Information Item:
2018 Water Resources River Report

Hong Wang, Principal Environmental Scientist
Erik Herberg, Environmental Scientist

Environment Committee: September 10, 2019

METROPOLITAN COUNCIL

Water Resources Program Overview

Purpose

Provide leadership and information to empower Council and local actions that ensure clean, healthy and sustainable water resources for the region.

Vision

Our region’s waters fully support public and ecosystem health, economic growth, and all recreational uses for current and future generations.

River and Stream Program Overview

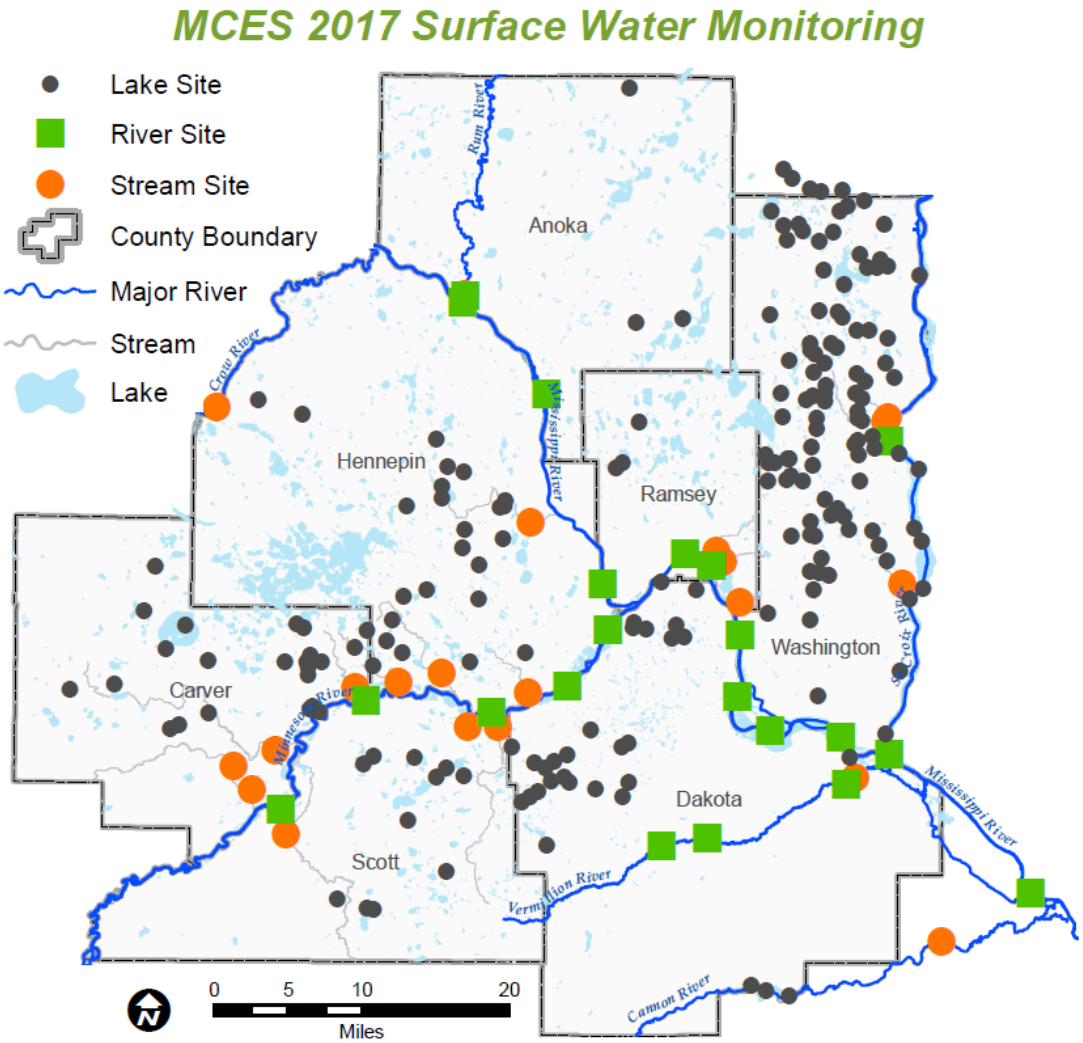
Permit compliance and regulatory strategy

Baseline data to inform planning and management efforts

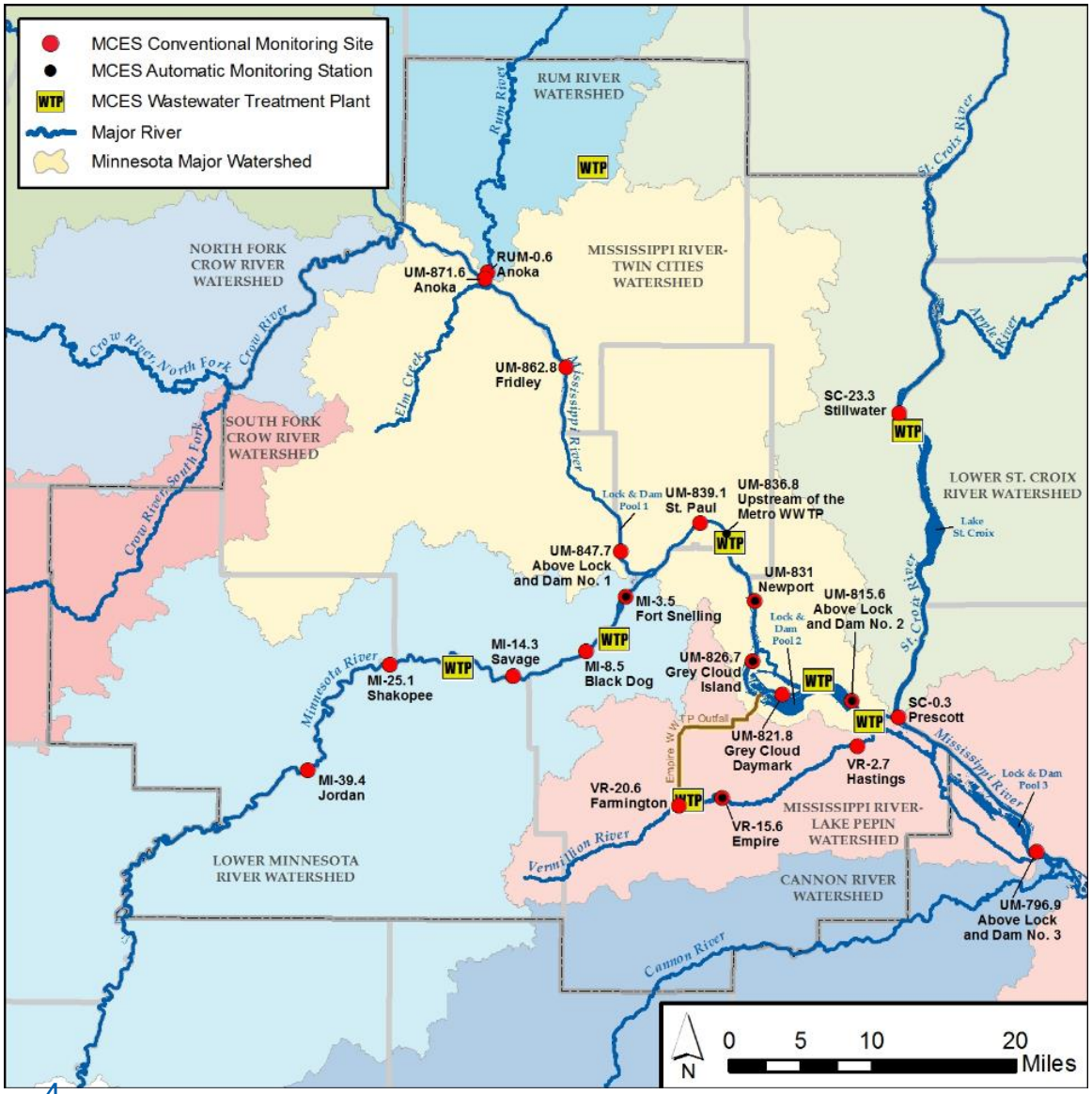
NPDES requirements and technical support

