

Kankakee River Watershed Conference- Ag Practices to Improve Water Quality

Jeff O'Connor - Kankakee County Farmer

Kankakee Co SWCD Chairman and Farm Bureau NLRS Advocate

When did Agriculture and Water Quality Start
to Share the Same Stage?



When did Agriculture and Water Quality Start to Share the Same Stage?

- When connection was established between the two in the Hypoxic Zones.



When did Agriculture and Water Quality Start to Share the Same Stage?

- When connection was established between the two in the Hypoxic Zones.
- Sedimentation studies in Gulf show highest concentrations from 1950's to present.



When did Agriculture and Water Quality Start to Share the Same Stage?

- When connection was established between the two in the Hypoxic Zones.
- Sedimentation studies in Gulf show highest concentrations from 1950's to present.
- 4 Major Hypoxic events have been detected before use of artificial fertilizers.



When did Agriculture and Water Quality Start to Share the Same Stage?

- When connection was established between the two in the Gulf Hypoxic Zone.
- Sedimentation studies in Gulf show highest concentrations from 1950's to present.
- 4 Major Hypoxic events have been detected before use of artificial fertilizers.
- Events became News worthy in 1960's and 1970's



ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

Improving our water resources with
collaboration and innovation

Illinois Nutrient Loss Reduction Strategy:



WHY IS THE STRATEGY NEEDED?

- Gulf Hypoxia Task Force
- USEPA Guidance Memo in March 2011
 - Purpose: Encourage states to develop nutrient reduction strategies while continuing to develop numeric nutrient standards.
 - Lays out 8 elements of a framework
- Federal litigation in Louisiana



STAKEHOLDER INVOLVEMENT

Stakeholders met August 2013 - May 2014:

- Illinois Department of Agriculture, Illinois EPA
- University of Illinois Science Team
- Illinois Farm Bureau, Illinois Pork Producers Association, Illinois Fertilizer and Chemical Association, Illinois Corn Growers Association, GROWMARK, Inc.
- Association of Illinois Soil and Water Conservation Districts
- University of Illinois Extension
- NRCS
- Sanitary Districts/Wastewater Treatment Plants
- Prairie Rivers Network, Environmental Law and Policy Center, Sierra Club
- Illinois Environmental Regulatory Group





STRATEGY IS FINAL...NOW GET TO WORK!

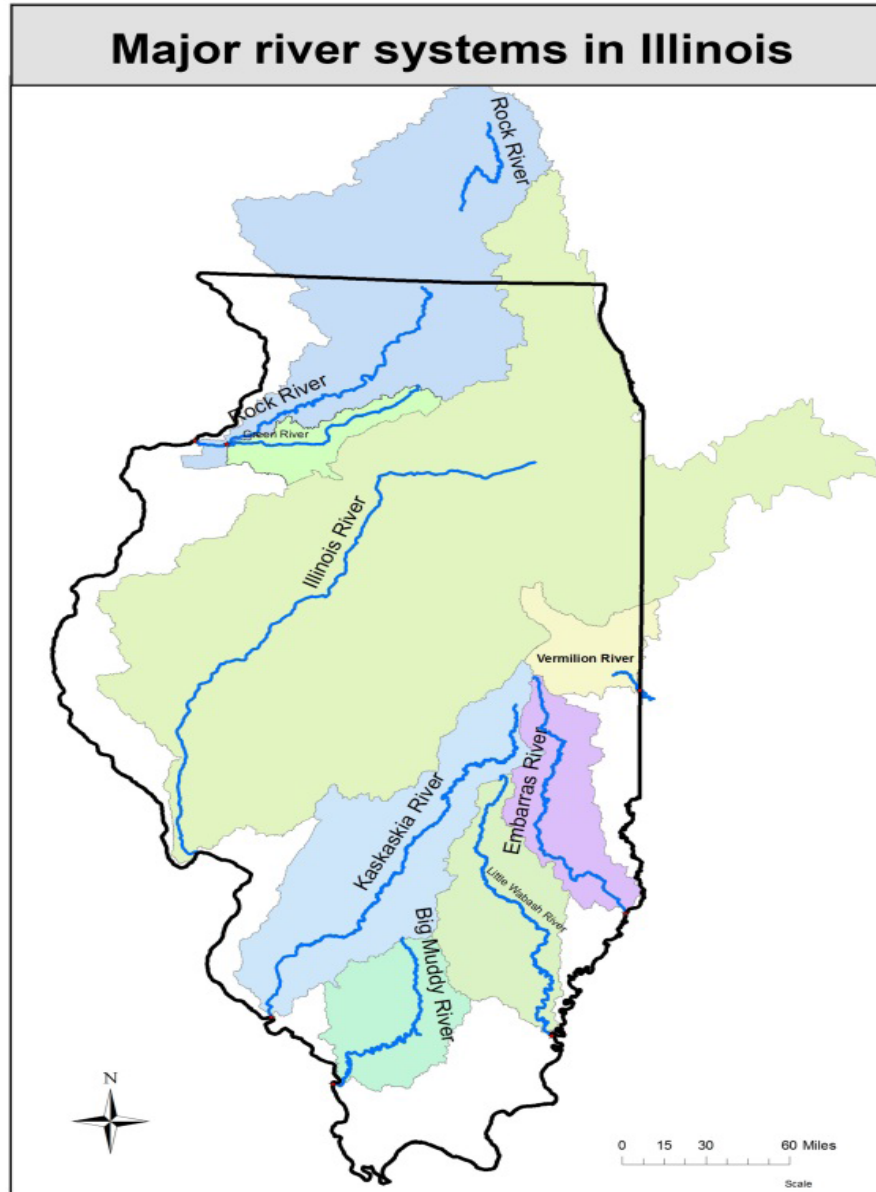
- NLRS was finalized and released in July 2015.
- Now work continuing to IMPLEMENT the NLRS.



