

Cedar Creek Watershed Plan Development

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ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

Improving our
water resources
with collaboration
and innovation

What is University of Illinois Extension?

1862 – Morrill Land-Grant Acts passed

Educate citizens in agriculture, home economics, mechanic arts, and other useful professions (second and third acts passed in 1890 and 1994)

1867 – “Illinois Industrial University” established as Illinois’ Land-Grant institution through the Morrill Acts

1885 – Name changed to University of Illinois

1914 – Smith Lever Act passed nationwide to establish the Extension Service

What Does Extension Do?

- Flagship outreach effort of U of I
- Offer educational programs to residents of the 102 counties in Illinois in five broad areas
 - Energy and environmental stewardship
 - Food safety and security
 - Economic development and workforce preparedness
 - Family health, financial security, and wellness
 - Youth development



Images courtesy of University of Illinois Extension

Life as a Watershed Outreach Associate

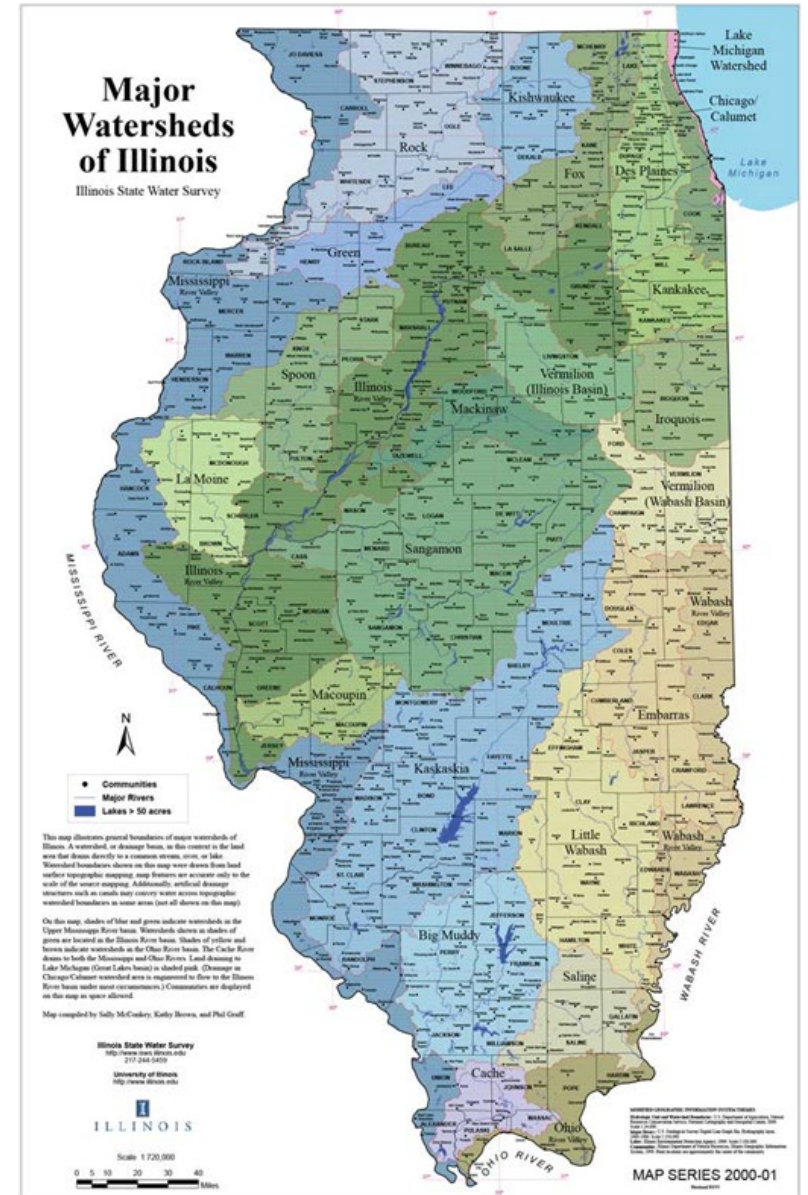


What's Your Watershed Address?

HUC = Hydrologic Unit Code

Temple Hoyne Buell Hall

- HUC 8 – Vermilion River Watershed
 - 916,351 acres
- HUC 10 – Saline Branch Drainage Ditch
 - 57,064 acres
- HUC 12 – Crystal Lake-Saline Branch Drainage Ditch
 - 23,365 acres



Types of Pollution

Point Source Pollution

Any discernible, confined, and discrete conveyance from which pollutants may be discharged.

- Pipe
- Ditch
- Tunnel
- Conduit
- Well
- Concentrated animal feeding operation (CAFO)
- Vessel or other floating craft

Nonpoint Source Pollution

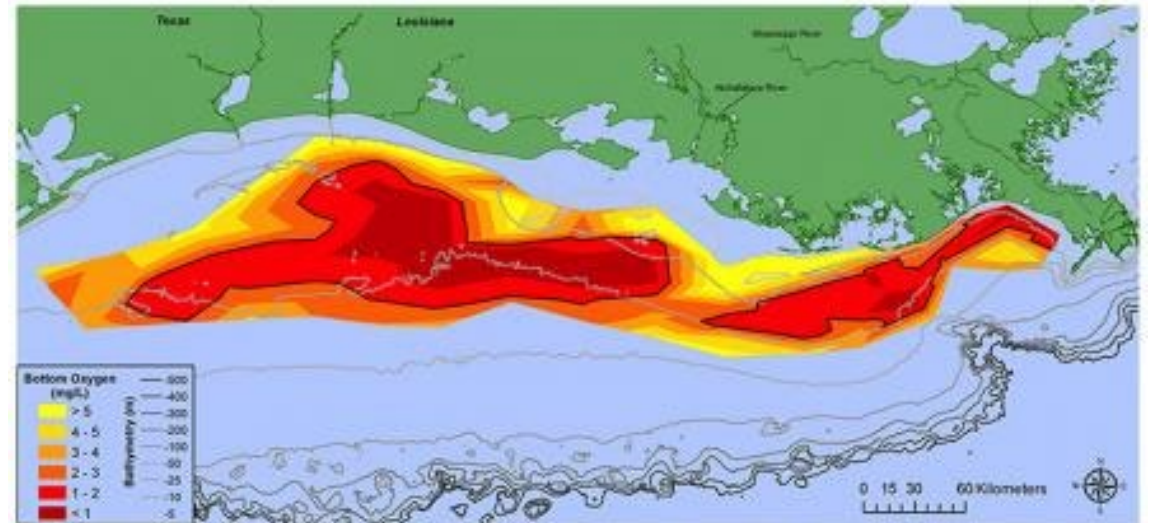
Harder to define...

