New Data
New Standards
New Impairments
New Limits

= More Trades

Matt Lindon

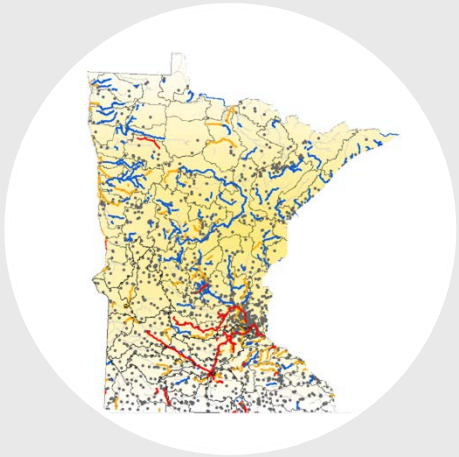
Dec. 6rd , 2017

What I will cover

Minnesota WQ Nutrient Standards

Statutory Authority for Trading

20 Years of History



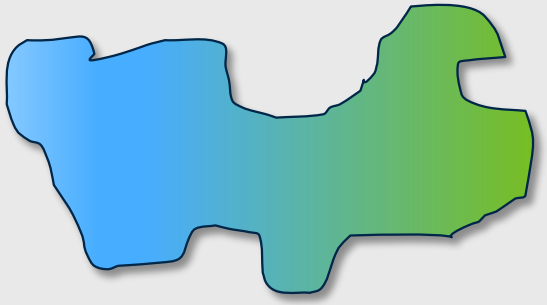
New Challenges

Minnesota River Basin Example

MN History

State Discharge Restrictions (SDRs)

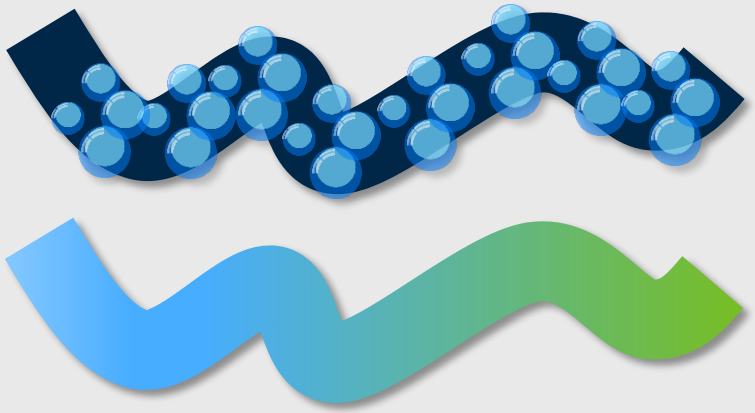
Lakes



- 1970s
- 1.0 mg/L if….
- Technology-based approach

- 2008
- Prevent nuisance algae
- 12 month rolling total mass limits

Rivers



- 2004
- Ensure sufficient dissolved oxygen (DO)
- May – Sept. 5 month seasonal mass limit

- 2015
- Prevent Nuisance Algae
- June – Sept. 4 month monthly avg mass limit

Minn. Stat. 115.03(10) Pollutant loading offset


No Rules


No Rules
Only Statute
+
Guidelines

Tested in the Courts

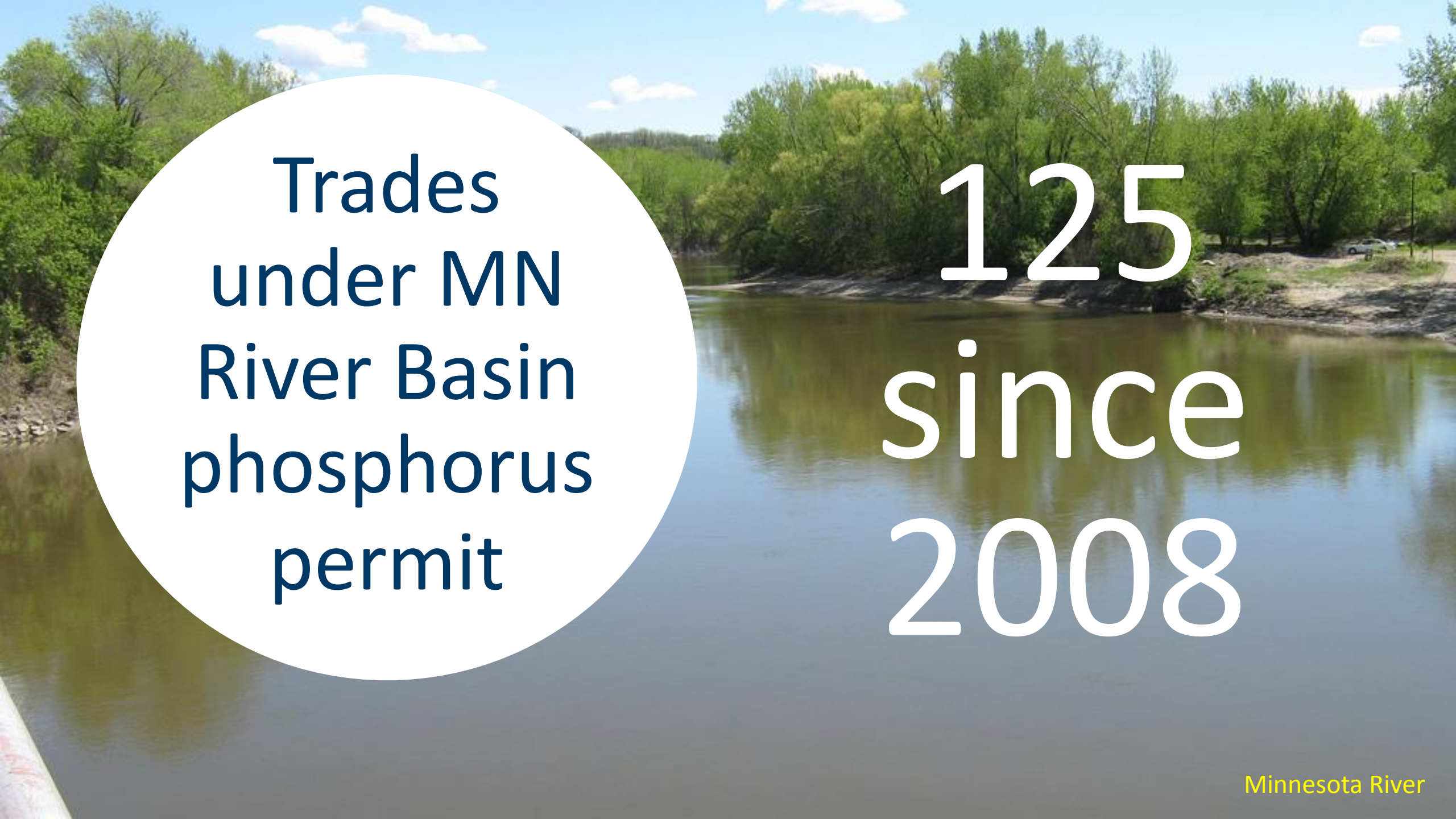
History of Water Quality Trading in Minnesota

