Importance of Urban and Non-Urban Nutrient Loss Reductions

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MINNESOTA POLLUTION CONTROL AGENCY

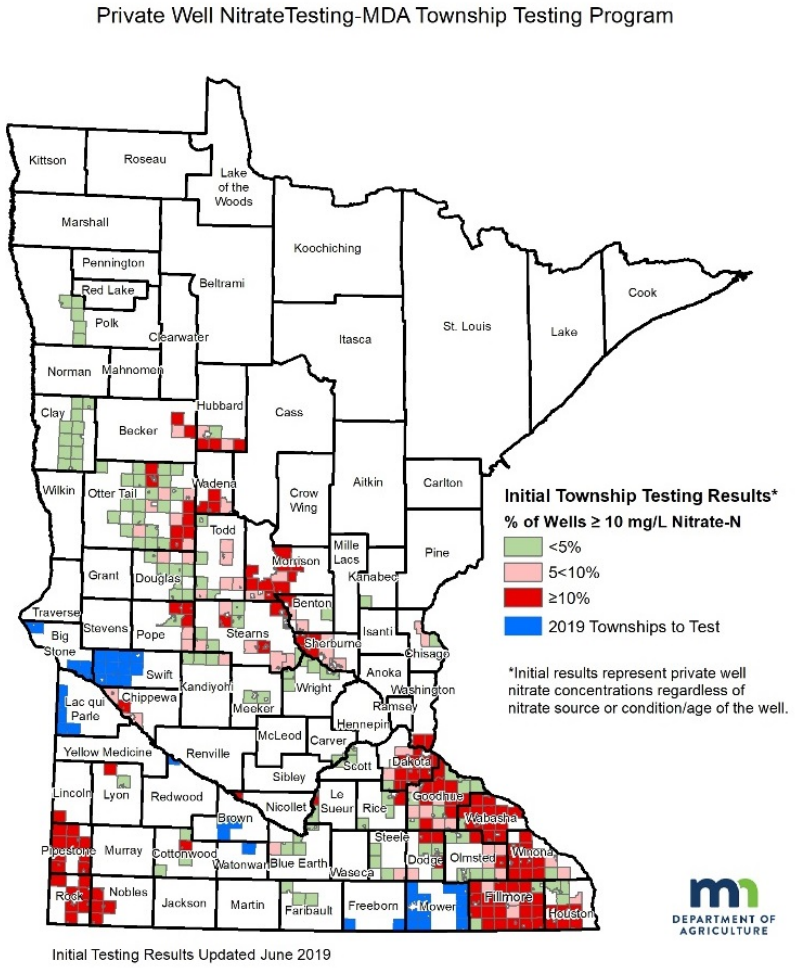
Outline – Nutrients in waters

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

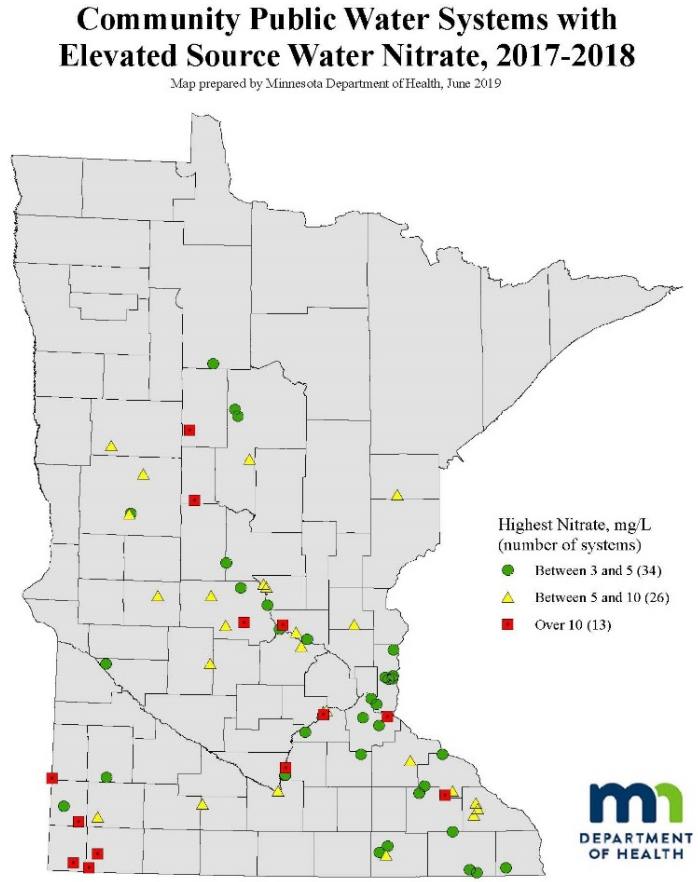
Private Wells

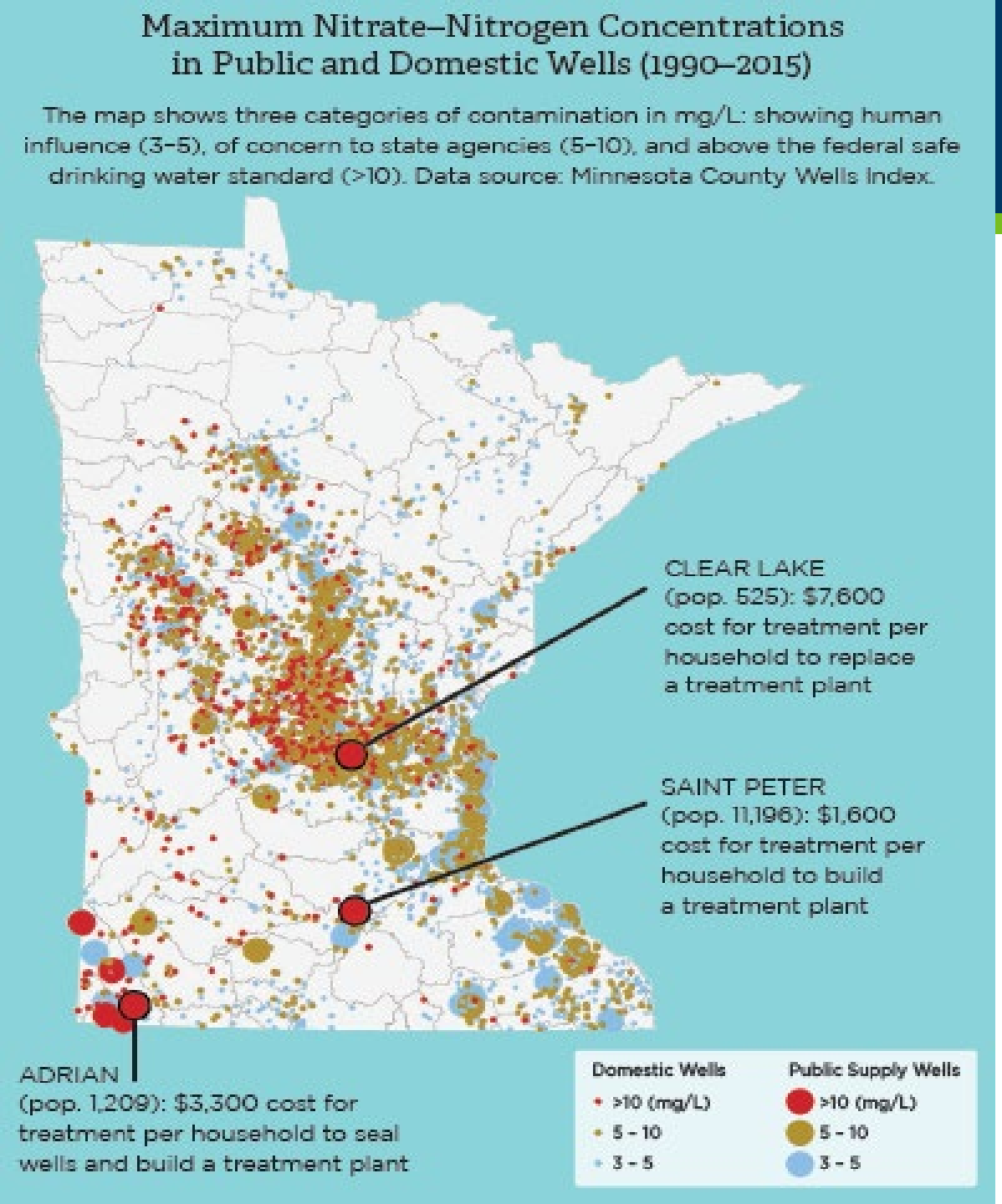
110+ townships have over 10% of wells exceeding nitrate standard



