

**EXECUTIVE SUMMARY:
WATER AND CLIMATE CHANGE –
IMPACTS ON WATER AND WATER UTILITIES
IN THE TWIN CITIES METROPOLITAN AREA**

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Executive summary

The effects of climate change on our region are being documented with ever-increasing frequency. Acute and chronic changes to weather patterns, including temperature and precipitation, are impacting the water resources we rely on for drinking, recreation, and economic productivity.

These changes are also impacting the ability of our wastewater utility and local water suppliers to provide essential public health services to the region. Climate change poses significant risks to water resources, infrastructure, and services provided to the communities, businesses, and residents of our region. Negative impacts threaten the reliability of water infrastructure and service delivery, and the predictability of the regulatory environment, resulting in increased costs for service providers and those that they serve.

To address these complex challenges the region must take steps to adapt to new climatic patterns, while mitigating the release of greenhouse gases that drive atmospheric warming. Failing to address climate change jeopardizes the ability of the region to grow sustainably and meet the water needs of future generations.

We at Metropolitan Council Environmental Services (Environmental Services) can work with the region to respond to climate change by mitigating greenhouse gas emissions in our wastewater operations and support services, and as stewards of environmental and public health for the region. Likewise, through our long-term planning responsibilities, our wastewater and water resource planning sections can help the region to adapt by providing technical support that helps communities to prepare, build resiliency, and grow sustainably.

Issue statement

Climate change poses immediate risks and future challenges to both the natural and built environments. The livability, prosperity, and sustainability of the region are threatened by the effects of climate change on water resources, water infrastructure, and water services. Public health, ecosystem function, economic growth, and community and individual well-being are facing increased pressures, all of which can affect outcomes for our residents. These impacts are especially costly to vulnerable communities in the region and exacerbate existing disparities.

Limiting the most severe impacts of climate change requires both immediate and sustained action to reduce greenhouse gas emissions (mitigation) and to implement climate-resilient design (adaptation) within our regional water infrastructure, water planning, and social systems that support our ability to thrive. Achieving the scale of reductions required will result in a substantial transformation across every sector of the economy, bringing both challenges and opportunities.

Our role in water and climate change

As the regional wastewater system operator, we at Environmental Services meet National Pollutant Discharge Elimination System and State Disposal System permit requirements. Our wastewater, surface water, and water supply planning functions work to promote sustainable water resources while addressing pollution and other factors impacting those resources for the seven-county metro area.

Our water planning role includes looking at current issues such as limited or poor-quality water resources for drinking water, supporting healthy ecosystems, and providing for a high quality of life in the region. The intent of our work is to collaborate with partners to define ways to move these issues forward.

All our work will be impacted by climate change. It will alter the amount, timing, and delivery of precipitation to our water cycle. It will cause environmental conditions that will threaten our water resources and water infrastructure, regional socioeconomic fabric, and our vulnerable communities. It will change our relationship with water.

Currently, we are updating our Water Resources Policy Plan, which includes policies and implementation strategies related to our water resources, water supply, and wastewater planning roles, as well as information needed to operate the regional wastewater system. Our goal with the Water Resources Policy Plan is to ensure sustainable water resources through planning and operational functions. Considering climate impacts and the mitigation and adaption actions that we can take is fundamental to achieve climate resiliency and to ensure clean water for future generations.

Equity, water, and climate change

The consequences of climate change will not be felt by all residents or communities simultaneously or in the same ways, potentially making disparities around water services and resources worse. However, these multifaceted challenges create significant opportunities to develop policies and partnerships that address climate change and its impacts within our organization, across communities and water sectors, and throughout the region.

Crucial concerns for water and climate change

Mitigating greenhouse gas emissions

Climate change is creating challenges, increasing costs, and negatively affecting water utilities and water resources in the metro area. This emphasizes the need for regional action at the individual, community, and organizational levels, including us at the Met Council, to mitigate greenhouse gas emissions. Without reducing greenhouse gas emissions, the climate will continue to become more volatile. This will lead to further impacts and new or evolving water challenges in the future that require regional water utilities and communities to adapt to limit negative consequences for metro area residents and businesses.

We know that we can never fully remove greenhouse gas emissions from our operations. We can actively work to improve our energy consumption and employ alternative technologies to reduce greenhouse gas emissions to help meet the state goal of carbon neutrality by the year 2050. Additionally, our local water suppliers and public works entities have an opportunity to reduce their greenhouse gas emissions. We can offer assistance and resources to help our local partners make infrastructure improvements that lessen their own energy demand.

