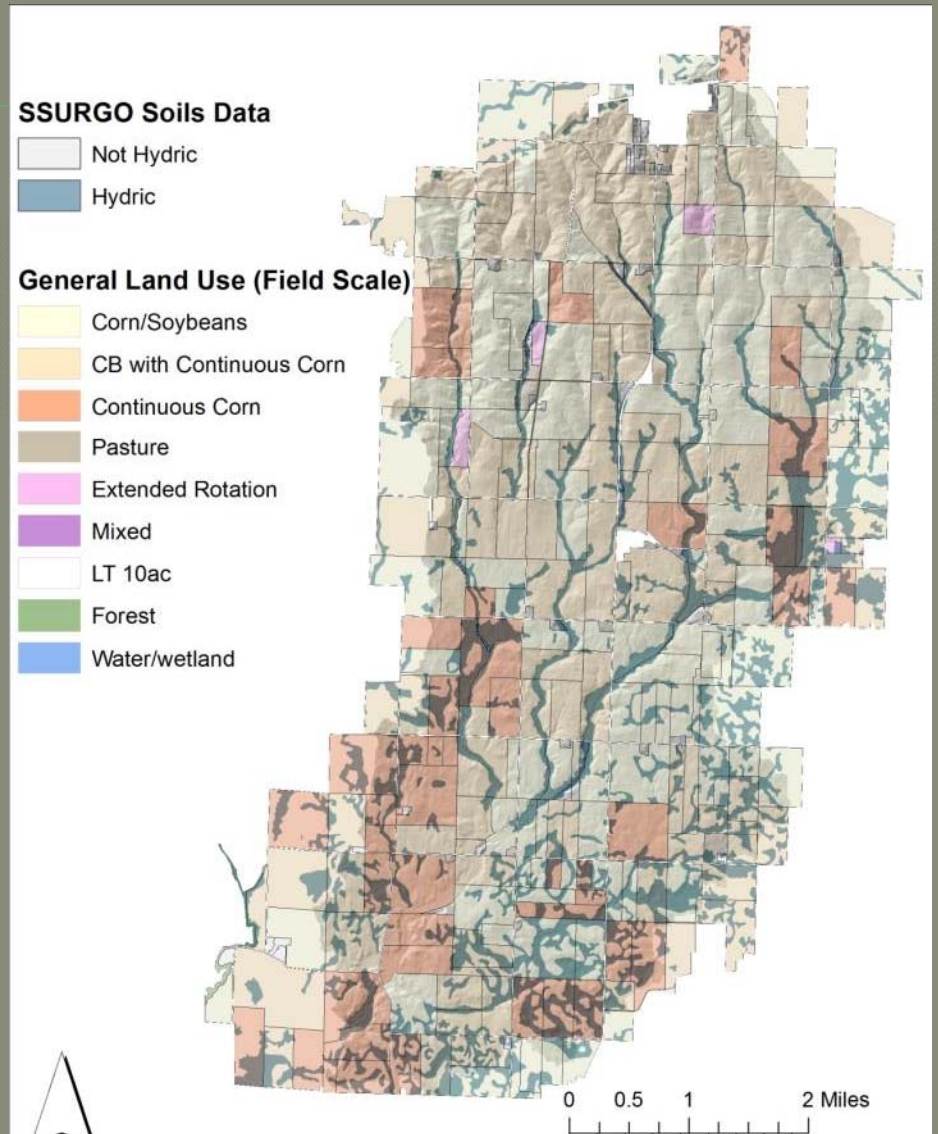
National Laboratory for Agriculture and Environment

