



**Title:** Climate Action Framework

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**Purpose:**

To reengage the Board in discussion of the Draft Climate Action Framework (CAF) presented in March 2021, to synchronize staff and Board expectations for:

- The need for the Climate Action Framework
- The process and timeline for ongoing Board engagement leading to adoption of the Climate Action Framework
- The structure and content of the Climate Action Framework
- The broader mid-term implications for the Climate Action Framework

**Climate Context:**

Climate change is already impacting Minnesota and its water resources, and the effects of climate change are expected to accelerate in the coming decades. The forecasted changes in precipitation and temperature pose a threat to both natural and built environments and will impact the communities MCWD serves.

Today's land use patterns and infrastructure have been designed over many decades, to a standard of acceptable engineering risk, based on stable rainfall patterns. Those patterns have already begun to shift. In the last decade, the District has experienced the seven wettest years on record, including a flood of record and an additional year's worth of rainfall, as well as a significant drought resulting in the closure of Gray's Bay Dam for over six months of the year.

As once stable and predictable annual rainfall patterns become more volatile, natural systems and built infrastructure will be increasingly taxed as available storage is readily consumed. Areas to first exhibit issues will be a product of their historic landscape context – low lying areas, historically wetlands, in proximity to ground and surface water, that were filled for development. These will manifest as local issues widely spreading throughout the District, before broader longer term system impacts are more fully realized.

Cities and voting taxpaying landowners will be on the front line of these changes. Experience has taught the District that these constituencies will demand answers, accountability, and solutions. In many instances, the District may be asked to solve local drainage issues it had no part in creating. In many others, proposed solutions may generate upstream-downstream conflict as communities and landowners struggle to manage new volumes of water.

In these instances, the District might reasonably expect to find itself in the middle of many conversations as a broker of a regional water budget, either in a reactive regulatory posture or proactively as data-driven partners capable of guiding wise investment in natural resources, infrastructure, and land use change.

**Need for Climate Action Framework:**

It is with that context in mind that the District must develop and implement its Climate Action Framework, to:

1. Assemble the cornerstones of its future role
2. Map actions over the next 5 years to grow into that defined role
3. Clearly communicate this role, direction, and action to watershed partners

### **Climate Action Framework Background:**

In 2020, the Board of Managers tasked staff and the Citizen Advisory Committee (CAC) with working together to conduct an initial phase of discovery work to provide a thoughtful initial framing for Board consideration. That work included a review of climate science in partnership with the state climatological office, a governance scan of other agency actions and roles in the area of climate, and a strategic analysis of organizational strengths/weakness and external opportunities/threats (SWOT) anticipated due to climate change.

The synthesis of this work was assembled into a draft Climate Action Framework (attached) for [Board consideration in March 2021](#), which outlined three pillars of the District's role in climate action. These roles, outlined below, closely align with timeless principles underpinning the District's long-term successes, as reinforced by Louis Smith's white papers of MCWD history.

1. Understand and Predict – The District will build on its brand of sound science and data driven decision making, by expanding its capabilities in data collection and analysis to understand and predict the impacts of climate change, establish goals, and evaluate potential solutions (e.g. RESNET, Machine Learning, 2D Model).
2. Communicate, Convene and Plan – The District will draw on its historic successes, with the power of convening and the power of proposal, to convene watershed partners to build consensus around climate issues extracted from the data and modeling, align goals and organizational roles, and guide the development of a coordinated watershed-wide implementation plan.
3. Implement, Measure and Adapt – The District will continue its trajectory of being a focused, high-impact and results-oriented organization by collaboratively implementing green and gray infrastructure projects, and promoting policy changes at the interface of land use and water, to achieve measurable progress toward climate goals.

Work under the first pillar (Understand and Predict) is already underway as the District prepares to select a consultant to build the pilot 2D watershed model. Staff are also beginning to lay the groundwork for the second pillar (Communicate, Convene, and Plan) through relationship-building with key partners like Hennepin County and the Met Council. It is anticipated that implementation of these first two pillars will be a significant effort over the next five years, culminating in the development of a 2027 Watershed Management Plan that has climate action as a central focus.

