

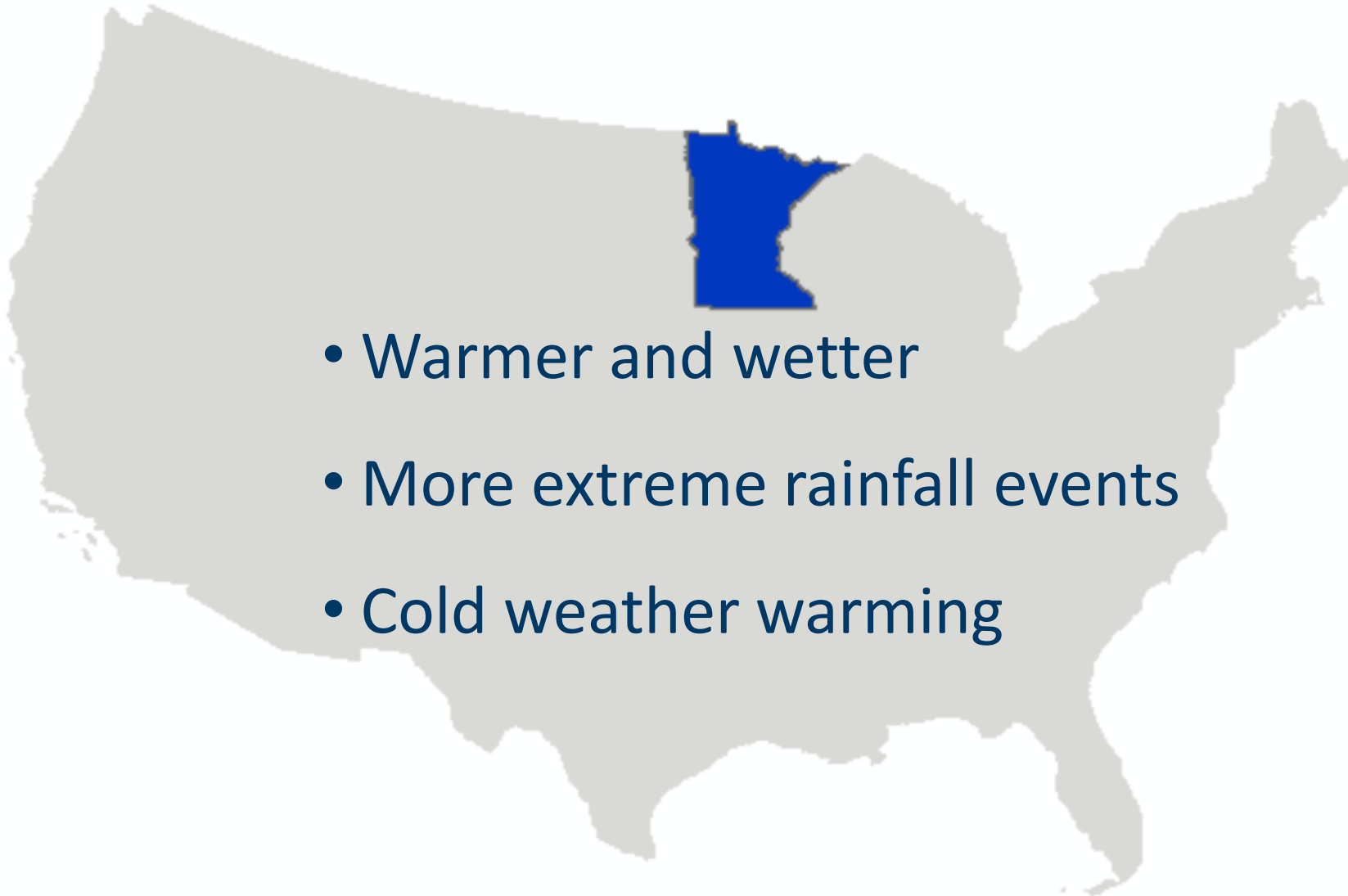


# “Climate change” or “a changing climate”: A survey of approaches to account for climate change in MN watershed studies

Andrea Plevan | TMDL Writer and Trainer

June 8, 2021

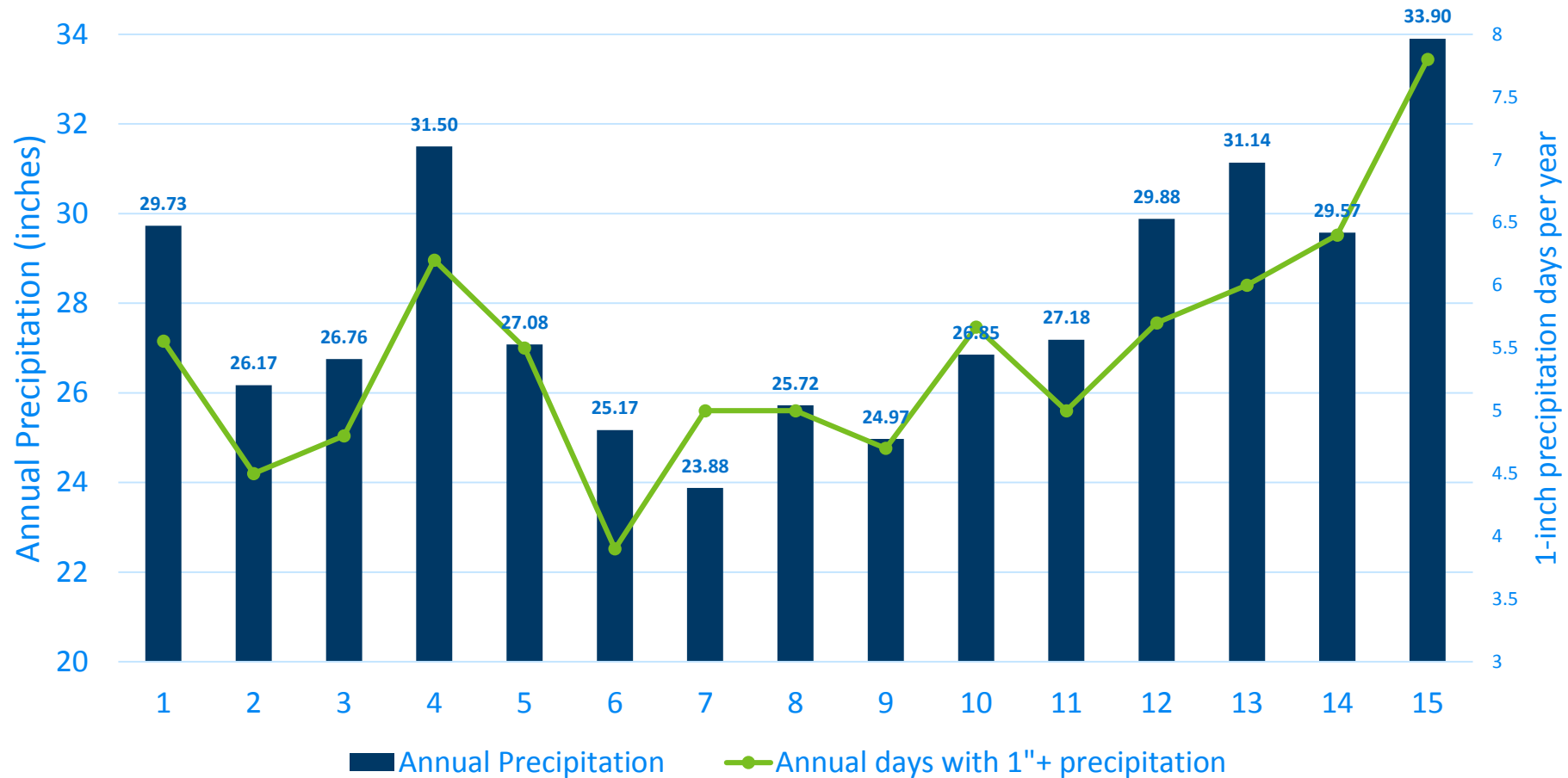
# Climate change in Minnesota



- Warmer and wetter