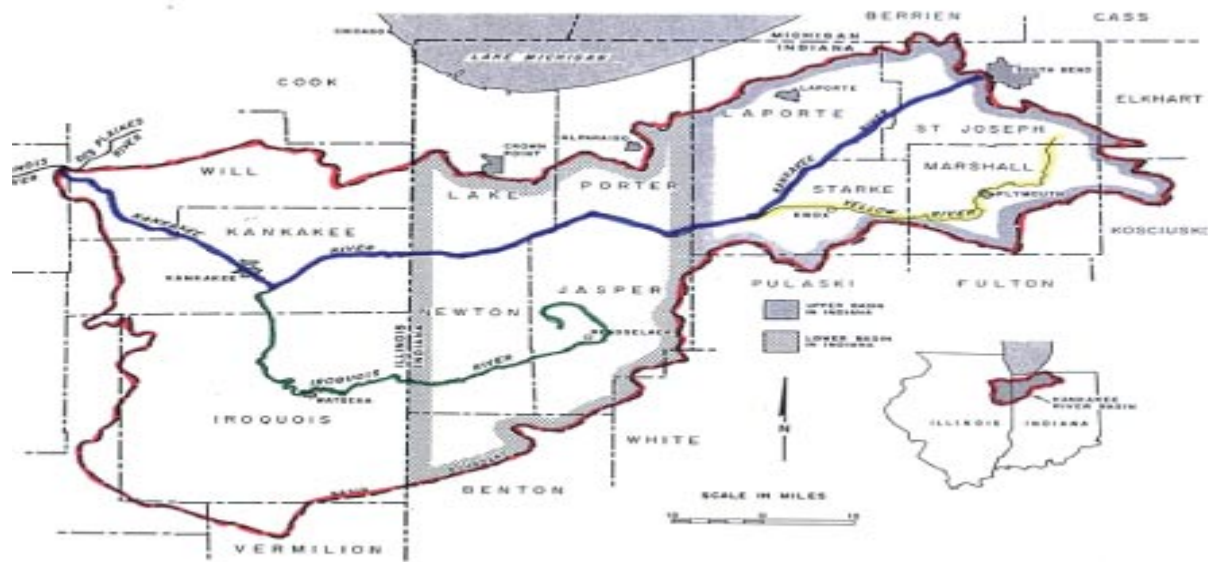
SCIENCE ASSESSMENT

- February 2013 - Illinois EPA partnered with University of Illinois to develop the Science Assessment:
 - Current conditions in Illinois of nutrient sources and export by rivers in the state from point and non-point sources
 - Methods that could be used to reduce these losses and estimates of their effectiveness throughout Illinois
 - Estimates of the costs of statewide and watershed level application of these methods to reduce nutrient losses to meet TMDL and Gulf of Mexico goals