CEAP Investigators Meeting
Kansas City, July 2013

Tom Moorman, Mark Tomer, Dan Jaynes, Rob Malone

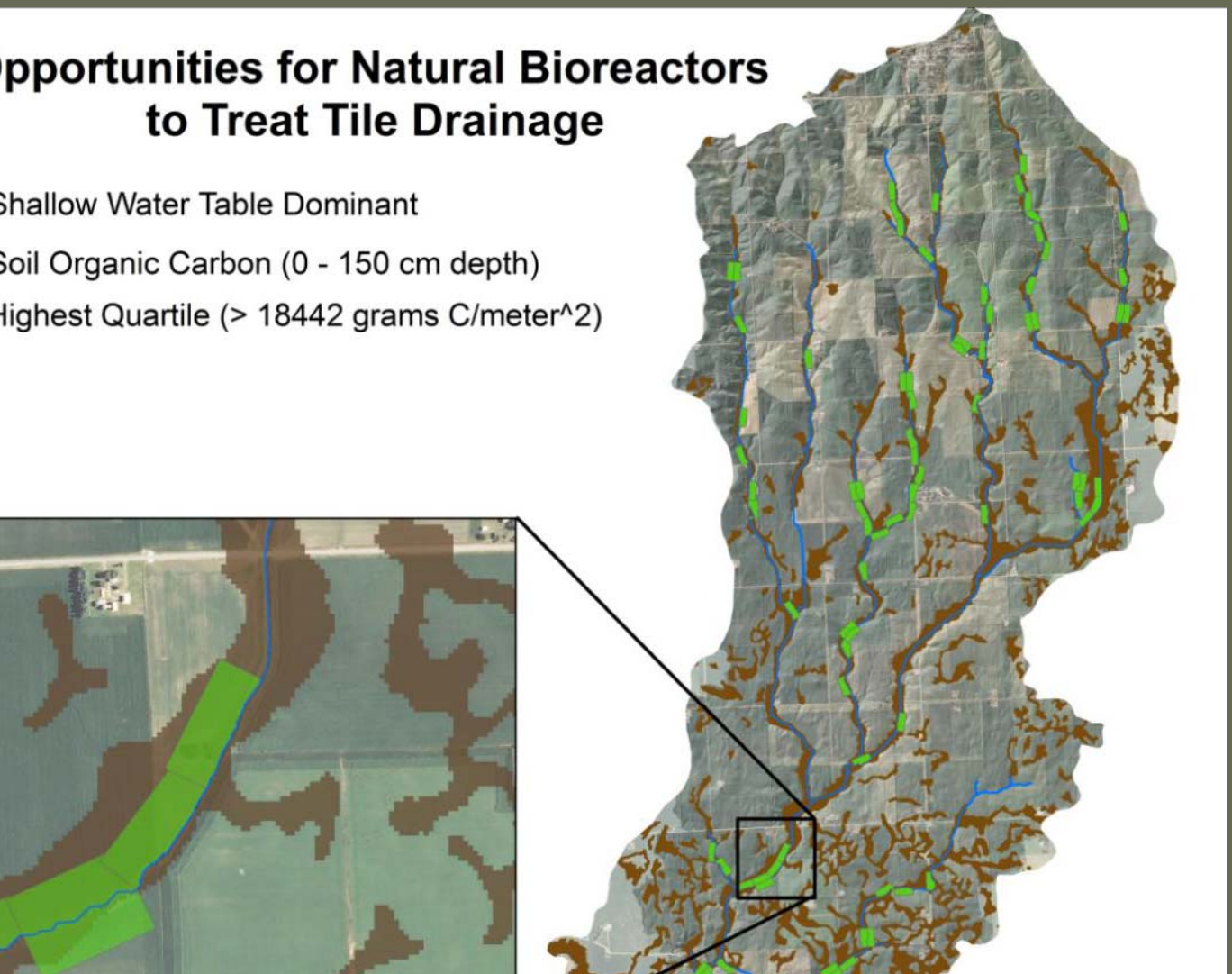
1) Select and place CPs on the land

Lidar and GIS are used to create DEM with water-flow paths
Add GIS layers for soils, crops