- More extreme rainfall events
- Cold weather warming

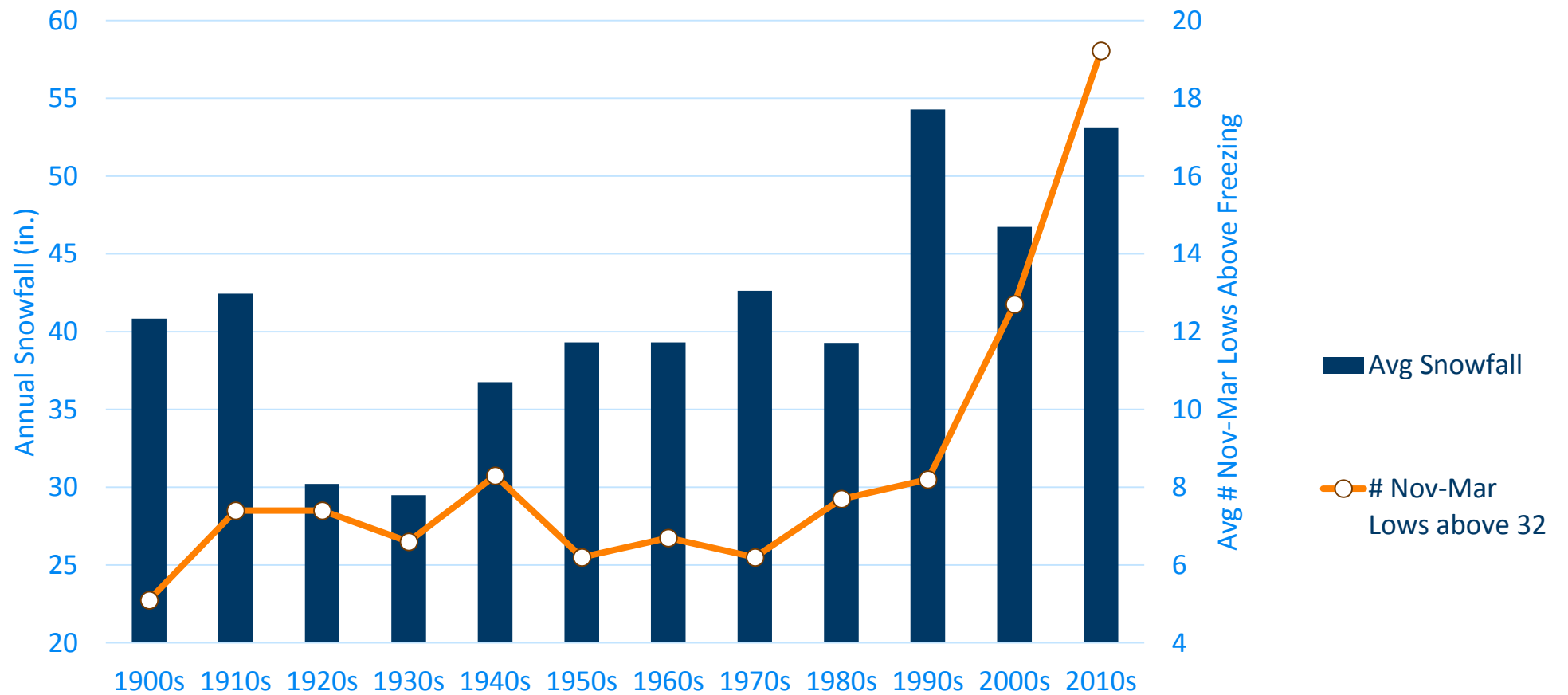
# Wetter overall and more heavy rains

## Annual Precipitation & Heavy Rain, Twin Cities



# More snow and more thaws

## Annual Snowfall & Winter Days above 32, Milan



# Lake ice