Major river systems in Illinois



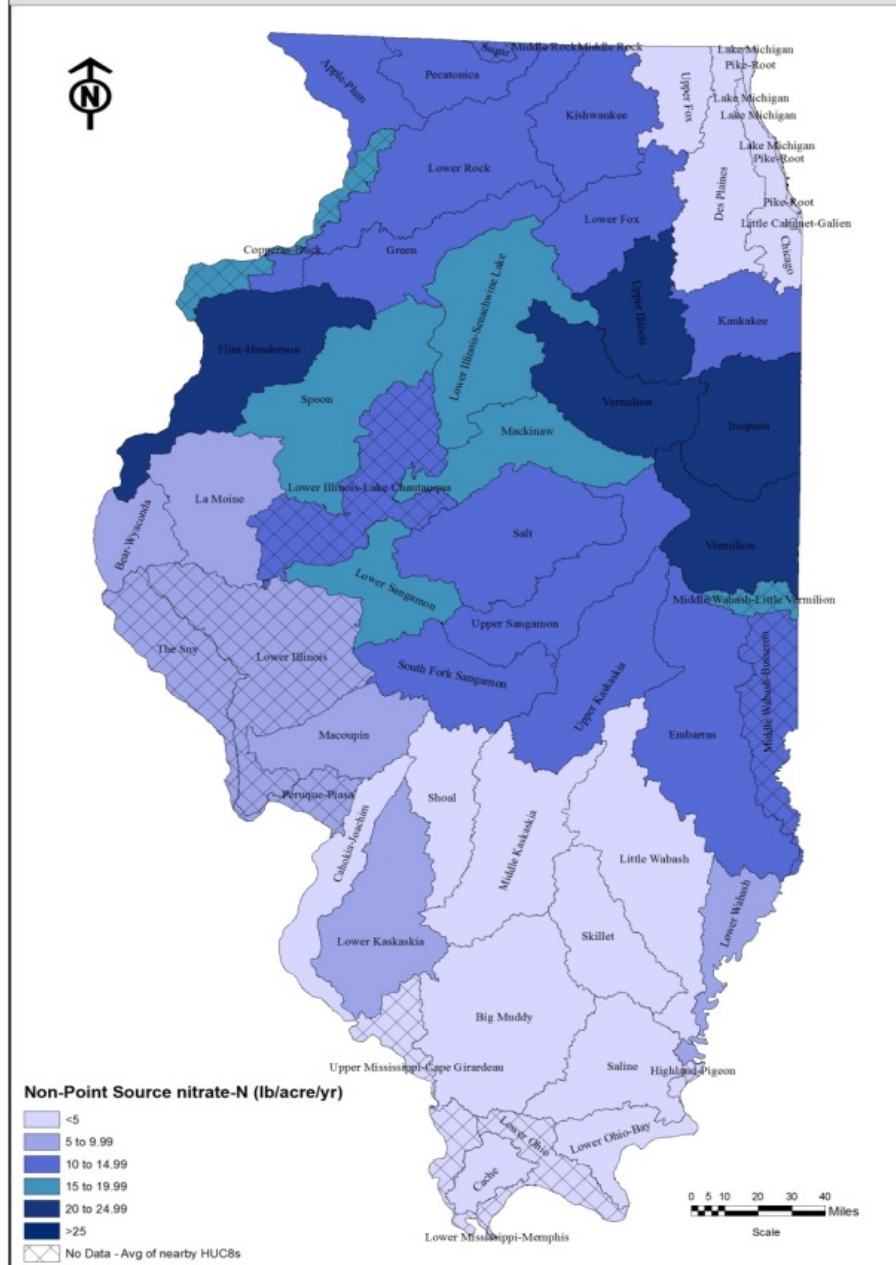
- 8 major river systems used in estimating nutrient loads
- Gaging stations are upriver from the state boundary, so the estimated area is smaller
 - Rock River - Joslin
 - Green River - Geneseo
 - Illinois River - Valley City
 - Kaskaskia River - Venedy Stn.
 - Big Muddy River - Murphysboro
 - Little Wabash River - Carmi
 - Embarras River - Ste. Marie
 - Vermilion River - Danville



