Agriculture's Challenge

Winona Area Rural Climate Dialogue

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EXTENSION
Driven to Discover℠

Questions you may have

- Who are you and what do you do?
- Why are *you* talking to us?

Winona County Ag Snapshot

- 1,115 farms in Winona County
- 180,000 acres of cropland on 855 farms

USDA Census of Ag, 2012

(There are 410,000 ac total in Winona Co)

630 produce corn for grain on 78,715 acres

645 produce forage on 41,554 acres

334 produce soybeans on 25,498 acres

591 with cattle, total of 82,610 animals

Ag's Challenge: Precipitation Patterns

- Field work - transitional period
- Loss of nutrients and soils negatively impacts production, groundwater, and streams
- Local topography and geology make it worse
- Variability and extreme nature is hard to handle
- For agriculture – it's an agronomic, environmental, and social issue

Since I started with Extension

2012: Drought

2013: Spring snow/rain, prevented planting

2014: ~10” precipitation in one month period

2015: Practically perfect

Addressing the challenge

We’re already doing some things right;

- Relatively diverse ag
- Over 40k ac of forage
- Conservationists with many effective practices in place

But there is cause for concern

Addressing the challenge - Farmers

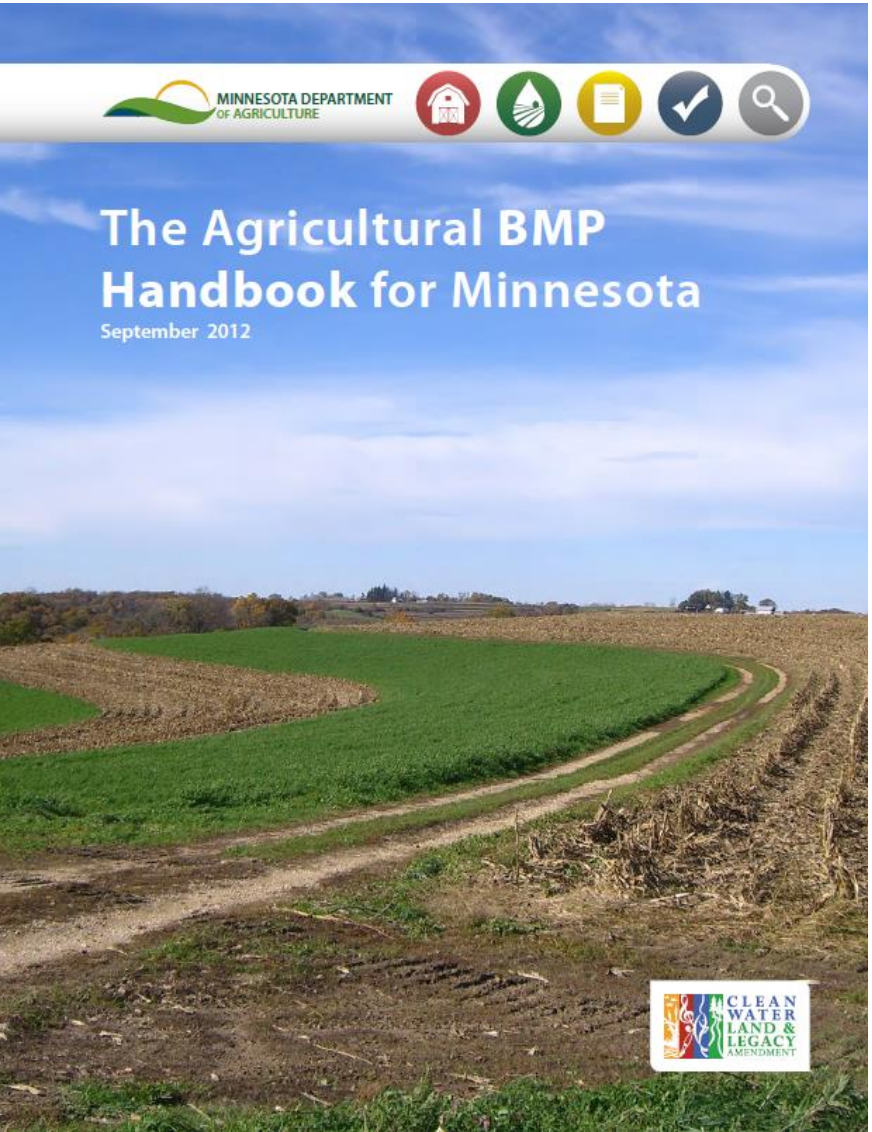
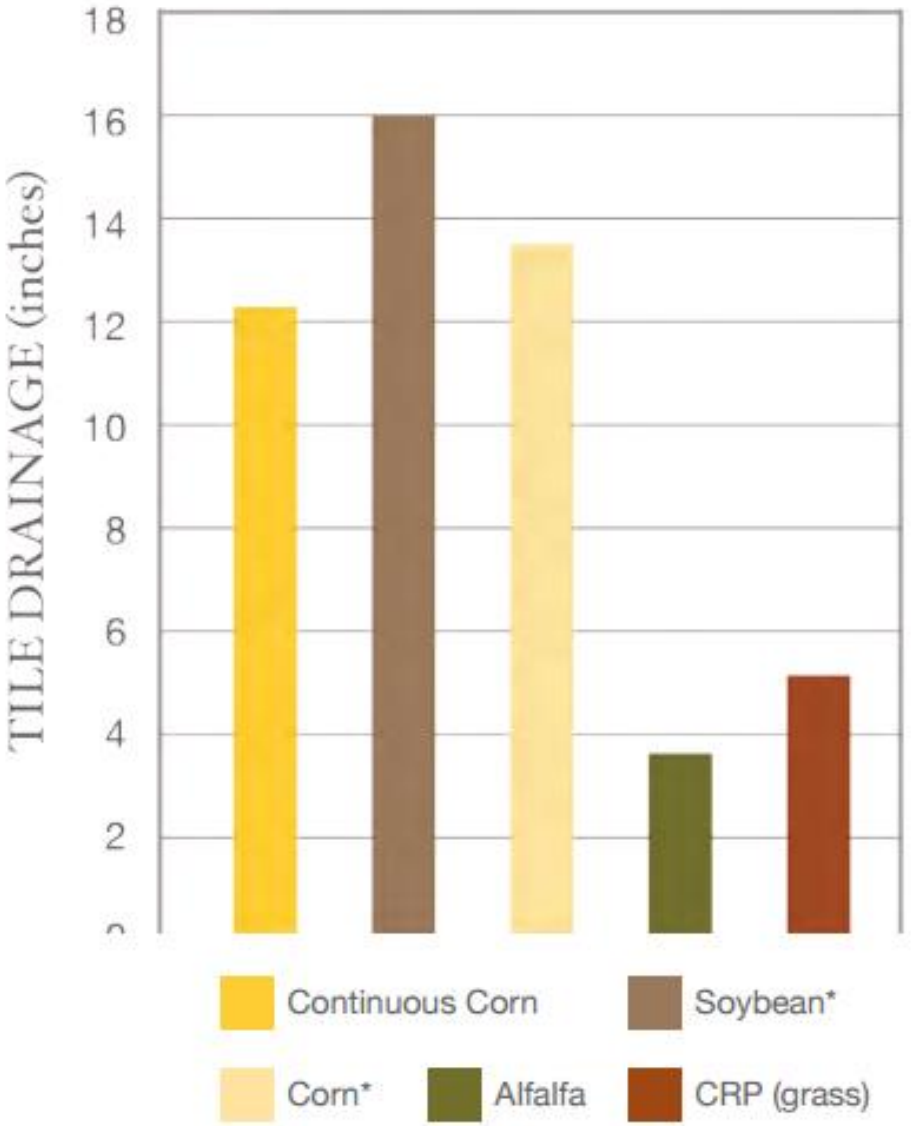