Community water systems

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





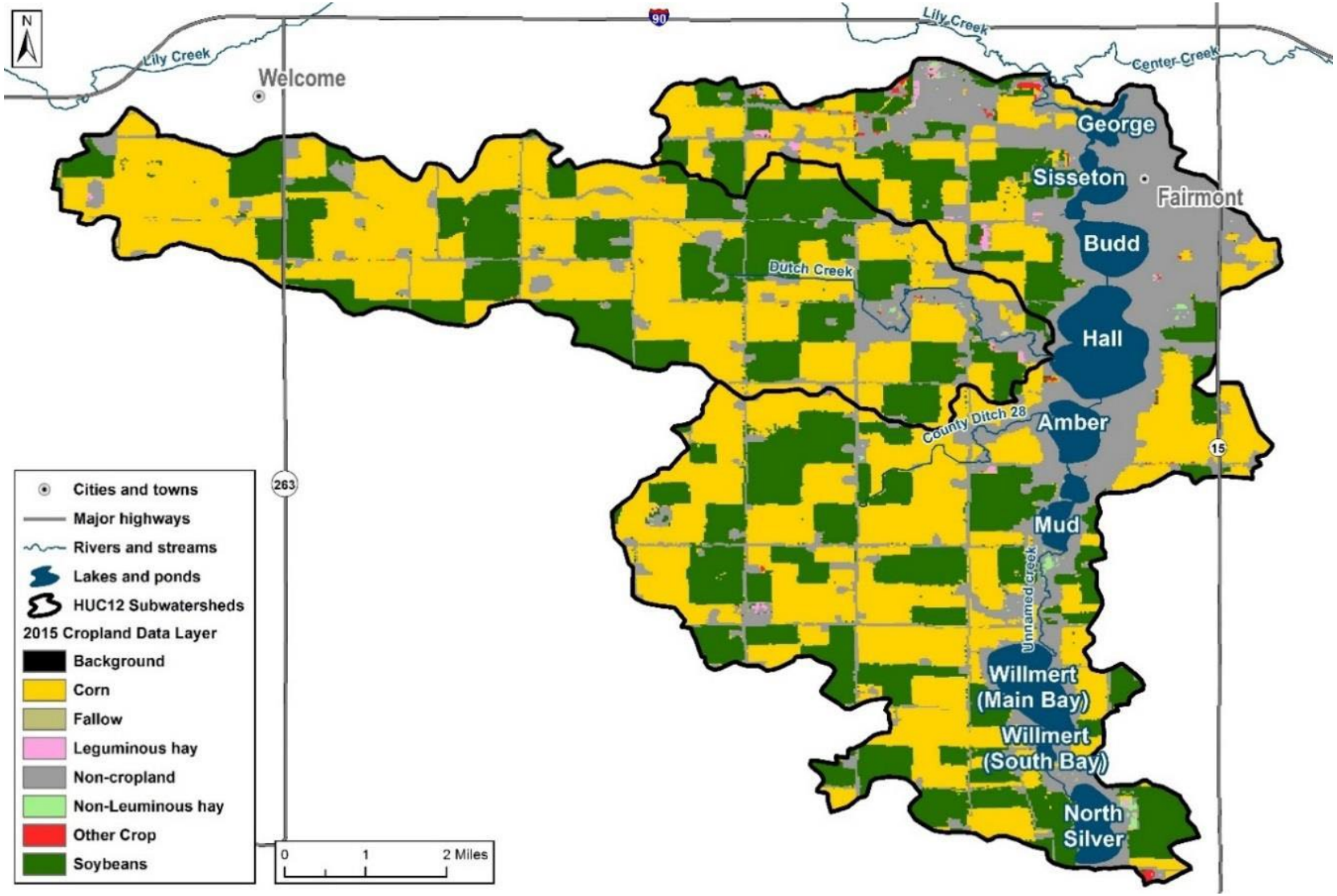
Costs for safe drinking water

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

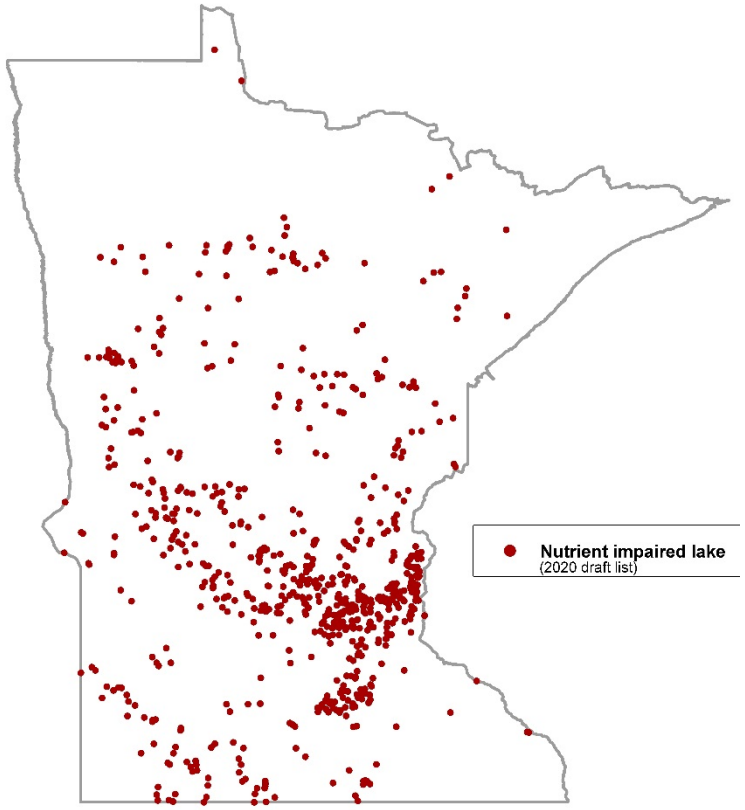
Effects:

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

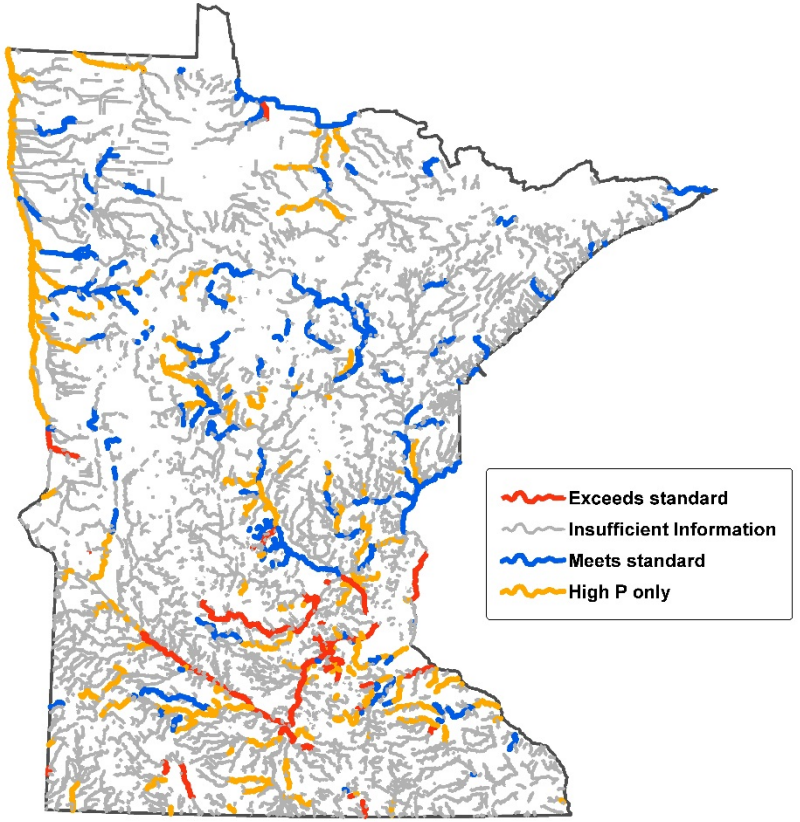
Benton Lake

Lake Byllesby

693 lakes impaired



814 river miles impaired



Why important? Aquatic life nitrate toxicity

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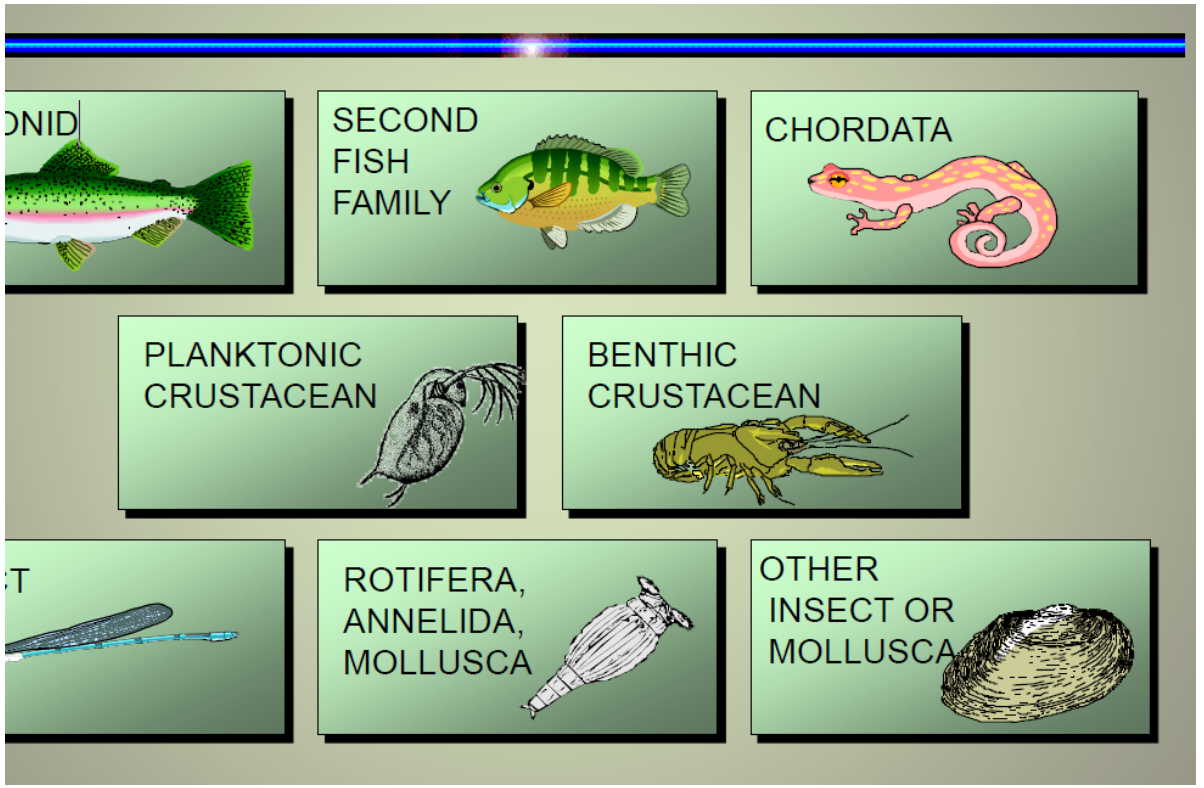
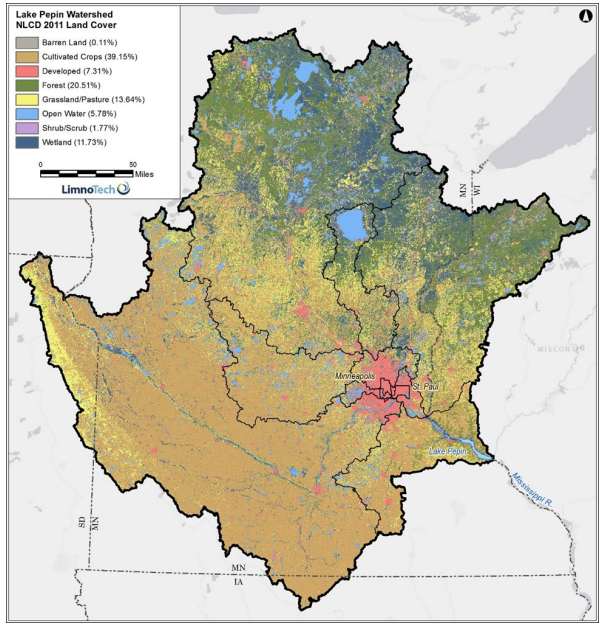


