

Proceedings from the 12th Annual Nutrient Management Conference



12th Annual

NUTRIENT MANAGEMENT CONFERENCE

Tuesday, February 4, 2020

VERIZON WIRELESS CENTER MANKATO

12th Annual

NUTRIENT MANAGEMENT CONFERENCE

Sessions 9:00 a.m.-3:25 p.m.

■ GENERAL SESSION

8:30 a.m. *Registration*

9:00 a.m. *Welcome*
Tom Rothman University of Minnesota

9:05 a.m. *Lessons Learned in 2019, Opportunities for 2020*
Liz Stahl University of Minnesota
Brad Carlson University of Minnesota

9:55 a.m. *Importance of Urban and Non-Urban Nutrient Reductions*
Katrina Kessler Minnesota Pollution Control Agency

10:30 a.m. *Break*

10:45 a.m. *Farmers Working To Reduce Nutrient Losses*
Brian Ryberg, Brian Biegler, Dan Coffman

11:45 *Lunch*

■ BREAKOUT SESSION #1 - NUTRIENT REDUCTION STRATEGY TRACK

12:45 p.m. *Minnesota's Nutrient Reduction Strategy- Progress Toward Milestone Goals*
Glenn Skuta Minnesota Pollution Control Agency

1:25 p.m. *Urban Efforts to Reduce Nutrient Pollution*
Katrina Kessler Minnesota Pollution Control Agency

2:05 p.m. *Potential for Cover Crops to Improve Nutrient Use Efficiency*
Axel Garcia y Garcia University of Minnesota

2:45 p.m. *Tile Drainage, Cover Crops and Nitrogen Interactions*
Jeffrey Vetsch University of Minnesota

■ BREAKOUT SESSION #2 RESEARCH TRACK

12:45 p.m. *Looking at Soil Health Tests*
Anna Cates, Liz Stahl University of Minnesota

1:25 p.m. *Evaluating Biologicals*
Dan Kaiser University of Minnesota

2:05 p.m. *Updating MN's P Index*
Lindsay Pease University of Minnesota

2:45 p.m. *Liquid Swine Manure - A Viable Nutrient Source for Sidedressing Corn?*
Melissa Wilson University of Minnesota

3:25 p.m. *Adjourn*

Thank you to all of our Supporters!

mn DEPARTMENT OF AGRICULTURE

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Minnesota's Agricultural Fertilizer Research & Education Council

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Importance of Urban and Non-Urban Nutrient Loss Reductions

Dana Vanderbosch | Director, Municipal Division

February 4, 2020

Outline – Nutrients in waters

1. Why is it important to reduce nutrient losses?
2. Conditions and trends
3. Urban and ag sources
4. We've made progress, but there's more we need to do
5. Minnesota's Nutrient Reduction Strategy

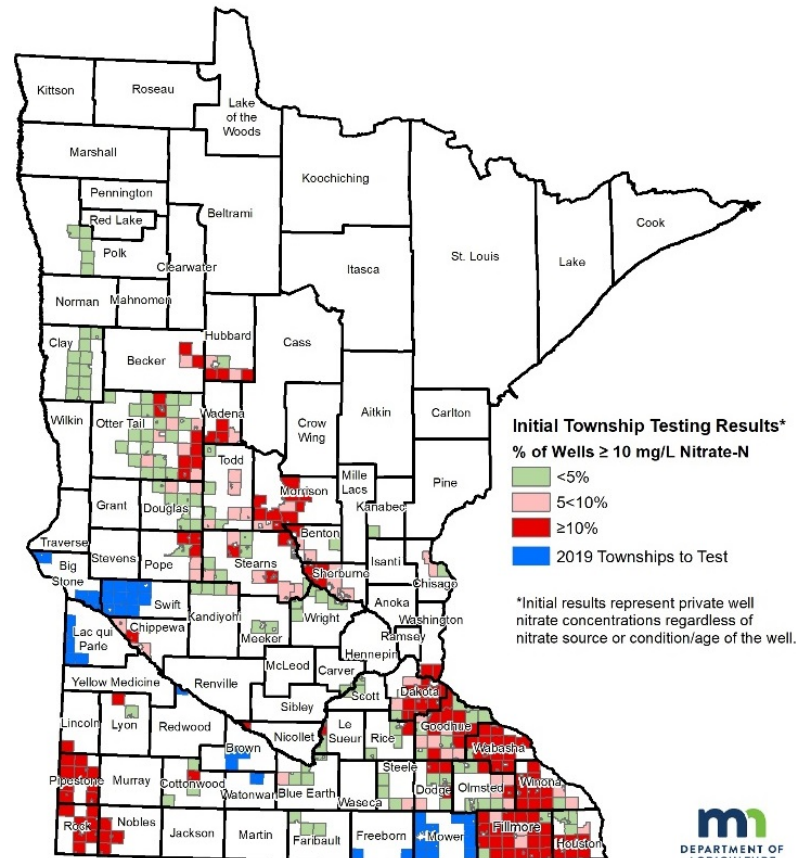


Why important? Drinking water – local wells

Private Wells

110+ townships have over 10% of wells exceeding nitrate standard

Private Well Nitrate Testing-MDA Township Testing Program



Initial Testing Results Updated June 2019

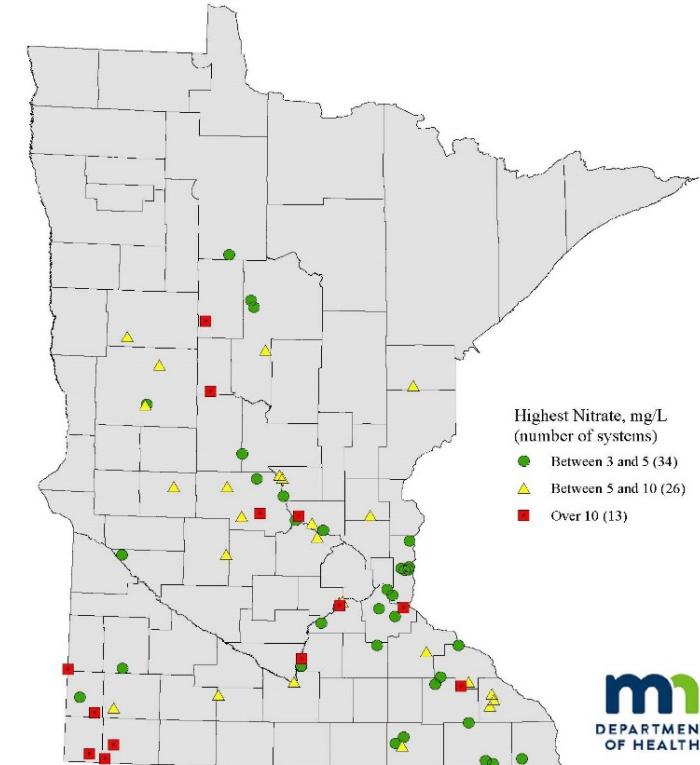


Community water systems

13 with nitrate over 10 mg/l; **26** with nitrate 5-10 mg/l

Community Public Water Systems with Elevated Source Water Nitrate, 2017-2018

Map prepared by Minnesota Department of Health, June 2019

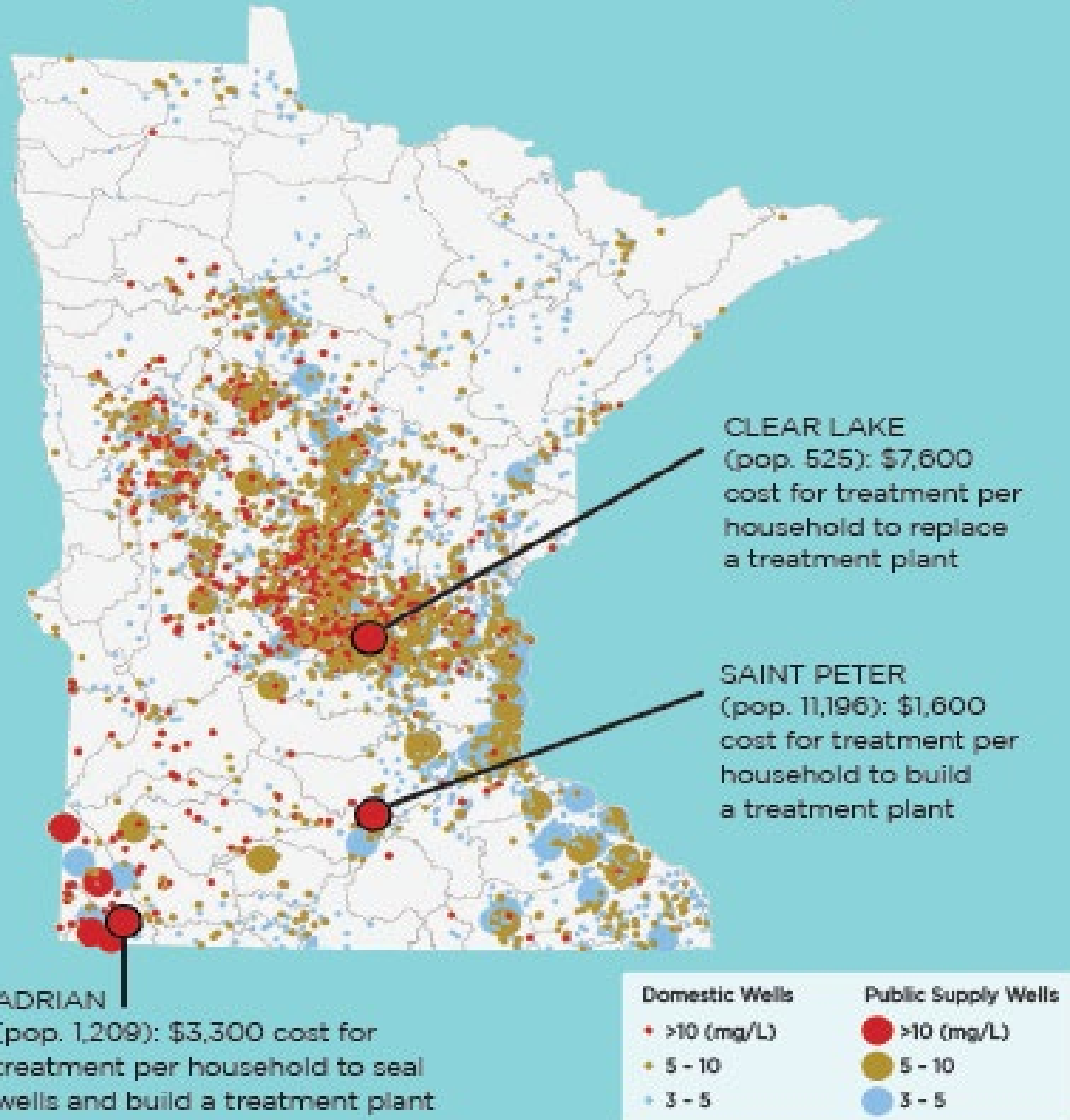


This map shows those community water systems where source water samples for nitrate were above 3 mg/L. The samples were collected and analyzed during 2017-2018. Each sample was collected from a source or entry point and represents source water nitrate levels. These results do not represent finished water quality. A total of 967 community public water systems exist in Minnesota. Community water systems provide water to people in their homes.