Table 3. Status of Upper Midwest and Minnesota BMP Research

Type	BMP	Turbidity/ Sediment	Phosphorus	Soluble Phosphorus	Nitrogen/ Nitrates	Ammonia	Pesticides	Bacteria	Dissolved Oxygen
AVOIDING	Conservation Cover (327)	◖	◖	○	●	○	○	○	○
	Conservation Crop Rotation (328)	○	○	○	●	○	○	○	○
	Contour Buffer Strips (332)	●	○	○	○	○	●	○	○
	Contour Farming (330)	○	○	○	○	○	○	○	○
	Cover Crops (340)	○	○	○	●	○	○	○	○
	Grade Stabilization (410)	○	○	○	○	○	○	○	○
	Livestock Exclusion/Fencing (382 and 472)	○	○	○	○	○	○	○	○
	Nutrient Management (590)	●	●	●	●	●	○	○	○
	Pest Management (595)	○	○	○	○	○	◖	○	○
	Tile System Design	○	○	○	◖	○	○	○	○
CONTROLLING	Alternative Tile Intakes	◖	◖	◖	○	○	○	○	○
	Contour Stripcropping (585)	○	○	○	○	○	○	○	○
	Controlled Drainage (554)	○	◖	◖	◖	○	○	○	○
	Culvert Sizing / Road Retention / Culvert Downsizing	○	○	○	○	○	○	○	○
	Grassed Waterways	●	○	○	○	○	●	○	○
	Irrigation Management (442 and 449)	○	○	○	○	○	○	○	○
	Waste Storage Facility (313)	○	○	○	◖	○	○	○	○
	Conservation Tillage (329, 345 and 346)	●	●	●	●	○	○	○	○
	Riparian and Channel Vegetation (322/390)	○	○	○	○	○	○	○	○
	Rotational Grazing	○	○	○	○	○	○	○	○
	Terrace (600)	○	○	○	○	○	○	○	○
	Two Stage Ditch	◖	○	○	◖	○	○	○	○
	Feedlot/Wastewater Filter Strip (635) and Clean Runoff Water Diversion (362)	◖	◖	◖	◖	○	○	◖	○
TRAPPING	Filter Strips (393) and Field Borders (386)	●	●	●	●	●	●	●	○
	Sediment Basin (350)	○	○	○	○	○	○	○	○
	Grade Stabilization at Side Inlets (410)	○	○	○	○	○	○	○	○
	Water and Sediment Control Basin (638)	○	○	○	○	○	○	○	○
	Constructed (Treatment) Wetlands	◖	◖	○	○	○	○	○	◖
	Wetland Restoration (651)	◖	◖	○	◖	○	○	○	○
	Woodchip Bioreactor (Denitrification Beds)	○	◖	◖	◖	○	◖	◖	○

