Planning for Current and Future Generations: Water Supply in the Twin Cities Metropolitan Area

Lanya Ross, P.G., Environmental Analyst, Metropolitan Council

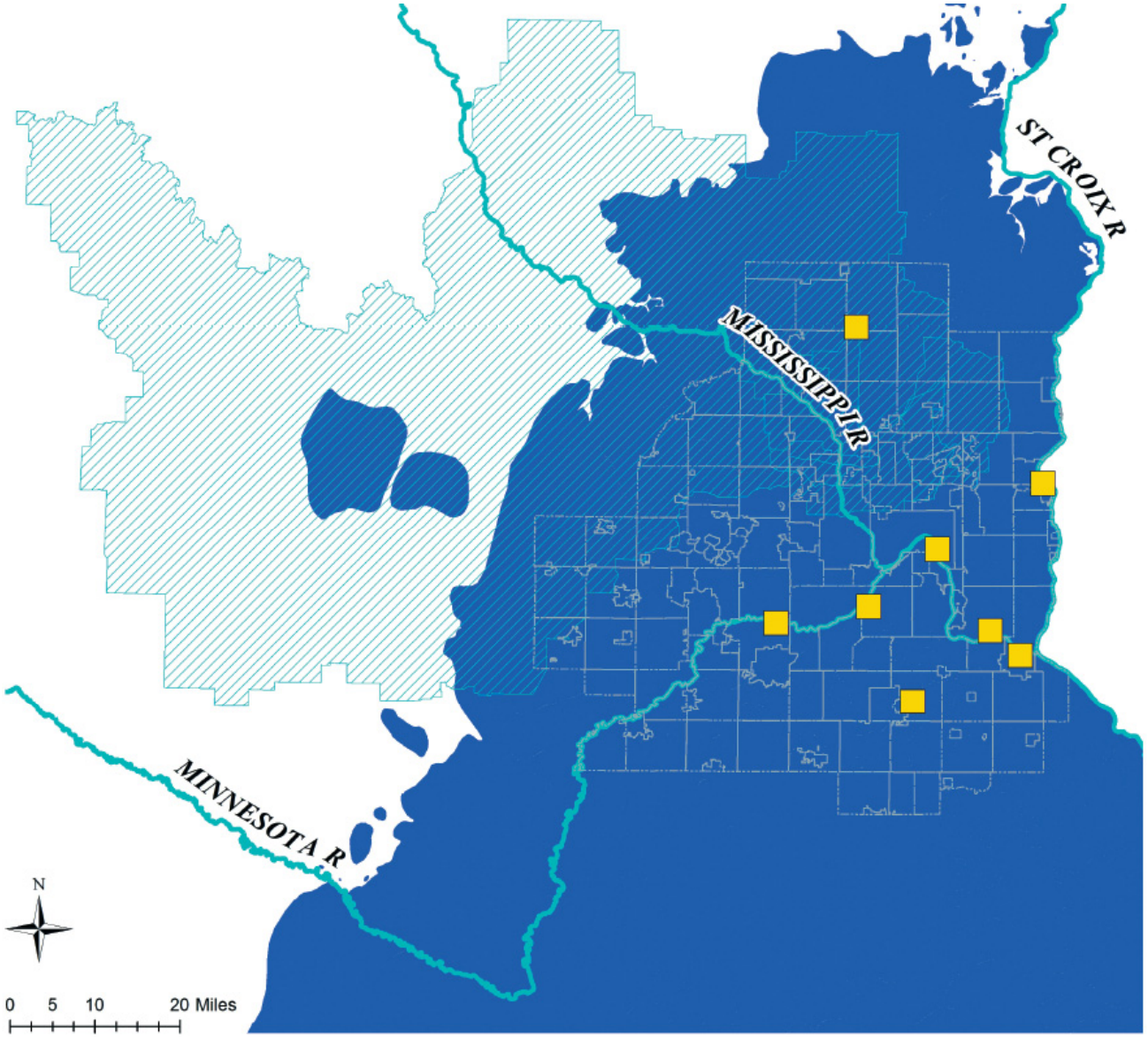
Minnesota Ground Water Association Fall Conference

November 15, 2018

If we could first know where we are,
and whither we are tending,
we could better judge what to do,
and how to do it.