Why important? Downstream algae blooms

Lake Pepin

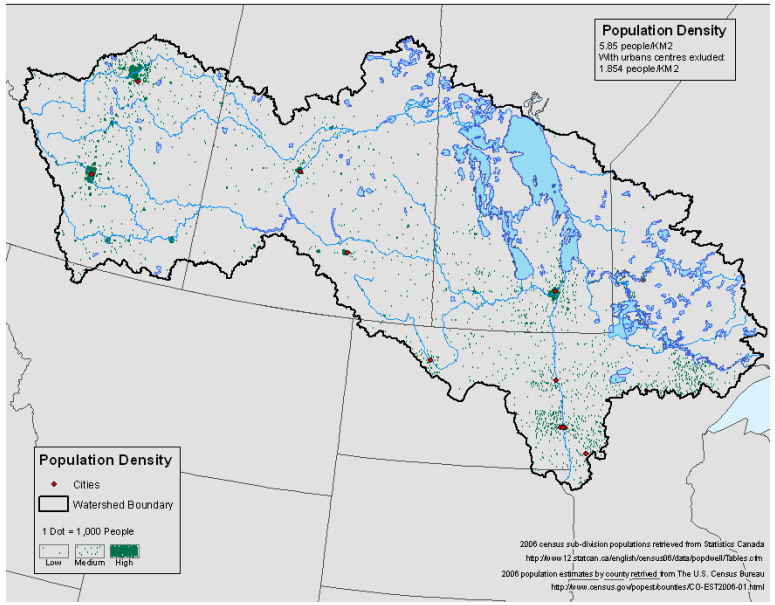
Need 35% P reduction*



*from 2008-17 baseline

Lake Winnipeg

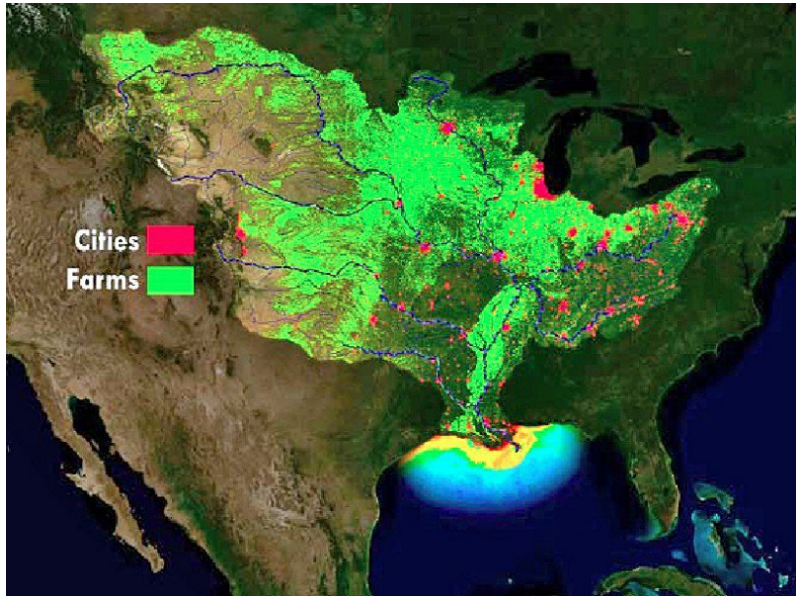
Need 50% N & P reductions in Red River**



**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:

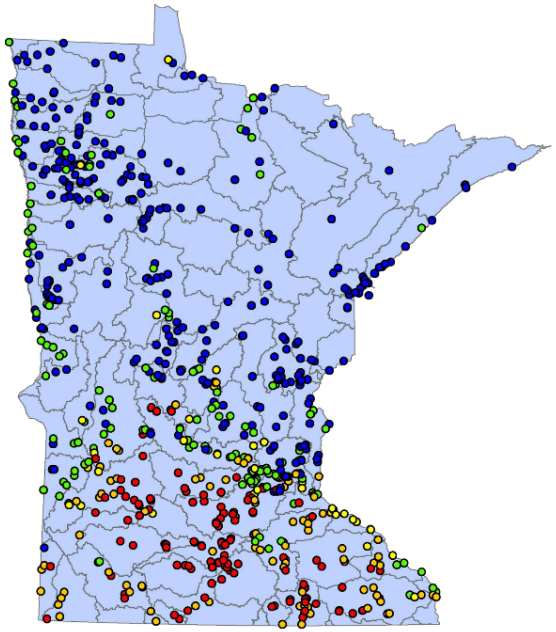
- Impacts human health/drinking water
- Lost nutrients to water = lost fertilizer value
- Costs to treat drinking water, replace wells, build onto water treatment plants
- Affects recreation and tourism in Minnesota and Canada
- Harms shell-fish industry in Gulf of Mexico