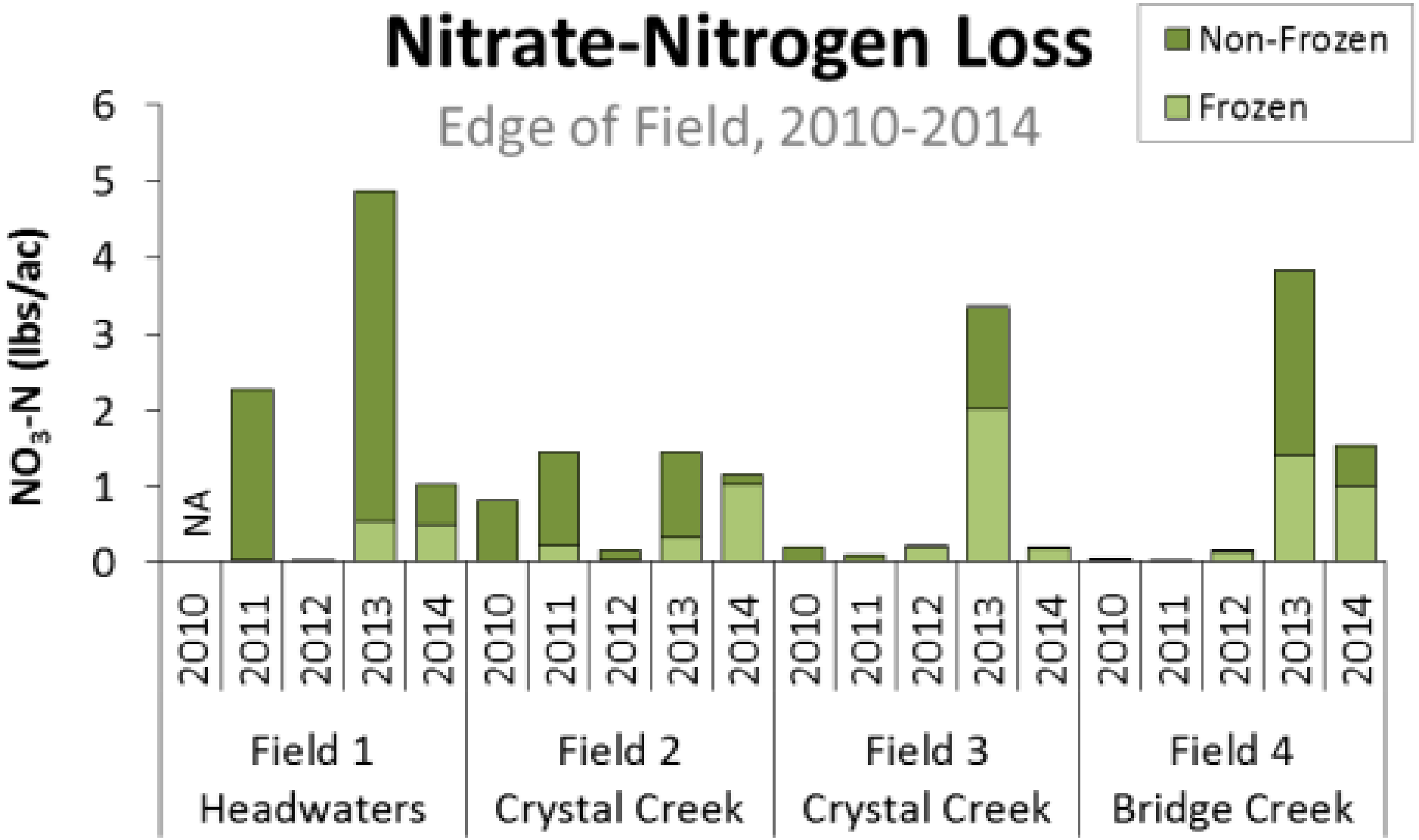
○ Not Studied ◖ Some Study ● Well Documented



