Addressing soil health and nutrient management can benefit birds

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USDA SARE - OUR FARMS, OUR FUTURE 2018 CONFERENCE

APRIL 4TH, 2018

Agricultural History

Increased land in row crops
- Current ~60%

Decrease in small grains

Removal of hedgerows & fence lines

Increase in chemical use

Soil disturbance
- Soil erosion

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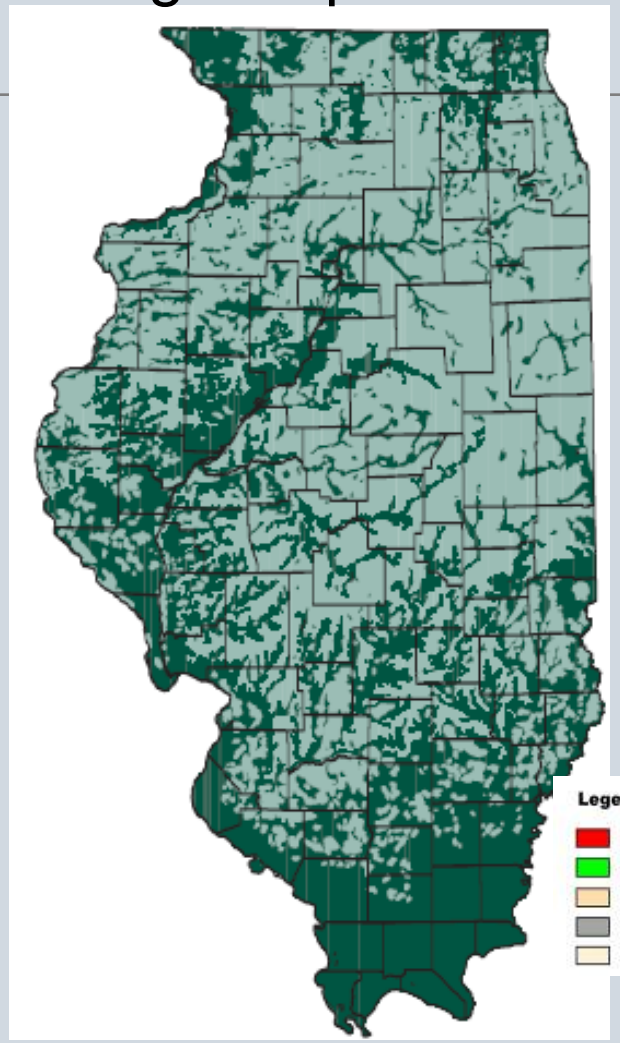
Water Quality

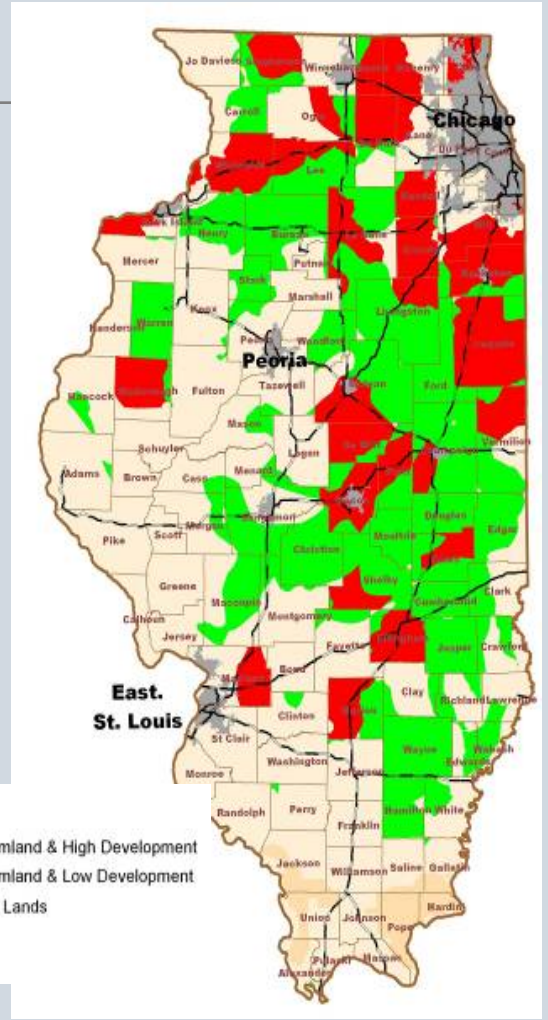
Wildlife population declines

Tallgrass prairie-1820



Anderson (1970)

Current arable land



American Farmland Trust (2006)

Cover Crops

What is a cover crop?

