Proposed Approach

2050 Water Demand Projections

METROPOLITAN COUNCIL

August 8, 2023 Greg Johnson, PE metrocouncil.org

Background (1/2)

2050 Water Resources Plan

The Metropolitan Council is updating the current Water Resources Policy Plan. It outlines water supply, water resources, and wastewater policies to align local and regional water priorities, set guidelines and expectations about our regional wastewater system, and help the region plan for future water supply needs until year 2050.

As part of this plan, Met Council's water supply planners are in the early stages analyzing updated Council regional forecasts and analyzing implications and projections for future water demands out to year 2050. This will be included in the next Metro Water Supply Plan.

Background (2/2)

Community Comprehensive Plan Updates

In addition, local comprehensive plans must address water supply and are expected to include information about water sources, including plans to protect public and private water supplies, in appropriate sections of their local comprehensive plan.

All communities in the metro region will need to include extended water demand projections for 2030, 2040, and 2050 that are consistent with population forecasts in the community's system statement.

Purpose of Demand Projections

Support Regional and Subregional Planning

The Met Council water demand projections are intended to:

1. Provide guidance for communities as they develop content for the water supply plan section of their comprehensive plan.
2. Help Met Council planners and policy makers, state agencies, and community planners to plan for future growth and address regional issues. These projections can help us understand where future water demand might bump up against, or exceed existing capacity - or where there is plenty of capacity to support growth.
3. Provide subregional and regional water demand data for Met Council's groundwater modeling projects, surface water analyses, and other studies.

Additional Water Demand Analyses

- Comparing wastewater discharge volumes from each community to wintertime water use.

- Analyzing and estimating projected water use for each of Met Council's wastewater treatment plant sewersheds.

- Reviewing impacts from employment water demands.

Question for MAWSAC – How else does your community or agency see these water demand projections being useful? Is there anything else that we should analyze?

Met Council Review of Local DNR Water Supply Plans (1/2)

Local Water Supply Plans for 2016-2018 required community water systems to be reviewed by Met Council. Each community's projection method was summarized. The methods varied significantly across the region. Fifty-six (56) communities provided more details for their calculations such as:

1. Population projections
2. Gallons per capita per day (GPCD) calculation
3. Maximum Day: Average Day calculation
4. Assumptions

Met Council Review of Local DNR Water Supply Plans (2/2)

Need for a consistent projection method across the region

- Communities used a range of 4 to 10 years of past GPCD data when projecting their gallons per capita per day (GPCD) for the future. In most cases, the communities did not explain their reasoning for why a certain time range was used.

- 19 separate and unique water demand projection methods were used for the communities that described the method used.