- Excess fertilizers and pesticides from agricultural lands and residential areas
- Oil, grease, and toxic chemicals from urban runoff
- Sediment – construction sites, forest and crop land, eroding streambanks
- Livestock and pet waste



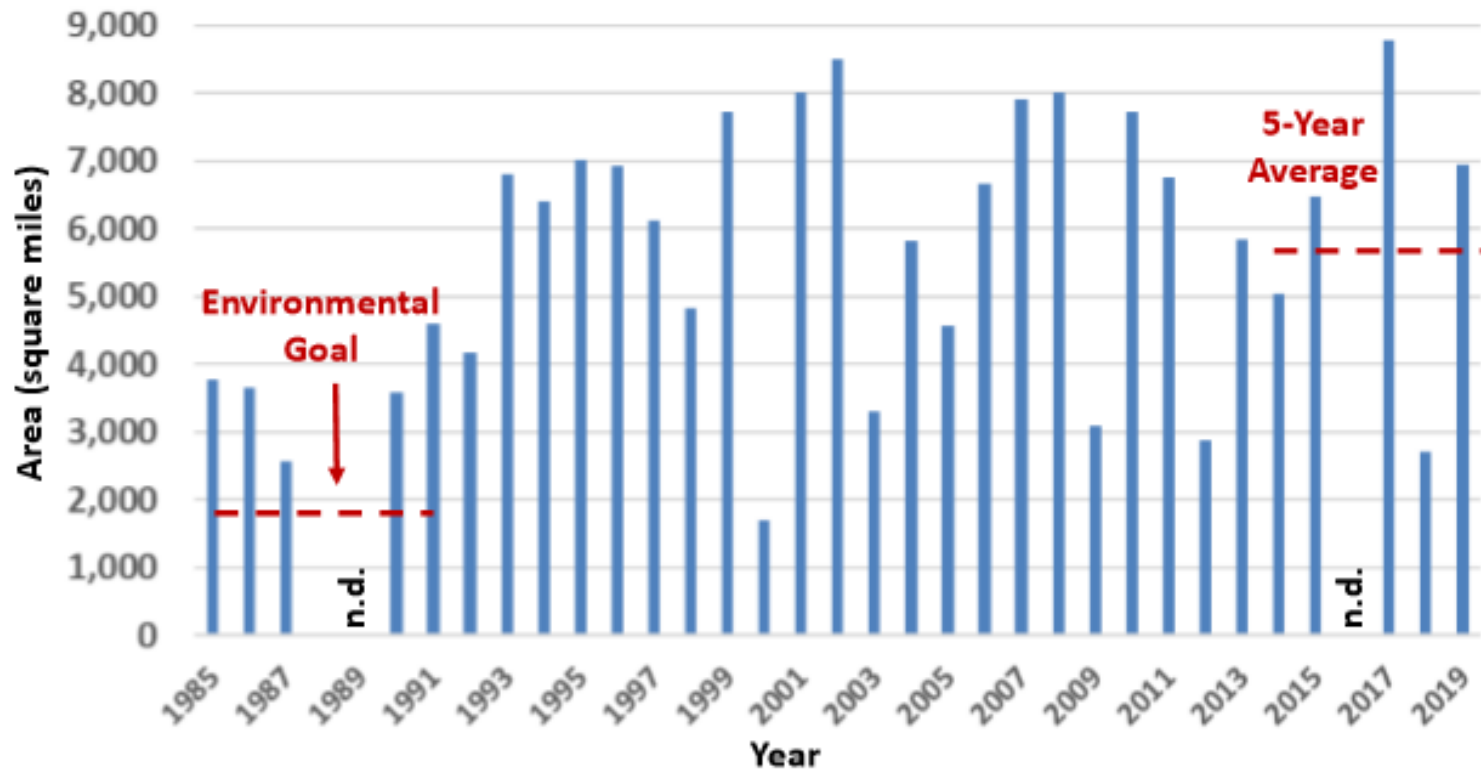
Gulf of Mexico Hypoxic Zone

- Hypoxia = low oxygen
- One leading cause is excess nutrients – primarily N and P
 - Promote algal overgrowth and eutrophication
 - Algae die and decomposition process consumes oxygen
- 2019 hypoxic zone was 8th largest mapped since 1985 (6,952 square miles)



Distribution of bottom-water dissolved oxygen, July 22-July 31, 2019. Black line denotes 2 mg/L. Data source: N.N. Rabalais, Louisiana State University & Louisiana Universities Marine Consortium; R.E. Turner, Louisiana State University. Funding source: NOAA

Bottom Area of Dissolved Oxygen ≤ 2 mg l⁻¹



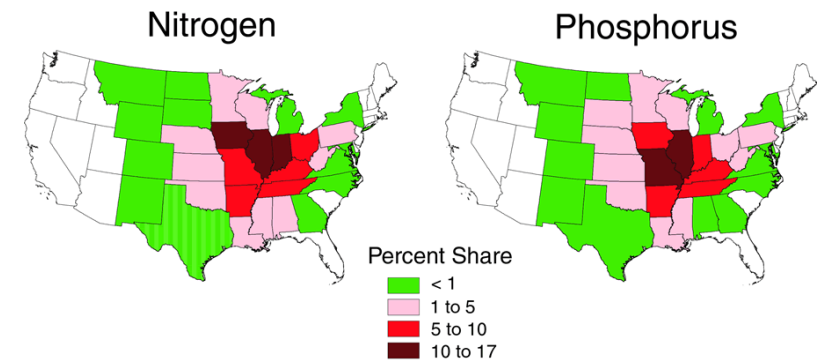
Historic size of hypoxia from 1985 to 2019. There are no data (n.d.) for 1989 and 2016. The value for 1988 is 15 square miles and barely visible on the scale. The environmental goal of the Hypoxia Task Force is an area of 1,900 sq km or less over a 5-year average by the year 2035.

Illinois' Contributions

Total Nitrogen				Total Phosphorus			
State	Percent of Total Flux	Cumulative Percent of Total Flux	Delivered Yield (kg km ⁻² yr ⁻¹)	State	Percent of Total Flux	Cumulative Percent of Total Flux	Delivered Yield (kg km ⁻² yr ⁻¹)
Illinois	16.8	16.8	1734.9	Illinois	12.9	12.9	117.4
Iowa	11.3	28.1	1167.2	Missouri	12.1	25.0	89.4
Indiana	10.1	38.2	1806.6	Iowa	9.8	34.8	89.2
Missouri	9.6	47.8	800.5	Arkansas	9.6	44.4	94.6
Arkansas	6.9	54.7	750.1	Kentucky	9.0	53.4	113.4



