Policy Working Group Meeting – May 22nd

Welcome!

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY | Improving our water resources with collaboration and innovation

Photo credit: Paul Gierhart

Introductions – Sign in Sheet

Point Source
Rick Manner Kay Anderson Nick Menninga Albert Cox Randy Stein Alec Davis
Agriculture
Liz Hobart Jennifer Tirey Lauren Lurkins Jean Payne Rodney Weinzierl Dick Lyons
Steve Stierwalt Kris Reynolds Julie Armstrong
Stormwater
Mary Beth Falsey
Drinking Water Supply
Ted Meckes Kevin Culver
University/Technical Assistance Providers
Laura Christianson Paul Davidson
Environmental Groups
Albert Ettinger Catie Gregg Cindy Skrukrud Ashley Maybanks
Government
Chris Davis Trevor Sample Warren Goetsch Mike Chandler Gene Barickman

Committee Charge

Policy Working Group Charge:

- Explore funding opportunities
- Identify needed legislative initiatives
- Network with the appropriate people and groups
- Identify adaptive management adjustments and update the strategy

NSAC Update and Next Steps
Sanjay Sofat, Illinois EPA

Updated Science Assessment

Greg McIsaac, University of Illinois

Nitrate-N and Total Phosphorus Load Estimates in Illinois Rivers: Update through the 2017 water year

Gregory McIsaac, Associate Professor Emeritus
University of Illinois at Urbana Champaign

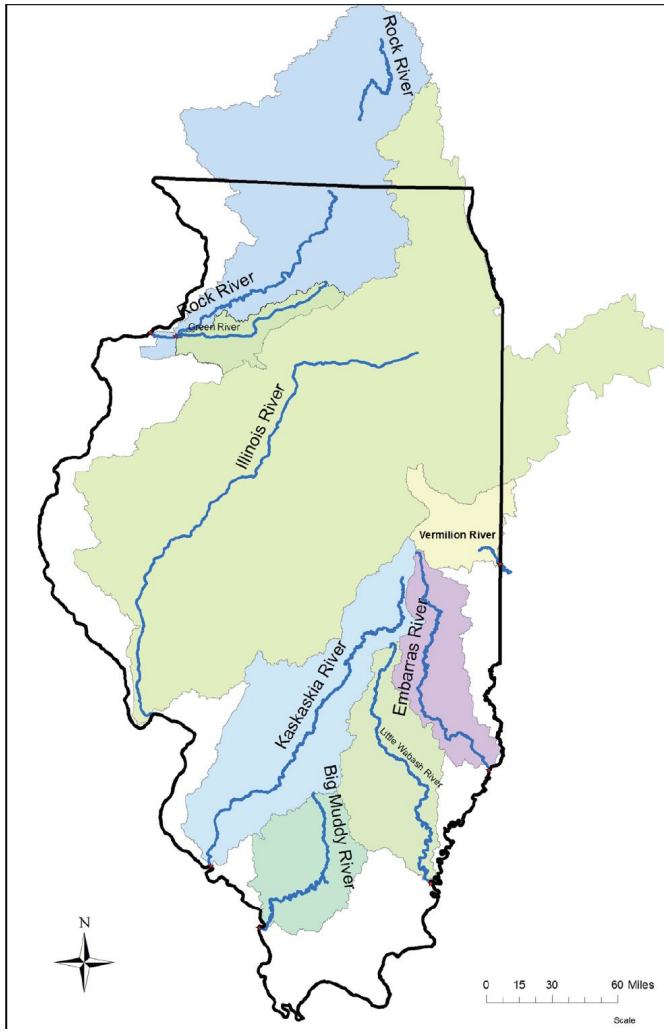
Adjunct Research Scientist
Agricultural Watershed Institute

Acknowledgements

- Funding from IEPA
- River flow and concentration data from USGS, IEPA, Lowell Gentry (U of IL), Fox River Study Group and Metropolitan Water Reclamation District of Greater Chicago (MWRD)
- Point Source discharge data from USEPA and IEPA (Trevor Sample) and Sanitary District of Decatur
- GIS from Aaron Hoyle-Katz and Jong Sung Lee at the National Center for Supercomputing Applications
- Helpful comments from Trevor Sample, Dennis McKenna, George Czapar, Momcilo Markus, Clark Bullard, Bruce Hannon.

IL Nutrient Loss Reduction Strategy (2015) and Biennial Progress Report (2017)

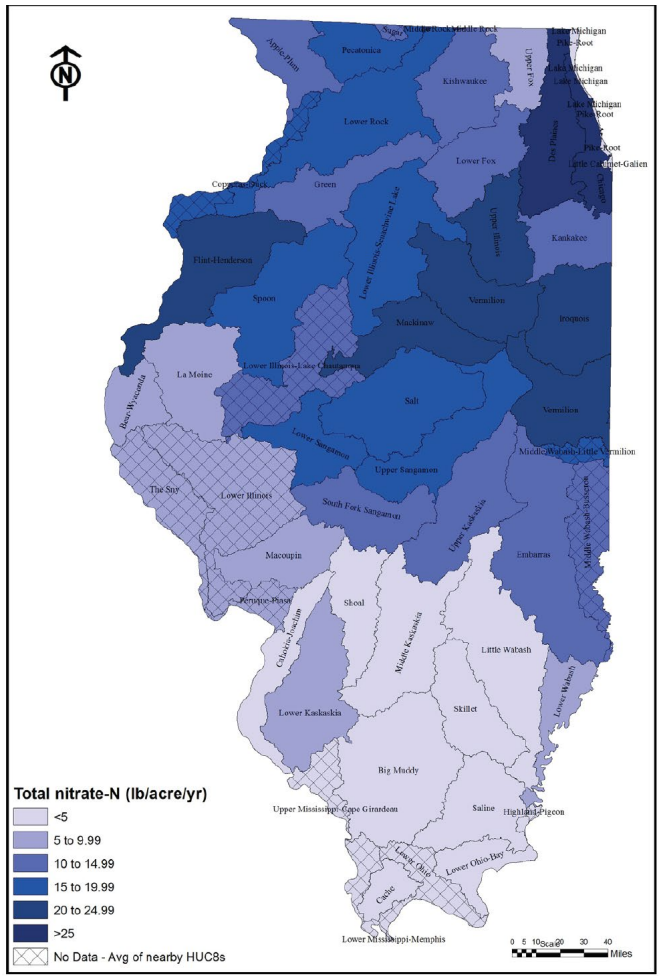
Statewide loads based on 8 major river systems



~40 HUC 8s with sufficient flow and concentration data for load estimation

Point source discharges also reported by HUC 8

HUC 8 Nitrate-N yields 1997-2011 (NLRS 2015)



Load Calculation Methods same as NLRS

Load = water flow (volume/time) x concentration (mass/volume)

Yield = Load/area

USGS provides daily water flow

IEPA and USGS provide sample concentrations approximately monthly

Daily Load = daily water flow x estimated daily concentration

Daily concentrations estimation methods

Nitrate: Linear Interpolation over time between measured samples

Phosphorus: Weighted Regressions on Time, Discharge and Seasonality (WRTDS)

Statewide Riverine Flow and Loads

	1980-96	**2013-17**	**% change**
Water Yield (in/yr)	13.0	14.7	+13%
Nitrate-N Load (Million lb N/yr)	397	425	+7%
Total P Load (Million lb P/yr)	34	43	+28%

Statewide Point Source Discharges

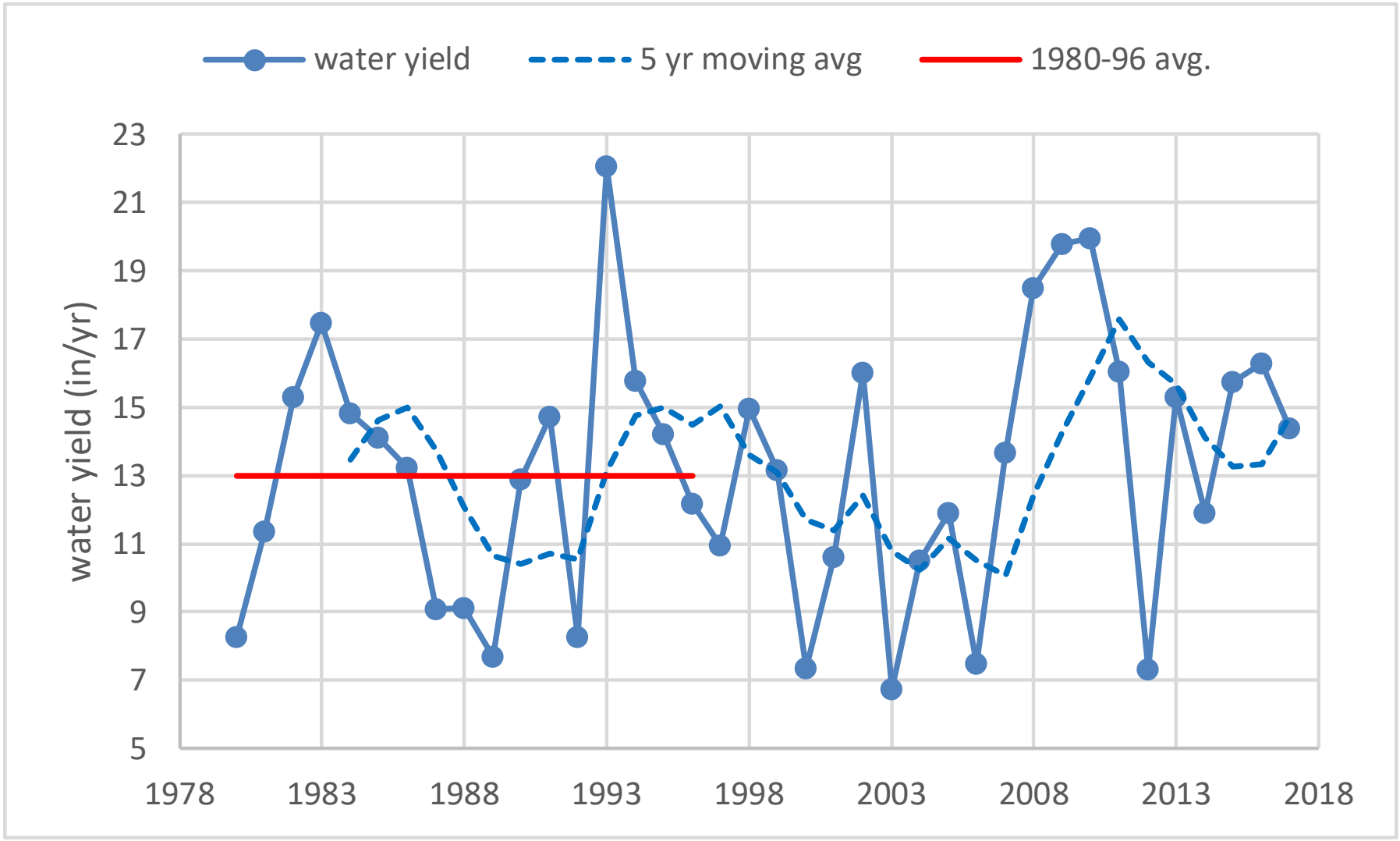
	2011	2017*	% change
Total N (Million lb N/yr)	87.3	75.0	-14%
# of facilities incl.	392	898	
Total P (Million lb P/yr)	18.0	14.1	-22%
# of facilities incl.	1660	1371	

*2011 discharge data was used for facilities included in the NLRS estimate, for which 2017 data was unavailable

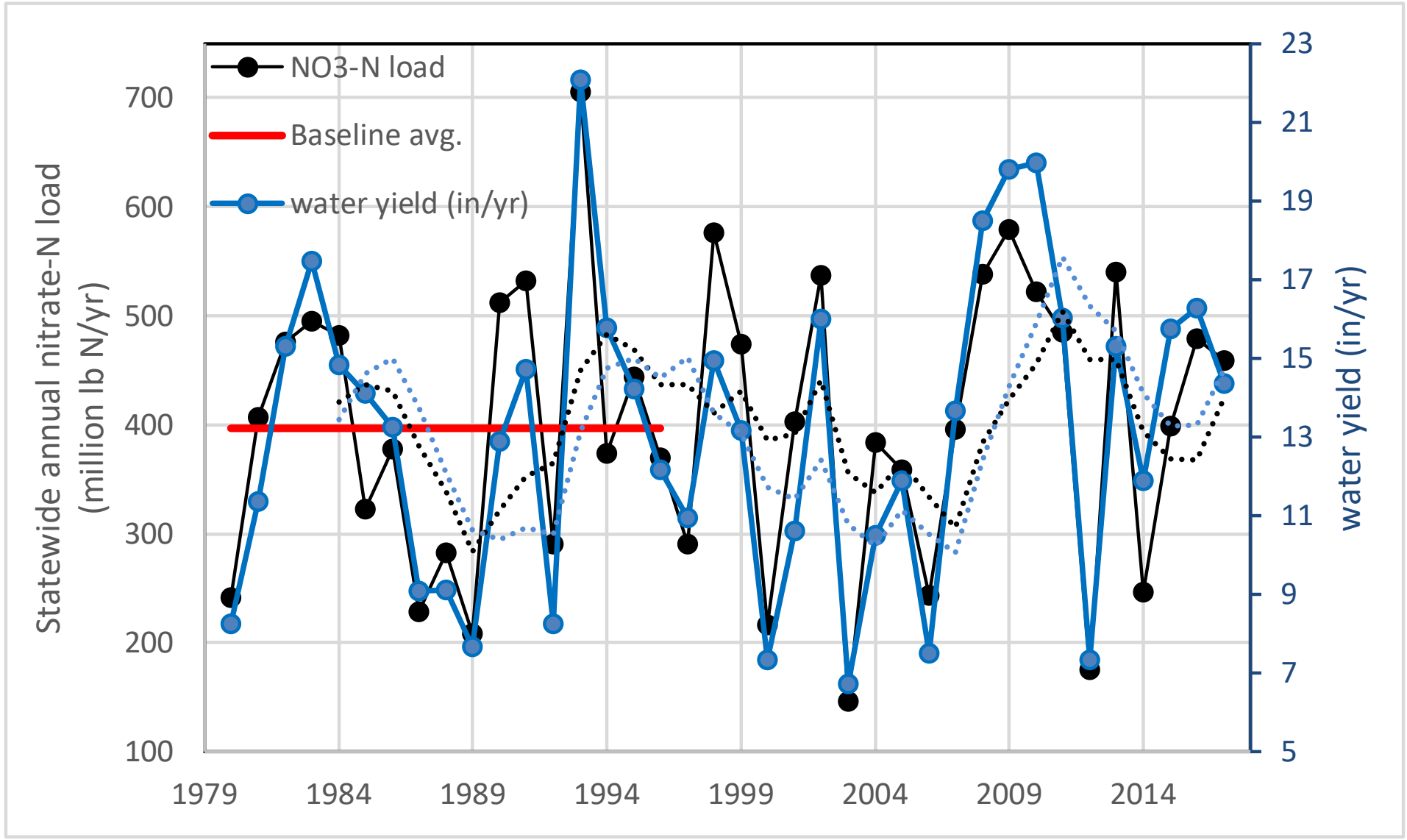
Cooling water discharge not included in 2017

Statewide annual water yield

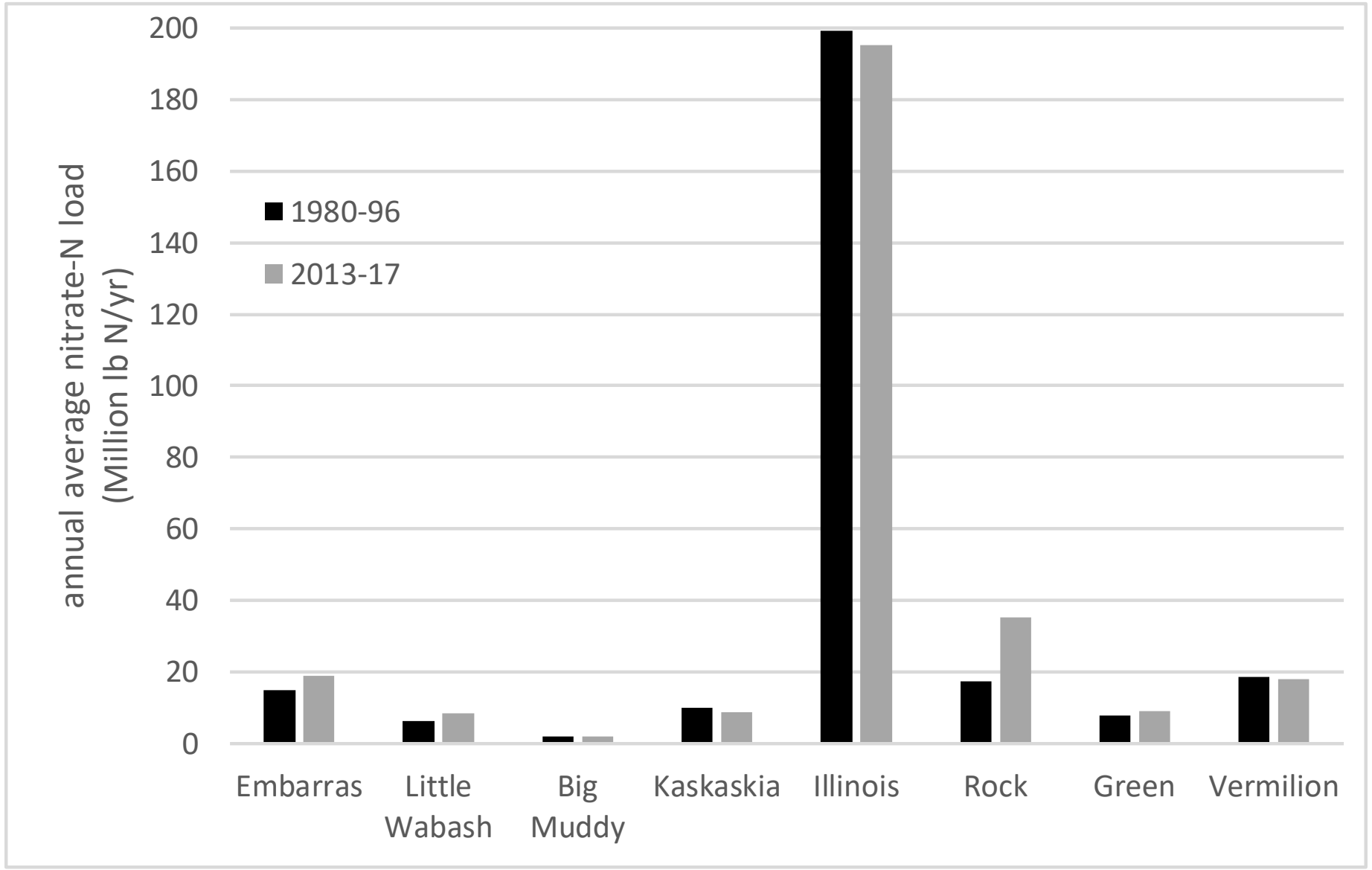
annual, 5 year moving average, and 1980-96 average



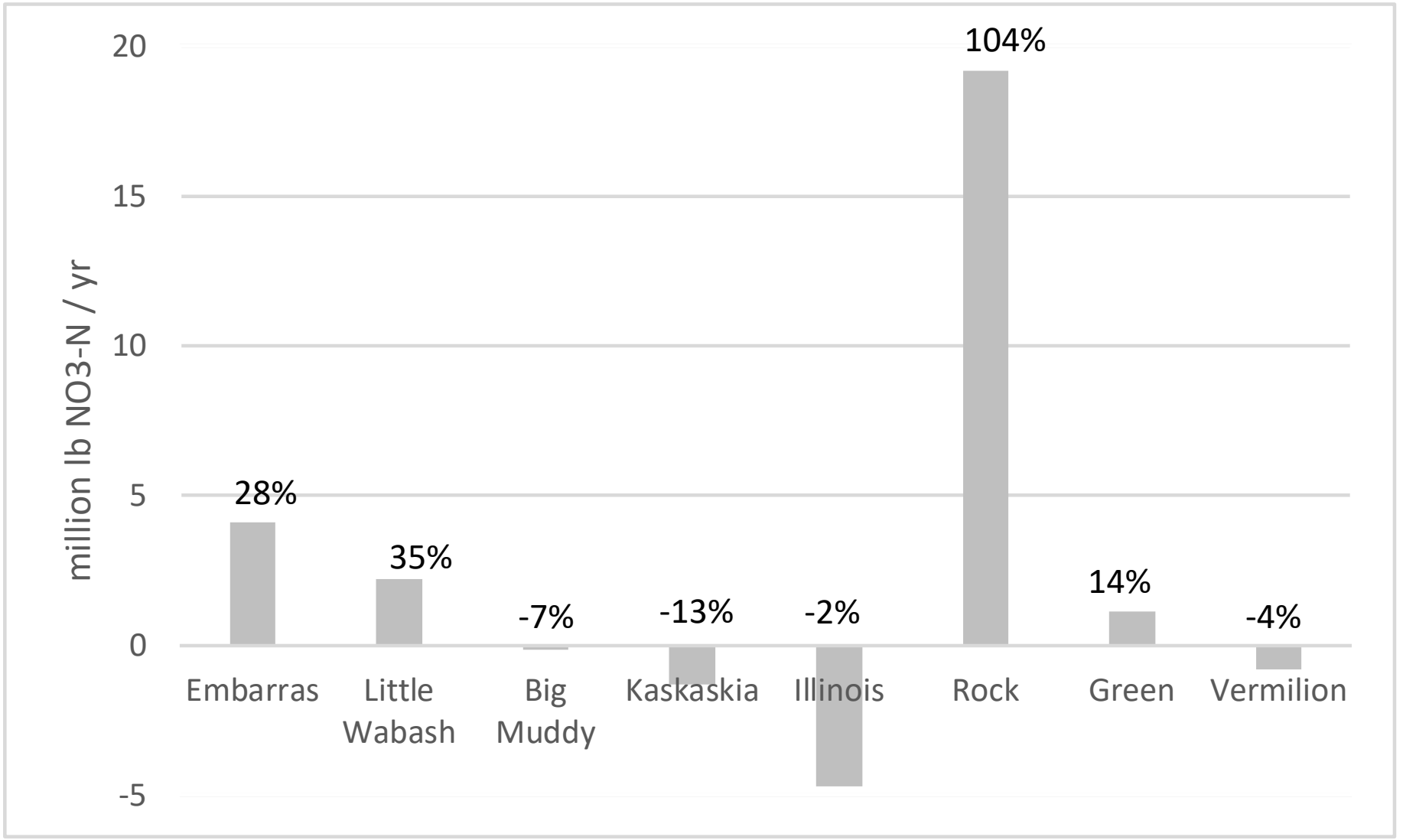
Statewide estimates of annual nitrate loads (black), water yield (blue), 1980-96 baseline average (solid red line), and five year moving average values (dashed lines)



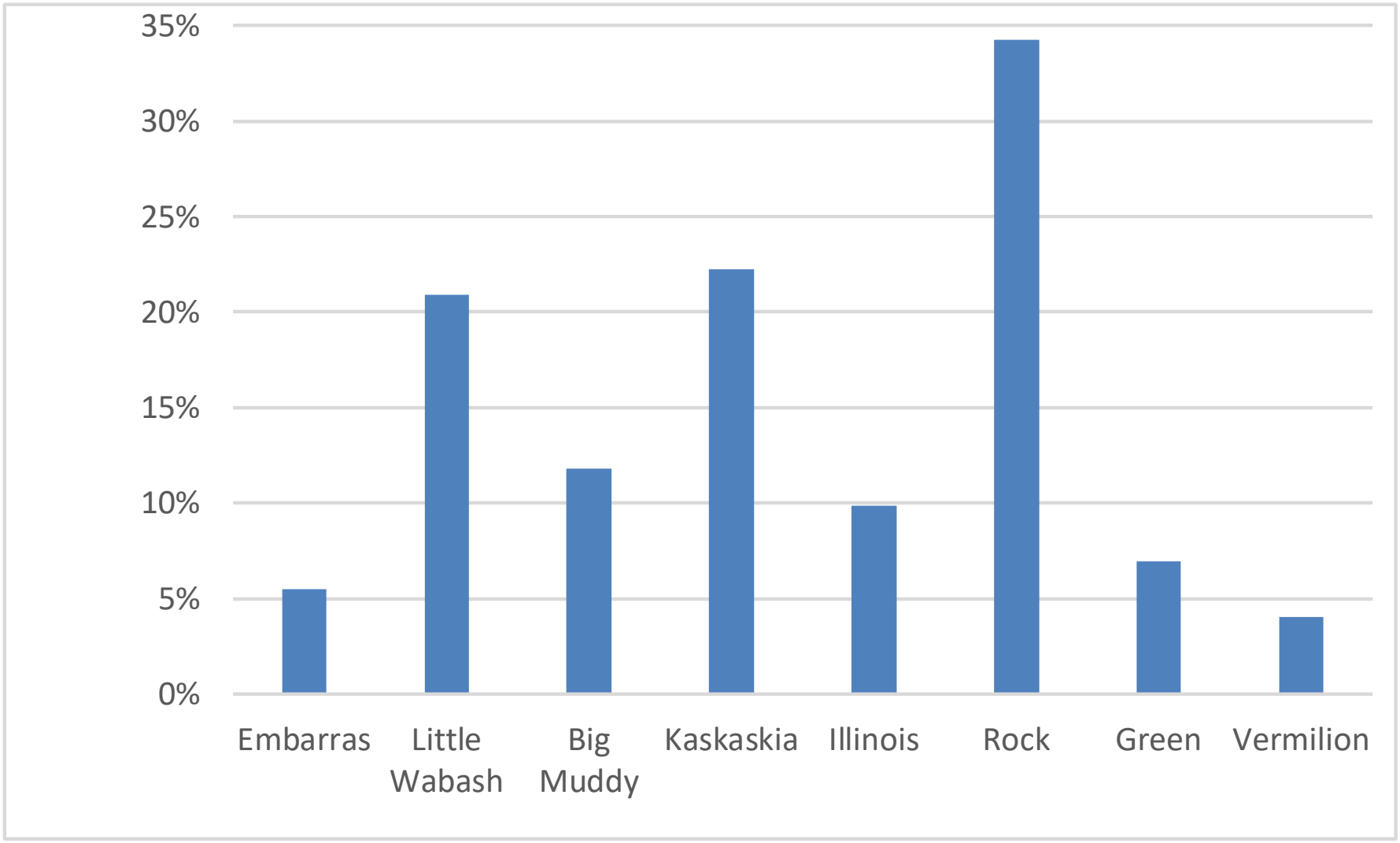
Nitrate-N Load Estimates in Major Rivers in Illinois 1980-96 and 2013-17