Note: The nitrate water quality standard for finished water is 10 mg/L.

Maximum Nitrate–Nitrogen Concentrations in Public and Domestic Wells (1990–2015)

The map shows three categories of contamination in mg/L: showing human influence (3–5), of concern to state agencies (5–10), and above the federal safe drinking water standard (>10). Data source: Minnesota County Wells Index.



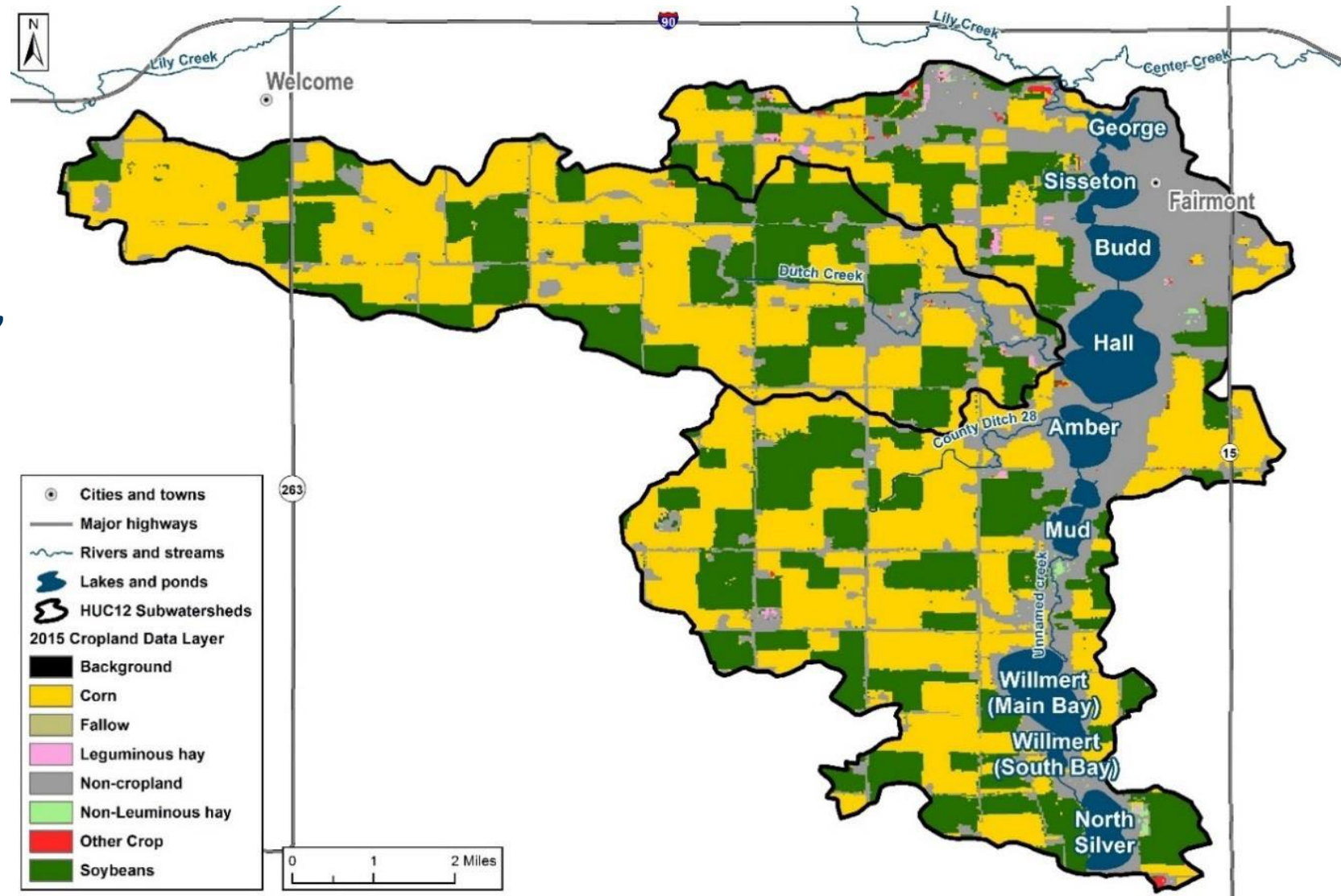
Costs for safe drinking water

Systems in smaller communities have fewer customers to spread the costs around

Inequities in what families have to pay to treat for nitrate

Why important? Drinking water – surface waters

City of Fairmont, Minnesota



Why important? Local lake & stream impairments

Effects:

- Less oxygen for fish
- Toxic blue-green algae
- Recreation/economic declines

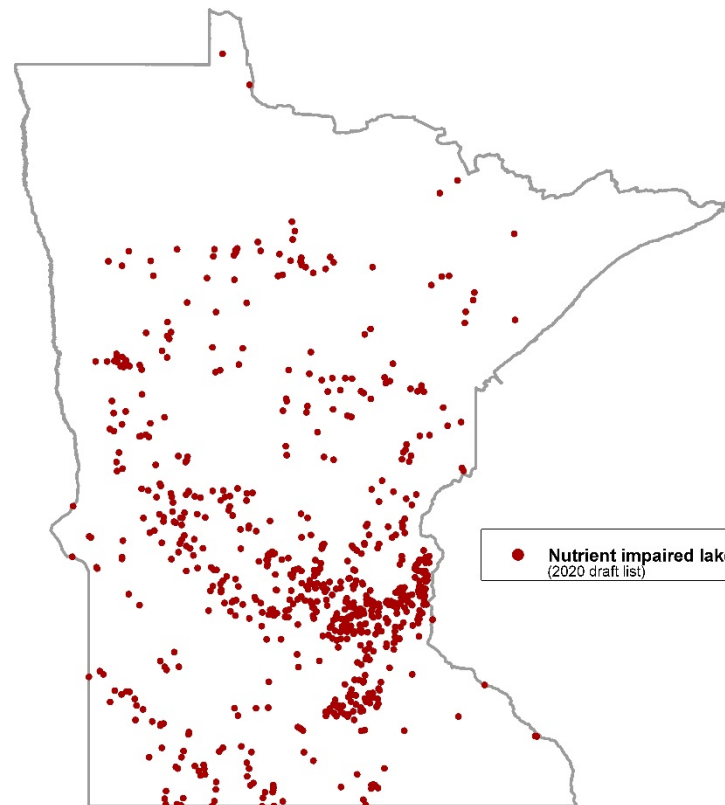


Benton Lake

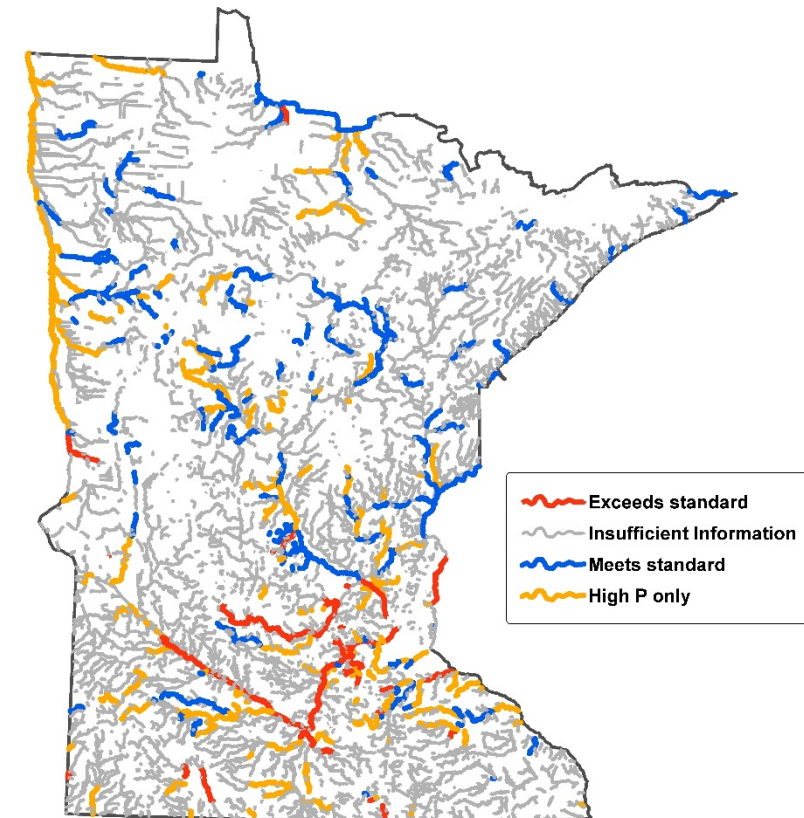


Lake Byllesby

693 lakes impaired



814 river miles impaired

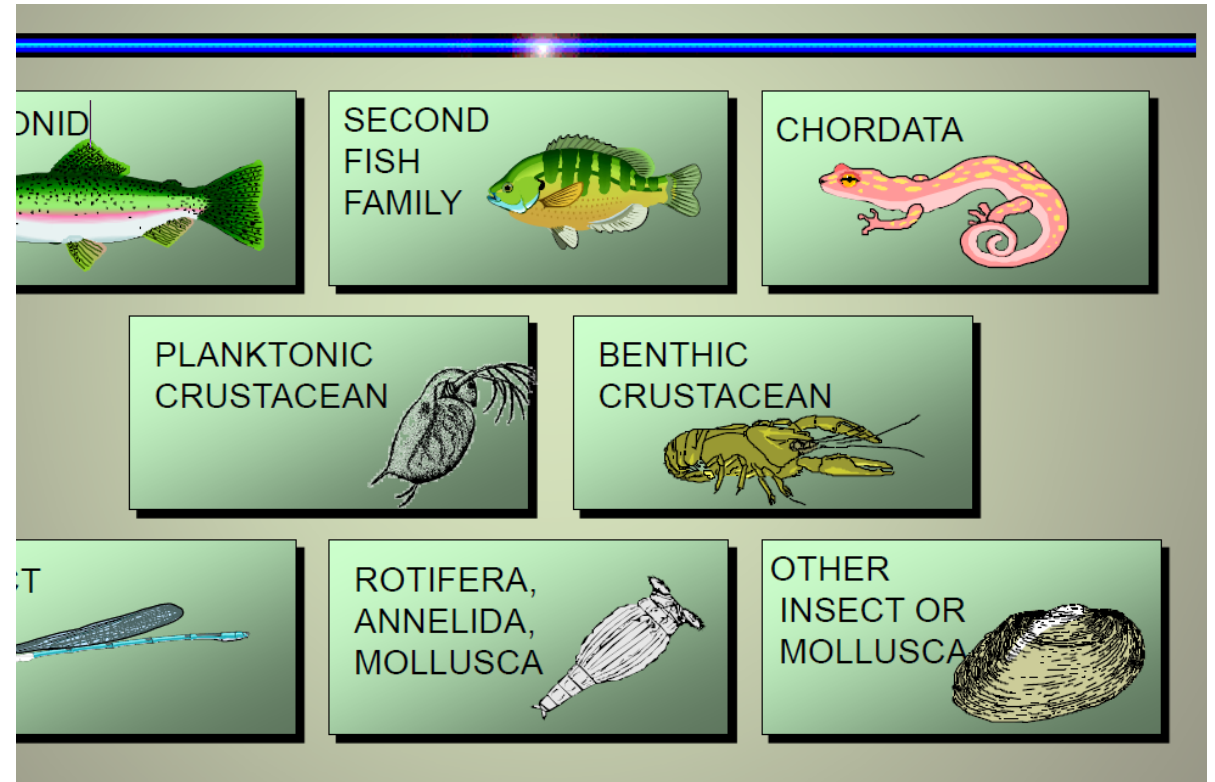


Why important? Aquatic life nitrate toxicity

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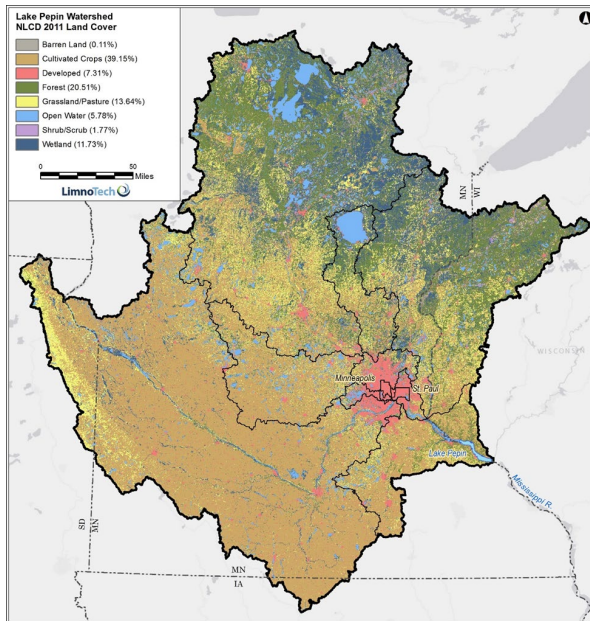
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Why important? Downstream algae blooms

Lake Pepin

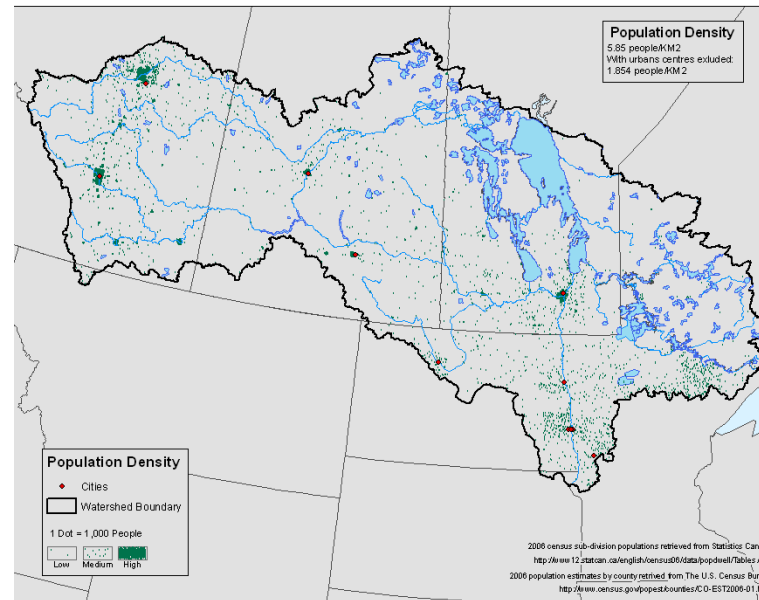
Need 35% P reduction*



*from 2008-17 baseline

Lake Winnipeg

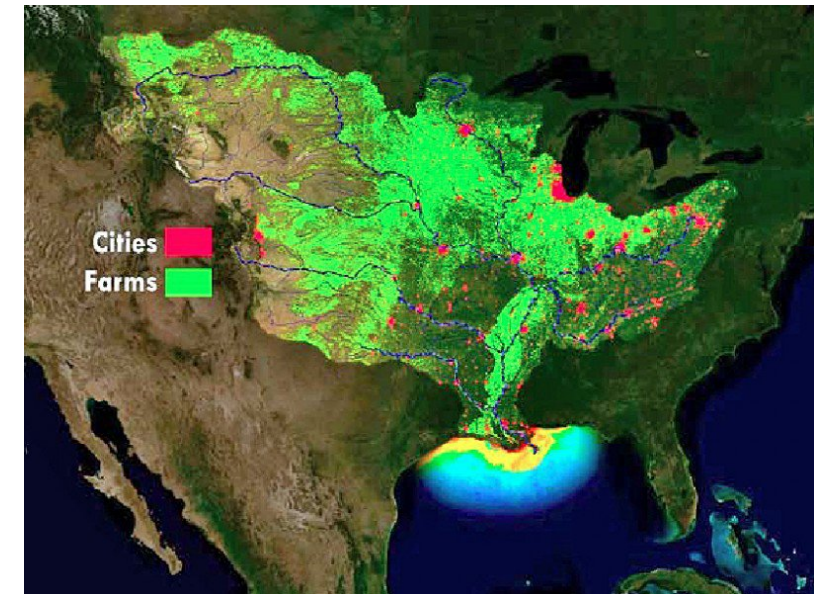
Need 50% N & P reductions in Red River**



**from late 1990s baseline

Gulf of Mexico

Need 45% N and P reductions to reduce hypoxic zone to 1/3 current size***



***from 1980-96 baseline

Good reasons to care

Nutrient loss to our waters:

- Impacts human health/drinking water
- Lost nutrients to water = lost fertilizer value
- Costs to treat drinking water, replace wells, build onto water treatment plants
- Affects recreation and tourism in Minnesota and Canada
- Harms shell-fish industry in Gulf of Mexico



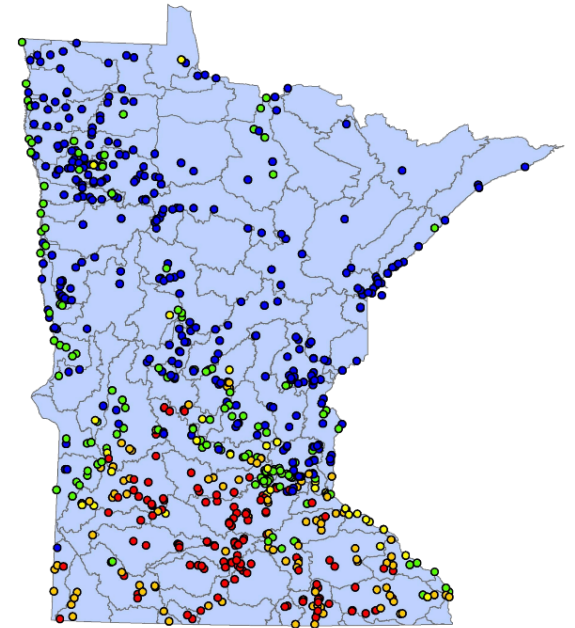
Minneopa Falls running green



Outlet of Cottonwood Lake

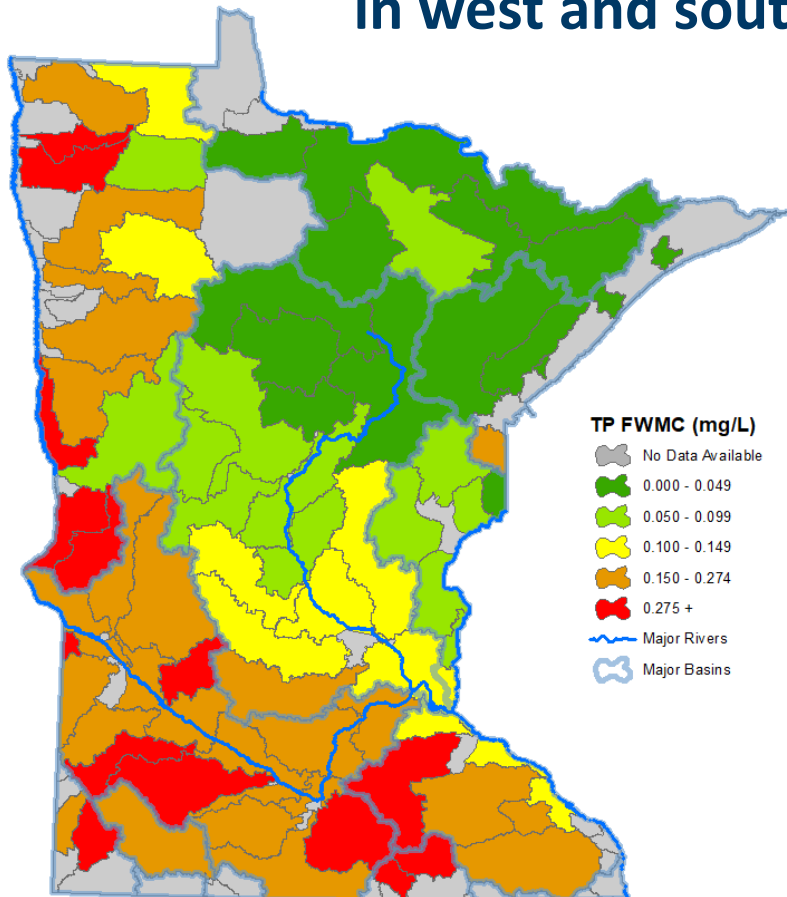
River conditions and trends

1. Why important to reduce nutrient losses?
2. Conditions and trends
3. Sources – ag and urban important
4. We've made progress, but there's more we need to do
5. Minnesota's nutrient reduction strategy addresses both urban and agricultural sources