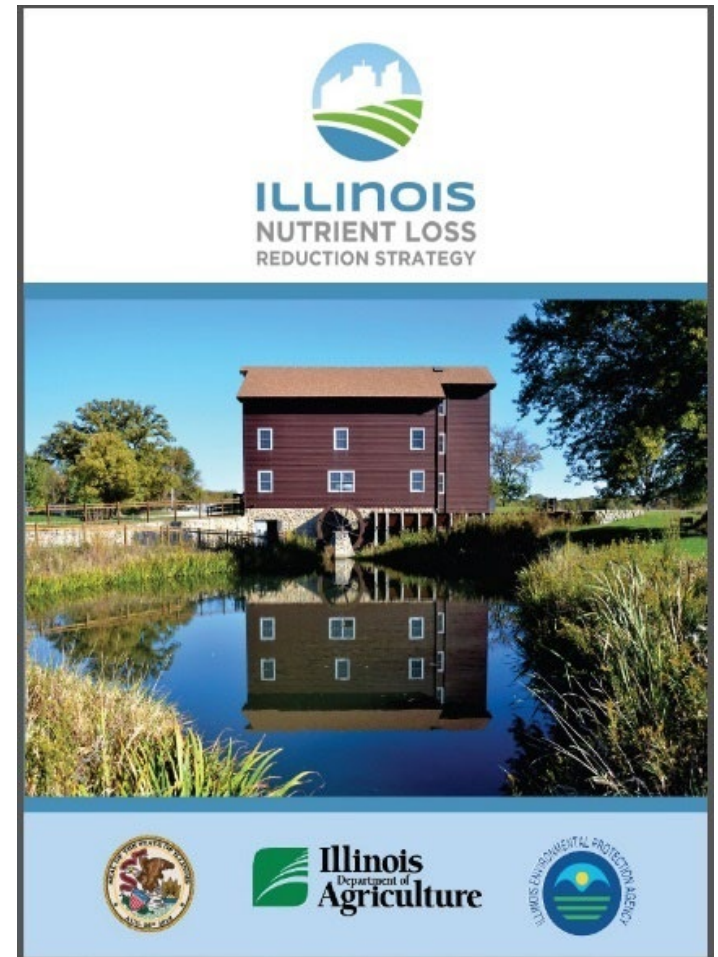
Source: Alexander et al., 2008



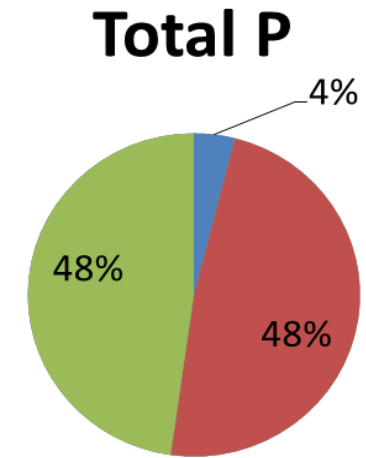
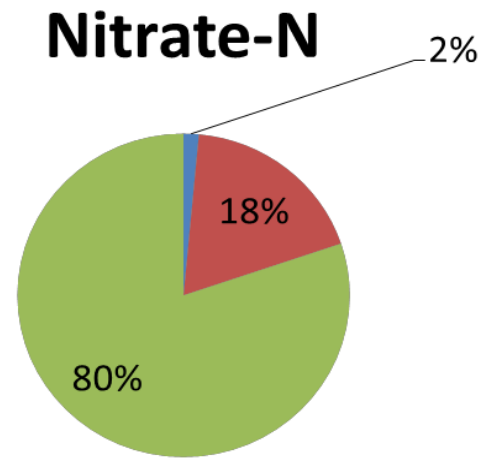
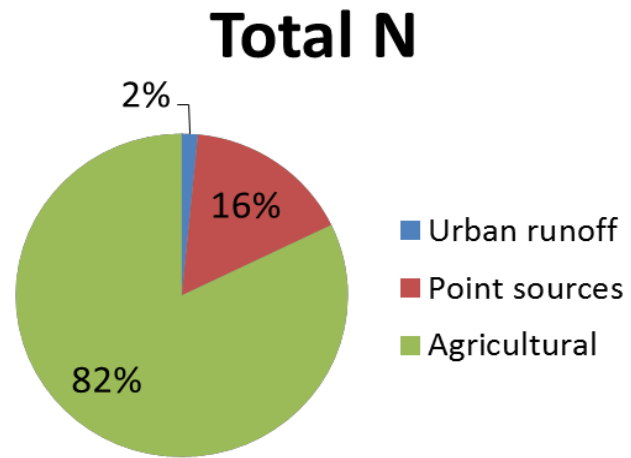
The Illinois Nutrient Loss Reduction Strategy

- Released July 21, 2015
- Addresses nutrient loads from Point Sources, Urban Stormwater, and Agriculture Nonpoint Sources
- Gulf of Mexico hypoxia
- Impacts of nutrients on local water quality

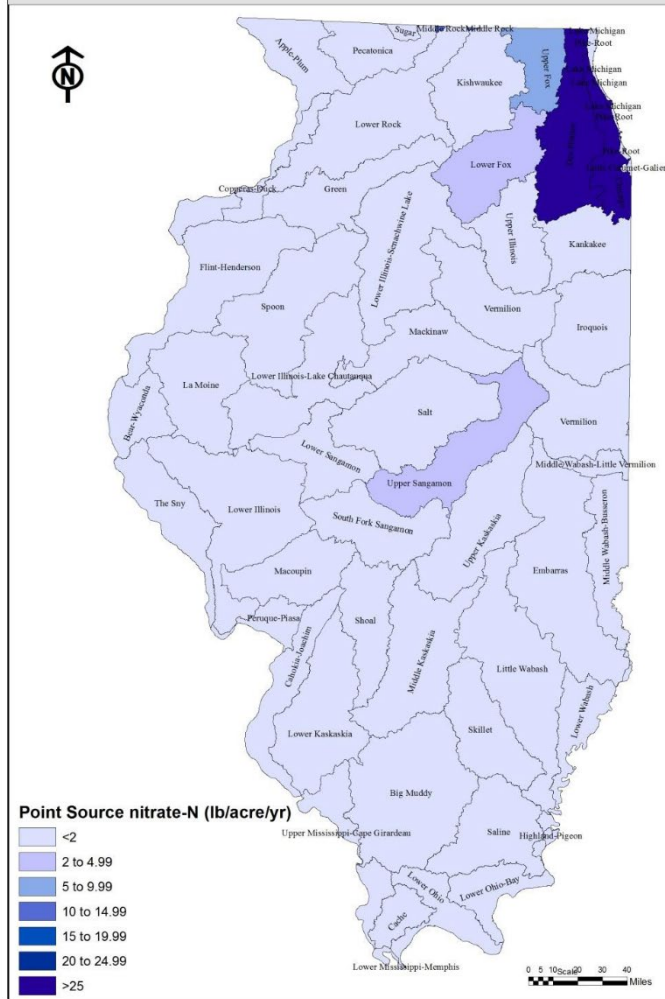
GOAL: REDUCE N AND TOTAL P LOSSES BY 45%
INTERIM GOAL: REDUCE N BY 15% AND TOTAL P BY 25% BY 2025