Staff plans to engage the Board in a series of discussions around the Climate Action Framework over the next few months to synchronize expectations and further refine the Framework with the goal of Board approval in March 2022. Staff has developed a draft process (attached) that frames these near-term discussions as well as the major phases of work over the next five years.

### **December 2, 2021 Meeting:**

To initiate these discussions and fulfill the meeting purpose defined above, the December 2 OPC discussion will be structured as follows:

1. Staff review of the climate context, discovery phase findings, and draft climate action framework - 15 min
2. Board discussion of MCWD's role through a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis - 20-30 min
  - a. What issues will MCWD face as a result of climate change? What opportunities does it present?
  - b. What is central to our capability/role based on history? What is outside of our strengths?
  - c. What risks will we need to manage for as we embark on this work? What might we need to do to prepare?

3. Staff review of the draft 5-year process, and near-term steps for finalizing the CAF with the Board - 15 min
  - a. Near-term discussions with the Board will include:
    - i. January - Review of case studies and discussion of questions we want to be able to answer as an organization
    - ii. February - Framing of the District's role in mitigation, interim actions the organization is taking, and the role of the District vs. partners
    - iii. March – Approval of Climate Action Framework, including visually-compelling infographics and fact sheet
4. Board discussion of proposed 5-year process and near-term Board engagement around CAF – 20 minutes

**Supporting documents:**

- CAC Climate Adaptation Series Report (Draft CAF)
- Draft 5-Year Process





# MCWD CITIZENS ADVISORY COMMITTEE CLIMATE ADAPTATION SERIES REPORT

*April 9, 2021 DRAFT*



**MINNEHAHA CREEK  
WATERSHED DISTRICT**



## Purpose

This report provides a synthesis of a series of meetings that were held with the Minnehaha Creek Watershed District (MCWD or District) Citizens Advisory Committee (CAC) to inform the development of the District's Climate Adaptation Strategy. Through these discussions, the CAC has contributed to the development of a situational assessment, insights regarding the District's role, and a high-level framework for the District's strategy. District staff will use this framework to build out a more detailed strategic roadmap for Board consideration later in 2021.

## Introduction

The MCWD recognizes that climate change is already impacting our state and its water resources, and the effects of climate change are expected to accelerate in the coming decades. The changes in precipitation and temperature patterns pose a threat to both natural and built systems and impact the communities we serve. As the effects of climate change are increasingly experienced across the watershed, the District has recognized the need to develop a clear strategy to effectively respond to these changes.

District staff worked with the CAC to conduct a situational assessment and develop insights about the District's role in climate adaptation. This process involved the following series of conversations with the CAC:

1. Climate Science – a presentation on Hydroclimatic Conditions & Changes from a State Climatologist ([March 3, 2020 CAC Meeting](#))
2. Governance Scan – review of existing plans and defined roles in climate adaptation across state, regional, and local governments ([June 16, 2020 CAC Meeting](#))
3. Role Framing – discussion and stress-testing of a high-level framework for the District's climate adaptation strategy ([October 14, 2020 CAC Meeting](#))
4. SWOT Analysis - conducting a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to inform the District's response to climate change ([November 10, 2020 CAC Meeting](#))

The following sections summarize the key findings and insights that came out of this series of CAC meetings. This work has resulted in the development of a high-level framework for the District's Climate Adaptation Strategy. Staff will use this framework to develop a more detailed roadmap in 2021 that will guide the District as it works with its partners to develop a Climate Adaptation Implementation Plan in the coming years.

## Situational Assessment

### *Climate Science*

The first step in the process was to build a shared foundational understanding of the climate science. The District brought in Kenny Blumenfeld, Sr. Climatologist for the MN DNR State Climatology Office, to provide a presentation on precipitation and temperature trends for our region. The presentation was recorded and can be viewed on the District's [YouTube channel](#).



