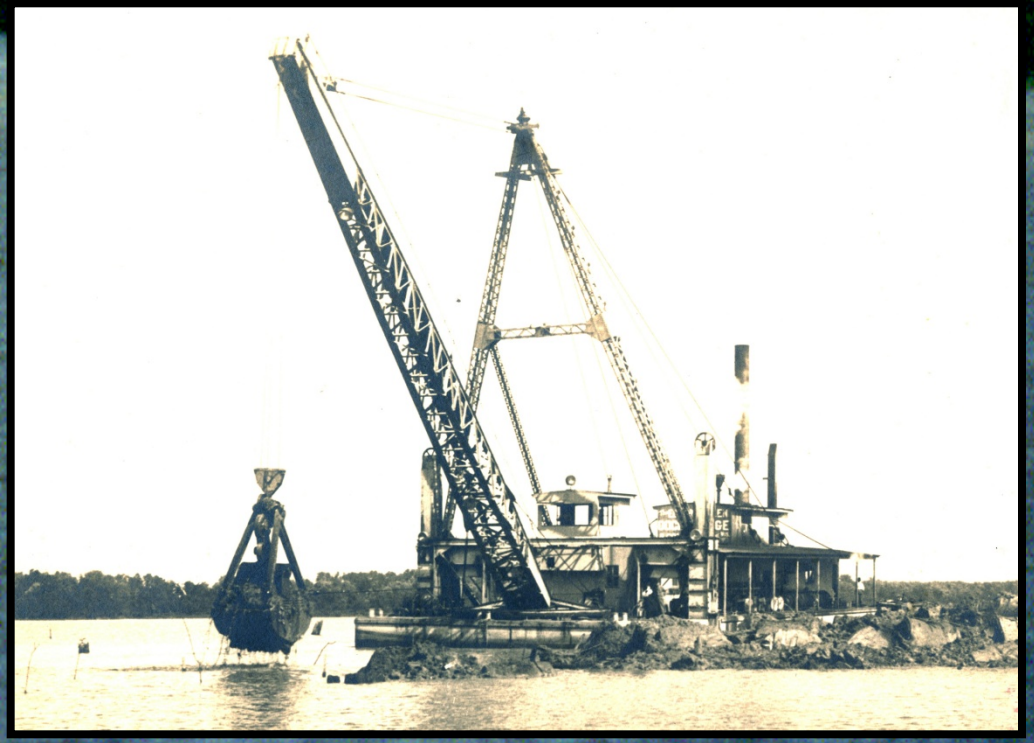




The Mason County
DEMOCRAT

1919

HAVANA — The three dredges that are working on Thompson Lake are throwing up a new levee in ‘Dan Hole’s Field’ ….



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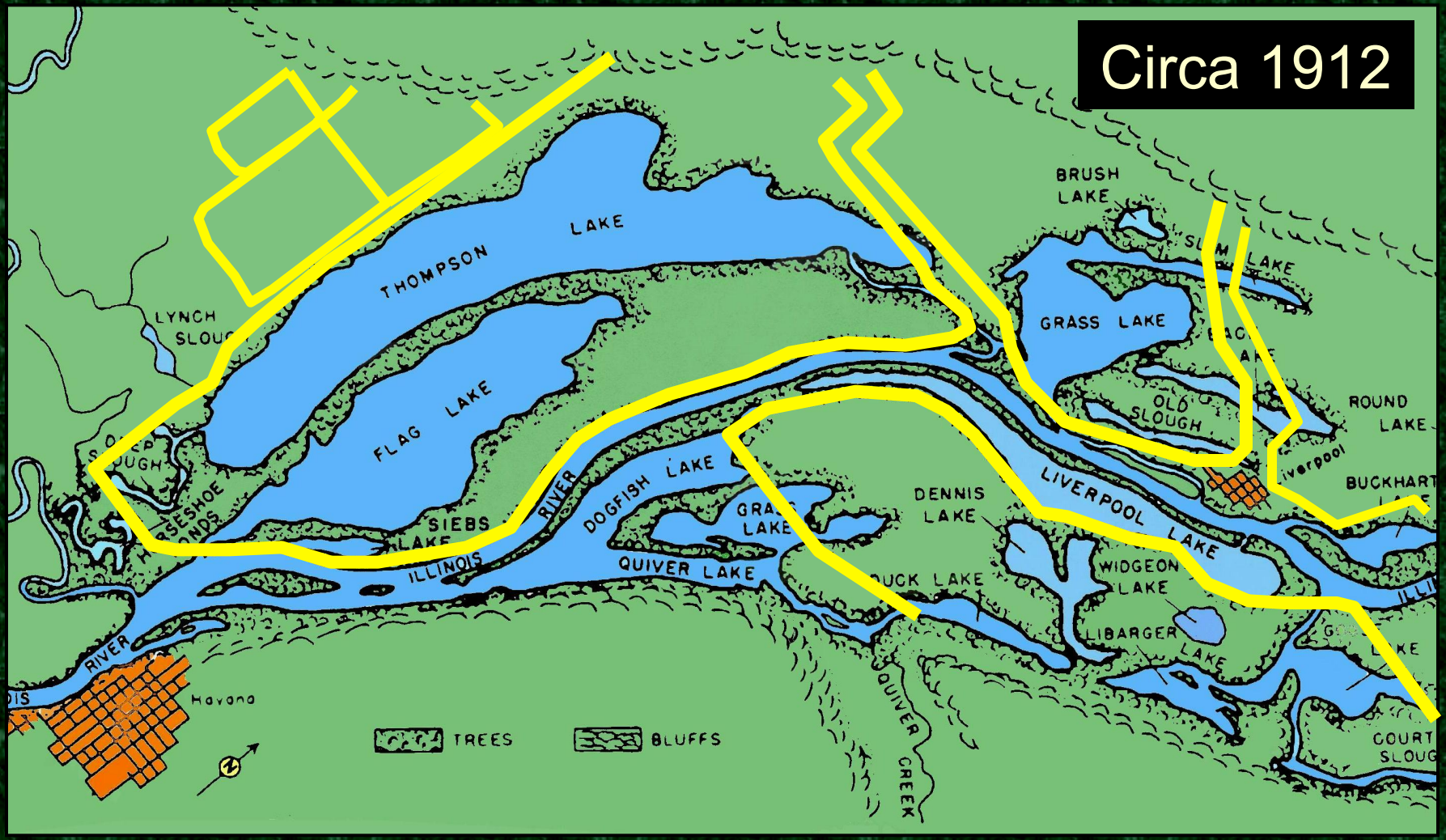

Adapted from a figure by the Illinois Natural History Survey

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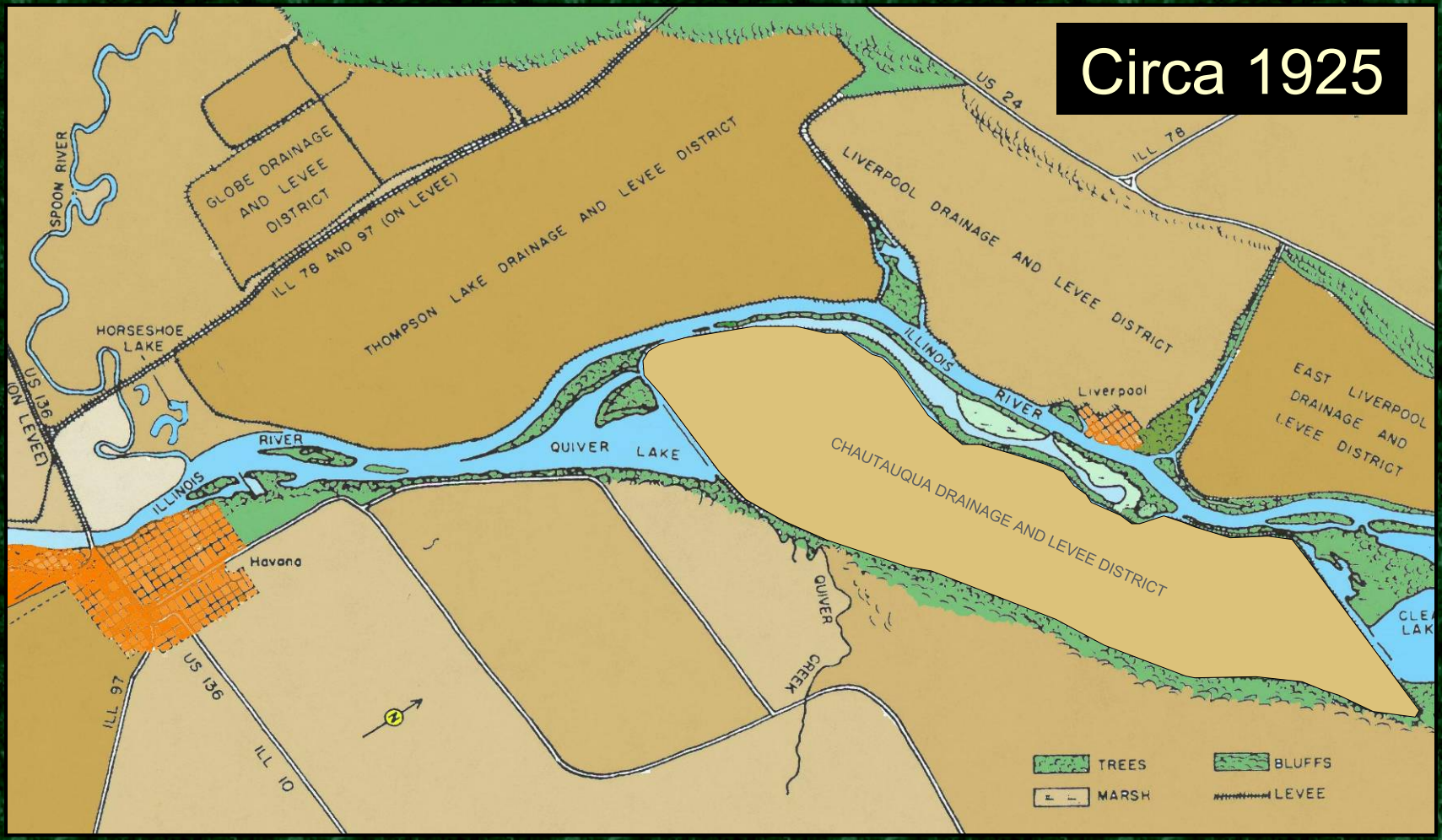

Adapted from a figure by the Illinois Natural History Survey

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Some benefits of functional floodplain wetlands …

Provide habitat for native plants and animals (aquatic and terrestrial, resident and migratory)

Contribute to a more natural hydrology by storing storm water (moderates unnatural water level fluctuations, reduces flooding and associated damages, and provides base flow)

Facilitate infiltration and groundwater recharge

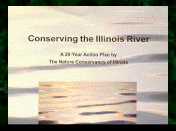
Improve water quality

Store and process nutrients (e.g., nitrogen, phosphorus) and sediments

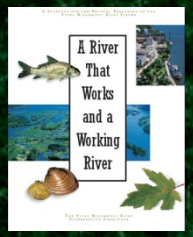
Sequester carbon (helps reduce global climate change)

Provide opportunities for recreation, education, and economic development

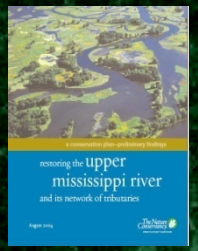
Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy. National Research Council, National Academic Press. Washington, D.C. 1992. 662 pp.



Illinois River Site Conservation Plan. The Nature Conservancy. 1998.



Restoration of functional floodplain is essential for restoring ecosystem health



Impact Statement for the UMR-IWW Navigation Feasibility Study. US Army Corps of Engineers. 2004. 606 pp.

Illinois River Basin Restoration Comprehensive Plan with Integrated Environmental Assessment. Main Report, Public Review Draft. US Army Corps of Engineers. February 2006. 452 pp.

The Mason County DEMOCRAT

Mason County's Oldest Established Business— Locally Owned. In Our 150th Year

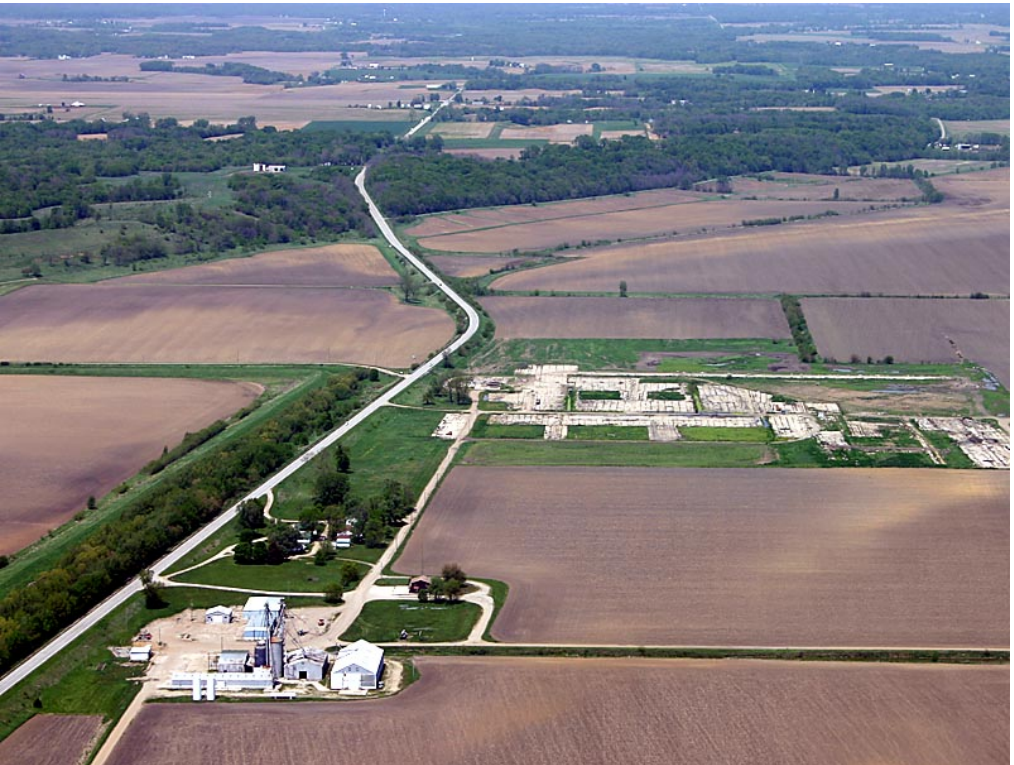
May 3, 2000

Lewistown— The Nature Conservancy announces the purchase of Wilder Farm.