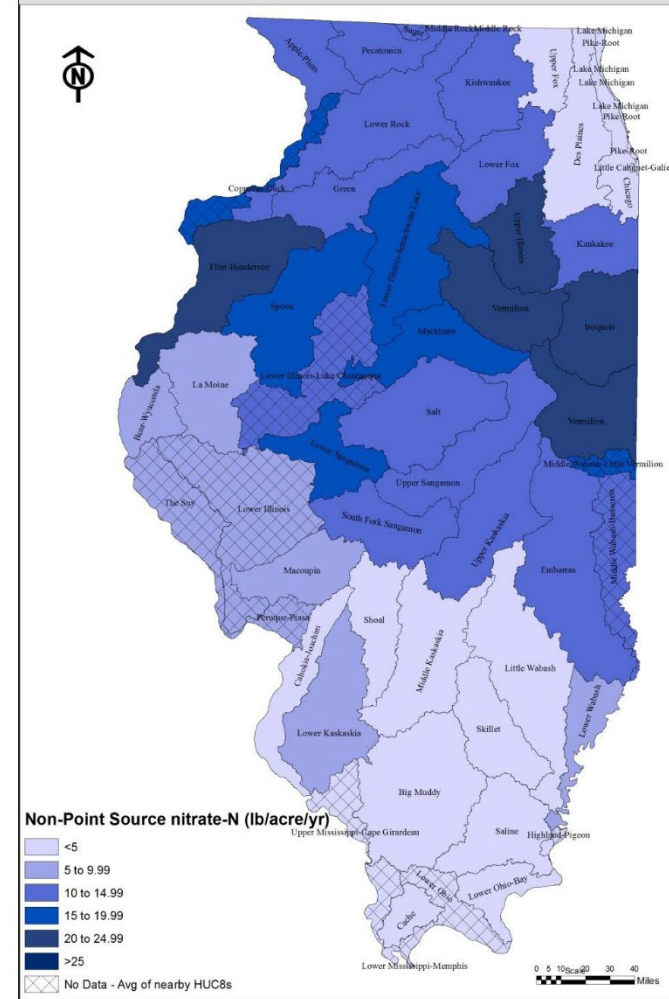
Illinois Nutrient Sources



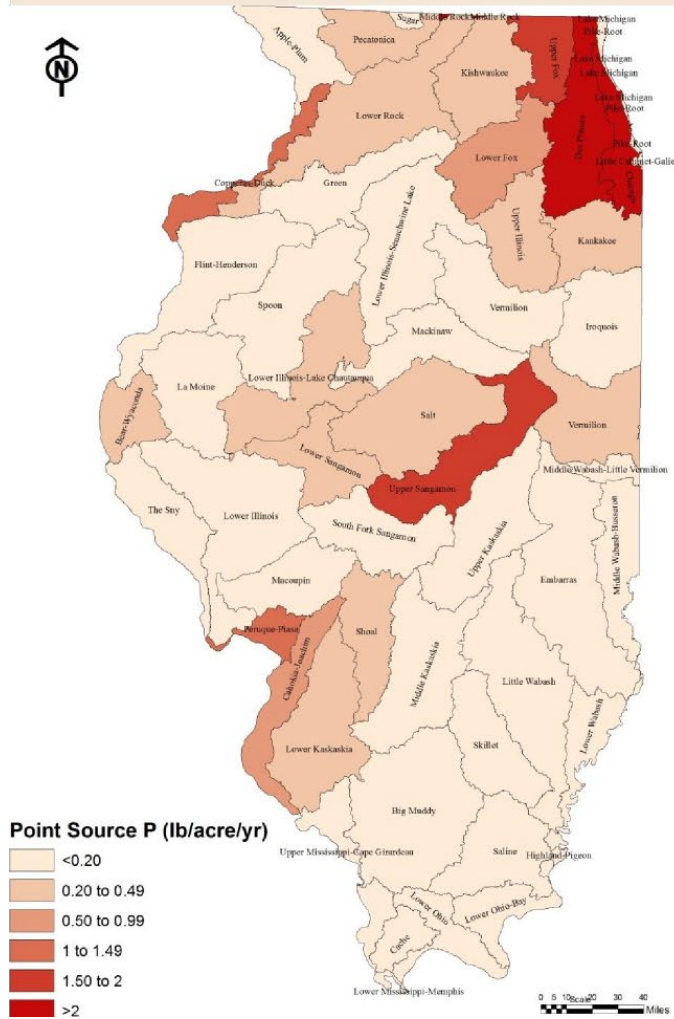
HUC8 Point Source nitrate-N Yields



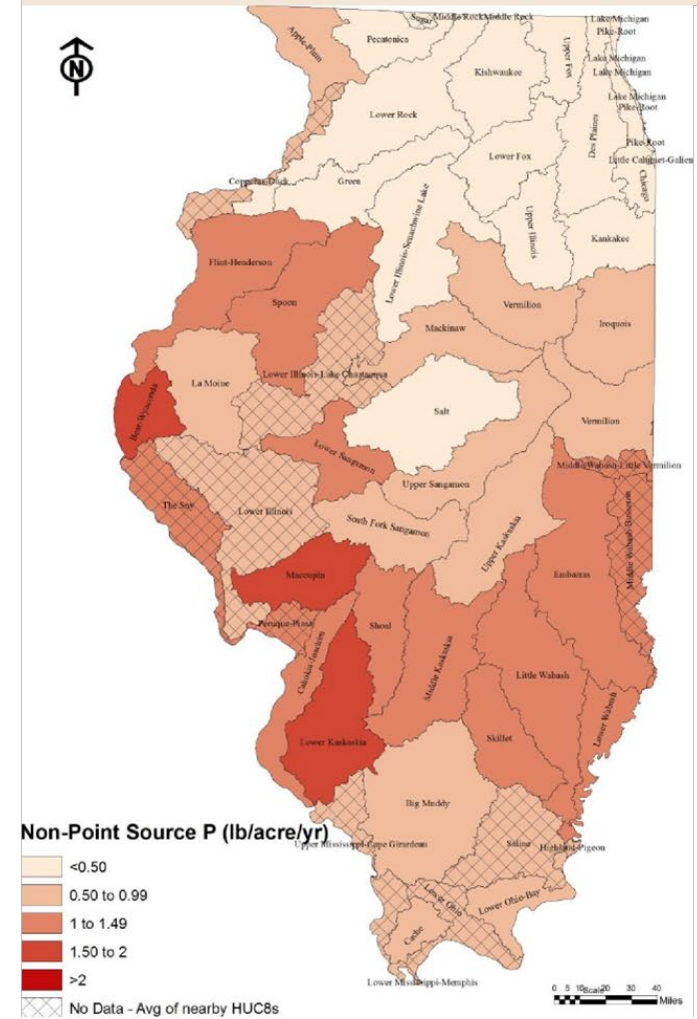
HUC8 Non-Point Source nitrate-N Yields



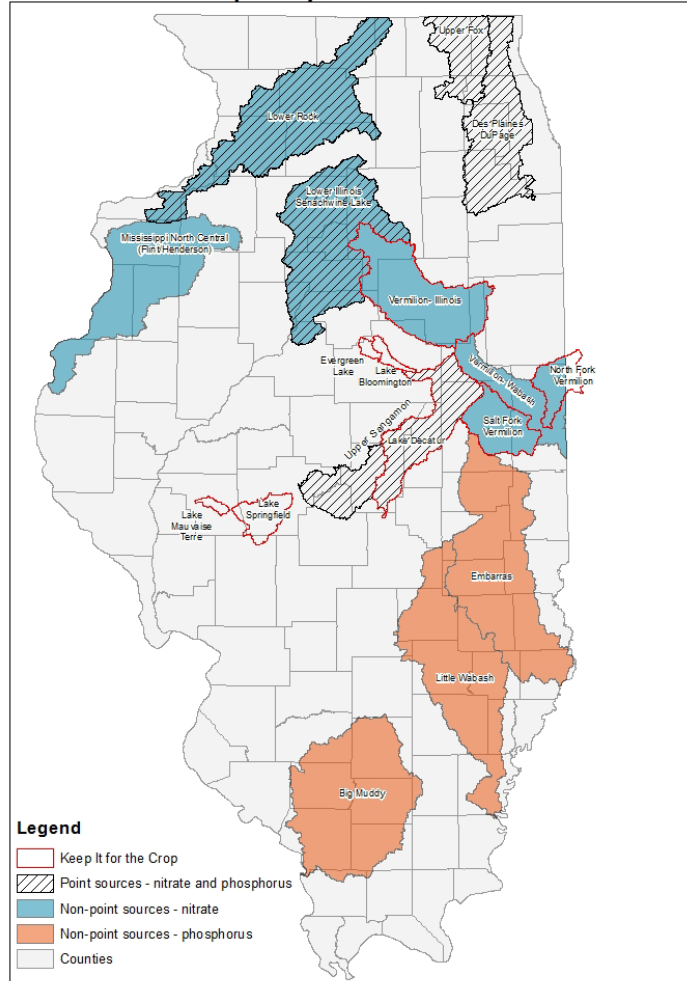
HUC8 Point Source P Yields



HUC8 Non-Point Source P Yields



Illinois Nutrient Loss Reduction Strategy priority watersheds



Agricultural Solutions to Nutrient Loss

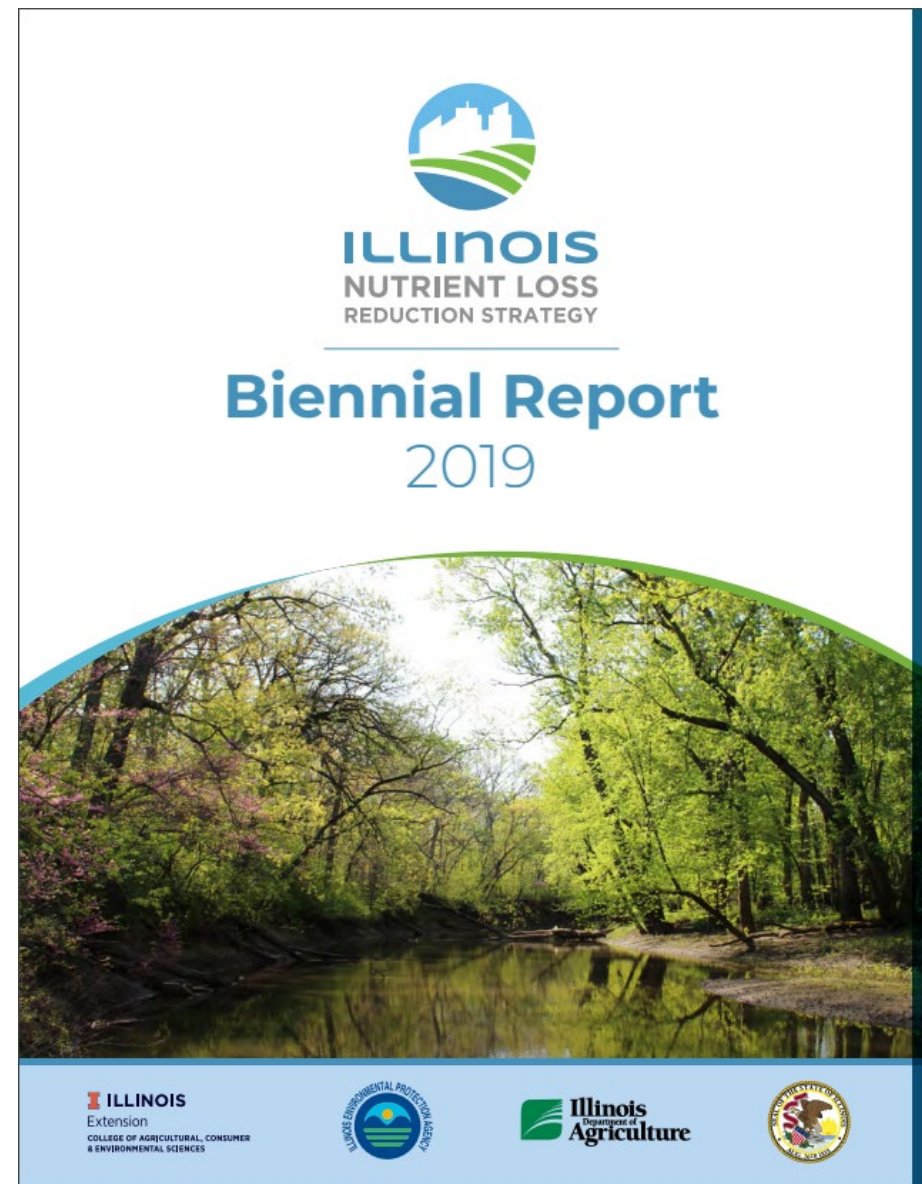
NITRATE

- **IN FIELD PRACTICES**
 - NITROGEN MANAGEMENT
 - MRTN, INHIBITORS, SPLIT APPL.
 - COVER CROPS
- **EDGE OF FIELD PRACTICES**
 - BIOREACTORS
 - BUFFERS (NON-TILE DRAINED)
 - WETLANDS
- **LAND USE CHANGE**
 - PERENNIAL/ENERGY CROPS

PHOSPHORUS

- **IN FIELD PRACTICES**
 - REDUCED TILLAGE SYSTEMS
 - SOIL TESTS/NUTRIENT MANAGEMENT
 - COVER CROPS
- **EDGE OF FIELD PRACTICES**
 - BUFFERS
- **LAND USE CHANGE**
 - PERENNIAL/ENERGY CROPS

How Are We Doing?