Minneopa Falls running green

Outlet of Cottonwood Lake

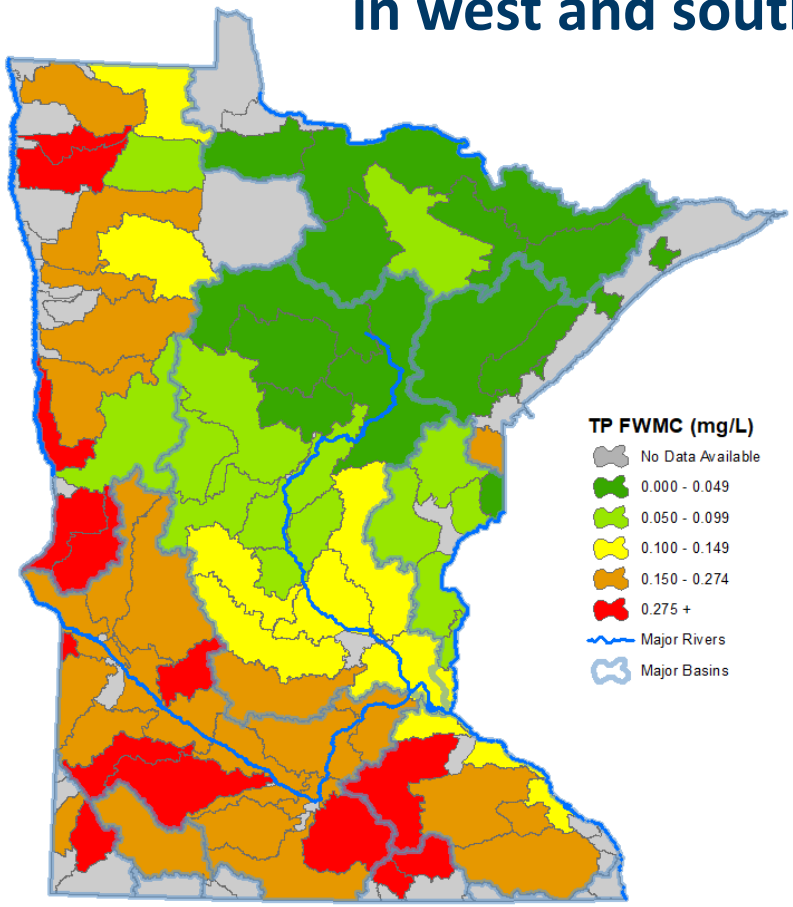
River conditions and trends

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

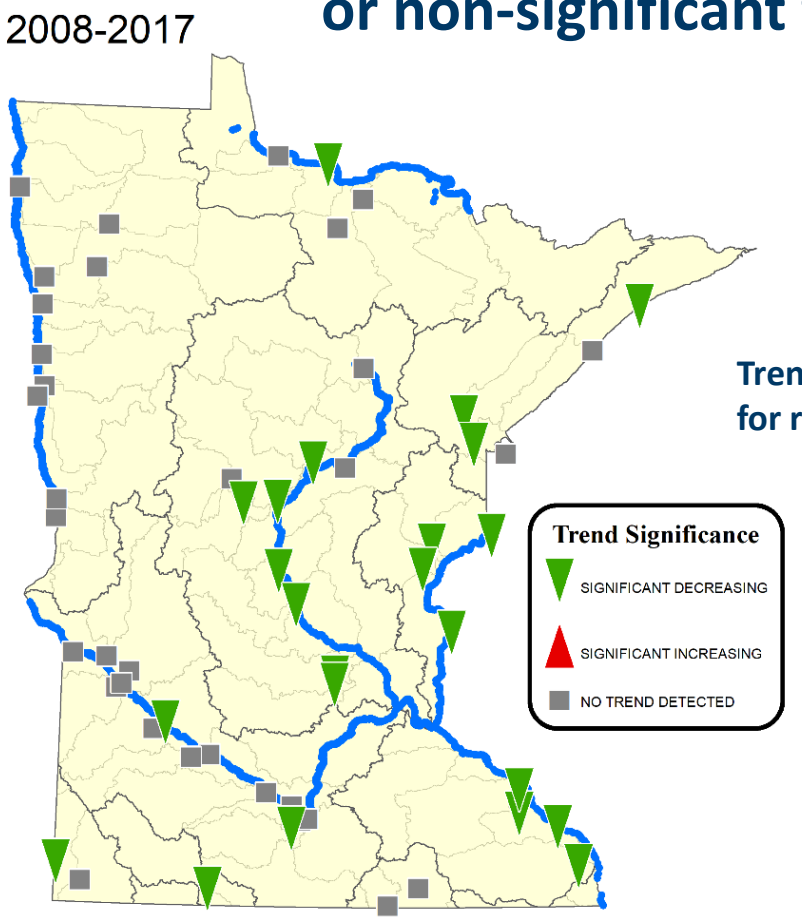


River condition, trends - phosphorus

Highest phosphorus in west and south



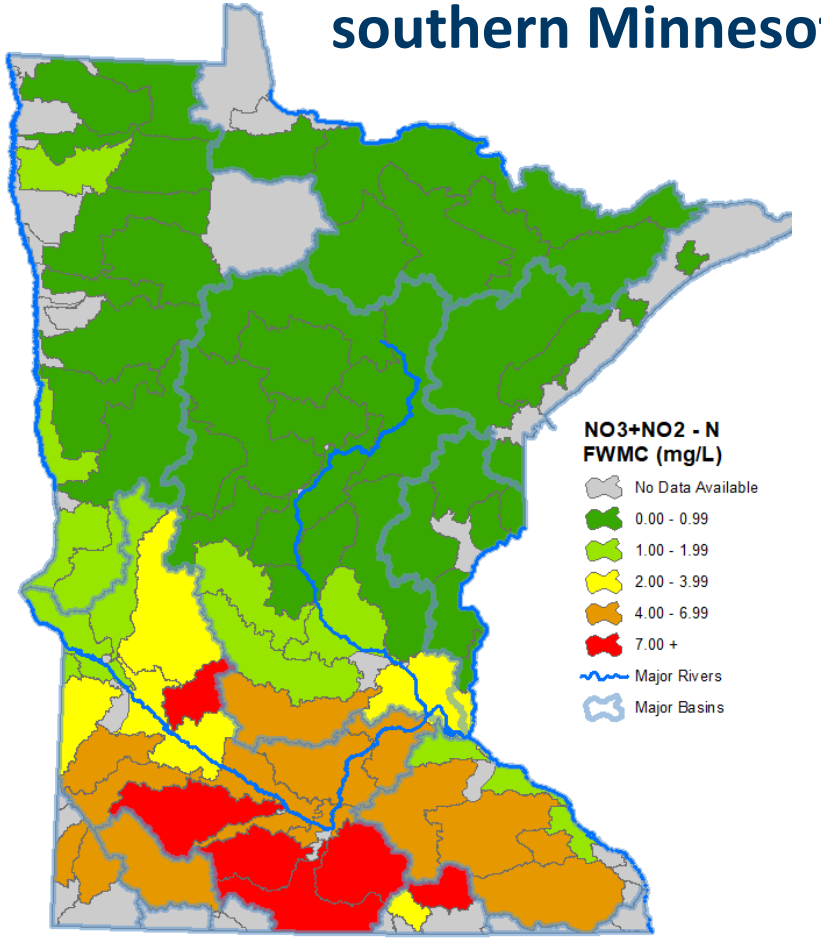
P concentrations decreasing or non-significant trend



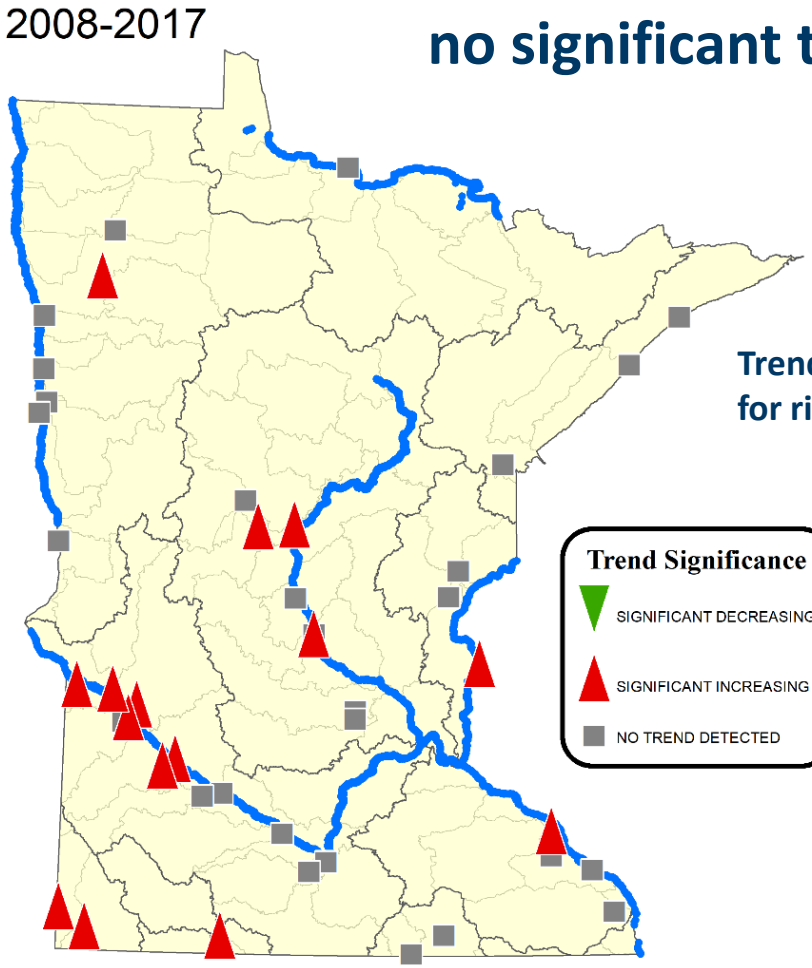
Trend methods correct for river flow variability

River condition, trends - nitrate

Highest nitrate in southern Minnesota



Nitrate increasing or no significant trend



Trend methods correct for river flow variability

Nutrient sources

1. Why important to reduce nutrient losses?
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3. Sources – urban and ag important
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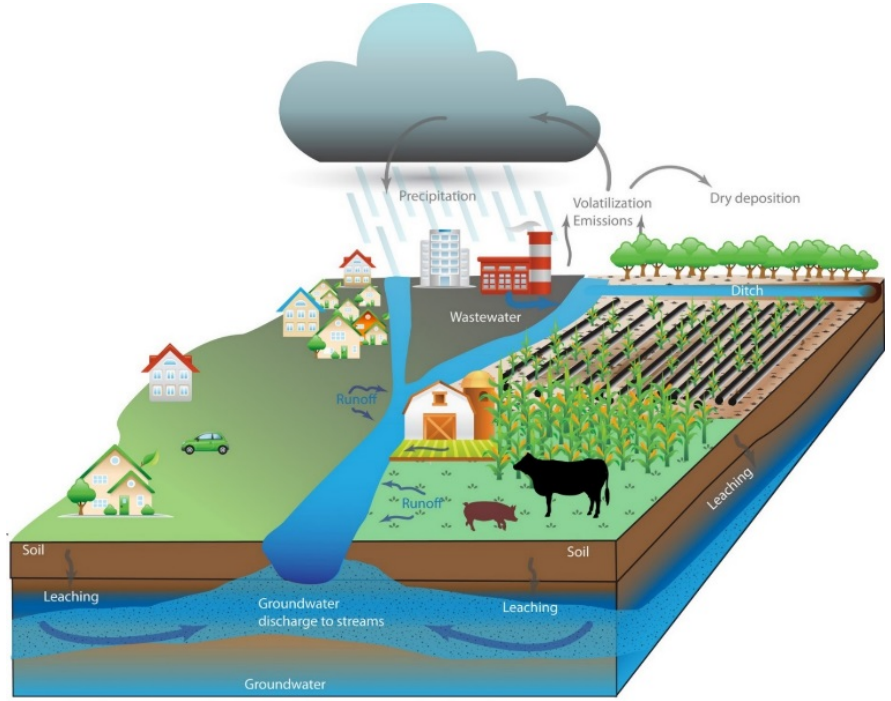
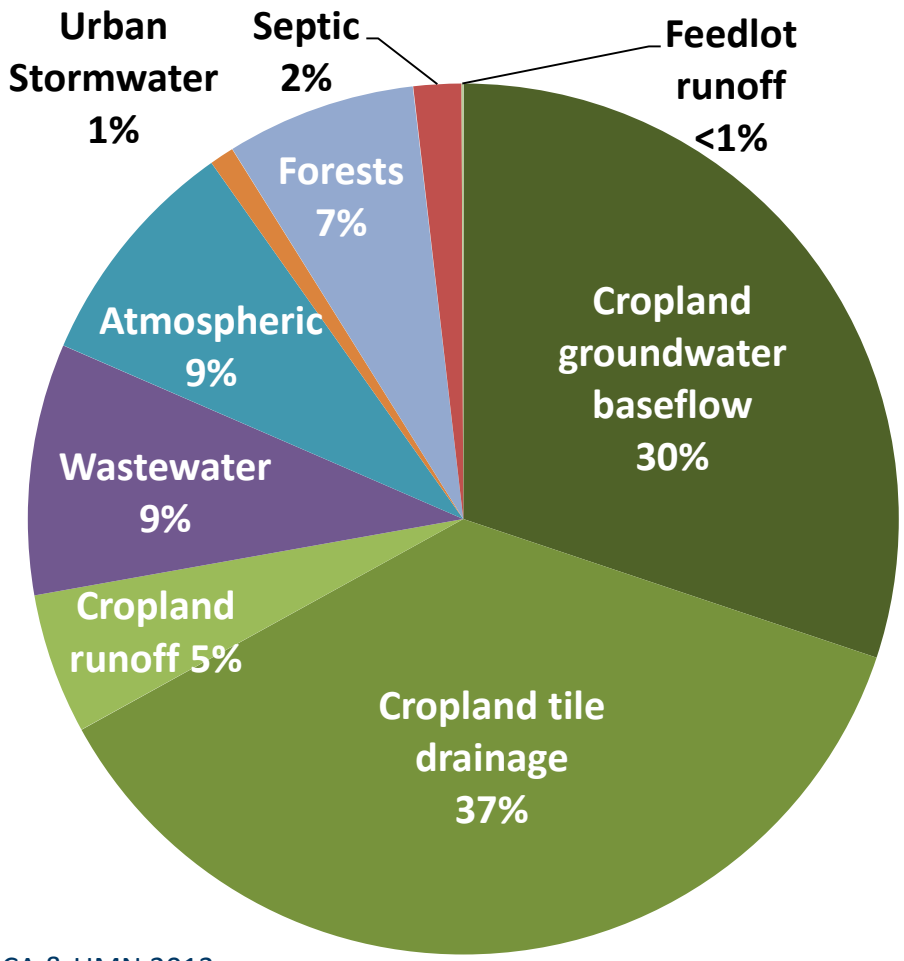