Data to support informed decisions and effectiveness of watershed improvements

Monitor and assess regionally significant streams and build local expertise



River Monitoring



- Back to 1976
- 5 rivers
- 22 monitoring sites
  (6 automonitoring)
- Parameters
  - Conventional
  - Toxics (Metals)
  - Organics
  - Biological

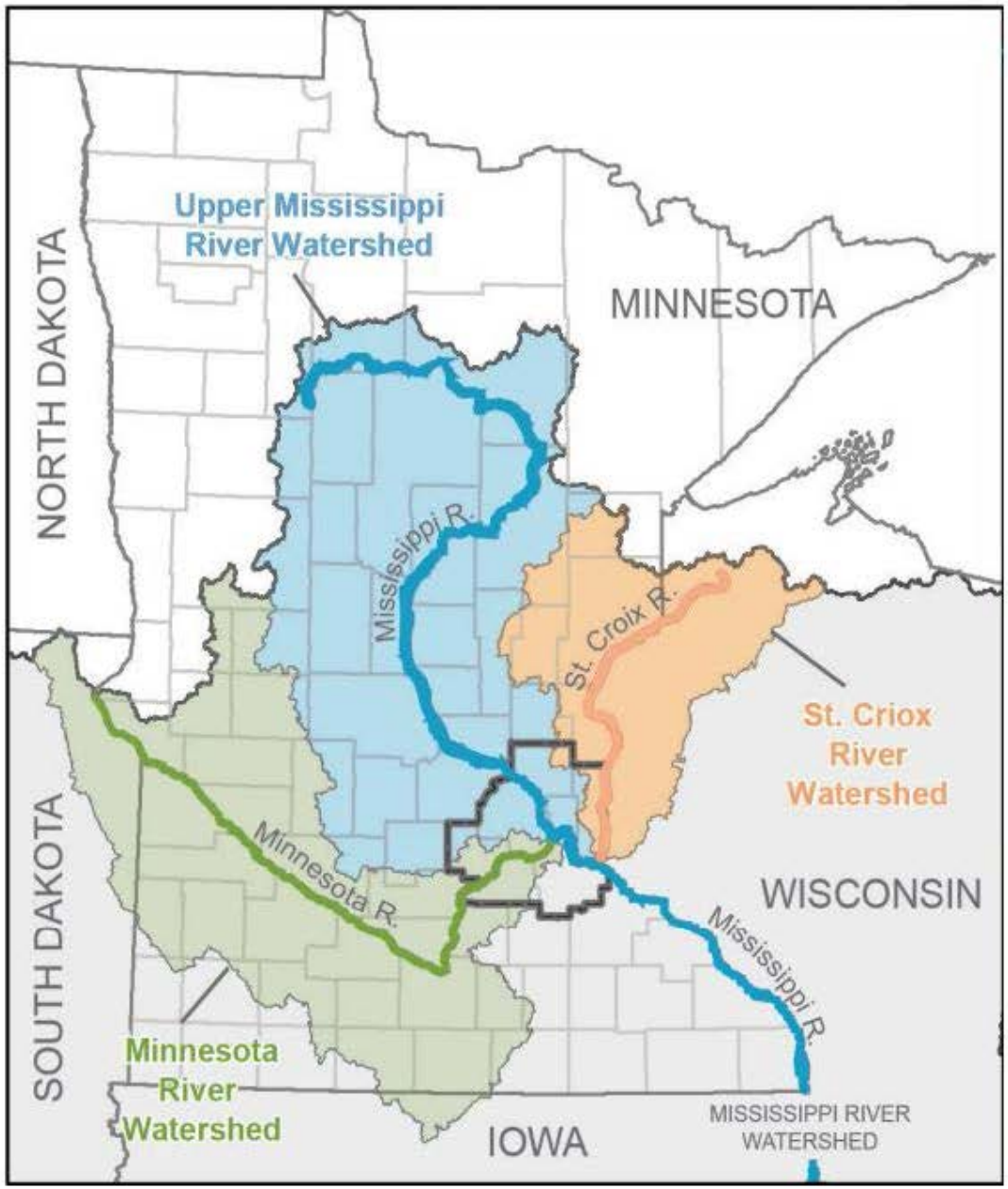
REGIONAL ASSESSMENT OF RIVER WATER QUALITY IN THE TWIN CITIES METROPOLITAN AREA 1976-2015