Water and land management

Minnesota is a headwaters state. Most of the water that falls within our boundaries flows out of the state. The timing, delivery, and amount of precipitation greatly affects the way we interact with it and how it moves across our lands. Projected increasing growth will affect our land uses

and alter the land, placing additional stresses on the physical, chemical, and social aspects of water. At the same time, climate change will have a great influence on water resources, ecosystem function, and water utilities. If these pressures and stressors to water sustainability are not considered together in policy and planning decisions, the region will be less able to meet the current and future water needs of communities and residents.

As land is developed or redeveloped within the region, we at the Met Council and our partner organizations need to keep climate in consideration. We own and maintain numerous land parcels along our major rivers and within the metro area. This provides us with an opportunity manage these lands in a way that demonstrates regional climate leadership.

Safeguarding water infrastructure

A foundational service to any prosperous region is the ability to provide clean, safe drinking water to residents, and to collect and treat wastewater so that it can be returned safely to the environment. Water is essential to every household, and economically vital to industries like manufacturing, health care, and food production. These water services cannot be provided without water infrastructure – the pipes and pumps that move water through the systems and the treatment facilities that produce clean water. It is of great importance to protect and maintain this infrastructure.

Climate change exacerbates the need for investments into all the region's water infrastructure to counteract stresses from declining surface water flows and aquifer recharge, flooding, and drought. As the region continues to grow, we need to make investments in existing or new water infrastructure that takes the opportunity to incorporate climate resilient design. This step will help to ensure this essential infrastructure lasts for many more centuries.

Aligning and supporting local climate efforts

Climate change is a global condition with local community impacts to water resources and water utilities. We are well-situated to align broader greenhouse gas mitigation and climate adaptation objectives, goals, and strategies with local water planning efforts. Further, there is a need to discern and connect broad water and climate policy so that local policy implementors can be empowered to take effective actions.

When water and water resources are negatively impacted expenses rise, lives are disrupted, and trust in services lost. Often bearing the brunt of these negative outcomes are residents and communities with the least ability to do so. Water managers and policy makers are left to address confounding global economic, environmental, and social issues within local political boundaries (Islam & Winkel, 2017). Addressing these challenges requires flexible, holistic approaches that allow water managers, services providers, and residents to collaborate across diverse communities.

Local climate-impacted decisions are supported by climate projections and models that have associated uncertainty. However, this uncertainty cannot and should not preclude any organization from reaching a decision. Tools and analyses can provide context for the uncertainty. We can develop regional policy based on adaptive management, scenario planning, and robust strategy development to help support local decision-makers.

Recommendations for water resource policy and related strategies/actions

Our intent in this document is to share our current understanding of issues, identify current policy connections or gaps, and propose future policies and strategies to ensure sustainable water resources. Not all the recommendations included in this paper will move forward for inclusion into the Water Resources Policy Plan, and conversely, the Water Resources Policy Plan may include policies not discussed in this paper. The intent is to begin to develop a shared understanding and conversation about water and climate, which is connected to all aspects of our core services.

The scope of the issue presented in this research paper reveals the need for a regional One Water approach, increased strong regional policies, and better, more frequent collaboration to effectively become a climate-resilient region.

We work together with our partners in several ways to promote water and climate efforts, including long-range visioning and planning, regional investments and system operations, technical assistance, research, and partnership. This paper offers several policy and action recommendations in two areas that can help build regional resiliency and ensure the sustainability of our waters and water infrastructure now and for many generations to come.

Mitigation Policies

Proposed policy recommendation:

The Metropolitan Council prioritizes the mitigation of greenhouse gas emissions and their climate consequences in its operations, facility management, and planning functions.

Proposed actions:

- The Metropolitan Council will have net zero emissions by 2050, in alignment with the Minnesota Climate Action Framework.
- The Metropolitan Council will maximize energy efficiency, electrification, energy recovery, and renewable energy opportunities in the planning, design, procurement, operation, and maintenance of its assets.
- The Metropolitan Council will work to implement a methodology to account for the social cost of greenhouse gases when conducting cost-benefit analyses.
- The Metropolitan Council will invest in efforts to quantify and monitor process and fugitive emissions and will pursue opportunities to minimize these emissions.
- The Metropolitan Council will collaborate to advance nature-based solutions and other best management practices that achieve dual reductions in nutrient loading and greenhouse gas emissions.
- The Metropolitan Council will support the development and piloting of innovative approaches to reduce emissions in our own or the region's operations emissions through demonstration projects.
- The Metropolitan Council will support local water suppliers to reduce their greenhouse gas emissions.

Adaptation Policies

Proposed policy recommendation:

The Metropolitan Council will support, partner, and create information to better understand the impacts of climate change on the natural and built environments within the metro area.