- Crop planted after main cash crop that is terminated before the next year's cash crop

Types

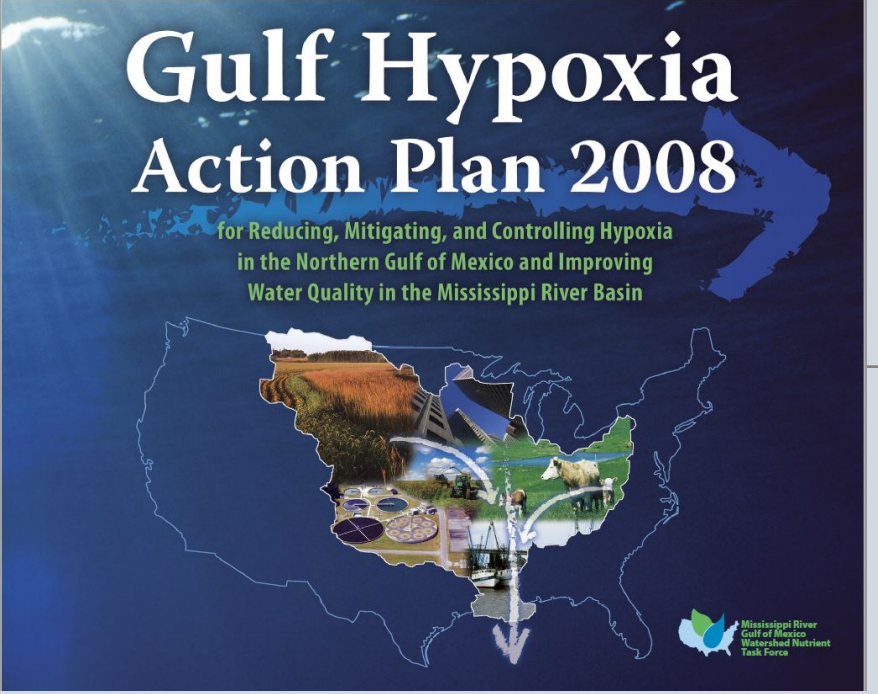
- Legumes, grasses, small grains, non-legume broadleaves