Minnesota, Mississippi, St. Croix Rivers

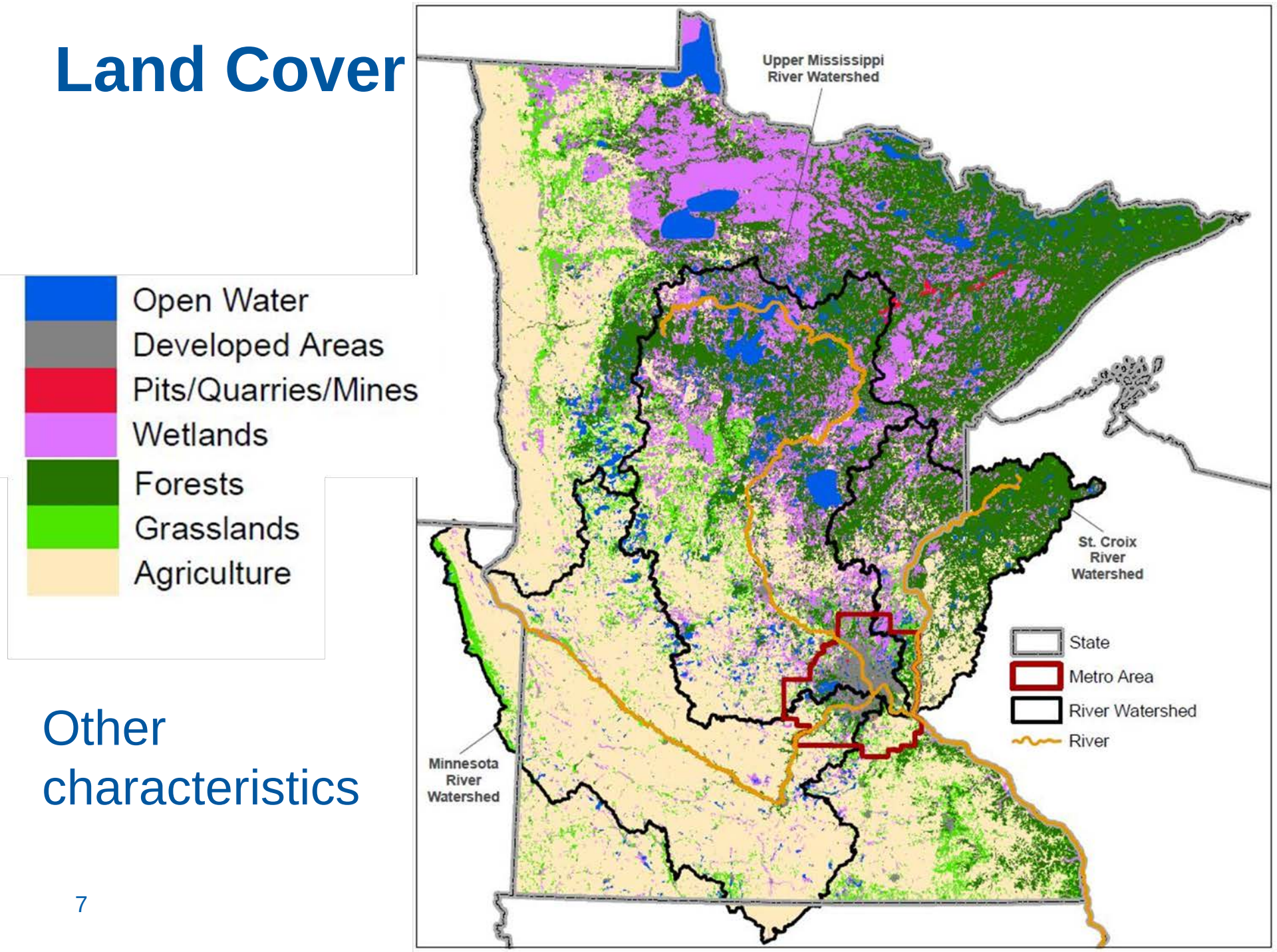
METROPOLITAN COUNCIL

June 2018

The Rivers

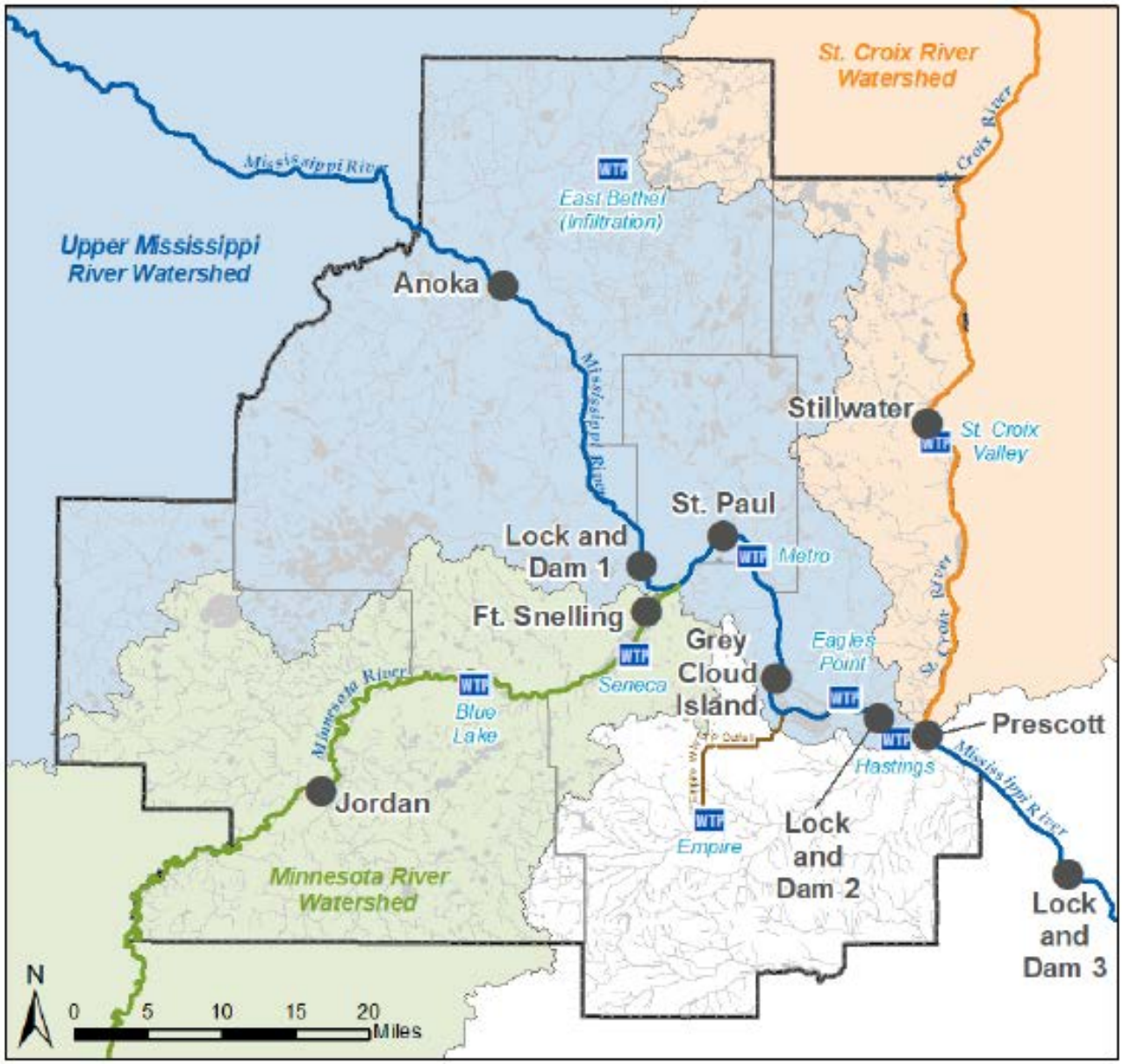

Upper Mississippi River Watershed
MINNESOTA
NORTH DAKOTA
Mississippi R.
St. Croix R.
St. Criox River Watershed
WISCONSIN
Minnesota R.
Mississippi R.
SOUTH DAKOTA
Minnesota River Watershed
IOWA
MISSISSIPPI RIVER WATERSHED

Land Cover



Other characteristics

Monitoring Sites



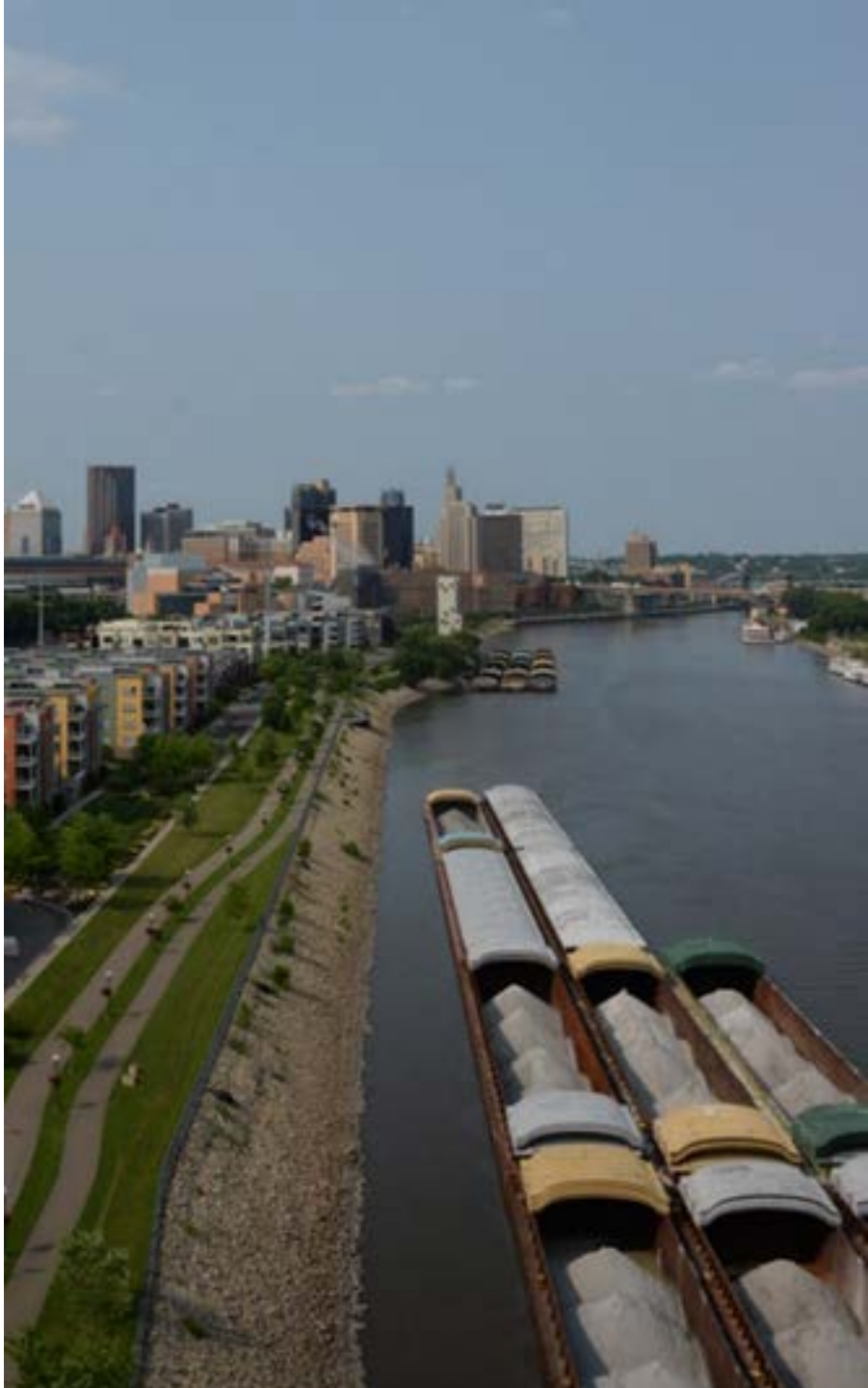
Methods

Parameters:

- Total of 15 in the full report
- Flow
- Total Phosphorus (TP) – “Nutrients”
- Nitrate-Nitrogen (NO_3) – “Nutrients”
- Chloride – “Salt”

Assessment:

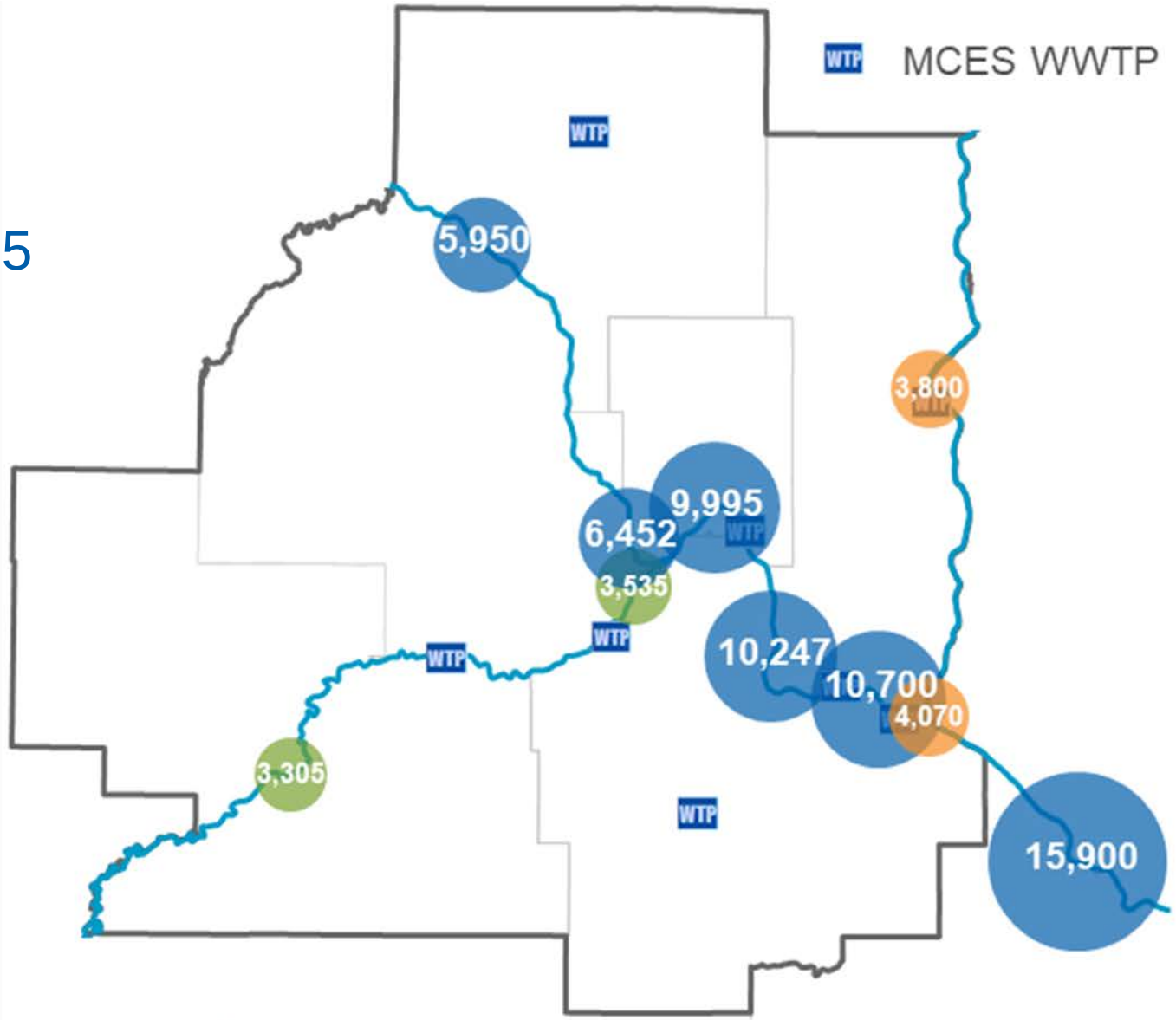
- Calculated Medians
  - “General patterns”
- Statistical Trends
  - “Changes over time”