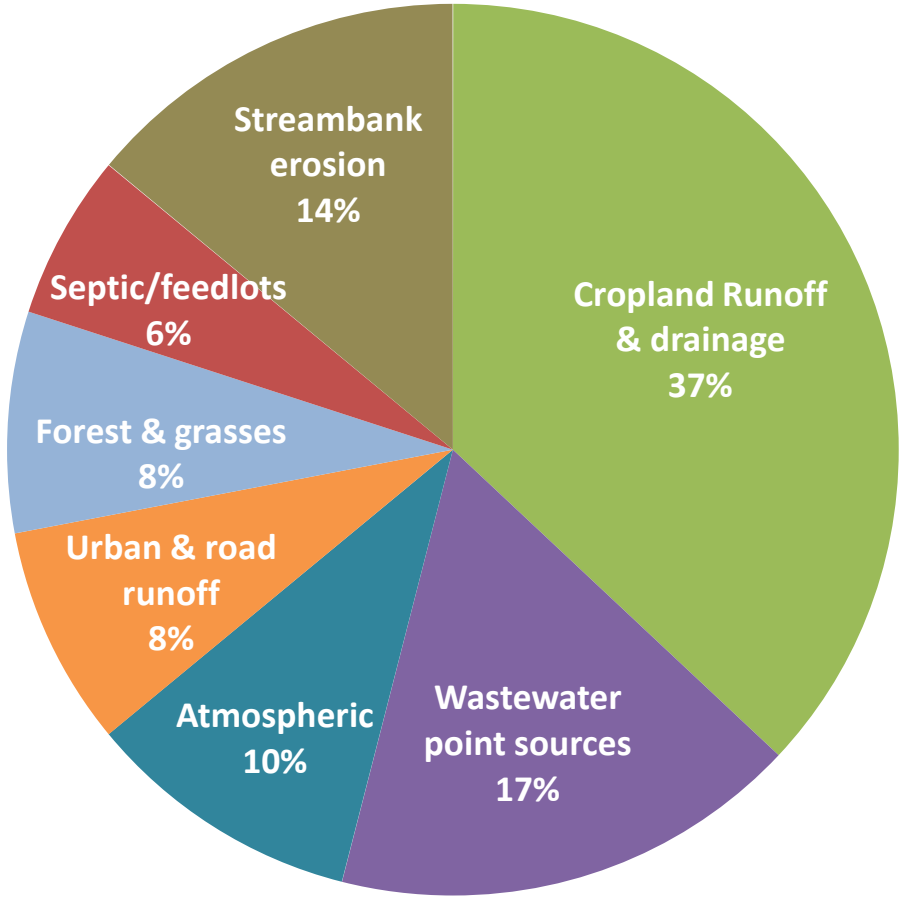
Statewide sources to rivers differ for N & P