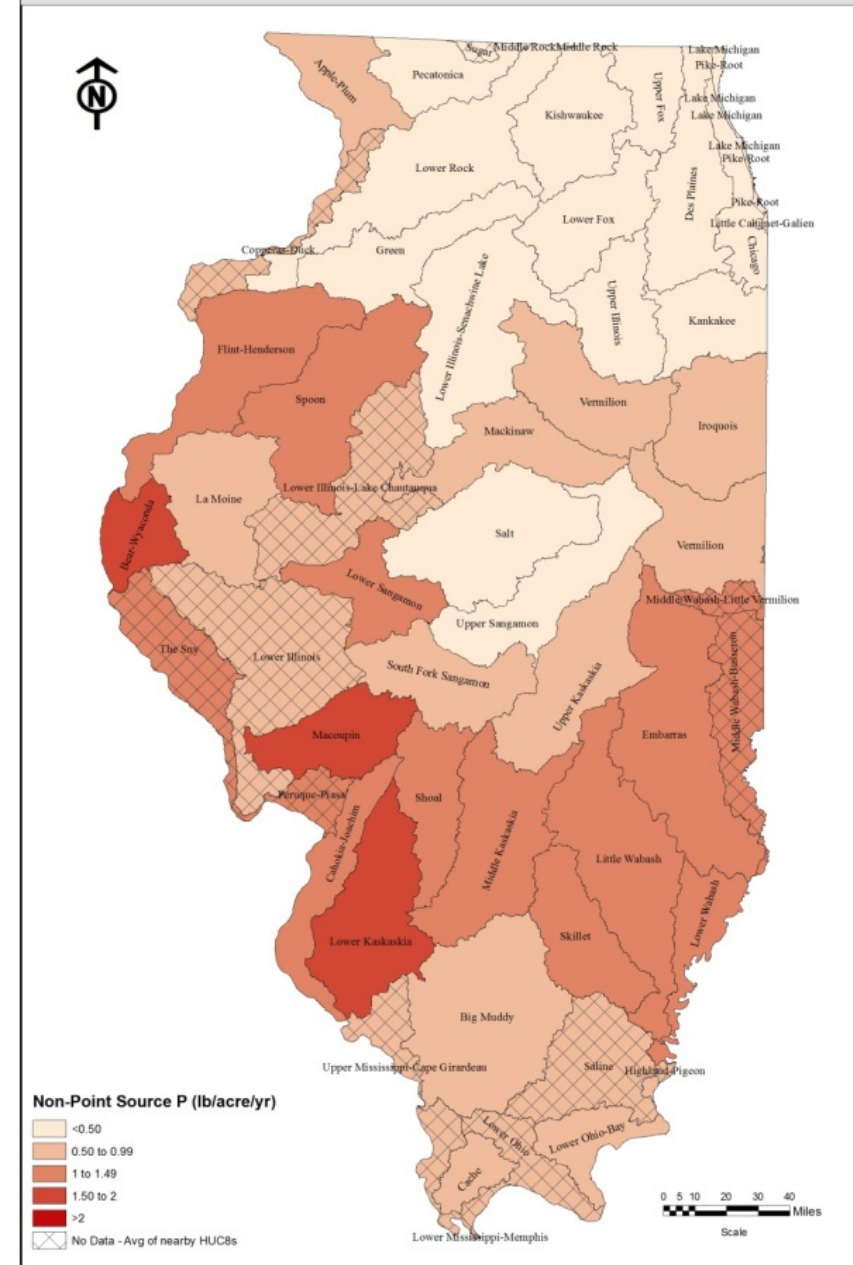
KANKAKEE RIVER BASIN

Illinois State Water Survey lists Kankakee River watershed at 5165 square miles. 2nd largest land area within the Illinois River Watershed. Only Sangamon River Watershed is larger at 5498 square miles.