Nearly 7800 acres (3150 hectares)

Wilder Corporation, Florida

$18.45 million



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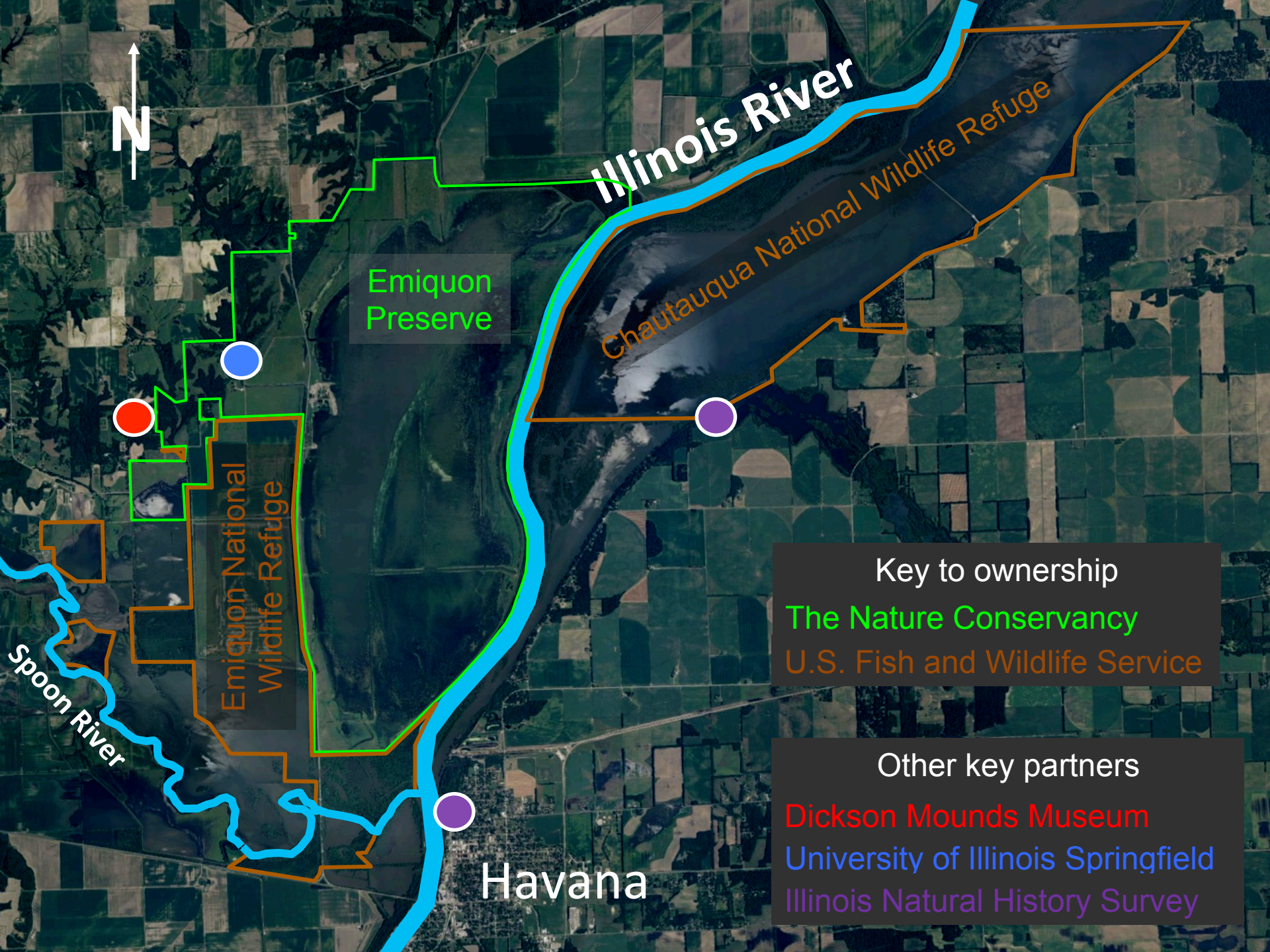
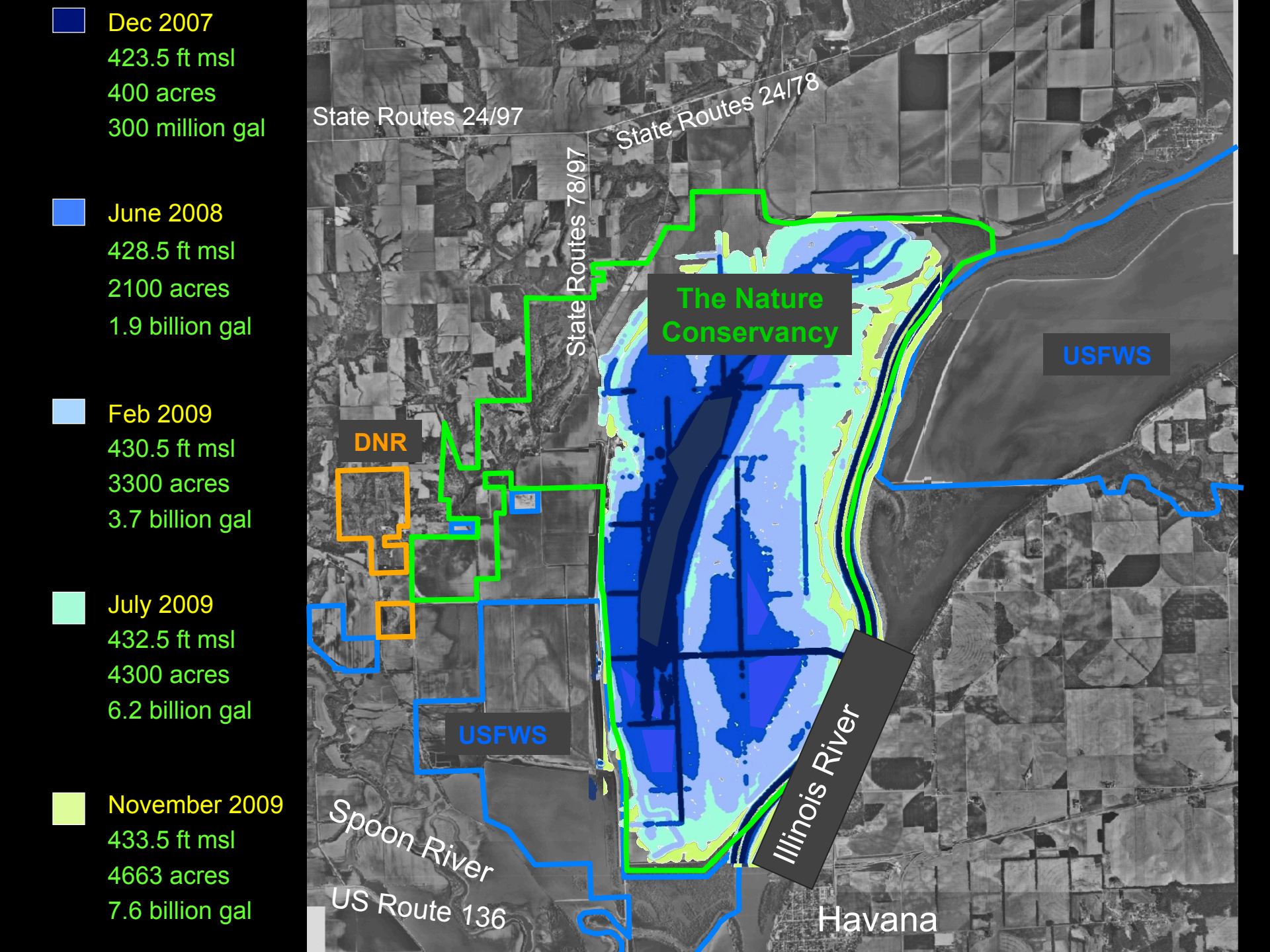

N
Illinois River
Chautauqua National Wildlife Refuge
Emiquon Preserve
Emiquon National Wildlife Refuge
Spoon River
Havana
Key to ownership
The Nature Conservancy
U.S. Fish and Wildlife Service
Other key partners
Dickson Mounds Museum
University of Illinois Springfield
Illinois Natural History Survey

A new day dawns at Emiquon


Dec 2007
423.5 ft msl
400 acres
300 million gal
June 2008
428.5 ft msl
2100 acres
1.9 billion gal
Feb 2009
430.5 ft msl
3300 acres
3.7 billion gal
July 2009
432.5 ft msl
4300 acres
6.2 billion gal
November 2009
433.5 ft msl
4663 acres
7.6 billion gal
State Routes 24/97
State Routes 24/78
State Routes 78/97
The Nature Conservancy
USFWS
DNR
USFWS
Illinois River
Spoon River
US Route 136
Havana

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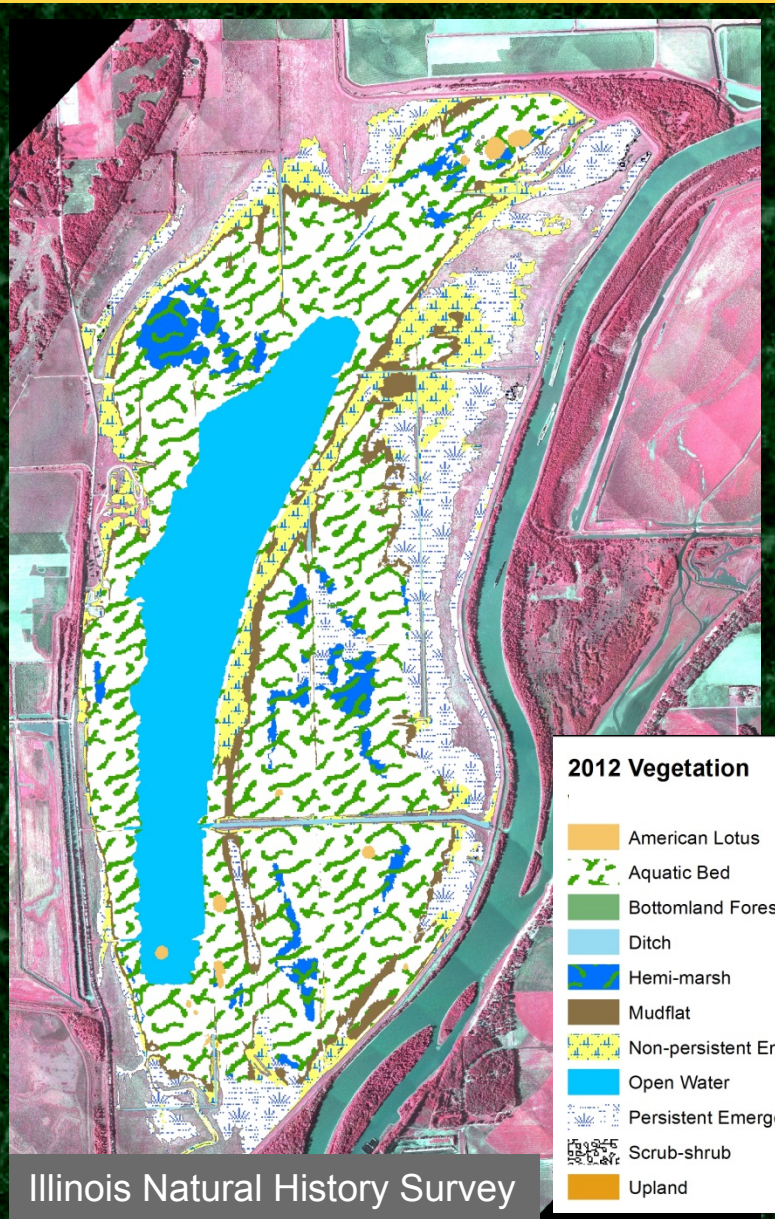
Rob Hilsabeck

Nerissa Michaels



Illinois Natural History Survey

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Peak waterfowl densities approaching 200,000

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More than 250 bird species observed to date with many relatively rare species …

including 90% of the wetland-associated T&E bird species

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CONSERVATION

Wetlands internationally important

Emiquon, Dixon among only 34 sites nationwide given designation

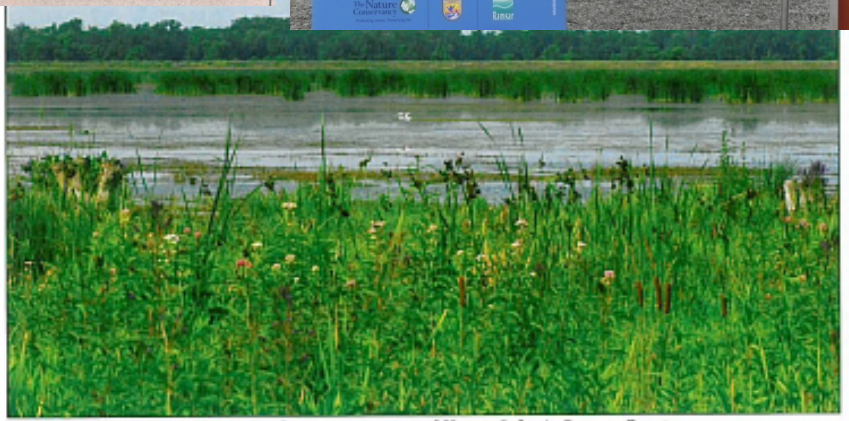
Ramsar

CONVENTION ON WETLANDS

CONVENTION SUR LES ZONES HUMIDES

CONVENCIÓN SOBRE LOS HUMEDALES

(Ramsar, Iran, 1971)



The Sue and Wes Dixon Waterfowl Refuge at Hennepin and Hopper Lakes in Putnam County

Yellowheaded blackbird

Black meadowhawk dragonfly

Illinois wetlands get international designation

Peoria sits on the Illinois River about 45 miles between two wetland complexes that have been recently designated as having international

"What this adds up to is, this is a great day for the Illinois River. That, to me, is the summary message. We hope that this recognition will bring to some people's attention who aren't aware of all the good and exciting stuff that's happening in the central Illinois

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Public programs

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Facilitate infiltration and groundwater recharge

Improve water quality

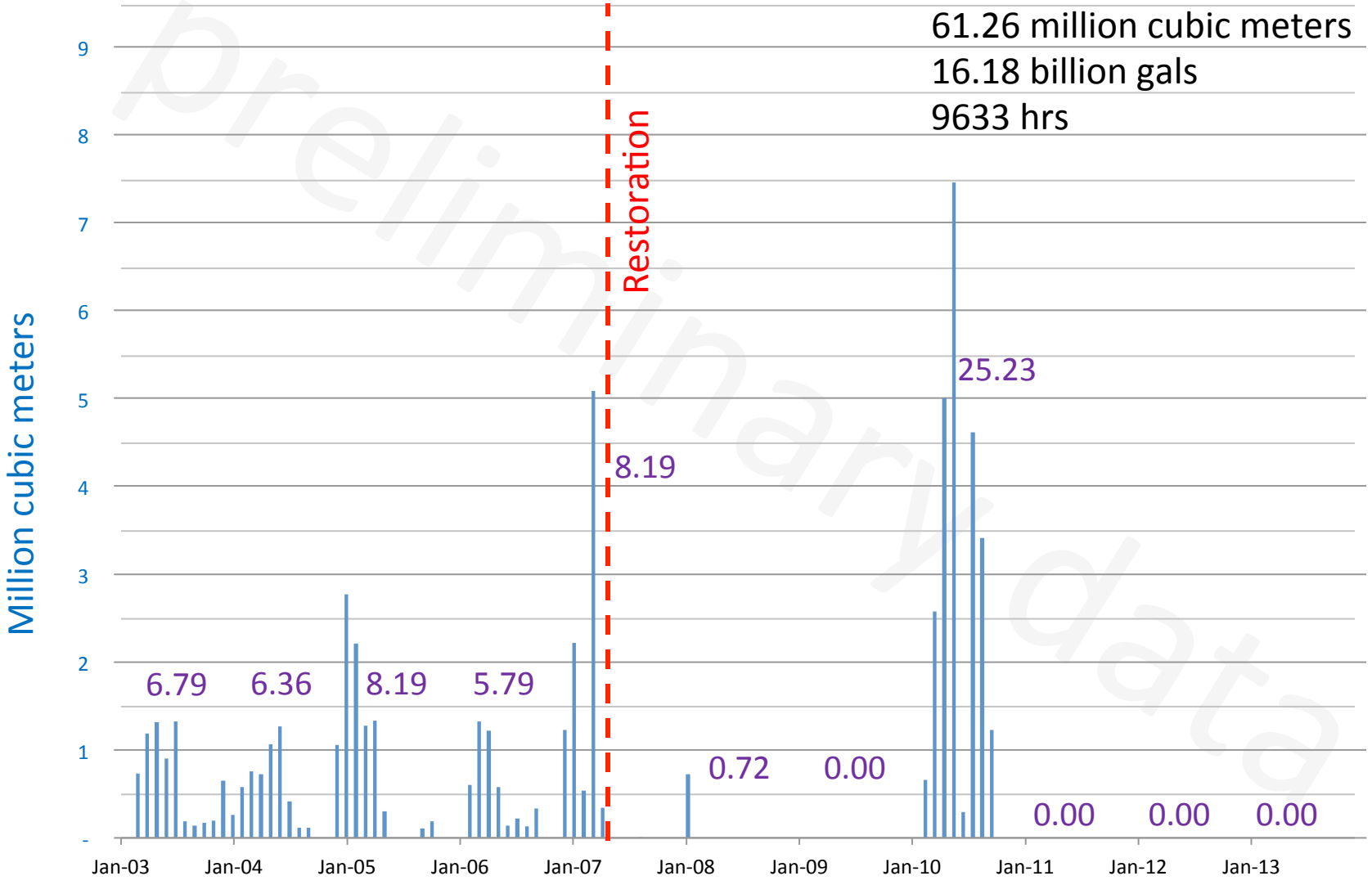
Store and process nutrients (e.g., nitrogen, phosphorus) and sediments

Sequester carbon (helps reduce global climate change)