The presentation highlighted two main, interrelated trends for MN:

- Wetter - more precipitation, more snow, more frequent and larger extremes
- Warmer - especially at night, during winter, and when it's generally cold

Both trends have been observed already, and climate models project that these precipitation and temperature trends will continue into the future. Projections for MN show annual precipitation increases ranging from more than 4 inches in the central region of the state to less than one inch in the northeastern region of the state. It was also noted that we should still expect dry years, and even drought along the way, because of normal variations in our climate.

The presentation included some recent statistics for the Twin Cities that illustrate the magnitude of change that is already being observed:

- 2019 was the wettest recorded year for the Twin Cities and State
- 2010-2019 was the wettest decade on record for the Twin Cities
- 2010-2019 had the most precipitation coming from "heavy" rain events (1 inch or more/day)

The presentation also reviewed impacts that are occurring elsewhere in the world, but have not yet been observed in MN:

- Heat extremes - not yet observed, but likely to occur in MN by mid-century
- Drought - not yet observed, but possible increases by mid-century
- Tornadoes - trends and projections are unclear

The MN Environmental Quality Board's (EQB) [2020 State Water Plan](#) summarized the changes as follows:

"We know that some seasons can be far warmer, colder, wetter or drier than normal. The high variability we expect from Minnesota's climate can make it difficult to notice where, when and how climate has changed in our state. However, rapid, widespread changes are already underway, and more changes are coming. In the past several decades, our state has seen substantial warming that is most pronounced during winter and at night, increased precipitation and heavier downpours.

An overwhelming base of scientific evidence projects that Minnesota's climate will see additional, significant changes through the end of this century, with even warmer winters and nights and even larger rainfalls—along with the likelihood of increased summer heat and the potential for longer dry spells. Although we will experience occasional cool or dry years, climate scientists expect these increases to continue through the 21st century."

### *Governance Scan*

Given the scale and complexity of the challenges posed by climate change, as well as the scale and jurisdictional complexity of the watershed, the District recognizes that it does not have the capacity, authority, or resources to respond on its own. Effectively responding to these challenges across the

watershed will require coordinated action across various local, regional, state, and federal agencies. To understand the current state of climate adaptation planning across this broader governance framework, the District conducted a [scan](#) of existing plans across state, regional, and local governments. The following findings and conclusions were drawn from this scan:

#### State Agencies:

- Since July 2009, MN state agencies have been collaborating on climate adaptation efforts through the Interagency Climate Adaptation Team (ICAT). In 2017, the ICAT produced a report, [Adapting to Climate Change in Minnesota](#), which describes actions that state agencies are already taking in climate adaptation and provides recommendations for further priority actions.
- In December 2019, Governor Walz's Executive Order 19-37 established a Climate Change Subcabinet and Advisory Council to identify policies and strategies across state agencies to meet MN's greenhouse gas reduction and resilience goals.
- In September 2020, the EQB completed its [2020 State Water Plan](#) which established a framework for aligning state agencies, legislative priorities, and local government policy, programs and actions for the coming decade related to climate change. The plan defines goals, strategies and actions for key water issues related to climate.
- The District's scan of state plans found many priorities and goals around climate change adaptation and resilience, and corresponding actions in areas of monitoring, modeling, coordination, and education/outreach. The state has also led the way in summarizing the impacts of climate change and is working to produce scaled down climate models to help communities plan for climate change. State agencies have not yet introduced changes to the regulatory framework or new standards in response to climate change.

#### Counties:

- Counties across MN have focused climate adaptation efforts primarily on gathering data (monitoring and modeling), providing education and outreach, and coordinating with other government entities.
- Hennepin County is in the final stages of developing its [Climate Action Plan](#) which includes initiatives to reduce greenhouse gas emissions and strategies to adapt to climate change in ways that reduce vulnerabilities and ensure a more equitable and resilient Hennepin County. The District is closely tracking the County's process and will continue to work with them to align our planning and implementation efforts.
- Neither the Carver County's Comprehensive Plan or the Carver County Watershed Management Organization Plan reference climate change.