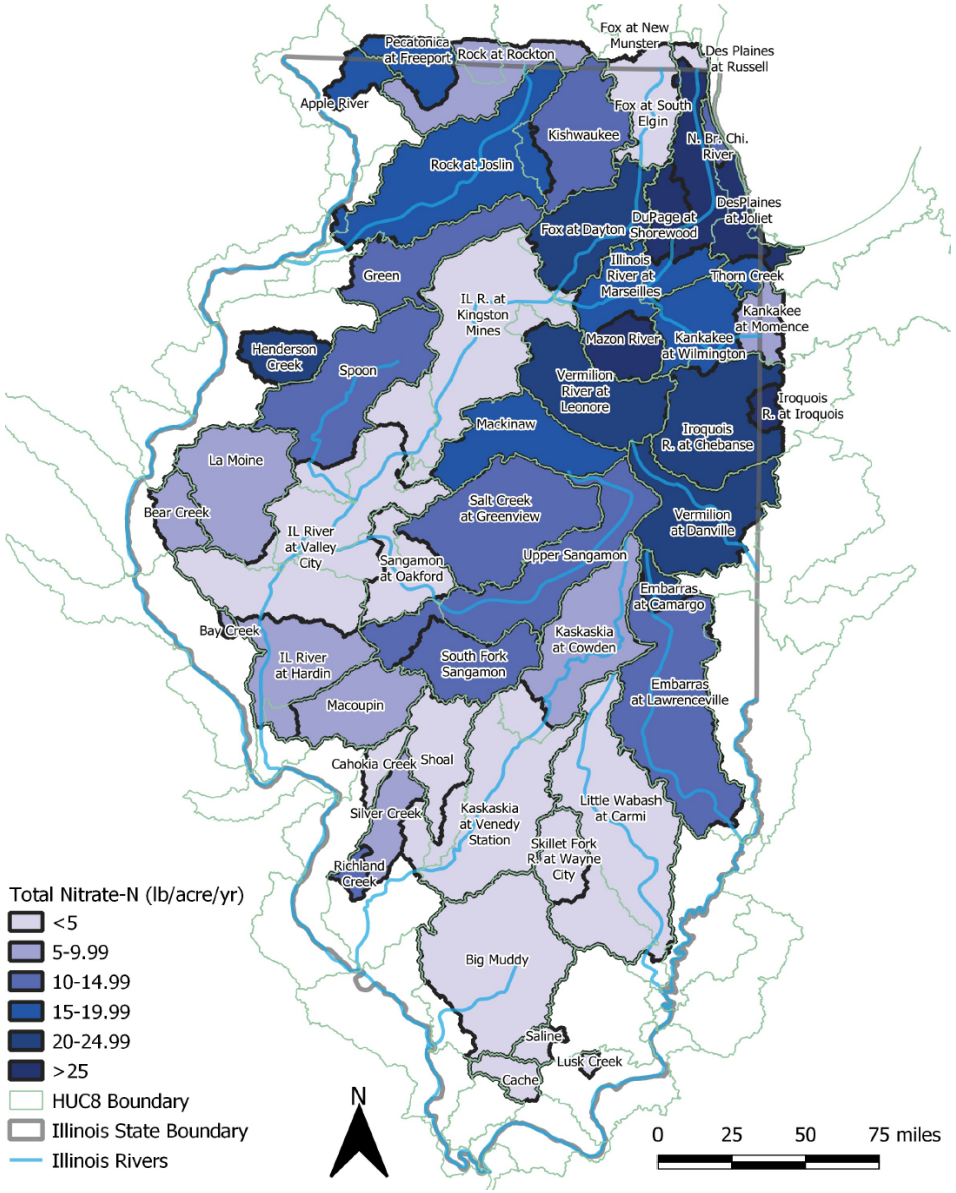
Changes in Riverine Nitrate-N Loads from 1980-96 to 2013-17 for major rivers in Illinois



% Changes in water flow from 1980-96 to 2013-17 for major rivers in Illinois



Nitrate-N yield (2012-17) at monitoring locations



(Aaron Hoyle-Katz, NCSA)

HUC-8 Challenges

Drainage areas of the monitoring locations do not match HUC boundaries.

Extrapolating from monitored area to HUC area introduces uncertainty and probability of inaccurate estimates

For 16 HUCs, monitored drainage area is between 85% and 115% of HUC area.

For another 9 HUCs, monitored drainage area is between 65% and 135% of HUC area.

For 15 HUCs, monitored drainage area differs from HUC area by more than 35%.

For 9 HUCS there is no monitoring data

2 HUCs draining to Lake Michigan are ignored

Estimated Average Annual Nitrate-N Yields by HUC (lb N/ac-yr)

1997-2011, NLRS

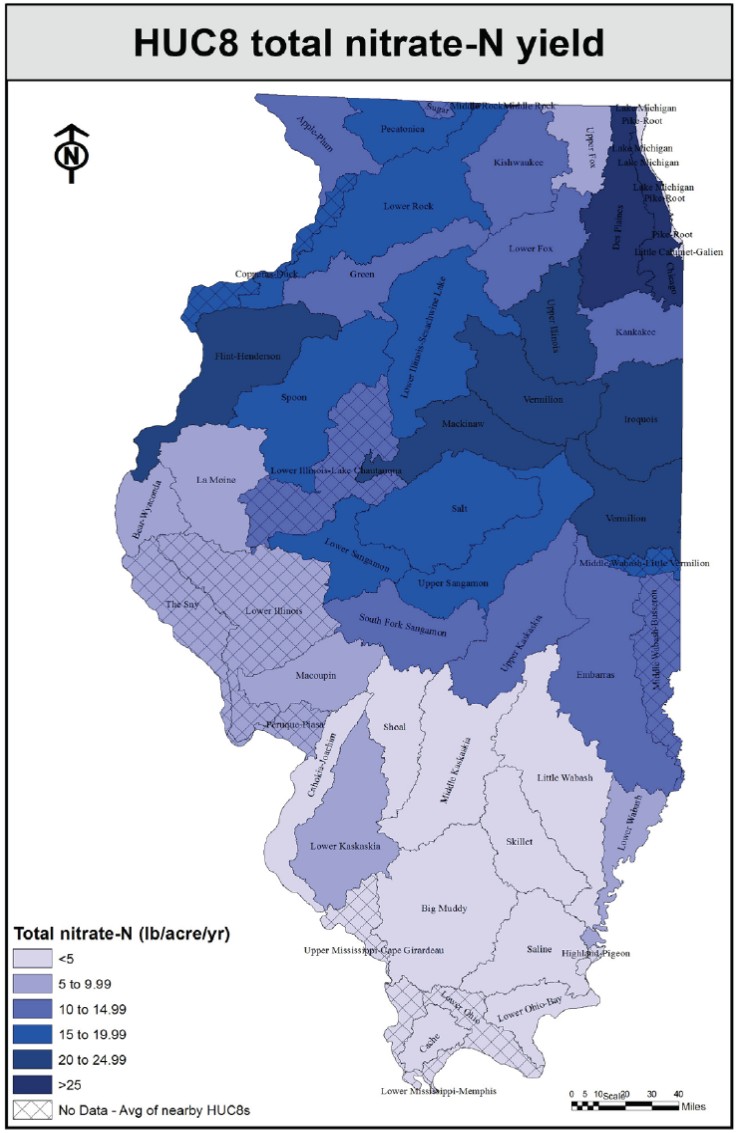
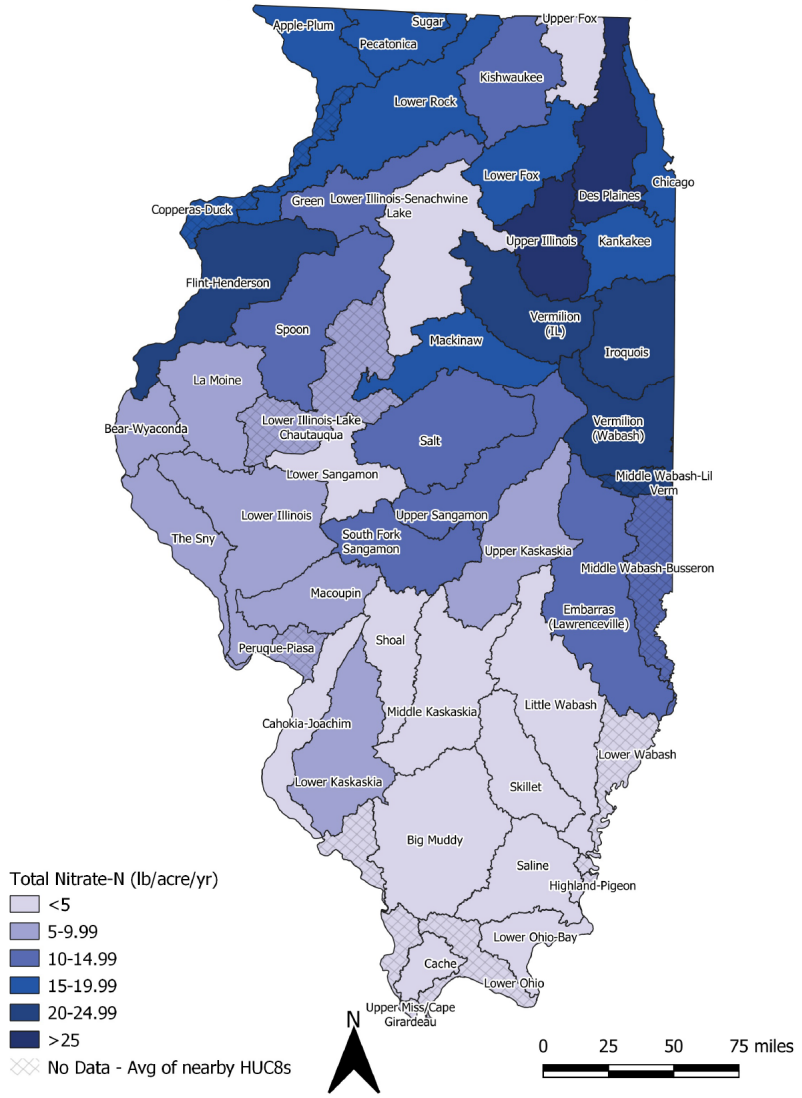


Figure 3.12. Total nitrate-nitrogen yields by HUC8 in Illinois.

2012-17 update



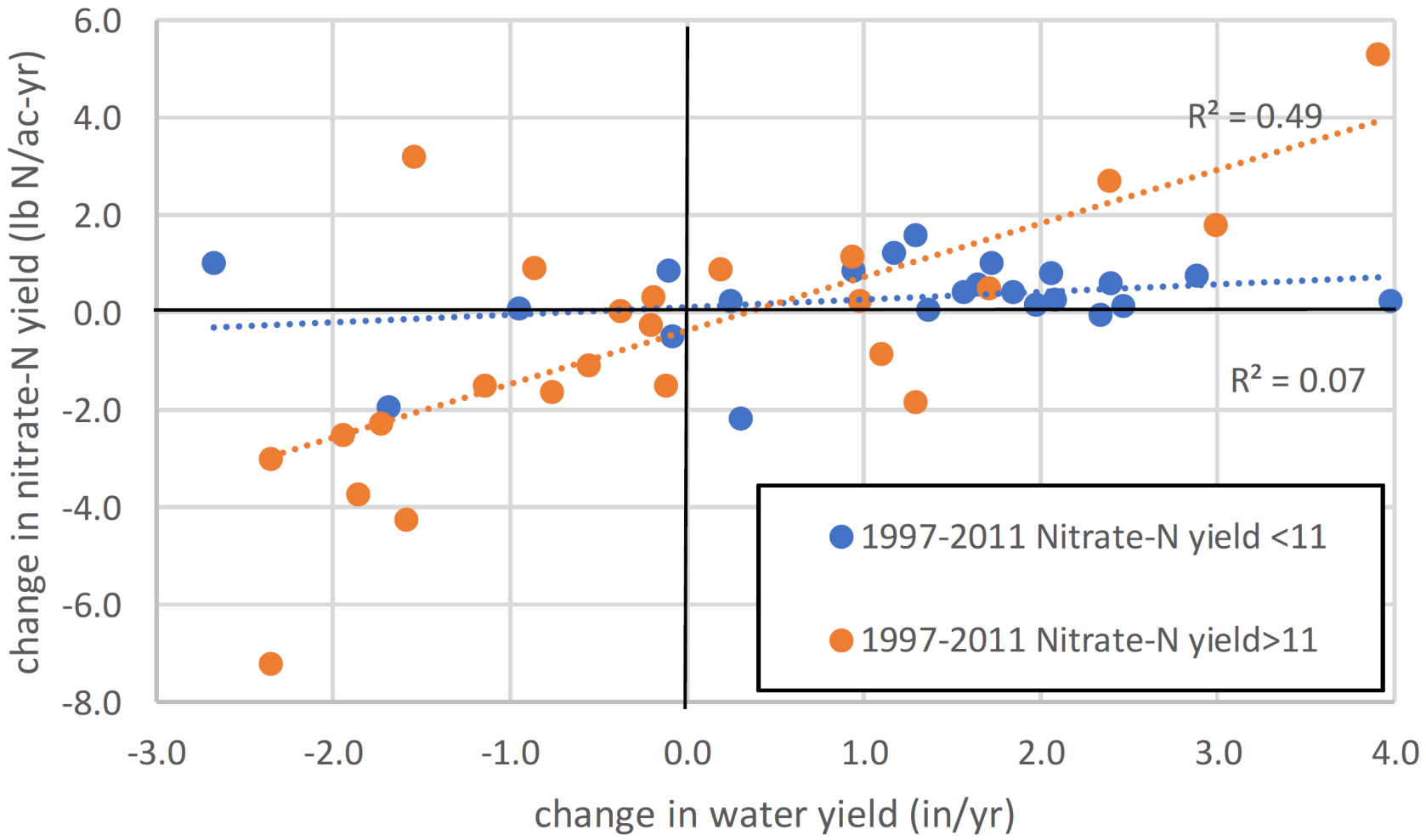
Aaron Hoyle-Katz, NCSA

Changes in HUC 8 estimation methods for the Lower Sangamon and Lower Illinois-Senachewine Lake

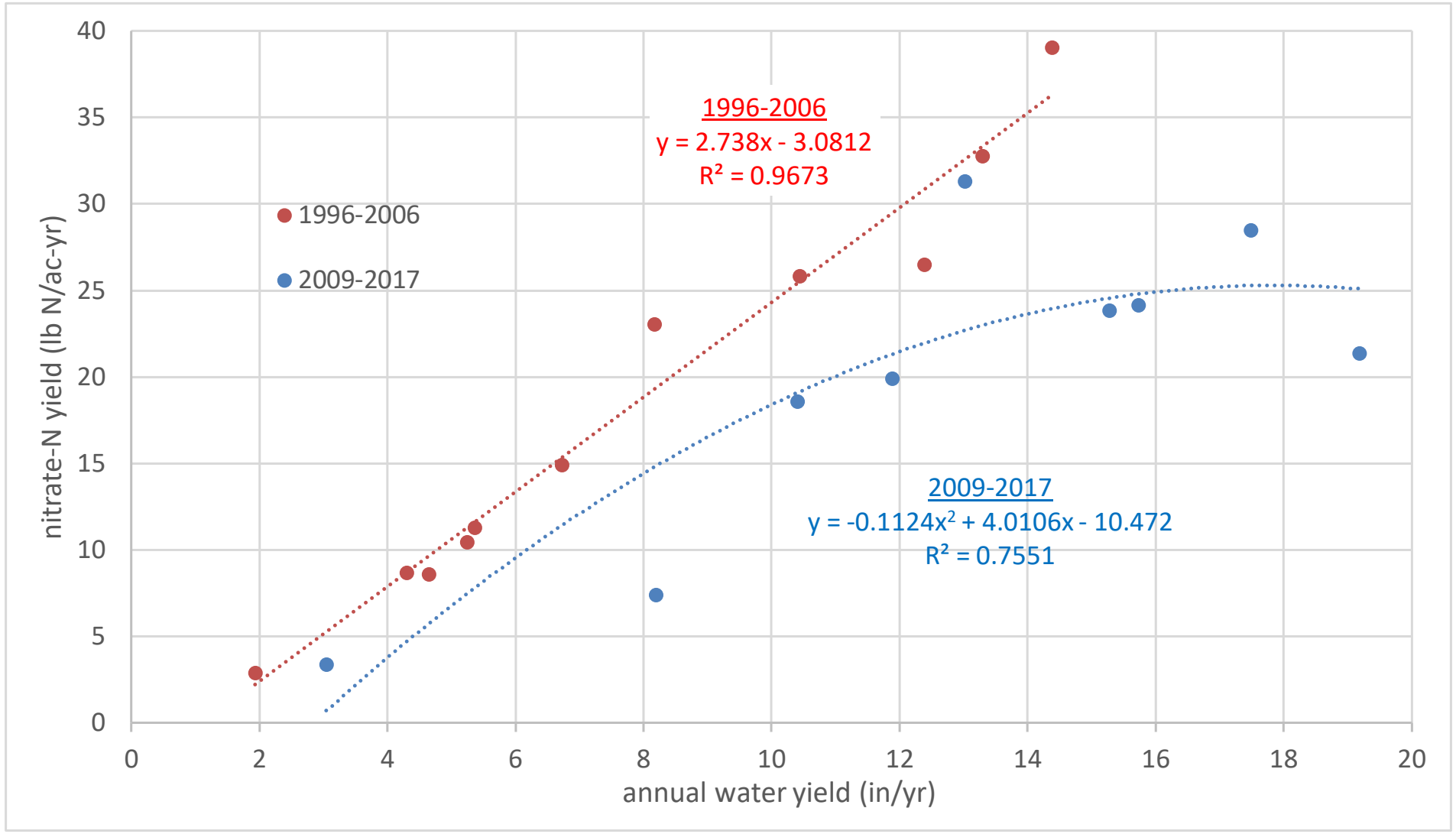
- For NLRS, small tributaries were used as proxies
  - Lower Sangamon: Spring Creek (12% of HUC area)
  - LI-SL: Big Bureau Creek (10% of HUC area)

- For 2012-17 Update
  - Upstream loads were subtracted from downstream load
  - Negative load estimates occurred in some years possibly due to denitrification
  - Comparison of upstream and downstream concentrations is consistent with denitrification losses

Change in Nitrate-N yields vs Change in Water Yield 1997-2011 to 2012-17



Mackinaw River at Green Valley (05568000) and South Pekin (DK-12)
Annual nitrate yield vs annual water yield 1996-2006 vs 2009-2017 water years



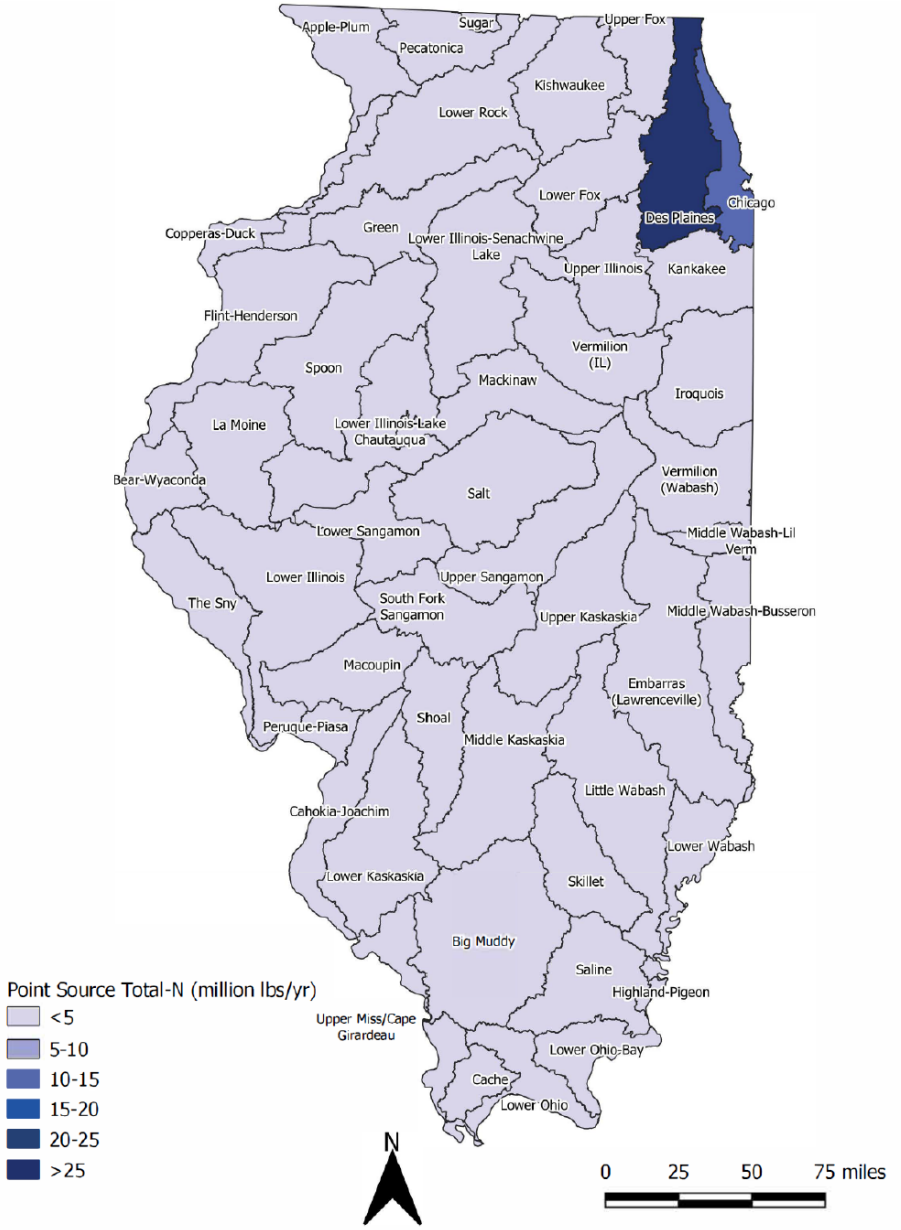
Similar patterns occurred for the Spoon River and Henderson Creek