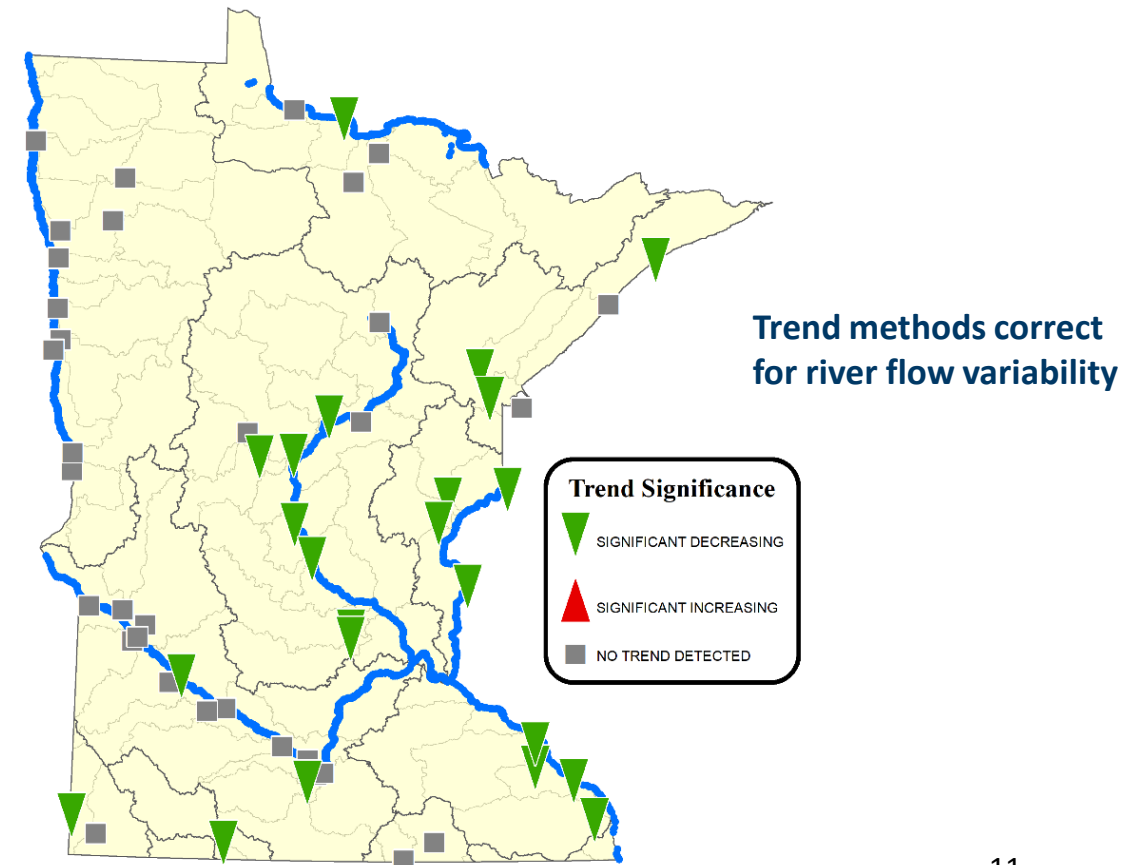
River condition, trends - phosphorus

Highest phosphorus
in west and south



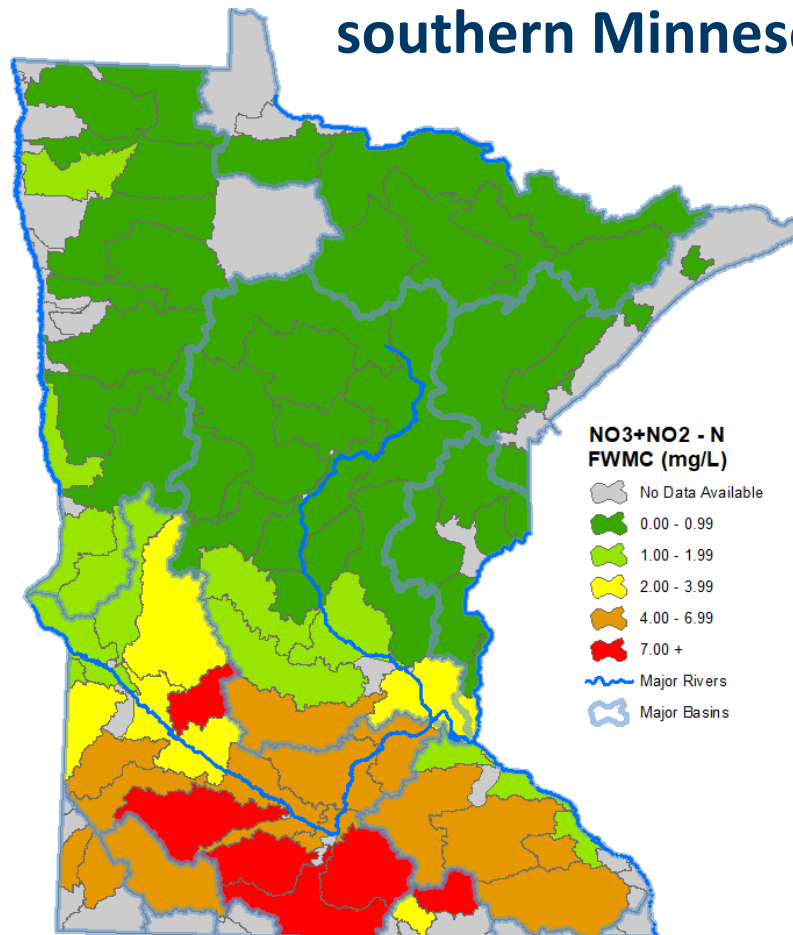
P concentrations **decreasing**
or non-significant trend