Nitrogen



Source: MPCA & UMN 2013

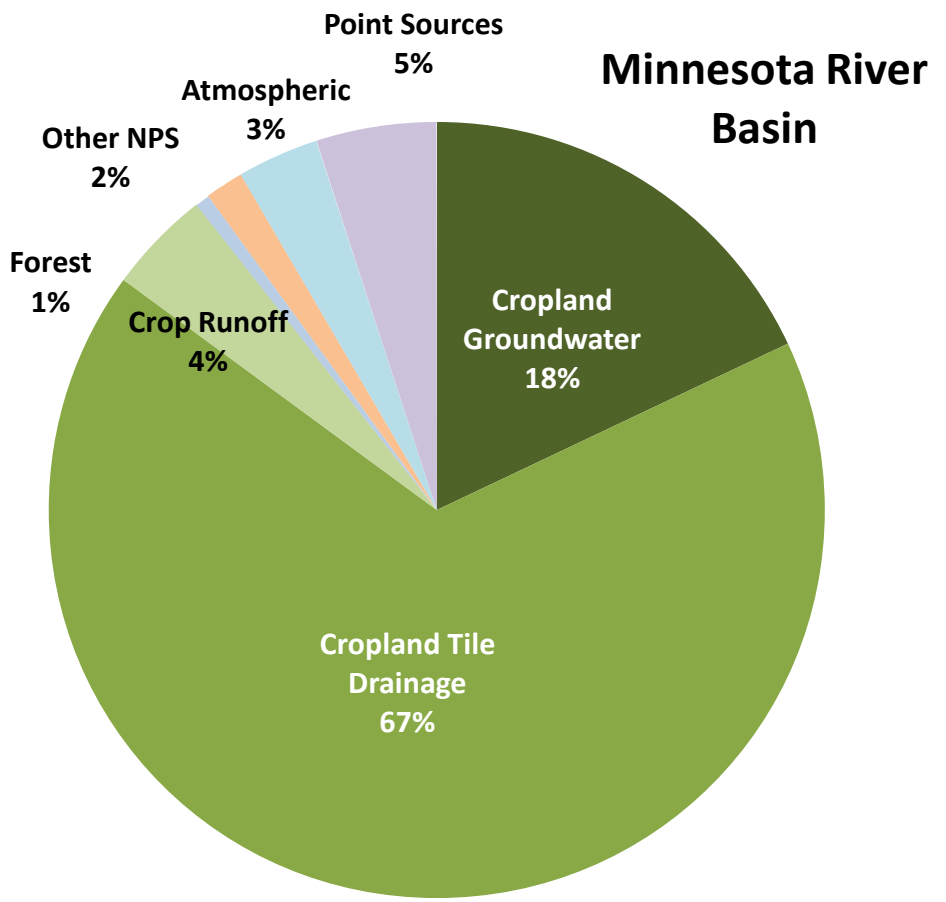
Phosphorus

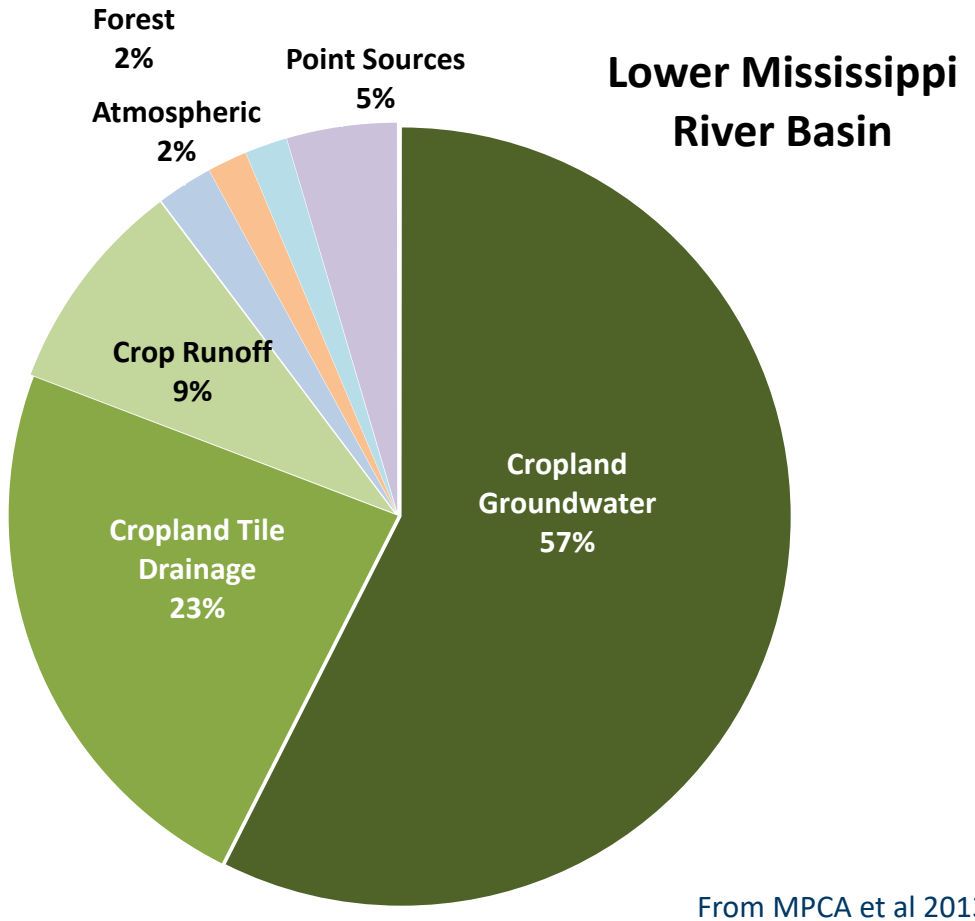


Source: MPCA et al., 2014

Sources and pathways vary by region

Nitrogen to rivers

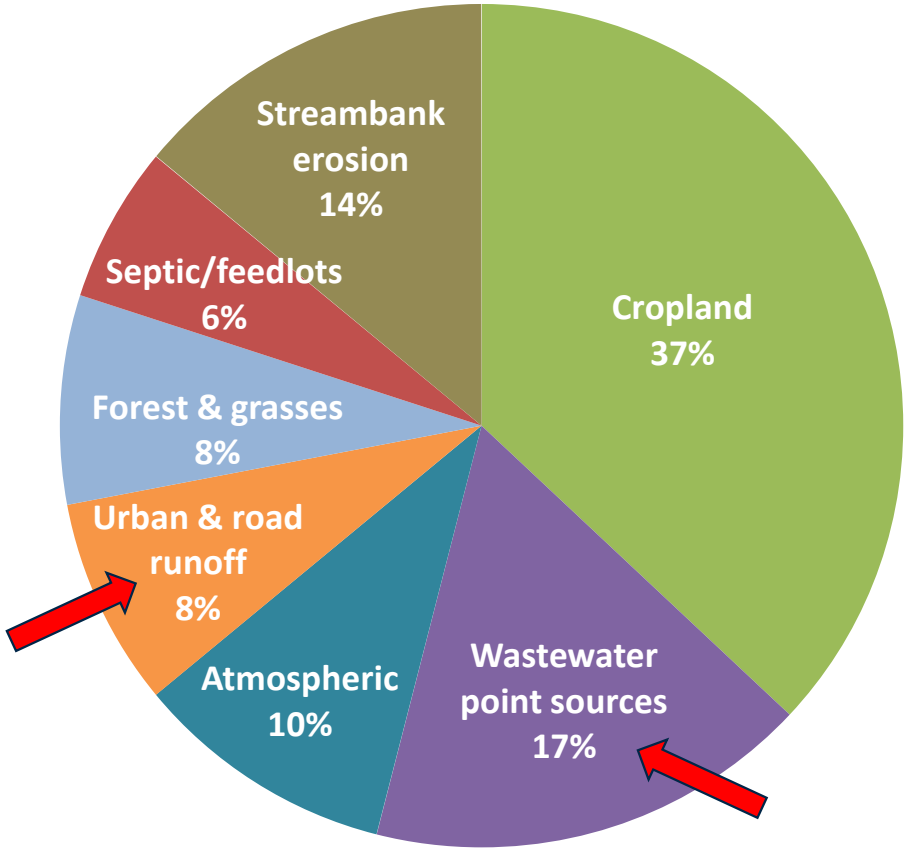




From MPCA et al 2013

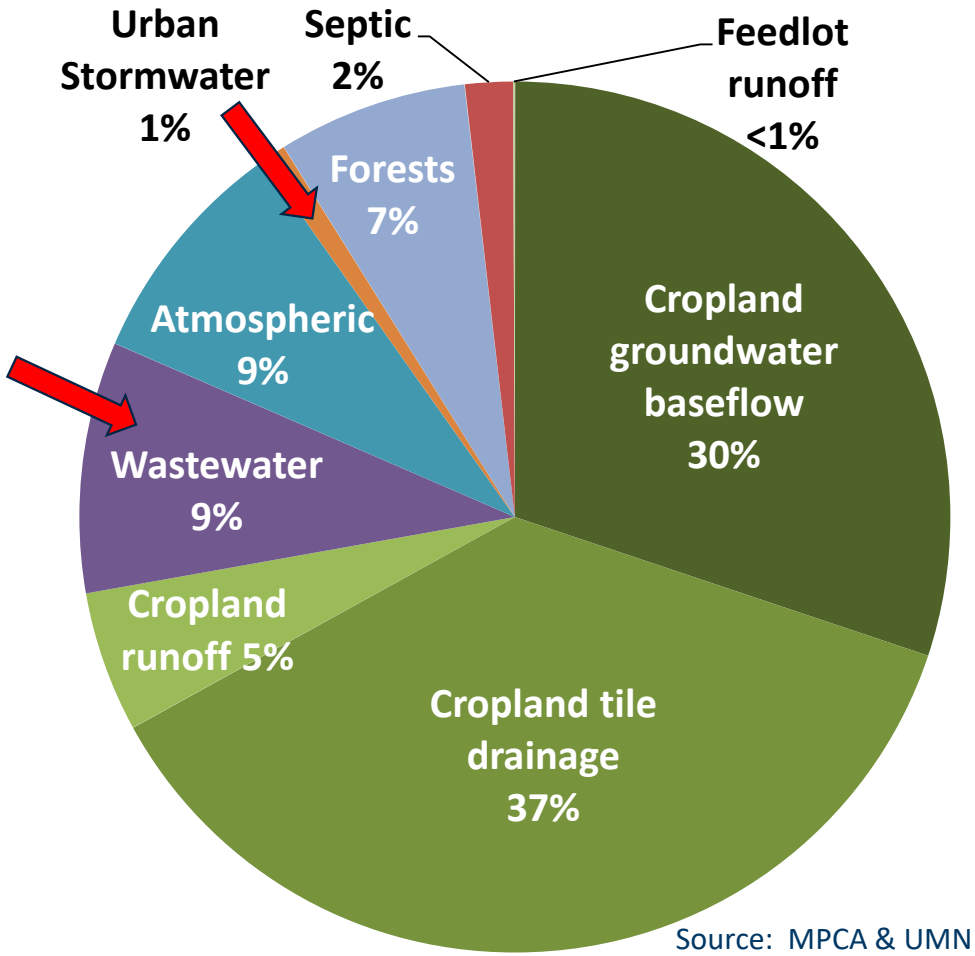
Important to reduce **Urban** sources of N & P

Phosphorus



Source: MPCA et al., 2014

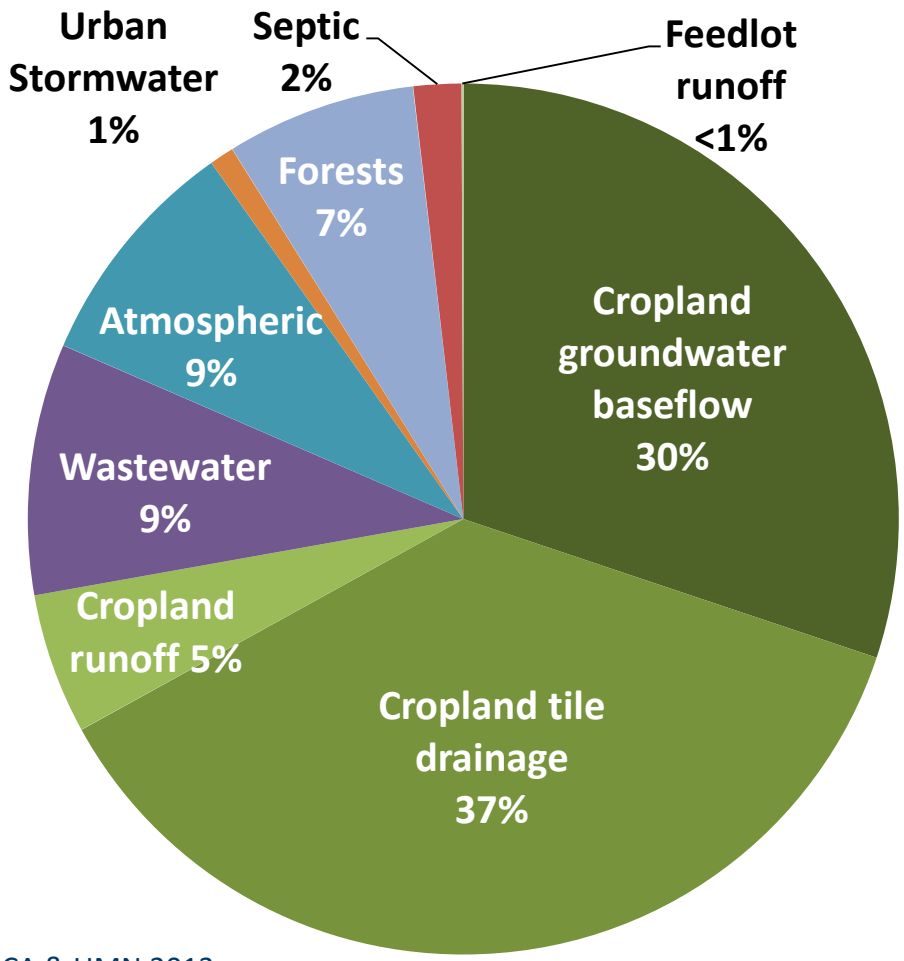
Nitrogen



Source: MPCA & UMN 2013

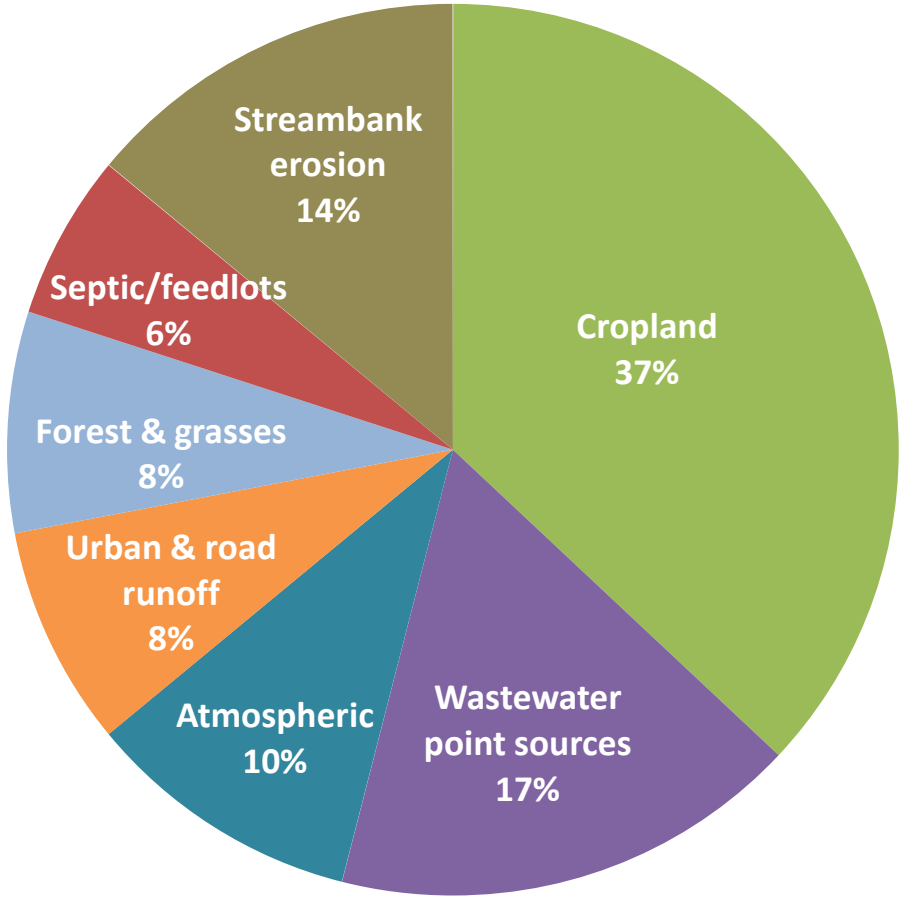
Important to reduce **Cropland** N & P losses