Provide opportunities for recreation, education, and economic development

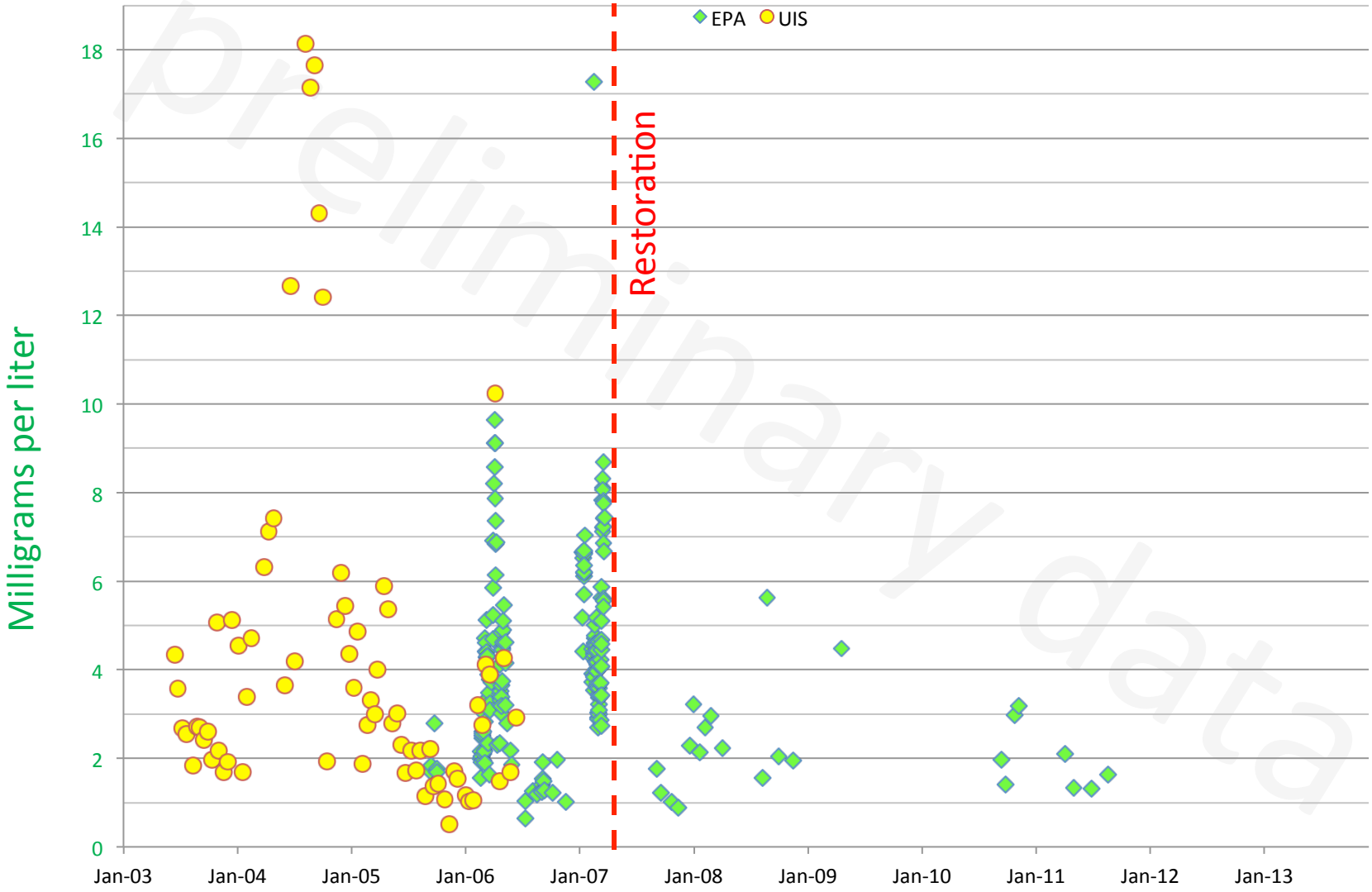
Discharge pumped from Emiquon to the Illinois River

Monthly (bars) and annual (text)

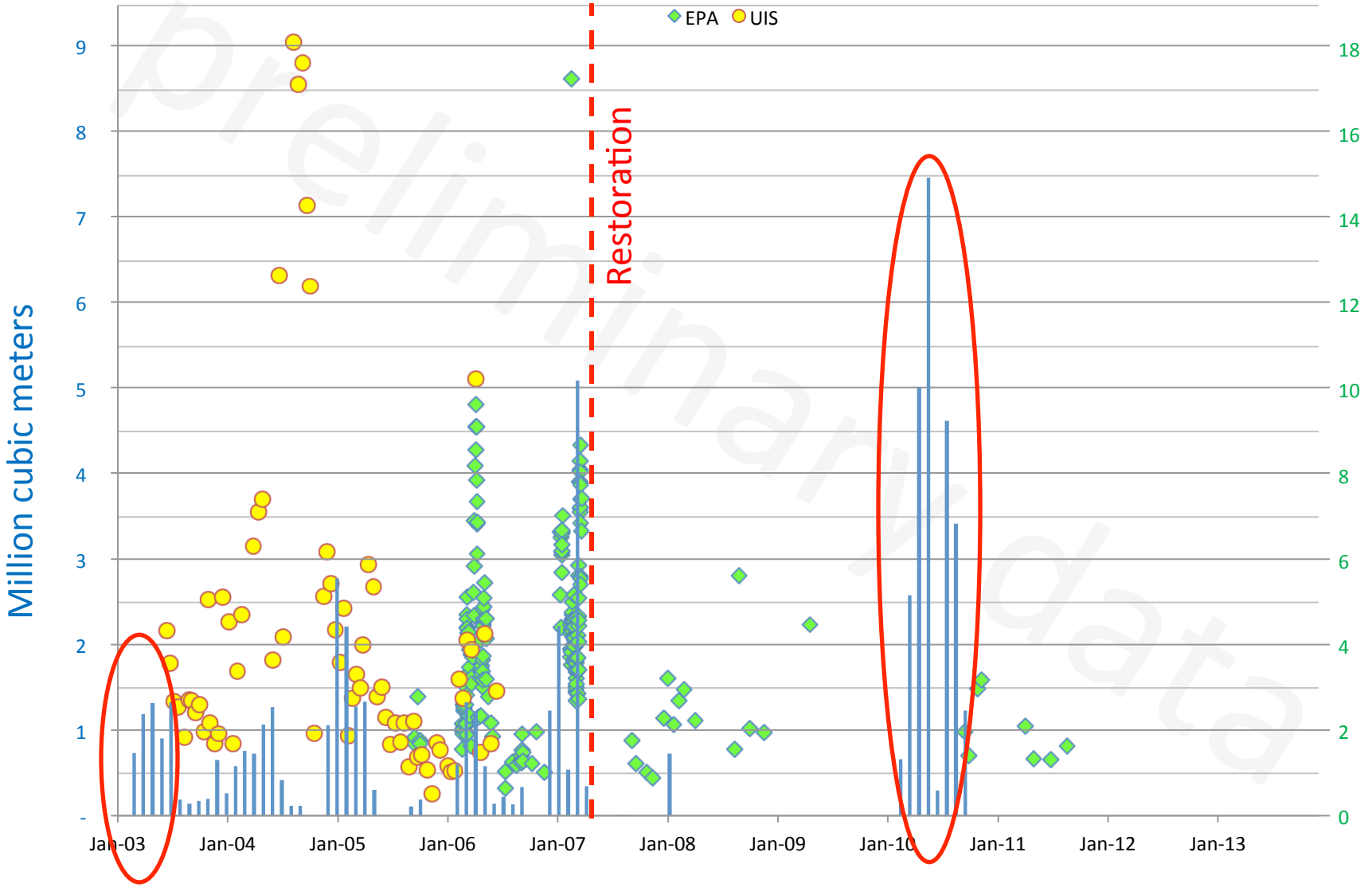


preliminary data

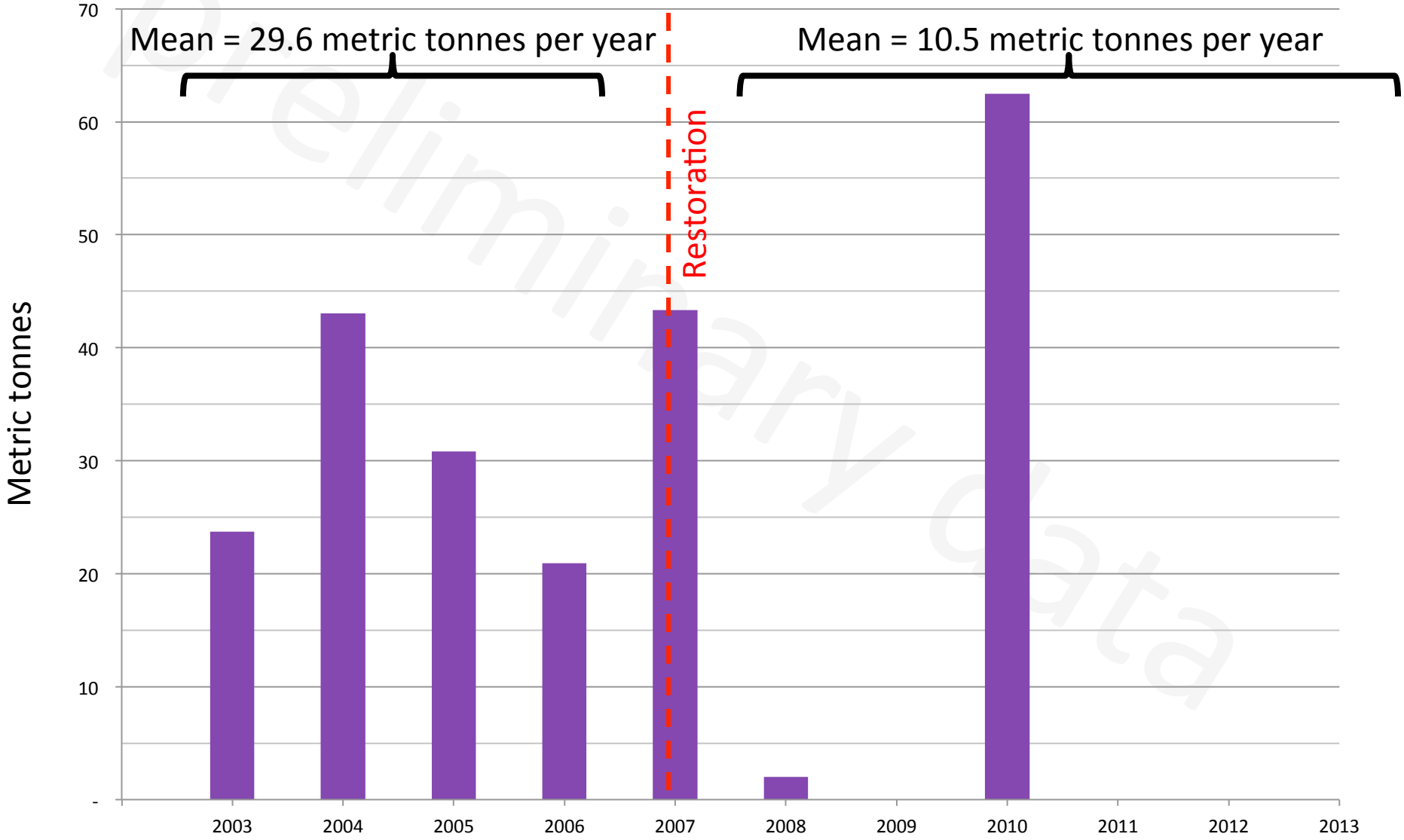
Total Nitrogen concentrations at Emiquon



Discharge and total Nitrogen concentrations at Emiquon



Annual discharge of nitrogen from Emiquon to the Illinois River (estimated total of 226 metric tonnes)



Preliminary data

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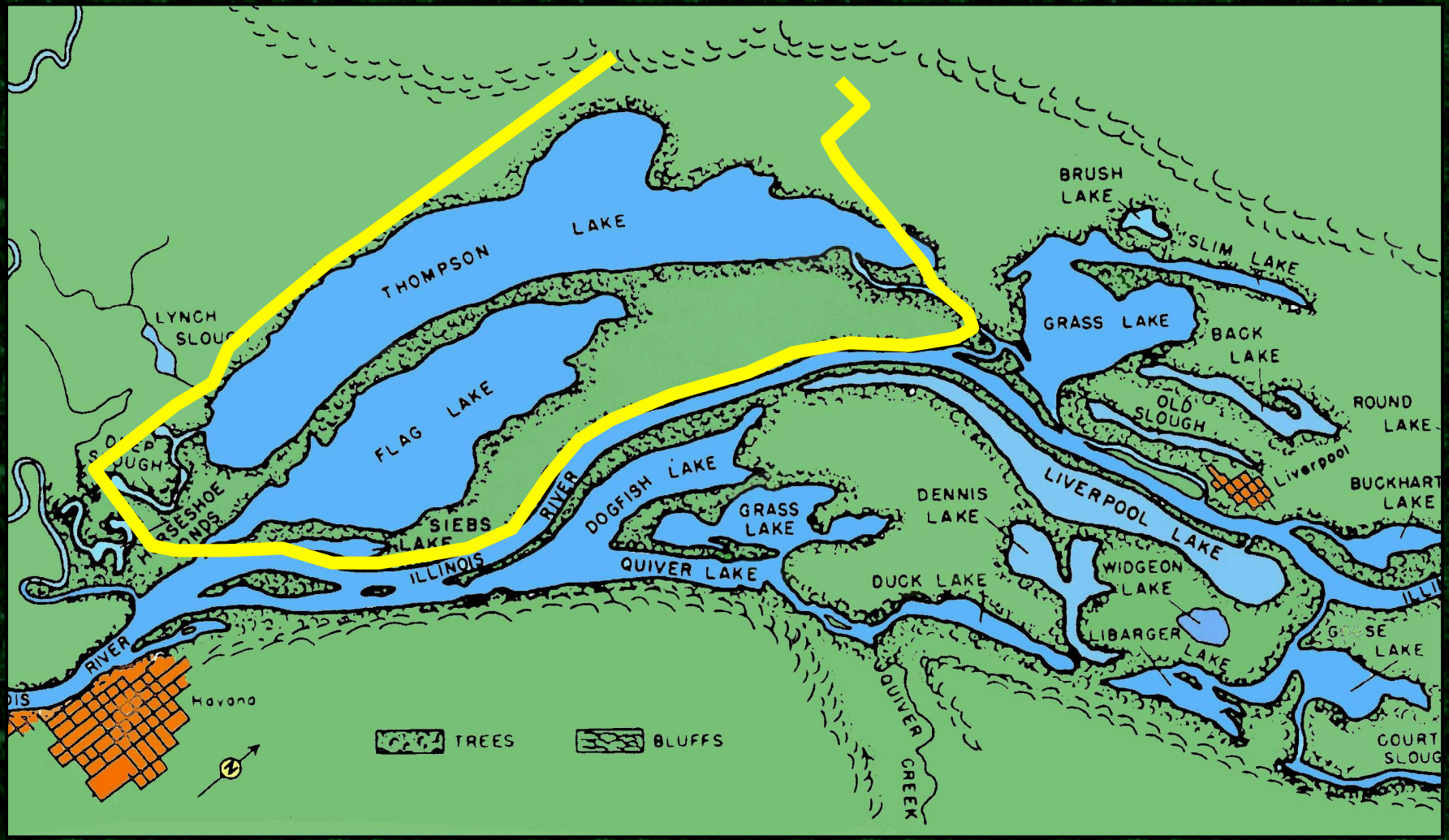