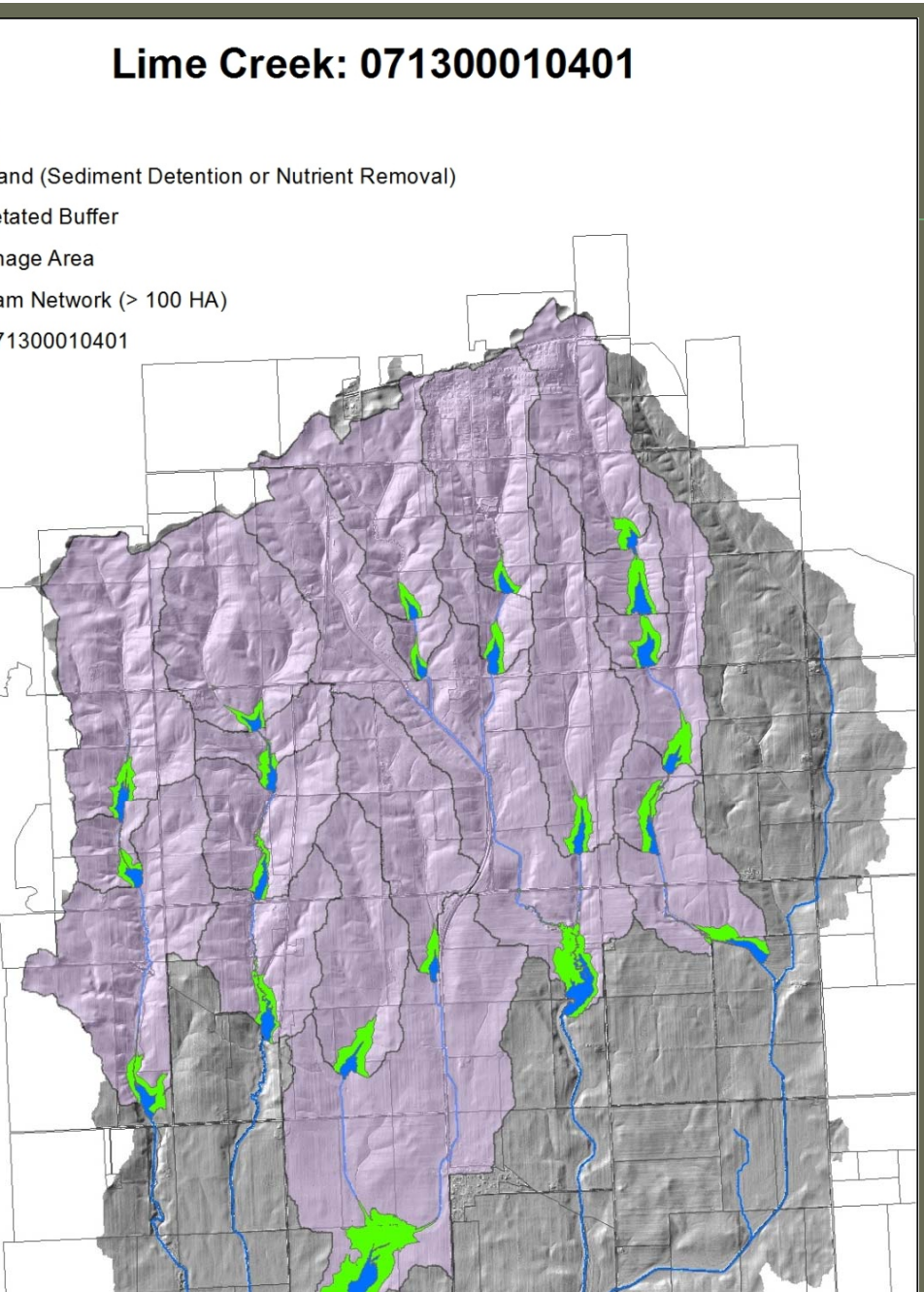


Lime Cr., IL

Select and place CP on the landscape



Use slope, proximity to streams, and soils data to identify suitable locations



Select and place CP on the landscape