2015 Master Water Supply Plan: Approach to Projecting Water Demand

Per Capita Demand Method

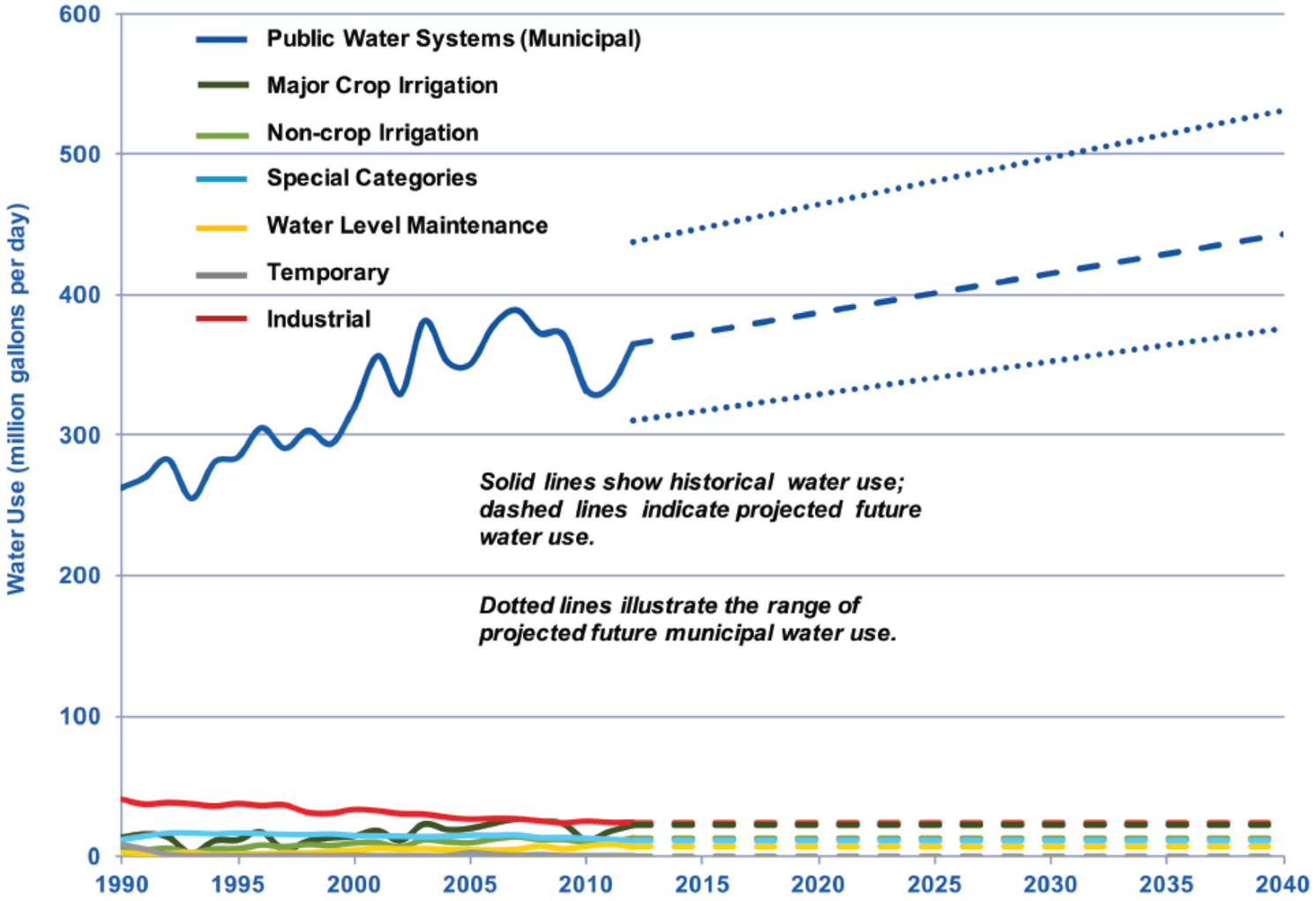
Use the average historical water use per capita demand and the community population projections to represent future (2020, 2030, 2040 and 2050) water use as follows:

[Projected Water Use] = [Projected Population] x [Per Capita Water Use]

Advantages: Connects Met Council forecasting data across the entire region. Simple and easy to explain to non-technical audiences.

Disadvantage: Does not reflect exact water usage by customer type.