2017 Estimated Point Source Total N Loads by HUC

Statewide total: 75 million lb N/yr

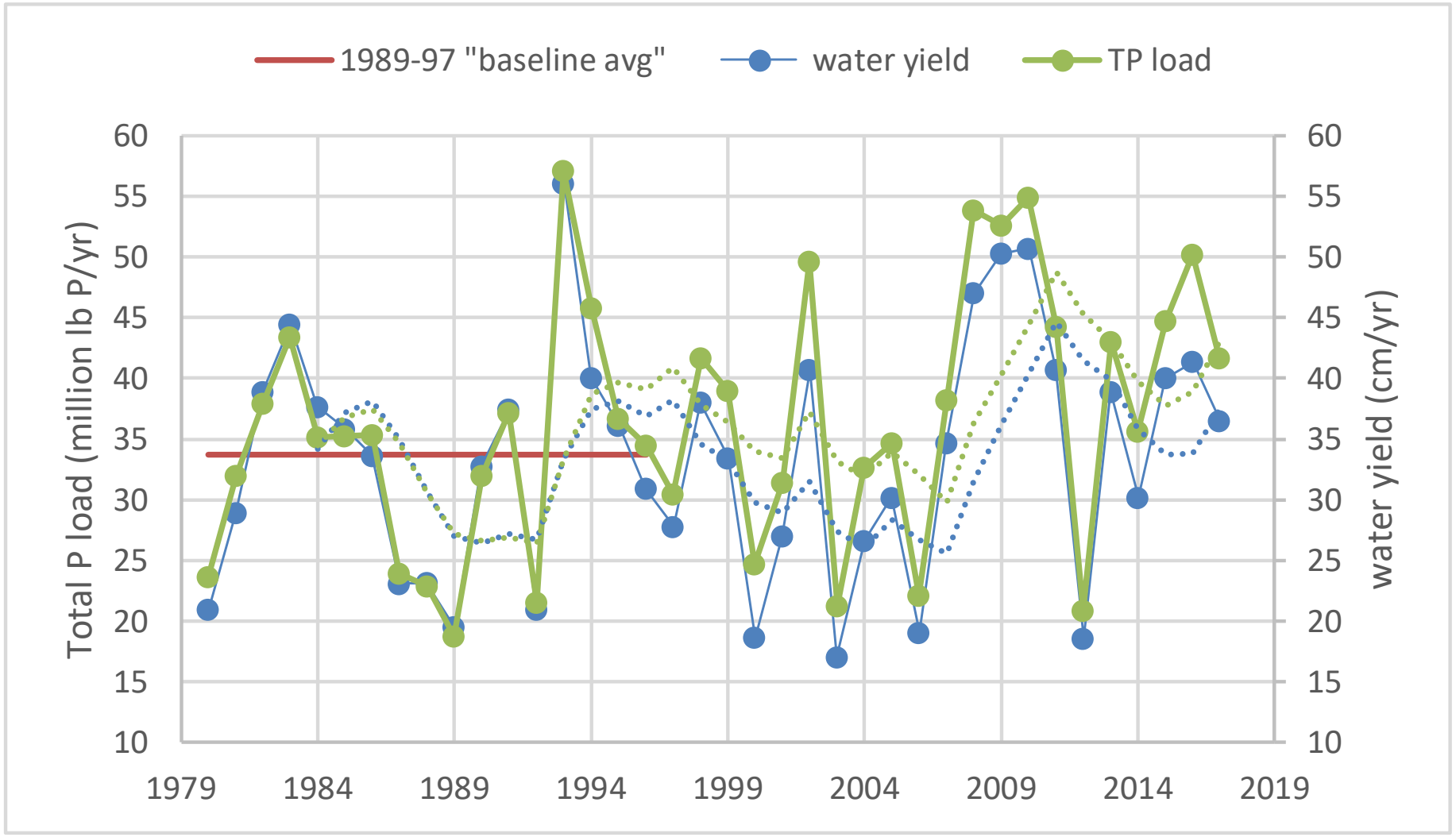
Des Plaines HUC: 32.2 million lb N/yr

Chicago HUC: 14.4 Million lb N/yr

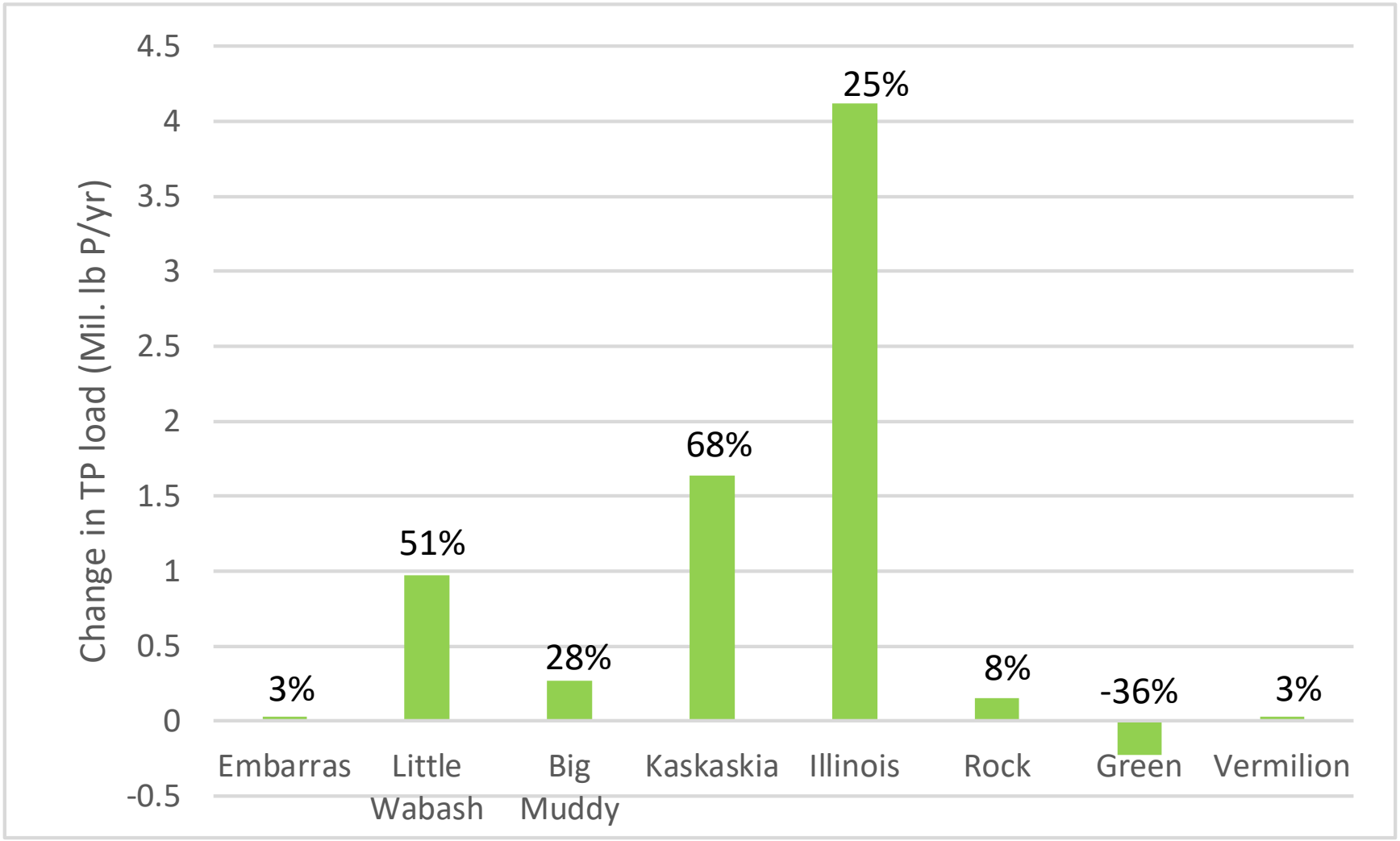


Total Phosphorus (TP) Loads

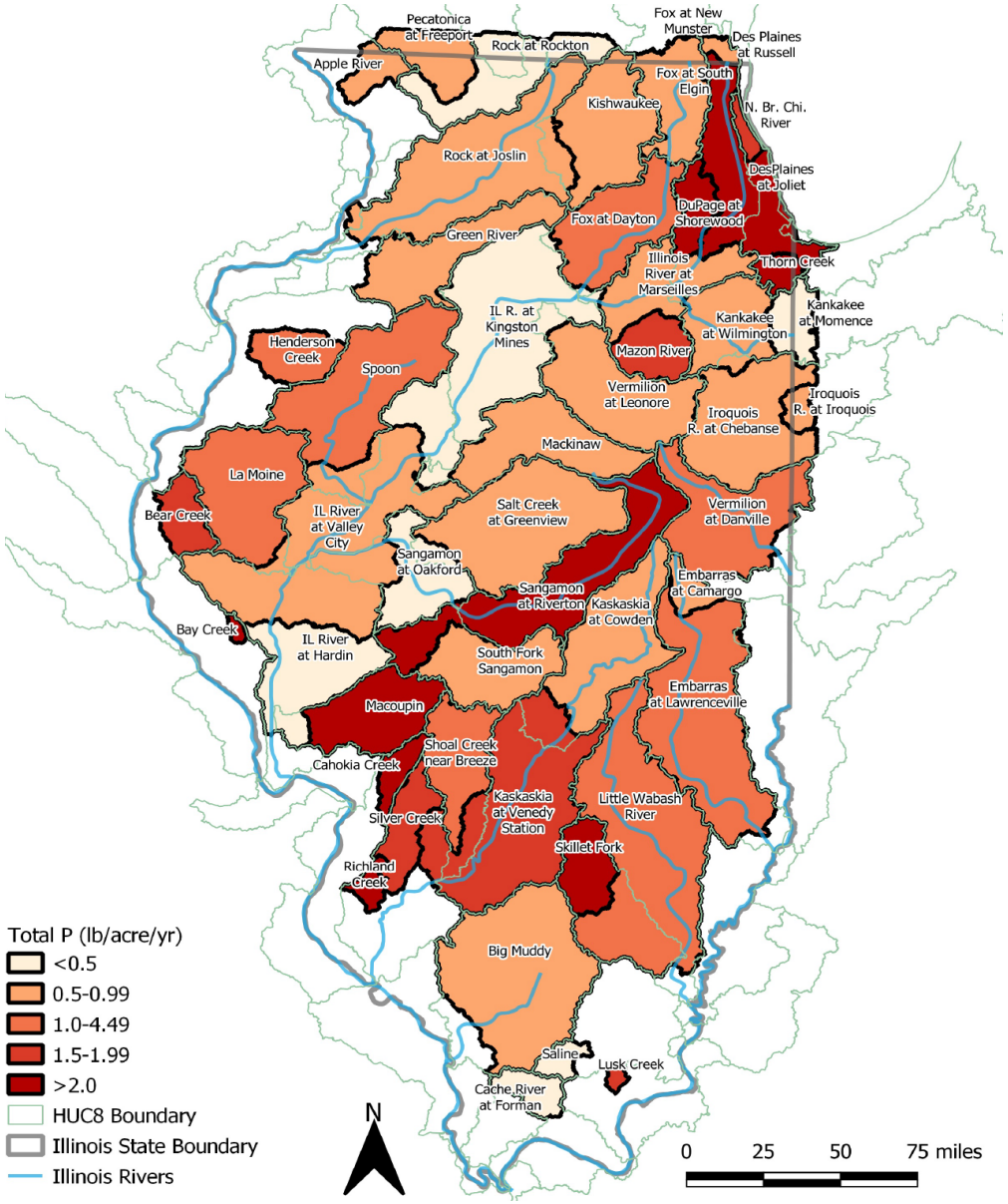
Statewide estimates of annual TP loads (green),
water yield (blue), 1980-96 baseline average (solid red line),
and five year moving average values (dashed lines)



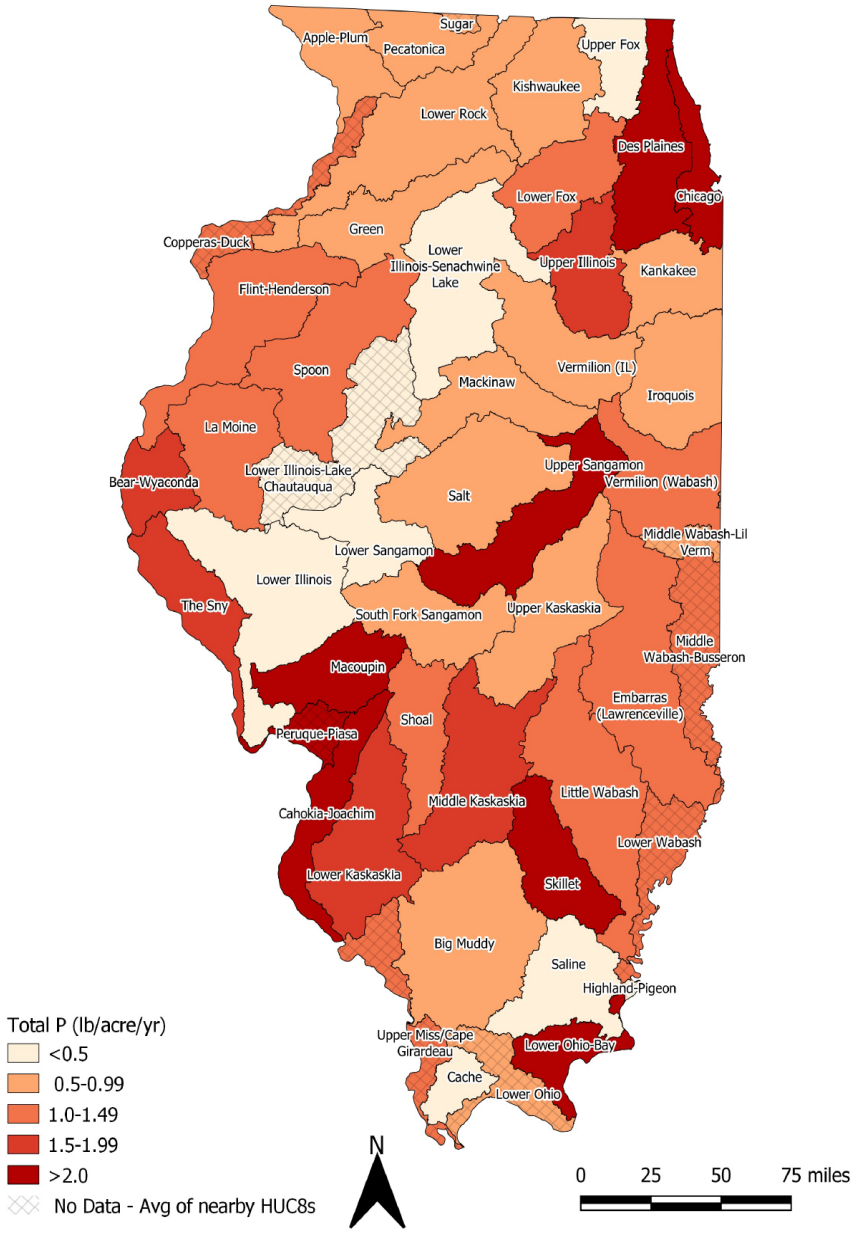
Changes in Riverine TP Loads (mass and percentage) from 1980-96 to 2013-17



Total P yield by monitored drainage area 2012-17

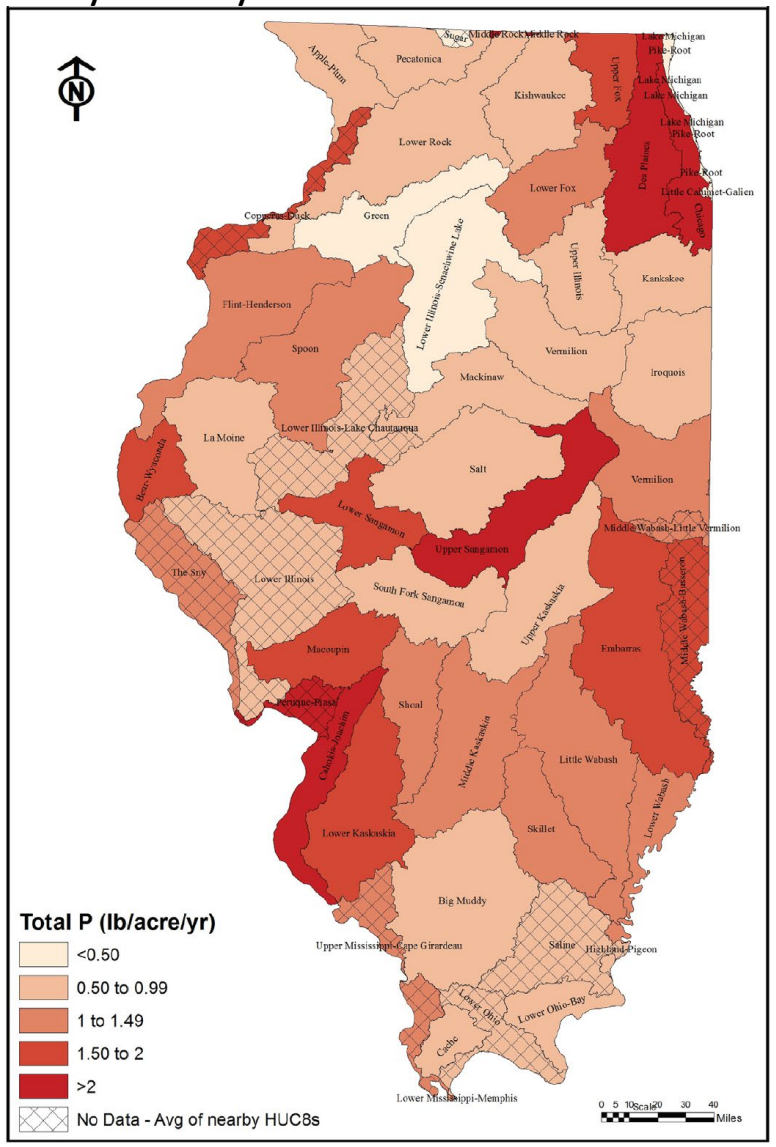


Total P yield by HUC 8 2012-17



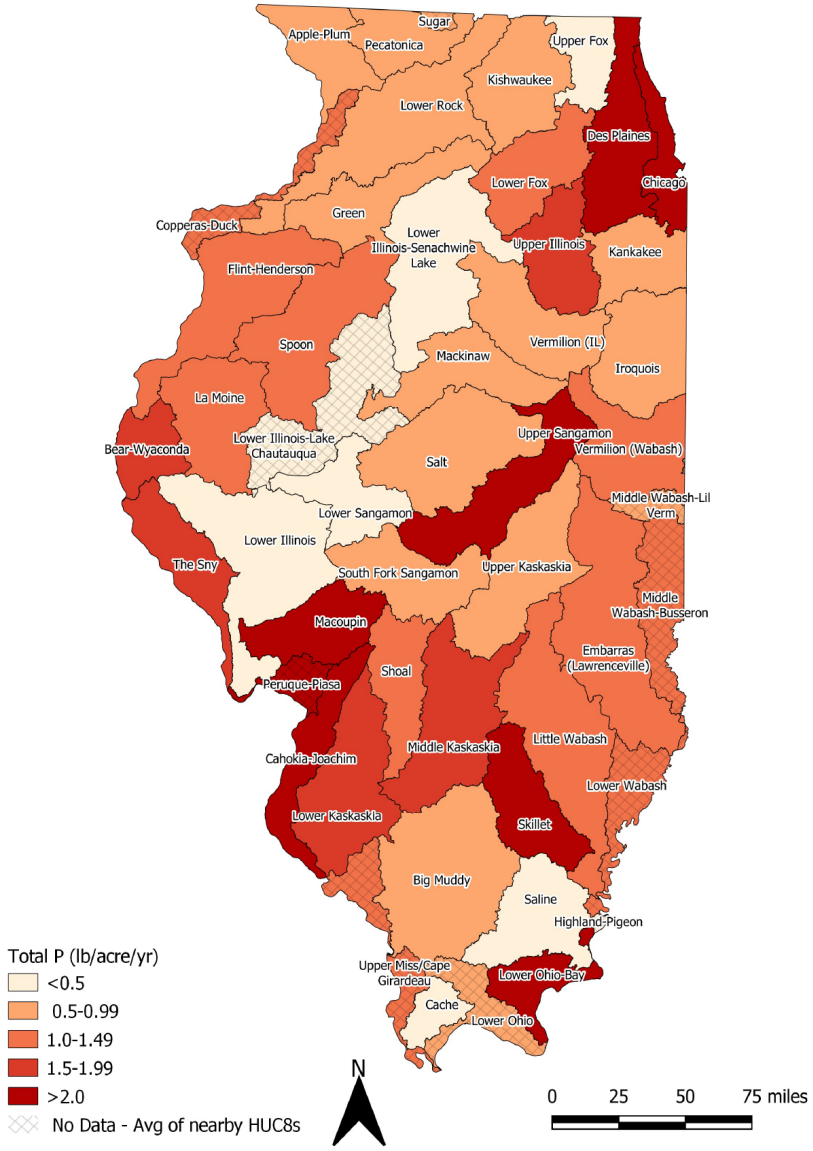
Aaron Hoyle-Katz NCSA

TP yields by HUC 8 1997-2011



IL NLRS (2015)

TP yields by HUC 8 2012-17



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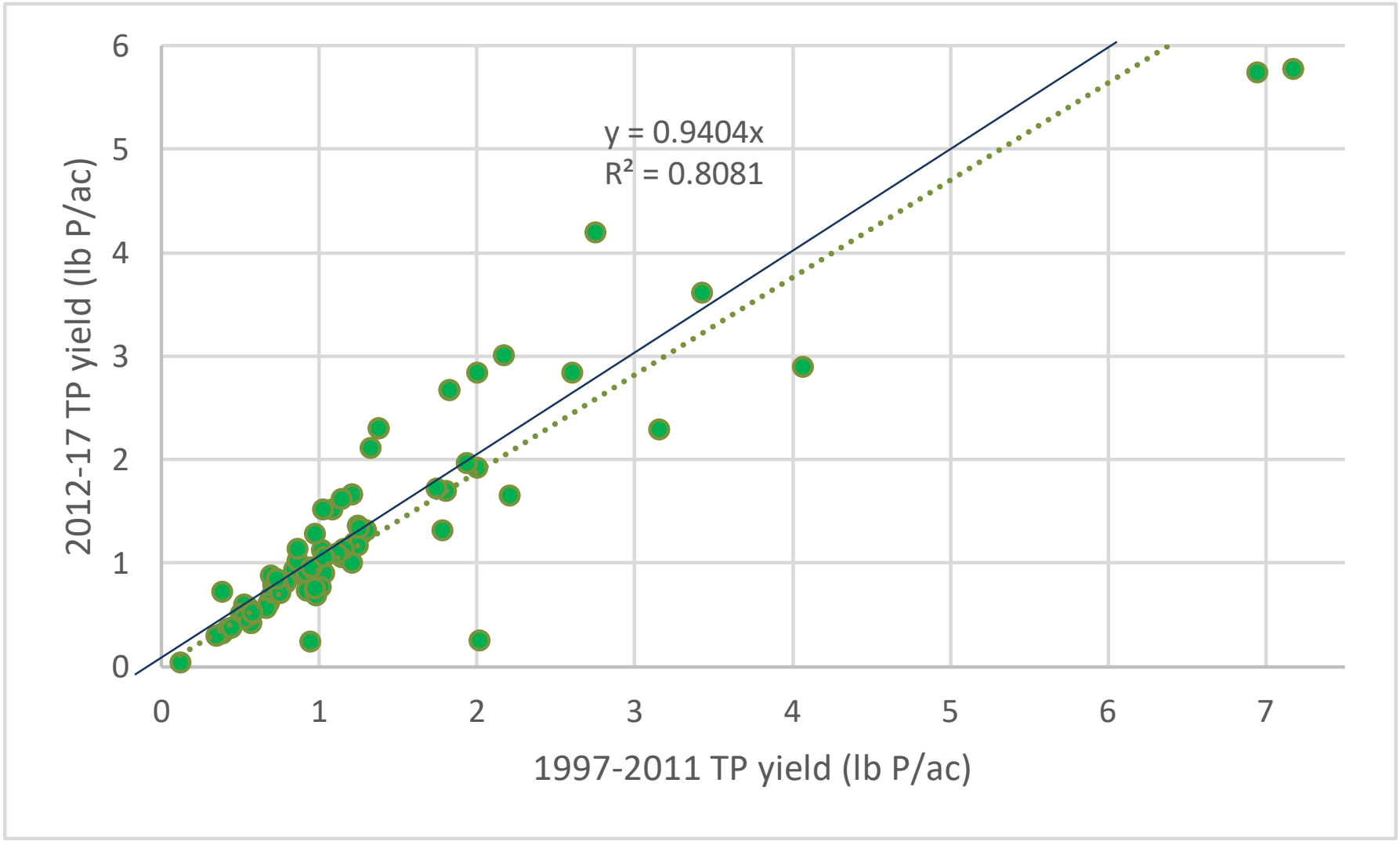
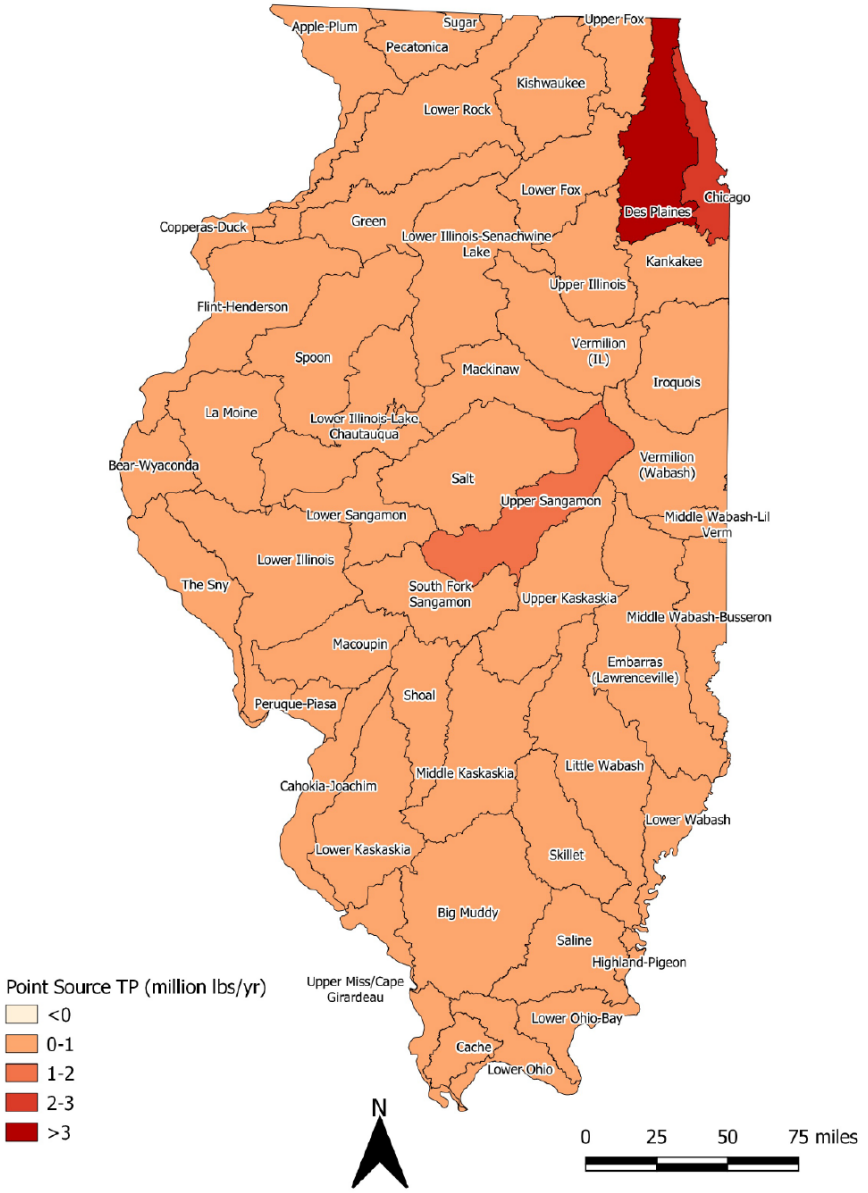
HUC 8 TP yields 1997-2011 vs 2012-17



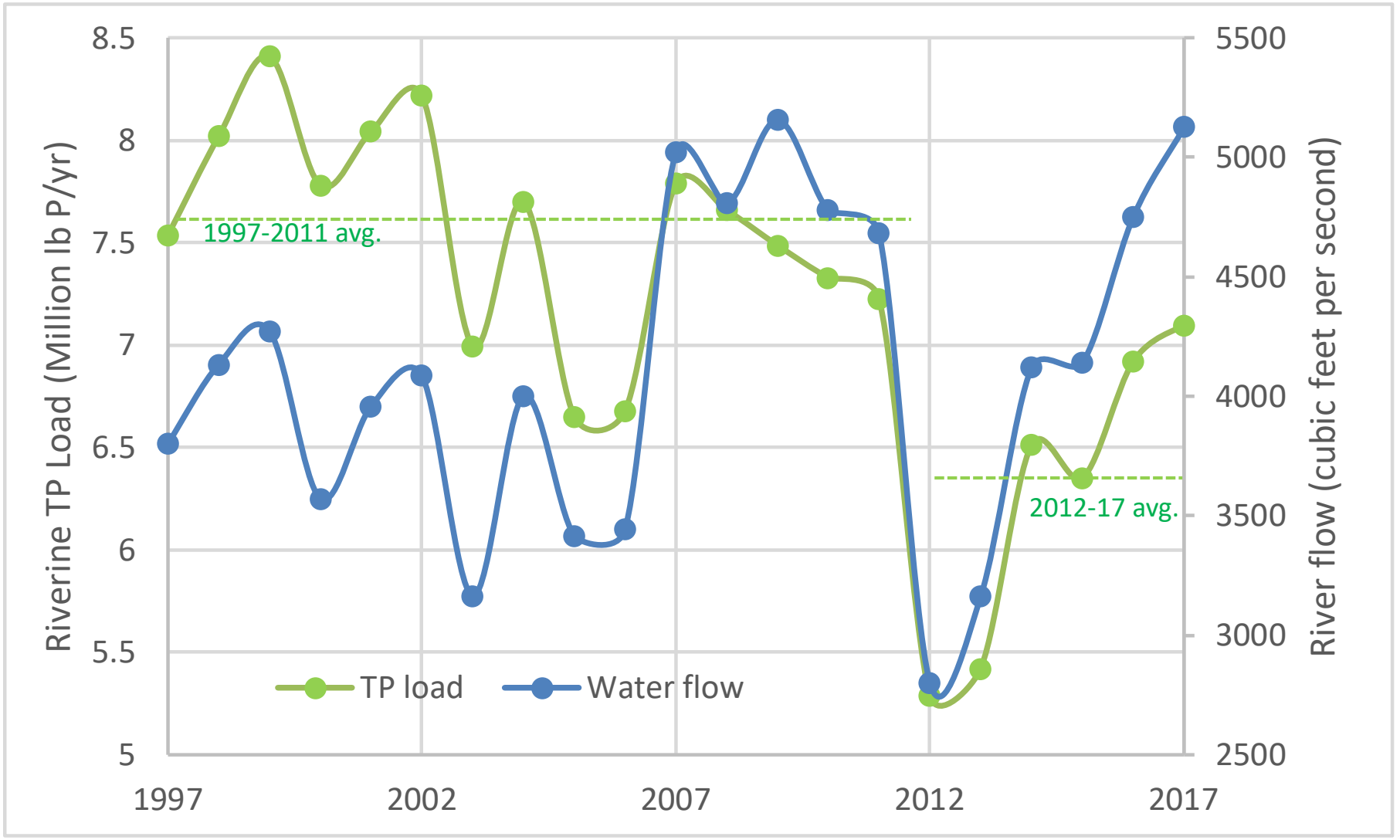
2017 Estimated Point Source Total P Loads by HUC 8

Statewide TP: 43 million lb P/yr

Des Plaines HUC:	4.1 million lb P/yr
Chicago HUC:	2.9 million lb P/yr
Upper Sangamon HUC	1.8 million lb P/yr
Upper Rock HUC	0.7 million lb P/yr



Riverine TP Load and Water Flow for the **Des Plaines River at Joliet** minus Des Plaines at Russell plus DuPage River at Shorewood (Approximately Des Plaines plus Chicago HUCs)



Summary

- Statewide riverine waterflow, nitrate-N load and TP load estimates 2013-2017 were 13%, 7%, and 28% greater than the 1980-96 baseline period.
- 2017 Estimated point-source TP and TN discharges were 22% and 14% lower than 2011 estimates.
- At the HUC 8 scale, nitrate and TP yields 2012-17 were generally similar to 1997-2011 values, with some exceptions:
  - TP load reductions in Chicago and Des Plaines
  - TP increases in the Upper Sangamon and elsewhere
  - Changes in nitrate-N load were correlated to changes in water flow for HUCs with high N yields
  - Possible Nitrate-N reductions per unit of water yield in the Mackinaw and Spoon Rivers and Henderson Creek

Suggestions for Further Study and Future Updates

- Identify factors causing changes in loads
- More frequent sampling of rivers, especially for P at high flow
- QA/QC point source data
- Use more than one year of point source discharge data
- Focus on monitored watersheds rather than HUCs
- Estimate loads in unmonitored watersheds by watershed characteristics rather than by neighboring HUC
- Evaluate Uncertainty and Climate Change Impacts

Thank you!