Confluence of St. Croix and Mississippi


First trading permit issued
1997

3

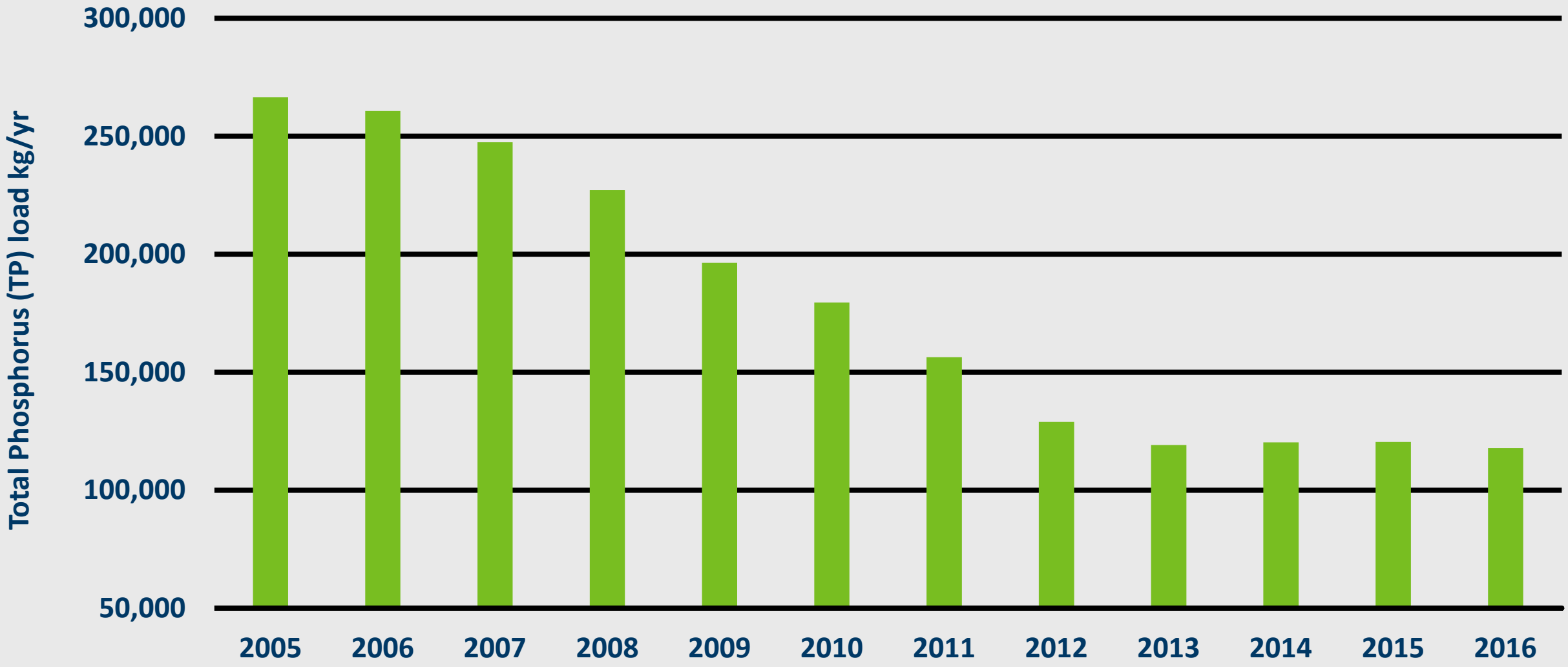
Point source to non-point source trades


Trades under MN River Basin phosphorus permit
125 since 2008
Minnesota River

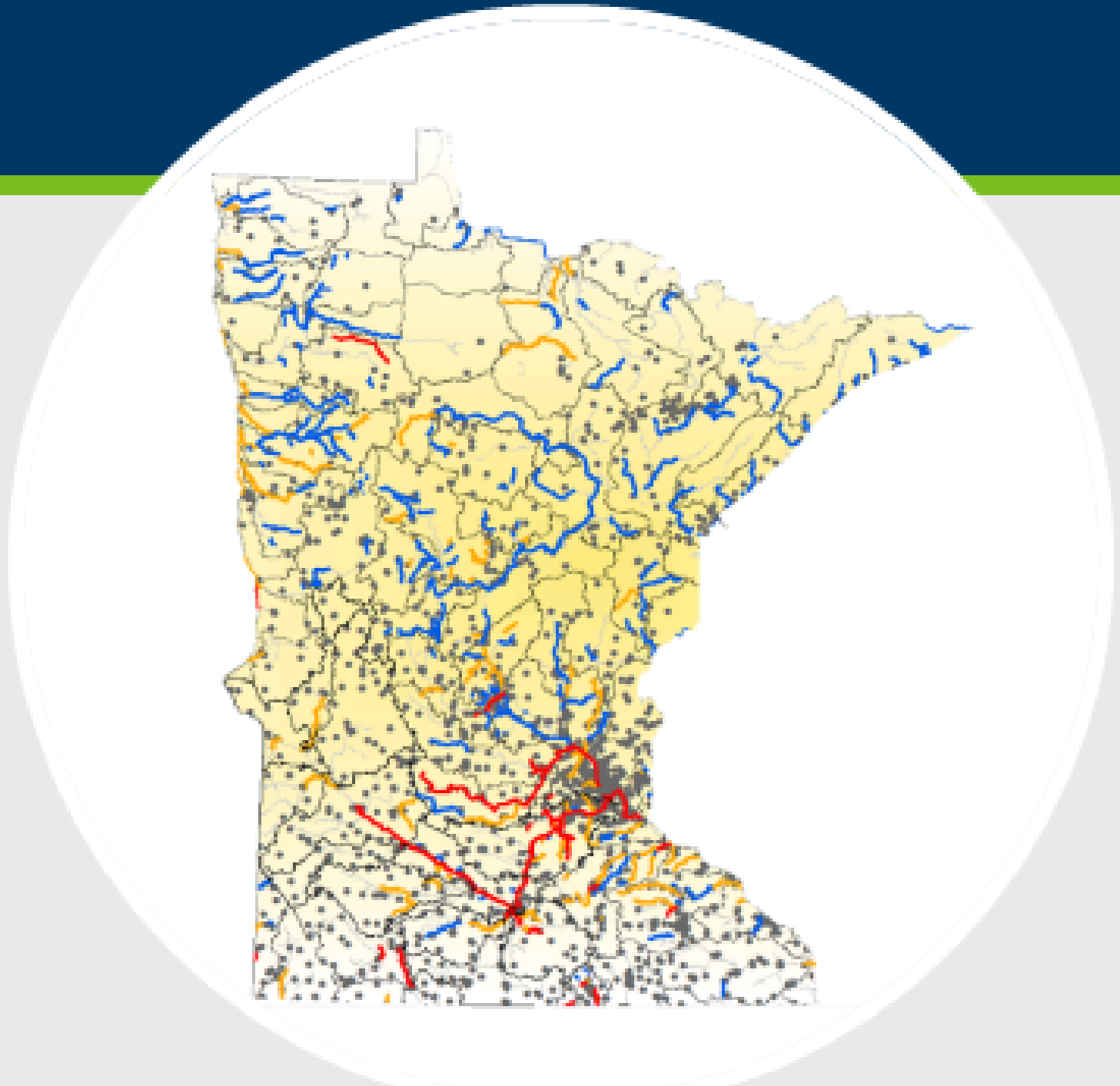
Low Dissolved Oxygen