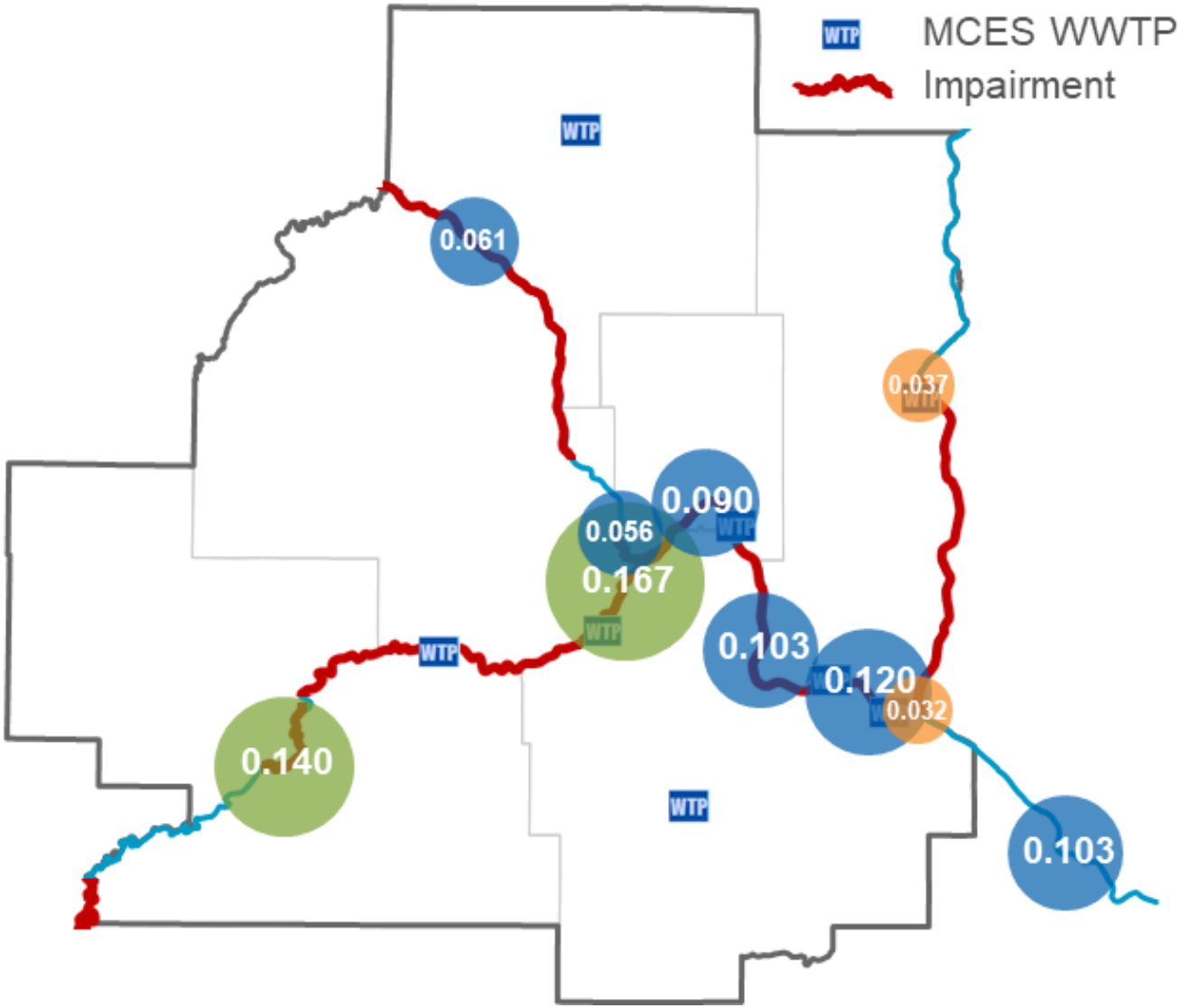
Spatial Medians Flow

One median per site using data from 2006 – 2015

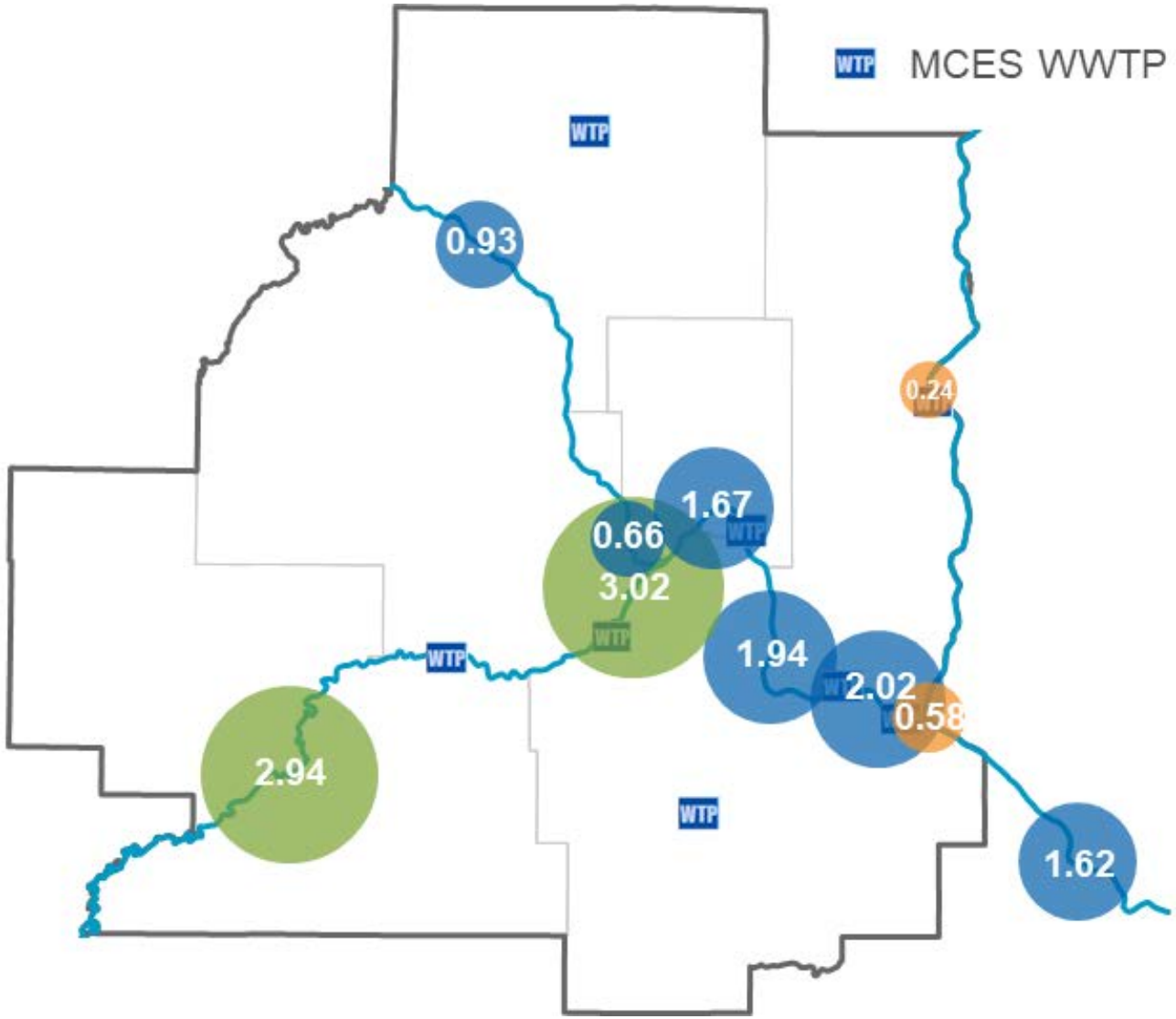
Indicates the "Recent Conditions"



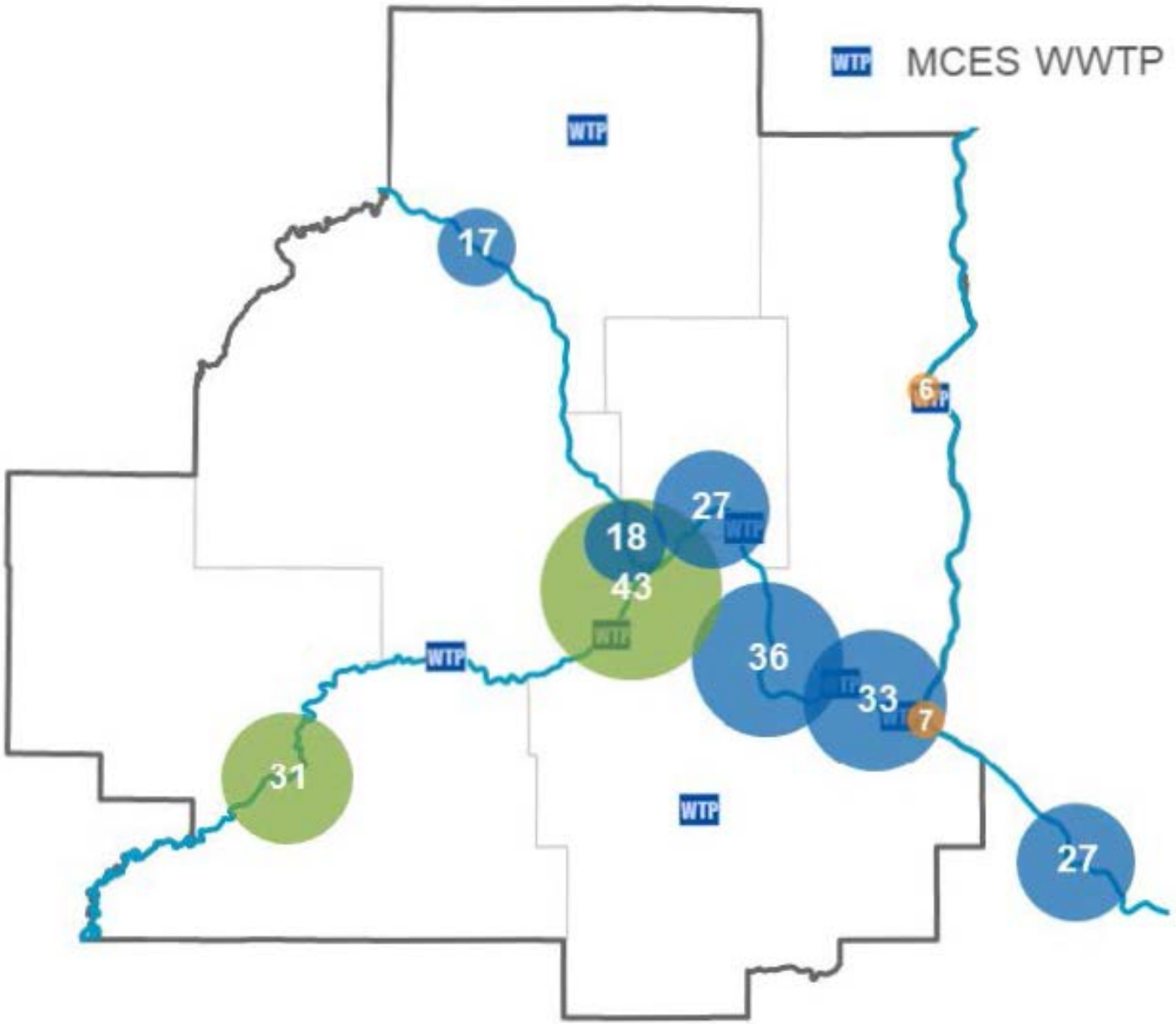
Total Phosphorus (milligrams per liter) – “Nutrients”