Proposed actions:

- The Metropolitan Council will convene water and climate-focused conversations to ensure regional priorities are represented and shared. This includes state agencies, climate policy experts, watershed organizations, water suppliers, community planners, and residents.
- The Metropolitan Council will partner with and support university and research organizations to generate metro area-specific climate information and best understand the potential future climate based on current science and models.
- The Metropolitan Council will, with assistance of our partners, monitor the quality of regional lakes and rivers and the quality and flow of regional streams.
- The Metropolitan Council will assess and evaluate long-term water quality trends for the region's lakes, streams, and rivers and identify climate-related issues to be addressed.
- The Metropolitan Council will prioritize inter-agency collaboration to understand the effectiveness of infiltration as a stormwater management practice, particularly under a range of potential climate futures (high and low water tables).
- The Metropolitan Council will research to better understand metro area water balances during both wet and dry periods.
- The Metropolitan Council will use the latest research to improve and update stormwater infiltration requirements and recommendations around best practices, particularly in vulnerable drinking water supply management areas.
- The Metropolitan Council will share climate research with local governments and decision-makers through tools and resources to encourage local risk assessments, evaluation, and action.

Proposed policy recommendation:

The Metropolitan Council will consider the climate vulnerabilities and risks within our facilities and reduce the impact of climate on water resources, land management, water planning, and regional wastewater services now and into the future.

Proposed actions:

- The Metropolitan Council will integrate and center state and regional climate objectives into our wastewater operations and water resources and supply planning within the region.
- The Metropolitan Council will connect, partner, and learn from other water utilities and planning organizations as we take on water and climate challenges.
- The Metropolitan Council will evaluate and quantify the risks to our regional waters, ecosystems, and facilities through scenario planning, adaptive management, and the creation of robust strategies and plans.
- The Metropolitan Council will consider future climate scenarios when evaluating the Inflow and Infiltration (I/I) Program.
- The Metropolitan Council will periodically reevaluate and assess climate vulnerability and risk to our facilities and infrastructure as we refine climate projections.

- The Metropolitan Council will make investments to safeguard our regional wastewater system to ensure its viability in a changing climate.
- The Metropolitan Council will be a regional leader in climate-focused land management by managing our facilities and land holdings to reduce impervious surfaces, integrate green infrastructure and nature-based solutions within our stormwater management systems, install native plantings where possible.
- The Metropolitan Council will assess our operational supply chain to build in resiliency against climate disruptions and ensure that we continue to achieve permit compliance at all our wastewater treatment plants and facilities.

Proposed policy recommendation:

The Metropolitan Council will support and collaborate with local communities and partners to understand regional climate risk, including the associated economic, social, and cultural consequences, and adapt land use and water infrastructure to ensure sustainable water resources and resilient regional growth.

Proposed actions:

- The Metropolitan Council strongly supports low-impact design and the integration of nature-based solutions into regional development to adapt to projected climate impacts on our land and waters.
- The Metropolitan Council will understand and quantify the impacts of land use change on water resources as the climate changes.
- The Metropolitan Council will evaluate and quantify the risks to our regional waters, ecosystems, and local water utilities through scenario planning, adaptive management, and the creation of robust strategies and plans.
- The Metropolitan Council will partner with research organizations to create tools and resources to identify risk to new and existing local water infrastructure.
- The Metropolitan Council will share climate research with local governments and decision-makers through tools and resources to encourage local risk assessment, evaluation, and action.
- The Metropolitan Council will promote stormwater and wastewater reuse as viable alternatives to augment non-potable water uses.
- The Metropolitan Council will identify social, economic, and cultural impacts of water-related climate change impacts on vulnerable communities within the region.
- The Metropolitan Council will consider climate migration (people forcibly moved by climate-related events) and its impacts on water resources and water utility systems to the metro area as we plan towards regional resiliency.
- The Metropolitan Council will work towards securing funds to provide grants promoting best management practices in regional water quality improvement and volume reduction.
- The Metropolitan Council will assess and provide recommendations on the creation of funds to help close the investment gap in water (stormwater, water supply, and wastewater) infrastructure.

Climate-Equity Policies

Proposed policy recommendation:

The Metropolitan Council recognizes that climate change exacerbates current and future regional disparities and will work with impacted communities to co-create water and climate solutions that fit regional objectives and best benefit the community.

Proposed actions:

- The Metropolitan Council will listen and make an honest effort towards reconciliation with communities most impacted by environmental injustices relating to wastewater, water planning functions, or other experienced water inequities.
- The Metropolitan Council will work to develop relationships with community members to build trust.
- The Metropolitan Council will co-create solutions with impacted communities to best alleviate water and climate burdens.
- The Metropolitan Council will partner and support metro area organizations with a water equity focus.
- Environmental Services will integrate equity metrics into our programs, projects, and services.
- Environmental Services will partner and collaborate with other Metropolitan Council divisions to address equity efforts that overlap regional systems.

Clear policies and guidance are vital to develop regional climate resiliency. This paper includes policies to address region-specific water and climate concerns to help ensure abundant and clean water for future generations.