2015 Master Water Supply Plan (MWSP): Results of Projecting Water Demand



Proposed Approach: Updated Projection of 2050 Water Demand

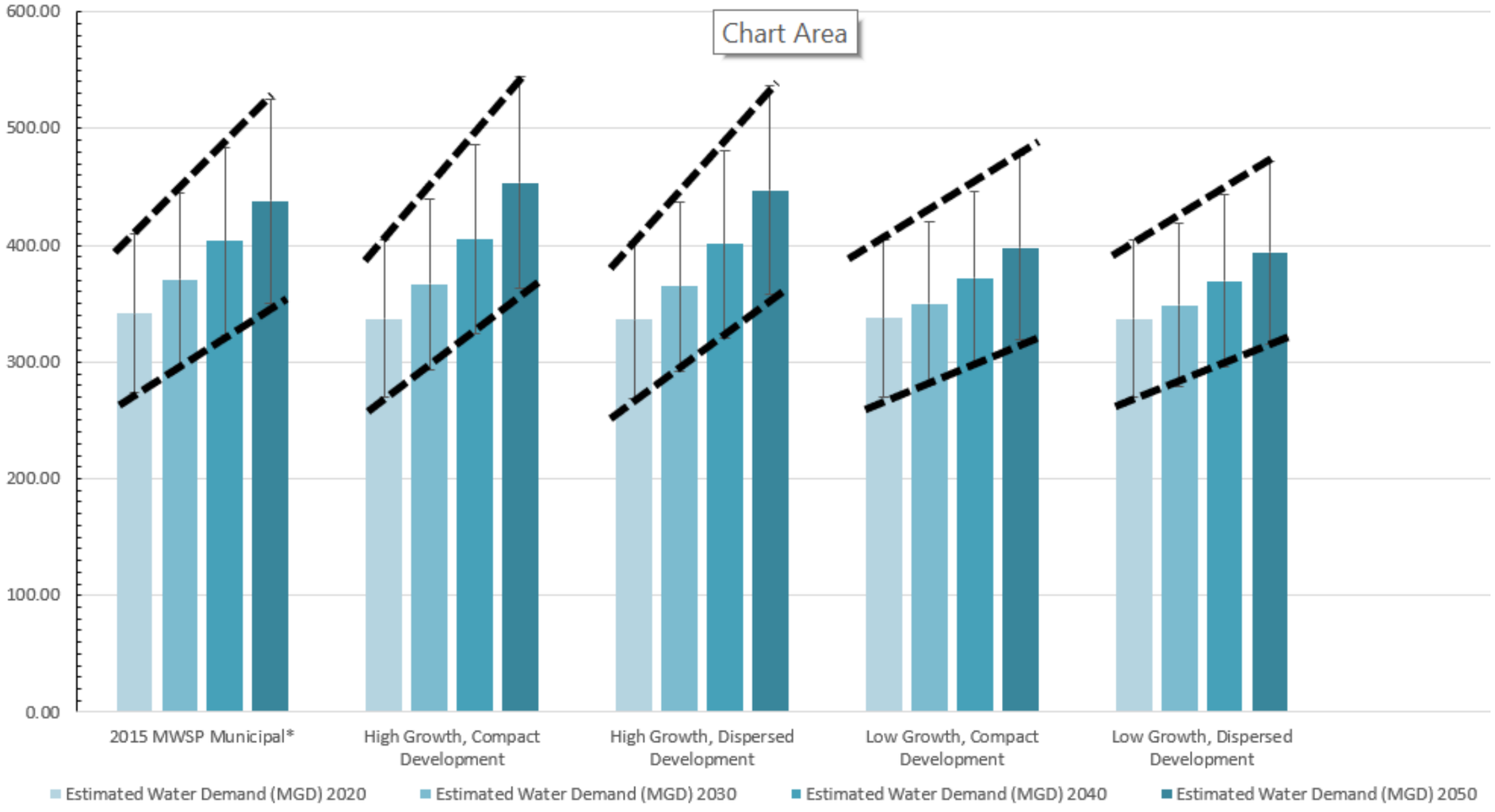
Use the average historical water use per capita demand and Met Council's population forecasts, including exploration of uncertainty, to represent a range of possible future (2050) water use as follows:

[Projected Water Use] = [Projected Population by Regional Growth Planning Scenario*]