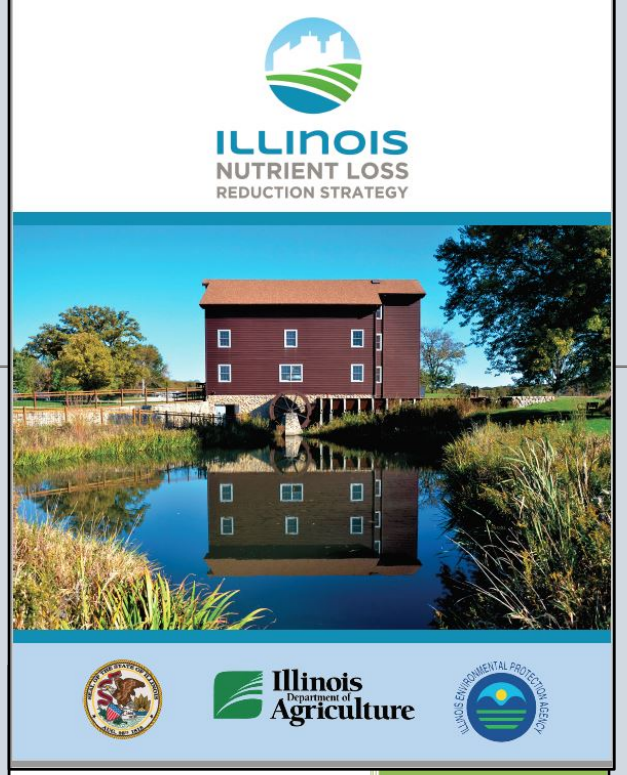
Benefits

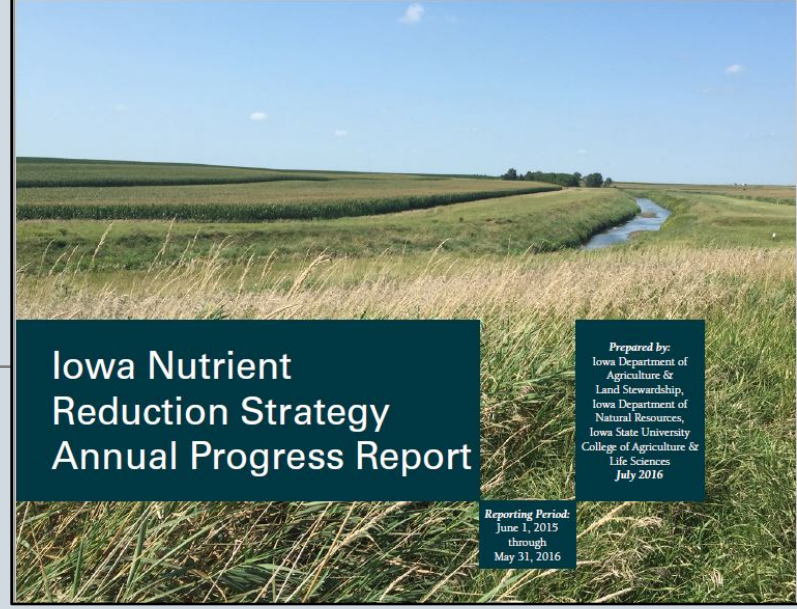
- Source of N → can increase yield
- N scavenger → improve water quality
- Improve soil quality (SOM)
- Weed suppressant
- Grazing/foraging
- Decrease erosion