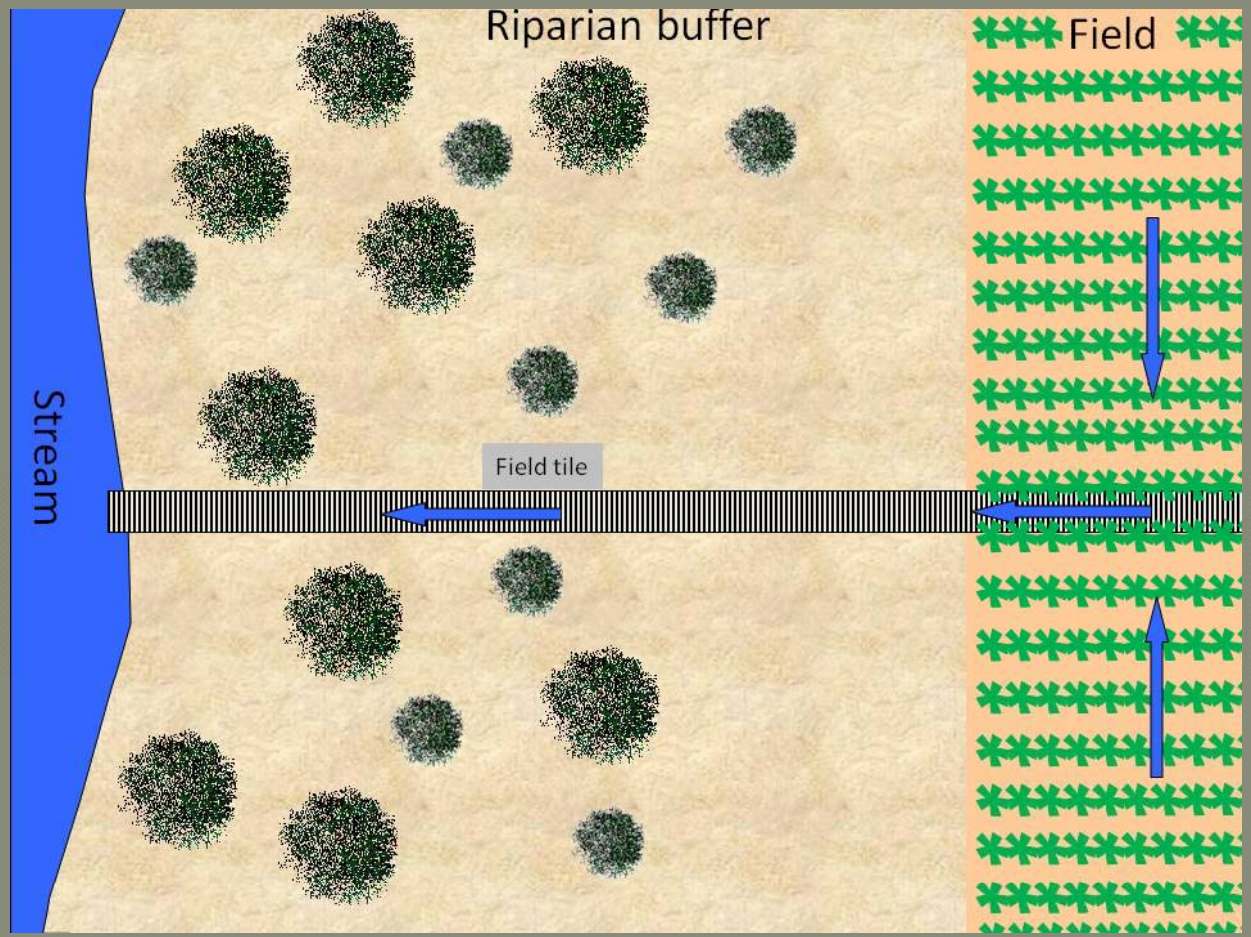
Lidar based GIS analysis shows where vegetated buffers or wetlands could remove sediment and/or nutrients

2) Improving conservation practices (CP)