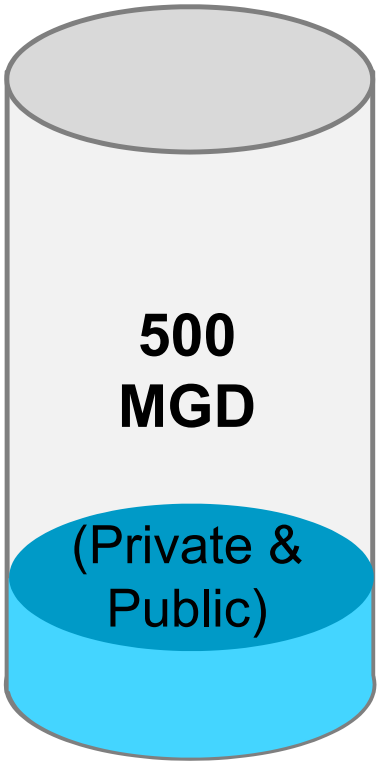
Abraham Lincoln, 1858

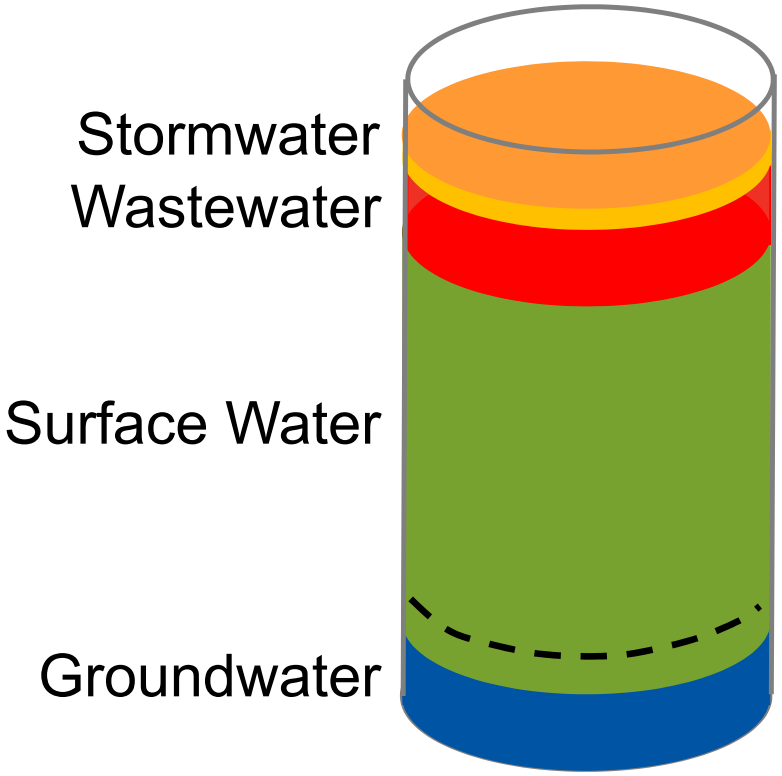
Twin Cities Metro Area, MN



- Extent of Paleozoic bedrock Aquifers
- Minneapolis/St. Paul Source Water Protection Area
- Wastewater Treatment Facilities