HUC8 Non-Point Source nitrate-N Yields



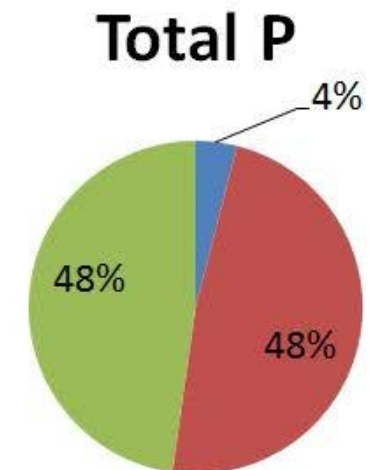
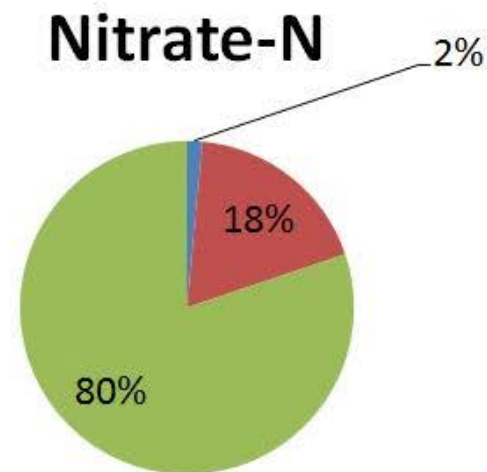
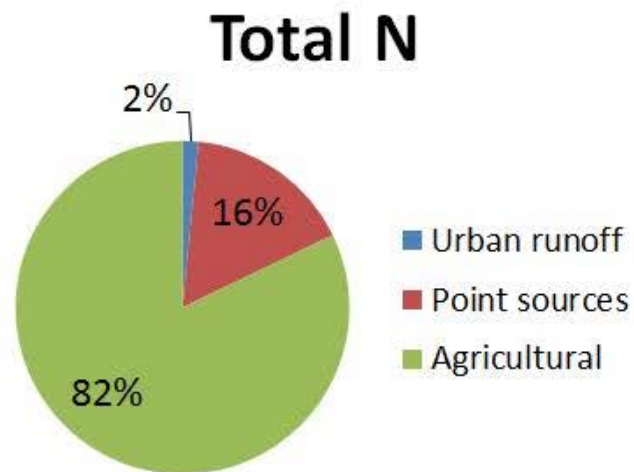
HUC8 Non-Point Source P Yields





SCIENCE ASSESSMENT

Illinois contributes 20% of nitrate (410 M lbs) and 11% of phosphorus (37.5 M lbs) that makes it to the Gulf





STRATEGY TARGETS AND COSTS

- Baseline - Average annual loading of nitrate-N and P from the 1980-1996 levels
- Targets - (5 year running average)
 - N: 15% by 2025, 45% ultimate
 - P: 25% by 2025, 45% ultimate
- Estimated costs - over \$800 million annually from point source and nonpoint source, with no new funding sources



CURRENT IFB NLRS PRIORITIES

- Education and Outreach
- Research
- Implementation
- Evidence



EDUCATION AND OUTREACH

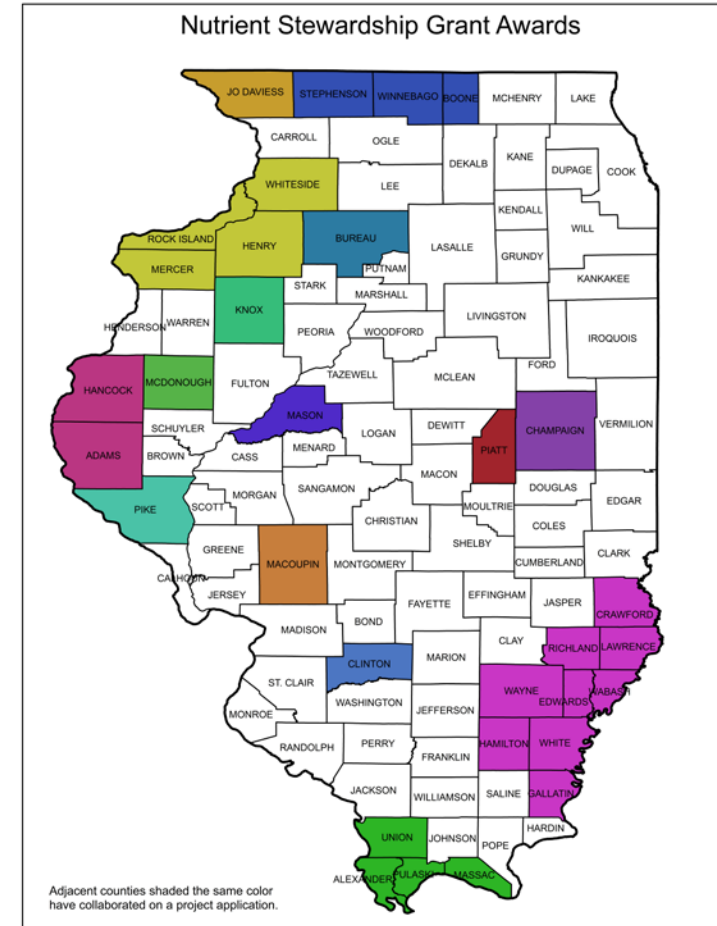
IFB:

- Iowa Issues Tour in August
- County Farm Bureau meetings
- FarmWeek, RFD radio, Partners magazine, social media
- Toolkit for CFBs (infographics, social media, handouts, resource guide)
- CBMP website - BMPs
- Conservation Story Map
- External meetings



IMPLEMENTATION-2016

- IFB:
 - Nutrient Stewardship Grant Program
 - \$100,000
 - 15 projects / 32 counties
 - Free, confidential water testing (CBMP, ICGA)
 - 21 counties
 - 2017 programming - STAY TUNED!!!
- Promotion of other programs
 - USDA FSA - CRP/CREP
 - USDA NRCS - CSP, EQIP
 - Watershed-level - IEPA 319 grants
 - Partnerships - RCPP



What's Next in the Field?

What's Next in the Field?

- Demonstration of New Practices



What's Next in the Field?

- Demonstration of New Practices
- As Much of a Cultural Change as it is a Procedural Change



What's Next in the Field?

- Demonstration of New Practices
- As Much of a Cultural Change as it is a Procedural Change
- Need for Innovators and Early Adopters to Lead the Way.



What's Next in the Field?

- Demonstration of New Practices
- As Much of a Cultural Change as it is a Procedural Change
- Need for Innovators and Early Adopters to Lead the Way.
- Change should Benefit both Environment and Livelihood of Agriculture

What is Working in the Field?

What is Working in the Field?

- Better nutrient planning



Kankakee Corn Yields

1972-'79 105 Bushels/Acre

1980's 110 Bu/A

1990's 123 Bu/A

2000's 157 Bu/A

2010-'15 143 Bu/A

2012 Drought & 2015 Flooding

TYPICAL NUTRIENT UPTAKE PATTERN OF A CORN PLANT.