duration

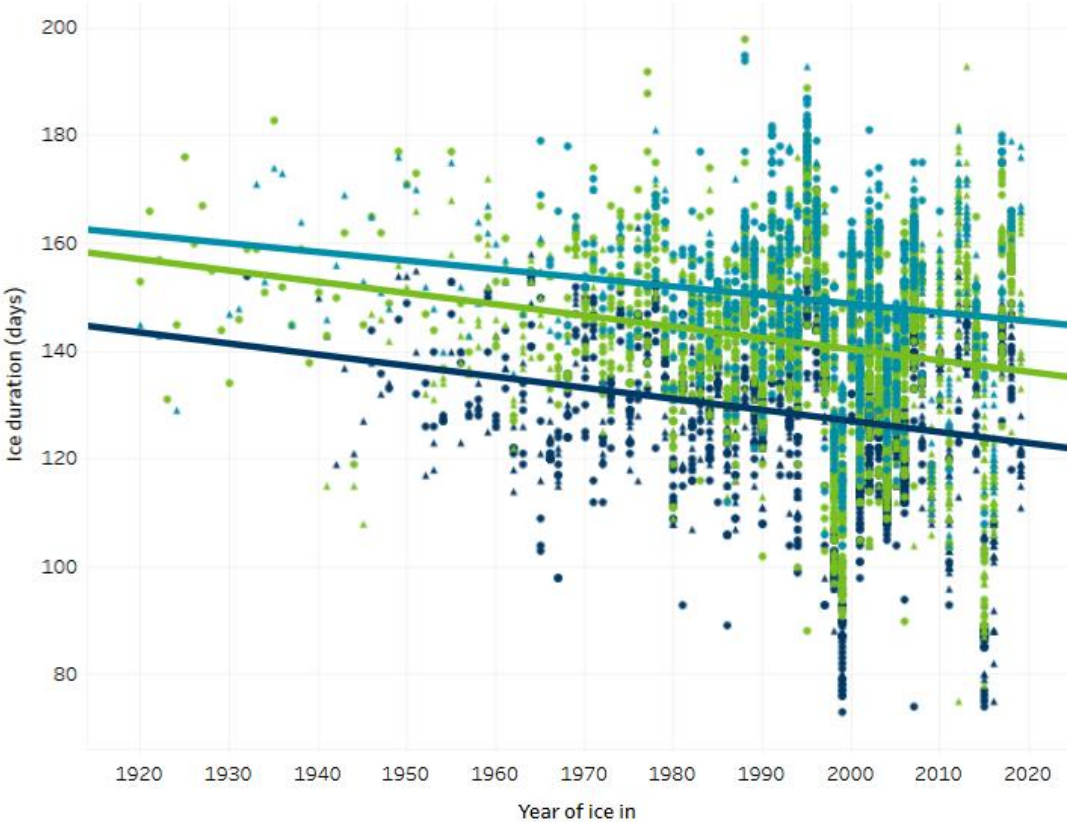


Photo: Laurie Shauli

## Our strategic plan

Sixteen strategic **goals** for our agency | 2018-2022

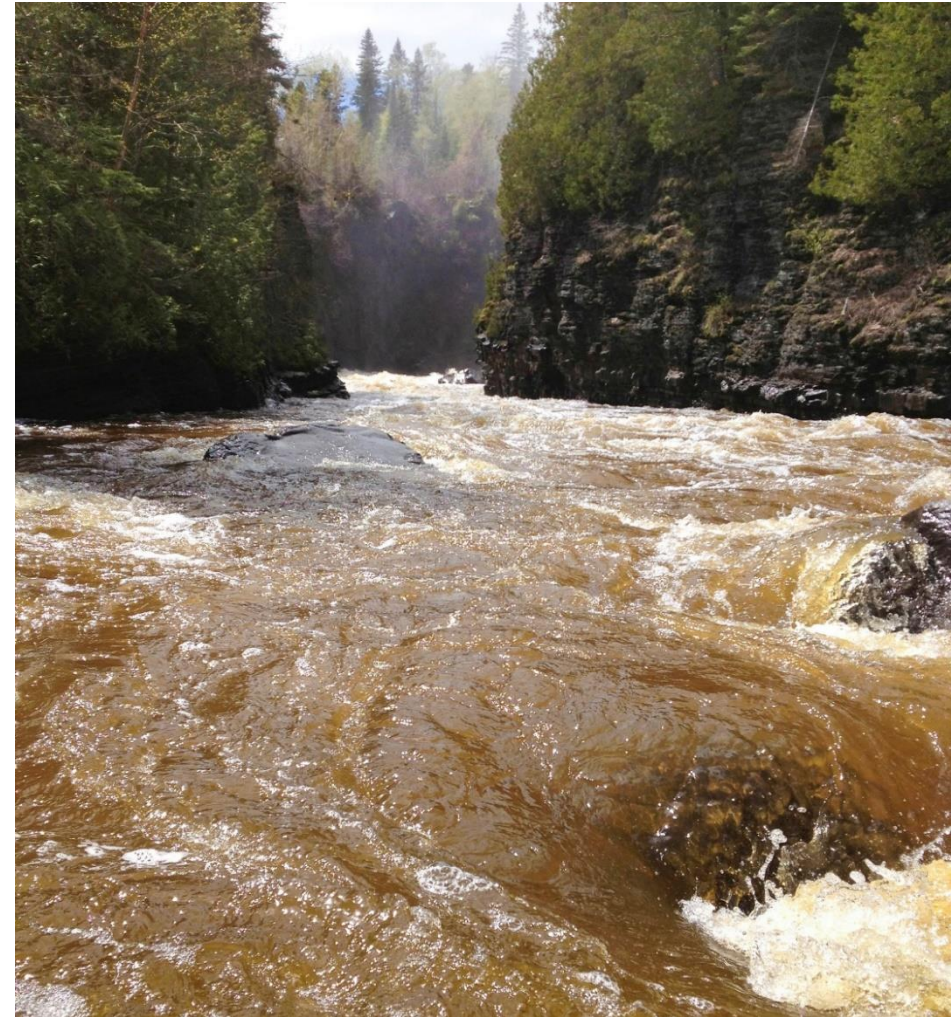


Act on opportunities to increase resilience of communities and the environment to climate change impacts.