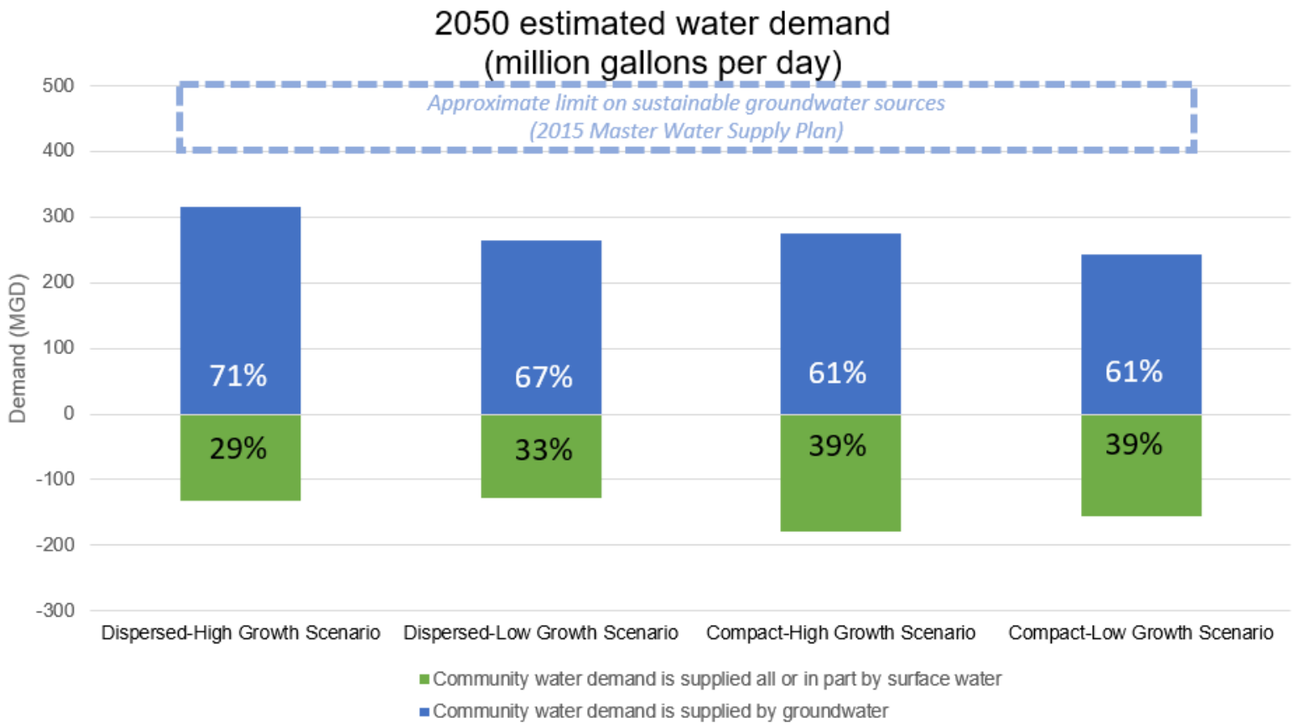
x [Per Capita Water Use] with a Variable Range (+/- 20%)

- Considering a range of population estimates produced through the Council's regional growth scenario project, as well as the official forecasts currently in development. These scenarios represent a hypothetical range of development futures (high versus low growth and compact versus dispersed development).
- Also considering 2021-2021 time period to evaluate average per capita water use, compared to the 2003-2012 time period used in the 2015 Master Water Supply Plan.
- Results will include assigning a variable range (percentage) to the water demand projections to account for anticipated uncertainties from year to year (droughts, wet year, water efficient projects, etc.).

Preliminary Results of Proposed Approach vs. 2015 MWSP Demand



Preliminary Results of Proposed Approach: Water Demand by Source



Dispersed growth scenarios:

- More groundwater than surface water use, bringing us closer to limits of groundwater sustainably
- More pressure to provide water through additional private wells in areas not served by municipal systems

Compact growth scenarios:

- Increased use of existing surface water systems (Mississippi River), which currently has higher monitoring requirements, treatment, and costs.
- Higher risk of impact from sudden drought.

High growth versus low growth scenarios:

- More pressure to expand or create new public and private water supply systems

White Bear Lake Area Water Demand Projections

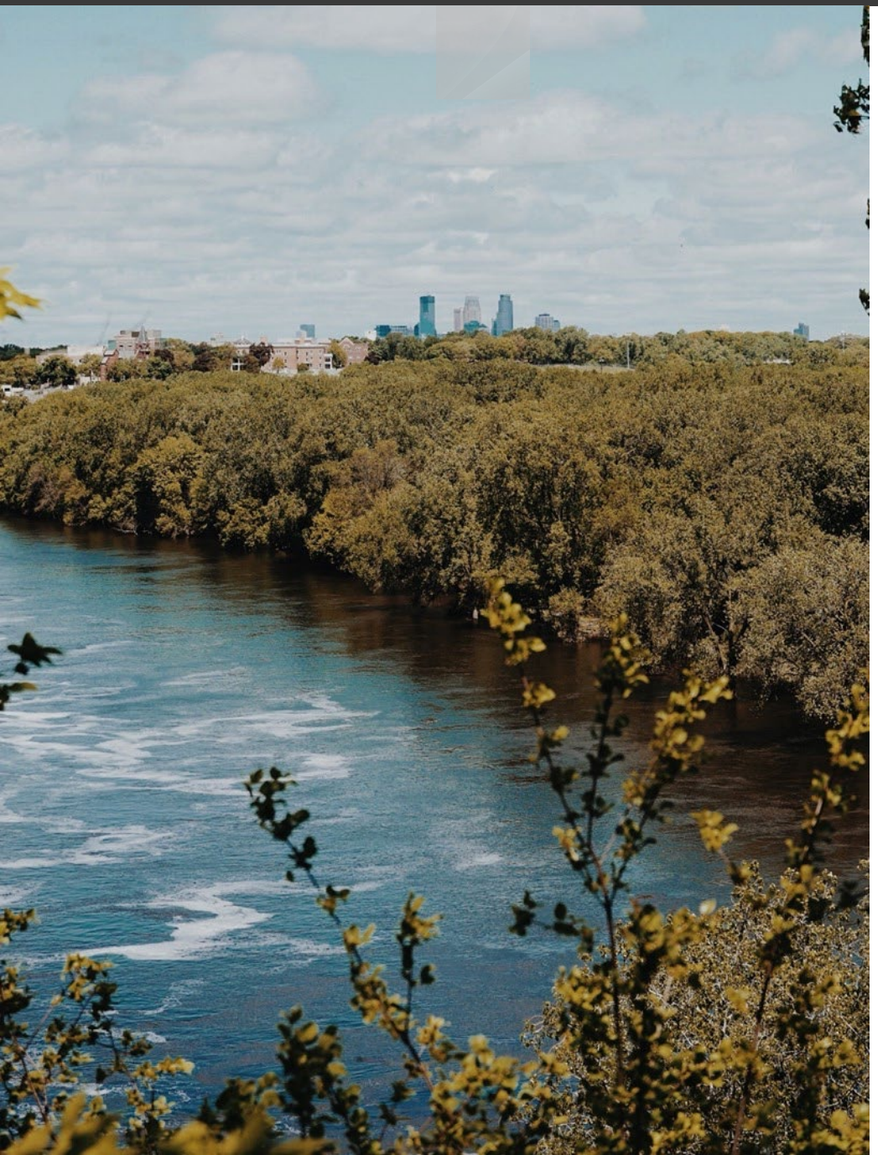
Preliminary Development Scenarios for White Bear Lake Area

Scenario 1 (All Groundwater Supplies with GPCD Restrictions) - All public water systems remain unchanged with their current water supply sources and consume groundwater at a maximum 75 gpcd residential and 90 gpcd total per the court order.

Scenario 2 (All Groundwater Supplies with Current GPCD Water Usage) - All public water systems remain unchanged with their current water supply sources and do not follow the court order and continue consuming their typical recent gpcd for existing and future growth, exceed their appropriation permits if needed to grow, and pay DNR fines and/or civil penalties.

Scenario 3 (Combination Groundwater/Surface Water Supplies with GPCD Restrictions for Groundwater Systems) - The cites that are not planning to grow significantly remain on groundwater and consume groundwater at a maximum 75 gpcd residential and 90 gpcd total per the court order, but the cities that are planning to grow significantly (ex. Lake Elmo, Lino Lakes, and Hugo) are supplied by surface water (ex. SPRWS).

Next Steps



- Work with the DNR to fill-in the missing data gaps from MPARS. Request missing date from communities for remaining data that the DNR cannot provide.
- Communicate water demand projection method at subregional workshops.
- Obtain final 2050 population projections from Met Council forecasting staff for high, medium, and compact development scenarios.
- Calculate and develop water demand projections to year 2050.
- Complete other water demand analyses (ex. comparison to wastewater flows, analyzing water demands by individual wastewater sewershed areas, analyzing employment demand projections, etc.)

Thank You

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