Adapted from a figure by the Illinois Natural History Survey

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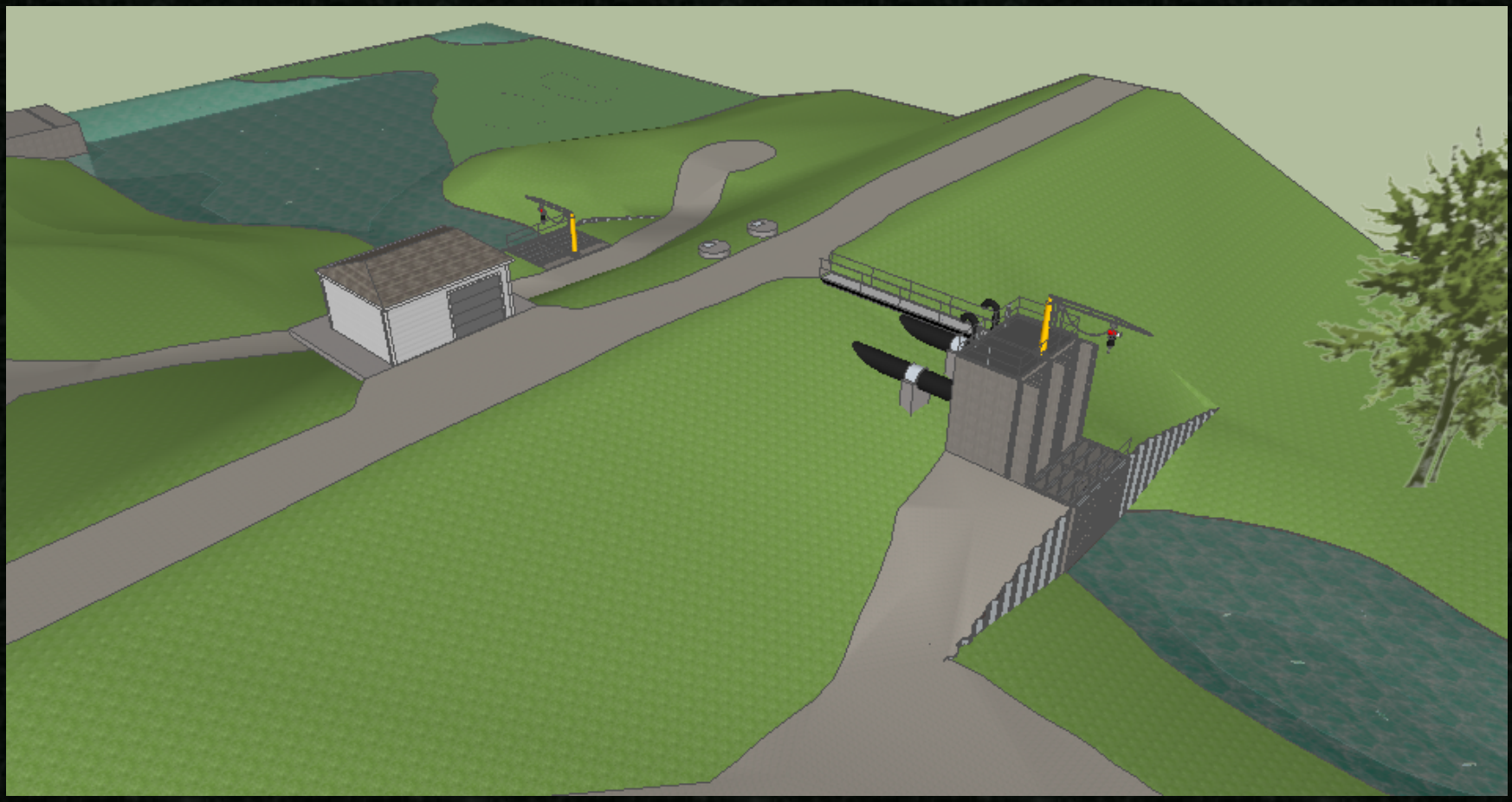
A Science-Friendly Structure to Manage Hydrology at The Nature Conservancy's Emiquon Preserve



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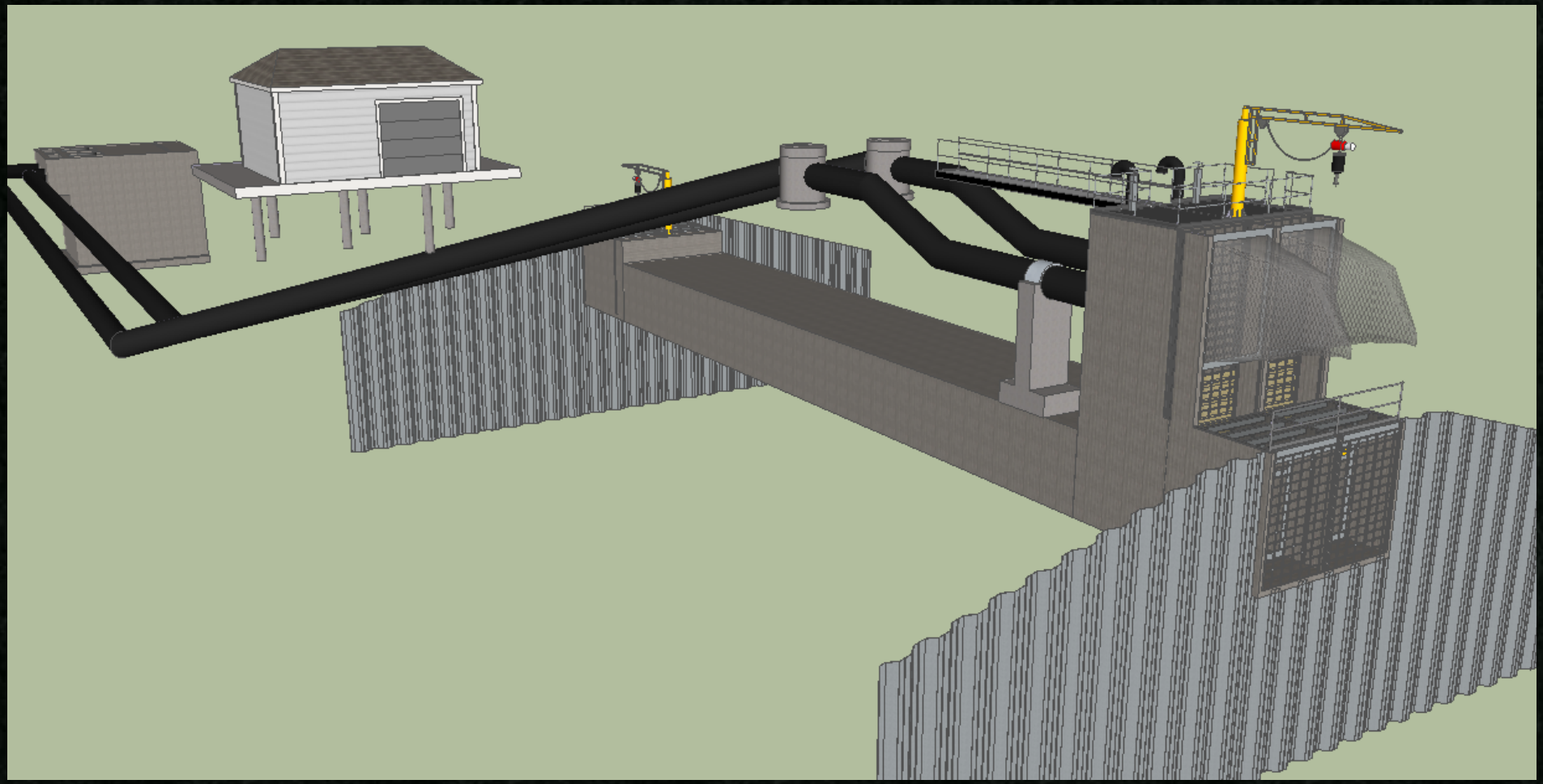
A Science-Friendly Structure to Manage Hydrology at The Nature Conservancy's Emiquon Preserve



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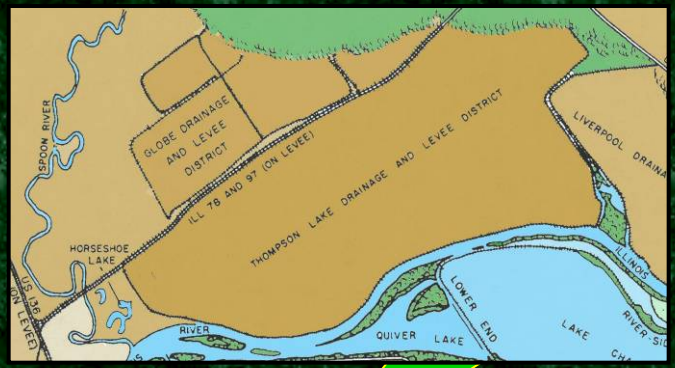
by K. Douglas Blodgett



2007

for the
Illinois Nutrient Reduction Strategy
Agricultural Nonpoint Source Subcommittee
16 December 2013, Bloomington, IL

Evaluating the Effectiveness of Agricultural Practices in Tile-drained Subwatersheds of the Mackinaw River, Illinois

Maria Lemke, The Nature Conservancy
David Kovacic, University of Illinois
Miran Day, Ball State University
Mike Wallace, University of Illinois
Krista Kirkham, The Nature Conservancy

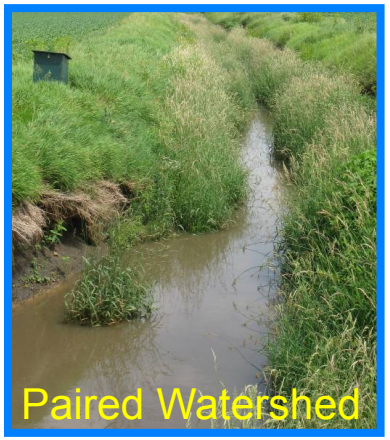
Mackinaw River Project Sites

Illinois River

Mississippi River

Research and Demonstration Farm

Drinking Watershed Project



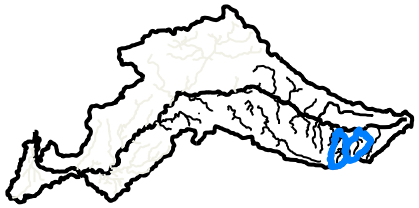
Paired Watershed

Lake Evergreen

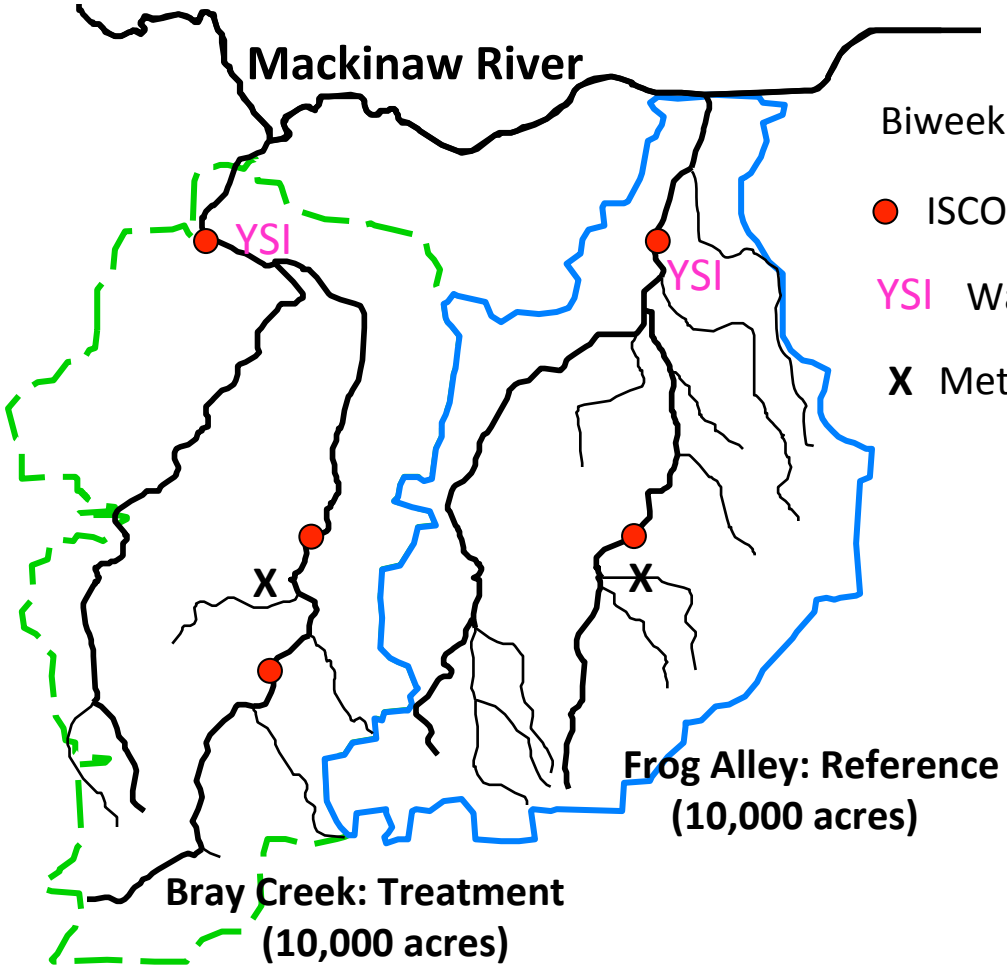
Lake Bloomington

USGS gaging stations

Paired Watershed Project (13 years)



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

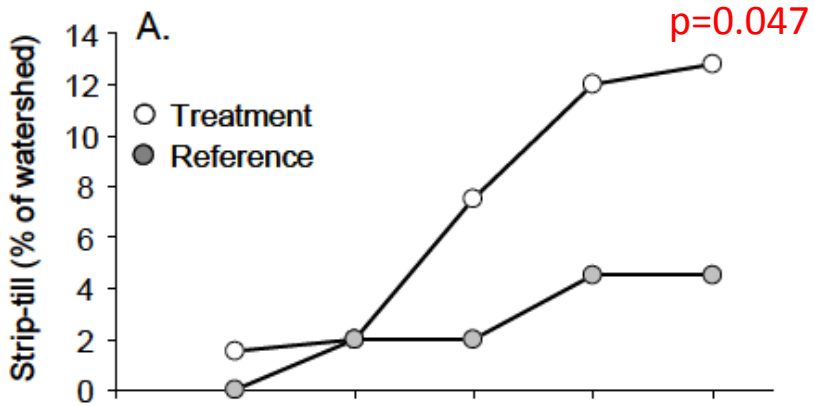


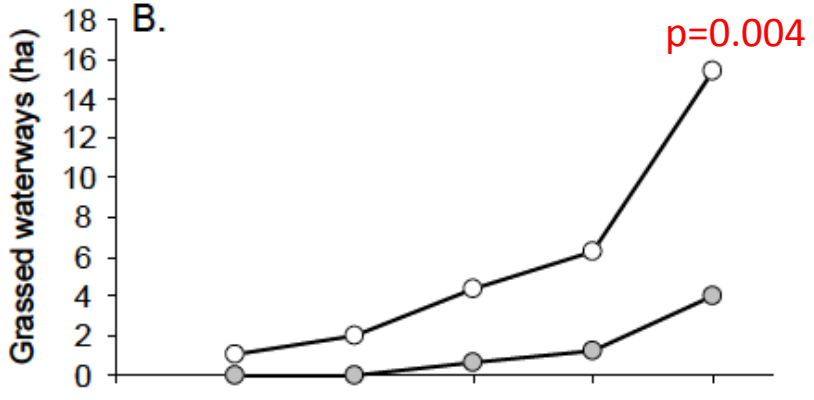
Biweekly grab samples: NH_4^+, NO_3^-, SRP, TP, TSS

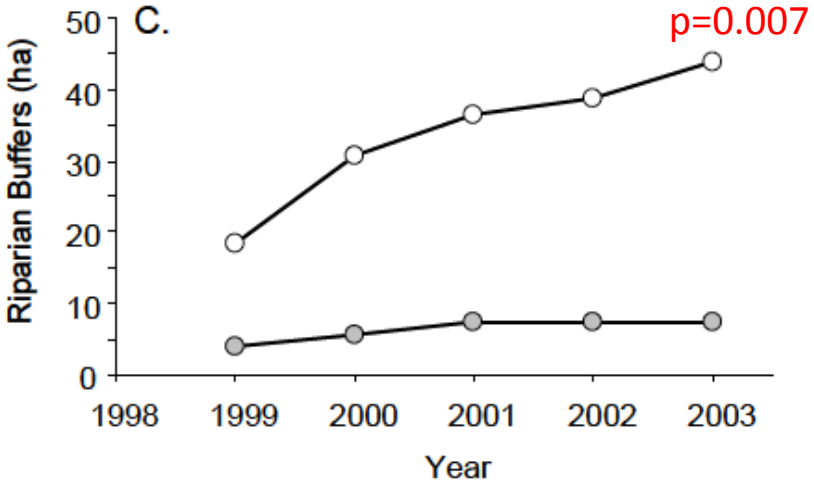
● ISCO Water Samplers (Storm events, stage height)