- Completed phase 1 of General Phosphorus permit (35% ↓)
- Actual discharge *way* below limits
- HSPF computer model used to simulate point and nonpoint source reductions

Wastewater Phosphorus load in the Minnesota River Basin



New Challenges



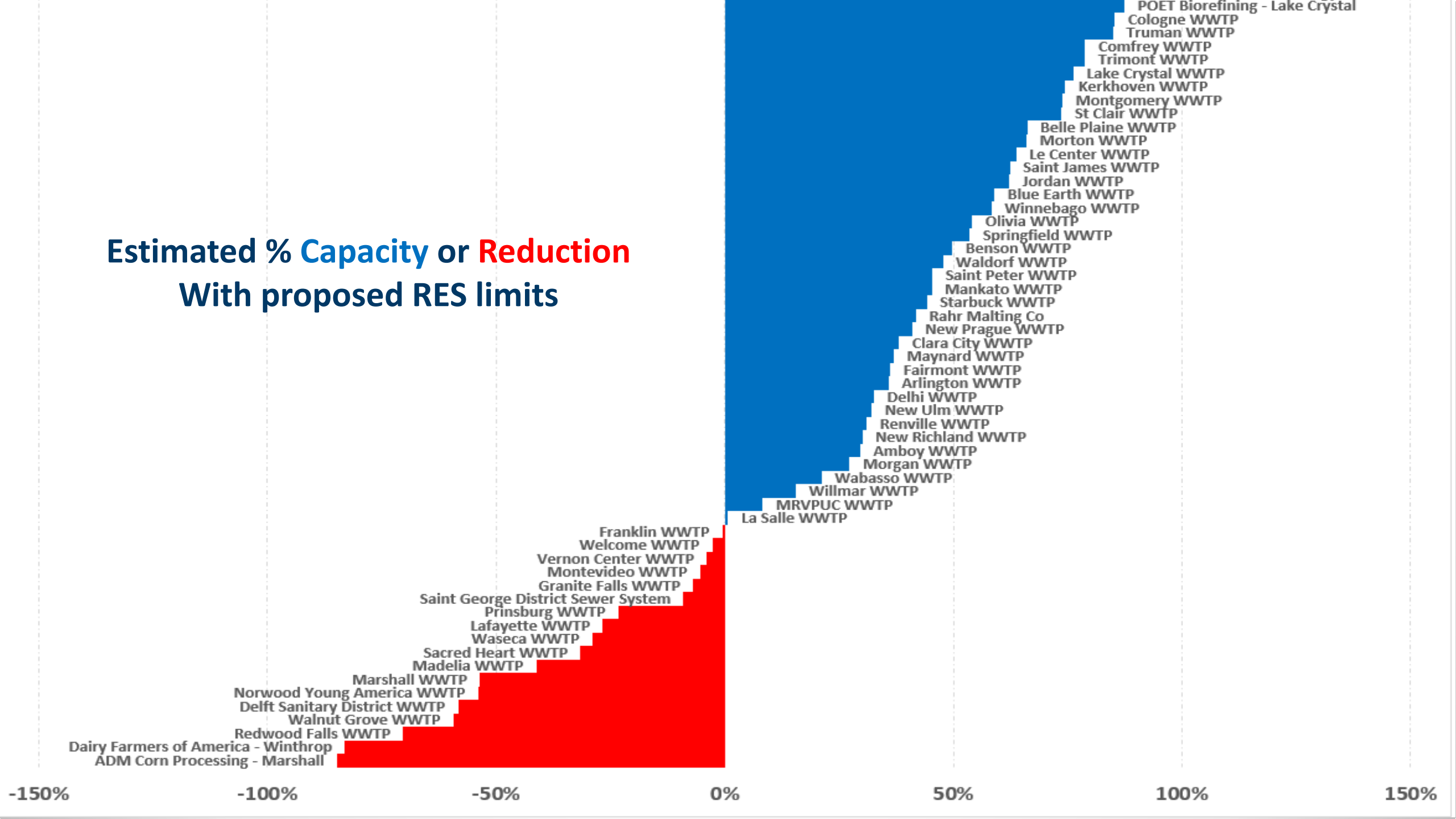
River Eutrophication Standards (RES)