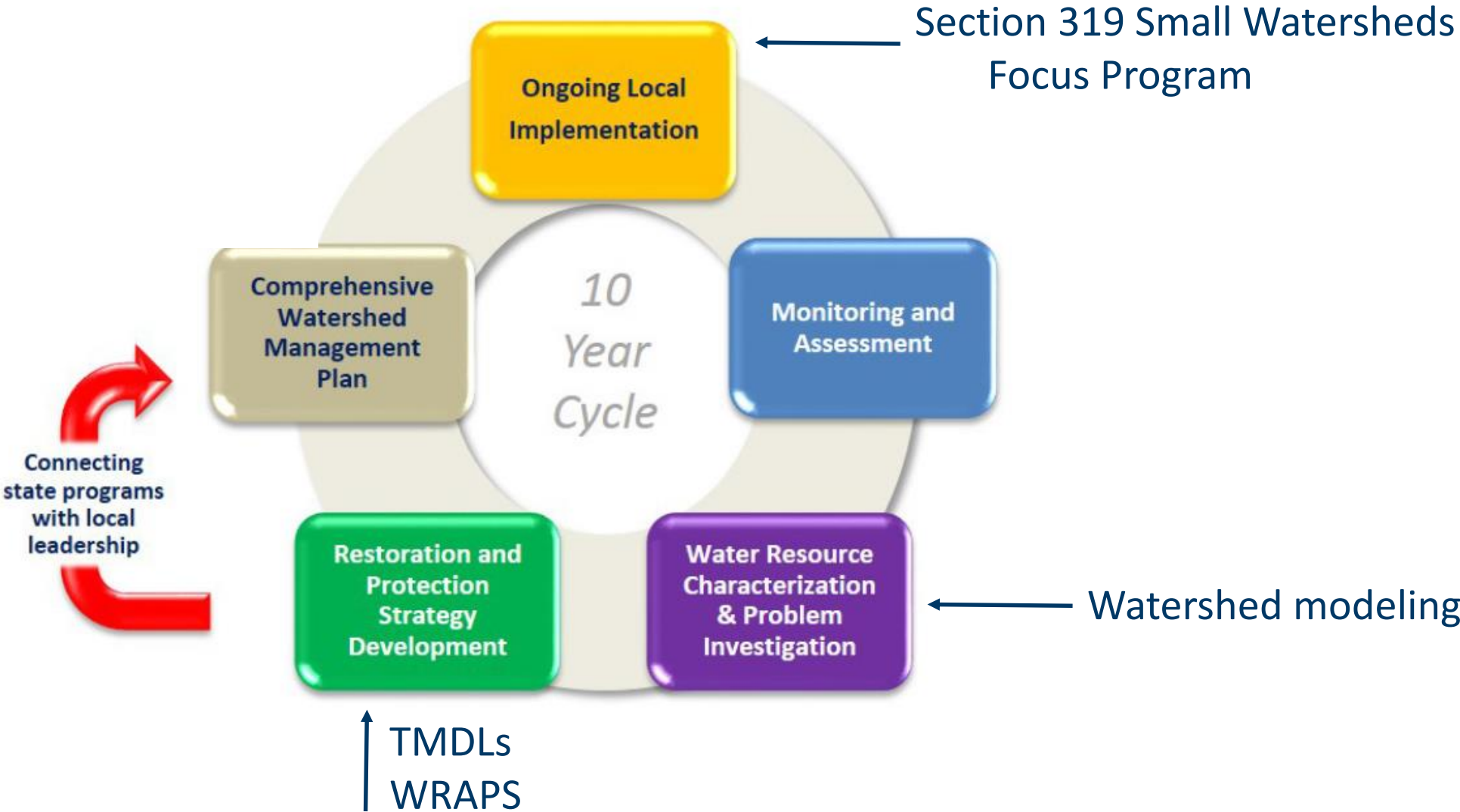
- MN Climate Change Subcabinet
- MPCA Climate Adaptation Team

# Watershed Division Program Plan: climate change

- Pollution control and watershed management
- Multiple benefits
- Altered hydrology
- Management strategies