2008-2017



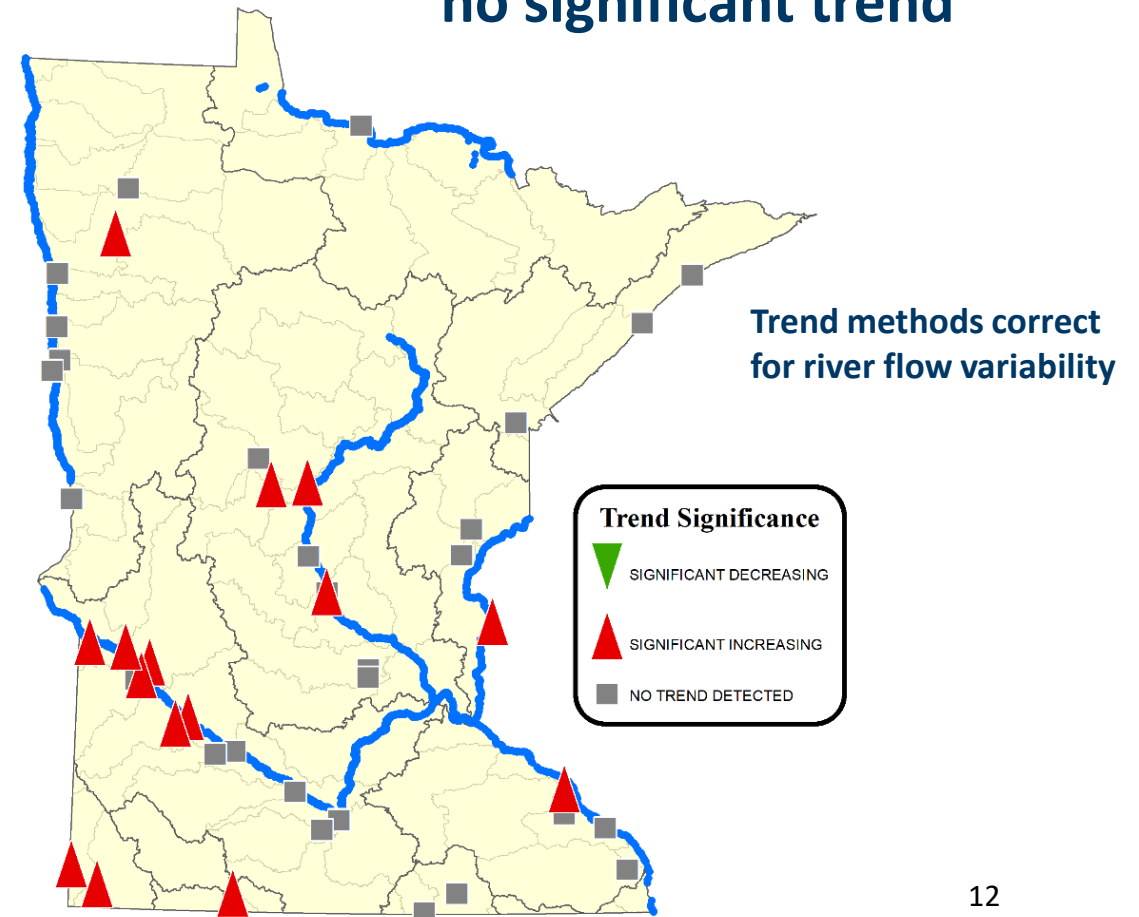
River condition, trends - nitrate

Highest nitrate in southern Minnesota



2008-2017

Nitrate **increasing** or no significant trend



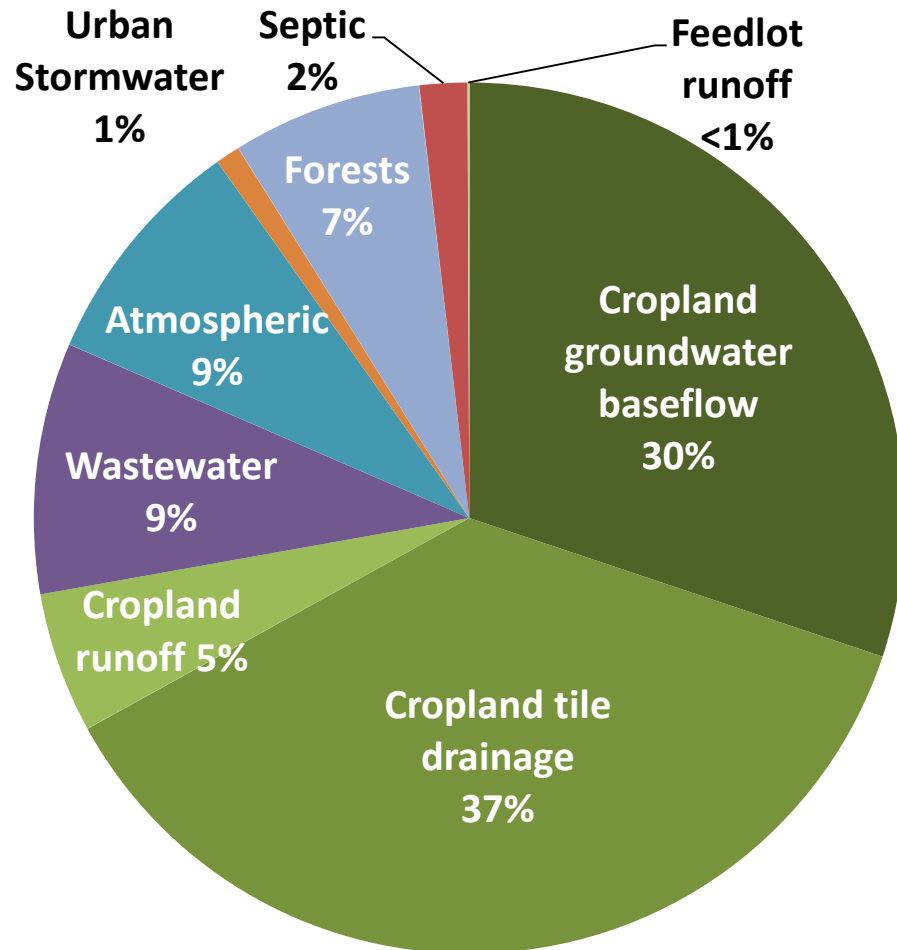
Nutrient sources

1. Why important to reduce nutrient losses?
2. Conditions & trends
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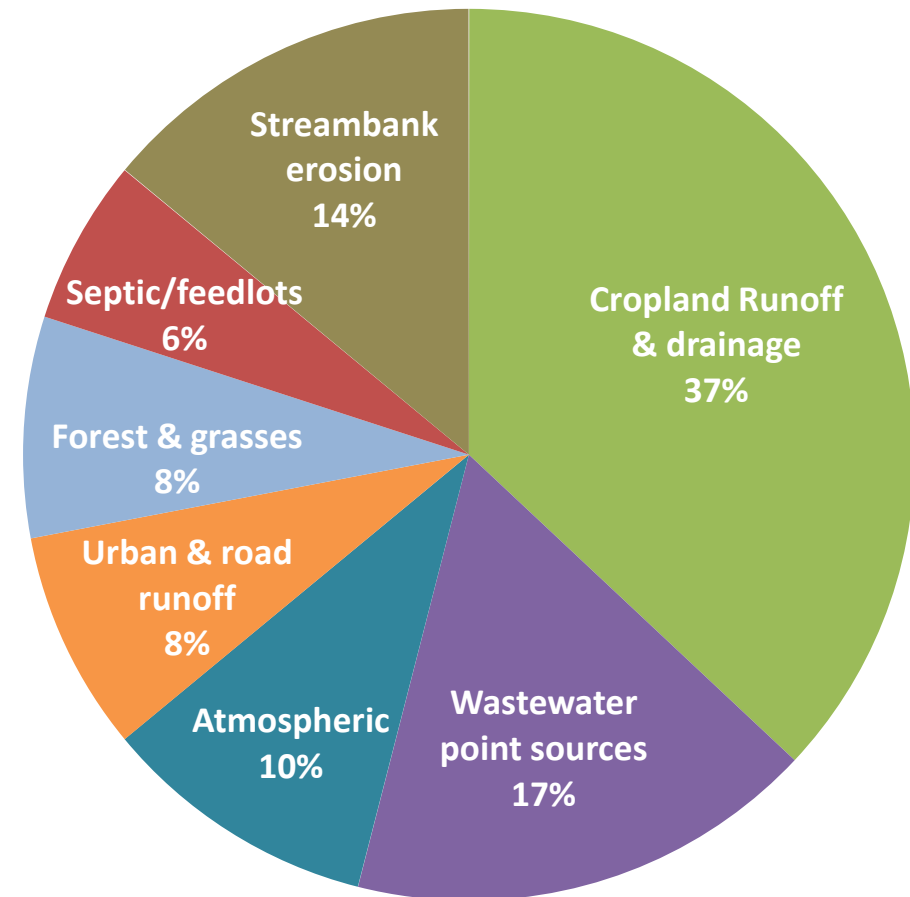
Statewide sources to rivers differ for N & P

Nitrogen



Source: MPCA & UMN 2013

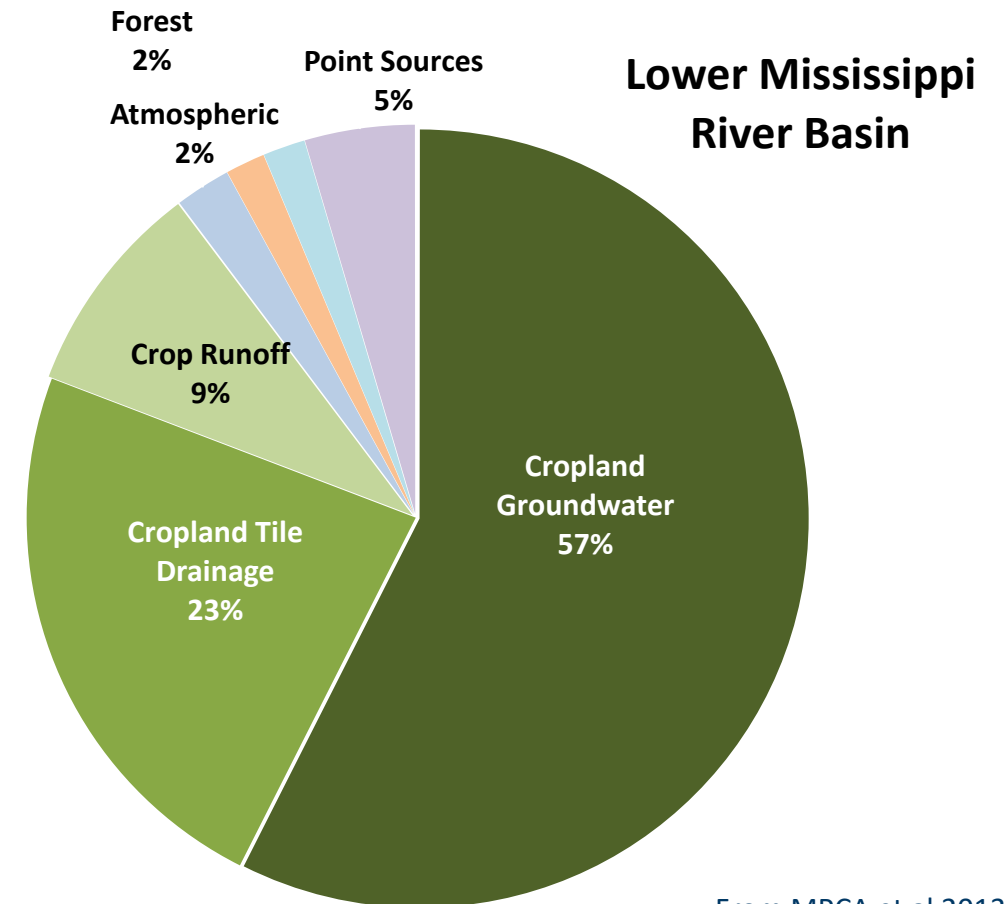
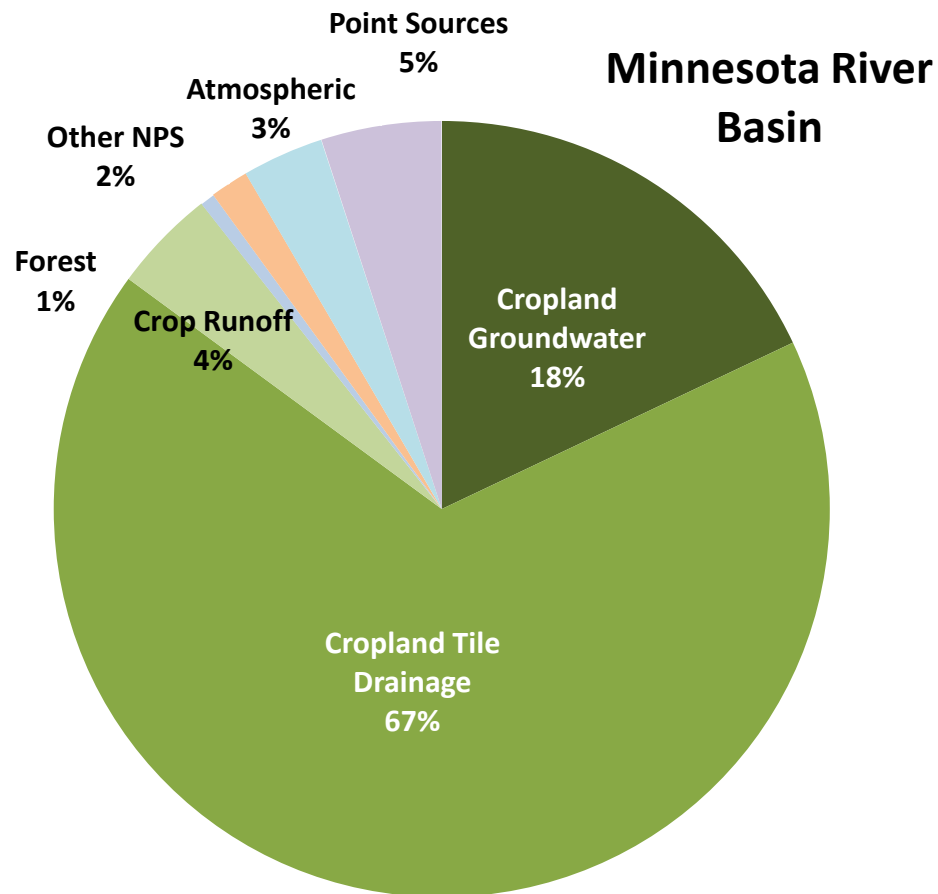
Phosphorus