Water Demand vs. Water Sources





Source: *2015 Twin Cities Master Water Supply Plan (Metropolitan Council)*

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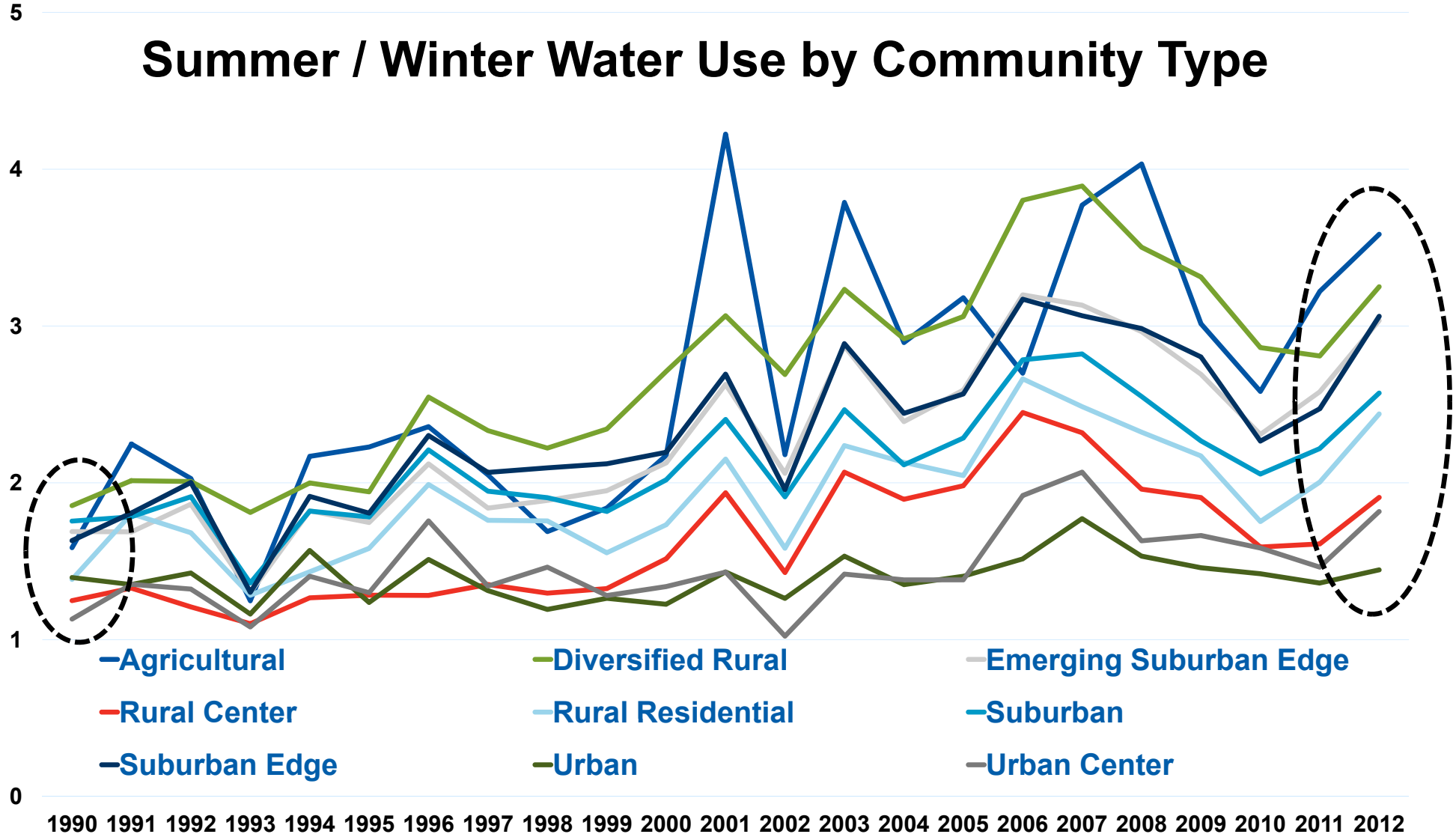
Data Source: MN DNR SWUDS/MPARS

Summer / Winter Water Use by Community Type



Data Source: MN DNR SWUDS/MPARS


“This Council was created to do a job which has proved too big for any single community.”
– Governor Harold LeVander