Lamberton, MN 91-92

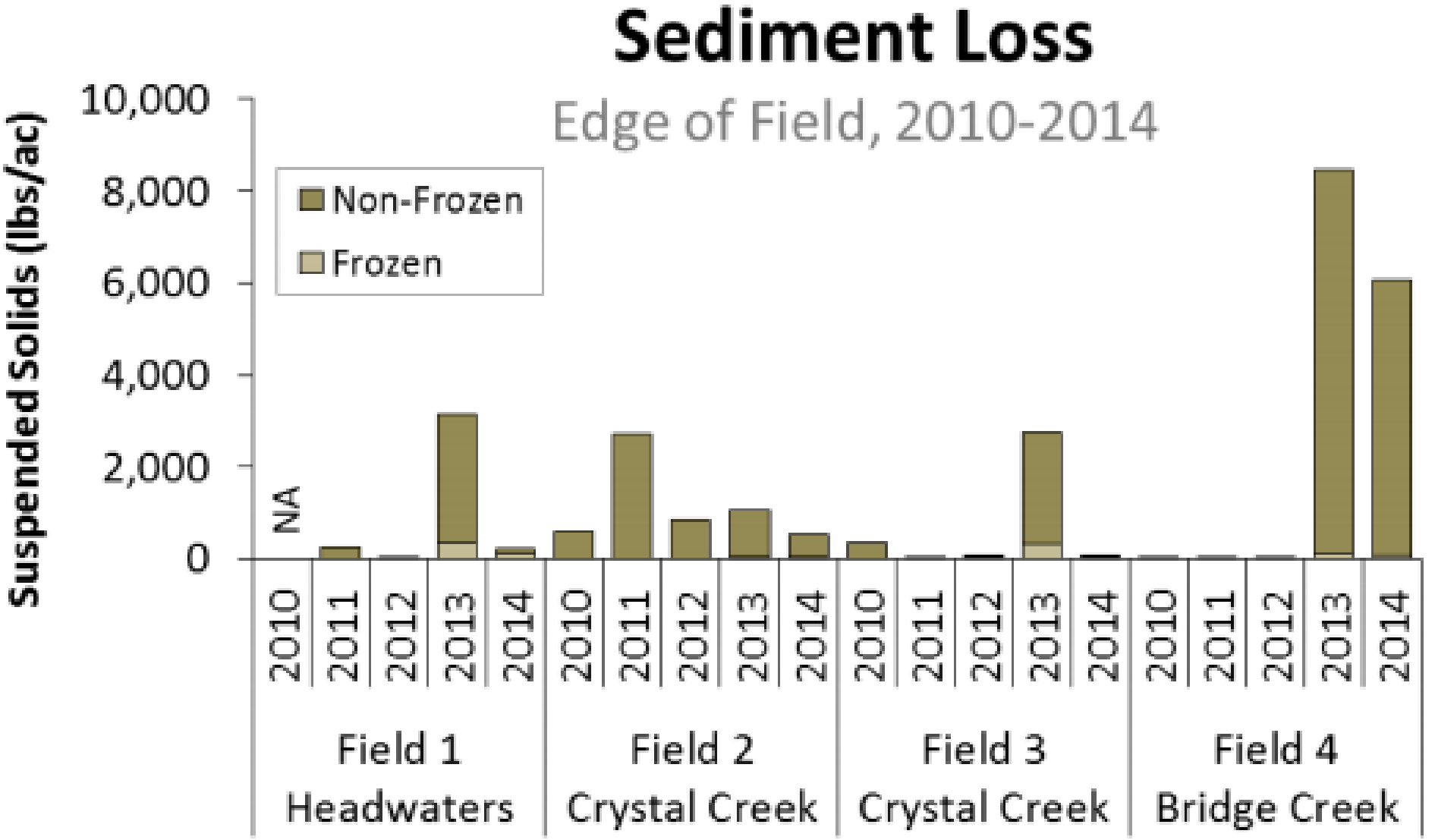
Randall et. al.

Edge of field monitoring flume in Crystal Creek Watershed. This flume measures surface runoff from a 96-acre field (#3).



"Over 90% of the annual losses occurred during four months: March, April, May and June."

K. Kuehner, Runoff Lessons: Field to Stream Partnership



"Typically, only one or two of these runoff events accounted for over 50% of the runoff volume."

K. Kuehner, Runoff Lessons: Field to Stream Partnership


June 8
Fremont, United States 06/08/2015 02:24 PM


June 9

June 13

Addressing the problem – Farmers

Medium - Long term

- Intermediate wheatgrass
- Field pennycress
- Hazlenuts
- Hybrid poplar
- Values based products

Glover, J. D. et al. 2010

Striking a balance - Solutions

- Desired result
- Actors who recognize and understand the issue
- Profitable
  - Production, infrastructure, markets, scale
- Knowledge and skills
- Demographics

Addressing the problem – Community

- Be proactive and positive
- Avoid the blame game
- Recognize our role

Competing arguments

- We can't change because we need to feed the world
- Go organic
- We should grow _____ (insert crop for which business model, infrastructure, or production is not developed)
- Climate change isn't happening

Challenge:

Producing sustainably given current and changing precipitation patterns

Opportunities

Ag BMPs and perennials can reduce nutrient, soil, and water loss while maintaining production and profitability.

Upcoming crops and systems may provide both strong economic and environmental benefits

Actions

Farmers:

- Assess land and practices
- Get technical and financial assistance if needed
- Implement BMPs/perennials where needed
- Look to new opportunities

Actions

The rest of us:

- Support farmers in adopting new practices
- Support beginning farmers
- Support programs that provide assistance (NRCS, SWCD, MDA, watershed groups)
- Support research, outreach, and education

Thanks!