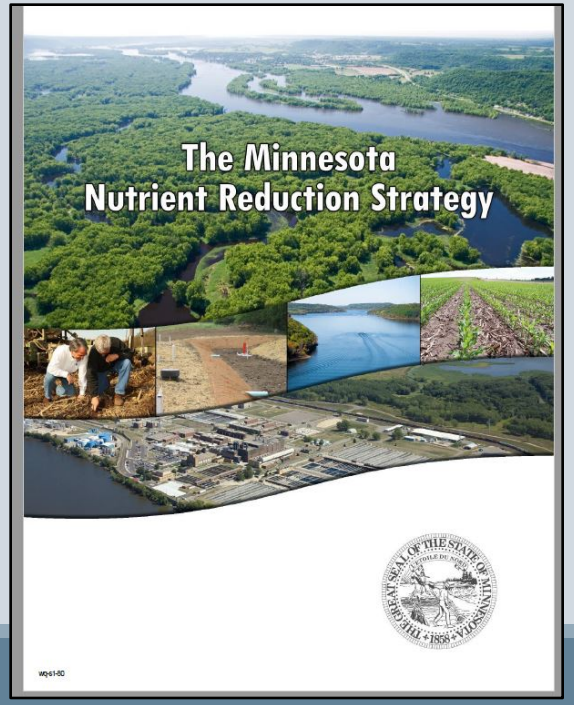
Tillage Radish

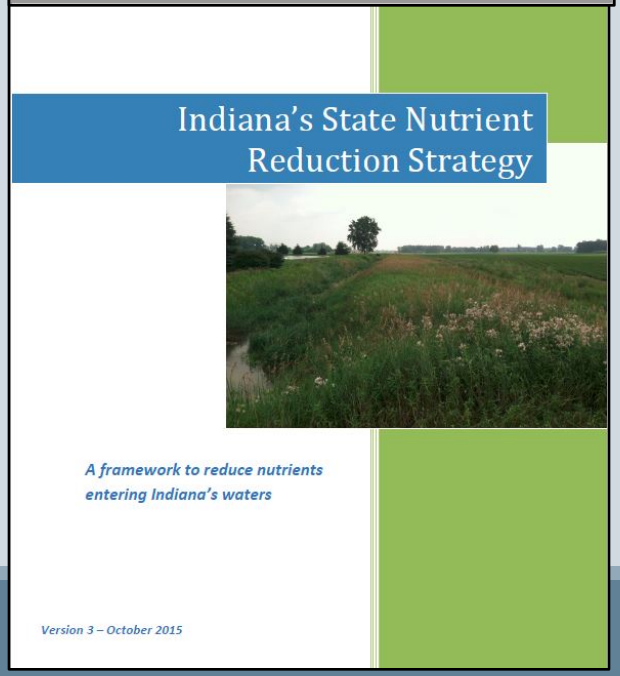
Cassandra Wilcoxen

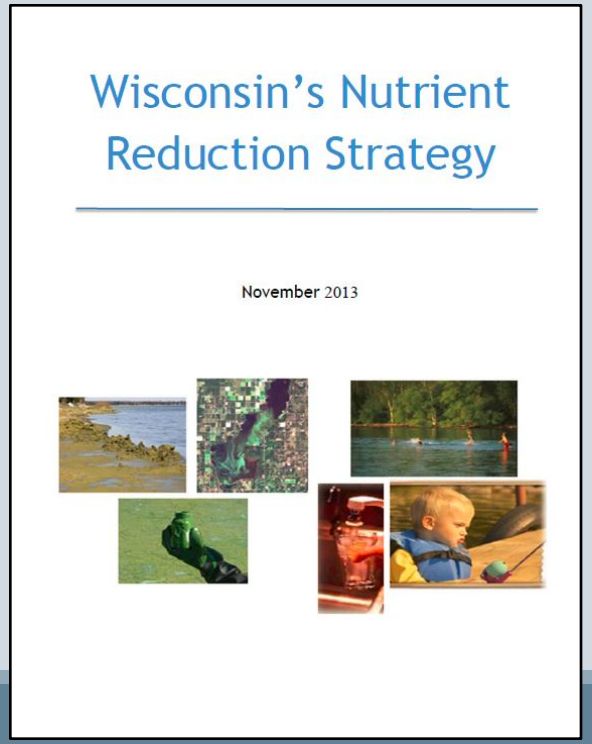

Gulf Hypoxia
Action Plan 2008
for Reducing, Mitigating, and Controlling Hypoxia
in the Northern Gulf of Mexico and Improving
Water Quality in the Mississippi River Basin
Mississippi River
Gulf of Mexico
Watershed Nutrient
Task Force


ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY
Illinois
Department of
Agriculture
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