#### Watershed Districts:

- Generally, watershed district plans throughout the state acknowledged that water levels are rising and that they are analyzing those trends. However, a minority of watershed districts (8 of 42 plans reviewed) have plans that identify climate adaptation policies or implementation actions.
- Several watershed district plans do state clear goals, priorities, and implementation activities related to adapting resource protection strategies in response to climate change. These include

additional monitoring, modeling/forecasting, identifying stormwater BMPs that need increased capacity, stricter permitting requirements, conducting education and outreach, and coordinating with other units of government.

#### Cities:

- Within the MCWD, the plans of the larger and more developed cities within the lower watershed (Minneapolis, Richfield, Edina, St. Louis Park, Hopkins, Minnetonka and Golden Valley) generally include climate change policies and action steps, while those in the upper watershed do not address the topic.
- Local entities leading in the area of climate change adaptation and resilience are engaged in monitoring climate change indicators, setting greenhouse gas reduction goals and reporting on outcomes, and community education on climate change resilience.
- The City of Edina's recently published Flood Risk Reduction Strategy is a leading example on climate adaptation planning efforts and policies.

#### *SWOT Analysis*

Based on the shared understanding of local climate trends and the state of climate adaptation planning across various levels of government, the CAC completed a Strengths, Weaknesses, Opportunities, and Threats (SWOT) workshop. Through this exercise, the CAC identified the external threats and opportunities posed by climate change as well as the District's internal strengths and weaknesses for responding. The full workshop summary can be found [here](#), and listed below are the responses that CAC members identified as most important:

#### Strengths

- MCWD has strong relationships with government entities at various levels and is viewed as a trusted and respected leader within the scientific and water resource community
- MCWD is known for its principles of sound science and has a wealth of data and the technical expertise to understand the water budget at a system scale
- MCWD has the capacity and track record for providing clear and effective communication to target audiences

#### Weaknesses

- MCWD has finite staff capacity and financial resources to address the needs and challenges presented by climate change
- MCWD has limited authority over land use change and limited ownership over the infrastructure that will be impacted by climate change
- MCWD is limited in its current technical capabilities to understand and predict the impacts of climate change

#### Opportunities

- MWCD can enhance its technical capabilities to predict and assess impacts and quantitatively evaluate management options to determine the most effective actions



- MCWD can build upon its existing relationships and position as a trusted leader to communicate threats and solutions
- As a regional agency, MCWD can act as a convener to build consensus and align resources for a larger impact
- MCWD can use this challenge as an opportunity for innovation, such as identifying new funding sources or pursuing bold demonstration projects

#### Threats

- Climate change poses numerous threats to natural resources, the built environment, and communities, including increased flooding, water quality degradation, and water contamination
- There are many agencies and stakeholders involved, each with their own interests, which could pull the District in many directions and make it difficult to align goals and priorities
- People may not trust or interpret the science in the same way which is a threat to building consensus and cooperation
- If the District takes a lead role in providing the technical understanding, there is a risk of our models being off and undermining our credibility

#### Insights

Based on this series of discussions between the CAC and MCWD staff, the following preliminary insights have been identified.

1. Given MCWD's mission, authorities, and the limited size of its operations, the District is best suited to focus its efforts primarily on climate change adaptation (addressing impacts) rather than mitigation (addressing causes).
2. Climate adaptation planning across the state is still in the early stages, and there is currently limited local planning guidance and no regulatory mandate for adapting to climate change within MN. Responsibilities for land and water management are dispersed across numerous agencies which are often siloed, making the development of a coordinated approach a challenge.
3. MCWD will be pressured to "solve" local manifestations of climate-driven hydrological shifts (e.g. local drainage issues). If the District doesn't develop a macro-strategy, it will get pulled into responding to micro problems that won't fundamentally address the larger drivers – versus operating at a system scale to help the watershed adapt in a sustainable and coordinated manner.
4. MCWD is a data driven organization, and any climate adaptation planning must be grounded in a strong quantifiable understanding of the issues climate change will bring to the watershed.
5. As a regional entity, and with its technical expertise, MCWD is uniquely positioned to serve as an information broker and work with other regional partners (e.g. USGS, DNR, counties) to understand the water budget and the upstream-downstream cause and effect across communities.