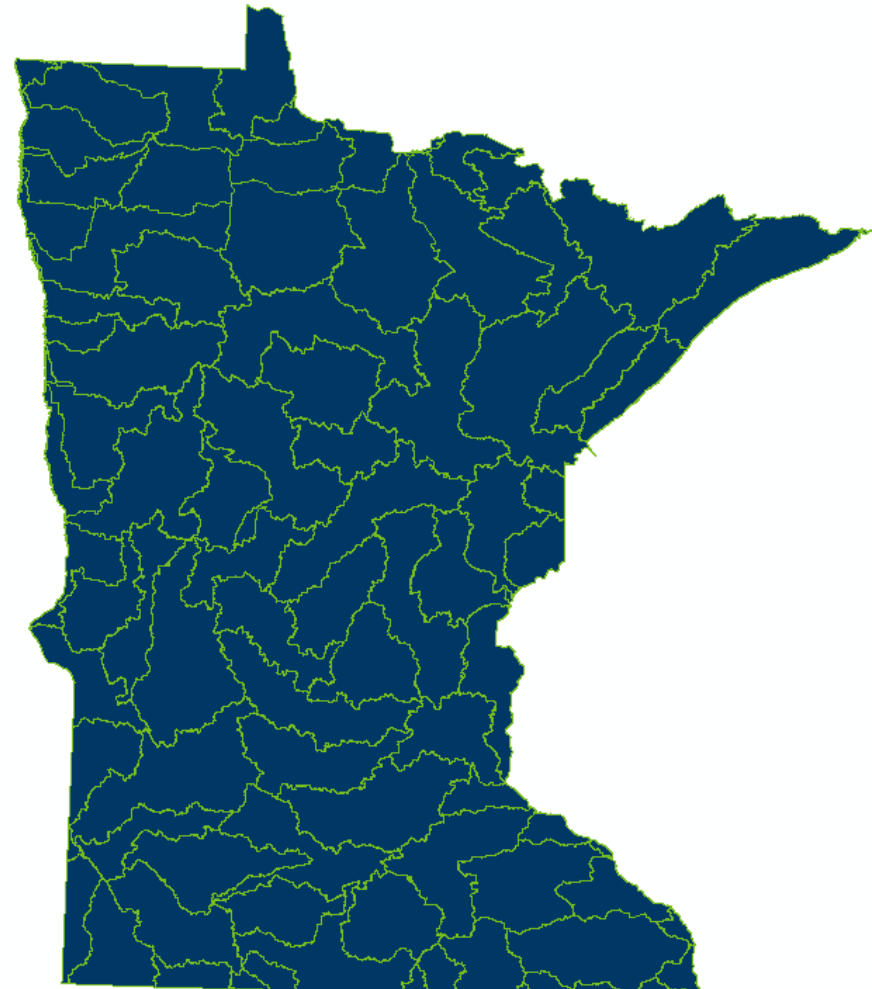
# Watershed approach





# Climate change and the watershed approach

1. Climate change happens
2. A changing climate
