Water Supply Sustainability

Reviewing the definition in the draft Metro Area Water Supply Plan

METROPOLITAN COUNCIL

Metro Area Water Supply Technical Advisory Committee | June 18, 2024 | Lanya Ross

Proposed high-level explanation of water sustainability in the Water Policy Plan

Umbrella for more specific definition of water supply sustainability

The region's waters are not sustainable when more water is used than is available, when more is used than is returned to the source, when use harms the environment, and when water is polluted by human activities. Likewise, if stormwater, water supply, and wastewater infrastructure that treats and moves water throughout the region is put at risk, the essential services provided by these built water systems cannot be sustainable. Sustaining natural waters and the services that provide clean and plentiful water is essential for public and ecosystem health, and to ensure a high quality of life for present and future generations.

Proposed definition of water supply sustainability

Water use is sustainable when the use does not harm ecosystems, degrade water quality, or compromise the ability of future generations to meet their own needs.

The region's water supply may be considered sustainable when water users maximize their use of existing water supply infrastructure investments within the sustainable limits of available sources, and use water in a way that:

- Is efficient and conserves water
- Maintains aquifer levels consistent with safe-yield conditions defined in Minnesota Statutes
- Maintains surface waters by managing withdrawals, including diversions of groundwater that support them, to maintain protected flows and water levels
- Minimizes impacts to groundwater flow directions in areas where groundwater contamination has, or may, result in risks to public health
- Recognizes uncertainty and seeks to minimize risk

Definition reflects Minnesota statutes and rules

Minnesota Statutes 103G.287 includes sustainability standard for groundwater

Minnesota Statues 103G.005 includes sustainable diversion limits from surface waters

Minnesota Statutes 103G.223 protects calcareous fens

Minnesota Statutes 103G.271 limits use of Mt. Simon-Hinckley aquifer

Minnesota Rules, Chapter 8420.0935 protecting calcareous fens

Minnesota Rules, Chapter 6115.0630 defining safe yield

Example of translating to quantitative analysis of sustainable groundwater

Use of Simulation-Optimization Modeling to Assess the Regional Groundwater System in the Twin Cities Metropolitan Area (Appendix 4 of the 2015 Metro Area Master Water Supply Plan)

Objective:

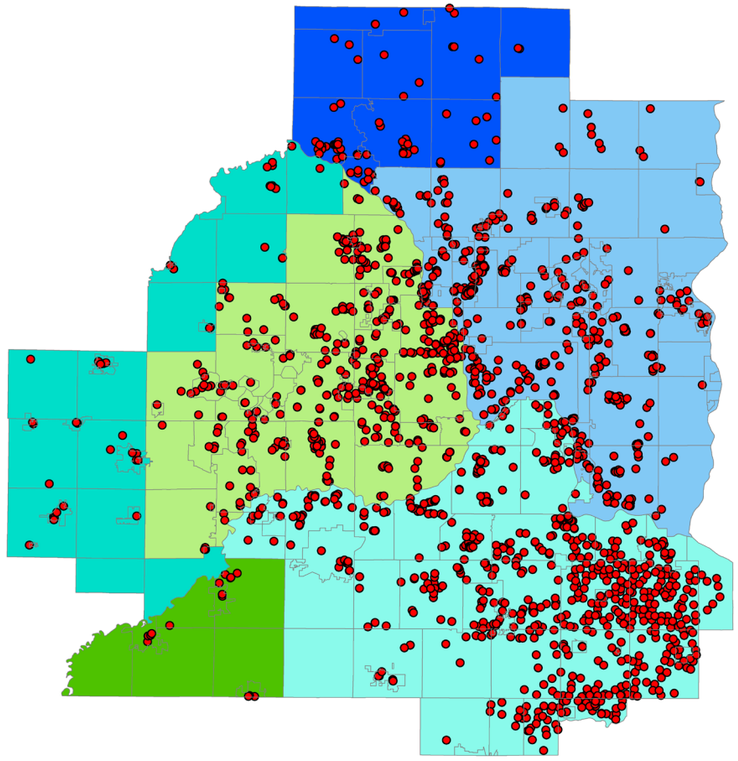
Maximize groundwater pumping in areas around existing permitted high capacity wells

Constraints:

No unacceptable: aquifer level decline, reduction in groundwater going to connected surface waters, changes in flow direction across areas of significant groundwater contamination

Decision variables:

Pumping rates were allowed to change at permitted wells in the seven-county metropolitan area, with some exceptions



DISCUSSION: Proposed definition of water supply sustainability

Water use is sustainable when the use does not harm ecosystems, degrade water quality, or compromise the ability of future generations to meet their own needs.

The region's water supply may be considered sustainable when water users maximize their use of existing water supply infrastructure investments within the sustainable limits of available sources, and use water in a way that:

- Is efficient and conserves water
- Maintains aquifer levels consistent with safe-yield conditions defined in Minnesota Statutes
- Maintains surface waters by managing withdrawals, including diversions of groundwater that support them, to maintain protected flows and water levels
- Minimizes impacts to groundwater flow directions in areas where groundwater contamination has, or may, result in risks to public health
- Recognizes uncertainty and seeks to minimize risk

Thank you

Lanya Ross

Environmental Analyst, Water Policy and Planning

METROPOLITAN COUNCIL

IMAGINE 2050