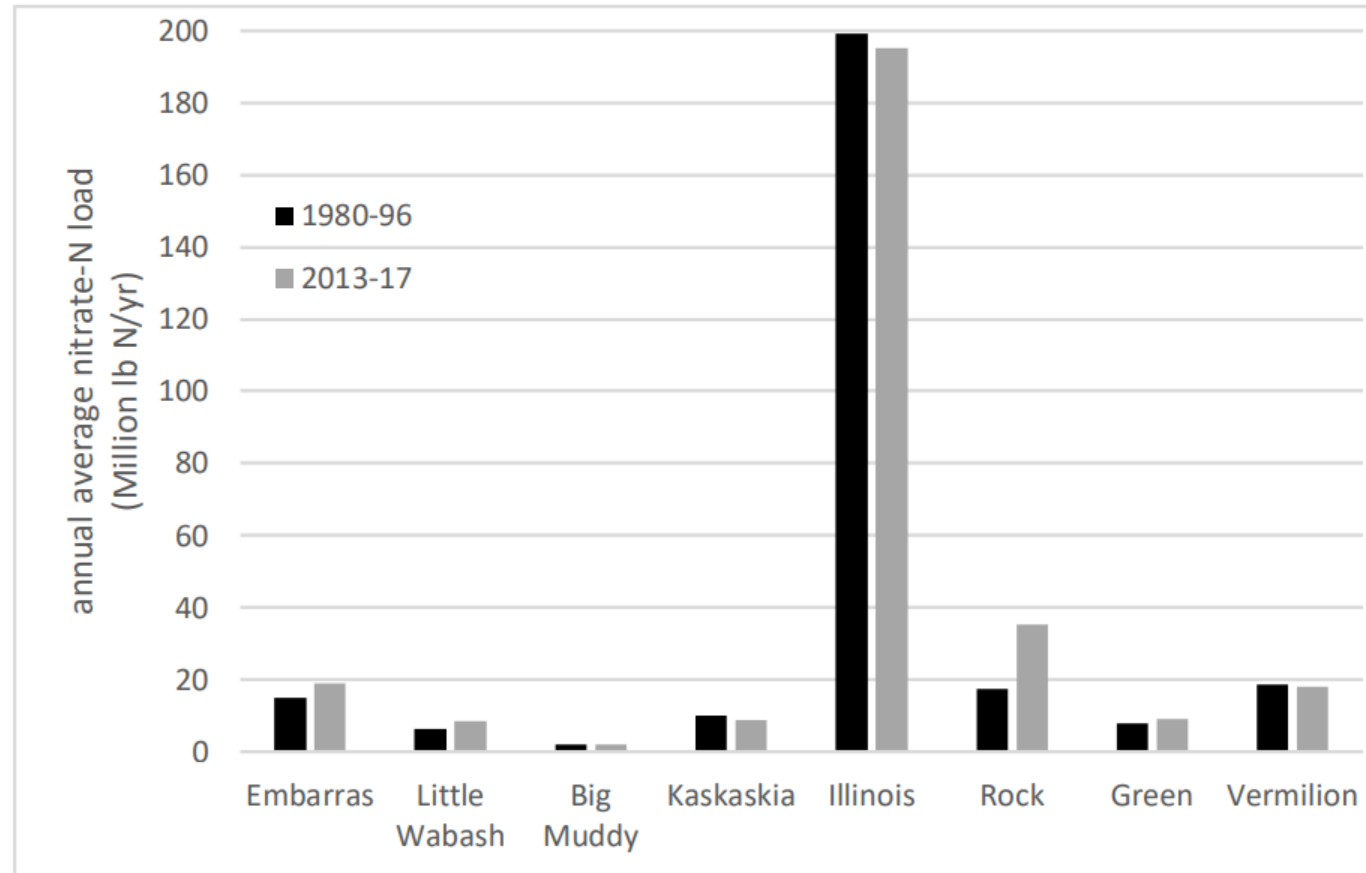


Statewide Riverine Flow and Loads

	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	+26%

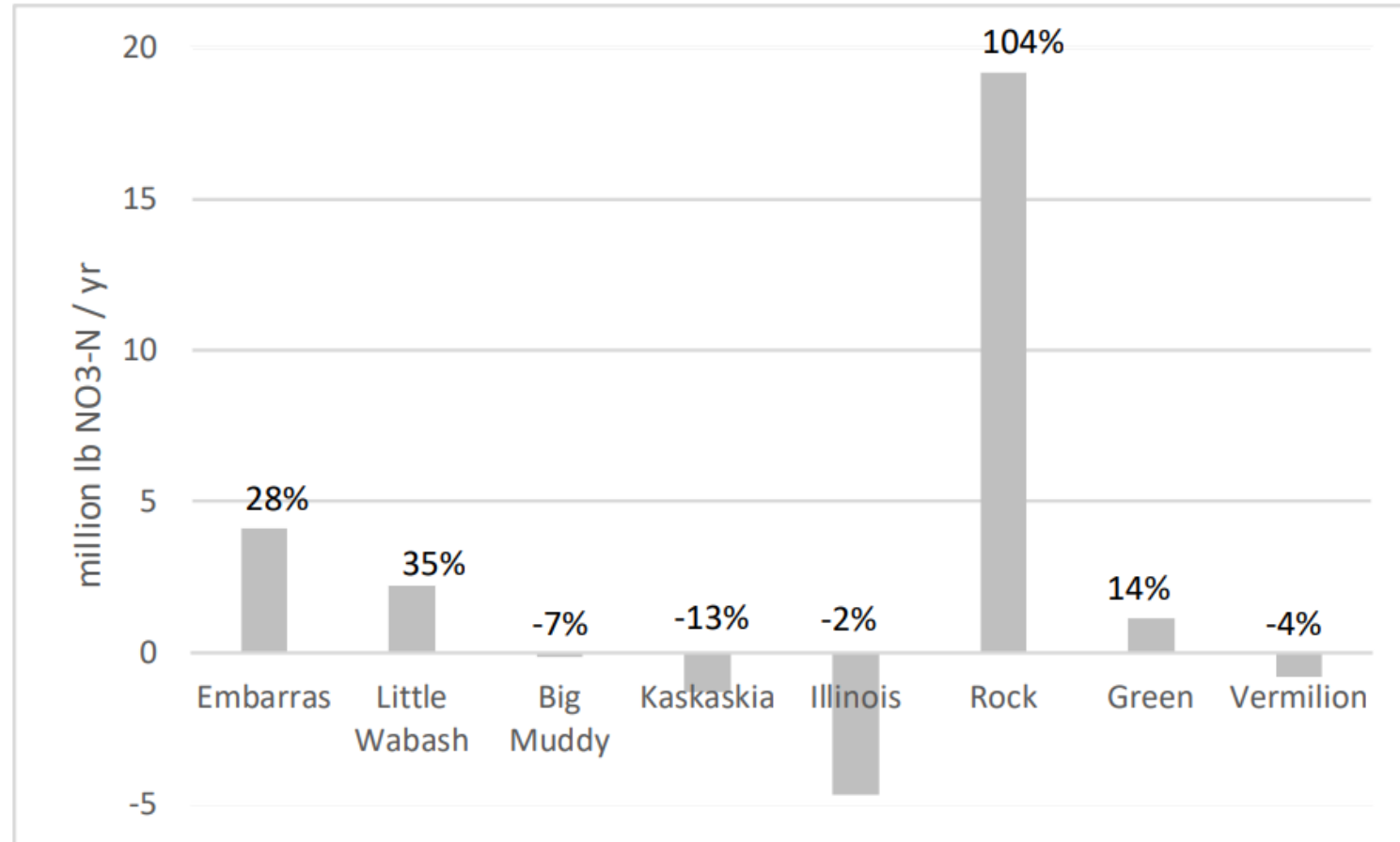
Dr. Greg McIsaac