NASS Survey Results
Mark Schleusener, Illinois Dept. of Agriculture

Policy Working Group

Nutrient Loss Reduction Strategy Survey Results

2017 CENSUS OF AGRICULTURE

USDA

United States Department of Agriculture
National Agricultural Statistics Service

www.nass.usda.gov/AgCensus

Mark.schleusener@usda.gov

- 30+ years with USDA – NASS
- 29 years as analyst and supervisor of analysts
- State Statistician since November 2013
  - Communication and outreach
  - College recruiting

Basic Survey Details

- Sampling
  - Cropland > 100 acres but less than 10,000 acres
  - Excluding fruits and vegetables
  - 1,096 total farms
- Two mailings
  - February 1, 2019
  - March 1, 2019 (just the non-respondents)
- Calling non-respondents
  - March 25 - 29

More Survey Details

- Funding from NREC
- Margins of error
  - For common items like tiled acres or MRTN acres, the margins of error are 5 to 15%.
  - For less common items like cover crops, the margins of error are 20% and higher.
  - Bioreactors are very rare and the margin of error is 60%.
- Response rate better than last survey

Nitrogen Management Strategy	Acres in 2011	Acres in 2015	Acres in 2017
Acres where an MRTN (Maximum Return To Nitrogen) strategy was used to determine application rates	8,820,000 or 70% of planted acres	9,430,000 or 81% of planted acres	3,730,000 or 33% of planted acres
Other Industry-approved technique acres	Not asked	Not asked	7,750,000 or 69% of planted acres
NASS corn planted acres	12,600,000	11,700,000	11,200,000

Fertilizer Application Strategies for corn on tiled acres	Acres in 2011	Acres in 2015	Acres in 2017	Percent of previous statistic
Acres of corn planted	12,600,000	11,700,000	**11,200,000**	
Fall / Winter nitrogen was applied with a nitrification inhibitor	3,240,000 or 26%	2,970,000 or 25%	**3,550,000 or 32%**	120%
Spring nitrogen was applied with a nitrification inhibitor	Not asked	Not asked	**2,790,000 or 25%**	N/A
Fall / Winter nitrogen was 50% or less of total Nitrogen	940,000 or 7%	950,000 or 8%	**780,000 or 7%**	82%
Fall / Winter nitrogen was 0% of total Nitrogen (all Spring applications)	2,480,000 or 20%	2,660,000 or 23%	**1,850,000 or 17%**	70%
Less than 50% FALL / WINTER applications, with remaining Nitrogen applications split between pre-plant and side-dress applications	1,730,000 or 14%	2,220,000 or 19%	**1,790,000 or 16%**	81%

Fertilizer Application Strategies for corn on non-tiled acres	2011 not asked	2015 not asked	Acres in 2017
Fall / Winter nitrogen was applied with a nitrification inhibitor			1,040,000 or 9%
Spring nitrogen was applied with a nitrification inhibitor			1,020,000 or 9%
Fall / Winter nitrogen was 50% or less of total Nitrogen			340,000 or 3%
Fall / Winter nitrogen was 0% of total Nitrogen (all Spring applications)			1,250,000 or 11%
Less than 50% FALL / WINTER applications, with remaining Nitrogen applications split between pre-plant and side-dress applications			930,000 or 8%

Reductions in Phosphorus applications		Acres
Tiled acres	Acres where phosphorus application rates were reduced since 2011	**4,440,000**
Non-tiled acres	Acres where phosphorus application rates were reduced since 2011	**2,150,000**
Tiled acres	Acres where placement of phosphorus applications were moved from broadcast to subsurface or banding	**1,530,000**
Non-tiled acres	Acres where placement of phosphorus applications were moved from broadcast to subsurface or banding	**280,000**

Reasons for reducing phosphorus applications	Acres
The Illinois Agronomy Handbook removal rates for phosphorus were updated	2,390,000
Soil test information	4,520,000
Other reasons, including cost	2,420,000

Cover Crop questions (tiled and non-tiled acres)	Acres
Corn / Soybean acres planted to cover crops after the 2011 crop season on tiled ground.	220,000
Corn / Soybean acres planted to cover crops after the 2011 crop season on non-tiled ground.	380,000
Corn / Soybean acres planted to cover crops after the 2015 crop season on tiled ground.	490,000
Corn / Soybean acres planted to cover crops after the 2015 crop season on non-tiled ground.	630,000
Corn / Soybean acres planted to cover crops after the 2017 crop season on tiled ground.	290,000
Corn / Soybean acres planted to cover crops after the 2017 crop season on non-tiled ground.	420,000

General Knowledge Questions

Percent of Farms reporting in 2019	Not at all knowledgeable	Slightly knowledgeable	Somewhat knowledgeable	Knowledgeable	Very knowledgeable
Nutrient Loss Reduction Strategy	21.0	27.0	38.4	11.6	2.0
MRTN Strategy	20.3	33.5	25.5	14.1	6.6
Bioreactors	53.8	23.0	15.0	5.5	2.7
Constructed Wetlands	19.7	29.6	38.0	10.2	2.5
Cover Crops Management	15.2	16.7	35.5	28.4	4.2

Edge of field practices	Acres
Bioreactors	(D)
Constructed Wetlands	160,000
Saturated buffers	390,000

Questions?

UMBRA Act, USGS Super Gage Website
Gregg Good, Illinois EPA

NUTRIENT MONITORING COUNCIL (NMC)

Update for Nutrient Policy Working Group (5/22/19)

<u>Last update:</u> at the 11/13/18 NLRS Workshop

<u>12th NMC Meeting:</u> 3/19/19 held in Springfield

Subjects to Touch On…..

- 3/19/19 NMC #12 Meeting Topics
- New USGS Super Gage Website
- Future of the USGS Super Gage Network
- Upper Mississippi River Water Quality Improvement Act

Nutrient Monitoring Council Members

Illinois EPA
Gregg Good, Rick Cobb

Illinois State Water Survey
Laura Keefer

Aqua Illinois
Kevin Culver

~~**Illinois Natural History Survey**~~
~~Andrew Casper~~ (Need Replacement?)

Illinois Dept. of Natural Resources
Ann Holtrop

Univ. of IL – Dept. of Agriculture and Biological Engineering
Paul Davidson

Sierra Club
Cindy Skrukrud

MWRDGC
Justin Vick

Illinois Corn Growers Association
Laura Gentry

U.S. Army Corp of Engineers-Rock Island
~~Chuck Theiling~~ ~~Nicole Manasco~~ ?????

U.S. Geological Survey
Kelly Warner

National Center for Supercomputing Apps
Jong Lee

Univ. of IL – Dept. of Natural Resources and Environmental Sciences (Emeritus)
Greg McIsaac

NLRS Coordinator – Illinois EPA
Trevor Sample

Ida and Jove Vick…New Members

New Member – Lucy Good!

Update on IL NLRS Data Portal

Jong Lee

National Center for Supercomputing Applications

University of Illinois

Great Lakes to Gulf
VIRTUAL OBSERVATORY

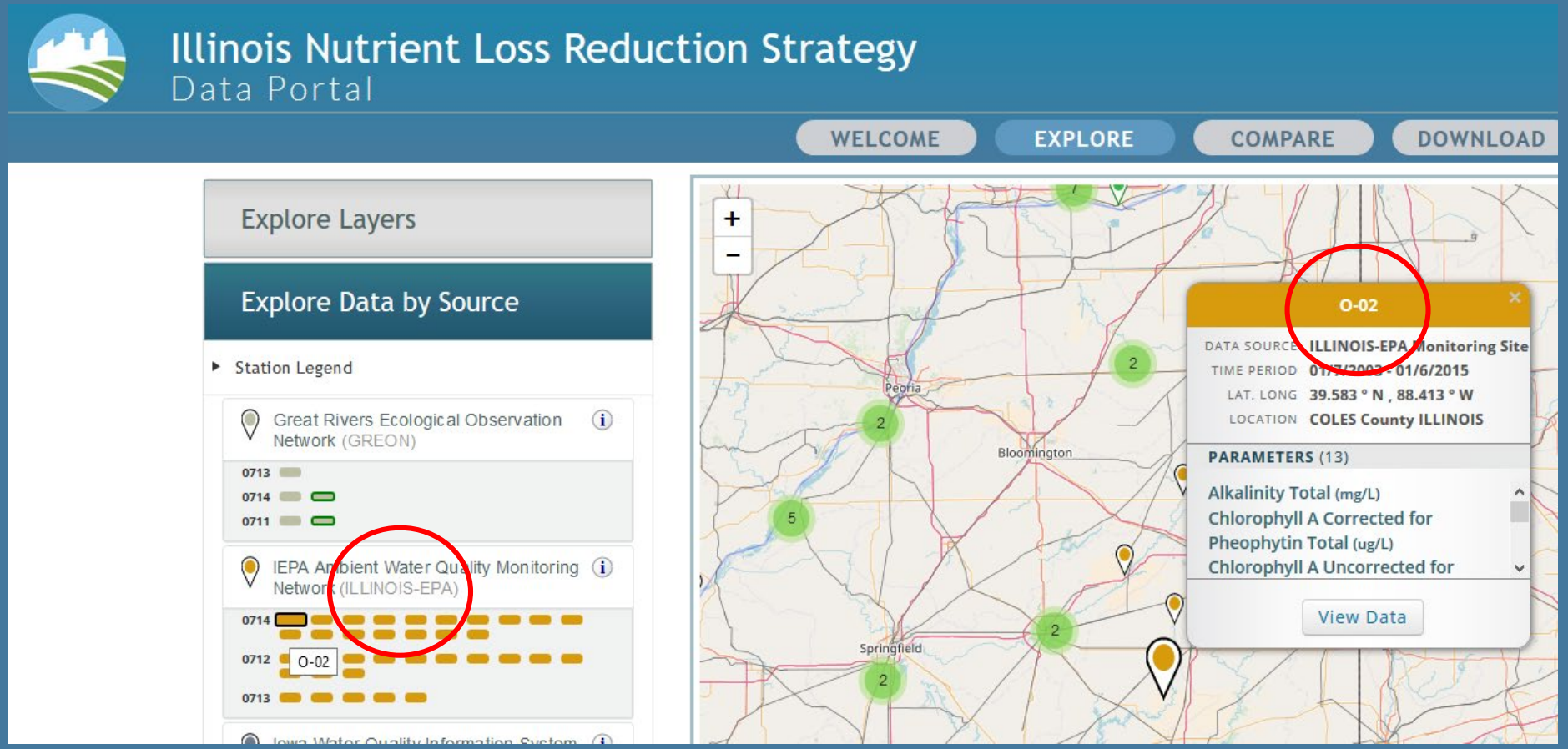
What is the Great Lakes to Gulf Virtual Observatory?

- The GLTG Observatory is a geospatial application that integrates water quality data from multiple sources to visualize nutrient pollution and water quality conditions in the Mississippi River watershed, and includes other information related to these conditions.

- The online interactive application provides users with tools to explore, analyze and compare water quality data from the Mississippi River and its tributaries.

Great Lakes to Gulf
VIRTUAL OBSERVATORY

Updated Naming of EPA and USGS Sites



Illinois Nutrient Loss Reduction Strategy Data Portal (3/19/19 Update)

- New data
  - EPA Pollutant Loading
  - Most of IEPA Ambient Water Quality Monitoring Network
  - Fox River Watershed, Fox River Study Group & Illinois State Water Survey
    - Updated with latest data
  - Iowa Water Quality Information System
- It will be updated to V3 soon

- New layers
  - SPARROW 2002 Nutrient Model Results
  - Hypoxia Contours from 2005 to 2017
  - In progress
    - Cropscape Frequency layer
    - NOAA Precipitation layer
    - Updated impaired stream layer for Illinois

Illinois NLRS Data Portal

https://ilnlrs.ncsa.illinois.edu/geodashboard/

Assessment of NPS Nutrient Load Reduction Goals Under Changing Climate

Momcilo Markus, Illinois State Water Survey/PRI/UIUC

Presentation Outline

- Nutrient loads are strongly related to climate. Loads in dry years are typically smaller than those in wet years. Loads are particularly related to heavy storms.
- Climate is changing, and as a result, nutrient loads will also be changing.
- What we design today, may not be sufficient in the future. Management strategies that work today may not down the road.
- Is there a way to add climate variability/change to the nutrient loss reduction strategy? Climate-normalized goals?
- Is there a way to use climate information in the future to determine if the strategy actually worked (validation)?
- Would a probabilistic approach to setting the goals be more appropriate (and still practical)?

Lunch Time!

USGS Happenings and Updates

Kelly Warner and Paul Terrio

- Super Gage Stations Update
- Impact of Government Shutdown
- Future Super Gage Network Funding

USGS
science for a changing world

Future of the USGS Super Gage Network?

- Collection through September 2020
- Annual and Final Reports
- Continued Operation?
  - Illinois EPA has foot the bill for first five years of operation!
  - Illinois EPA can't foot the bill for the next five years of operation!
  - Start putting your thinking caps on and open your pocketbooks to keep this going!

USGS Super Gage Website

- https://www.usgs.gov/centers/cm-water/science/water-quality)
- https://il.water.usgs.gov/data/Nutrient_Gages/

Date published: MARCH 18, 2019

Status: Active

Illinois Nutrient Monitoring Sites

Eight nutrient monitoring stations were established in 2015 to continuously monitor nutrient and sediment concentrations and loads in support of the Illinois Nutrient Loss Reduction Strategy. This site provides current and historical monitoring information for the eight nutrient monitoring stations.

Contacts: Paul J Terrio

Attribution: Central Midwest Water Science Center

Central Midwest Water Science Center

Illinois Nutrient Monitoring Sites

USGS Gage 05447500

USGS Gage 05446500

USGS Gage 03346500

Overview | Publications | Partners

Eight nutrient monitoring stations were established in 2015 to continuously monitor nutrient and sediment concentrations and loads in support of the Illinois Nutrient Loss Reduction Strategy. This site provides current and historical monitoring information for the eight nutrient monitoring stations.

Follow this link to the Illinois Nutrient Monitoring Sites-Current Conditions.

Status - Active

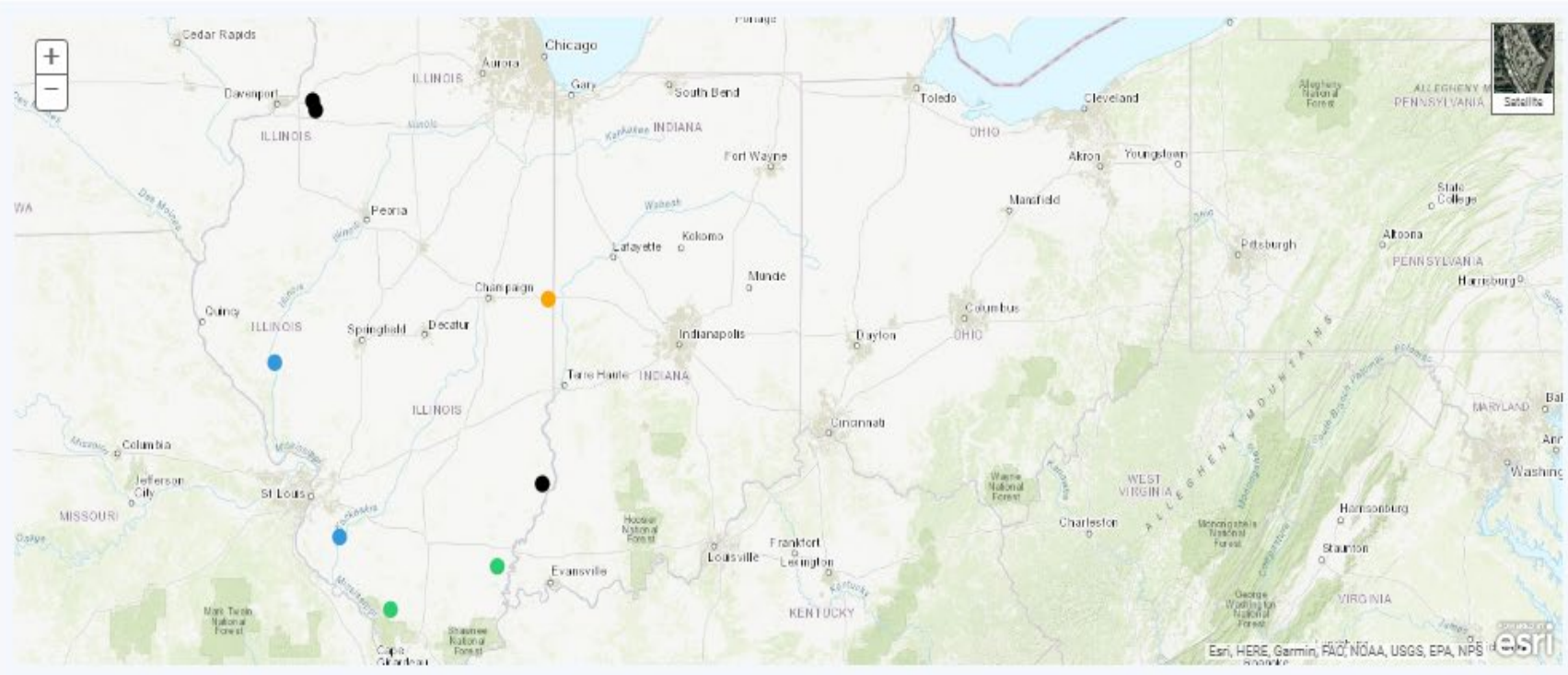
Contacts

Paul J Terrio

Illinois Nutrient Monitoring Sites-Current Conditions

In cooperation with the

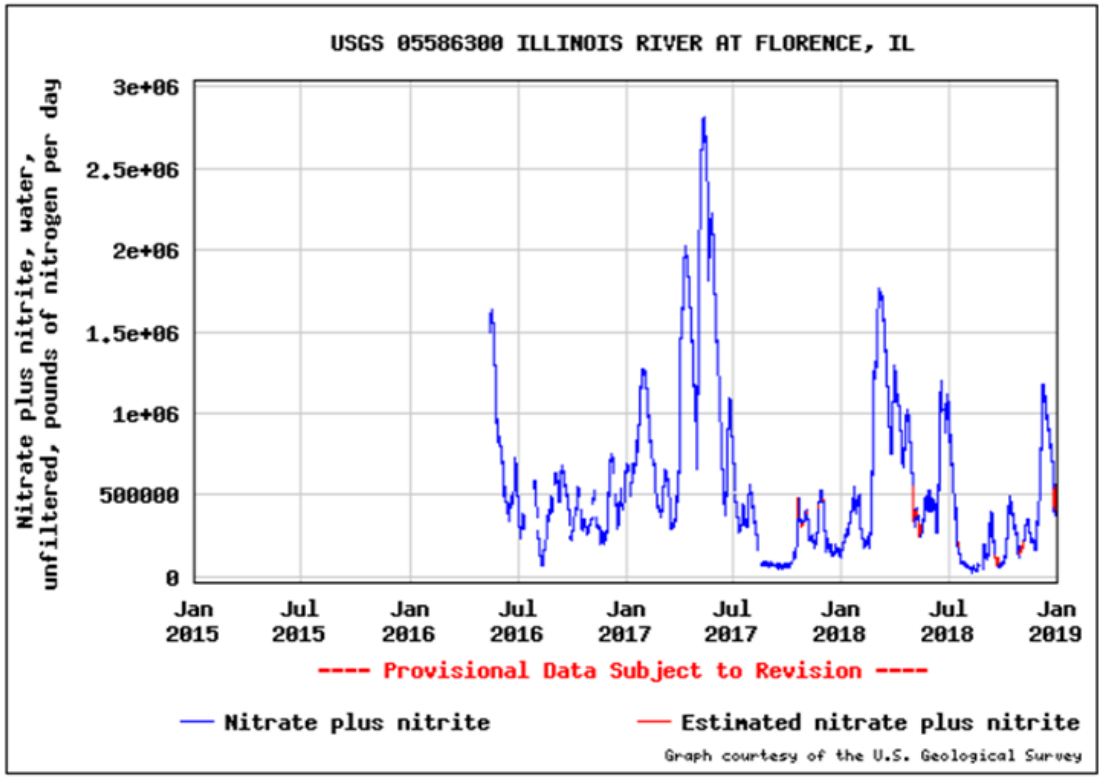
Illinois Environmental Protection Agency



Station Number	Station Name	Date/Time	Nitrate (mg/L, as N)	Date/Time	Phosphate (mg/L, as P)
05586300	ILLINOIS RIVER AT FLORENCE, IL	2019-05-17 13:30	4.8	2019-05-17 13:30	Unavailable
03346500	EMBARRAS RIVER AT LAWRENCEVILLE, IL	2019-05-17 13:00	Unavailable	2019-05-17 13:00	0.248
05599490	BIG MUDDY RIVER AT RTE 127 AT MURPHYSBORO, IL	2019-05-17 13:00	0.4	2019-05-17 13:00	Unavailable
05446500	ROCK RIVER NEAR JOSLIN, IL	2019-05-17 13:00	Unavailable	2018-12-04 10:15	0.0360
05447500	GREEN RIVER NEAR GENESEO, IL	2019-05-17 13:00	Unavailable	2019-03-21 14:00	0.0420
05595000	KASKASKIA RIVER AT NEW ATHENS, IL	2019-05-17 13:00	1.3	2019-05-17 13:00	0.000
03339000	VERMILION RIVER NEAR DANVILLE, IL	2019-05-17 13:15	5.5	2019-05-17 13:15	0.212
03381495	LITTLE WABASH RIVER AT MAIN ST AT CARMI, IL	2019-05-17 13:00	0.2	2019-05-17 13:00	0.0470