- Phase I Genera Permit limits – not protective
- Phase II General Permit (51% ↓)– close but also not protective
- Used HSFP model to simulate point and nonpoint source reductions

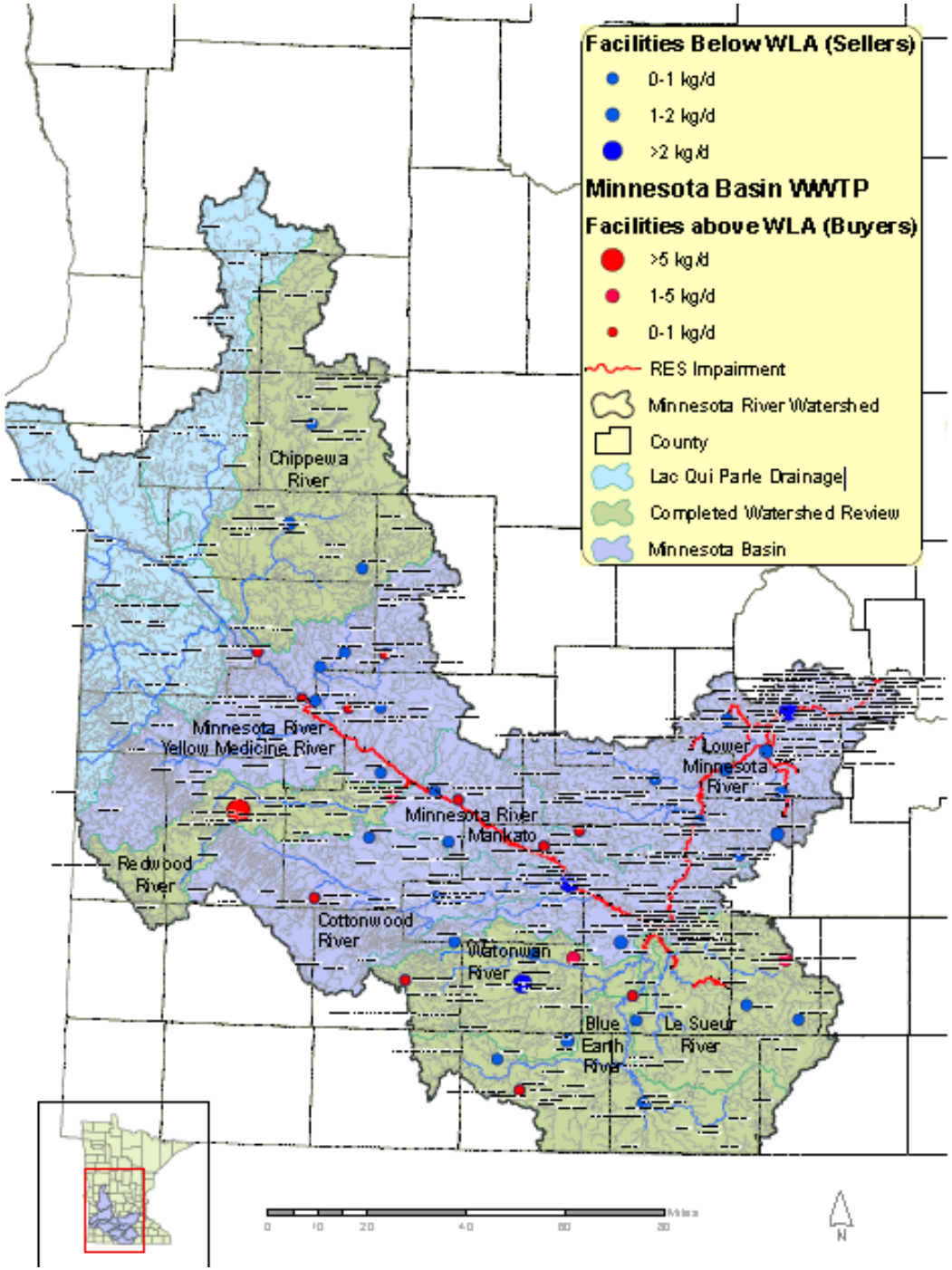
Minnesota River Basin Approach for River Eutrophication

- Model existed per Low DO TMDL
  - Looked at all summer flows for multiple years
- Scenarios were created to assess non-point management impact of TSS/TP
  - Allowed Non-point reductions to be taken into account
- Look at the impact of many facilities (~200) on the Minnesota River Mainstem
- The outcome --- we needed to go beyond the previous basin permit