Nitrate-Nitrogen (milligrams per liter) – “Nutrients”



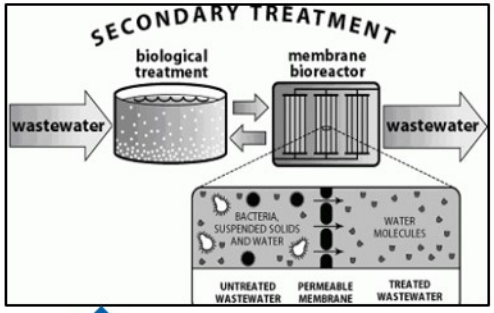
Chloride (milligrams per liter) – “Salt”



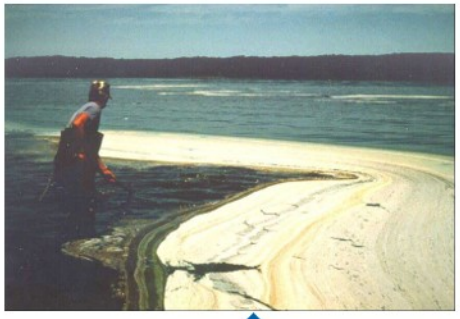
What Happened to the Region

1880 Direct sewer discharge

1966 2nd treatment



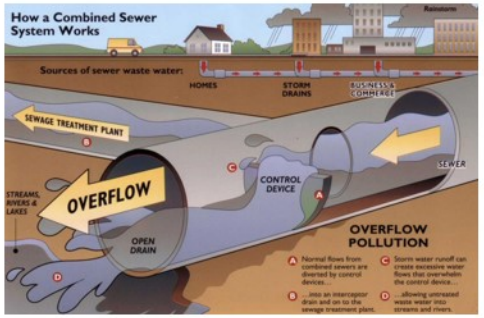
1984 Denitrification
2000 Bio-P removal



Rapid population growth, Ag. and urban expansions

1938 Metro WWTP

1972 Clean Water Act



1985 CSO

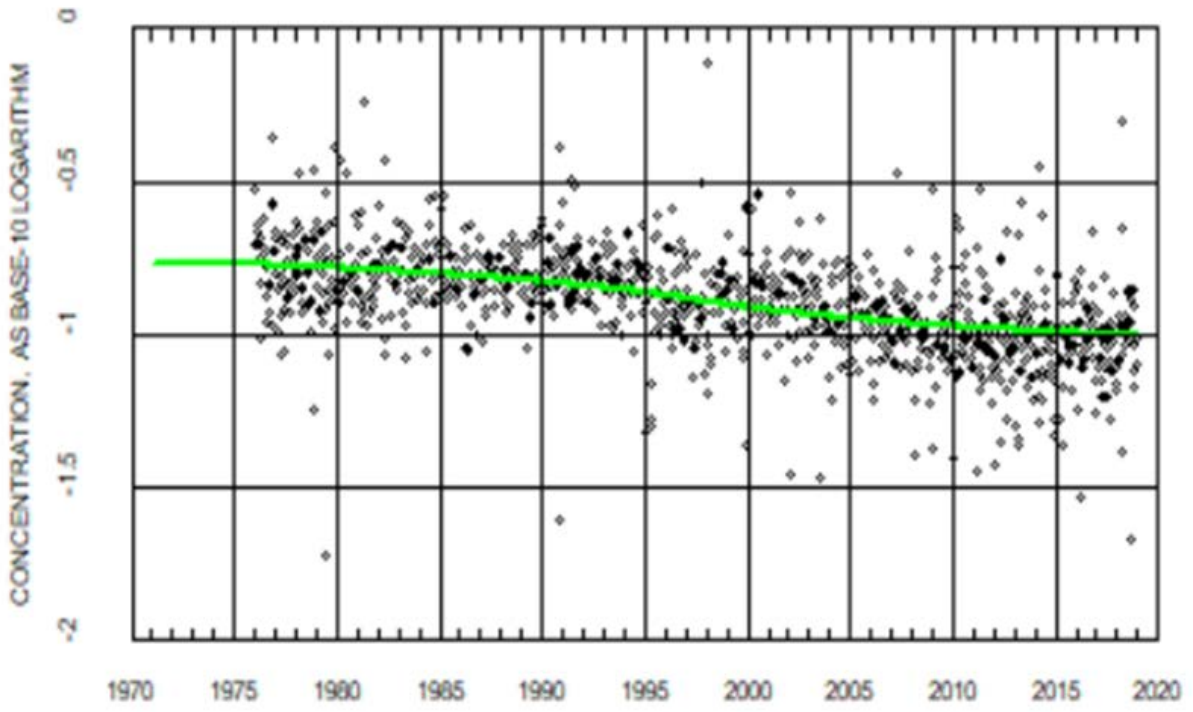
Why Trend Analysis

Changes in water quality over the last 40 years

Contributions to the Changes

Current water quality issues and needs for improvement

