Recommendations:
Groundwater – Surface Water Interaction

Emily Steinweg, Senior Engineer, MCES Water Supply Planning
Lanya Ross, Environmental Analyst, MCES Water Supply Planning

MAWSAC meeting: September 21, 2021

METROPOLITAN COUNCIL

PRE-WORK: Review info shared by committee members and staff in memo attached to meeting agenda

Resources related to the following topics:

- **Local work**
- **Research examples: understanding ground – surface water interactions**
- **Existing ground – surface water data**
- **Examples of guidance (technical assistance, best practices, planning, funding)**
- **Community data**

Committee members are encouraged to share useful and interesting resources!

METROPOLITAN COUNCIL

Working Together

Metro Area Water Supply Advisory Committee (MAWSAC)

- Informs Metropolitan Council's water supply planning activities and preparation of its regional development framework.
- Pools collective expertise to address increasingly complex water problems that require a collaborative approach.

What recommendations to make as a committee around groundwater – surface water interaction?

This information will be included in a 2022 report to the Metropolitan Council and Minnesota Legislature.

Presentation overview:

1) Introduce proposed language
2) Consider regional and local context
3) Explore and revise proposal
4) Next steps

METROPOLITAN COUNCIL

GROUNDWATER-SURFACE WATER INTERACTIONS

DRAFT RECOMMENDATIONS

Problem or need

Planning for water supply sustainability comes down to understanding water budgets: the amount of water moving through the different parts of the regional water cycle; how water flow affects contaminant migration, including between ground and surface waters; how water can be used or reused without doing damage to connected resources; and how different environmental and use conditions affect water availability.

Because water systems extend beyond jurisdictional boundaries, approaches that support a subregional perspective will improve understanding of the challenges and opportunities and allow the potential impacts of interacting groundwater and surface water to be prioritized when making decisions.

Goal

The TAC, serving at the pleasure of the MAWSAC, recommends that the MAWSAC, with the Metropolitan Council and the State of Minnesota, promote actions to further understand how ground water and surface water interact and how those interactions impact the sustainability of water supply systems and resources. Ongoing support for collaborative management strategies, research, and monitoring is needed to better understand these interactions and impacts.

Solutions

- **Research** – *enhance monitoring and data accessibility, metro area water balance during wet and dry periods, movement of contamination, reuse and infiltration*
- **Outreach, engagement, training** – *risk management, updated stormwater infiltration requirements and recommendations, water reuse BMP*
- **Financial support** – *water reuse grants for communities and developers, subregional projects that address interconnectedness of water resources and emergency response*
- **Regulatory** – *streamlined regulatory direction for storm or wastewater reuse*
- **Regional policies & planning** – *policy making with acknowledgement of ground – and surface water interaction, PWS working with state agencies to discuss changes in water demand and supply, safety planning*