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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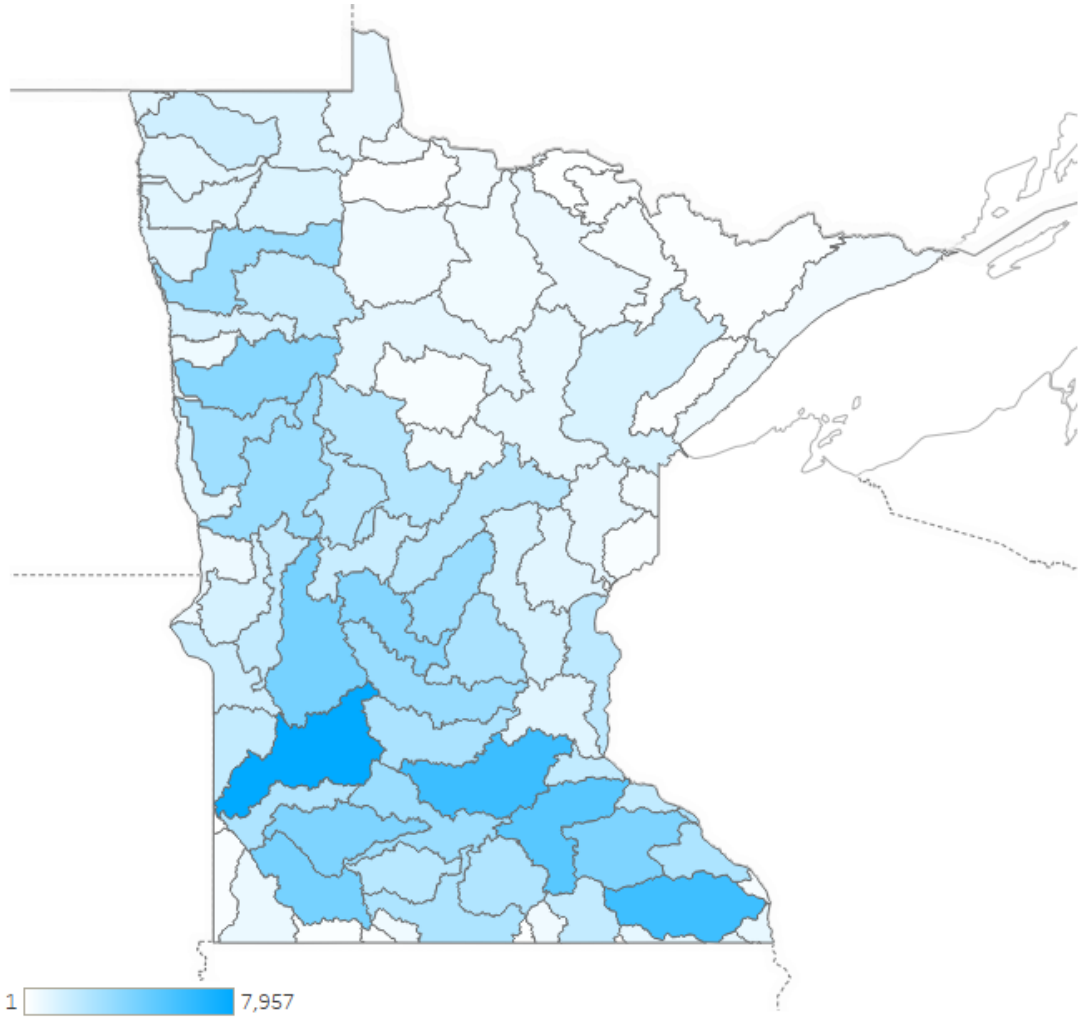
4. We've made progress, but there's more we need to do
5. Minnesota's nutrient reduction strategy addresses both urban and agricultural sources

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

www.pca.state.mn.us/water/healthier-watersheds

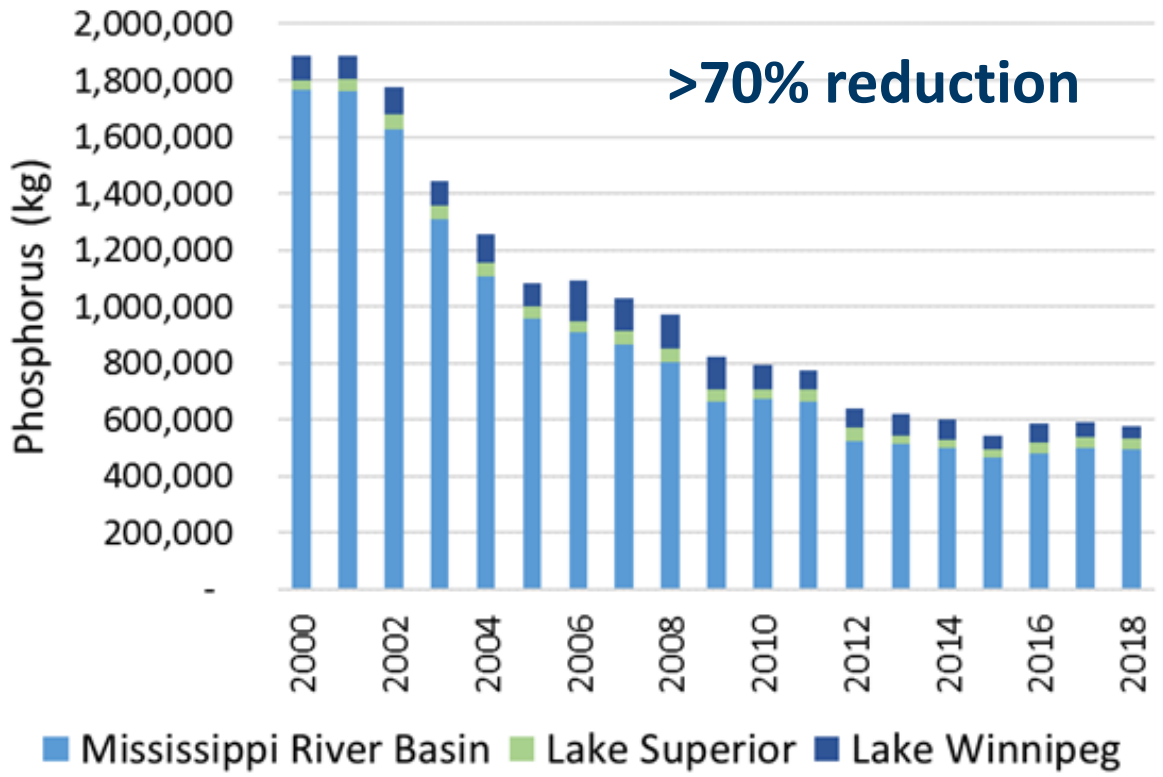
Agricultural progress

- er Basin
- de 1997-
- eased by
- fication
  - More than 500,000 acres certified, and growing