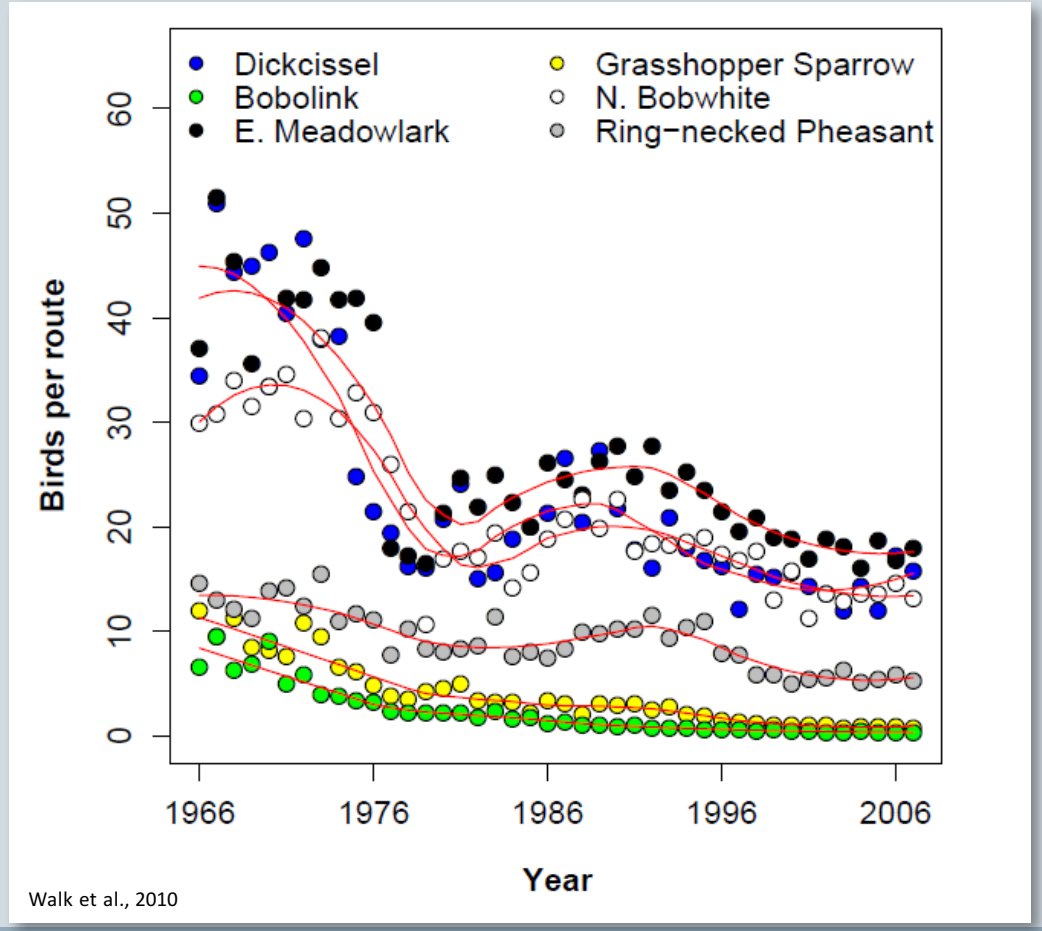

Iowa Nutrient
Reduction Strategy
Annual Progress Report
Prepared by:
Iowa Department of
Agriculture &
Land Stewardship,
Iowa Department of
Natural Resources,
Iowa State University
College of Agriculture &
Life Sciences
July 2016
Reporting Period:
June 1, 2015
through
May 31, 2016


The Minnesota
Nutrient Reduction Strategy


Indiana's State Nutrient
Reduction Strategy
A framework to reduce nutrients
entering Indiana's waters
Version 3 – October 2015


Wisconsin's Nutrient
Reduction Strategy
November 2013

Resident Birds



Walk et al., 2010

Migratory Birds

T. SCOTT SILLETT
AND RICHARD T. HOLMES

Long-Term Demographic Trends, Limiting Factors, and the Strength of Density Dependence in a Breeding Population of a Migratory Songbird

www.wildtones.com

Journal of Animal Ecology 2002
71, 296–308

Variation in survivorship of a migratory songbird throughout its annual cycle

T. SCOTT SILLETT*† and RICHARD T. HOLMES*
*Department of Biological Sciences, Dartmouth College, Hanover, NH 03755, USA; and †Patuxent Wildlife Research Center, US Geological Survey, 11510 American Holly Drive, Laurel, MD 20708, USA

Summary

1. Demographic data from both breeding and non-breeding periods are needed to manage populations of migratory birds, many of which are declining in abundance and are of conservation concern. Although habitat associations, and to a lesser extent, reproductive biology, are known for many migratory species, few studies have measured survival rates of these birds at different parts of their annual cycle.

British Ecological Society

Journal of Animal Ecology 2014, **83**, 176–184

doi: 10.1111/1365-2656.12135

When and where does mortality occur in migratory birds? Direct evidence from long-term satellite tracking of raptors

Raymond H. G. Klaassen[1,2,3]*, Mikael Hake[1], Roine Strandberg[1], Ben J. Koks[2], Christiane Trierweiler[2,4], Klaus-Michael Exo[4], Franz Bairlein[4] and Thomas Alerstam[1]

Spring Avian Cover Crop Surveys

Questions

- What birds are using cover crops during spring migration?
- Are more species and individuals using cover crop fields compared to control fields?
- Are more birds of conservation concern using cover crop fields?

Study Area & Methods

Walking point counts

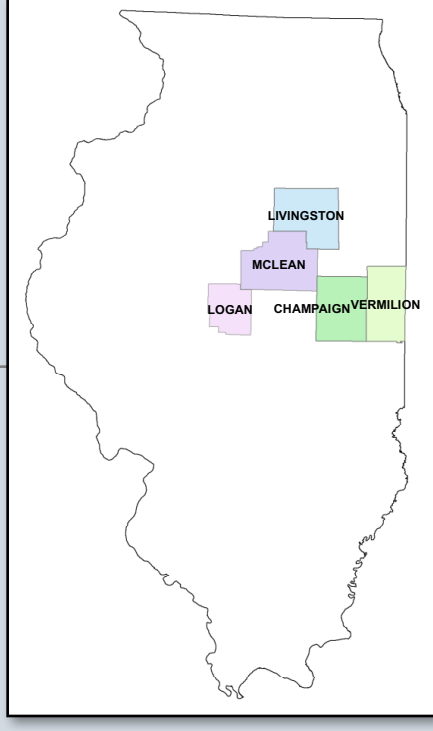
4 field types:

Corn

Corn + cover crop

Soybean

Soybean + cover crop



Red-winged Blackbird 27.7%

Common Grackle 10.2%

American Robin 9.9%

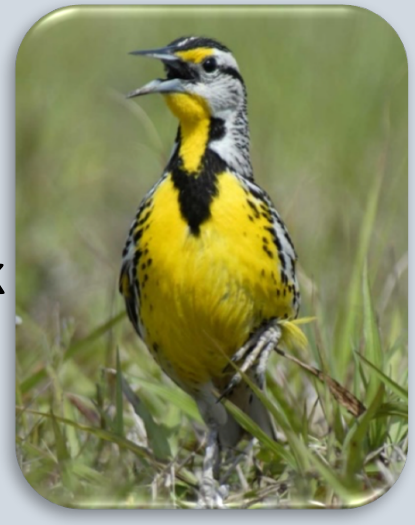
6339 individuals detected

53 species

14 species = 90%

Vesper Sparrow 5.6%

Eastern Meadowlark 4.4%



American Golden-Plover 3%

28 species

2.2 birds/100 meters

23 species

2.4 birds/100 meters

Bird Density & Species Richness

44 species

4.4 birds/100 meters

34 species

3.0 birds/100 meters

Birds of Conservation Concern

≠

Avian Conservation Significance values (ACS)

Partners in Flight (PIF) * density

ACS = 39.44

ACS = 24.6

Avian Conservation Significance values (ACS)

ACS = 57.8

ACS = 44.69

Cover Crop Summary

Greater densities in cover crop fields

Vegetation structure is more robust

Cassandra Wilcoxen

<u>Hypotheses</u>

Resident birds:

- Breeding
  - protection from predators & elements
  - foraging

Migratory birds:

- Stopover
  - protection from predators & elements
  - foraging

Cover Crop Termination

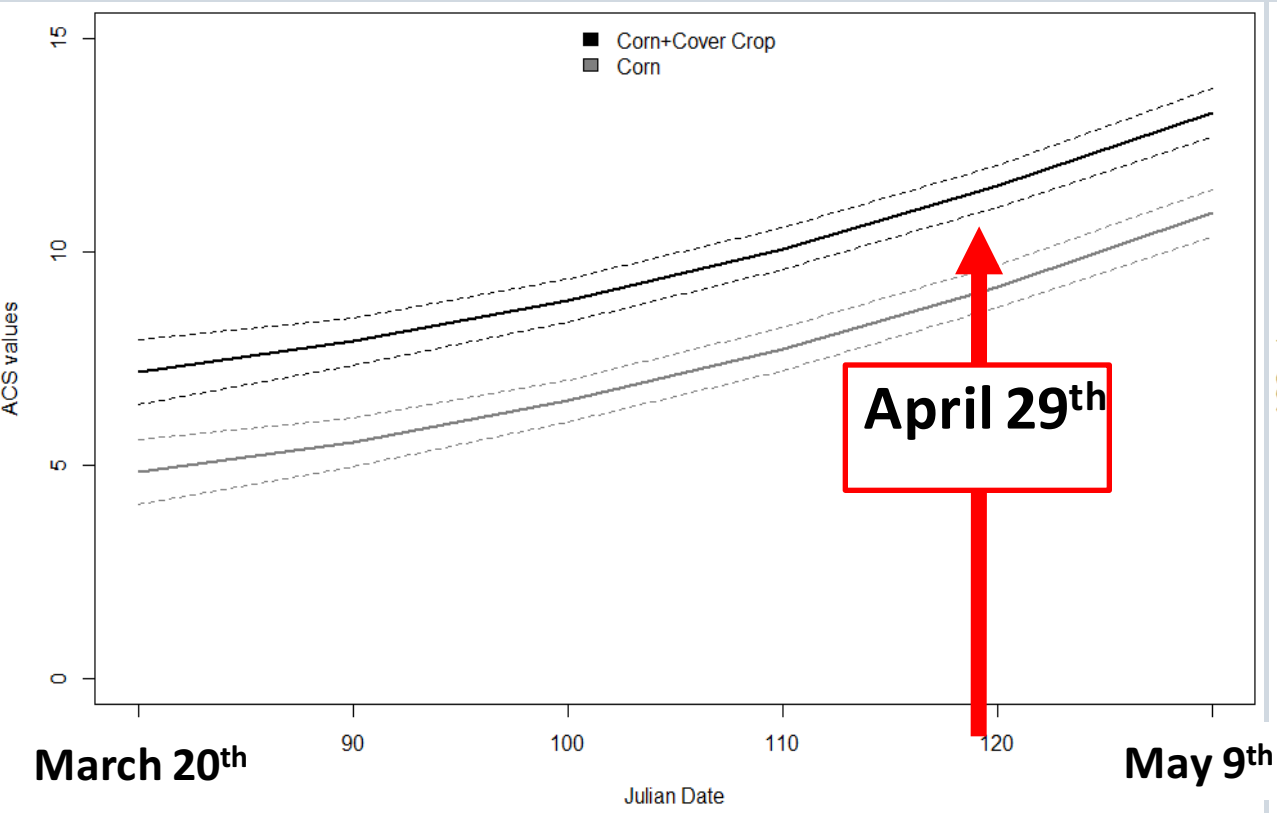
Termination

- Chemical vs mechanical
- Timing

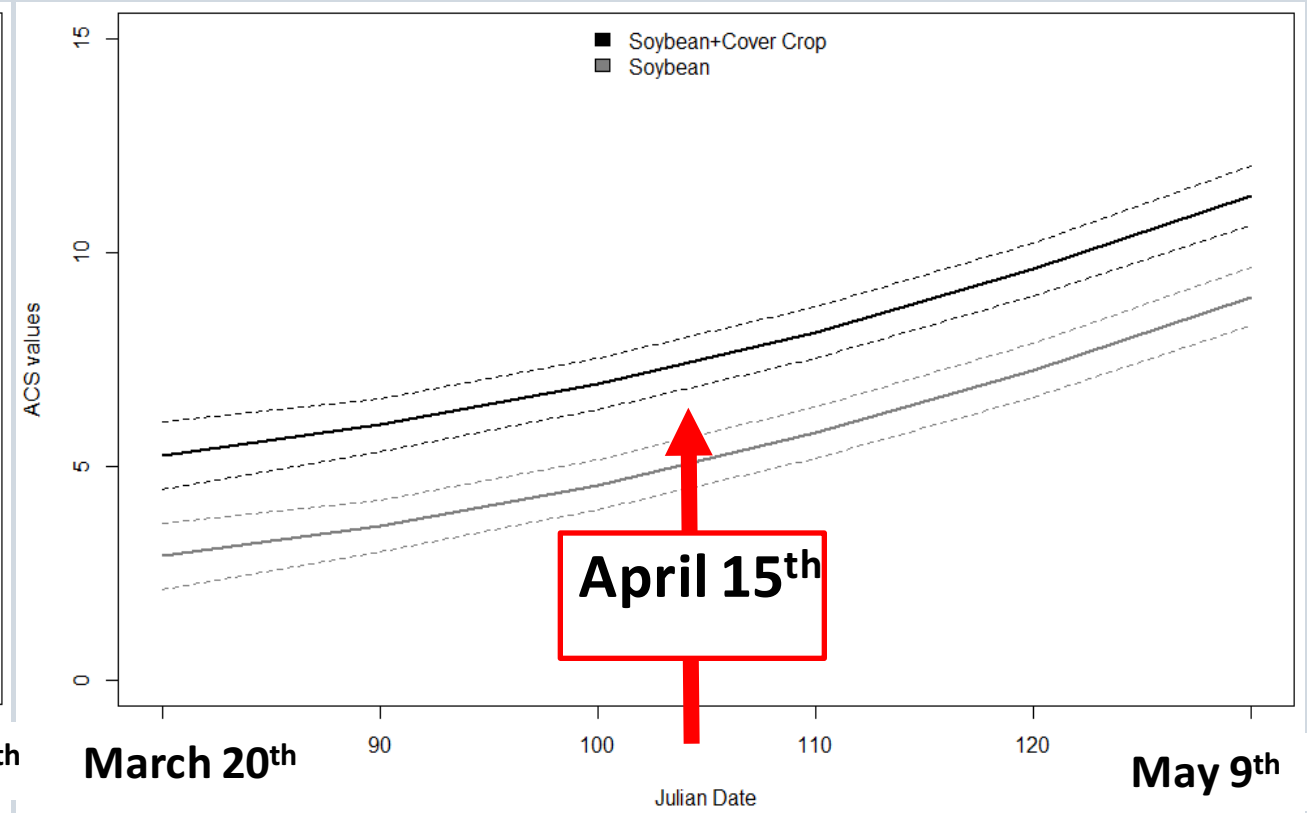
Vs.