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



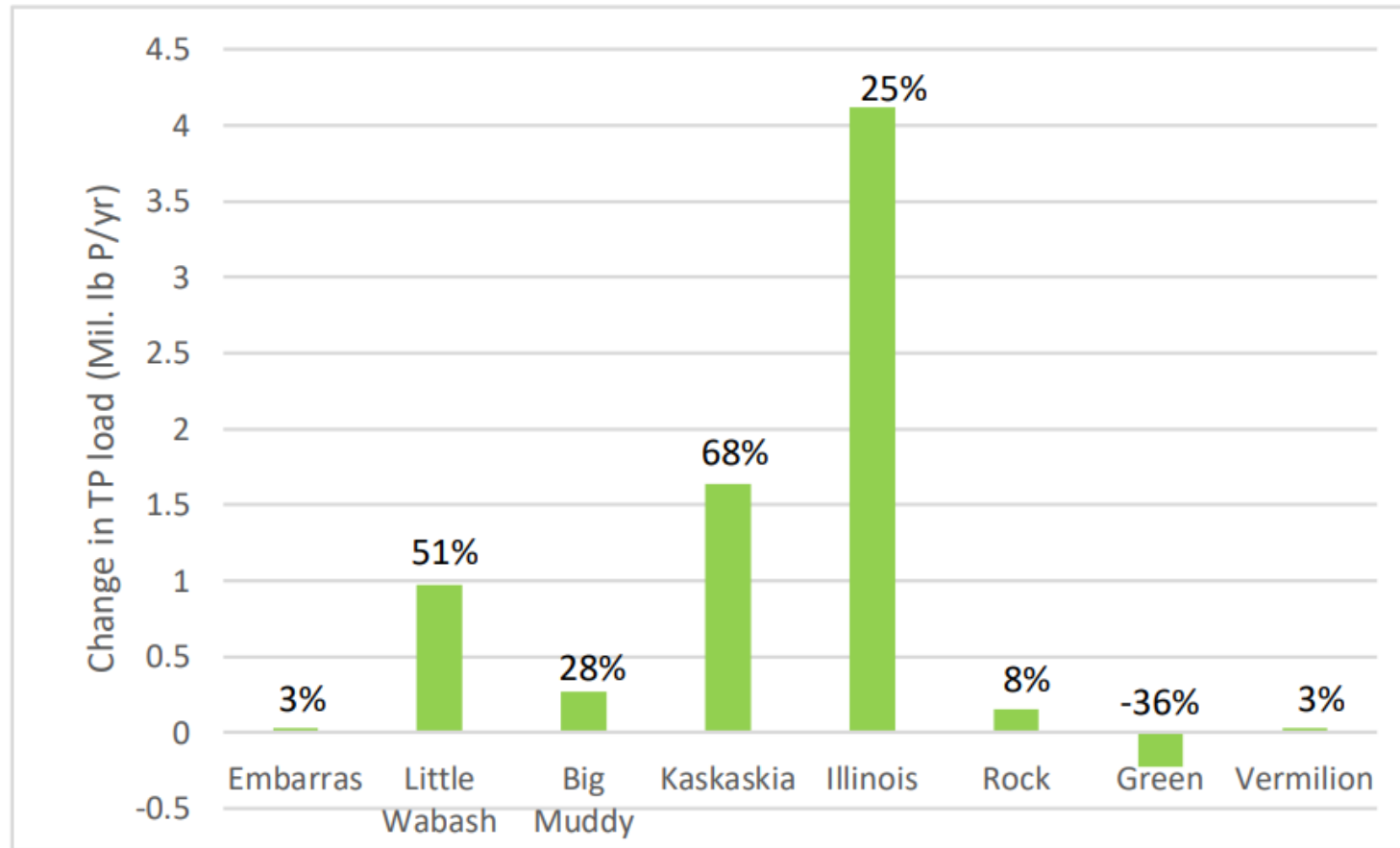
Dr. Greg McIsaac

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



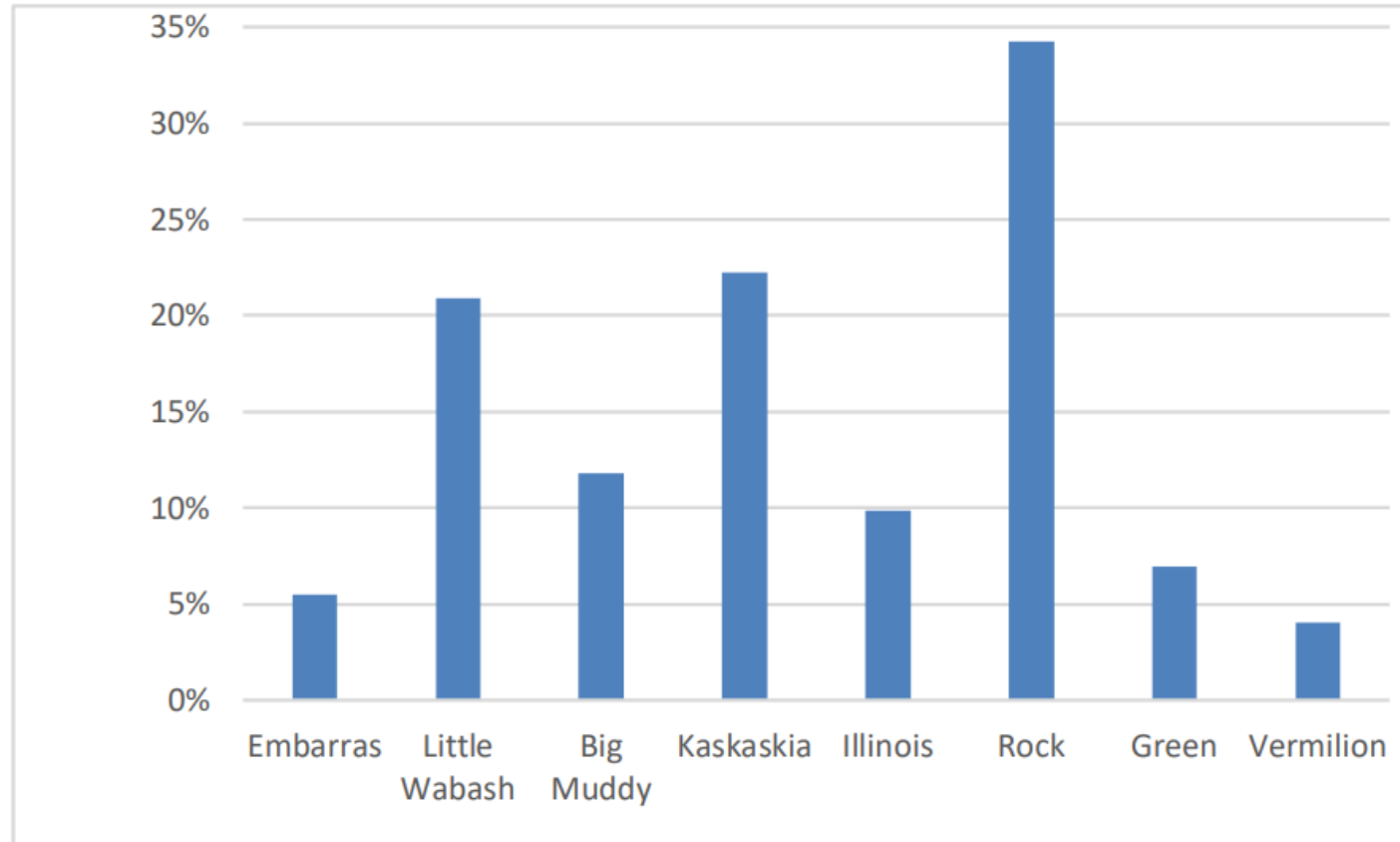
Dr. Greg McIsaac