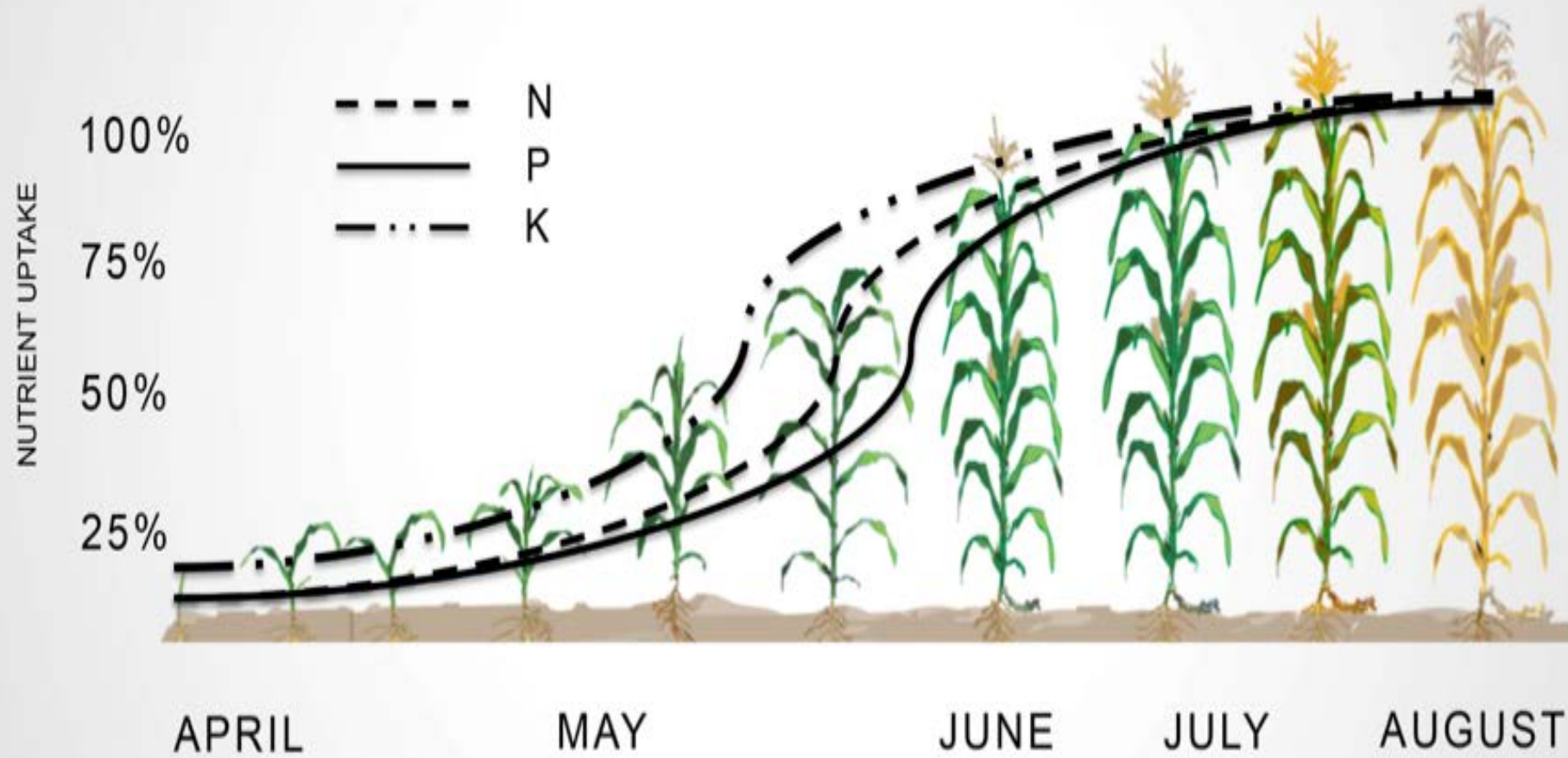


Table 3.11. Example statewide results for nitrate-nitrogen reductions with shading to represent in-field, edge-of-field, land use, and point source practices or scenarios.

Practice/scenario	Nitrate-N reduction per acre (percent)	Nitrate-N reduced (million lb)	Nitrate-N reduction from baseline (percent)	Cost (\$/lb removed)
Reducing N rate from background to MRTN on 10 percent 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	2.33
Split application of 50 percent fall and 50 percent spring on tile-drained corn acres	7.5-10	13	3.1	6.22
Spring-only application on tile-drained corn acres	15-20	26	6.4	3.17
Split application of 40 percent fall, 10 percent pre-plant, and 50 percent side dress	15-20	26	6.4	
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	33	7.9	11.02
Bioreactors on 50 percent of tile-drained land	40	56	13.6	1.38
Wetlands on 25 percent 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
Perennial/energy crops equal to pasture/hay acreage from 1987	90	10	2.6	9.34
Perennial/energy crops on 10 percent of tile-drained land	90	25	6.1	3.18
Point source reduction to 10 mg/L		14	3.4	3.3

What is Working in the Field?

- Better nutrient planning
- Change in tillage patterns



Planting into Field with Tillage



No Till Planting



Planting into Cover Crop

What is Working in the Field?

- Better nutrient planning
- Change in tillage patterns
- Adoption of Cover Crops

TYPICAL DRAINAGE WATER MANAGEMENT INSTALLATION

Inline Water Level Control Structure™



Structure can be used to retain water during growing season, benefitting the growing crop. During the rest of the year it can be shut off to restrict transport of nutrients to ditches, creeks and streams. Will not work everywhere. Yet, it is another tool that works well.



Cereal Rye planted after Fall Corn Harvest

Planted right after fall harvest. Typically Sept-Oct to show good growth in the fall. Can be planted as late as winter freeze up.



Cereal Rye and Winter Rapeseed



The key is in the below ground root growth. Nutrients are sequestered and stored in above ground growth. Biological activity on all levels are increased.



Planting into Cover Crop



Ag Must Continue to Share the Story

September 2016 Producer and Local stakeholder meeting in Kankakee. Helping to introduce the NLRS Strategy to local farmers.



Progress should be shared with Non-Farm Sector as well

November 2016 Field visit with AQUA staff. Helping to connect the dots, actual practice to what has been talked about.

QUESTIONS?

Jeff O'Connor
ocfarms@gmail.com