YSI Water temperature, turbidity, pH, conductivity, DO

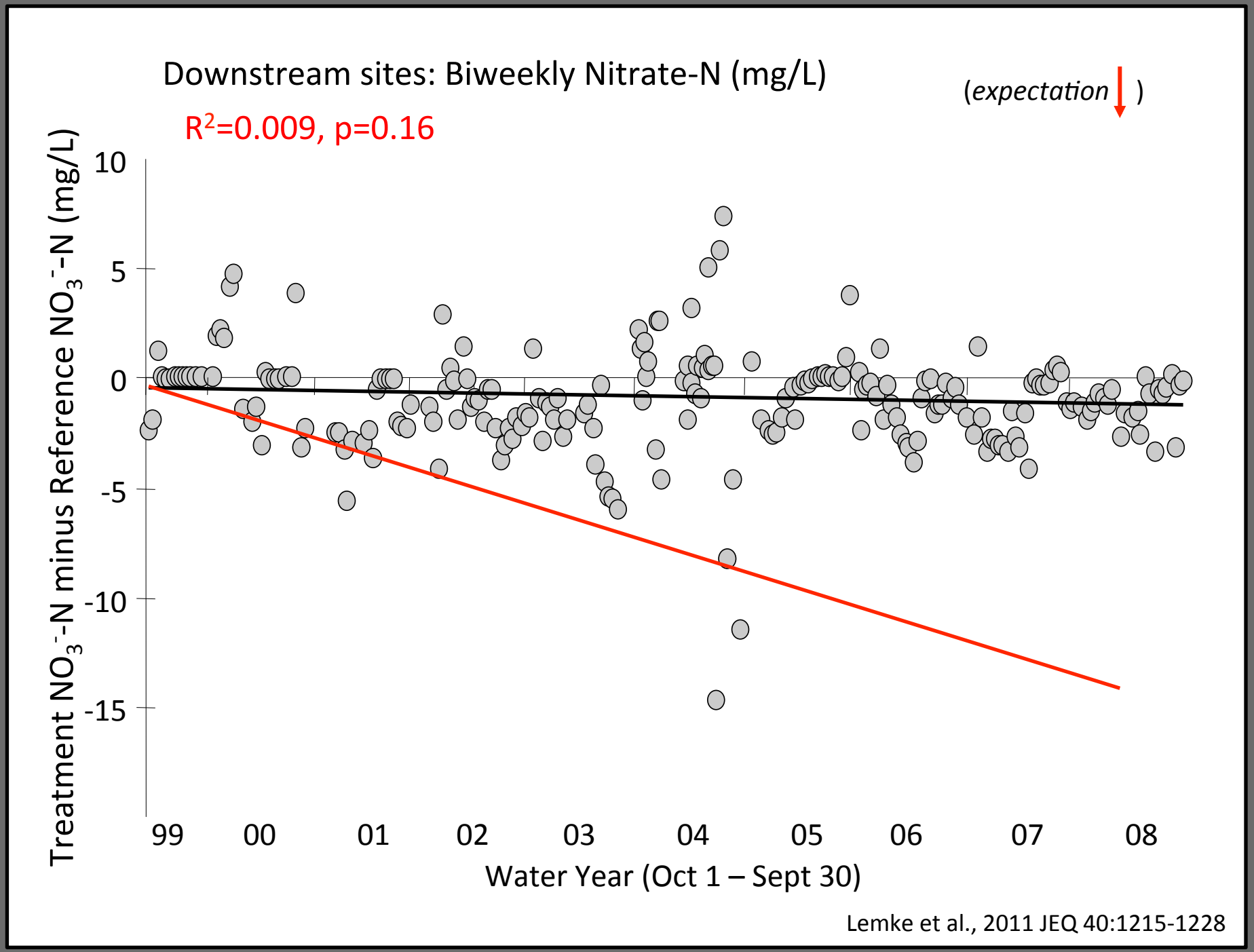
X Met Stations: Air temperature, rain, soil moisture



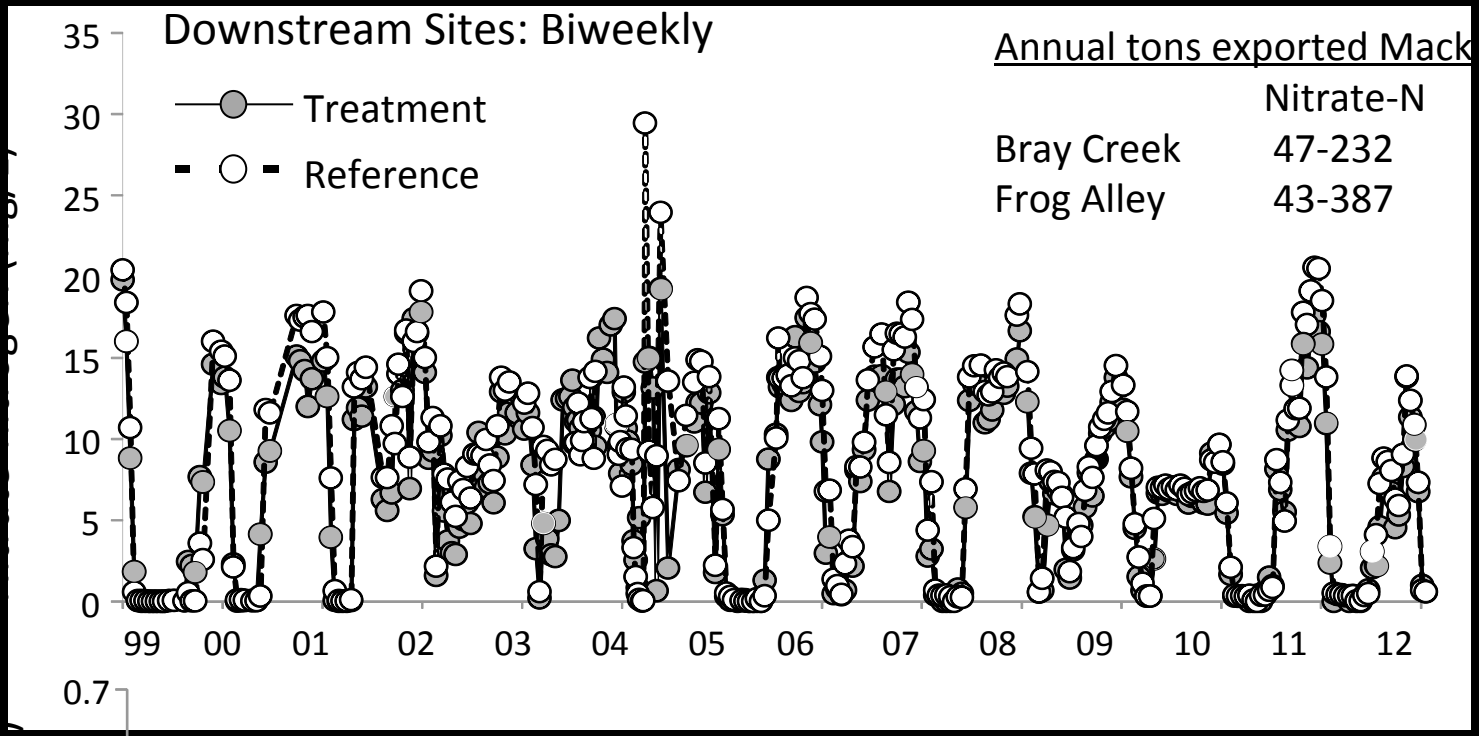




Lemke et al., 2011 JEQ 40:1215-1228

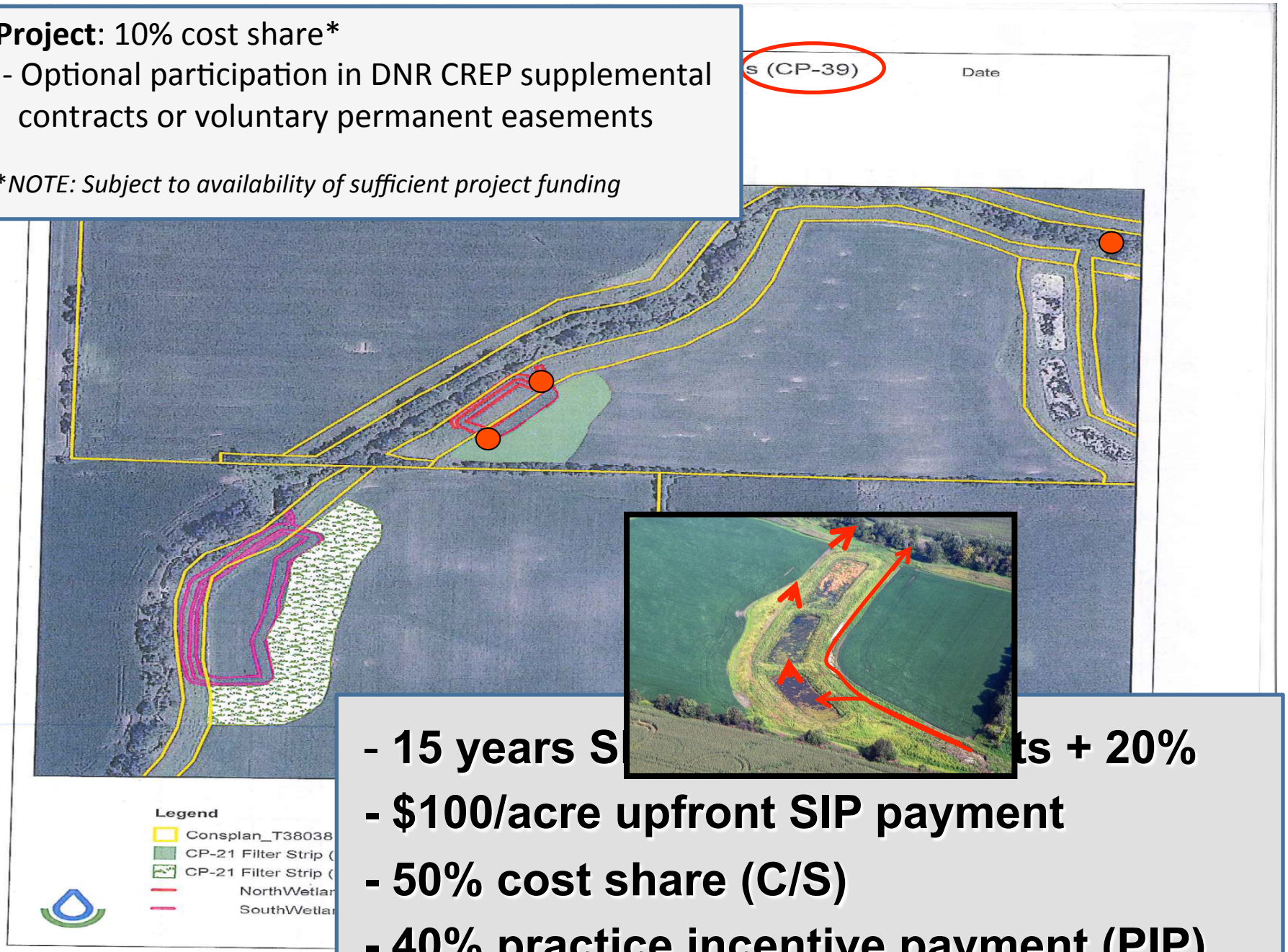


Lemke et al., 2011 JEQ 40:1215-1228

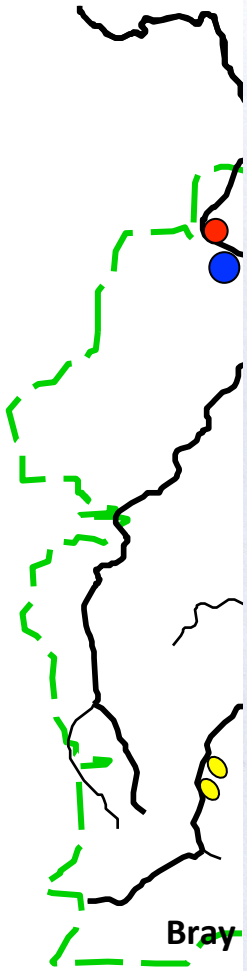

Downstream Sites: Biweekly
Treatment
Reference
35
30
25
20
15
10
5
0
99
00
01
02
03
04
05
06
07
08
09
10
11
12
Annual tons exported Mack
Nitrate-N
Bray Creek 47-232
Frog Alley 43-387
0.7

Project: 10% cost share*
- Optional participation in DNR CREP supplemental contracts or voluntary permanent easements

**NOTE: Subject to availability of sufficient project funding*

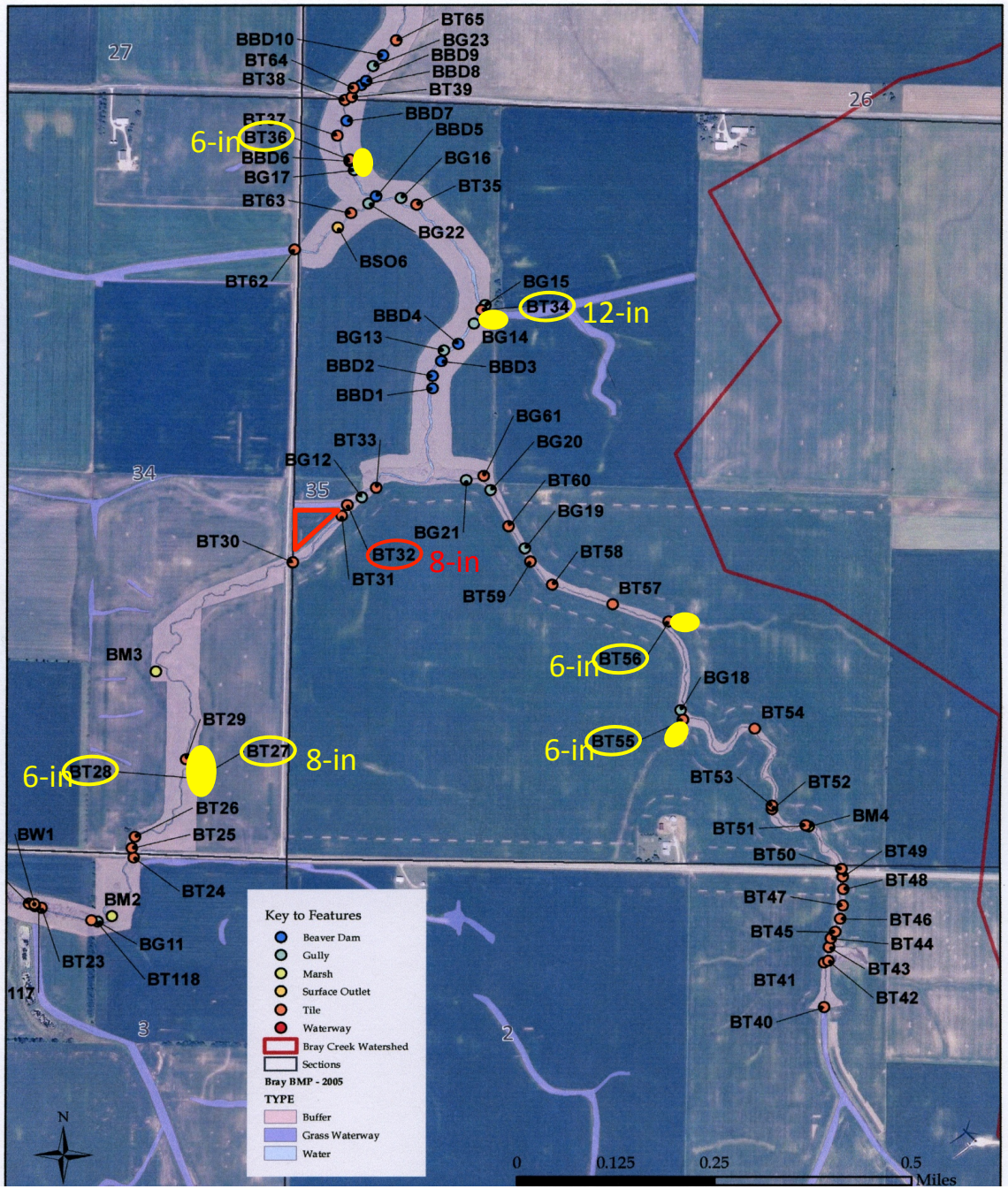


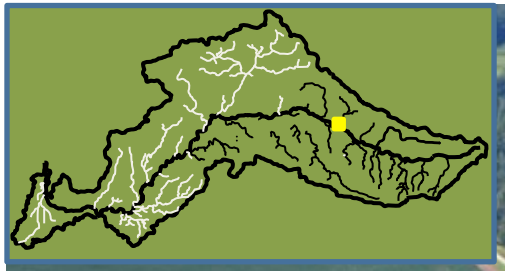
- 15 years S ts + 20%
- $100/acre upfront SIP payment
- 50% cost share (C/S)
- 40% practice incentive payment (PIP)