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



Dr. Greg McIsaac

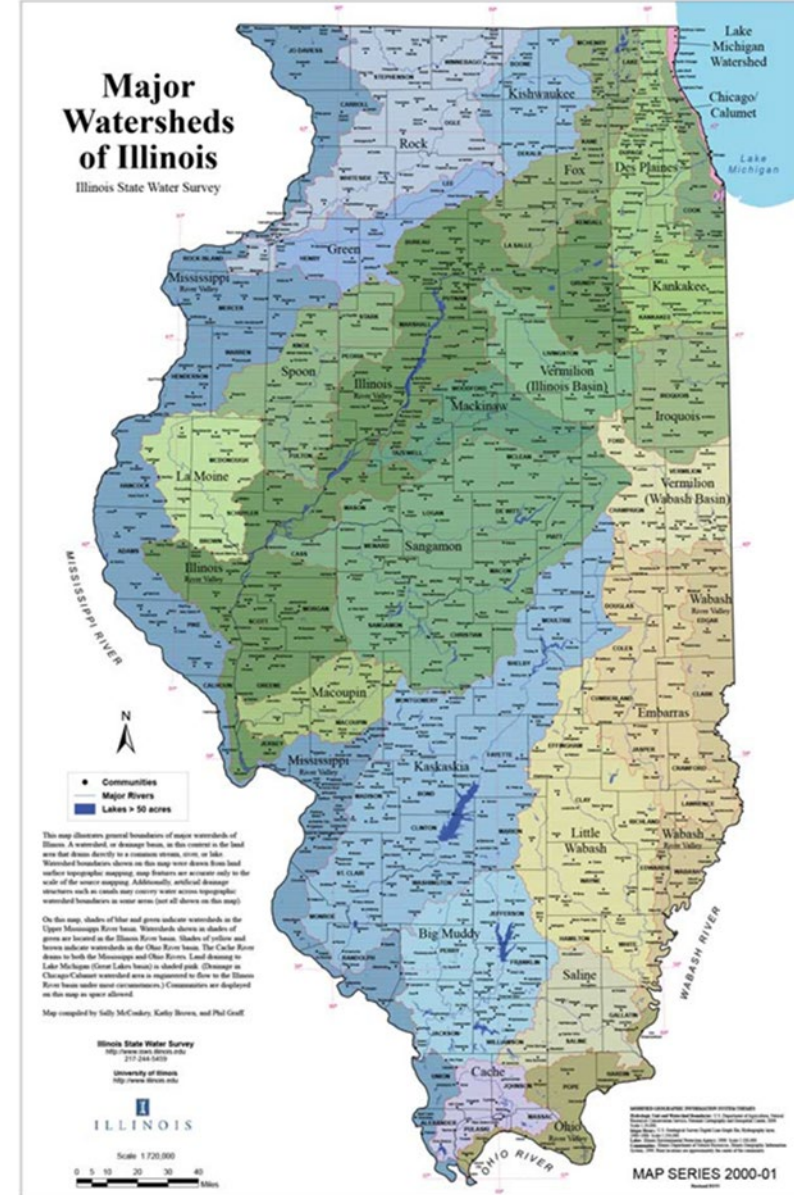
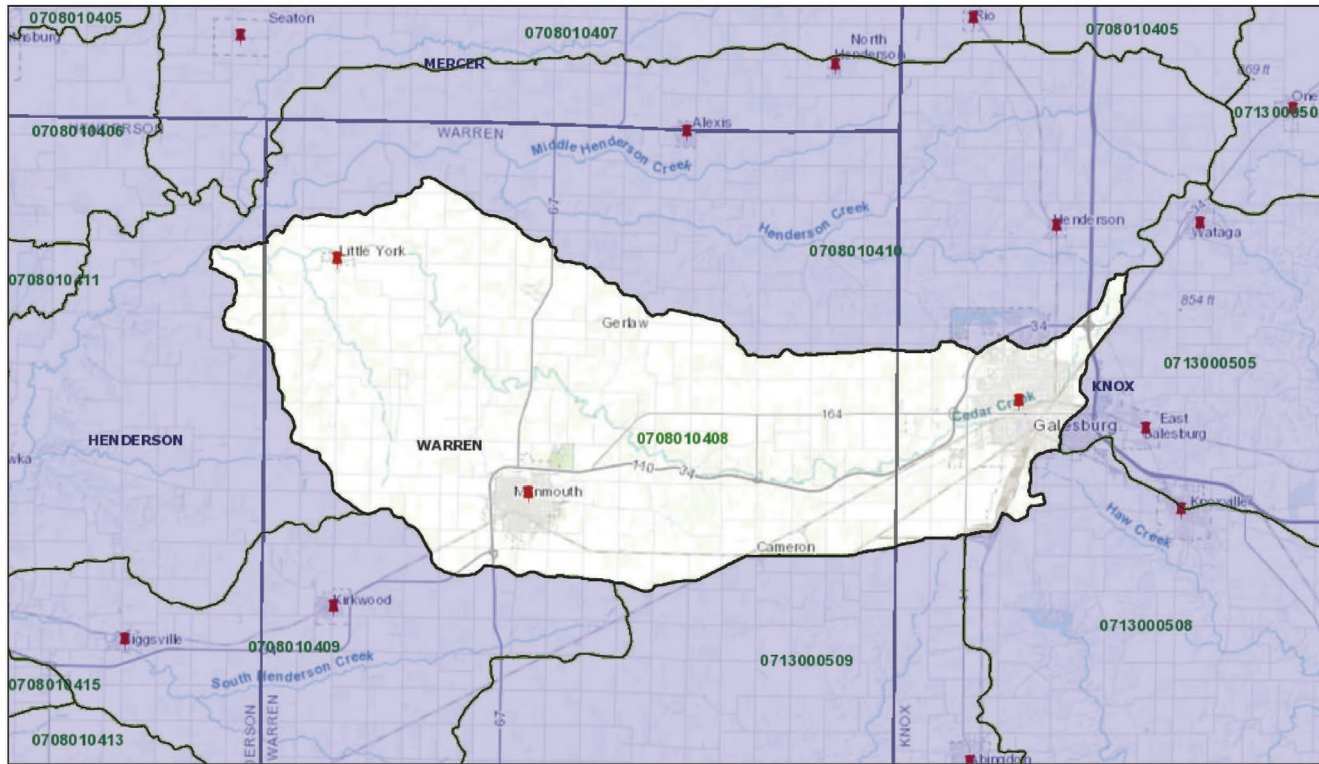
% Changes in water flow from 1980-96 to 2013-17 for major rivers in Illinois