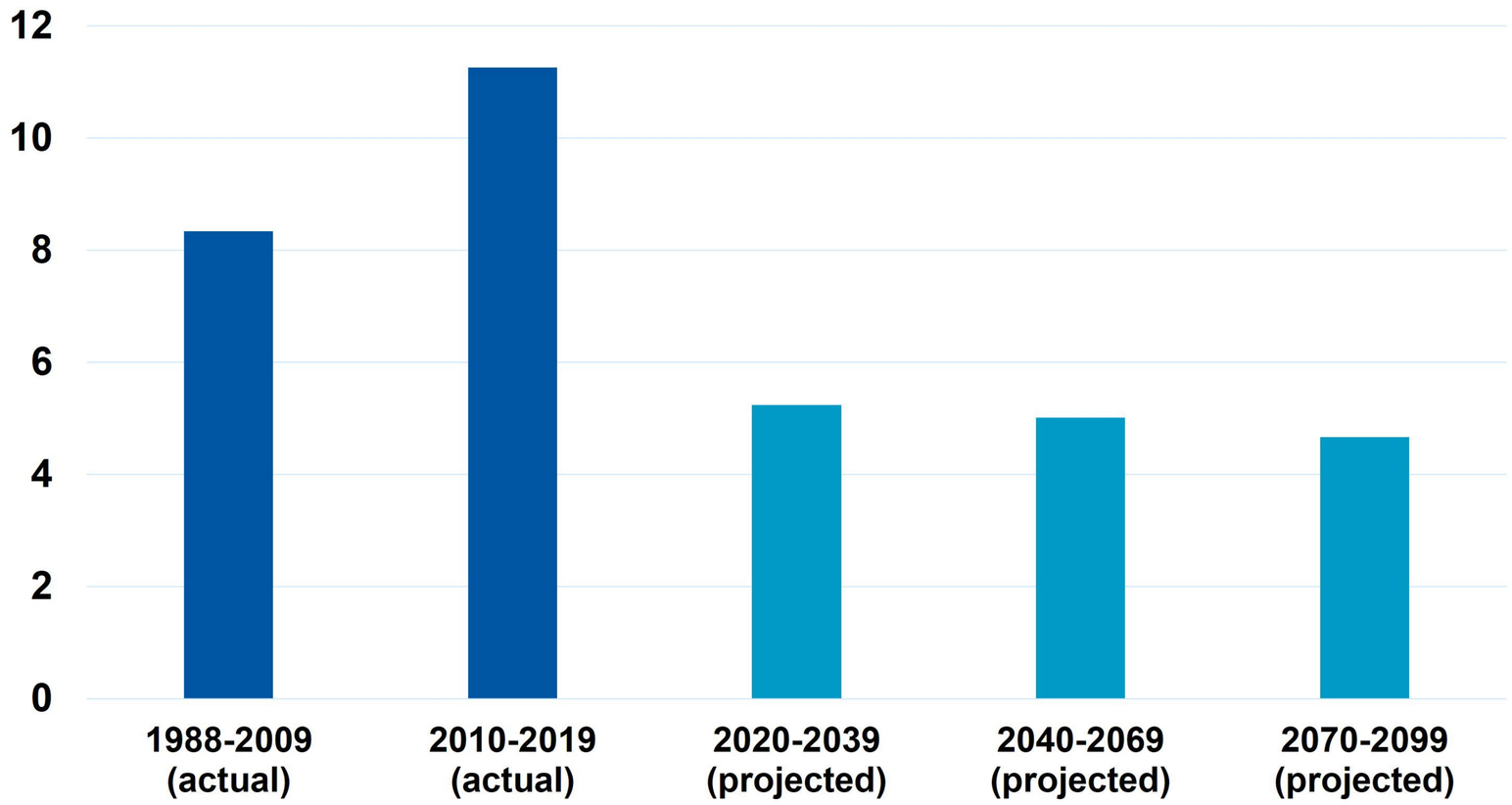
TAC considerations for MAWSAC

- More data is needed to better understand interactions and problem solve.
- Collaboration is necessary to treat water as one resource.
- Acknowledge the challenge of bringing different management organizations together and the need to be sensitive to power/authority dynamics where responsibilities overlap.
- It is important that proposed approaches and recommendations be more specific.

METROPOLITAN COUNCIL

Climate projections and uncertainty

Regional modeling is a tool that may help explore how projections of precipitation and temperature could change the amount of water available to recharge groundwater



Calculated Model-wide Mean Infiltration (Inches per Year)

METROPOLITAN COUNCIL

Council Priority Waters List

Emily Resseger, Environmental Analyst, Metropolitan Council
Environmental Services Water Resources

METROPOLITAN COUNCIL

What is the Priority Waters List?

The priority waters list is those waters the Council has determined provide significant use and benefits to the region. The Council will prioritize dedicating resources to these waters to help maintain and improve their use for present and future generations.

Why Do We Need to Prioritize?

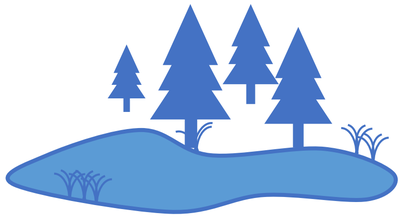
- We have over 950 lakes and hundreds of miles of rivers and streams.
- We need priorities for planning, investment and operations purposes.
- How do we spend staff time and money on:
  - Monitoring
  - Assessment
  - Technical assistance
  - Grants
  - Education
  - Investment in our systems