MPCA's Proposed 2014 Waters List

Reach Name	Pollutant or Stressor
Whitewater River, Middle Fork	Aquatic Macroinvertebrate Bioassessments
Whitewater River, Middle Fork	Turbidity
Whitewater River, Middle Fork	Fecal Coliform
Whitewater River, Middle Fork	Nitrates
Whitewater River, Middle Fork	Aquatic Macroinvertebrate Bioassessments
Whitewater River, Middle Fork	Fishes Bioassessments
Whitewater River, Middle Fork	Turbidity
Whitewater River, Middle Fork	Escherichia coli
Whitewater River, North Fork	Turbidity
Whitewater River, North Fork	Aquatic Macroinvertebrate Bioassessments
Whitewater River, North Fork	Fishes Bioassessments
Whitewater River, North Fork	Turbidity
Whitewater River, North Fork	Fecal Coliform
Whitewater River, North Fork	Turbidity
Whitewater River, North Fork	Fecal Coliform
Whitewater River, South Fork	Aquatic Macroinvertebrate Bioassessments
Whitewater River, South Fork	Fishes Bioassessments
Whitewater River, South Fork	Turbidity
Whitewater River, South Fork	Fecal Coliform
Whitewater River, South Fork	Turbidity
Whitewater River, South Fork	Fecal Coliform
Whitewater River, South Fork	Aquatic Macroinvertebrate Bioassessments
Whitewater River, South Fork	Turbidity
Whitewater River, South Fork	Fecal Coliform
Whitewater River, South Fork	Nitrates