Dr. Greg McIsaac

Cedar Creek Watershed

Cedar Creek Watershed



Cedar Creek Watershed

- HUC 10 subwatershed (0708070408) of the Flint-Henderson Watershed
- Approximately 108,000 acres in size
 - Knox, Warren, and Henry Counties
- Consists of 3 HUC 12 watersheds
 - Headwater Cedar Creek (070807040801)
 - Talbot Creek-Cedar Creek (070807040802)
 - Cedar Creek (070807040803)

<http://www.rmms.illinois.edu/RMMS-JSAPI/>

Cedar Creek Watershed

- City of Galesburg – approximately 29,900 people
- City of Monmouth – approximately 9,700 people
- Village of Little York – approximately 300 people



Cedar Creek Watershed 303(d) Listings

Appendix A-1. Illinois' 2018 303(d) List and Prioritization

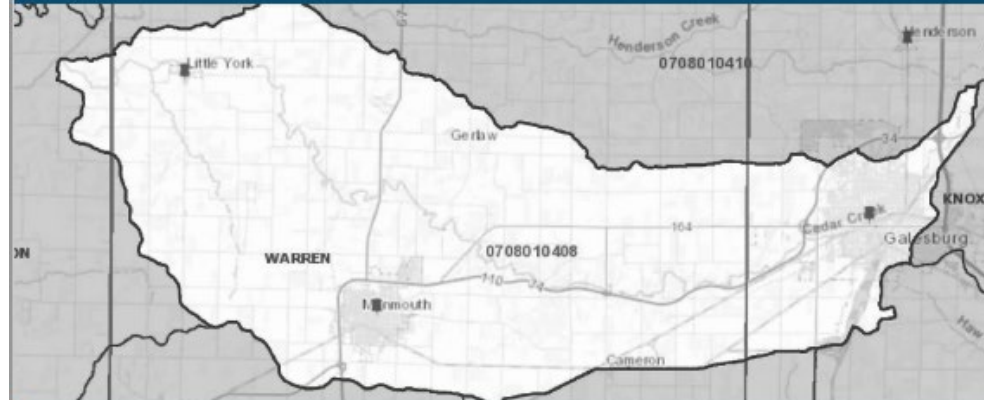
Order	Priority	Hydrologic Unit Code	Water Name	Assessment ID	Water Size*	Designated Use	Cause
690	Medium	0708010408	Cedar Creek	IL LDD-23	6.43	Aquatic Life	Phosphorus (Total)
691	Medium	0708010408	Cedar Creek	IL LDD-23	6.43	Aquatic Life	Polychlorinated biphenyls
692	Medium	0708010408	Cedar Creek	IL LDD-23	6.43	Aquatic Life	Sedimentation/Siltation
693	Medium	0708010408	Cedar Creek	IL LDD-23	6.43	Aquatic Life	Total Suspended Solids (TSS)
694	Medium	0708010408	Cedar Creek	IL LDD-23	6.43	Fish Consumption	Mercury
695	Medium	0708010408	Cedar Creek	IL LDD-23	6.43	Fish Consumption	Polychlorinated biphenyls
696	Medium	0708010408	Cedar Creek	IL LDD-A1	0.96	Aquatic Life	Polychlorinated biphenyls
697	Medium	0708010408	Cedar Creek	IL LDD-A1	0.96	Fish Consumption	Mercury
698	Medium	0708010408	Cedar Creek	IL LDD-A1	0.96	Fish Consumption	Polychlorinated biphenyls
699	Medium	0708010408	Cedar Creek	IL LDD-A3	6.05	Fish Consumption	Mercury
700	Medium	0708010408	Cedar Creek	IL LDD-A3	6.05	Fish Consumption	Polychlorinated biphenyls
701	Medium	0708010408	Markham Creek	IL LDDC	6.24	Aquatic Life	Boron
702	Medium	0708010408	Markham Creek	IL LDDC	6.24	Aquatic Life	Phosphorus (Total)
703	Medium	0708010408	Markham Creek	IL LDDC	6.24	Aquatic Life	Sedimentation/Siltation

List of impaired waters updated every 2 years by Illinois EPA

WE NEED YOUR HELP

CEDAR CREEK WATERSHED STAKEHOLDER MEETING

Do you live, work, or farm within
the Cedar Creek Watershed?



**FEBRUARY 18 | 9:30AM OR 5PM
ZOOM MEETING**

Register online at extension.illinois.edu/hkmw under the events tab. You can also e-mail Rachel Curry at rccurry@illinois.edu or Carrie McKillip at mckillip@illinois.edu

University of Illinois Department of Urban and Regional Planning and University of Illinois Extension are developing a watershed plan for the Cedar Creek Watershed. We are seeking local stakeholders, such as landowners, farmers, city officials, and anyone interested in improving water quality to participate by discussing their water quality resource concerns and potential solutions.



Questions?