FIGURE 3. AVERAGE ANNUAL ACREAGE OF ADDED DEVELOPED LAND

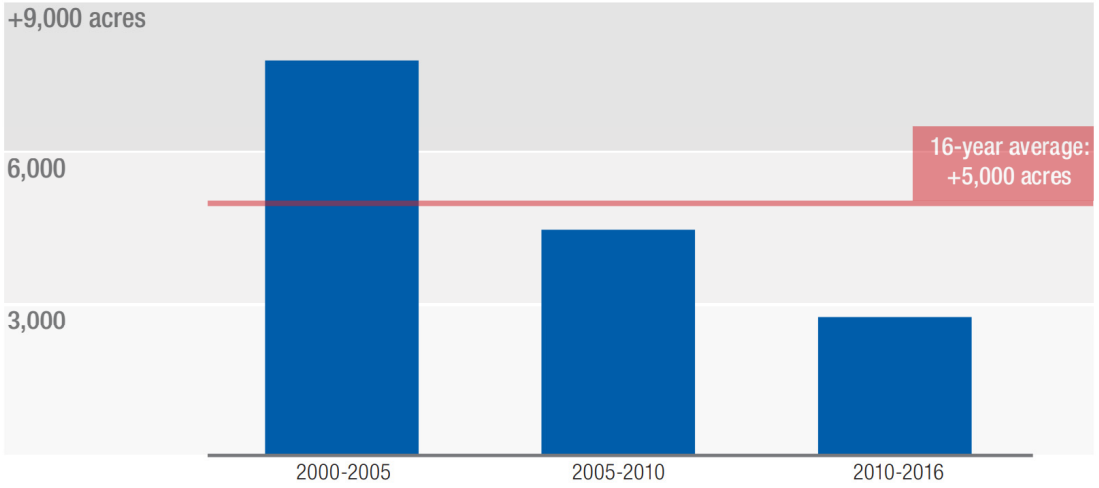
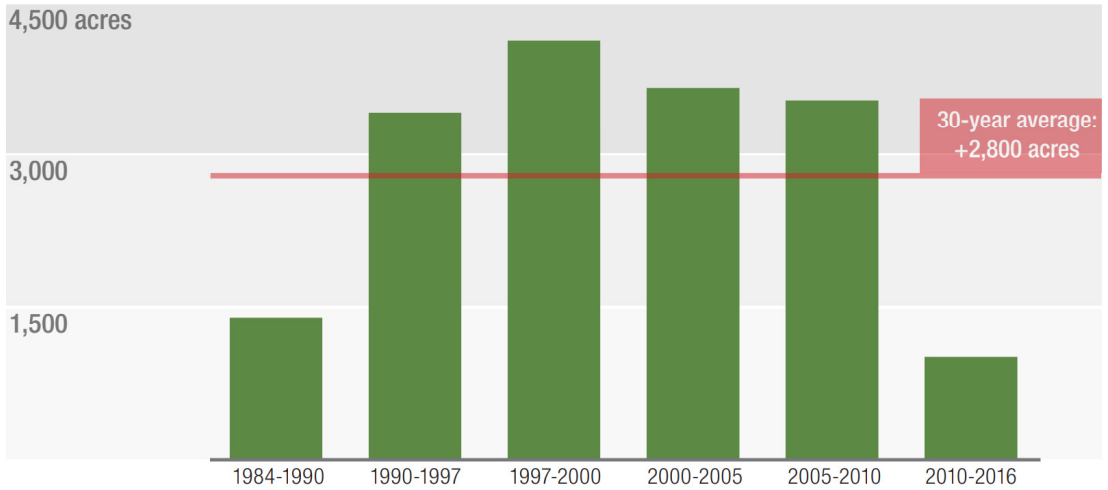


FIGURE 4. AVERAGE ANNUAL ACREAGE OF ADDED PARKS AND RECREATION LAND

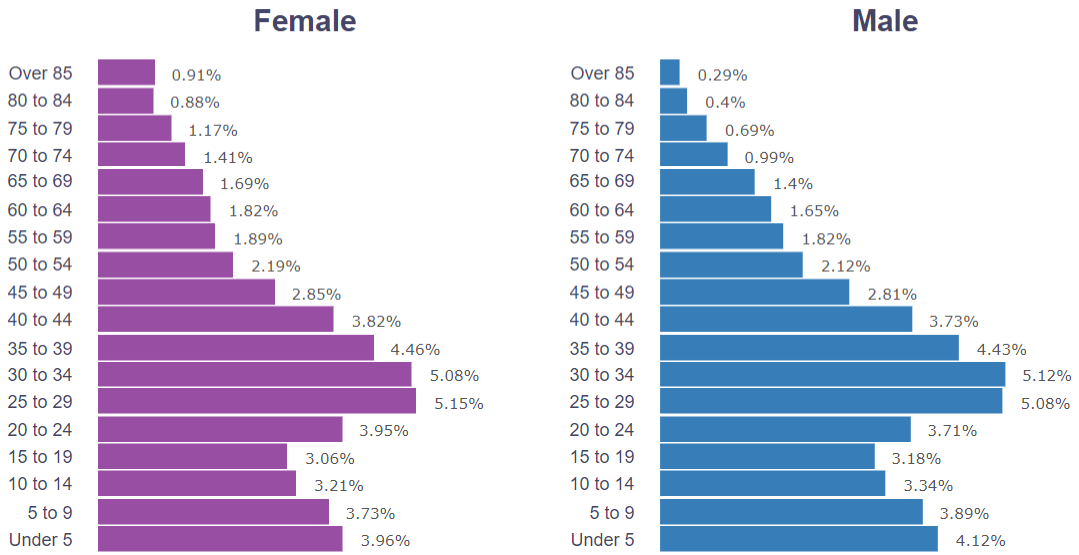


Change in Developed Land and Parks/Recreational Land in the Twin Cities Region (7-County)