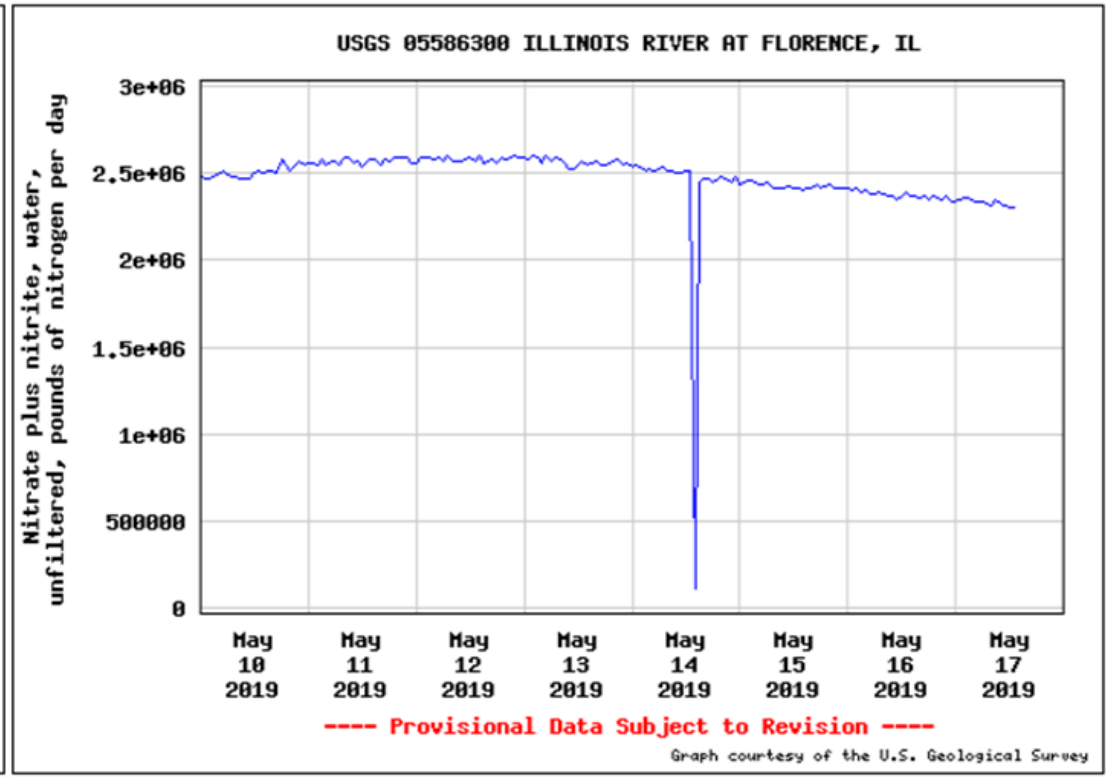
Period of Record

Nitrate | Phosphate



Current/Historic Observations

Nitrate | Phosphate



Start Date 2019-05-10 to End Date 2019-05-17 change date

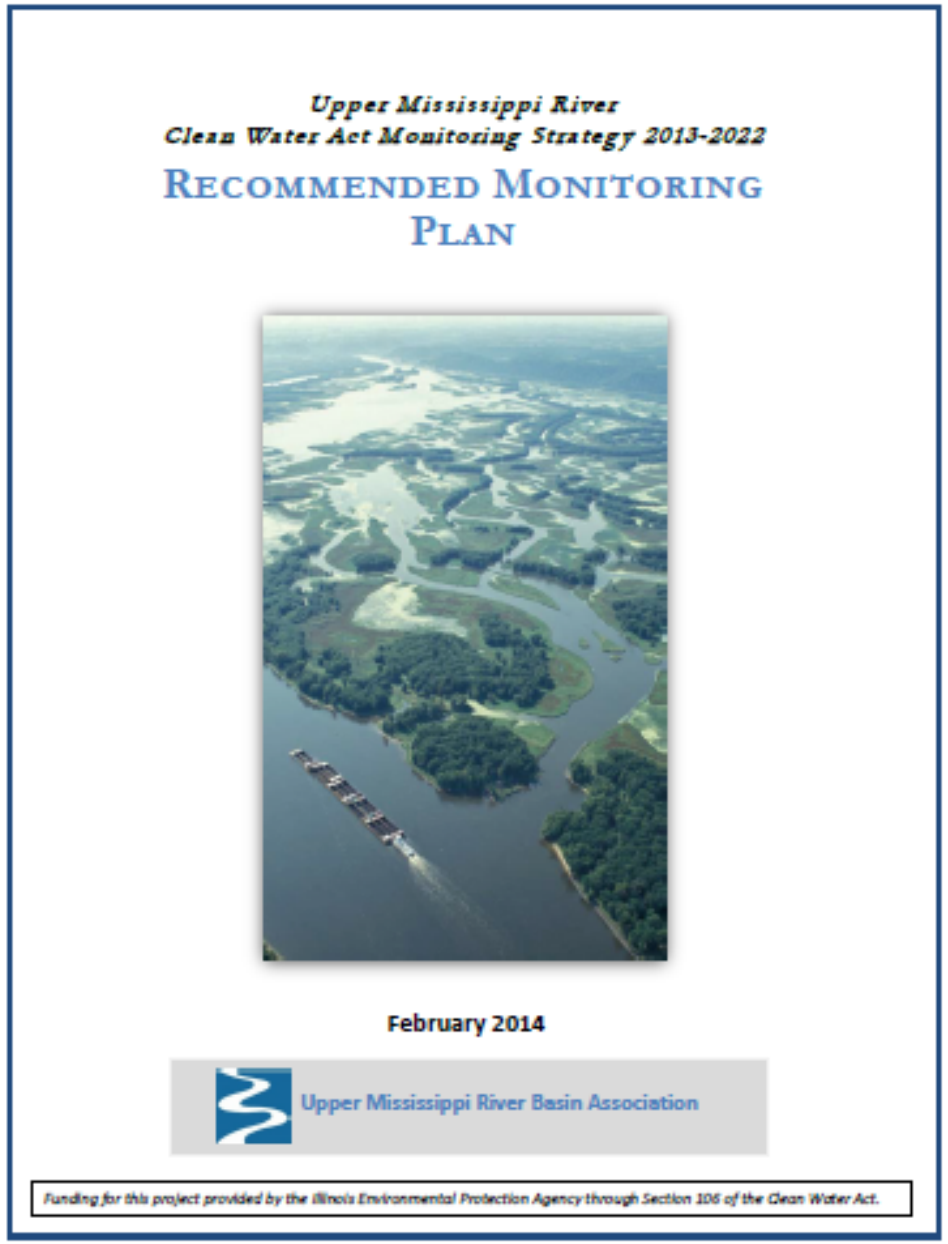
Proposed UMR Water Quality Improvement Act Legislative Framework

Gulf Hypoxia

State NLRSs

UMR CWA Recommended Monitoring Plan

National Priority or Not?



UMBRA Act, USGS Super Gage Website

Proposed UMR Water Quality Improvement Act Legislative Framework (draft 4/2/19)

- Establish and implement a State-Federal collaborative for the reduction, monitoring, and assessment of sediment, nutrients, and other contaminants.
- Minimize the effects of excess sediment and nutrients on the UMR and the Gulf of Mexico.
- Improve knowledge of water quality status and trends.

UMBRA Act, USGS Super Gage Website

Proposed UMR Water Quality Improvement Act Legislative Framework (draft 4/2/19)

- Title I: Sediment/Nutrient Runoff Reduction
- Title II: Sediment and Nutrient Monitoring Network
- Title III: Modeling and Research
- Title IV: Communications Strategy
- Title V: Authorization of Appropriations
  - Establish Mississippi River National Program Office jointly administered by USEPA and NRCS with specific responsibilities for USGS and UMRBA
  - Funding authorization for states and establishment of grant programs

Next NMC Meetings

- *September 10th, 2019 (#13)*
- *December 3rd - 4th, 2019 (#14?)*

  2019 NLRS Partnership Workshop

Break

Biennial Report

Report Outline – Eliana Brown

Report Outline

Ch. 1: Executive Summary

Ch. 2: Tracking and reporting approach

Ch. 3: Science Assessment Update

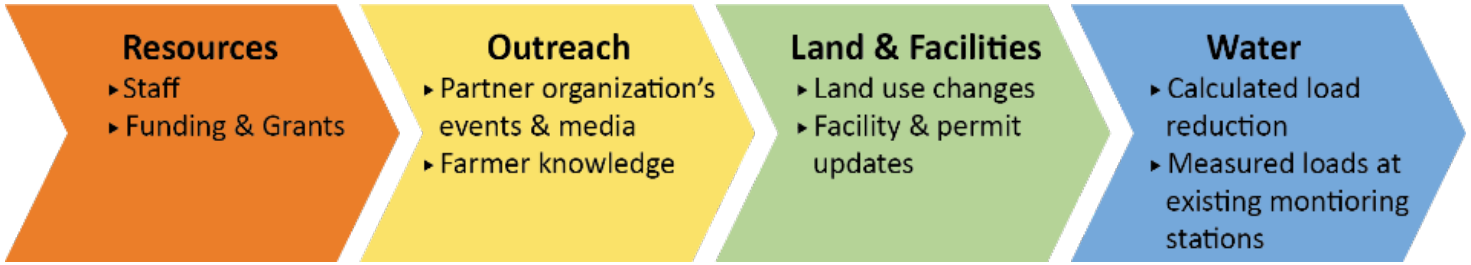
Ch. 4: Agriculture Sector

Ch. 5: Point Source Sector

Ch. 6: Stormwater Sector

Ch. 7: Working Group accomplishments

Ch. 8: Adaptive Management



Biennial Report

Staff and Financial – Eliana Brown

Spreadsheet Reporting Partners: Agriculture

Reported in 2017

American Farmland Trust
Illinois Association of Drainage Districts
Illinois Corn Growers Association
Illinois Department of Natural Resources
Illinois Extension
Illinois Farm Bureau
Illinois Fertilizer & Chemical Association
Illinois Land Improvement Contractors Association
Illinois Natural Resources Conservation Service
Illinois Nutrient Research & Education Council
Illinois Soybean Association
The Nature Conservancy NLRS

Reported in 2018

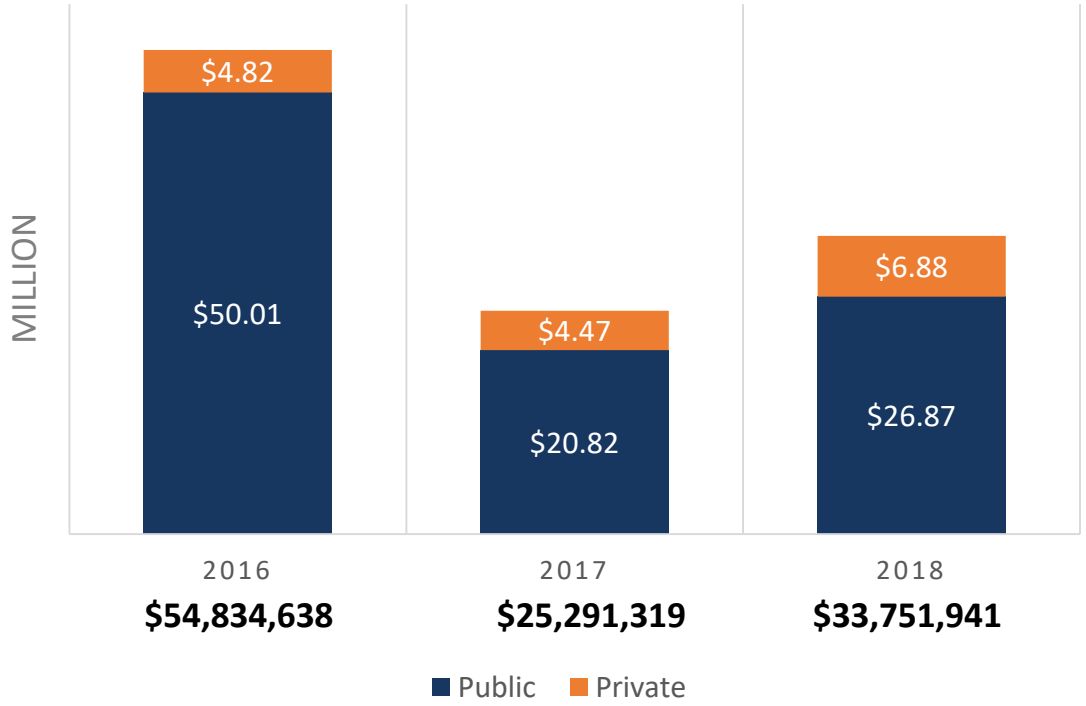
American Farmland Trust
Argonne National Laboratory
Illinois Corn Growers Association
Illinois Department of Natural Resources
Illinois Extension
Illinois Farm Bureau
Illinois Fertilizer & Chemical Association
Illinois Land Improvement Contractors Association
Illinois Natural Resources Conservation Service
Illinois Nutrient Research & Education Council
The Nature Conservancy NLRS
The Wetlands Initiative
55 Soil & Water Conservation Districts

Staff and Financial Resources: Agriculture

AGRICULTURAL STAFF SUPPORTING NLRS ACTIVITIES

2016	2017	2018
89	246.6	371.8

PUBLIC VS. PRIVATE AGRICULTURAL EXPENDITURES



Public: IDNR, Illinois Extension, USDA-NRCS, SWCD

Spreadsheet Reporting Partners: Point Source

Reported in 2017

Bartlett Public Works Department

Bloomington & Normal Water Reclamation District

Downer’s Grove Sanitary District

Glenbard Wastewater Authority

Lake County Public Works

Lower DuPage River Watershed Coalition

MWRDGC

North Shore Water Reclamation District

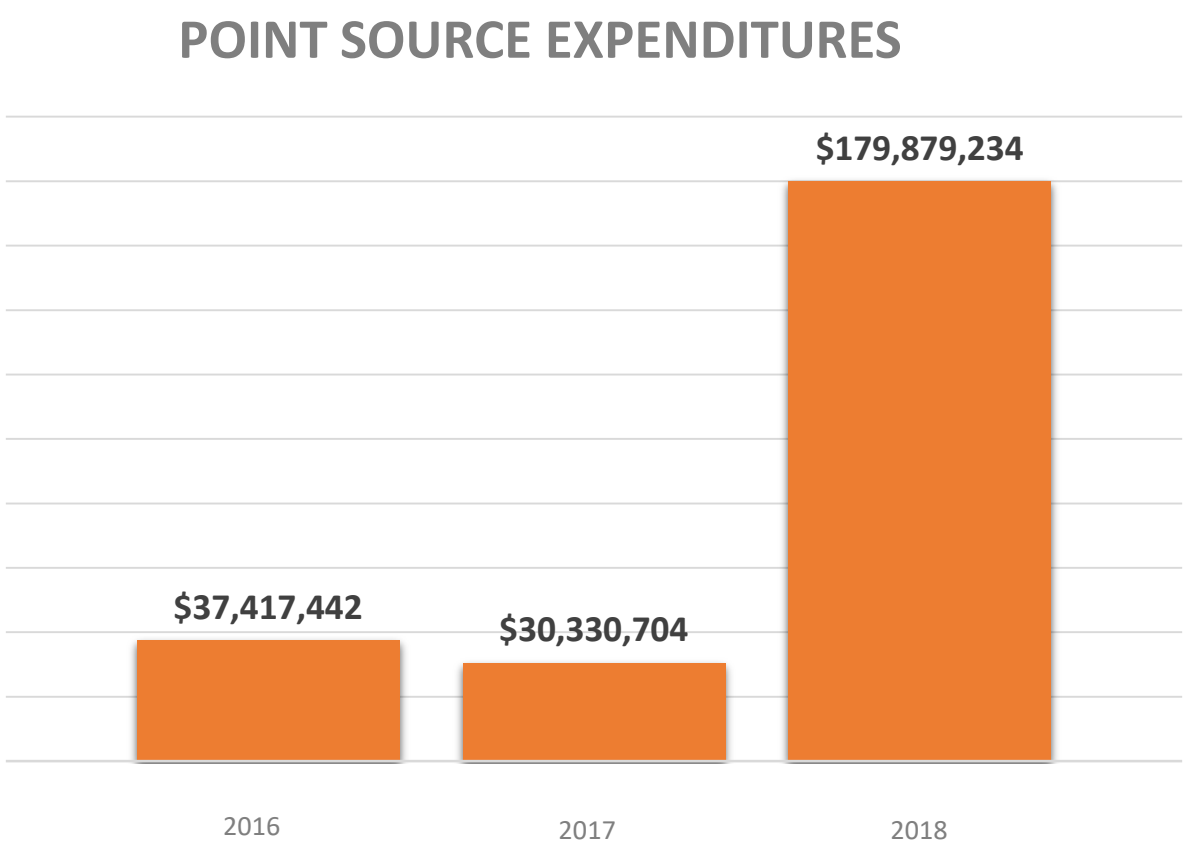
Urbana-Champaign Sanitary District

Reported in 2018

IAWA

- Bartlett Public Works Department
- Bloomington & Normal Water Reclamation District (BNWRD)
- Downer's Grove Sanitary District (DGSD)
- DuPage River Salt Creek Workgroup (DRSCW)
- Fox Metro Water Reclamation District (FMWRD)
- Fox River Water Reclamation District (FRWRD)
- Glenbard Wastewater Authority (GBWA)
- Greater Peoria Sanitary District (GPSD)
- Illinois Assoc. of Wastewater Agencies (IAWA)
- Kishwaukee Water Reclamation District (KWRD)
- Lake County Public Works (LCPW)
- Lower DesPlaines Work Group (LDWG)
- Lower DuPage River Watershed Coalition (LDRWC)
- Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)
- North Shore Water Reclamation District (NSWRD)
- Sangamon County Water Reclamation District (SCWRD)
- Urbana-Champaign Sanitary District (UCSD)
- Wheaton Sanitary District (WSD)

Financial Resources: Point Source



Spreadsheet Reporting Partners: Stormwater

Reported in 2018

DuPage County

Greater Egypt Regional Planning and Development Commission

Parkland College

Staff and Financial Resources: Stormwater

STORMWATER STAFF SUPPORTING NLRS ACTIVITIES

2016	2017	2018
NA	NA	44

2018 STORMWATER EXPENDITURES: $955,878

NLRS OUTREACH -- PRELIMINARY ANALYSES

Anna-Maria Marshall
Department of Sociology
University of Illinois, Urbana-Champaign

Data and Methods

- Analyses Based on Organizations' Reports about Outreach and Communication
  - Agricultural Sector – Stormwater and Point Source Coming
  - Different Organizational Reporting Styles
- Comparisons Are Complicated
  - Changes to Definitions of Types of Outreach
  - Added County SWCDs to the Organizations Reporting

Type of Outreach, 2017-2018

FACE-TO-FACE ACTIVITIES

Type of Outreach	Number of Events	Total Reported Attendance
Presentations	436	34,689
Field Days	204	18,493
Workshops	423	18,478
Conferences	42	9355
TOTAL	**1,105**	**81,015**

NOTE: 82% of these events were done in partnerships with 2 or more organizations

Type of Outreach -- COMPARISON

FACE-TO-FACE ACTIVITIES

	2015-2016		2017-2018	
Type of Outreach	Number of Events	Total Attendance	Number of Events	Total Attendance
“Presentations”	457	16,000	436	34,689
Field Days	130	3,692	204	18,493
Workshops	607	12,695	423	18,478
Conferences	27	6,935	42	9355
TOTAL	**1,221**	**39,325**	**1,105**	**81,015**

Type of Outreach -- INFORMATION

Type of Outreach	Number of Items / Appearances
Print or Media / Newsletters	596
Radio / TV	95
Social Media / Webinars	514 (at least)
TOTAL	1,205

Topics Covered

- NLRS Discussed at 37% of Face-to-Face Events Reported

Topic	# of Events	% of Events
Cover Crops	158	24%
Soil Health	158	24%
Nutrient Management	145	22%
Edge-of-Field Practices	114	17%
Tillage	26	4%

Conclusions

- There has been more of everything, reaching a larger audience.
- Information and training on specific best management practices
  - Technical assistance
  - Rental programs

Comments? Questions?

- Anything in particular you'd like to know?

Biennial Report

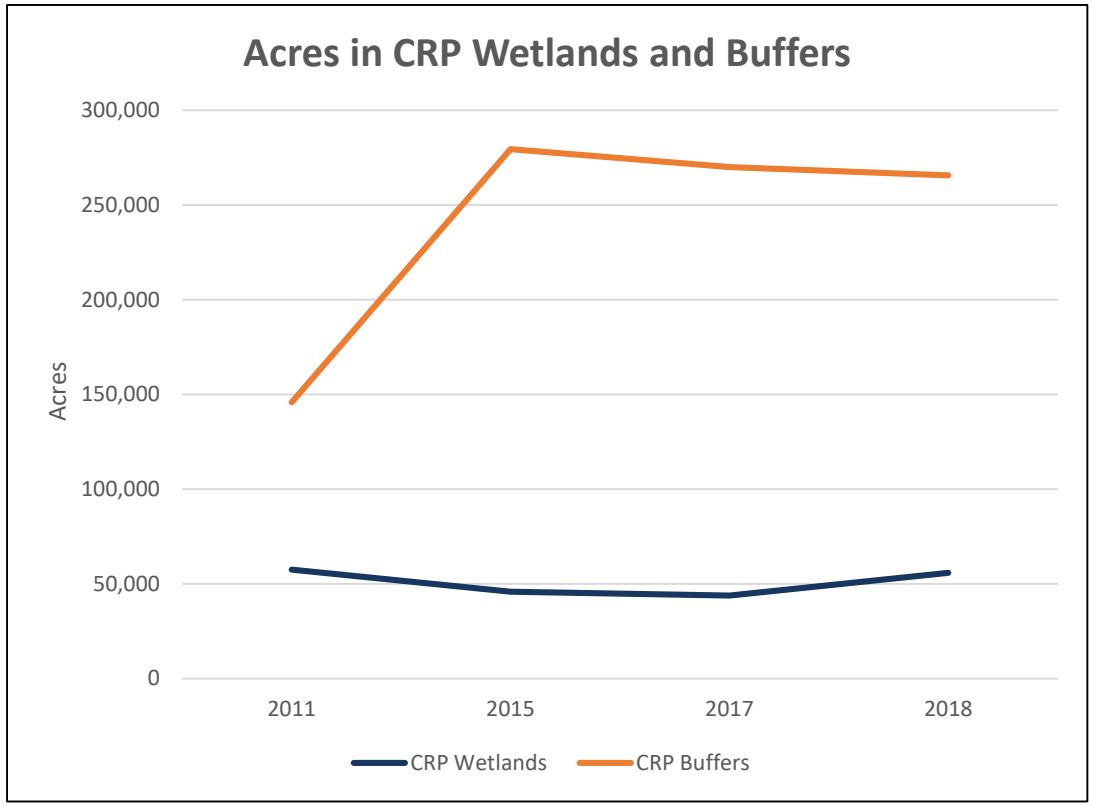
Agriculture Land Measures – Warren Goetsch

Agriculture Land Measures - FSA

Acres in CRP Wetlands and Buffers				
	2011	2015	2017	2018
CRP Wetlands	57,463	45,790	43,826	55,716
CRP Buffers	145,813	279,534	270,002	265,753

Acres in CRP Perennials/Energy/Pasture				
	2011	2015	2017	2018
CRP Perennials/Energy/Pasture	985,531	1,524,379	1,547,612	1,086,474
Cumulative CRP Perennials/Energy/Pasture	985,531	2,509,910	4,057,522	5,143,996

Acres in Cover Crops Reported by Producers to FSA				
	2011	2015	2017	2018
Cover crops	768	11,064	83,980	92,970



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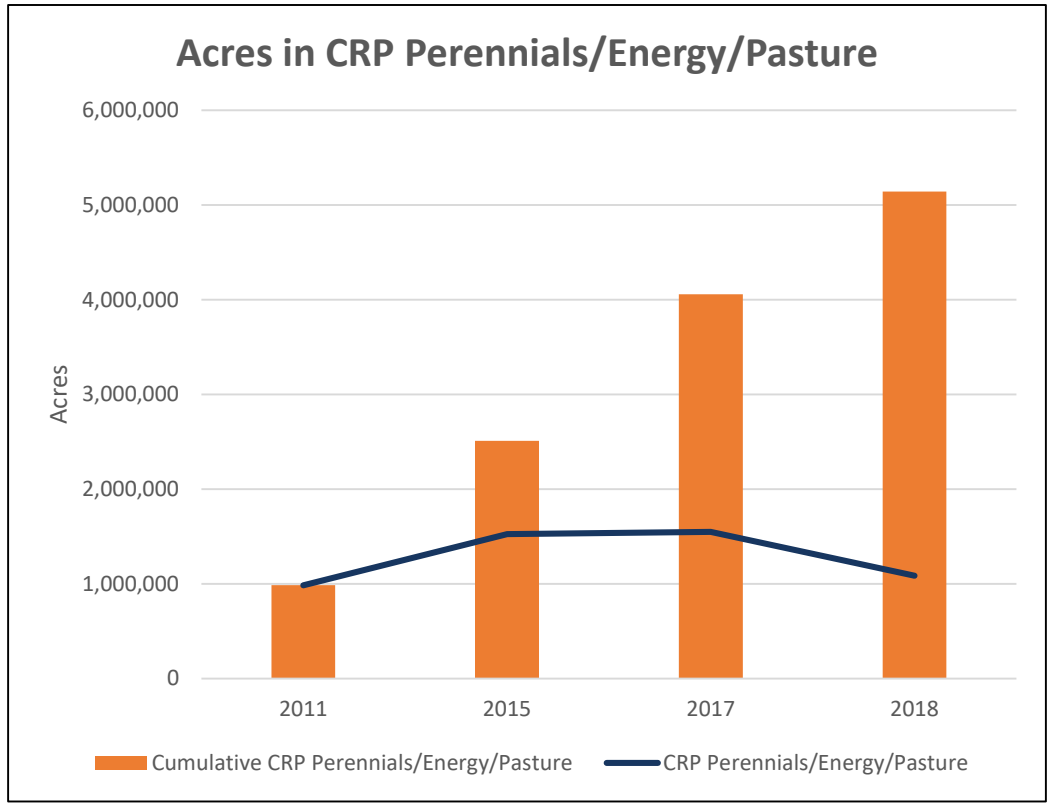

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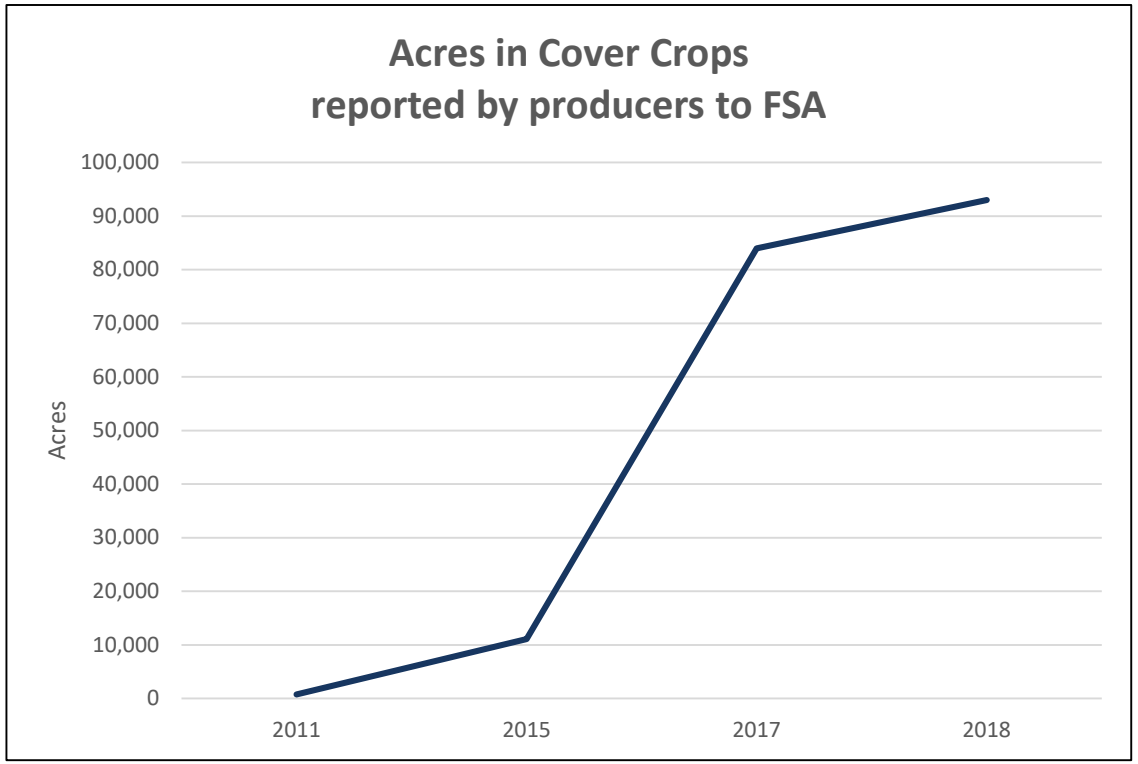
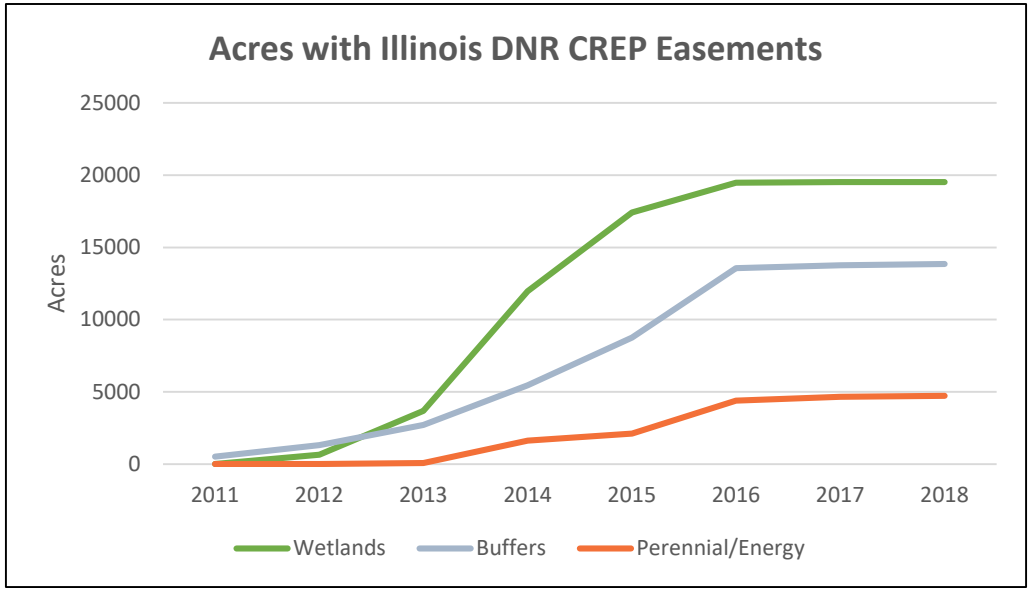