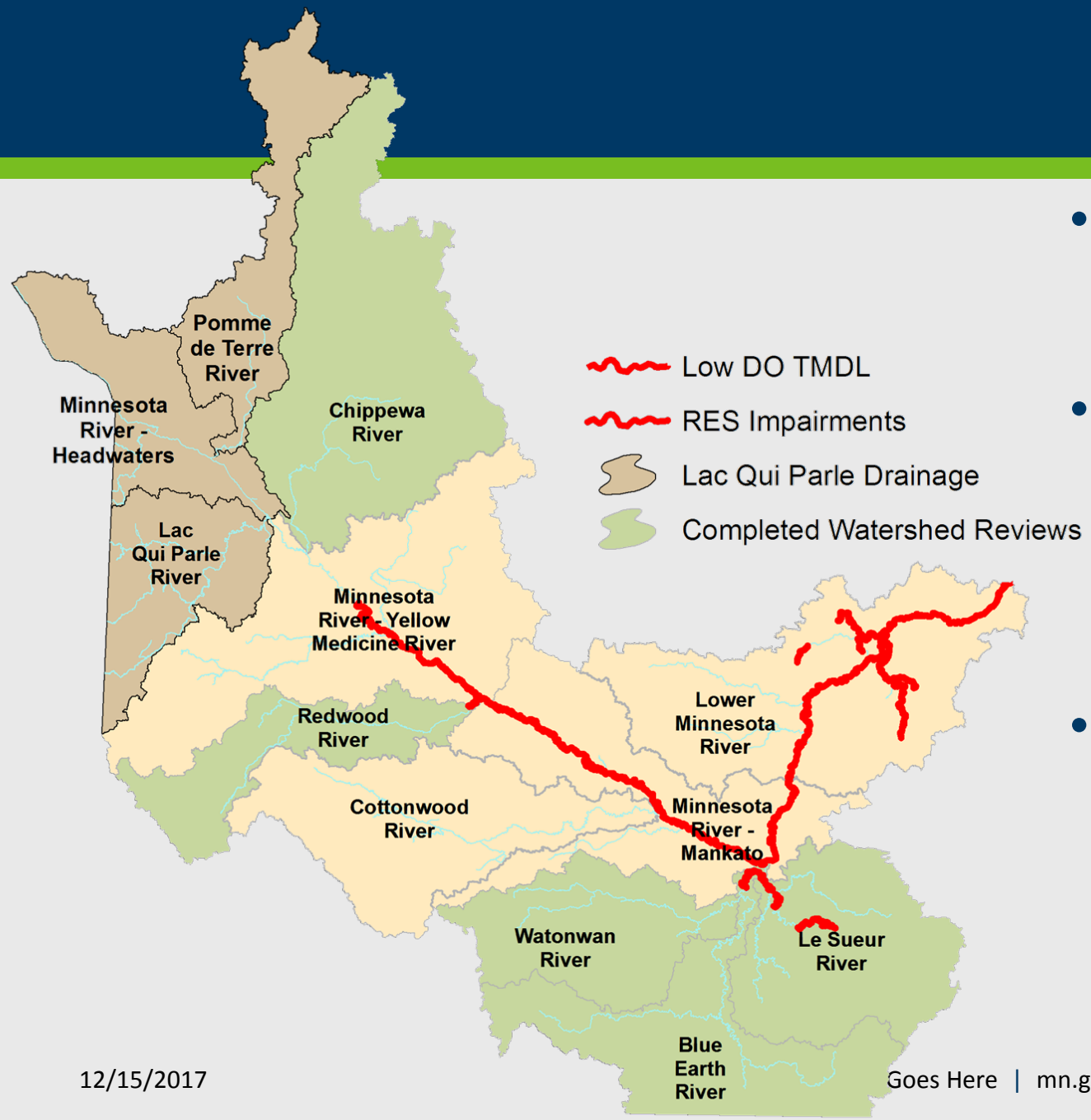
Estimated % Capacity or Reduction
With proposed RES limits



What Does this look like at a Basin Scale ?