METROPOLITAN COUNCIL

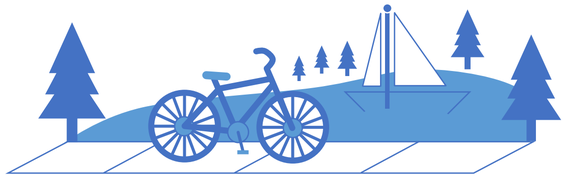
Priority Waters Categories

Drinking Water

Scientific & Education

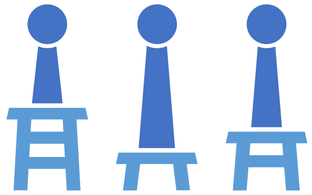


Healthy Habitat

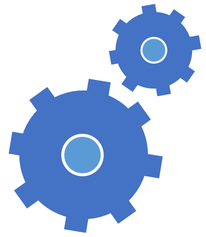


Recreation & Tourism

Tranquil Connection

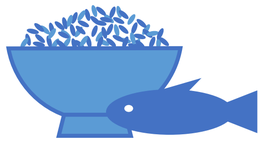


Equity



Industrial & Utility

Cultural and
Historical Value

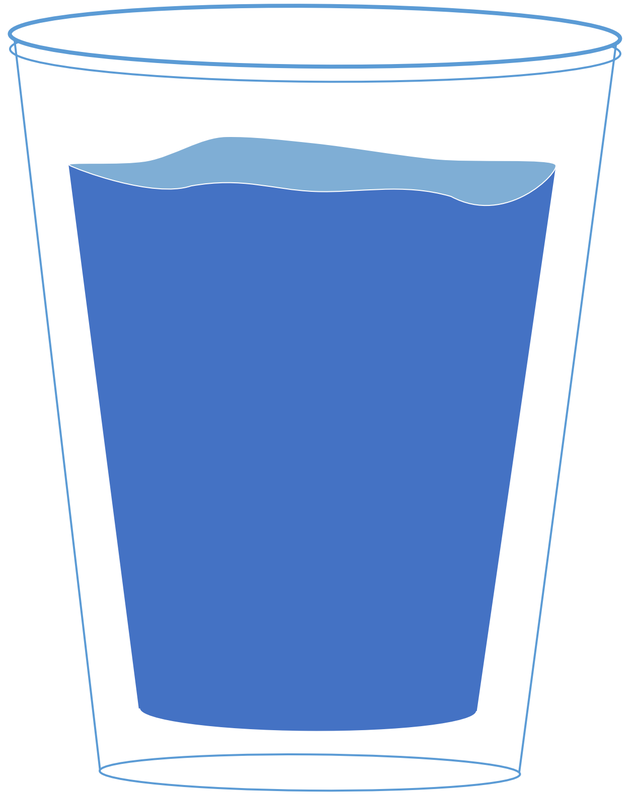


Provisioning

METROPOLITAN
COUNCIL

Drinking Water Measures

- Drinking water sources
  - Principal drinking waters
  - Reserve drinking waters
- Regional source water protection
  - Highest potential to impact drinking water
    - GW-DWSMA vulnerability
    - Pollution sensitivity
    - DWSMA for surface water
    - Emergency response areas
- Drinking water use
  - Municipal DWSMA population served
  - Domestic and non-municipal well density



METROPOLITAN COUNCIL

Takeaways

- The Priority Waters list is a tool Council staff can use to ensure the highest valued waters in the region are prioritized and protected in our work.
  - Completion date ~early 2022
  - Part of the Council's 2050 Water Resources Policy Plan
  - Available for partners to use as well

- The Council is committed to considering drinking water -surface and ground- in how we prioritize resources towards surface water.

- Datasets are now at high enough quality and at fine enough scale to make regional decisions.

METROPOLITAN COUNCIL

Interactions of Ground and Surface Waters

Understanding connections and associated impacts for better planning and management

John Clark, Senior Environmental Scientist, Metropolitan Council
Environmental Services Water Supply Planning

METROPOLITAN COUNCIL

What are the concerns?