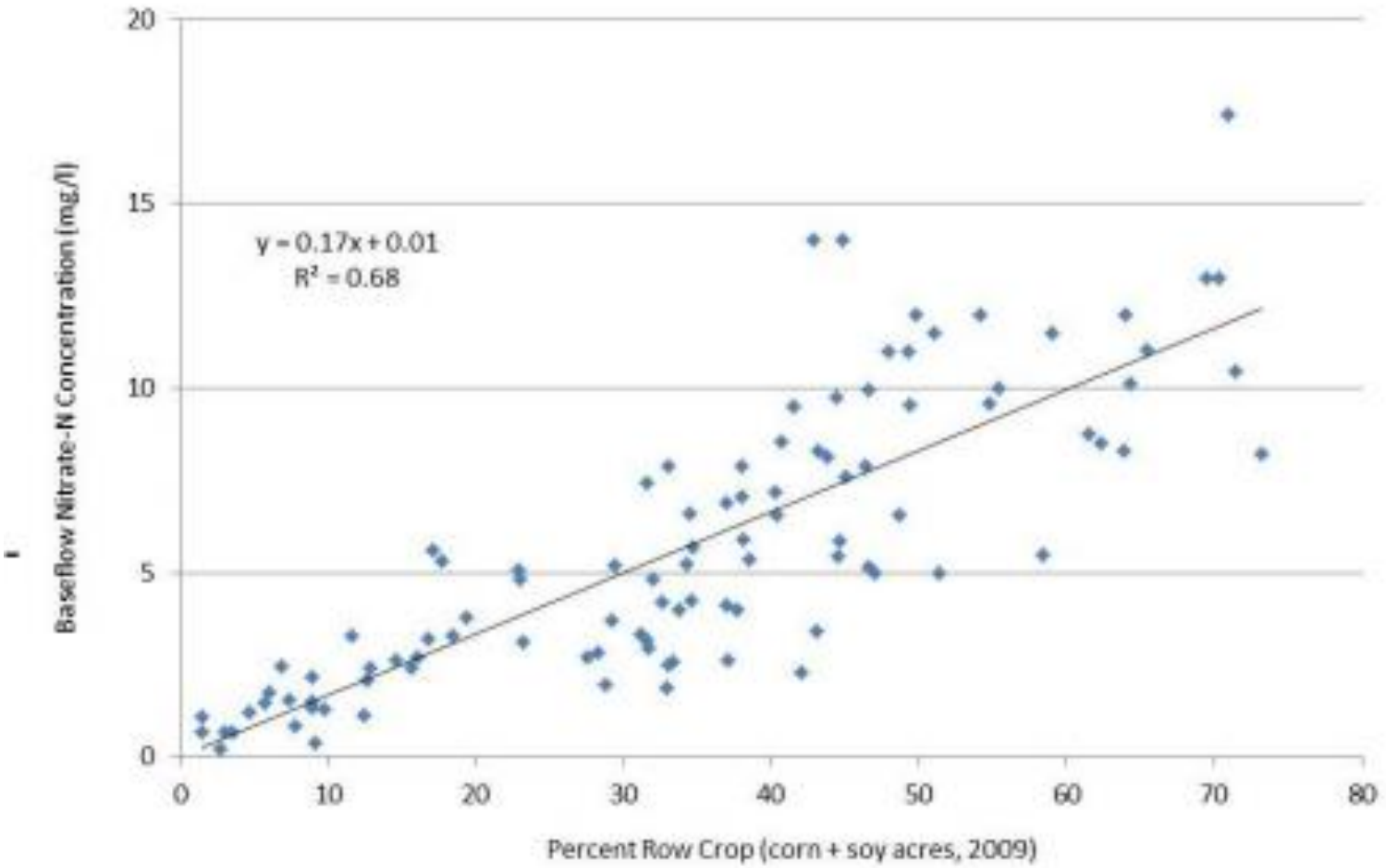
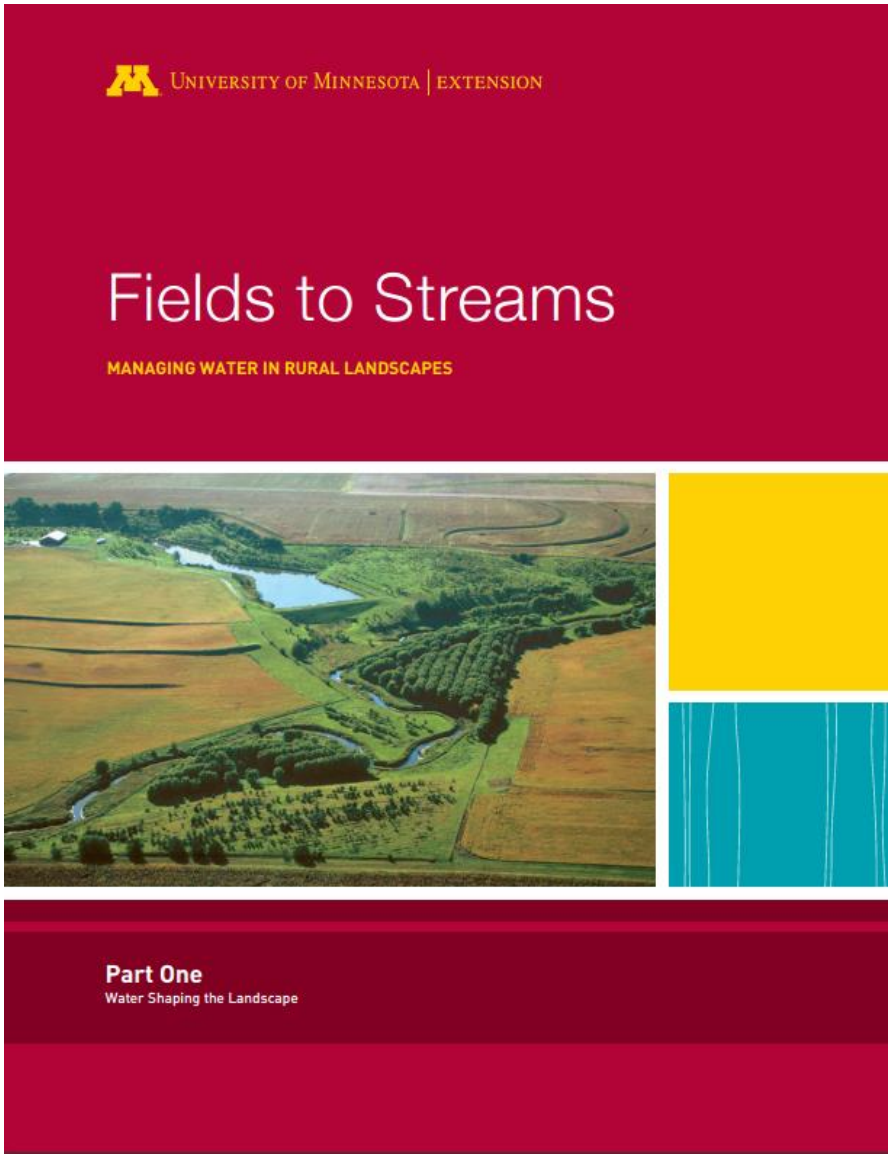


Figure 1. Percent Row Crop vs. Baseflow Nitrate-N[1] Concentration in Trout Stream Watersheds of SE MN; n = 100.