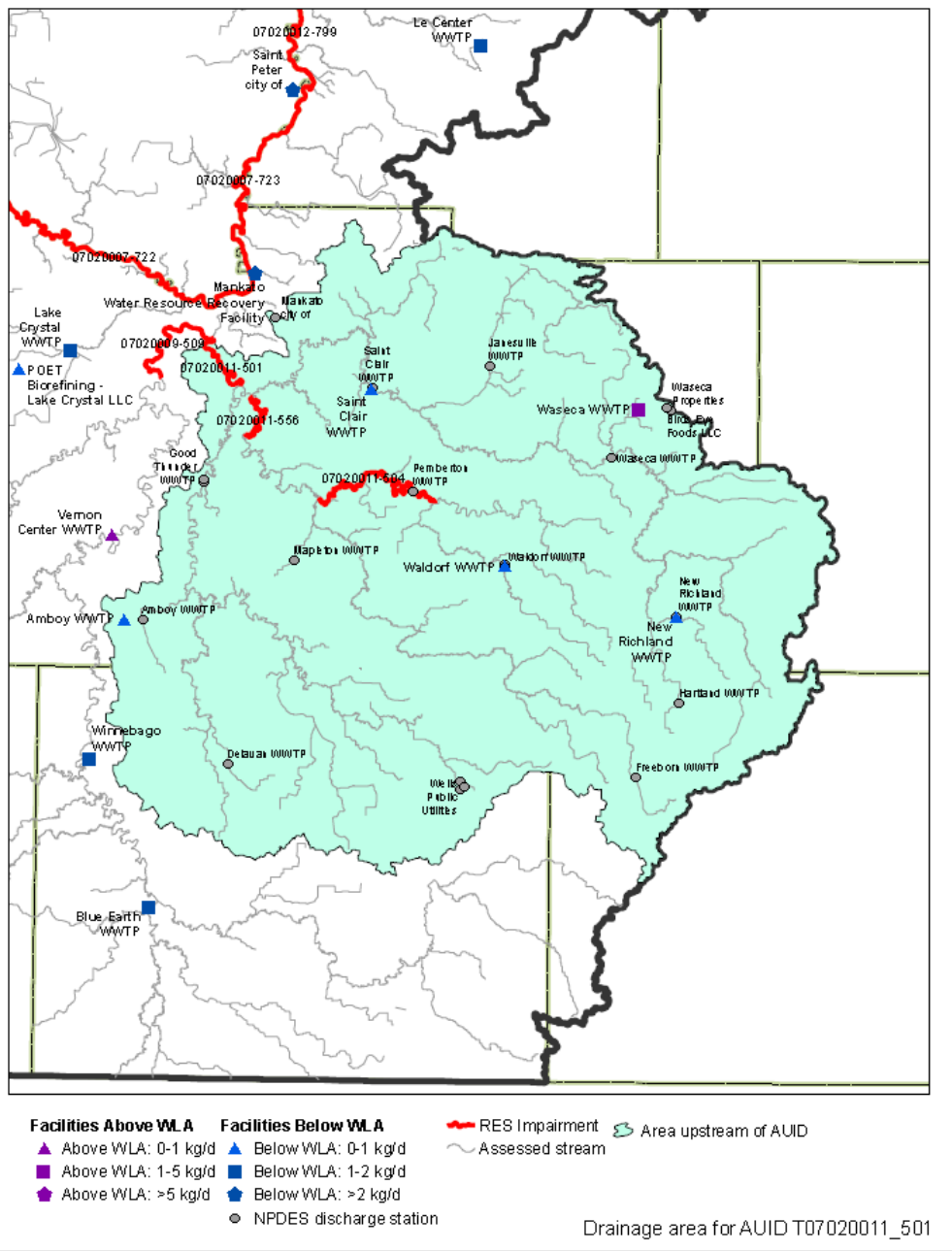


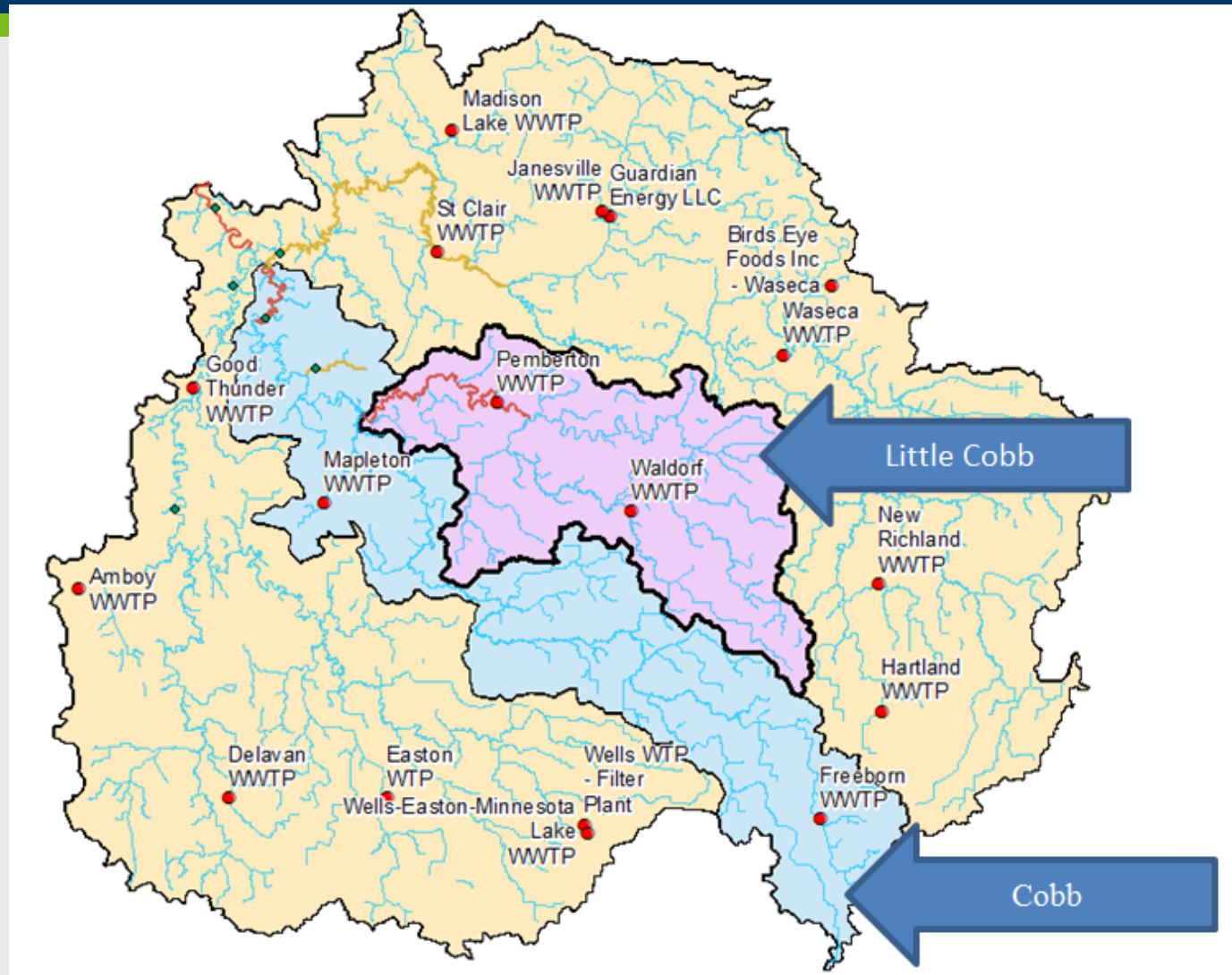
Watershed Approach



- Major watershed within basin also have algae/impairments
- Simple dilution equations used to evaluate protection for major watersheds. (Greater Blue Earth, Redwood, Chippewa)
- Limits for Minnesota River RES, good enough to protect local reaches, generally