Decisions for future actions

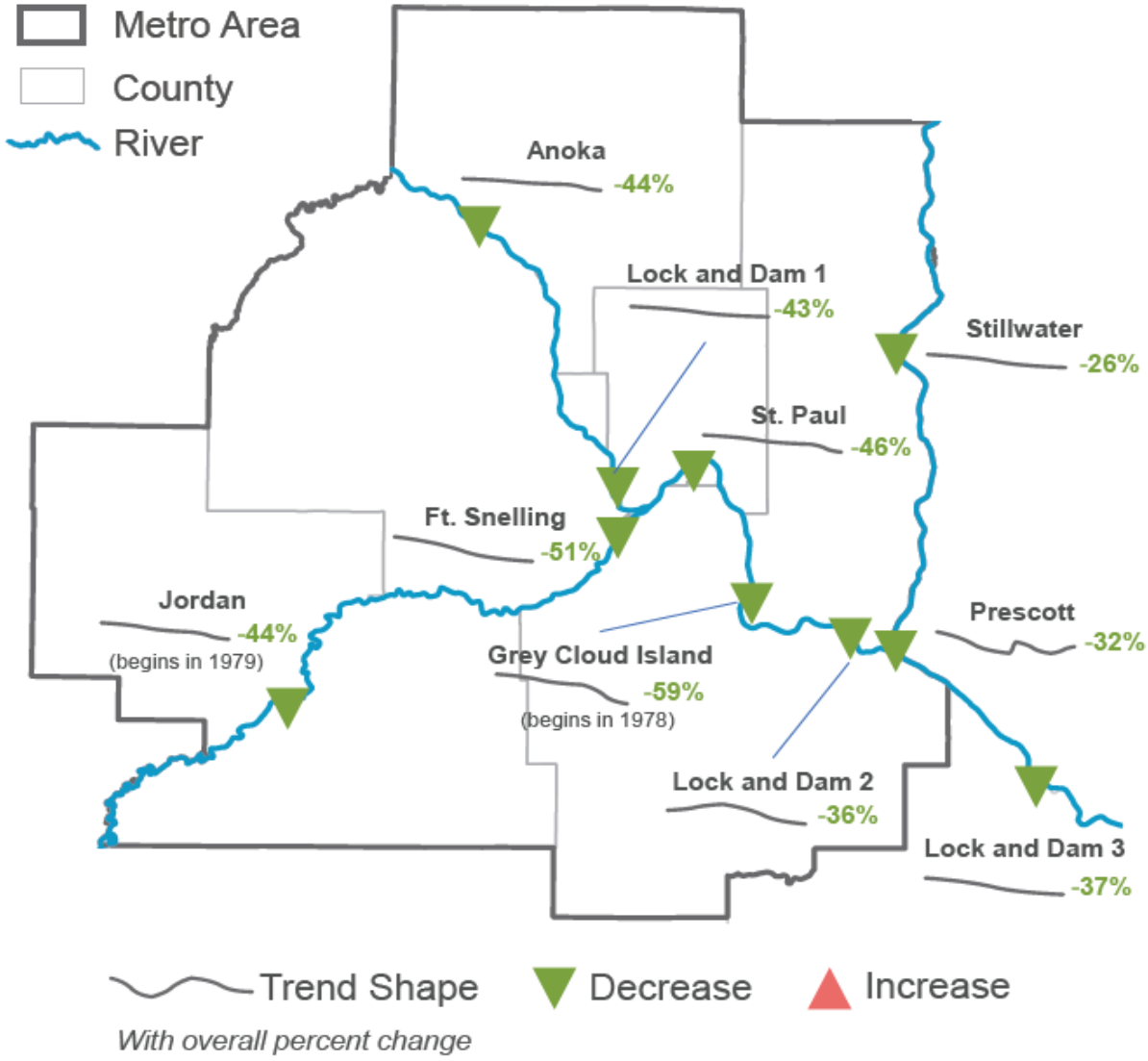


Significantly Improved Water Quality

Example Total Phosphorus

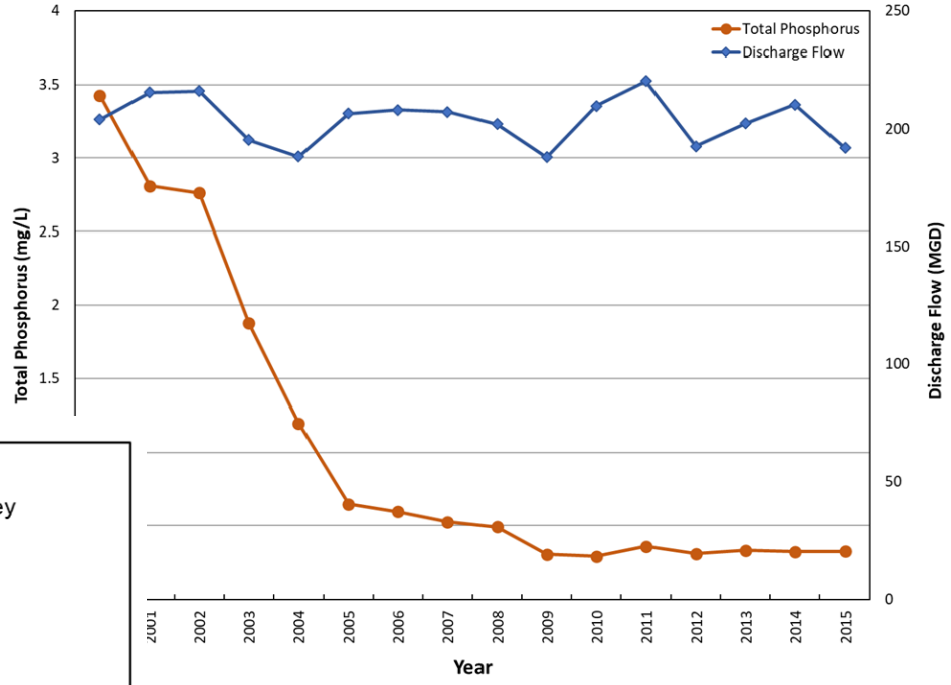
Influencing factors

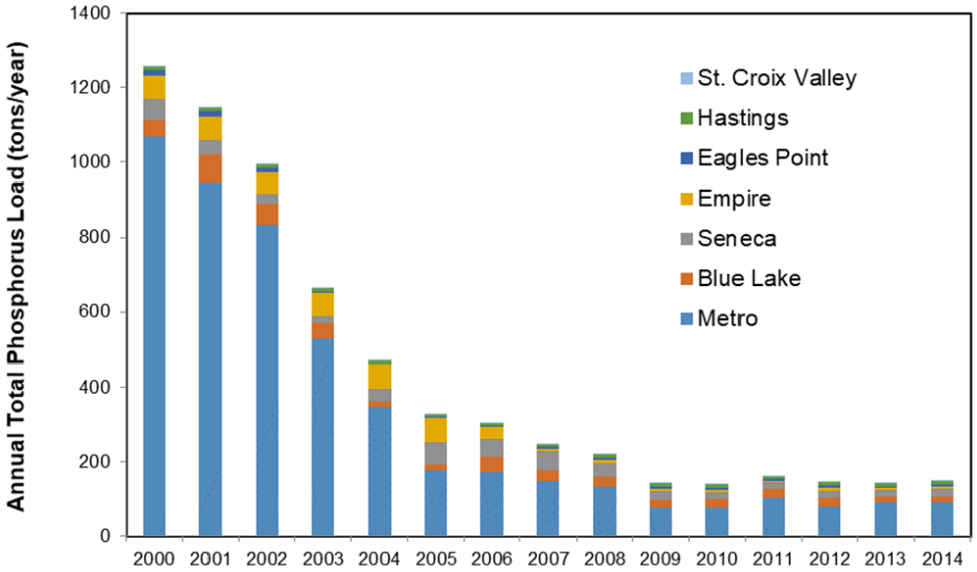
- Phosphorus bans
- Total Maximum Daily Load
- Best Management Practice
- Treatment Plant Biological Phosphorus Removal



Significantly Reduced Total Phosphorus Discharges from Treatment Plants

Biological phosphorus removal technology started in 2000





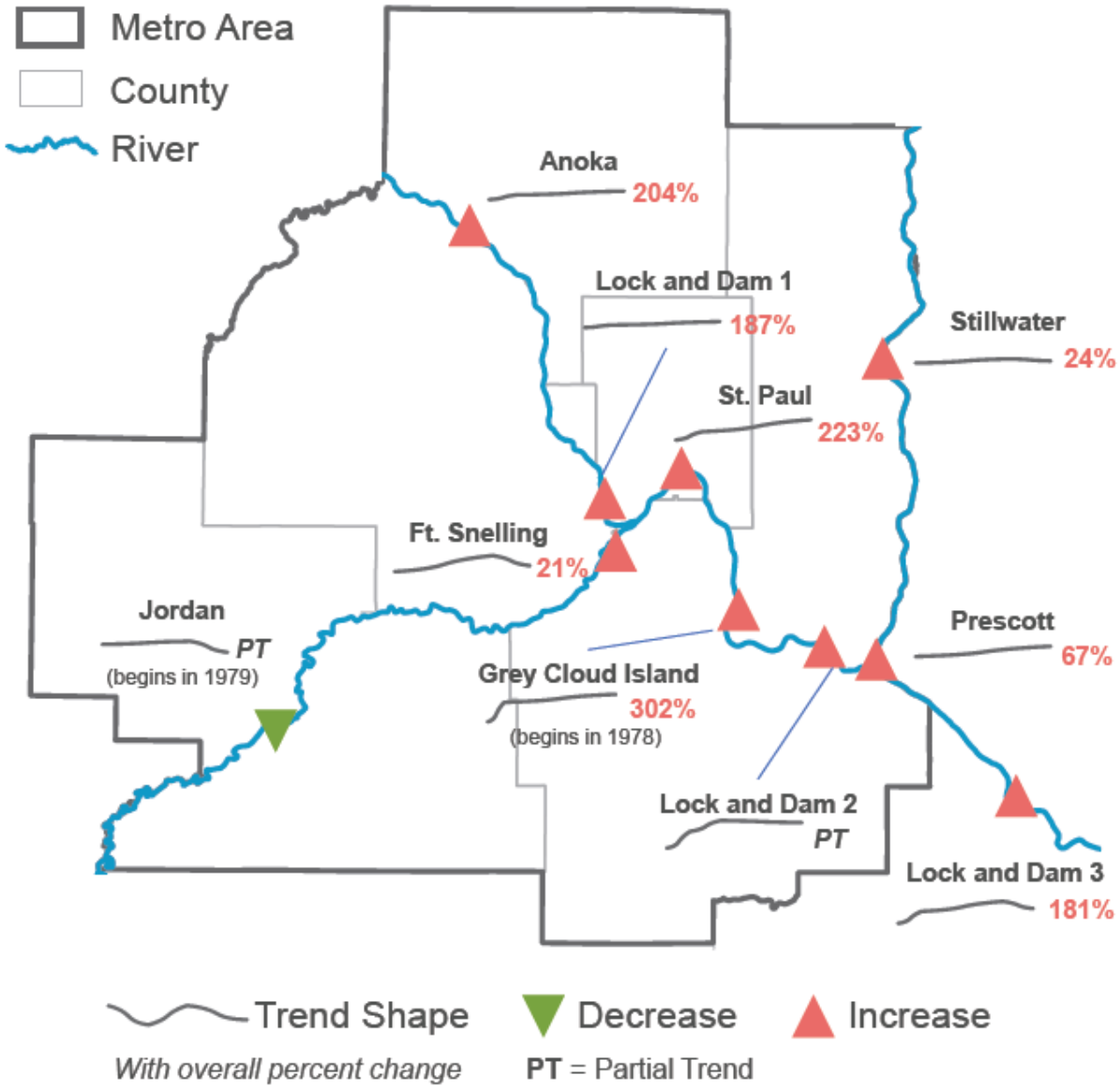
Total phosphorus reduced by more than 90% during 2000 - 2015