Source: MPCA et al., 2014

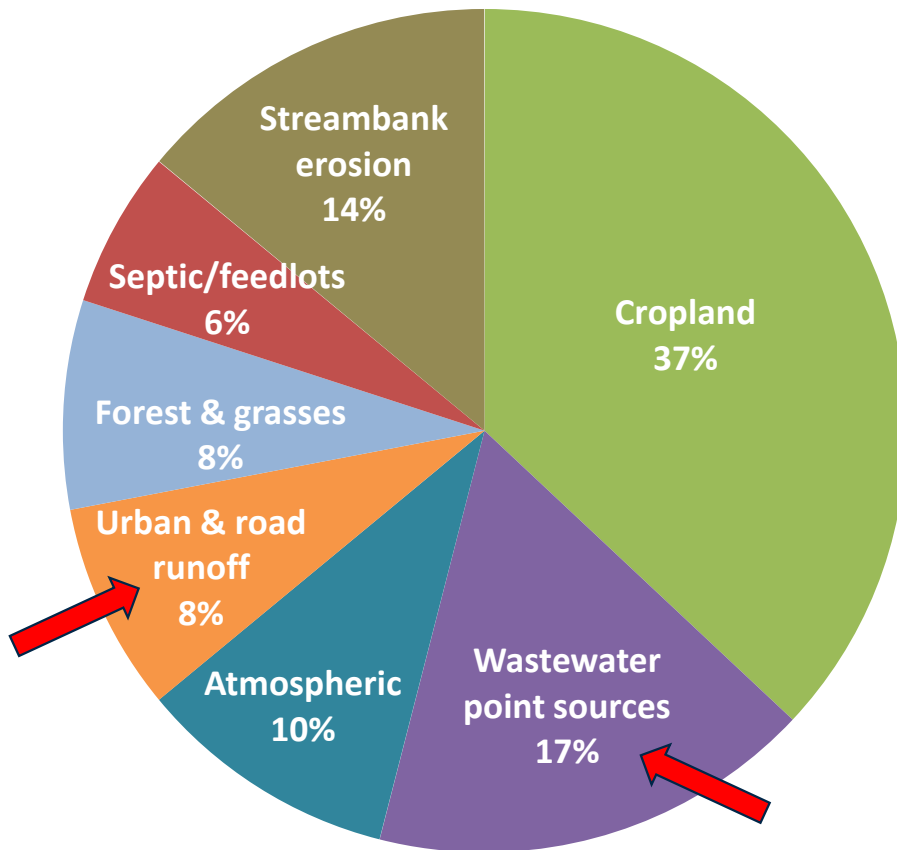
Sources and pathways vary by region

Nitrogen to rivers



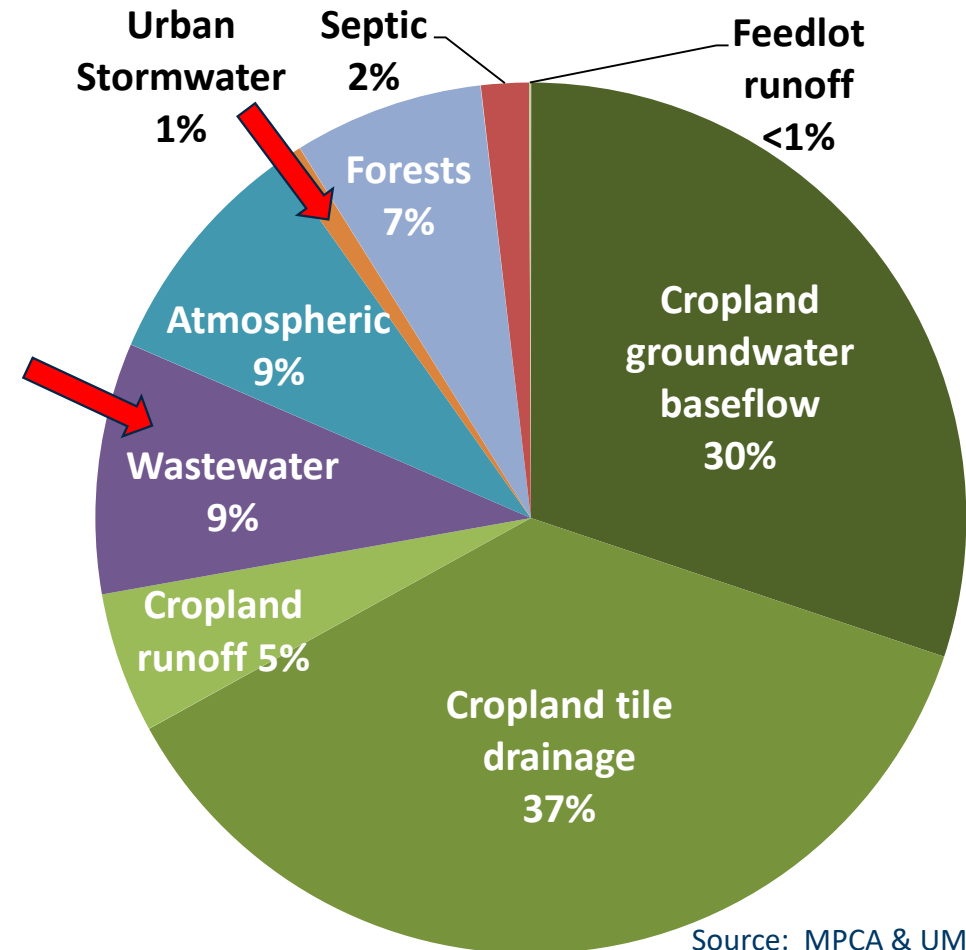
Important to reduce **Urban** sources of N & P

Phosphorus



Source: MPCA et al., 2014

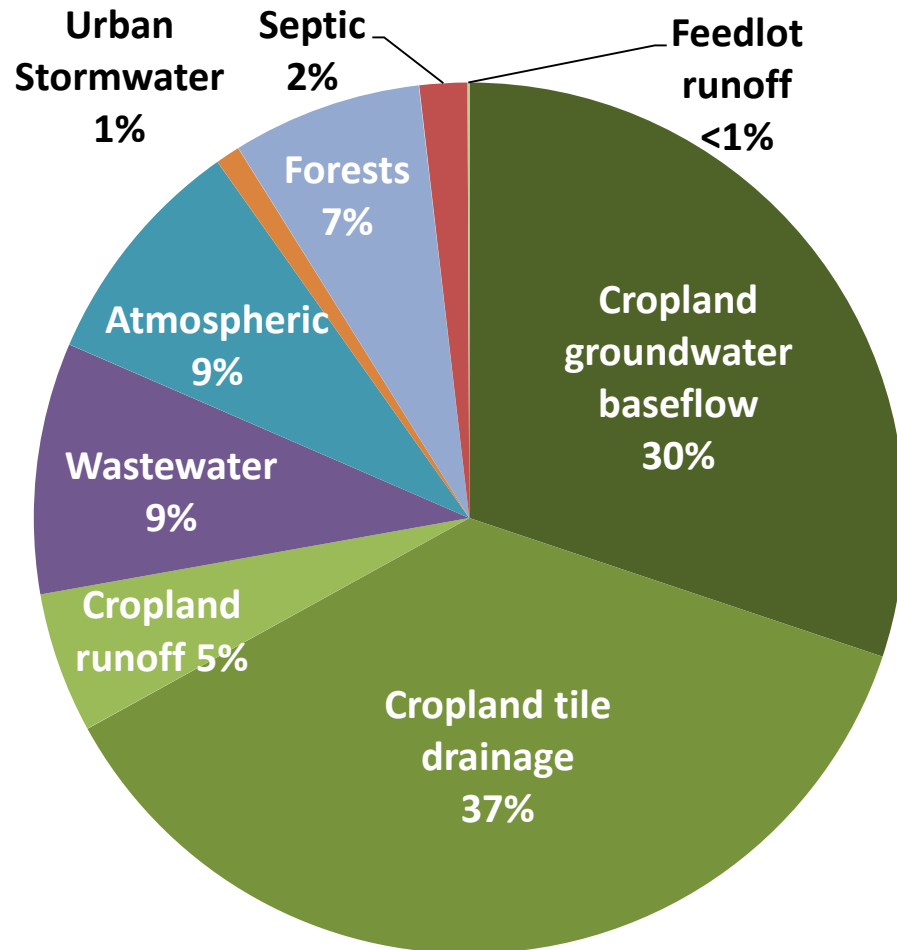
Nitrogen



Source: MPCA & UMN 2013

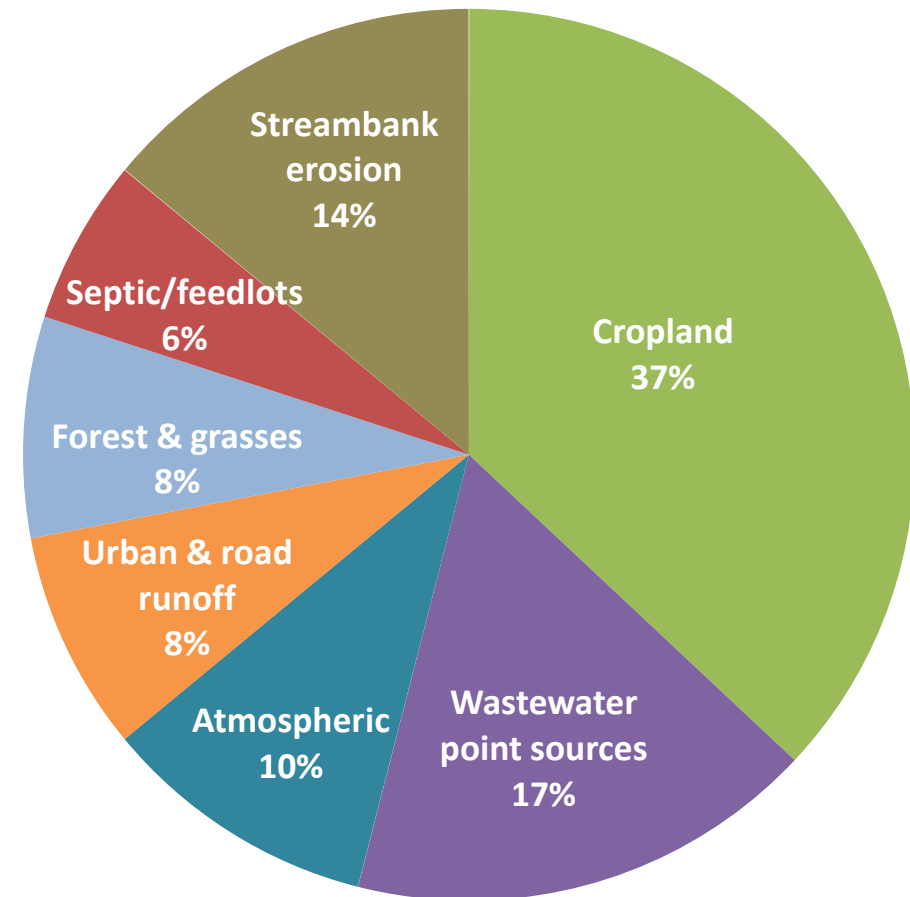
Important to reduce Cropland N & P losses