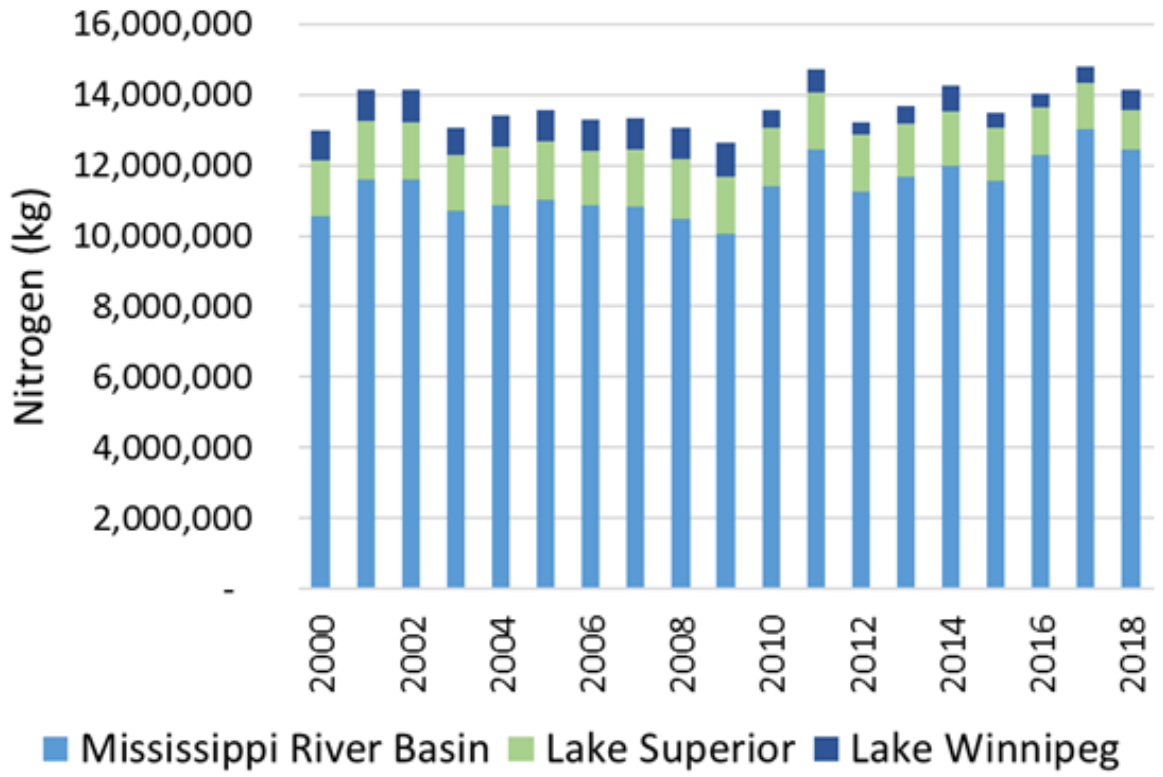
Wastewater nutrient discharges

2000-2018

Phosphorus



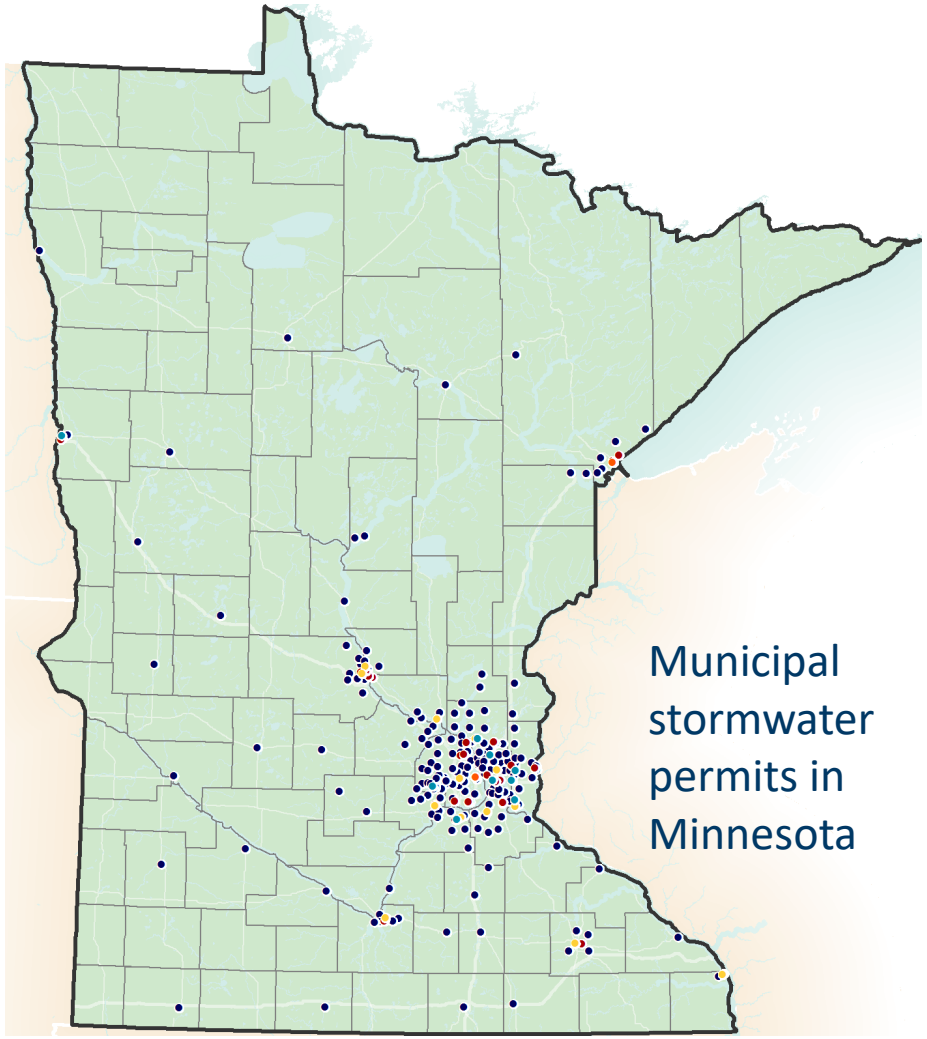
Nitrogen



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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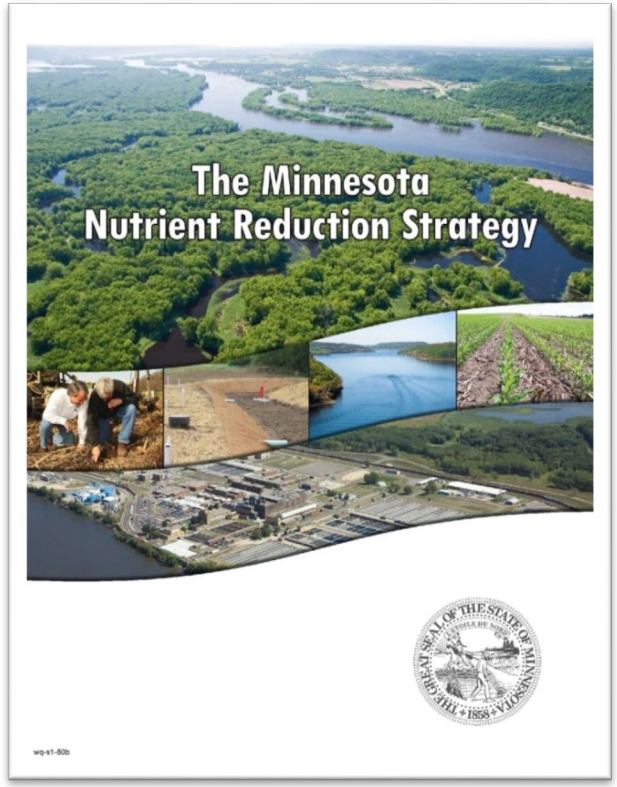
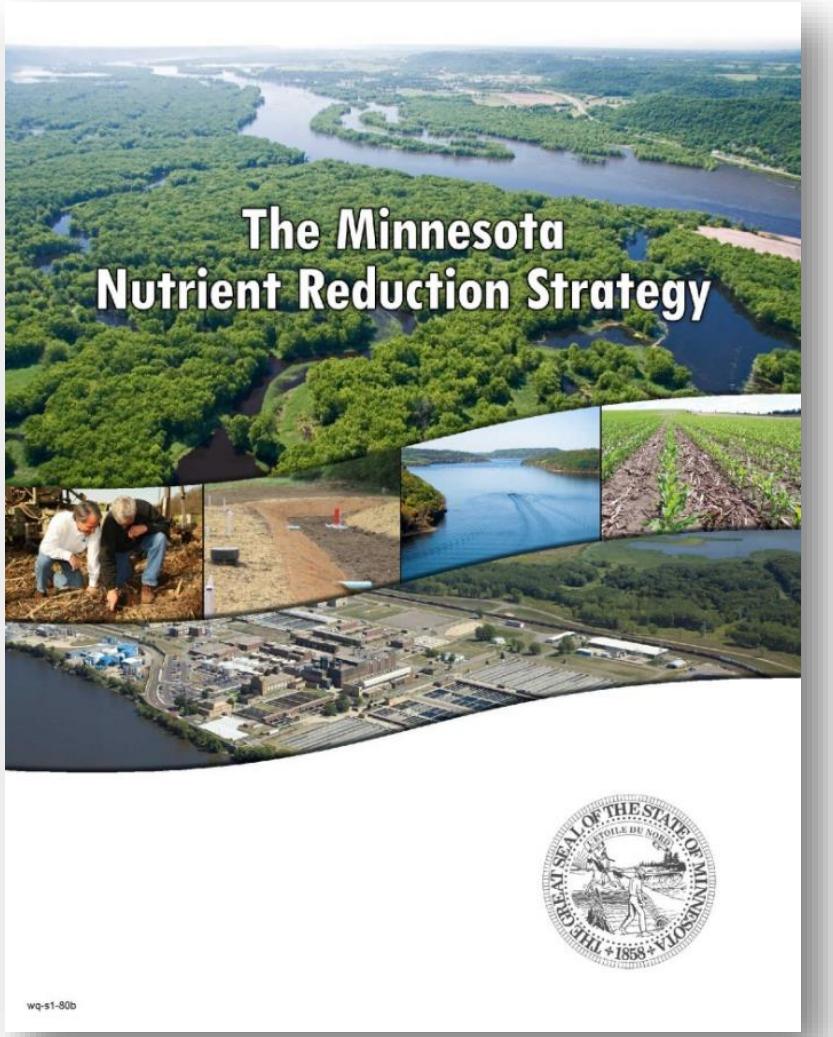


Minnesota Nutrient Reduction Strategy



Minnesota Pollution Control Agency · Minnesota Department of Agriculture · Minnesota Board of Water & Soil Resources · NRCS · FSA Farm Service Agency · Minnesota Department of Natural Resources · Minnesota Department of Health · PFA Minnesota Public Facilities Authority · University of Minnesota Driven to Discover℠ · Metropolitan Council · USGS science for a changing world

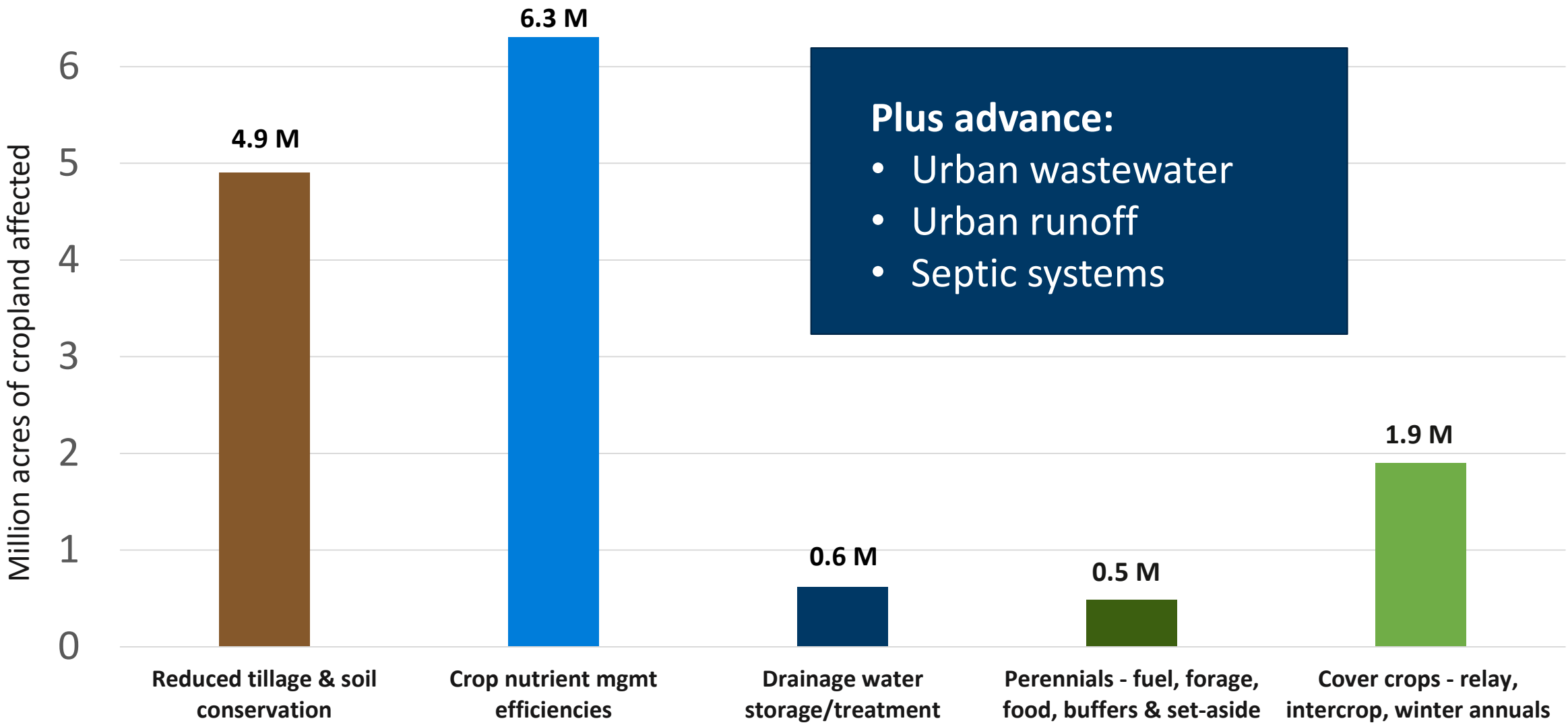
Finalized in 2014 by 11 organizations

Public review in 2013

Afternoon breakout session

www.pca.state.mn.us/water/nutrient-reduction-strategy

How many new BMP acres to reach 2025 milestone?



Working together for Waverly Lake

Waverly Lake – impaired and today

Questions?

MINNESOTA POLLUTION CONTROL AGENCY

CLEAN WATER LAND & LEGACY AMENDMENT