6. The District's ability to predict the impacts of climate change within our watershed and evaluate solutions is limited. The District must further develop its data-analytic capabilities to enhance its understanding as a foundation for implementation planning. It will take time and resources to develop those capabilities.
7. MCWD doesn't have all of the authority, have all of the resources, or own all of the infrastructure needed to adapt the watershed to climate change. Therefore, it must translate its data-driven system understanding for a diverse audience of stakeholders and develop a coalition of willing partners to build a cohesive watershed-wide strategy to proactively manage the change.

## Climate Action Framework

Based on the situational assessment and insights that have been drawn from these CAC discussions, MCWD staff developed a high-level framework for the District's strategy which defines the three pillars of the District's role as:

1. Understand and Predict – The District will utilize and expand its capabilities in data collection and analysis to understand and predict the impacts of climate change, establish goals, and evaluate potential solutions
2. Convene and Plan – The District will convene its partners to build consensus around the issues, align goals, and guide the development of a coordinated watershed-wide implementation plan
3. Implement, Measure, and Adapt – The District will implement projects, programming, and policy changes, in coordination with its partners, to achieve measurable progress toward the goals

These three roles also represent three largely-sequential phases of work, with each informing the next. This framework was discussed and stress-tested with the CAC at its October meeting. Below is a summary of the three phases and some of associated action steps that have been identified thus far.

### *Phase I – Understand and Predict*

During this first phase of work, the District will need to identify knowledge gaps and build out its organizational capabilities to better understand and predict the impacts of climate change within the watershed. The District's current data sets and analytical tools are insufficient to predict how specific areas will be impacted, establish measurable goals, and quantitatively compare potential solutions.

Fortunately, advances in data science have made it affordable to collect exponentially more data and analyze it in more sophisticated ways. MCWD is developing a program to integrate and maximize the value of recent public investments in data collection to better predict the impacts of changing precipitation across the watershed, and to pinpoint, quantify and evaluate solutions.

This program would draw on existing investments made by MCWD, U.S. Geological Survey and Hennepin County in monitoring precipitation and watershed response across the District, which will collect more than 1 million real-time data points per year for precipitation, surface and shallow ground water levels, and pollutant loading. It will integrate this local understanding with state investments in producing

detailed topography of Minnesota, along with local municipal investments in digitizing storm sewer information.

The tools currently being proposed for development include:

- Machine Learning - Develop a machine learning model that can forecast future water levels based on the vast quantity of newly available remote sensing data, which will provide real time flood forecasting at 25 locations throughout MCWD
- 2-Dimensional (2D) Watershed Model - Integrate state topographic and municipal infrastructure data to create a high resolution planning tool to pinpoint, quantitatively evaluate, and drive decisions on climate adaptation projects and policies

Some of the actions steps that are currently planned for 2021 include:

- Continuing to build out the District's network of remote sensors, known as RESNET, which provide real-time data on water level, flow, and pollutant loading throughout the watershed
- Soliciting third-party feedback on the development of the District's predictive machine learning model
- Using staff, Board, and CAC input to define the questions that need to be answered to inform which model(s) will provide the capabilities needed
- Developing a pilot model within the Western Growth Area of the Six Mile Creek Subwatershed to test capabilities and inform the development of a watershed-wide model
- Developing a funding strategy and building support for the watershed-wide 2D model build

### *Phase II – Convene and Plan*

The District recognizes that its strategy for responding to climate change must be not only science-based but also collaborative and built on concrete partnerships. MCWD doesn't have all of the authority, have all of the resources, or own all of the infrastructure needed to adapt the watershed to climate change. Therefore, the District cannot define its role in a silo, but must contextualize it against the roles, responsibilities, and organizational capabilities of the cities, counties, and state agencies.

As a regional entity with strong technical and outreach capabilities, the District is well-positioned to serve as a convener and help to guide the development of a cohesive watershed-wide strategy to respond to climate change.