Nitrogen



Source: MPCA & UMN 2013

Phosphorus



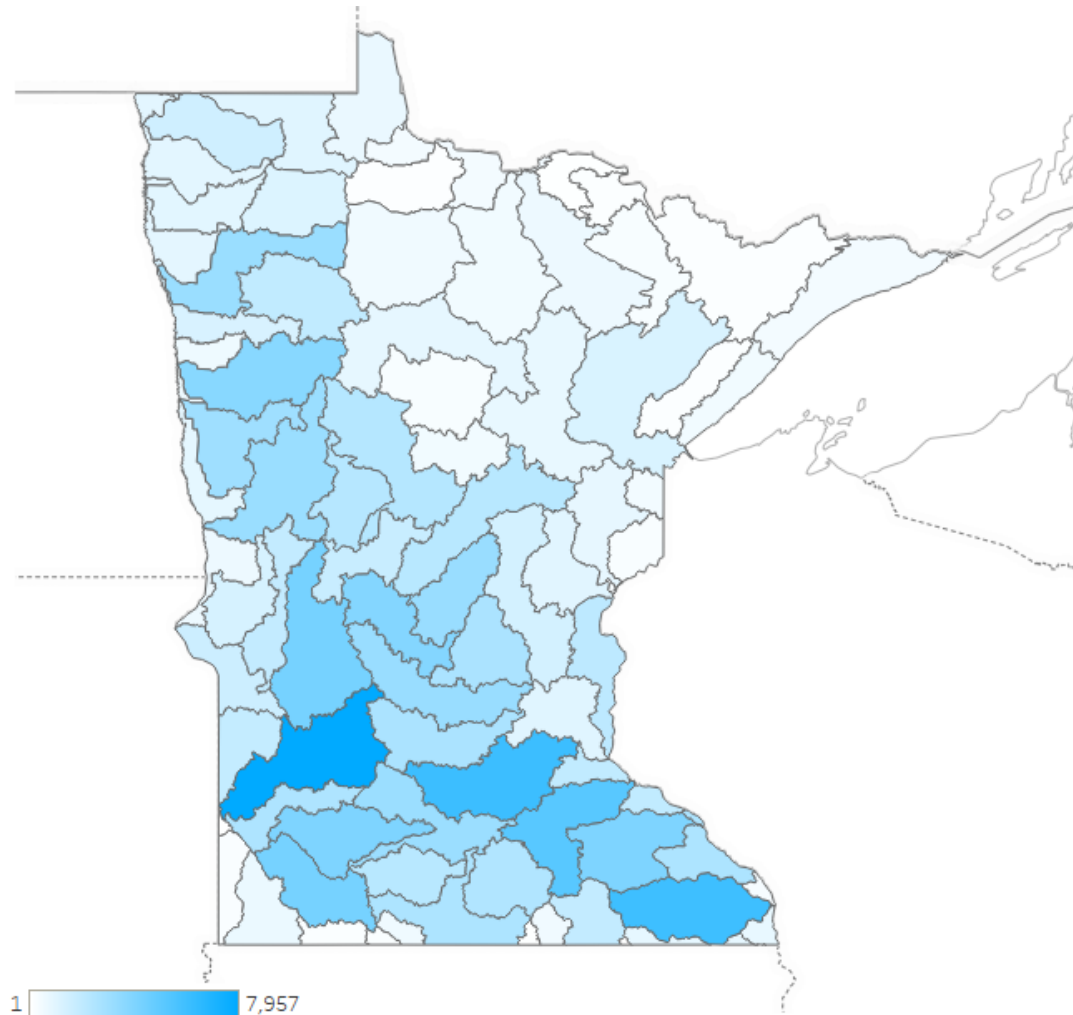
Source: MPCA et al., 2014

Progress and needs

1. Why important to reduce nutrient losses?
2. Conditions and trends
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BMPs adopted through governmental programs



BMPs Installed 2004-2018	BMP Count
Tillage/residue management	11,382
Designed erosion control & trapping	10,236
Nutrient management (cropland)	9,992
Septic System Improvements	7,874
Converting land to perennials	7,696
Open tile inlet & side inlet improvements	7,136
Stream banks, bluffs & ravines protected/restored	6,073
Buffers and filters - field edge	5,348
Add living cover to annual crops in fall/spring	4,508
Habitat & stream connectivity management	4,026
Pasture management	3,087
Drainage ditch modifications	2,715
Agricultural tile drainage water treatment/storage	1,184
Urban Stormwater Runoff Control	1,114
Changing rotations to less erosive crops	455
Feedlot runoff controls	173
Forestry Management	138
Wetland restoration/creation	104
In Lake Management	4
Other	51,878
Grand Total	135,123

Agricultural progress

- *er Basin*

- *de 1997-*

- eased by

- fication

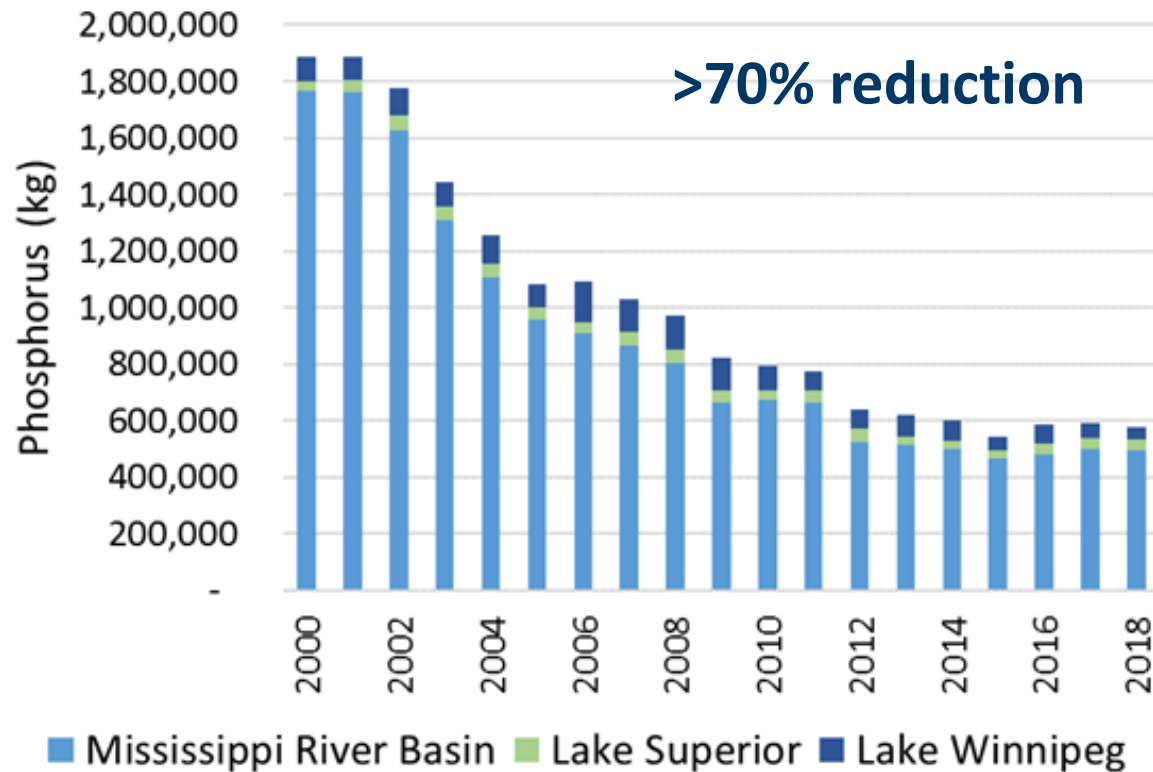
- More than 500,000 acres certified, and growing