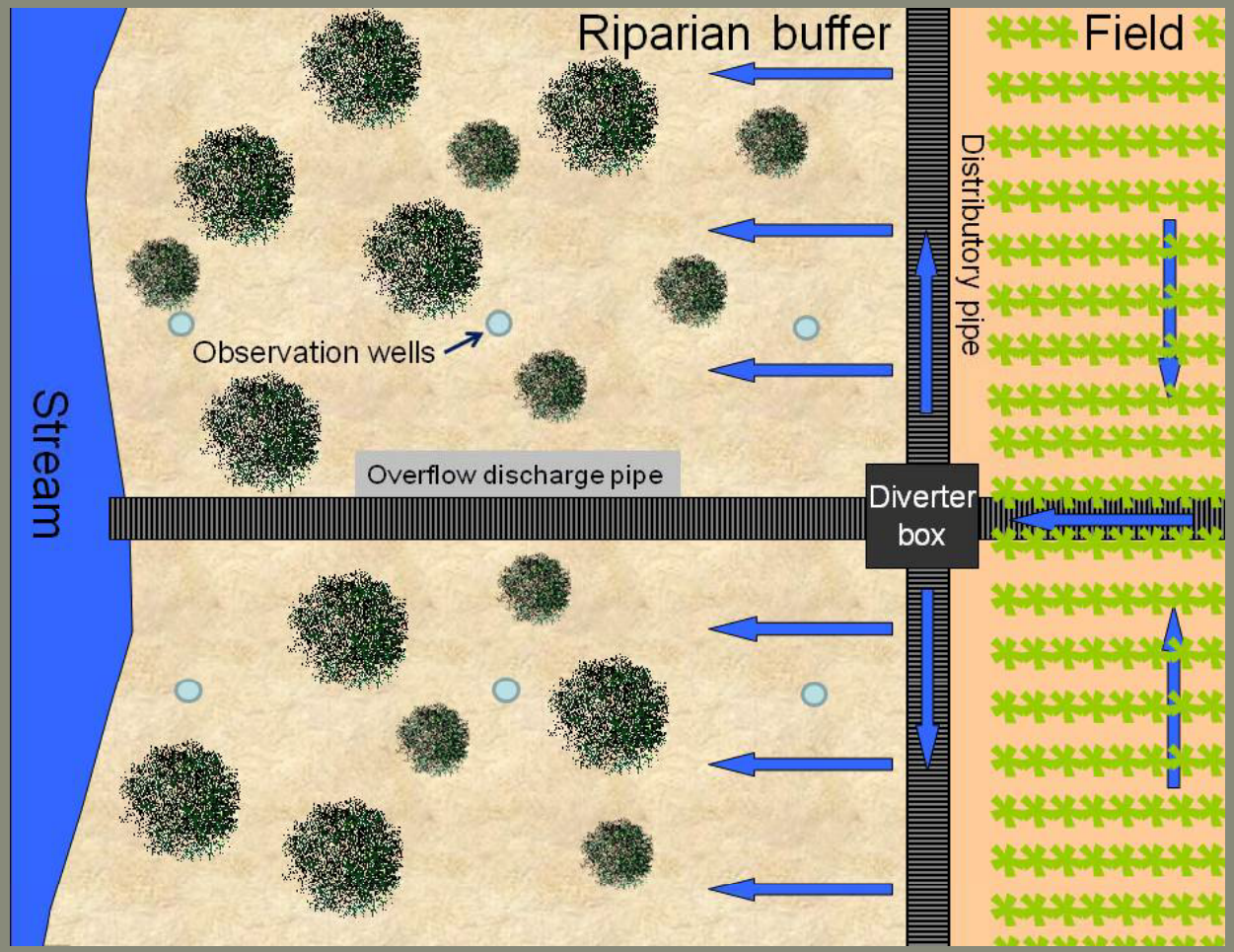
Continue field and plot research to reduce nitrate in tile-drainage:

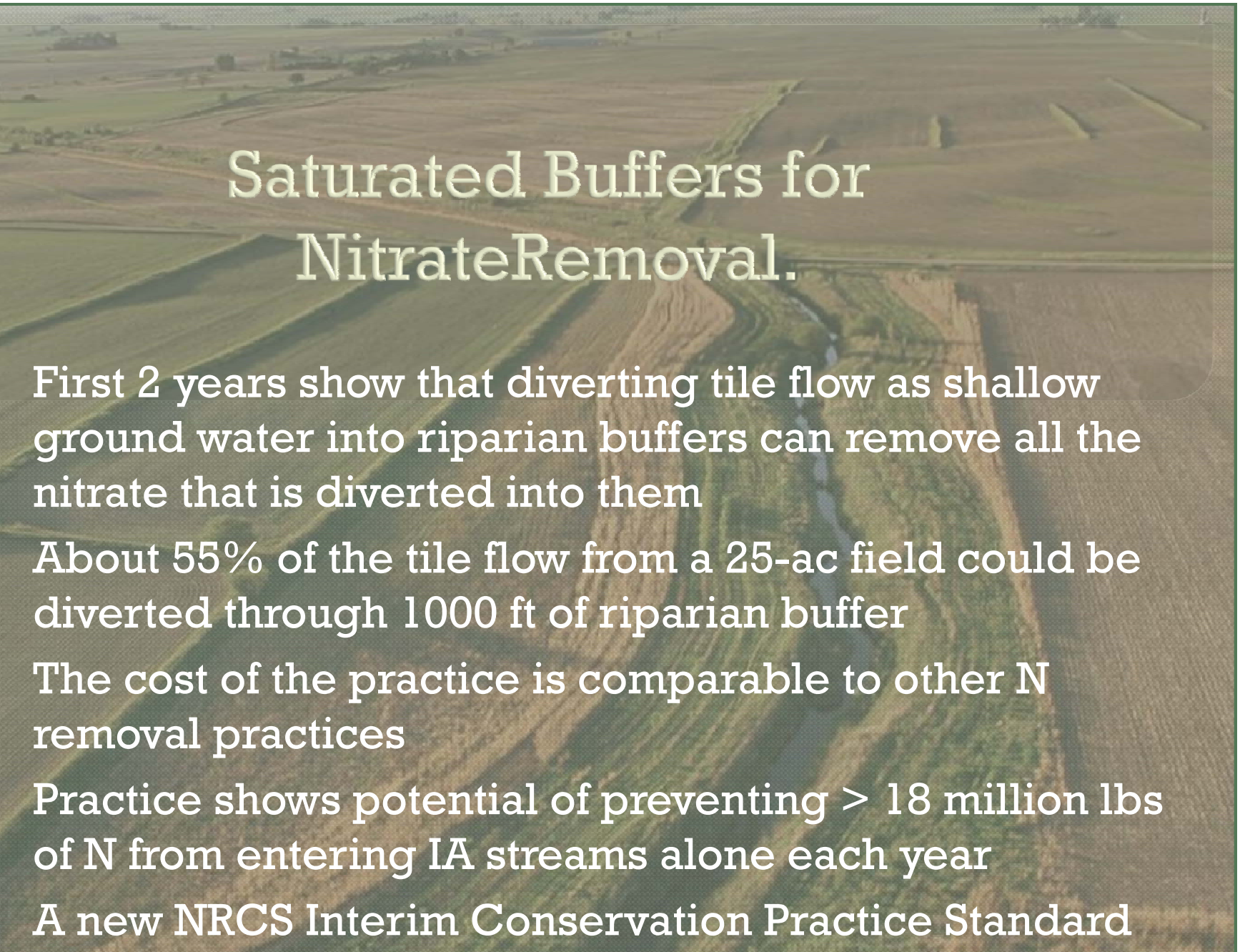
- N fertilizer application timing
- Controlled drainage
- Denitrification bioreactors
- Saturated riparian buffers
- Cover crops

Saturated buffers for nitrate removal



Saturated buffers for nitrate removal





Saturated Buffers for NitrateRemoval.