This Phase II work will involve bringing together the District's partners at the cities, counties, and state agencies to:

1. Share the District's data-driven system understanding and build consensus around the issues
2. Establish measurable goals based on the data (e.g. a system-wide water budget)
3. Evaluate potential management strategies to achieve the goals
4. Establish priorities, roles, timelines, and funding strategy for implementation

The District is planning to form a standing technical advisory committee (TAC) in 2021 which will be made up of technical staff from the District's cities, counties, state agencies, and other key stakeholders. The group's initial focus in 2021 will be on the District's Permitting Program Alignment and Responsive Model. It is anticipated that the TAC will be the primary venue for engaging the District's partners in climate adaptation planning beginning in 2022.

In parallel to initiating the Phase I work in 2021, the District will continue to track and engage in planning efforts of partner agencies to understand how the governance framework is evolving over time and lay the ground work for Phase II. This will include:

- Continuing to engage with Hennepin County to align the District's strategy with the County's Climate Action Plan
- Tracking developments at state agencies and the legislature
- Communicating the District's strategy to its cities and other partners to set the stage for engaging them in TAC discussions in 2022-23

### *Phase III – Implement, Measure, and Adapt*

Finally, in Phase III, the District will implement its role as defined in coordination with its partners in Phase II. Based on the District's mission, authorities, and capabilities, implementation actions by the District may include any of the following:

- Projects - Implementing high-impact capital projects to manage the volume and rate of stormwater runoff
- Dam Management – Optimizing operation of the Gray's Bay Dam based on additional data and improved predictive capabilities
- Management Planning – Utilizing its own Watershed Management Plan and approval authority of city local water management plans to guide the management of water across municipal boundaries
- Policy Change – Establishing its own policies, and influencing the policies of other entities, for more effective land and water management
- Regulation - Aligning District regulations with state and local agencies to appropriately manage predicted impacts while reducing duplication between agencies
- Incentives – Providing incentives, such as funding or technical assistance, for projects by public and private partners through the District's Responsive Model
- Outreach – Conducting targeted, high-quality outreach to key stakeholders to enhance understanding of the science and build support for the actions needed to respond to climate change

The scope and scale with which the District may apply these management levers and programmatic activities will be informed by the goal setting and scenario planning in Phase II. Also critical in this phase



will be ongoing effectiveness monitoring and adaptive management to ensure that the District and its partners continue to make measurable progress toward the goal.

## Next Steps

By utilizing the findings and insights gathered to-date through discussion with the CAC, this high-level strategic framework provides a foundation for staff and the Board to begin mapping out the District's approach in greater detail, beginning with Phase I – Understand and Predict. The March CAC Meeting marked the transition into this first phase of work with the Research & Monitoring staff presenting on the District's current capabilities and preliminary plans for further developing capabilities to understand and predict the impacts of climate change.

In March, the MCWD Board began a series of strategic discussions, which have been broken into three phases of work:

1. Phase 1 – Past – Where have we been and what have we learned?
  - a. A historical analysis to derive insights that underpin MCWD's identity today, and lessons for the future
2. Phase 2 – Present – Where are we now and what needs to be done?
  - a. A status report on current strategic priorities, and assessment of what will be required near term to execute
3. Phase 3 – Future – What challenges will we face in the future, and how can we prepare?
  - a. An inventory and education on emerging strategic issues the District wishes to begin preparing for (including climate change)

As part of this process, it is anticipated that staff will begin to engage the Board in climate adaptation discussions sometime in third or fourth quarter of 2021. Based on feedback from the CAC and other advisors, this process will include further exploration of the District's role in climate change mitigation. The timeline for these discussions will continue to be refined as the process progresses.

At this time, it is anticipated that this work will result in a Climate Adaptation Strategy that will be adopted by the Board and amended to the District's 10-year Plan. This will allow the District to communicate its approach to its partners and stakeholders ahead of formally engaging them in the development of a Climate Adaptation Implementation Plan for the watershed. Staff will report back to the CAC with progress updates at significant milestones throughout 2021.

# Climate Action Framework - 2027 Watershed Plan