Historical Pollution Problem

Nitrate Nitrogen

Influencing factors

- Population growth
- Agricultural and industrial activities
- Harmful ammonia reduction
- Expansion in livestock and poultry production

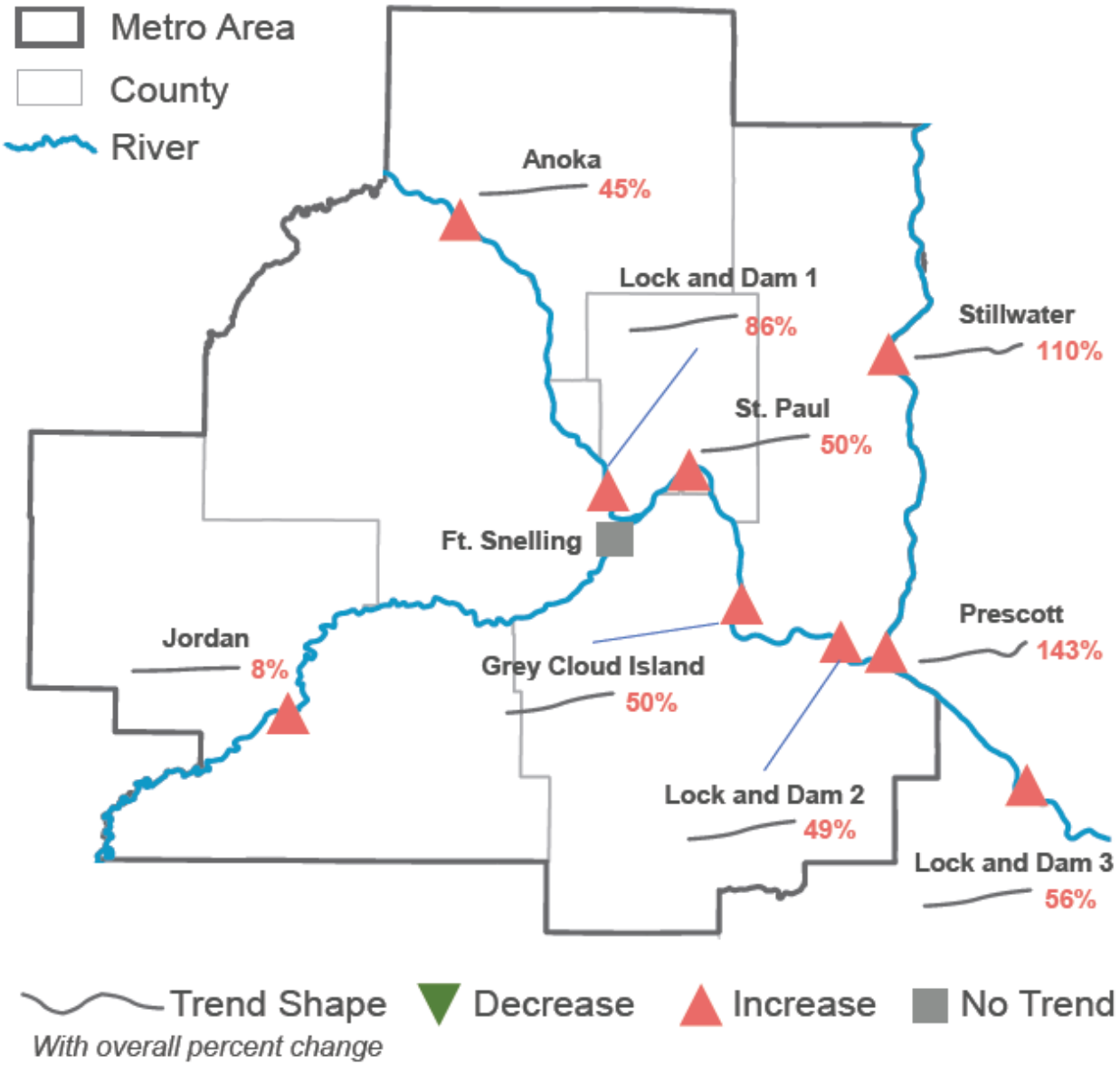


Emerging Pollution Issue

Chloride

Influencing Factors

- Salt use
- Treatment plant discharges
- Fertilizer uses
- Livestock wastes
- Septic systems
- Ground water contribution



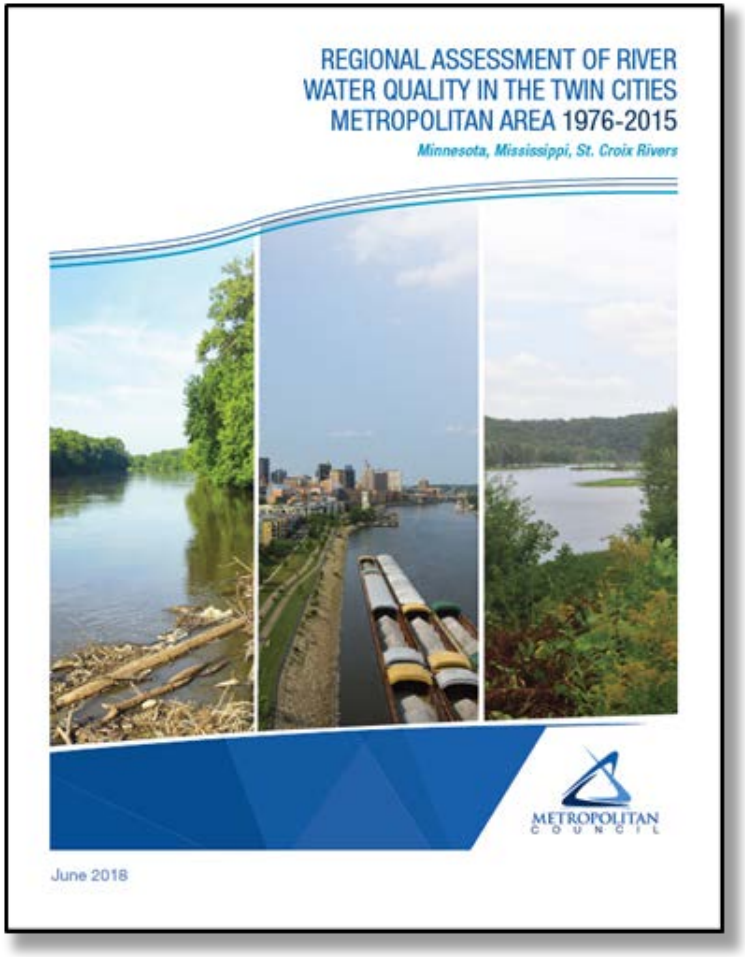
Conclusions

- Water quality improved generally
  - Sediment
  - Phosphorus
  - Bacteria
  - Biological Oxygen Demand
  - Ammonia
- Existing and merging issues
  - Nitrogen (Total nitrogen, nitrate)
  - Chloride
- Mixed trends for Chlorophyll-a

More Information

Full report, technical summary, and fact sheets are available at:

www.metrocouncil.org/river-assessment



Questions

Erik Herberg, Environmental Scientist
Environmental Quality Assurance/Water Resources
Erik.Herberg@metc.state.mn.us
651-602-1473

Hong Wang, Principal Environmental Scientist
Environmental Quality Assurance/Water Resources
Hong.Wang@metc.state.mn.us
651-602-1079