3. Addressed through strategies but not discussed



# Climate change: Duluth urban streams

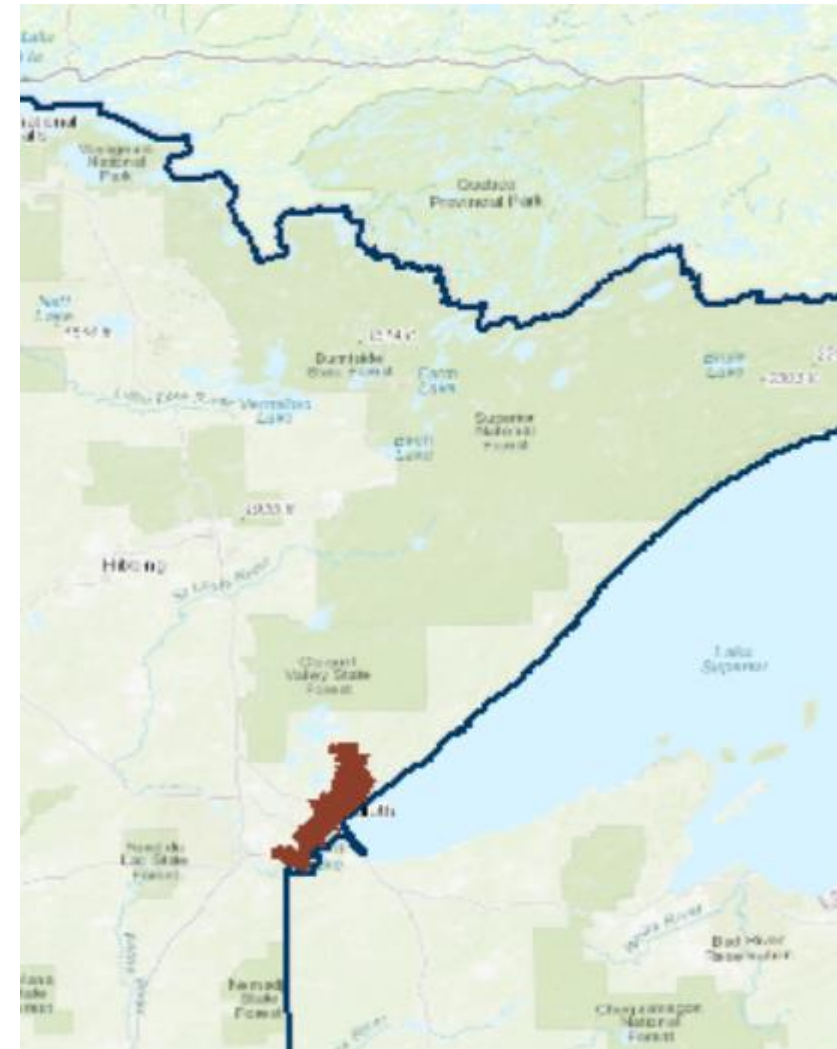
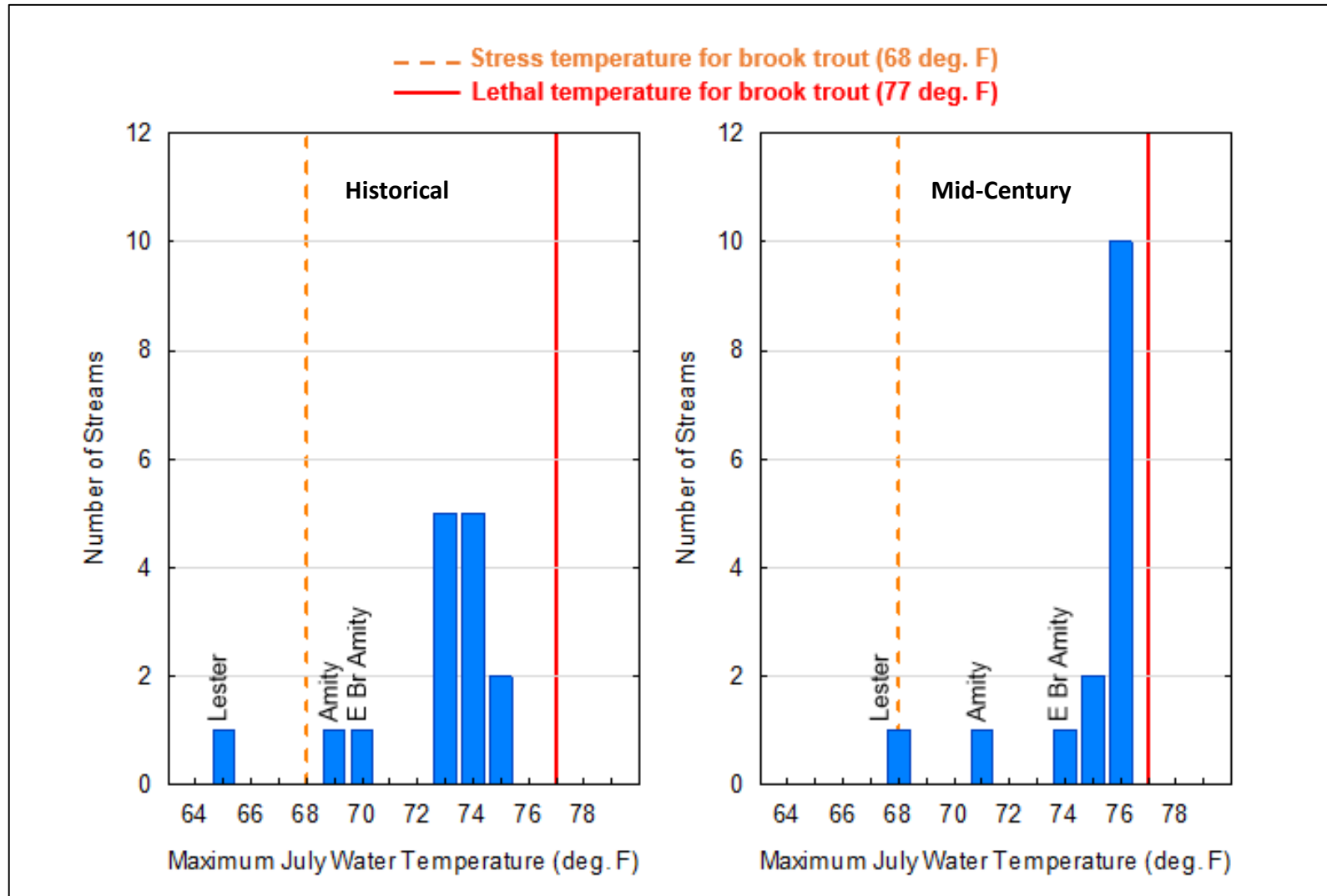