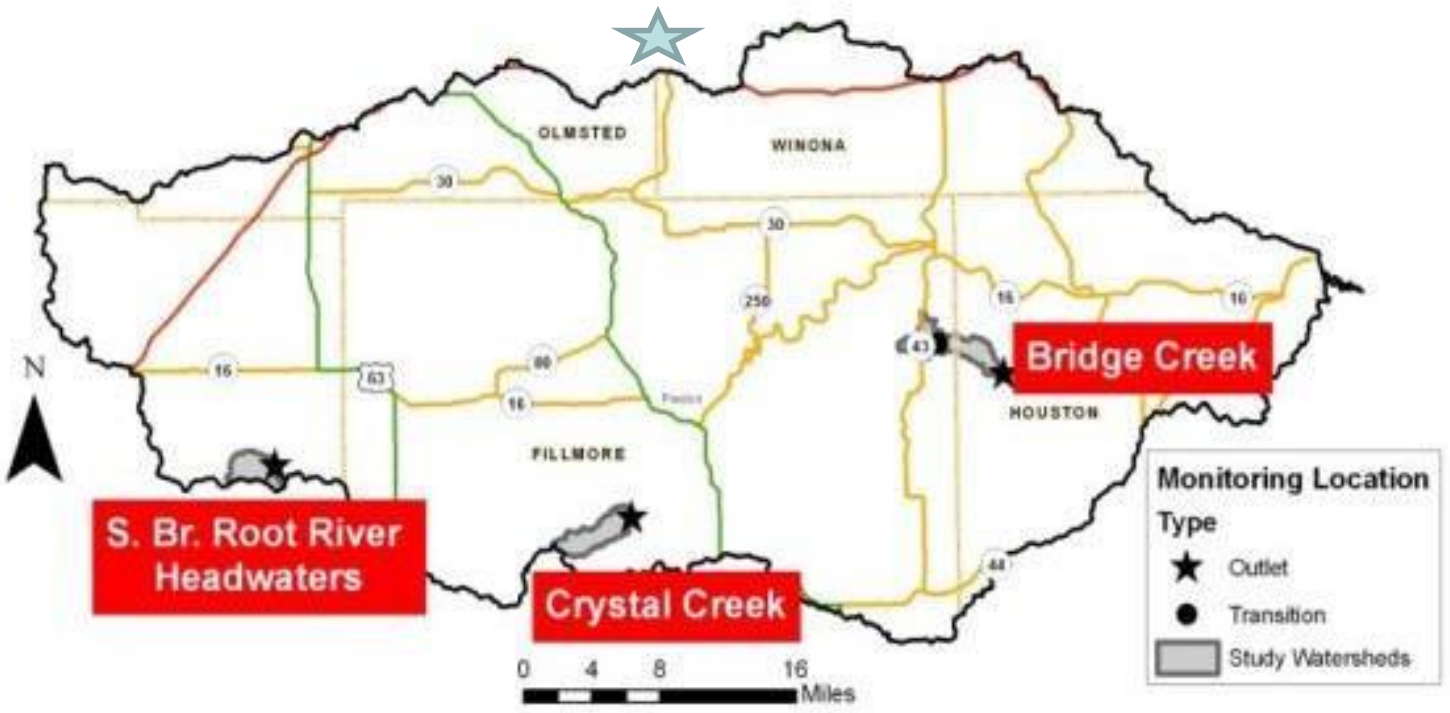
J. Watkins, et. al. Nitrate-Nitrogen in the Springs and Trout Streams of SE MN

Addressing the challenge - Farmers



Project Area ----- Root River Watershed

Glacial Till | Karst | Bluffland Karst



35 miles

75 Miles