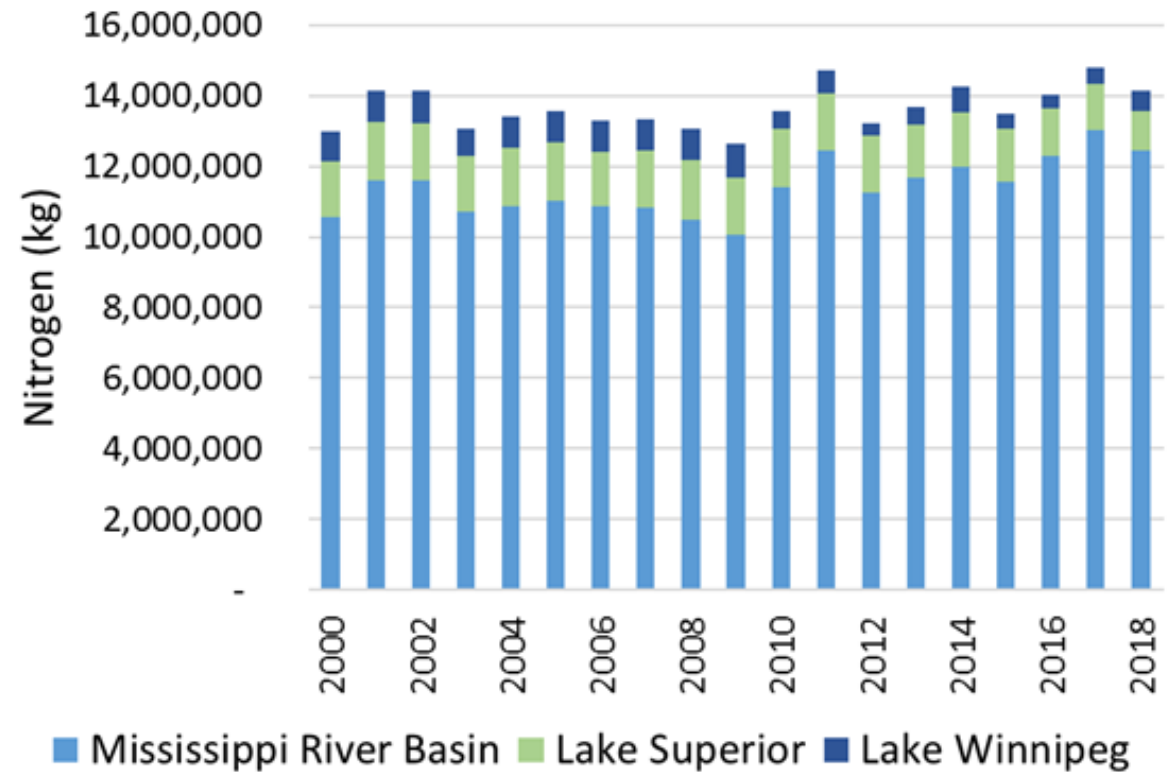
Wastewater nutrient discharges

2000-2018

Phosphorus



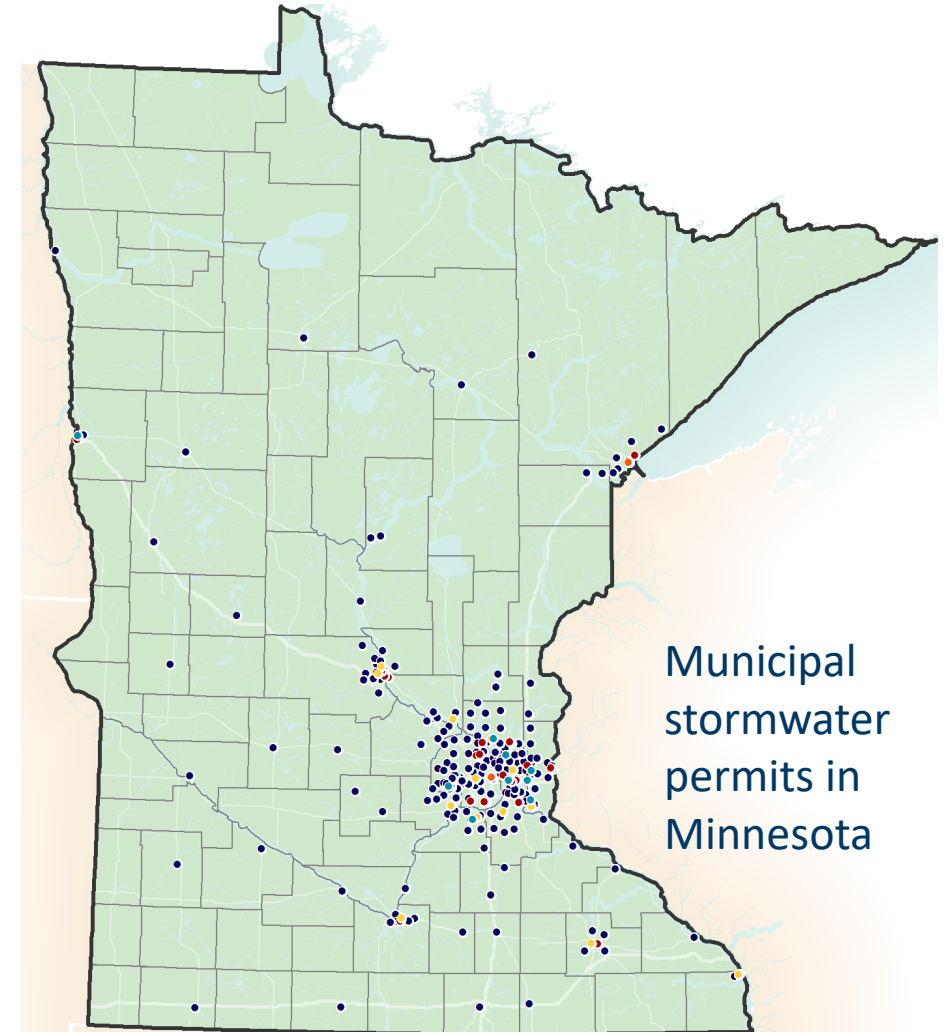
Nitrogen



Stormwater reductions

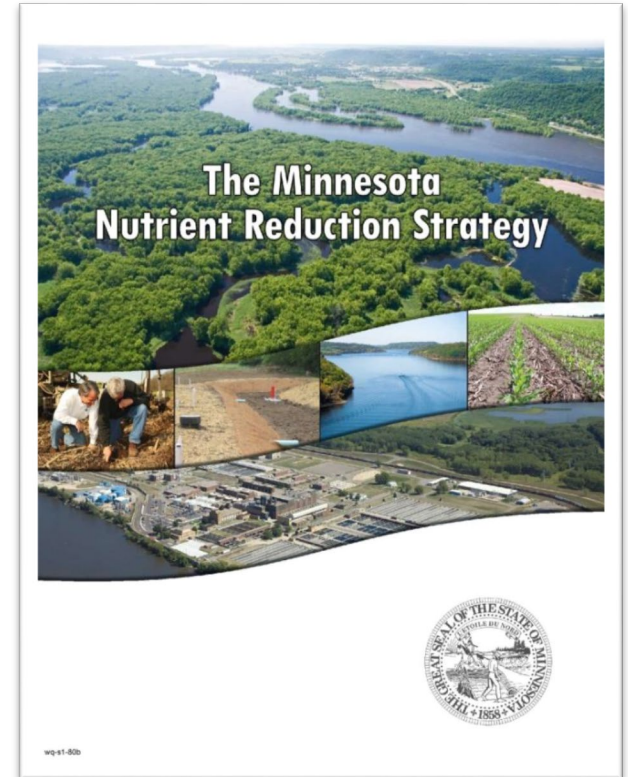
- Lawn fertilizer phosphorus restricted since 2004
 - Turf N and P fertilizer ~ 2% of all fertilizer used
- Urban stormwater runoff programs:
 - Thousands P lbs reduced
 - 2,000-2,500 construction projects per year

Afternoon breakout session

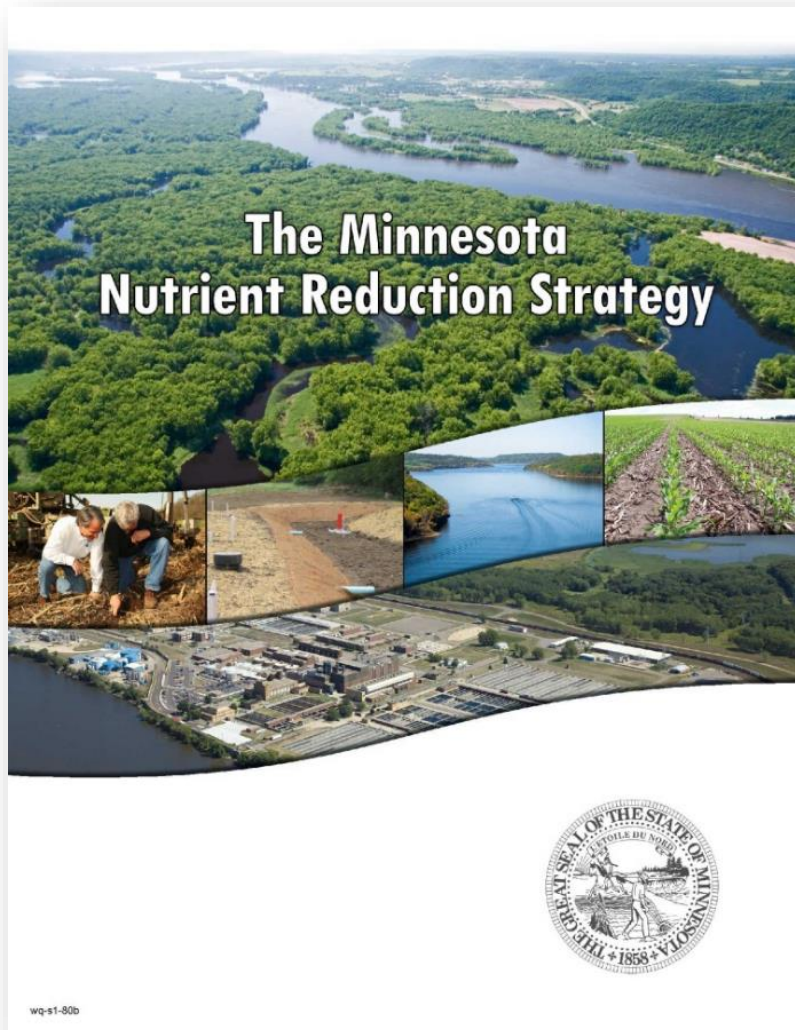


Minnesota Nutrient Reduction Strategy

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Minnesota Nutrient Reduction Strategy



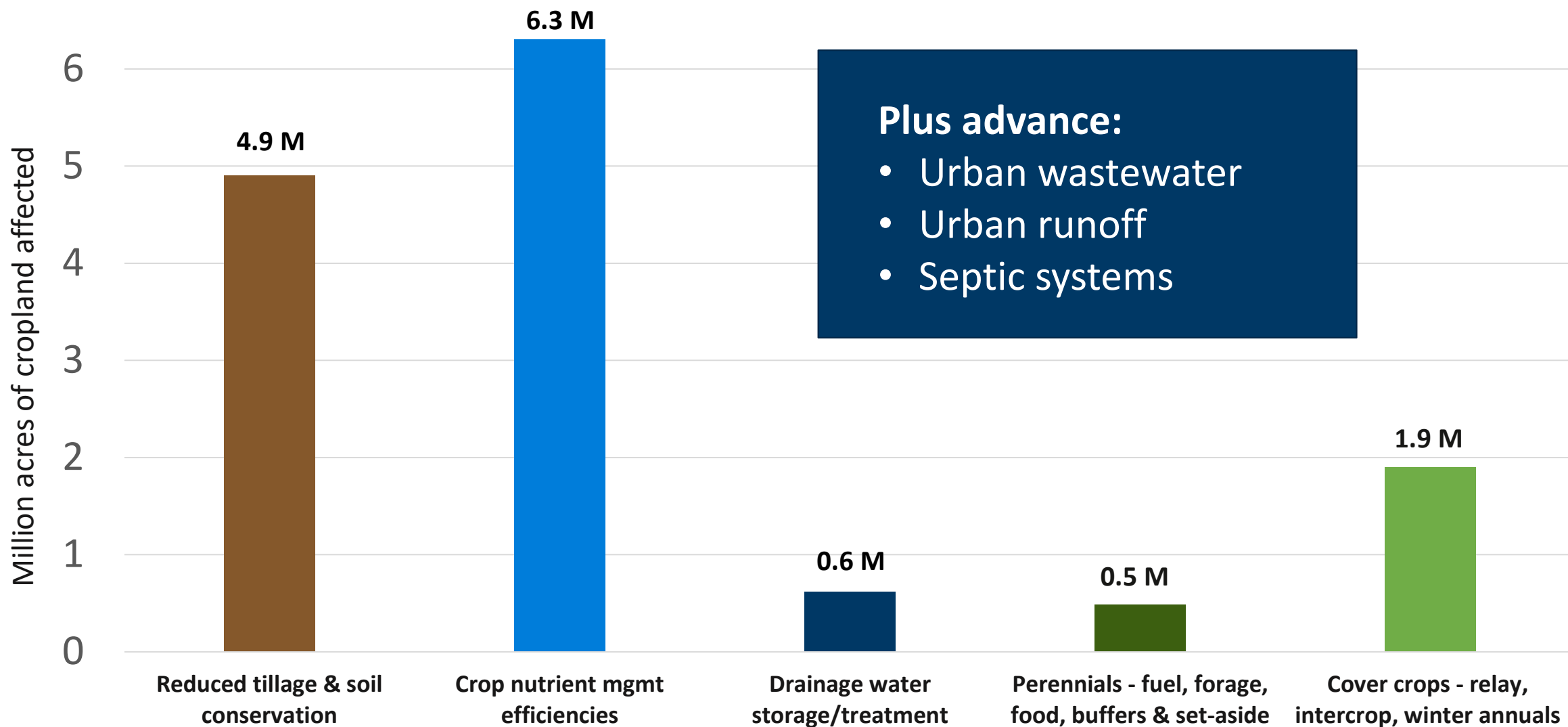
Finalized in 2014 by 11 organizations

Public review in 2013

Afternoon breakout session

How many new BMP acres to reach 2025 milestone?

7



Working together for Waverly Lake



Waverly Lake – impaired and today

Questions?