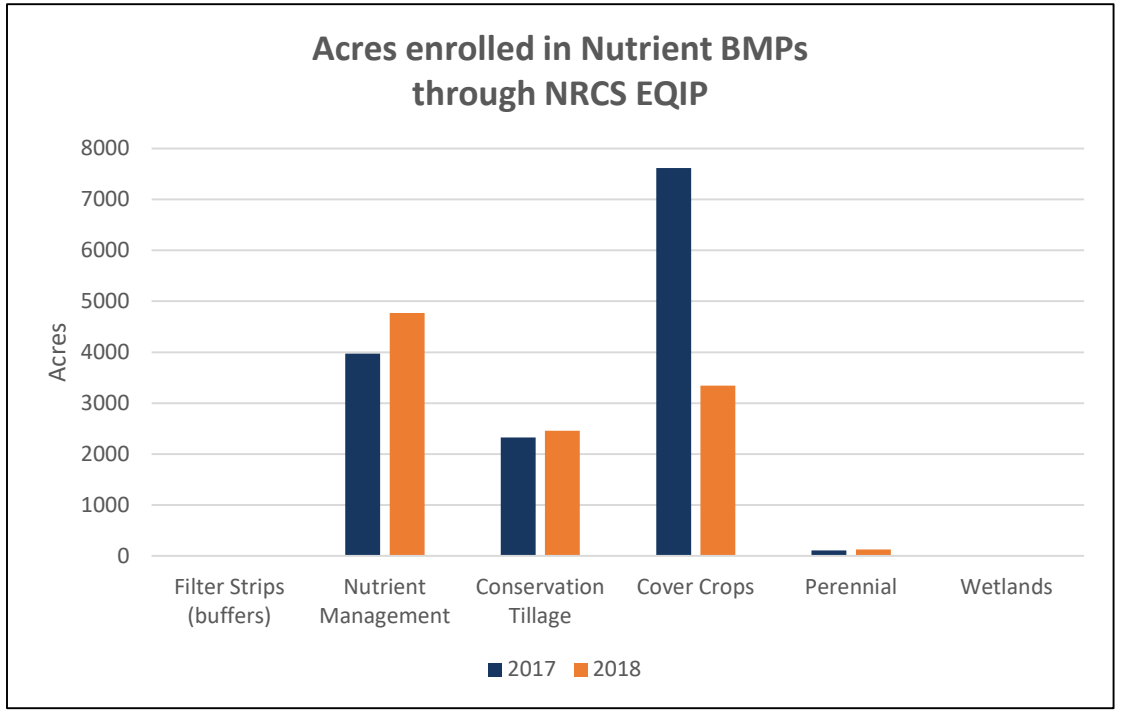
Agriculture Land Measures - IDNR



Acres with Illinois DNR Conservation Reserve Enhancement Program Easements								
	2011	2012	2013	2014	2015	2016	2017	2018
Wetlands	20	651	3,681	11,976	17,406	19,467	19,523	19,523
Buffers	526	1,324	2,720	5,467	8,768	13,568	13,764	13,850
Perennial/Energy	0	7	84	1,622	2,107	4,395	4,670	4,718

Agriculture Land Measures – USDA-NRCS

Acres enrolled in nutrient BMPs through the NRCS Environmental Quality Incentives Program				
	2017	2017 ($)	2018	2018 ($)
Filter Strips (buffers)	13.5	$ 7,105	2.7	$ 1,296
Nutrient Management	3975	$ 73,955	4772.9	$ 181,440
Conservation Tillage	2,325.90	$ 35,740	2456.2	$ 39,662
Cover Crops	7,614.40	$ 462,344	3342.7	$ 176,559
Perennial	108	$ 77,820	126.24	$ 86,520
Wetlands	0	$ 0	0.7	$ 895



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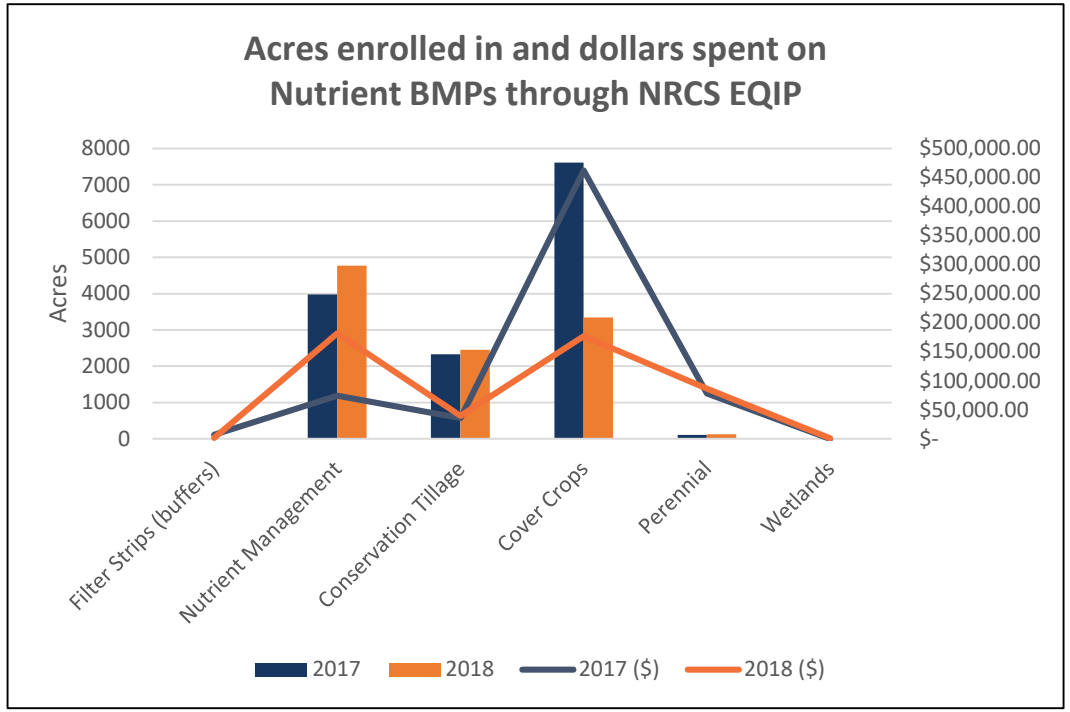
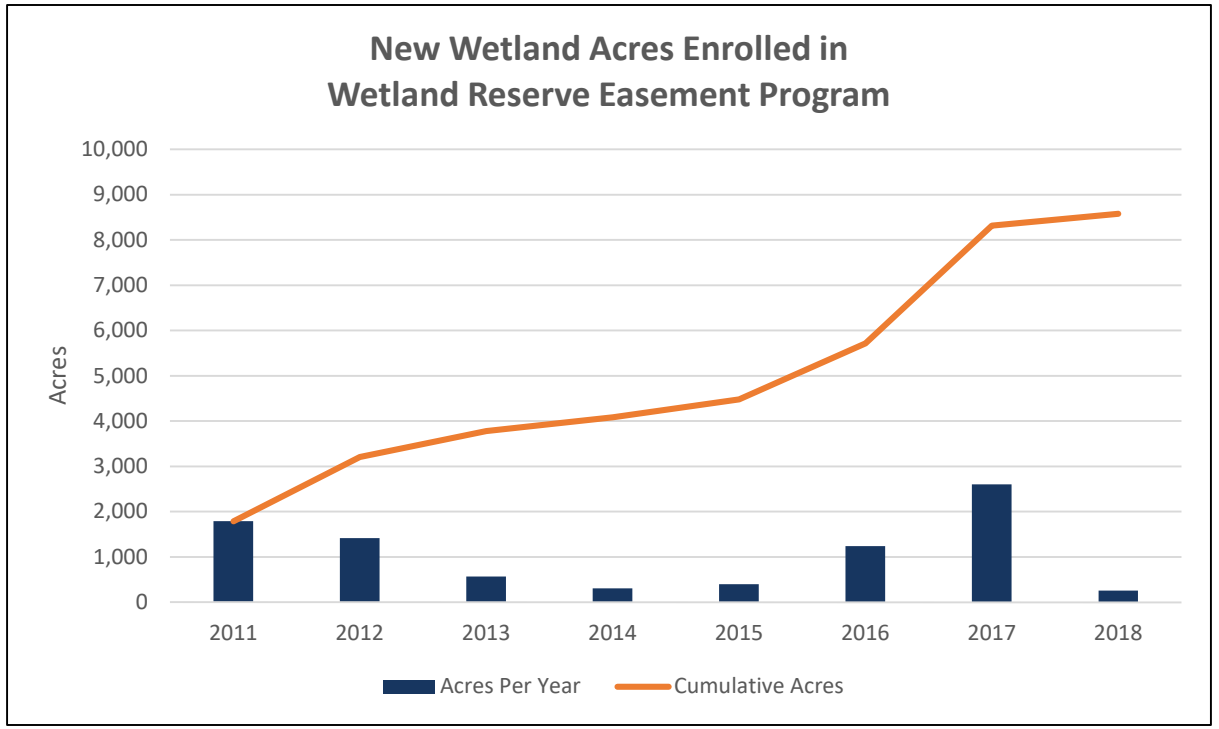
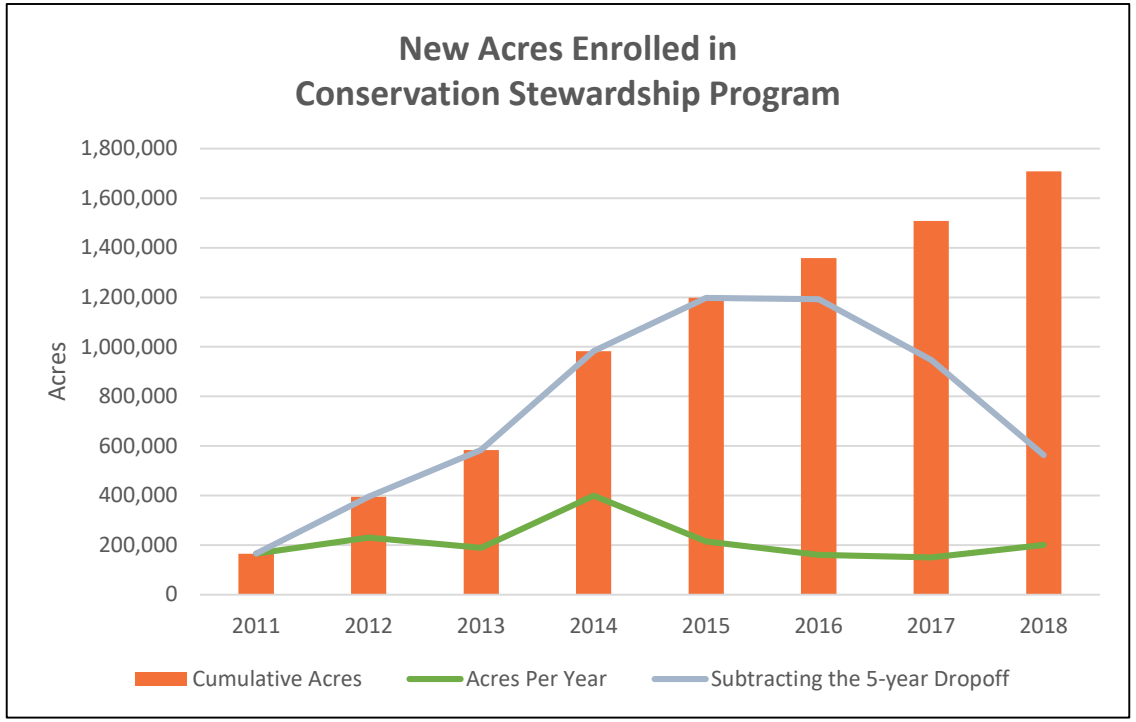


Agriculture Land Measures – USDA-NRCS



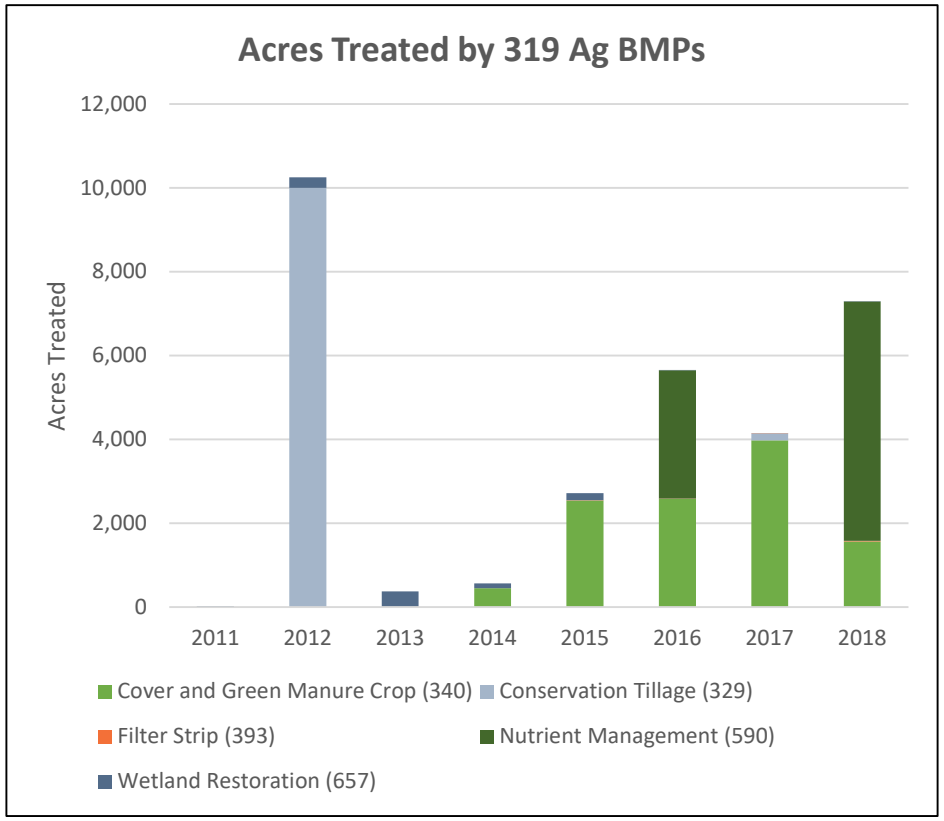
New wetland acres enrolled in Wetland Reserve Easement Program								
	2011	2012	2013	2014	2015	2016	2017	2018
Acres Per Year	1,788	1,420	569	305	396	1,237	2,600	260
Cumulative Acres	1,788	3,208	3,777	4,082	4,478	5,715	8,315	8,575

Agriculture Land Measures – USDA-NRCS



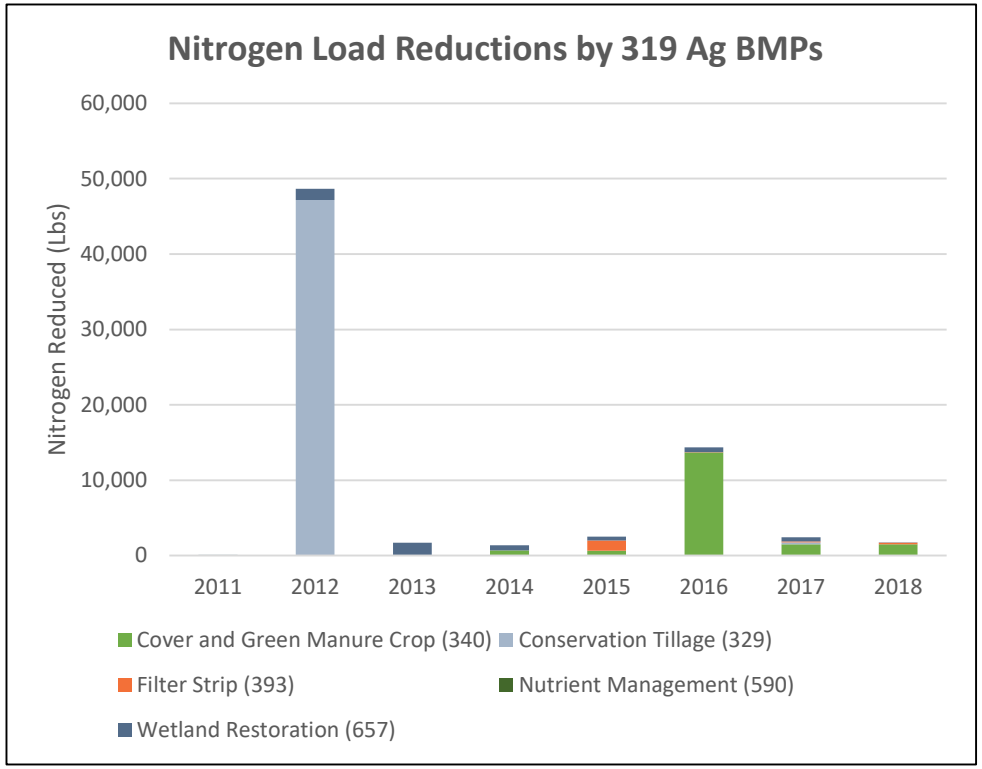
New acres enrolled in Conservation Stewardship Program								
	2011	2012	2013	2014	2015	2016	2017	2018
Acres Per Year	165,416	229,815	188,731	399,024	214,557	160,172	149,844	200,455
Subtracting the 5-year Drop-off	165,416	395,231	583,962	982,986	1,197,543	1,192,299	946,912	563,405
Cumulative Acres	165,416	395,231	583,962	982,986	1,197,543	1,357,715	1,507,559	1,708,014

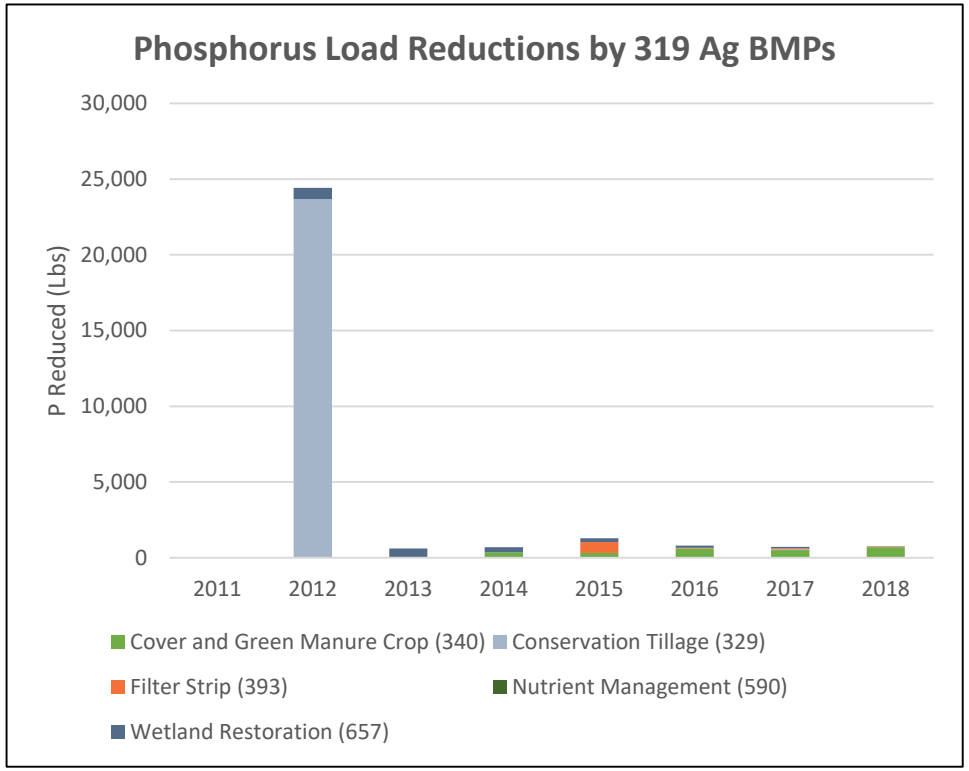
Agriculture Land Measures– IEPA 319



Acres Treated by 319 Ag BMPs								
	2011	2012	2013	2014	2015	2016	2017	2018
Cover and Green Manure Crop (340)				453	2,544	2,583	3,978	1,570
Conservation Tillage (329)		9,998					151	
Filter Strip (393)					8	8	3	9
Nutrient Management (590)						3,062		5,713
Wetland Restoration (657)	24	255	380	116	164	1	1	1
Total	24	10,253	380	569	2,716	5,654	4,133	7,294

Agriculture Land Measures– IEPA 319





Nitrogen Load Reductions (lbs./year)								
	2011	2012	2013	2014	2015	2016	2017	2018
Cover and Green Manure Crop (340)				703	636	13,684	1,486	1,498
Conservation Tillage (329)		47,169					267	
Filter Strip (393)					1,360	50	106	214
Nutrient Management (590)	-							
Wetland Restoration (657)	94	1,474	1,718	679	506	609	552	10
Total	94	48,643	1,718	1,382	2,502	14,343	2,411	1,722

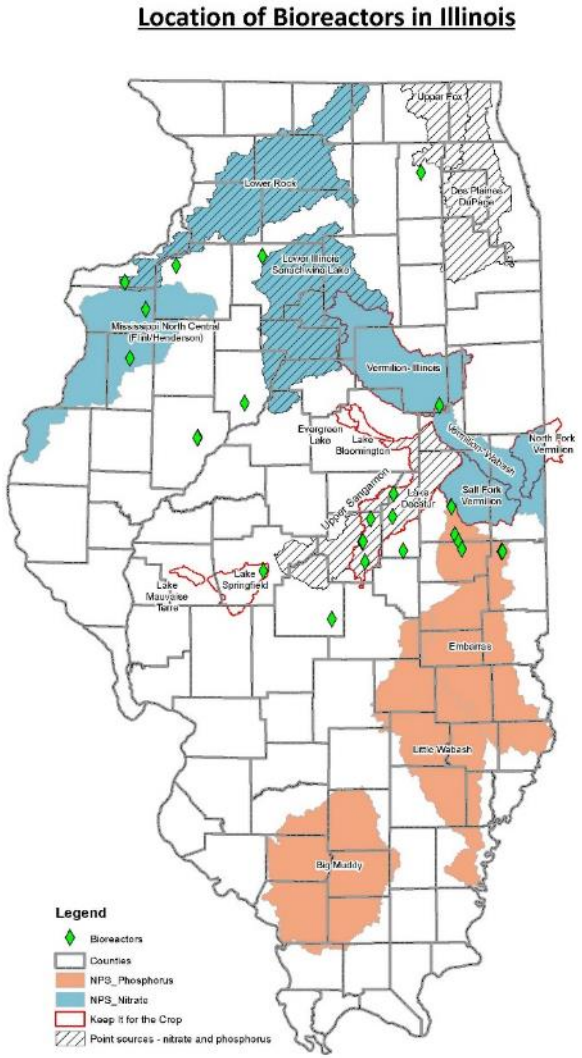
Phosphorus Load Reduction (lbs./year)								
	2011	2012	2013	2014	2015	2016	2017	2018
Cover and Green Manure Crop (340)				351	320	617	509	697
Conservation Tillage (329)		23,691					59	
Filter Strip (393)					725	27	57	47
Nutrient Management (590)								
Wetland Restoration (657)	47	738	604	340	253	164	87	10
Total	47	24,429	604	691	1,298	808	712	754

Agriculture Land Measures - Bioreactors

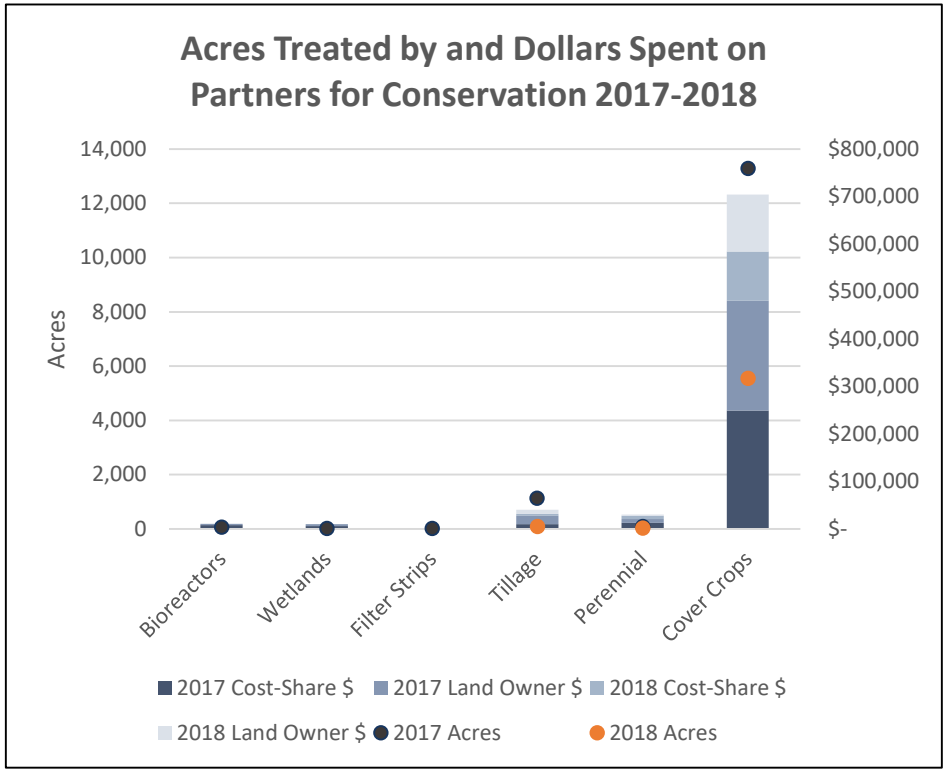
In 2017, there were 20 known bioreactors in Illinois treating **611 acres**.