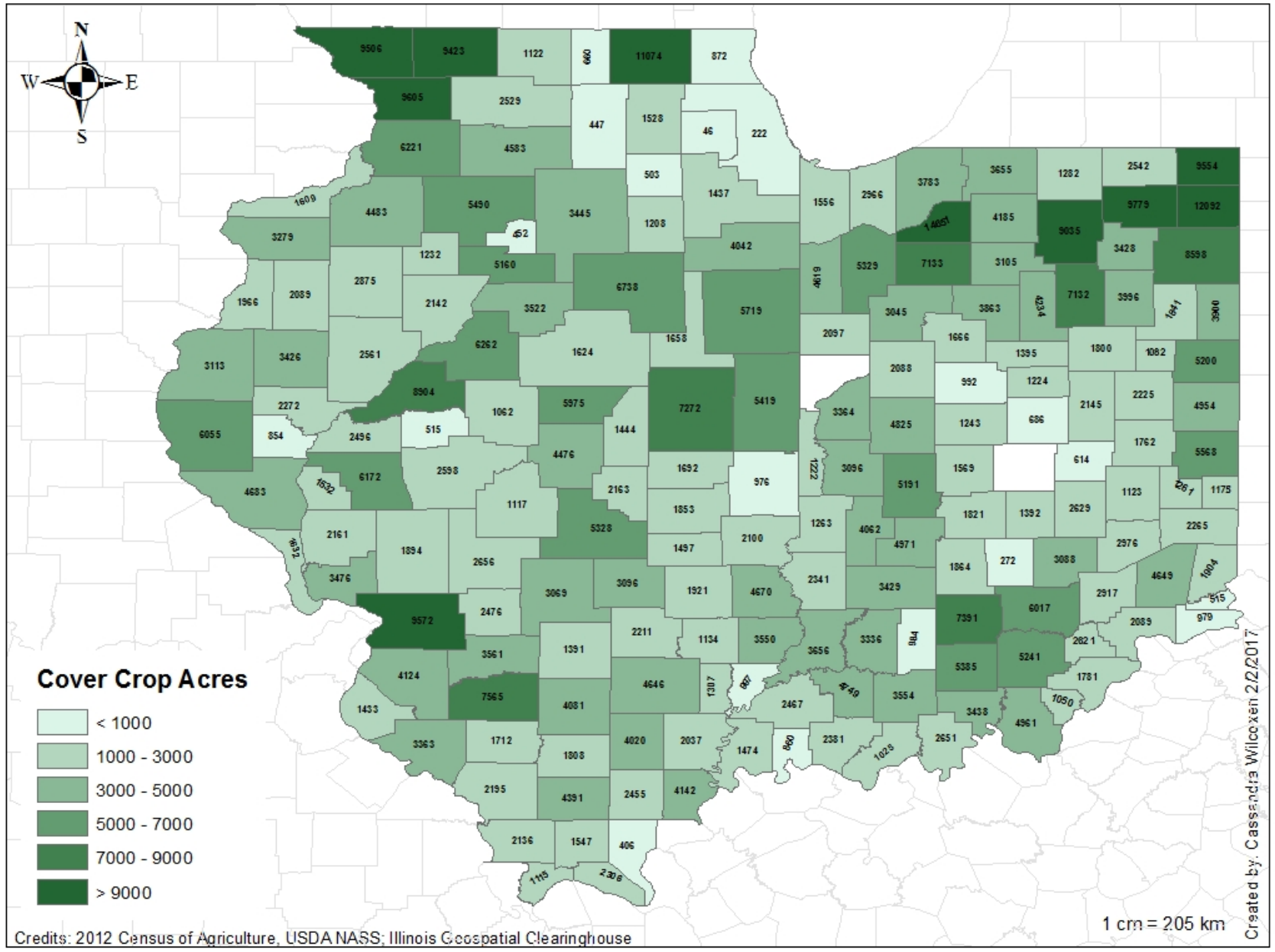
Cover Crop Termination

Corn vs Corn + cover crop



Soybean vs Soybean + cover crop





2012 1.3 million acres planted in Illinois & Indiana (NASS)

Evidence of increased acreage

Future Challenges & Opportunities

Termination

- Chemical vs mechanical
- Timing

Recommendations

- delay to early May
  - early breeders
  - later breeders

More integrated & holistic approach to soil health

Research needs: Nest success & food availability in cover crop fields

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McLean County NRCS, Livingston County NRCS, individual farmers

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