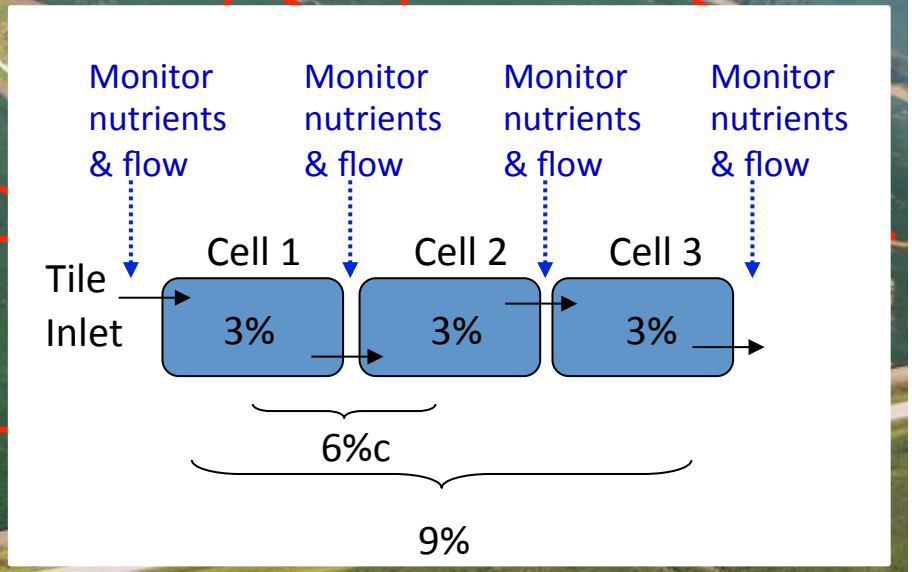


amplers

Mackinaw River Project Area
Bray Creek Drainage Tile GPS Points

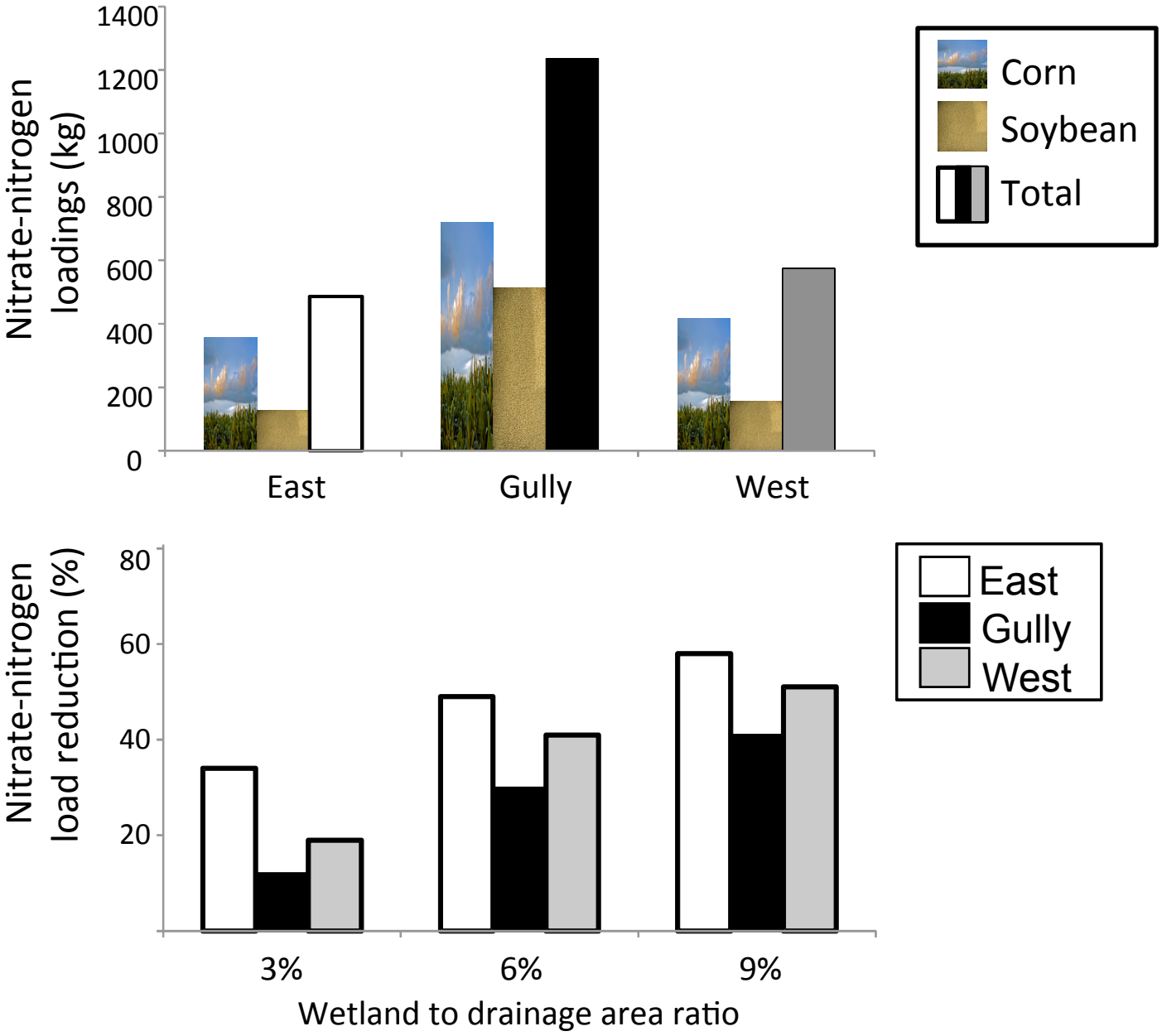




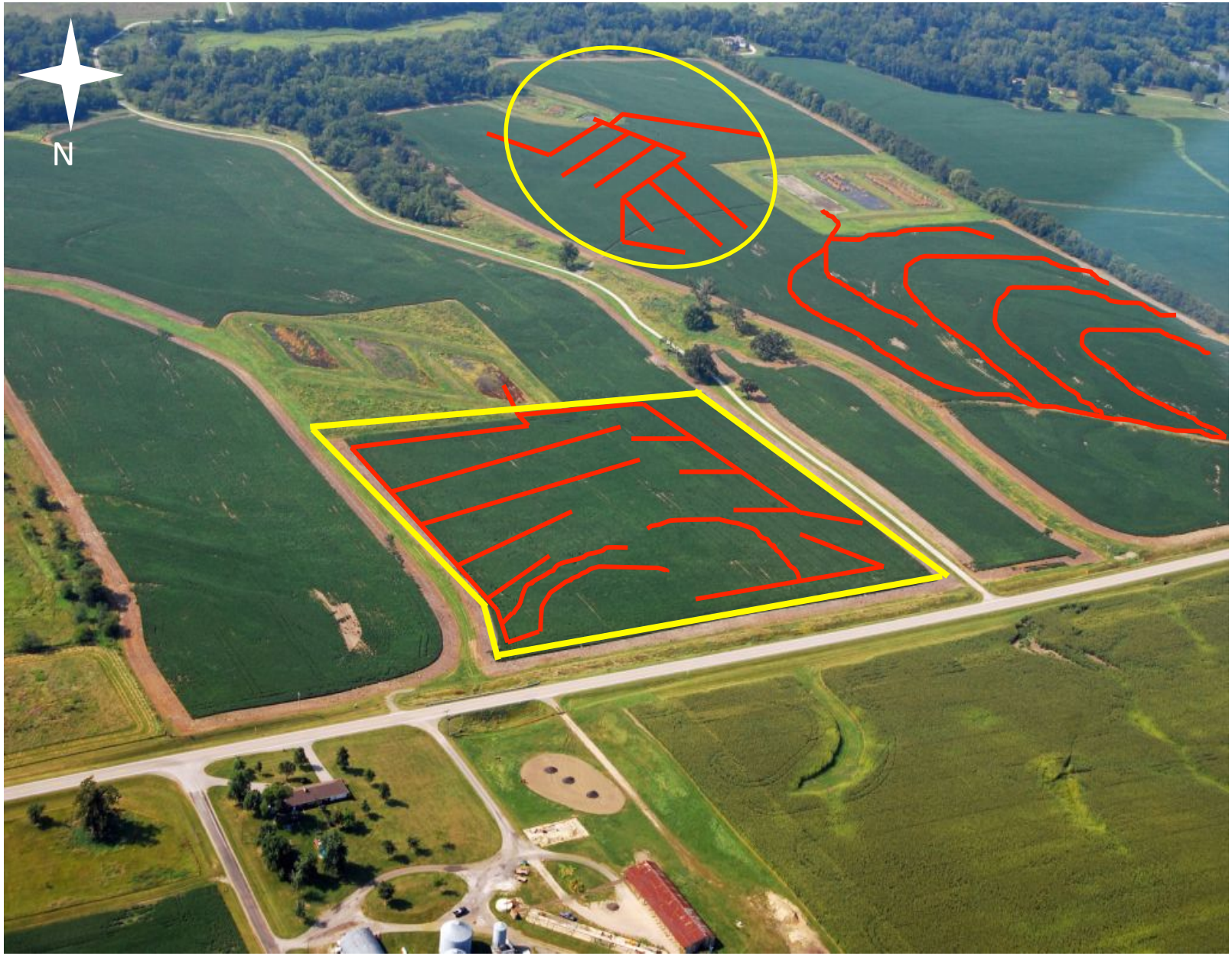


What size of wetland is most effective at reducing nutrients in tile runoff?

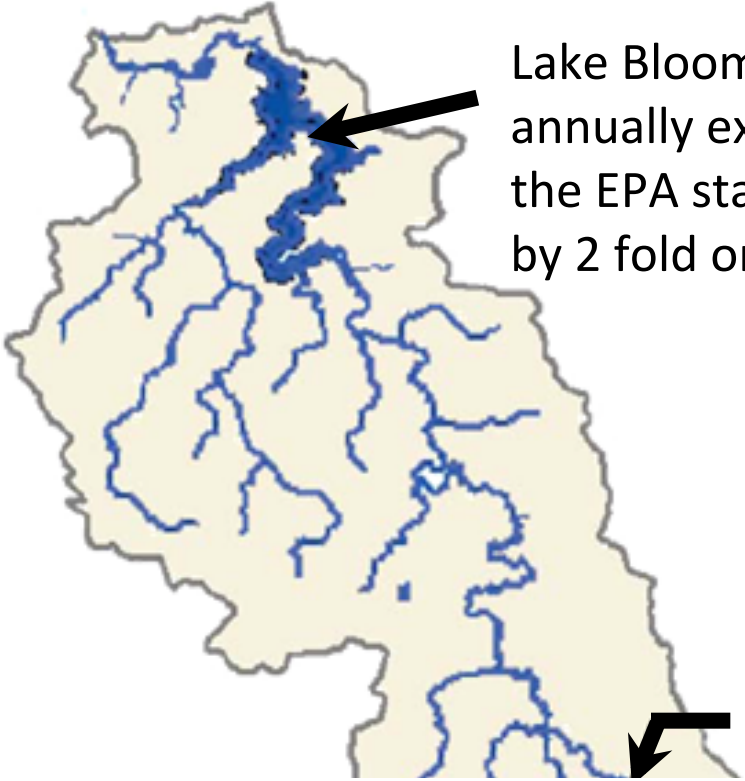
6-year Monitoring Results



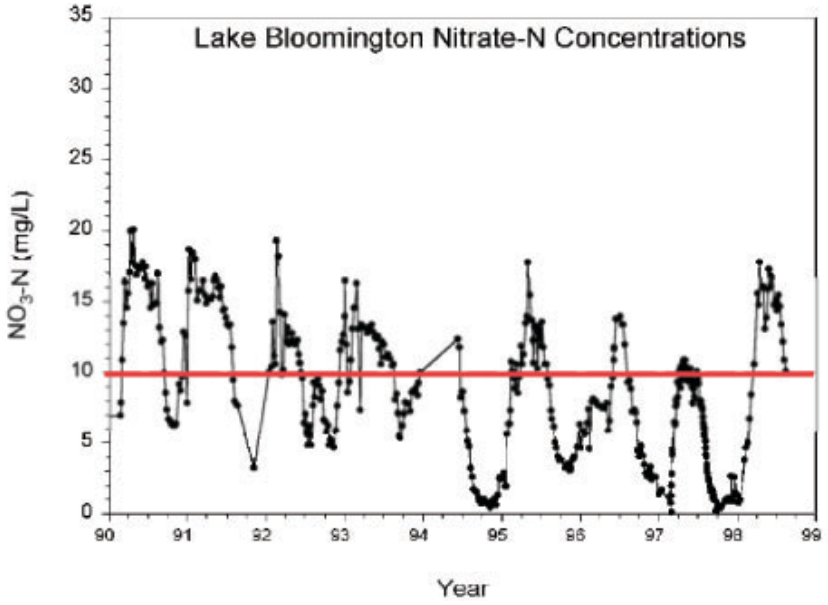
How do winter cover crops influence nutrient export from tile-drained farmland?



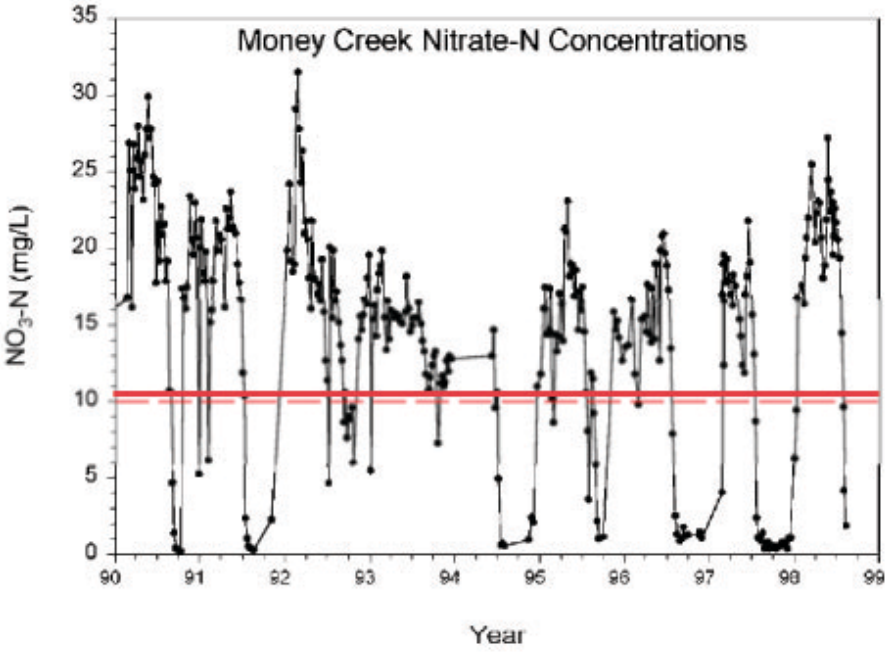
NRCS Conservation Innovation Grant 2011-2013

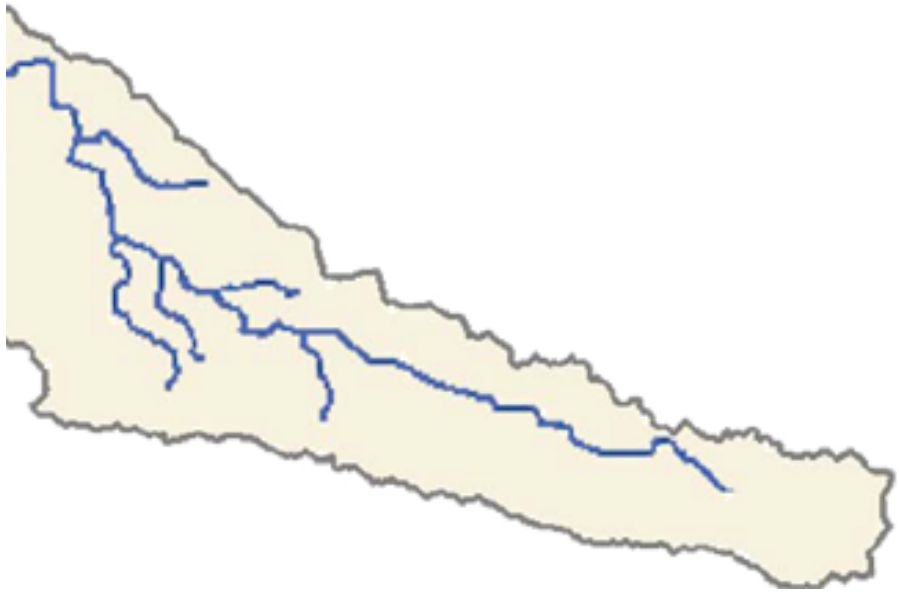


Lake Bloomington annually exceeds the EPA standard by 2 fold or less.