RES Trading Details/Examples





Trading With Non-point

nlcd_2011_landcover_mn_usgs

Land Cover Class

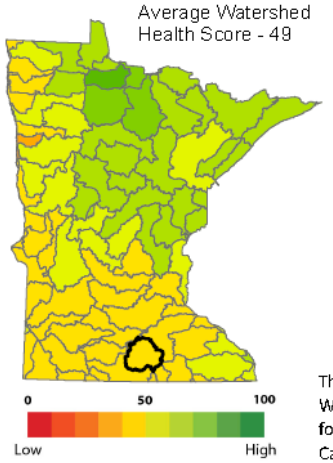
- Woody Wetlands
- Shrub/Scrub
- Open Water
- Mixed Forest
- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Deciduous Forest
- Cultivated Crops
- Barren Land

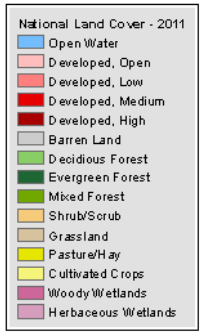
Getting at Non-point

Le Sueur Watershed

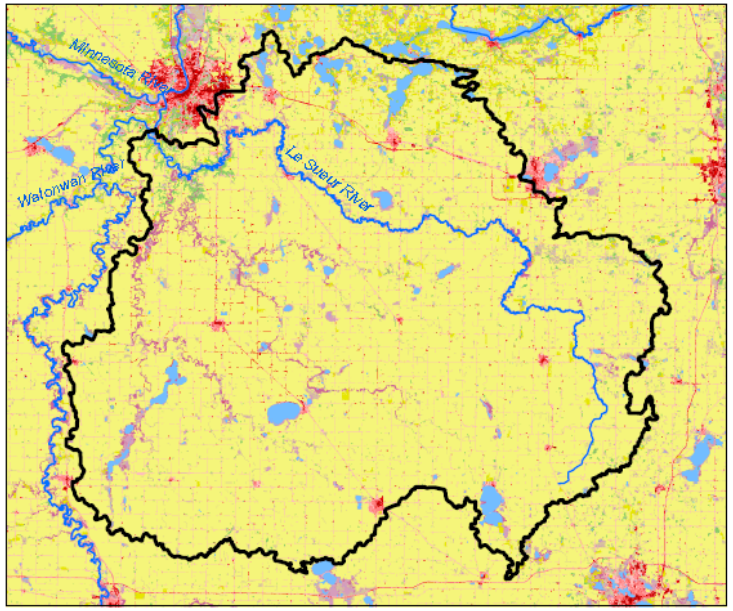
Watershed Health Report - Major Watershed

Le Sueur River





These health scores are calculated at the Major Watershed (HUC8) scale. Health score names followed by (*) are also calculated at the DNR Catchment scale (subdivided HUC12). Those results are reported on the following pages.