Just two years later, we have 37 known bioreactors treating **1,345 acres**.

Information provided by Dr. Laura Christianson, Dr. Richard Cooke, Lincoln Land Community College, and Illinois Dept. of Agriculture



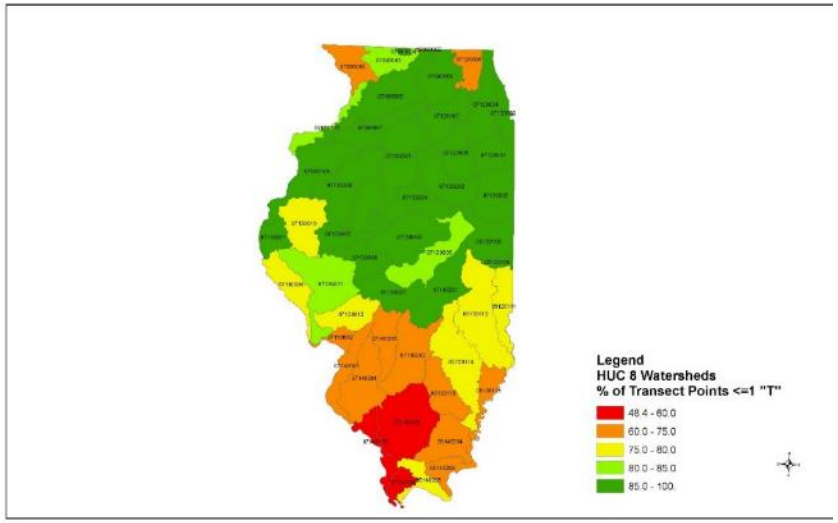
Agriculture Land Measures – IDOA-Partners for Conservation



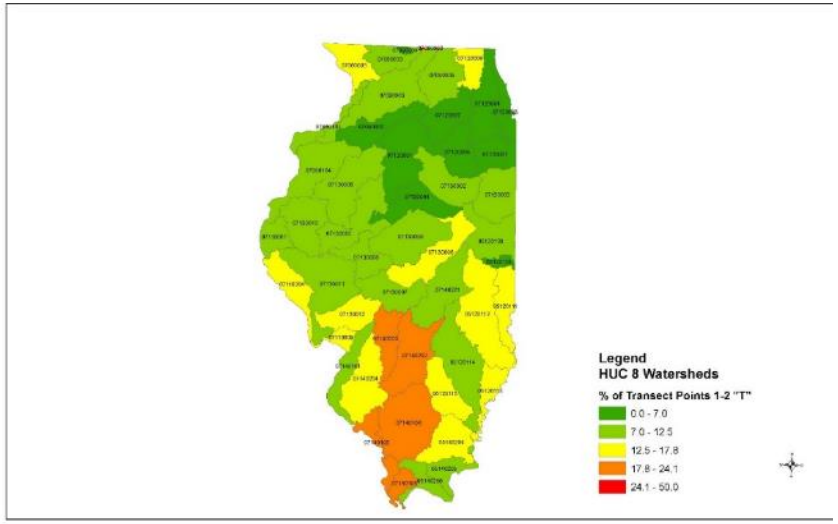
IDOA Partners for Conservation						
	2017 Acres	2018 Acres	2017 Cost-Share $	2017 Land Owner $	2018 Cost-Share $	2018 Land Owner $
Bioreactors	75		$ 8,000	$ 2,667		
Wetlands	24		$ 6,021	$ 4,429		
Filter Strips	22		$ 304	$ 481		
Tillage	1,124	95	$ 9,934	$ 17,817	$ 4,132	$ 8,380
Perennial	89	36	$ 12,980	$ 7,950	$ 6,406	$ 2,717
Cover Crops	13,293	5,555	$ 249,524	$ 230,848	$ 104,021	$ 120,001

Agriculture Land Measures – Soil Transect Survey

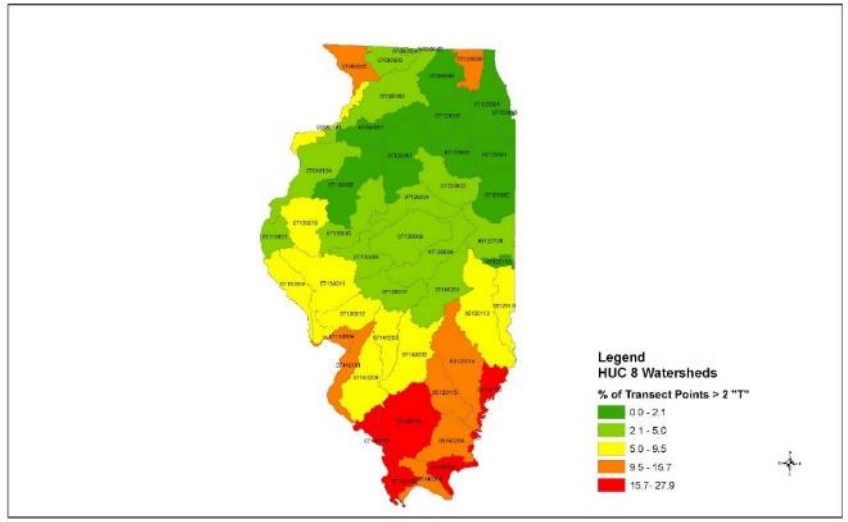
2018 HUC 8 Transect Survey



% of Transect Points <=1 “T”

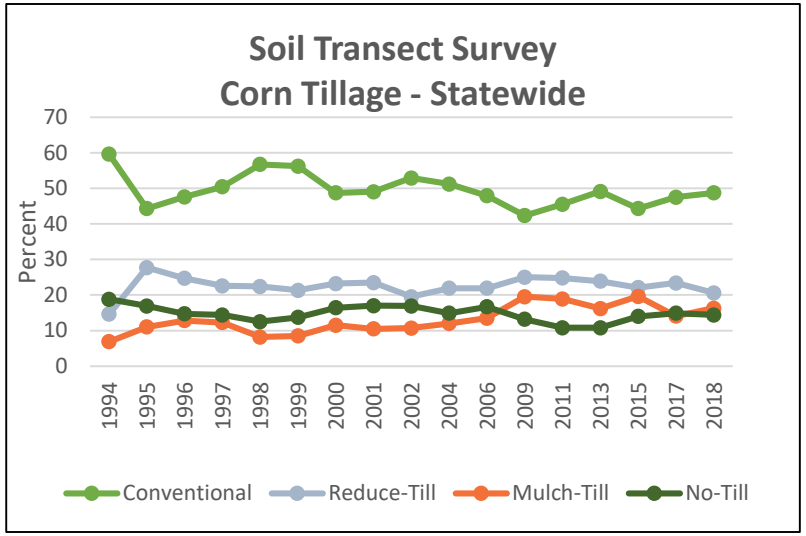


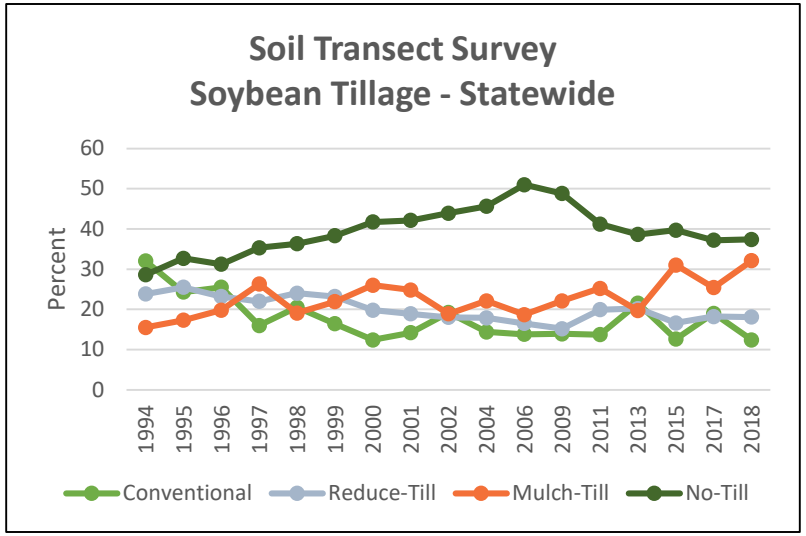
% of Transect Points 1-2 “T”

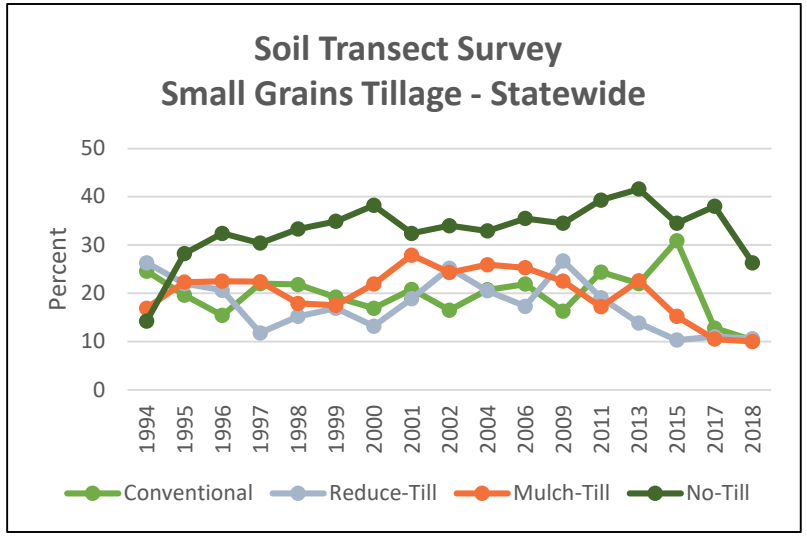


% of Transect Points >2 “T”

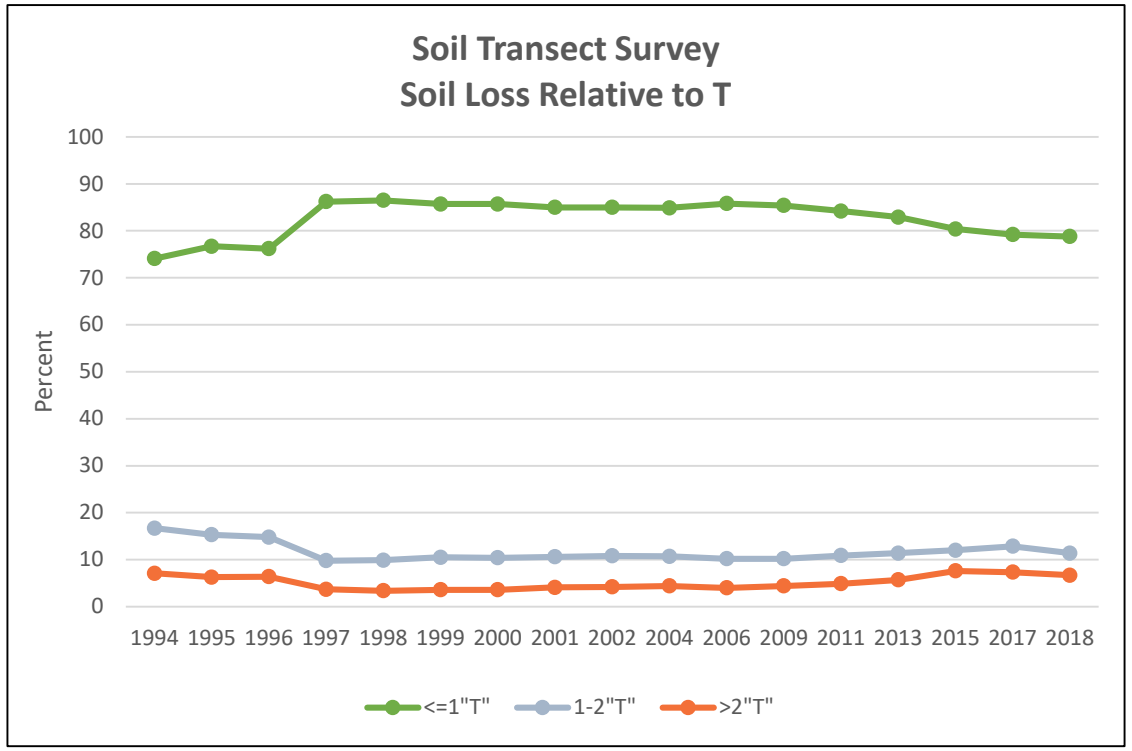
Agriculture Land Measures – Soil Transect Survey

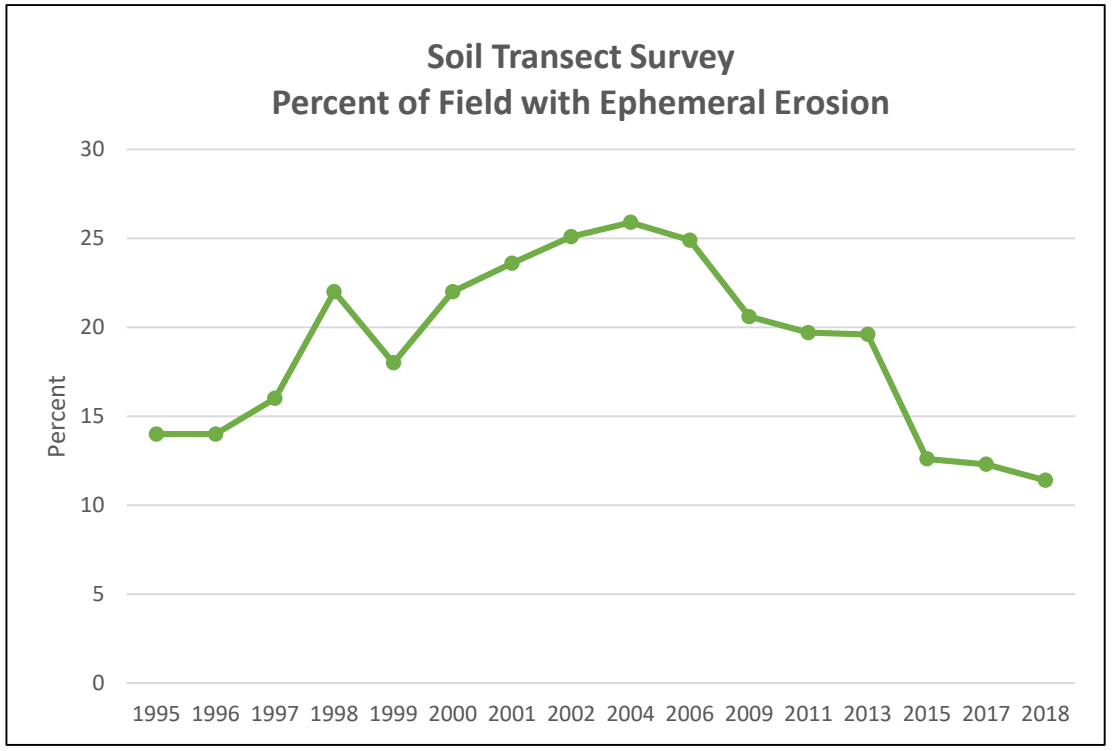




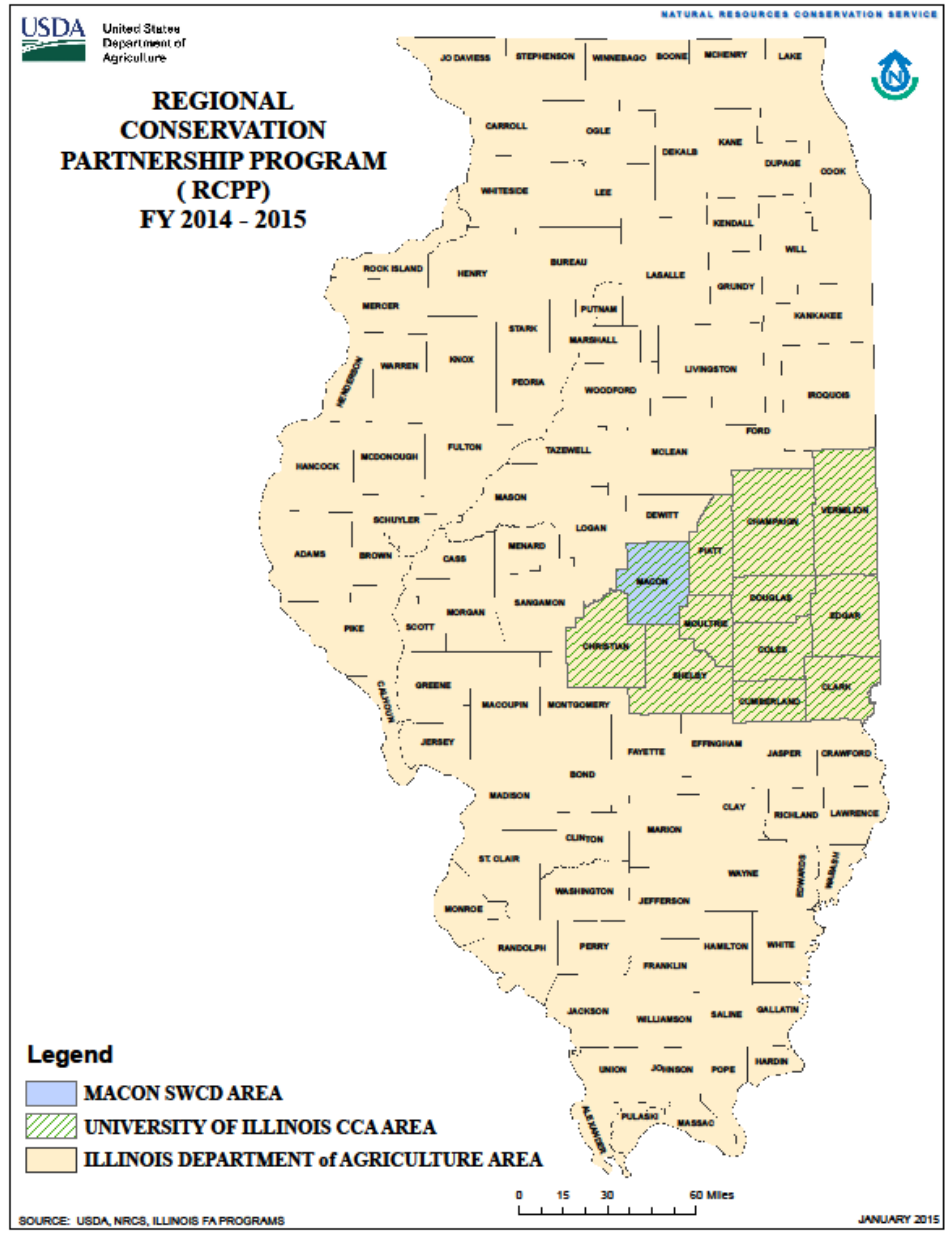


Agriculture Land Measures – Soil Transect Survey





Additional maps


USDA
United States Department of Agriculture
NATURAL RESOURCES CONSERVATION SERVICE
REGIONAL CONSERVATION PARTNERSHIP PROGRAM (RCPP) FY 2014 - 2015
JO DAVIESS
STEPHENSON
WINNEBAGO
BOONE
MCHENRY
LAKE
CARROLL
OGLE
DEKALB
KANE
DUPAGE
COOK
WHITESIDE
LEE
KENDALL
WILL
ROCK ISLAND
HENRY
BUREAU
LASALLE
GRUNDY
MERCER
PUTNAM
KANKAKEE
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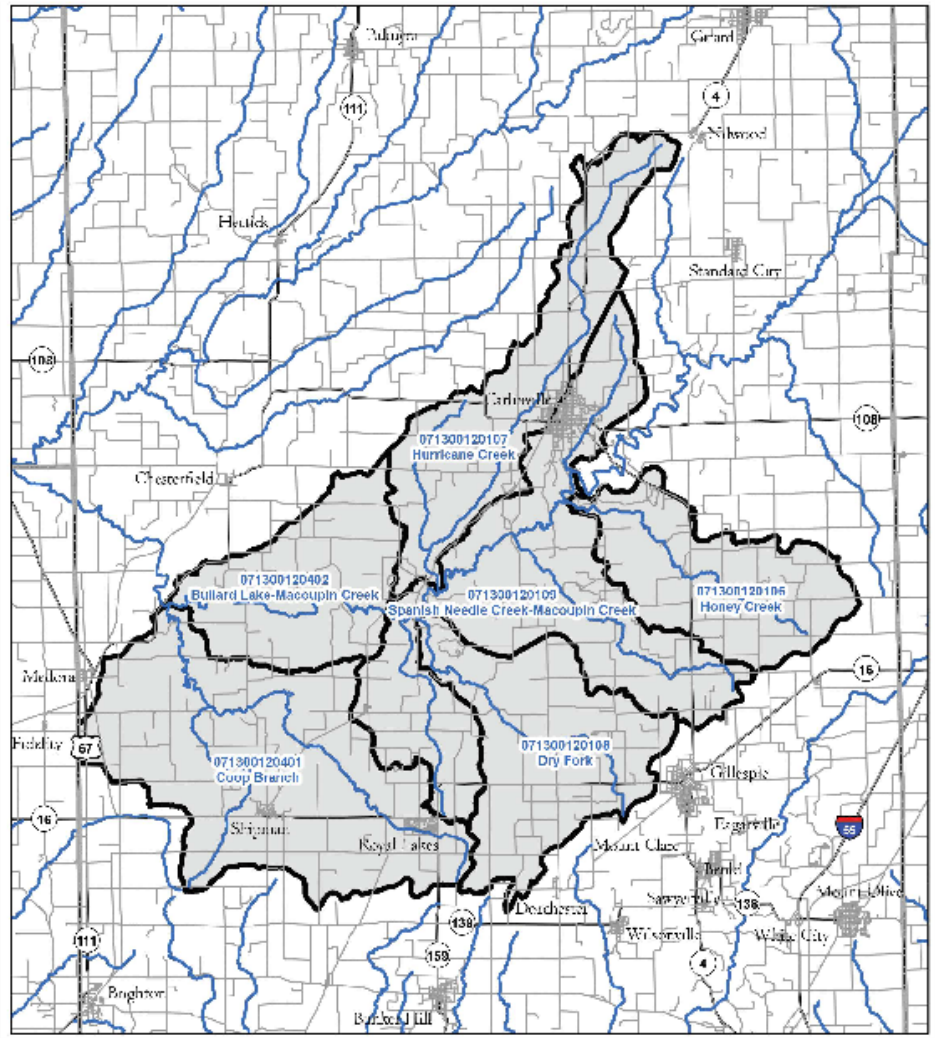
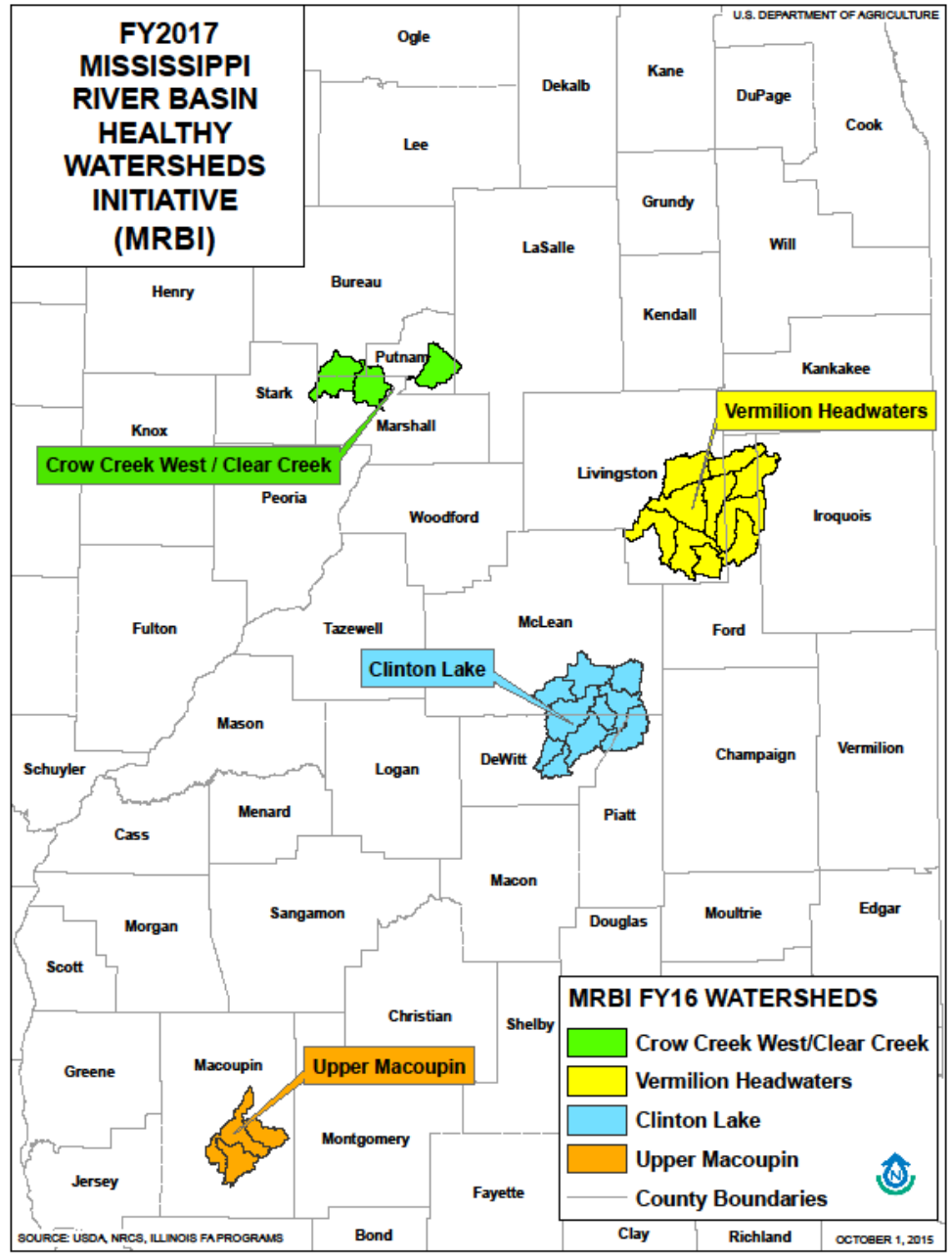
MARSHALL
WARREN
KNOX
PEORIA
LIVINGSTON
HENDERSON
WOODFORD
IROQUOIS
FORD
FULTON
TAZEWELL
MCLEAN
HANCOCK
MCDONOUGH
MASON
DEWITT
CHAMPAIGN
VERMILION
SCHUYLER
LOGAN
PIATT
ADAMS
BROWN
CASS
MENARD
MACON
DOUGLAS
EDGAR
MORGAN
SANGAMON
MOULTRIE
PIKE
SCOTT
CHRISTIAN
COLES
SHELBY
CLARK
GREENE
CALHOUN
MACOUPIN
MONTGOMERY
CUMBERLAND
JERSEY
EFFINGHAM
FAYETTE
JASPER
CRAWFORD
BOND
MADISON
CLAY
RICHLAND
LAWRENCE
MARION
CLINTON
ST CLAIR
WAYNE
EDWARDS
WABASH
WASHINGTON
JEFFERSON
MONROE
RANDOLPH
PERRY
HAMILTON
WHITE
FRANKLIN
JACKSON
WILLIAMSON
SALINE
GALLATIN
Legend
MACON SWCD AREA
UNIVERSITY OF ILLINOIS CCA AREA
ILLINOIS DEPARTMENT of AGRICULTURE AREA
UNION
JOHNSON
POPE
HARDIN
ALEXANDER
PULASKI
MASSAC
0 15 30 60 Miles
SOURCE: USDA, NRCS, ILLINOIS FA PROGRAMS
JANUARY 2015