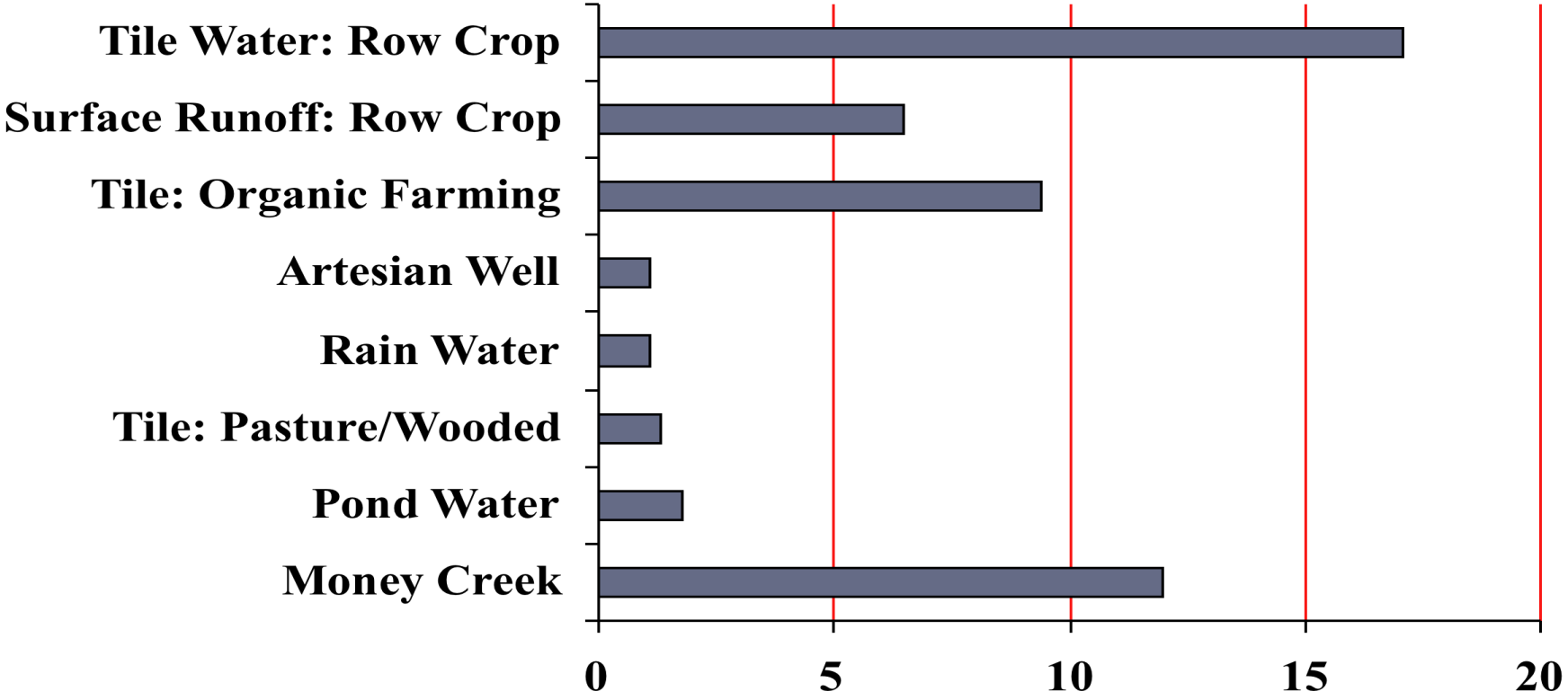
Money Creek which feeds Lake Bloomington annually exceeds the EPA standard by >2 fold





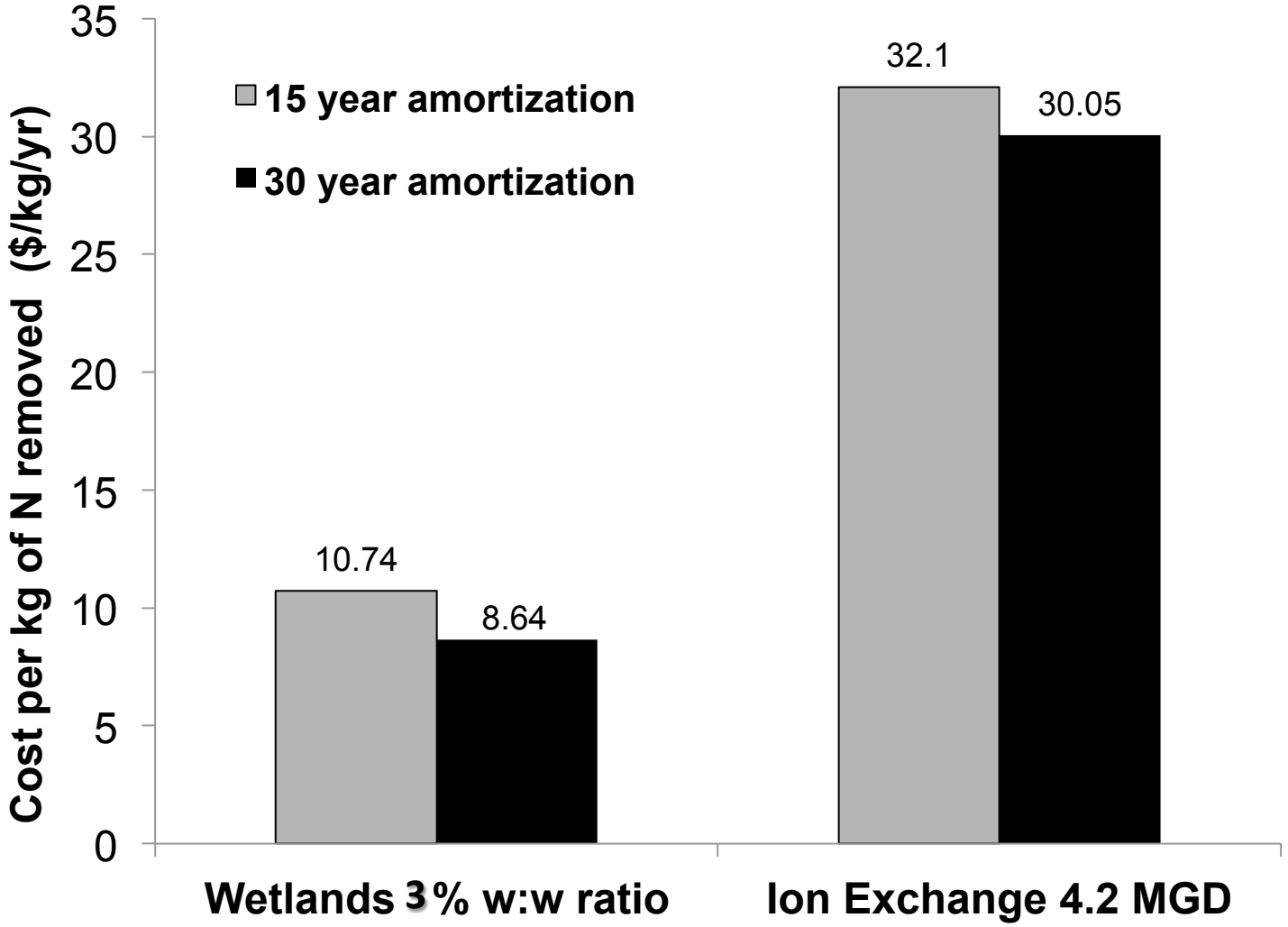
Average Nitrate-N: 1993-1998

Smiciklas & Moore, 1999



Economic Analysis - Comparing Wetland to Ion Exchange Removal Costs per kg N

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



Divided the Lake Bloomington watershed into hierarchical series of nested sub-basins (Tiers 1 through 6)