Photo: Sharon Mollerus



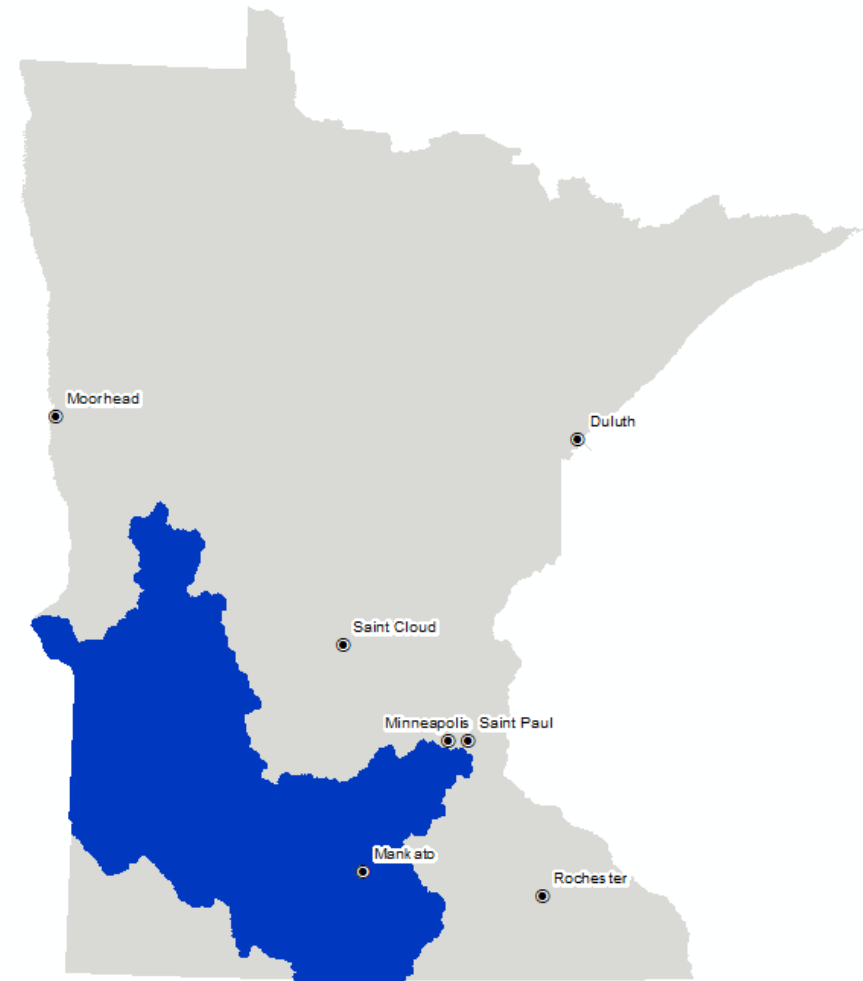
# Climate change: Duluth urban streams

Maximum July water temperatures



# Climate change: Minnesota River basin

- [Sediment Reduction Strategy](#)
- [Minnesota River TSS TMDLs](#)