USDA United States Department of Agriculture
Natural Resources Conservation Service

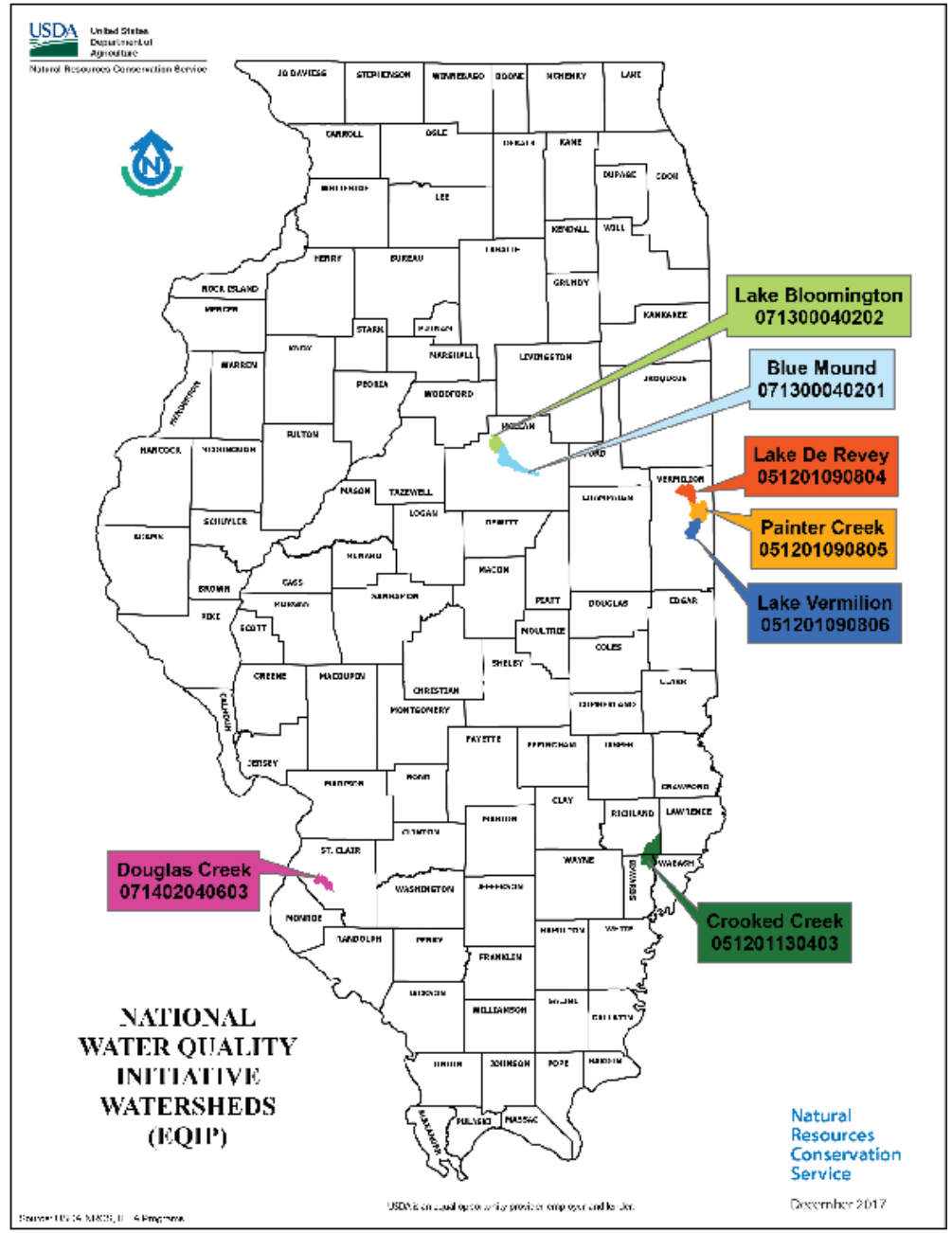
Upper Macoupin Creek Priority Watersheds



ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY | Improving our water resources with collaboration and innovation



ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY | Improving our water resources with collaboration and innovation


USDA
United States Department of Agriculture
Natural Resources Conservation Service
Lake Bloomington
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Blue Mound
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Lake De Revey
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Painter Creek
051201090805
Lake Vermilion
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Douglas Creek
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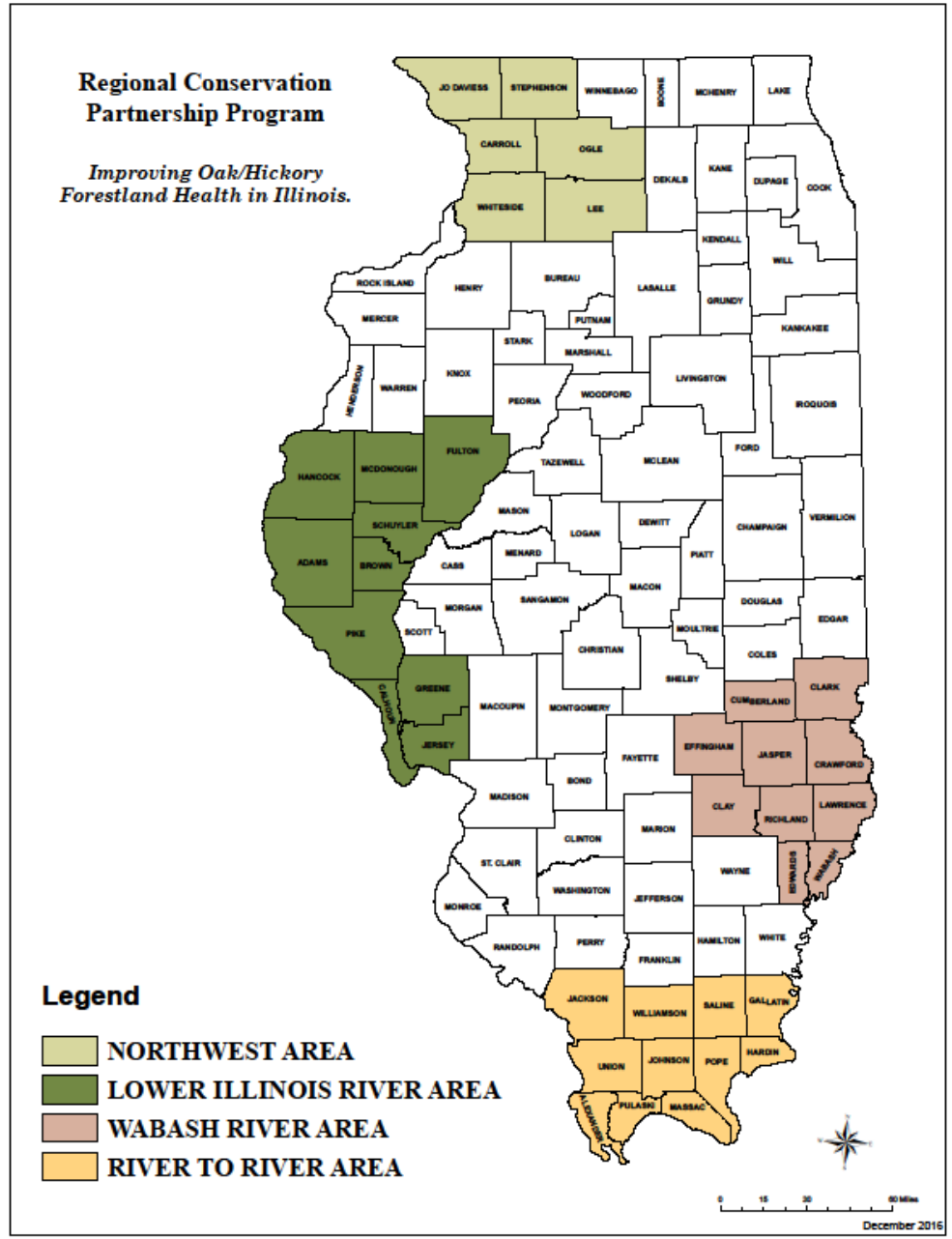
NATIONAL WATER QUALITY INITIATIVE WATERSHEDS (EQIP)
Natural Resources Conservation Service
December 2017


Regional Conservation Partnership Program
Improving Oak/Hickory Forestland Health in Illinois.
JO DAVIESS
STEPHENSON
WINNEBAGO
BOONE
MCHENRY
LAKE
CARROLL
OGLE
DEKALB
KANE
DUPAGE
COOK
WHITESIDE
LEE
KENDALL
WILL
ROCK ISLAND
HENRY
BUREAU
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GRUNDY
MERCER
PUTNAM
KANKAKEE
STARK
MARSHALL
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LIVINGSTON
HENDERSON
WARREN
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WOODFORD
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FULTON
FORD
HANCOCK
MCDONOUGH
TAZEWELL
MCLEAN
SCHUYLER
MASON
LOGAN
DEWITT
CHAMPAIGN
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MENARD
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MOULTRIE
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SHELBY
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CLARK
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JASPER
CRAWFORD
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MADISON
CLAY
RICHLAND
LAWRENCE
MARION
CLINTON
ST. CLAIR
WAYNE
EDWARDS
WABASH
WASHINGTON
JEFFERSON
MONROE
RANDOLPH
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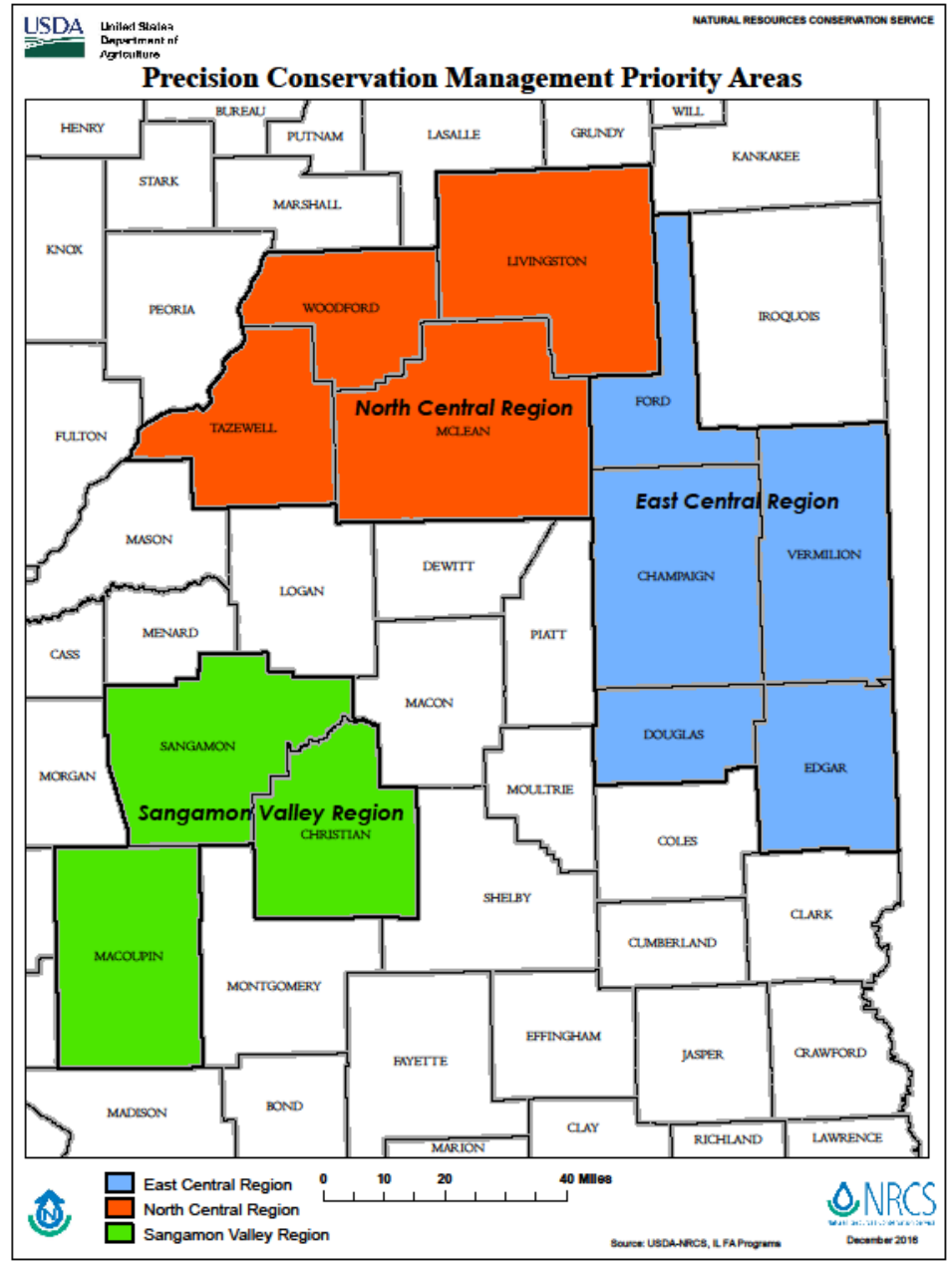
JOHNSON
POPE
HARDIN
ALEXANDER
PULASKI
MASSAC
Legend
NORTHWEST AREA
LOWER ILLINOIS RIVER AREA
WABASH RIVER AREA
RIVER TO RIVER AREA
0 15 30 60 Miles
December 2016


USDA
United States Department of Agriculture
NATURAL RESOURCES CONSERVATION SERVICE
Precision Conservation Management Priority Areas
HENRY
BUREAU
PUTNAM
LASALLE
GRUNDY
WILL
KANKAKEE
STARK
MARSHALL
KNOX
LIVINGSTON
PEORIA
WOODFORD
IROQUOIS
FULTON
TAZEWELL
North Central Region
MCLEAN
FORD
East Central Region
MASON
LOGAN
DEWITT
CHAMPAIGN
VERMILION
MENARD
PIATT
CASS
MACON
DOUGLAS
EDGAR
SANGAMON
MORGAN
MOULTRIE
Sangamon Valley Region
CHRISTIAN
COLES
SHELBY
CLARK
MACOUPIN
CUMBERLAND
MONTGOMERY
EFFINGHAM
JASPER
CRAWFORD
FAYETTE
MADISON
BOND
CLAY
RICHLAND
LAWRENCE
MARION
East Central Region
North Central Region
Sangamon Valley Region
0
10
20
40 Miles
Source: USDA-NRCS, IL FA Programs
NRCS
December 2018

Estimating Nutrient Point Source Loads

2019 Biennial Report

Trevor Sample, Illinois EPA

Point Source Nutrient Loads
NLRS Original Science Assessment

- Based on 2011 data provided by
  - Mosher, IEPA from ICIS tool and reported by facilities (DMRs)
  - IAWA
  - Best 40 estimates for industrial and agriculture facilities
  - Focused on Major (>1MGD) facilities
  - Estimates for Minors
- NOTE: At that time, not many major facilities were required to report monitoring nutrient data to IEPA.

Baseline Point Source Loads

- Total Nitrogen: 87.3 Million pounds annually
  - 45% reduction = 48.75 million pounds annually
- Total Phosphorus: 18.1 million pounds annually
  - 45% reduction = 9.03 million pounds annually

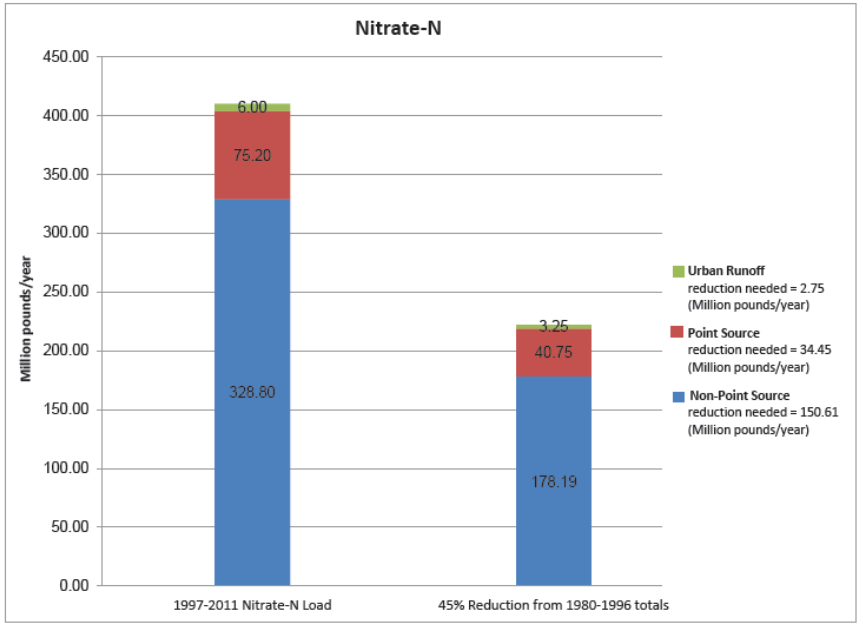


Figure 2.2. Nitrate-N reduction goal in pounds per year by source.

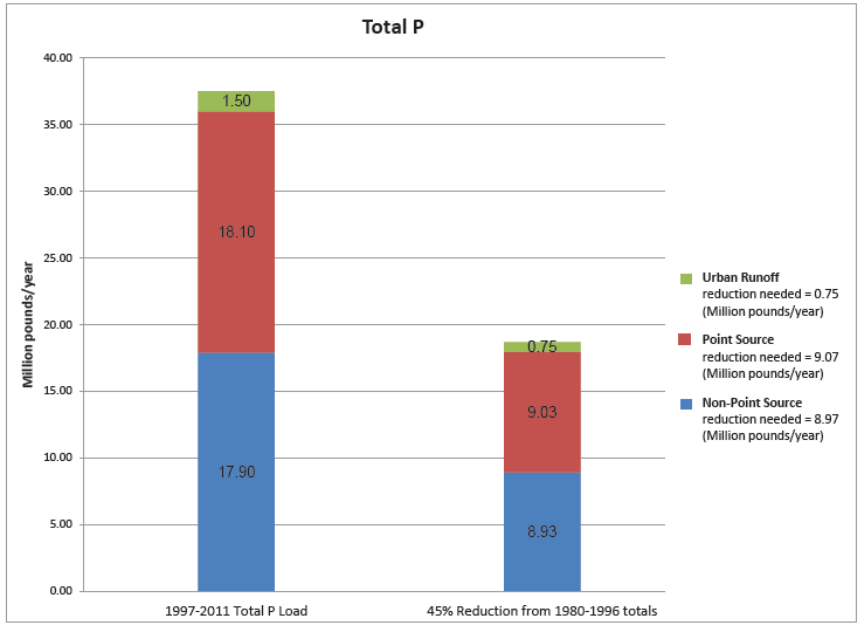


Figure 2.3. Total phosphorus reduction goal in pounds per year by source.

Estimating 2017 Point Source Nutrient Loads

- Hypoxia Task Force "Second Report on Point Source Progress in Hypoxia Task Force States" draft report
- USEPA used the Water Pollutant Loading Tool on the ICIS data system.
- Focused on Major municipal facilities with SIC code 4952 (sewerage systems)
  - For Illinois, we determined this to included 213 facilities
- Tool uses reported flow and concentration data reported by facilities through DMRs.
- Where a facility does not report data, the concentrations are estimated.
- This information was sent to state for review
- Upon review, IEPA found errors
  - The tool initially pulled from facilities' 001 outfalls
  - Many facilities have been given a B01 outfall in certain circumstances
  - Some facilities report nutrients from non-001 outfalls

Estimating 2017 Point Source Nutrient Loads

- Monthly reported flow and TN/TP concentration data was pulled for facilities with B01 or non-001 outfalls and manually calculated annual loads
- Other QA/QC performed for facilities where there were data issues.

Estimating 2017 Point Source Nutrient Loads

- While the 213 Major municipals represent the largest nutrient loads, the original Science Assessment included industrial and other minor facilities as well, so these loads were estimated for 2017 to provide a proper accounting of total statewide point source nutrient loads.
- Water Pollutant Loading Tool was used to estimate nutrient loads for Major/Minor industrials
  - Power Plants were NOT included—difficult to discern intake water from phosphate additions.
- Minor Municipal Facilities were given the same loads as 2011
- Data for MWRDGC, Decatur SDD and Sauget were obtained directly from the facilities or their websites

2017 Total Phosphorus Annual Loads (lbs.)

- 213 Major Municipal Facilities = 11,403,056
- Major and Minor Industrial Facilities = 285,821
- Minor Municipals/domestic wastewater = 2,479,624
- Statewide = **14,168,501**
- 2011 Estimate = 18.1
- Reduction in lbs = 4,000,000
- Percent Reduction = 22%

2017 Total Nitrogen Loads (lbs.)

- 213 Major Municipal Facilities = 70,097,850
- Major and Minor Industrial Facilities = 1,752,000
- Minor Municipals/domestic wastewater = 3,048,601
- Statewide = **74,898,451**
- 2011 Estimate = 87,300,000
- Reduction in lbs = 12,401,549
- Percent Reduction = 14%

Estimating 2018 Point Source Nutrient Loads

- Same procedure used for 2017 used for 2018
- Loads are currently being developed

Updating Additional Point Source Measures

- 2017 Biennial Report gave statewide values for:
  - Permits issued with Phosphorus limits
  - Permits to be issued requiring Optimization and Feasibility Studies
  - Permits issued awaiting Optimization and Feasibility Studies
  - Optimization and Feasibility Studies submitted

- These were also reported by watershed study group areas:
  - Fox River Study Group
  - DuPage River Salt Creek Workgroup
  - Hickory Creek Watershed Planning Group
  - Des Plaines River Watershed Workgroup

- These measures will be updated for the 2019 Biennial Report

Updating Additional Point Source Measures

- Total Maximum Daily Loads
- CAFOs
- State Revolving Fund
- Water Quality Trading

Performance Benchmark – Adaptive Management

2019 Biennial Report

Trevor Sample, Illinois EPA

Performance Benchmark - Adaptive Management

- In 2018, Policy Working Group member recommended that the 2019 Biennial Report should address performance benchmarks, particularly for agriculture implementation tracking
- Performance Benchmark Group met in August 2018 to begin discussions
- A subsequent meeting was held in April 2019
  - Draft outline for a Performance Benchmark-Adaptive Management chapter was presented and discussed

Performance Benchmark - Adaptive Management

- Issues to be discussed
  - Compare load contributions by source: Ag, Point Source, Urban.
    - 1997-2011, 2015 load estimates, 2017 load estimates, 2025 interim goals, and 45% reduction goals

Performance Benchmark - Adaptive Management

- Agriculture implementation scenarios
  - Explain the assumptions behind them
  - How to establish conservation practice “benchmarks” without choosing a scenario
  - Look at implementation trends so far
  - Combine practice data to estimate overall load reductions (Reid Christianson work)

Point Source implementation

- Trends for Point Source reductions realized from 2011 baseline loads to 2017 and 2018 loads.
- Project what future load reductions could be if all 213 major municipal facilities were meeting 1.0 mg/L and 0.5 mg/L.

Performance Benchmark - Adaptive Management

- Adaptive Management
  - Discuss Role of Science Team
  - Process for adding new agriculture conservation practices
  - Process for updating practice performance
  - Future Biennial Reports may add practices or update practice performance, leading to potential changes in scenarios
  - Cost share of practices may drive implementation as more programs come online to incentivize adoption
- Potential to add priority watersheds

Performance Benchmark - Adaptive Management

- Additional Resource Needs
- Do we include a section that discusses resource needs in order to reach the level of implementation that is needed?
- Examples:
  - Funding needed to fully operate SWCDs
  - Restore Partners in Conservation funding to previous levels
  - Resources needed to continue and enhance IEPA WQ monitoring programs
  - Funding needed to continue USGS continuous monitoring network
  - Funding needed to upgrade wastewater plants
  - Other?

Biennial Report

Report Logistics – Eliana Brown

Report Logistics

Date	Action	Responsible entity
Late June, 2019	Illinois Extension provides draft report to Policy Working Group for 2 week review	Illinois Extension
Mid-July, 2019	Policy Working Group returns comments to Illinois Extension	Policy Working Group
Aug - Sept, 2019	Final Draft of report due to Illinois EPA	IDOA and Illinois EPA
Aug - Sept, 2019	Biennial Report printed and released	Illinois Extension

Hypoxia Task Force Update

Trevor Sample, Warren Goetsch

Fall Conference

Eliana Brown

Fall Conference

NLRS Partnership Workshop

December 3rd – 4th, 2019
Crowne Plaza
Springfield, IL