First 2 years show that diverting tile flow as shallow ground water into riparian buffers can remove all the nitrate that is diverted into them

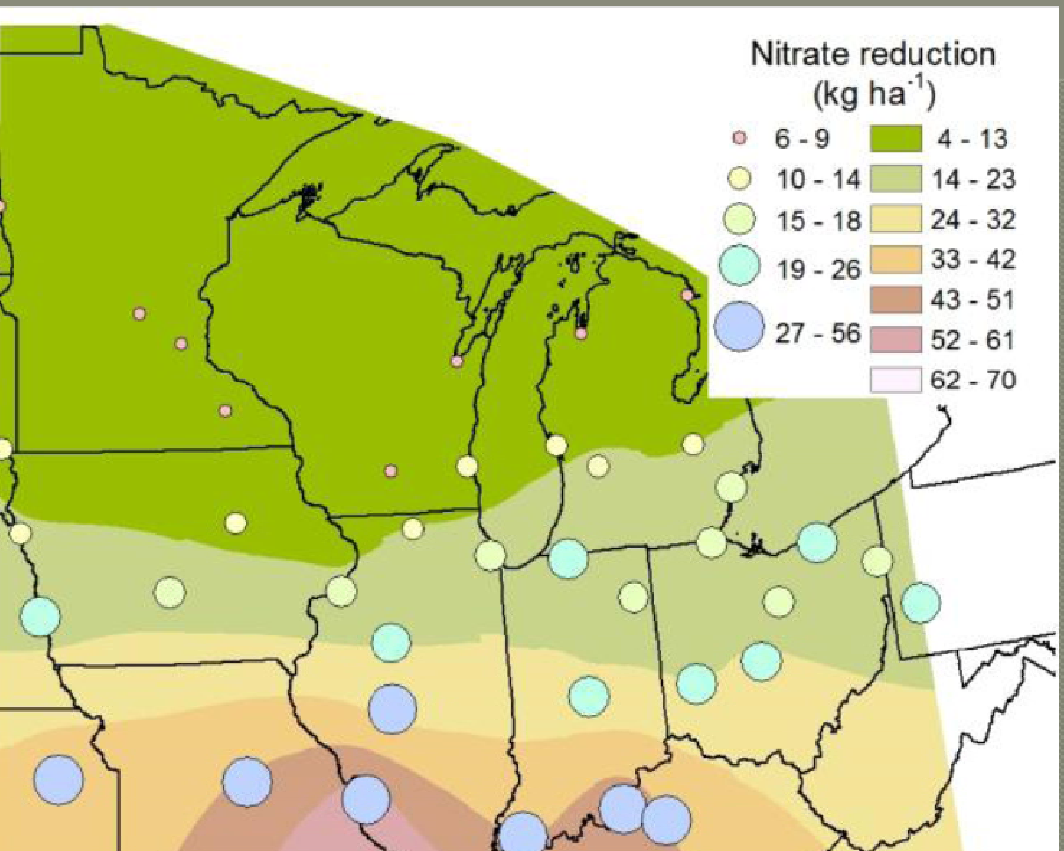
About 55% of the tile flow from a 25-ac field could be diverted through 1000 ft of riparian buffer

The cost of the practice is comparable to other N removal practices

Practice shows potential of preventing > 18 million lbs of N from entering IA streams alone each year

A new NRCS Interim Conservation Practice Standard

rate reduction in tile drains across the U.S. corn-belt
m including winter rye into a corn-soybean system
imated using RZWQM..



The size of the circle represents the long-term average annual reduction in nitrate (kg N ha^{-1}) to artificial tile drains from overseeding a winter rye cover crop in a no till corn – soybean rotation system across 40 U.S. Midwest locations.

The interpolated nitrate loss reduction across the region is also presented (graduated color).

On average, RZWQM predicts that winter rye can reduce nitrate loss to tile drains by more than 40% across the U.S. Midwest.

3) Watershed Monitoring:

outh Fork of the Iowa River, Walnut Creek, Story Co, Walnut Creek , Jasper Co (Neal Smith)