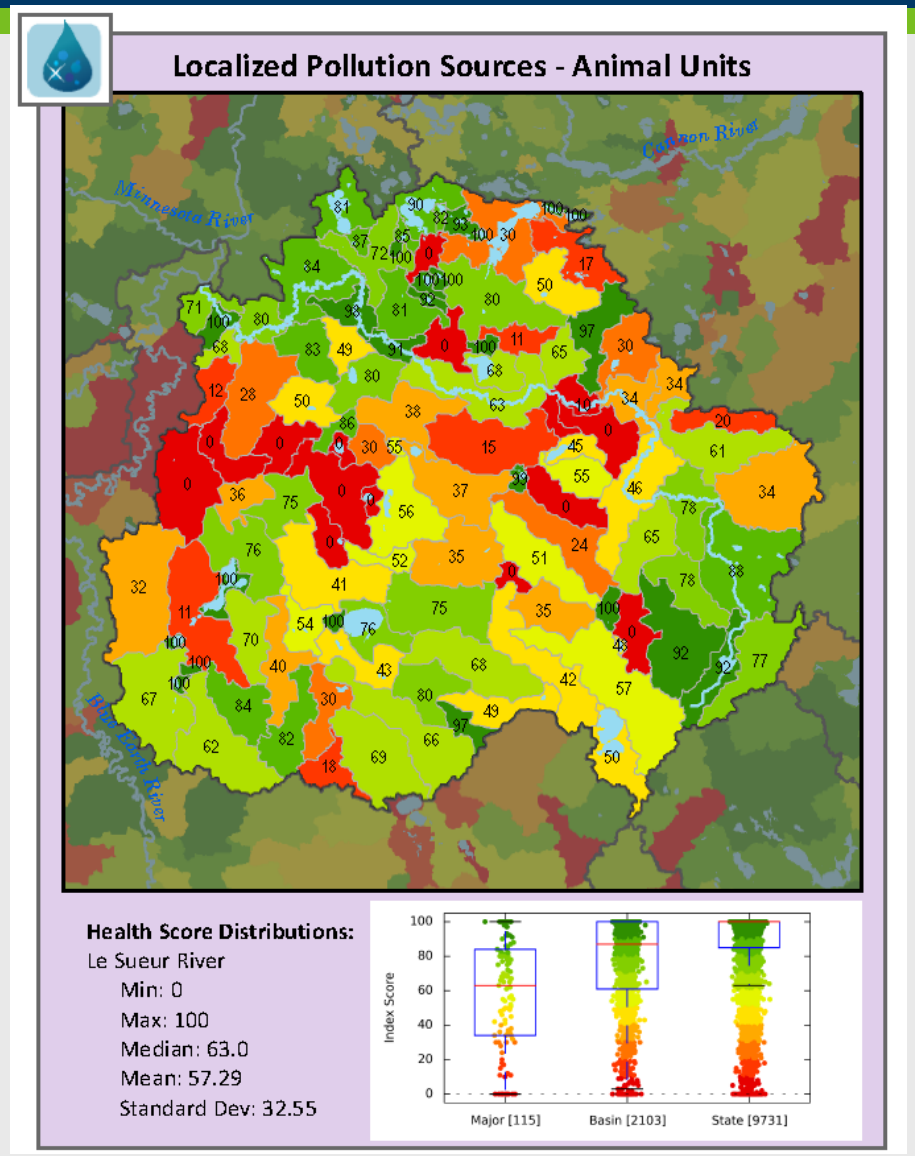


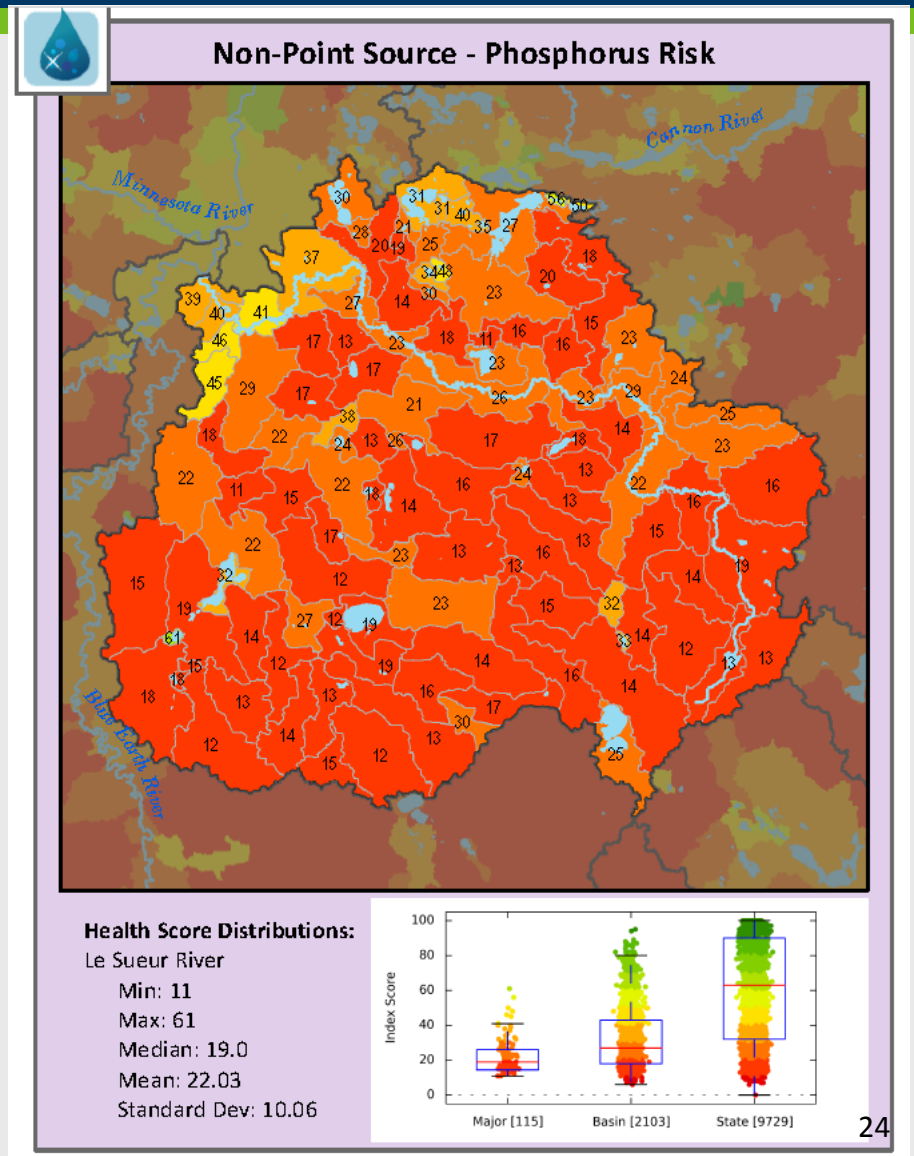
Hydrology		Geomorphology		Biology		Connectivity		Water Quality	
Component Health Score (index average)	60	Component Health Score (index average)	74	Component Health Score (index average)	38	Component Health Score (index average)	19	Component Health Score (index average)	52
Index Scores		**Index Scores**		**Index Scores**		**Index Scores**		**Index Scores**	
Perennial Cover*	9	Soil Erosion Potential*	76	Terrestrial Habitat Quality*	1	Terrestrial Habitat Connectivity	2	Non-Point Pollution Sources	31
Impervious Cover*	71	Groundwater Susceptibility	55	Stream Species Quality*	76	Aquatic Connectivity*	45	Sub-Score Phosphorus Risk*	5
Water Withdrawal*	99	Climate Vulnerability	92	Species Richness	56	Riparian Connectivity*	44	Localized Pollution Sources*	81
Flow Variability	65			At-Risk Species Richness	18			Assessments	39
Hydrologic Storage	35								
Sub-Scores									
Altered Streams*	53								
Surface Storage	18								

Watershed Health Assessment Framework
Health score methodology - www.dnr.state.mn.us/whaf/about/scores

September, 2015

Non-Point Trading





Summary

- Minnesota has numeric Lake and River Eutrophication Standards
- Standards are being implemented in to permit limits
- Trading is supported in statute and as a means to meet nutrient limits
- The new standard and impairments make trading more complicated but more need there before