# Climate change: Minnesota River basin



# Climate change: Minnesota River basin

- Climate change alters
  - Precipitation patterns
  - Hydrology
- Multiple benefits

		BMP Location	
		Upland	Near-Channel
Sediment Origin	Upland	Crop residue management Buffers Water and sediment control basins Waterways	Sediment traps Reservoirs
	Near-Channel	Water storage Water and sediment control basins Cover crops and perennial vegetation	Infrastructure repair and protection Armoring Diversions Stream restoration Two-stage ditch

# A changing climate



# Skunk Creek Nine Key Element Plan

- “...three rainfall events in the past three years that have exceeded the 200-year storm event...”
- “Increased volumes and rates of runoff and stream-flow that have altered the channel stability and evolution of Elim Creek.”



Photo: Pine Journal



# Skunk Creek Nine Key Element Plan



Critical area	Activity
Failing red clay dams	Dam removal
Improperly sized culverts	Culvert replacement
Near-channel erosion	Stream channel restoration and riparian management

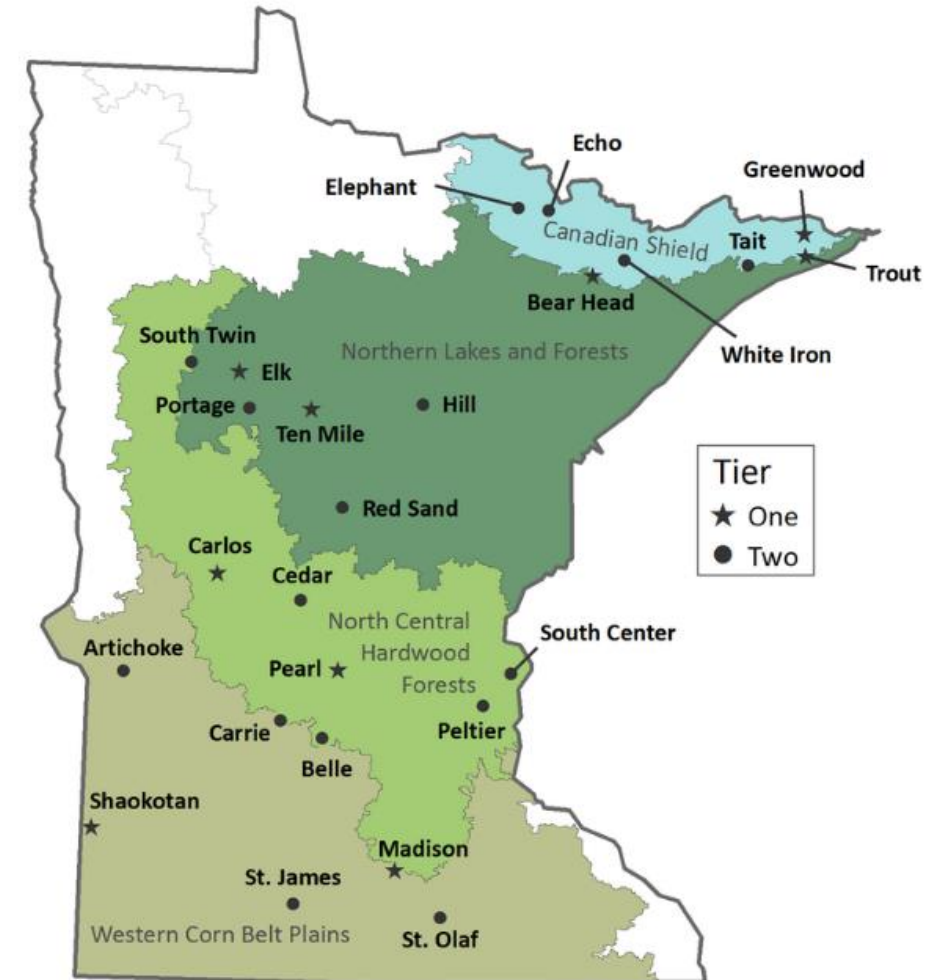
# Dobbins Creek Nine Key Element Plan



## **Sediment source: stream bank erosion and altered hydrology**

- Near-channel practices
- Soil health practices
- Agricultural BMPs

- Long-term stream flow and water quality monitoring
  - [Cooperative Stream Gaging \(DNR/MPCA/USGS\)](#)
  - [Watershed Pollutant Load Monitoring](#)
- [Sentinel Lakes Program \(DNR\)](#)
- [Long-term biological monitoring of rivers and streams](#)
- Local organizations



Sentinel Lakes

- [Climate Adaptation Dashboard](#)
- [MN Climate Trends \(DNR\)](#)
- [MN Climate Explorer \(DNR\)](#)
- [Watershed modeling](#)



Choose a surface water characteristic



- Most agree that climate is changing. Less agreement on cause.
- We are talking about climate change (or a changing climate).
- We recommend watershed management strategies to mitigate and adapt to climate change.
- We are treating existing problems. We don't know the scope of future problems.

# Thank you!

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