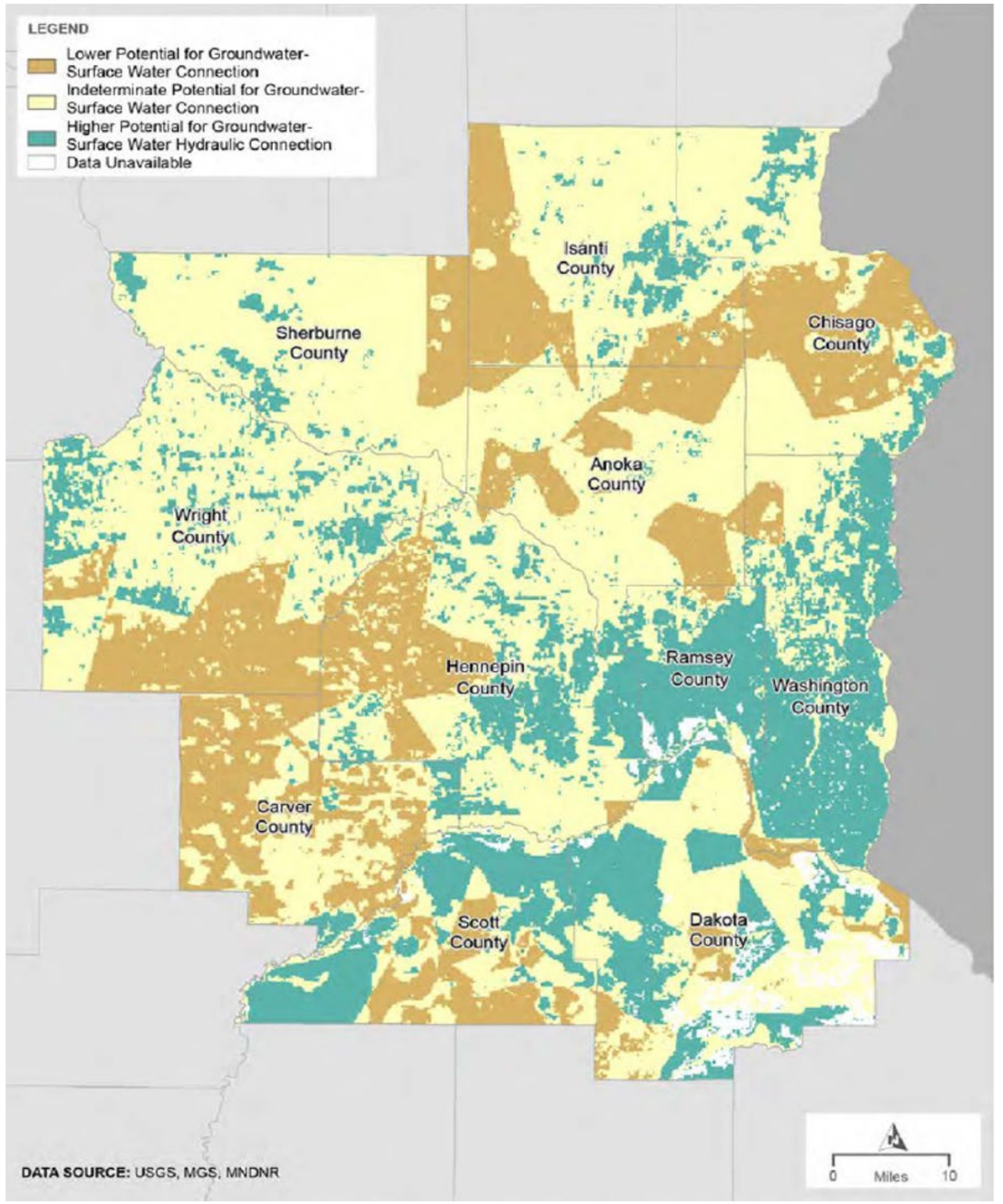
- Surface waters can be impacted by groundwater pumping
- Recharge is impacted by surface water routing and land use changes
- Impacts to water chemistry and ecological function
- Impacts to infrastructure and homes from rising water tables
- Lawsuits, business and tax losses
- Social and political costs
- Loss of recreation and cultural activities
- Loss of trust
- Permitted pumping restrictions
- Increased requirements for water utilities

Project Purpose

- Identify areas of the metro where connections are most likely
- Identify areas that are most susceptible to impacts
- Develop guidance that helps water managers and planners consider and prioritize GSIs in their decision-making
- Ultimately – improve the resiliency of our water resources and water systems

METROPOLITAN COUNCIL

- Used a two-pronged data approach
  - Hydrogeologic
  - Geochemical
- Assessed the time of travel from the water table to the bedrock surface
  - Looked for agreement between methods
  - Used as a proxy for likelihood of connection
- Limitations
  - Limited measurements increase interpolation
  - Need updated geologic atlas info. for some counties
  - Doesn't explicitly evaluate water table and surficial aquifer relationships



What needs to be done? What info needed?

- A shared, holistic, conceptual model of our water systems that include:
  - All water types
  - Hydrogeology
  - Land use
  - Climate
  - Water infrastructure
  - Water treatment
  - Natural capital
  - Cultural values
- A robust monitoring network that links and is built around surface and groundwater interactions
- High-resolution modeling in prioritized areas where impacts are likely
- Information that allows communities, water resource managers, and policy-makers to consider GSIs in their decision-making

METROPOLITAN COUNCIL

Local experiences – food for thought

Local utility and water resource managers invited to share their experience working on specific projects or programs.

QUESTIONS

1. What was the problem or challenge, and what impacts were most concerning?
2. What trade-offs or tensions shaped the work?
3. What resources were needed to do this work? Financial or other?
4. Who are key stakeholders/partners and what outreach is effective? Any gaps?
5. How could the Council and/or organizations represented on TAC help?

METROPOLITAN COUNCIL

Questions

Lanya Ross
Environmental Analyst, MCES Water Supply Planning
Lanya.Ross@metc.state.mn.us
651-602-1803

Emily Steinweg
Senior Engineer, MCES Water Supply Planning
Emily.Steinweg@metc.state.mn.us
651-602-1516