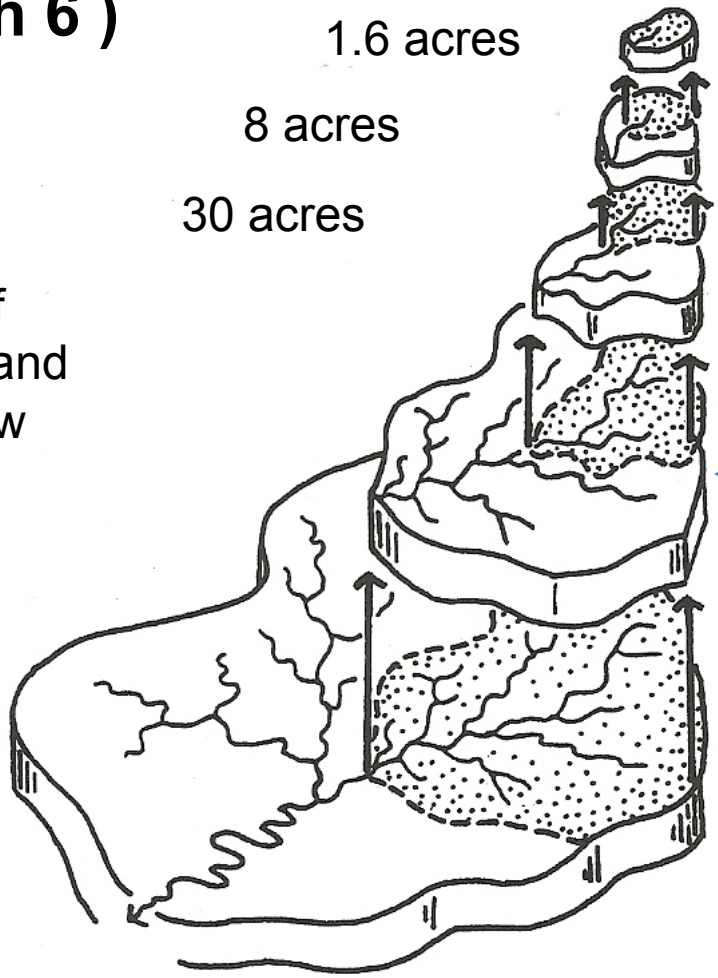
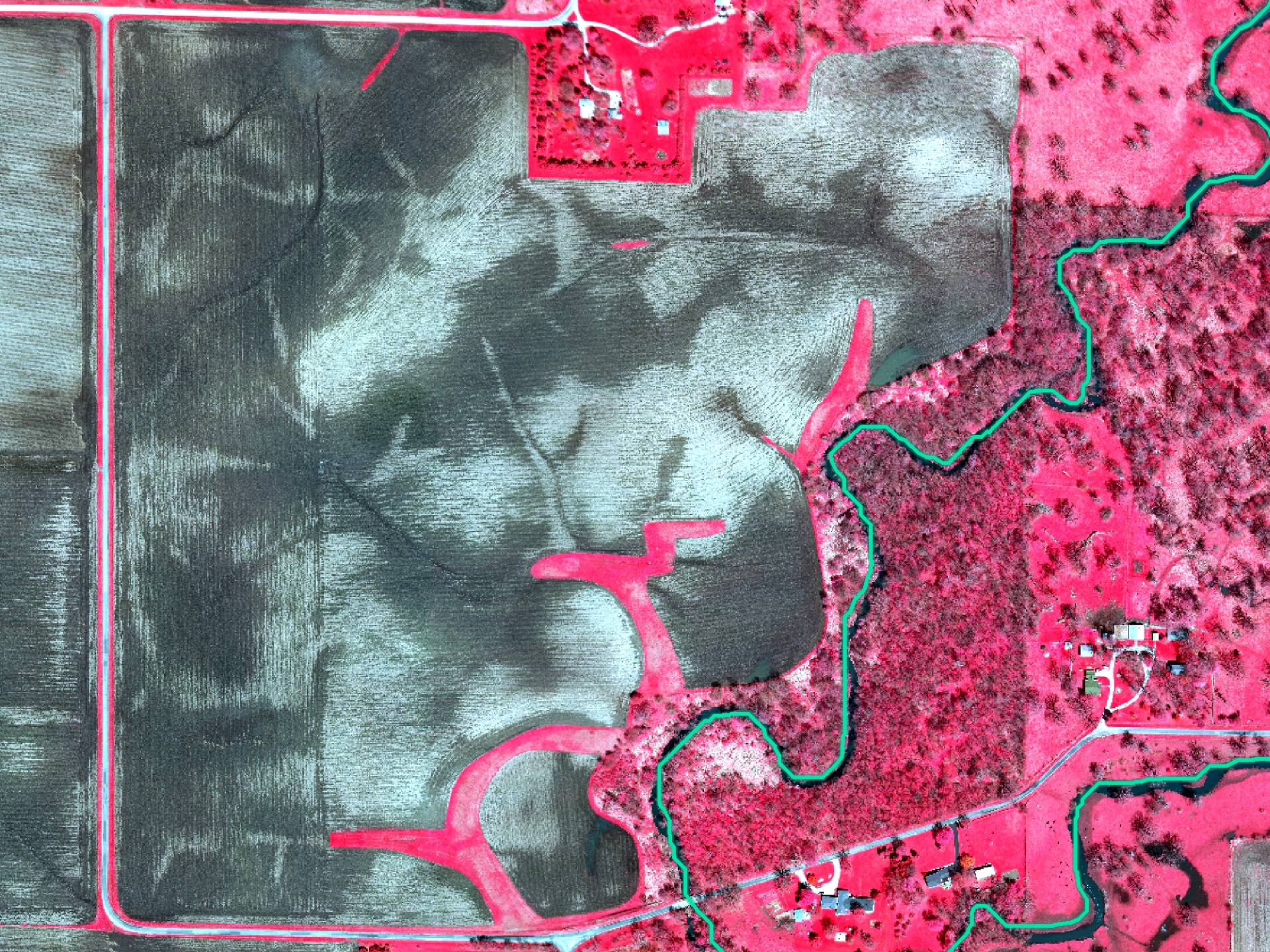
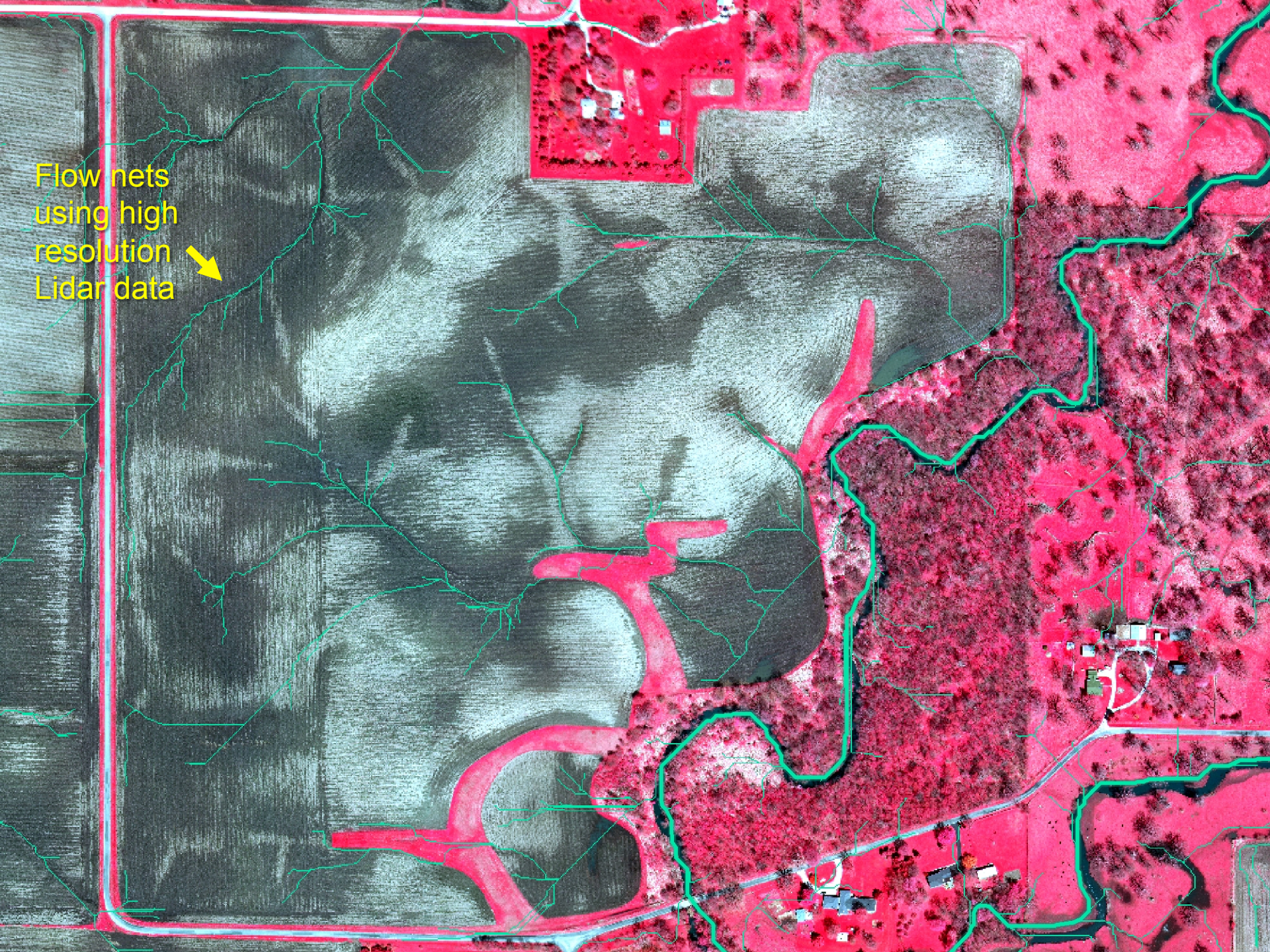
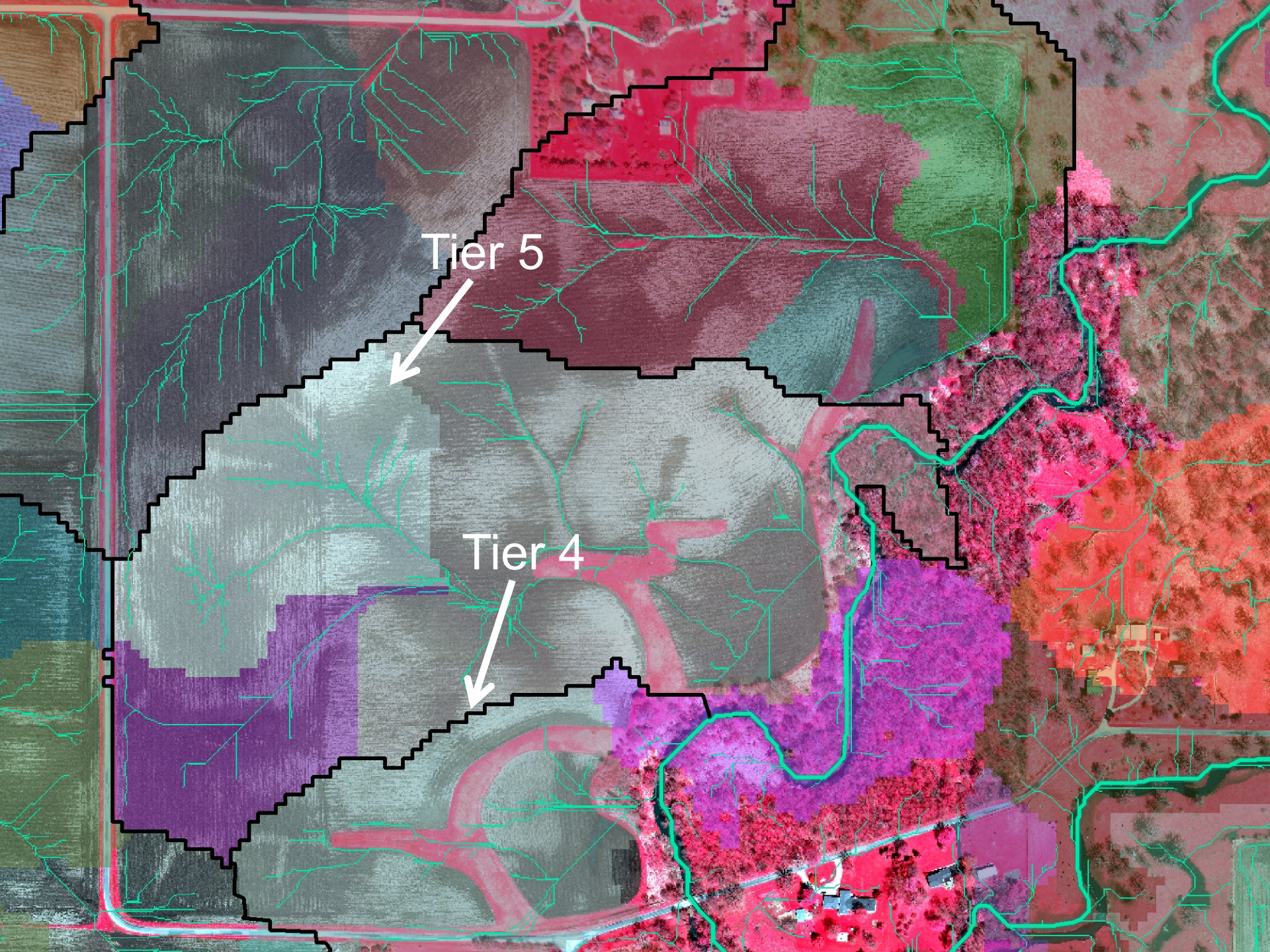
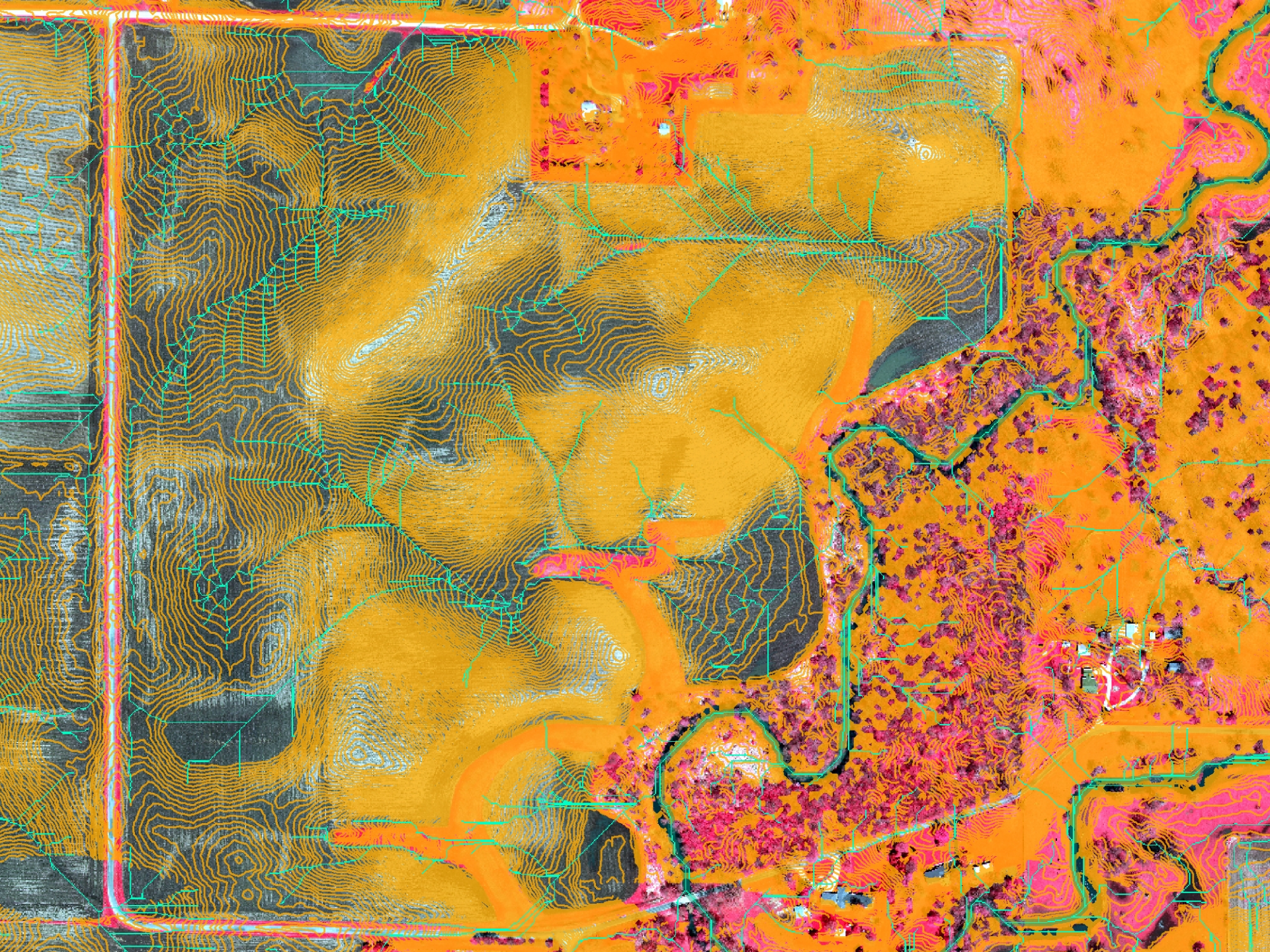


Fig. 9.2 Illustration of the nested hierarchy of lower-order basins within a large drainage basin.

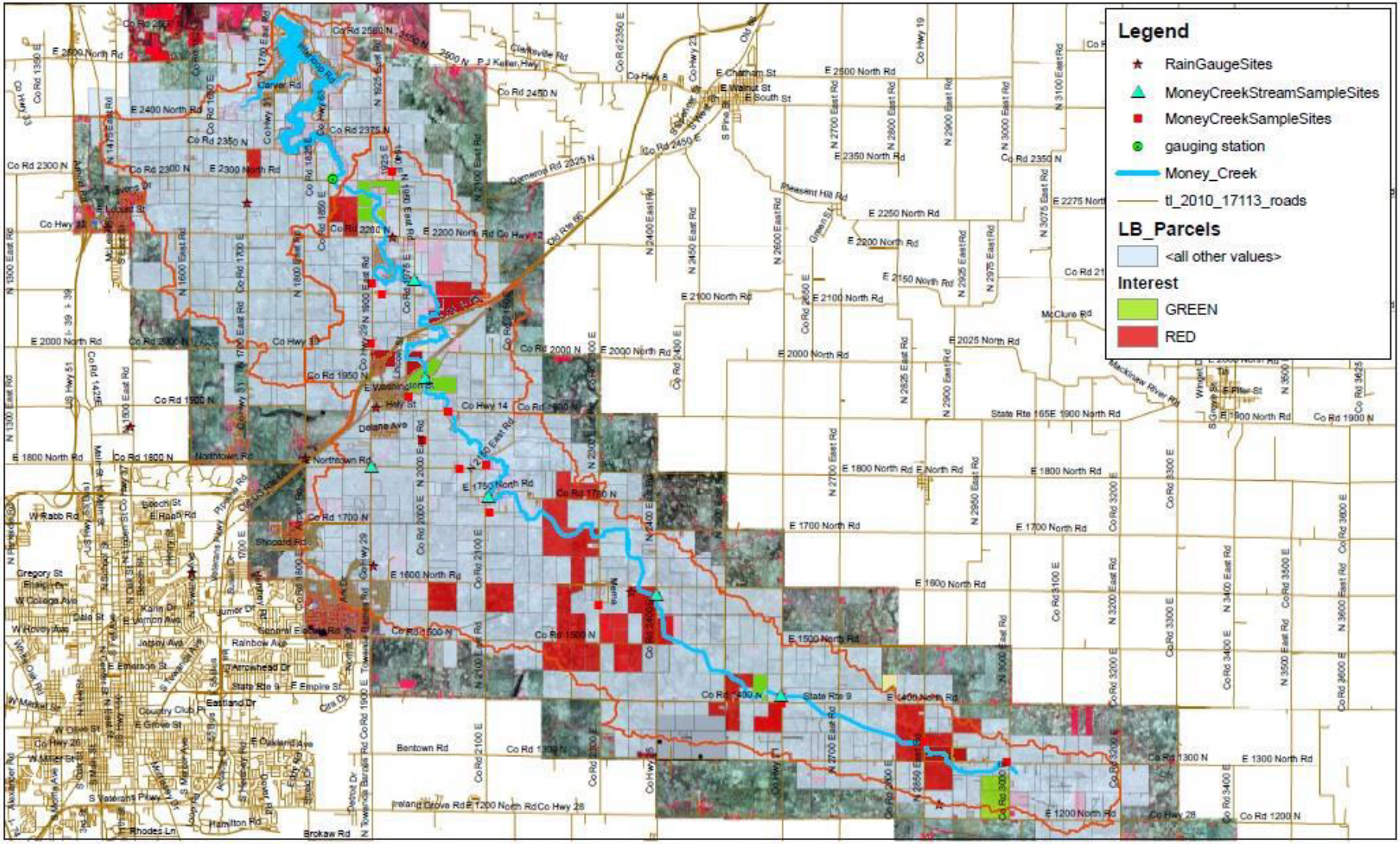



Flow nets
using high
resolution
Lidar data


Tier 5
Tier 4

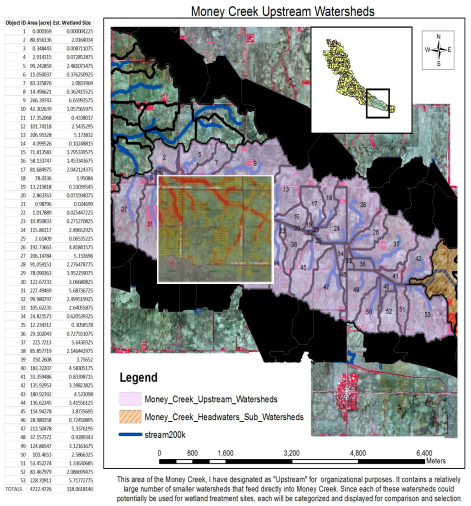


Green Light Map



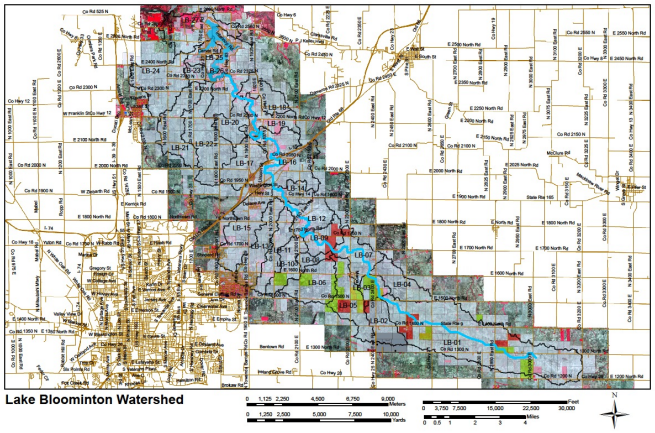
Lake Bloomington Watershed

What do we do with all of this?



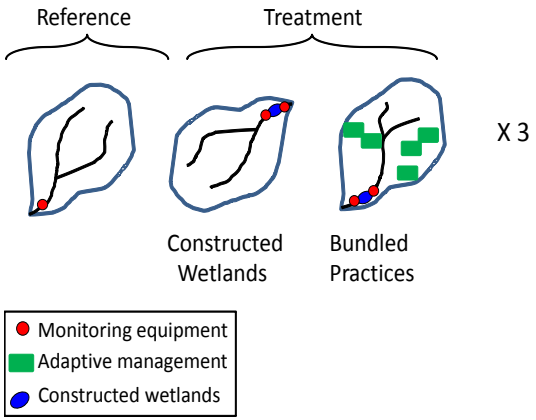
How many wetland acres are needed

+



How many wetland acres are likely

+



What kind of watershed reductions can be expected

Economic analyses of grey versus green treatment

+

Clear documentation and streamlined process

- **Watershed conservation blueprint for the City of Bloomington**
- **Applicability beyond the Mackinaw River for sustainable conservation and agricultural production**

Photo credits:

Tim Lindenbaum

Partners and Funding Sources

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

University of Illinois at Champaign-Urbana
Illinois State University

Environmental Defense Fund
City of Bloomington, Illinois
Private landowners and producers

Walton Family Foundation
Grand Victoria Foundation
Lumpkin Family Foundation
World Wildlife Foundation/Coca Cola Company
Mosaic Company
Monsanto
DuPont-Pioneer
Kellogg Foundation
Ducks Unlimited
USDA-NRCS Conservation Innovation Grant Program
U.S. Farm Services Agency