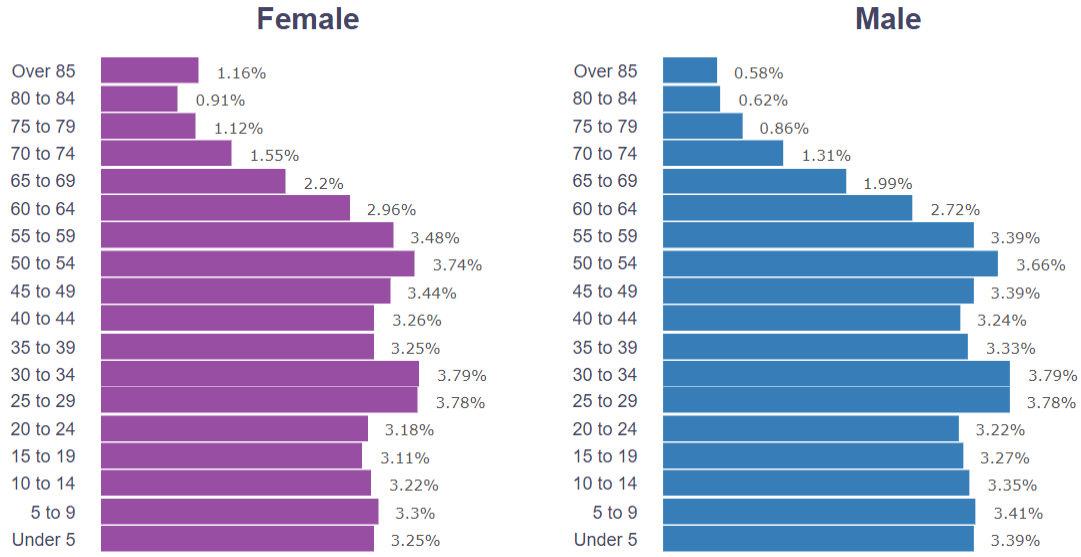
Explore more on our website at https://metrocouncil.org/getattachment/c8bdb41b-97bb-4f4d-8070-7a4d8f5607dd/Growing-Greener,-Getting-Leaner-Land-Use-in-the-Twin-Cities-Region-in-2016.aspx

Population by Age & Gender in the Twin Cities Region (7-County)

1990



2012-2016



Explore more on our website at https://stats.metc.state.mn.us/profile/

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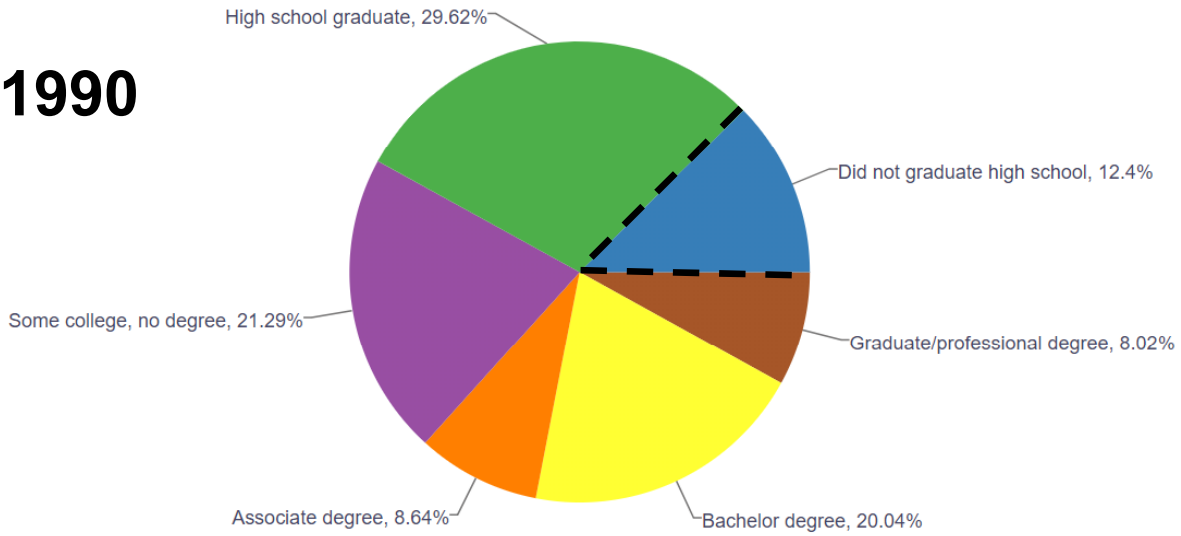
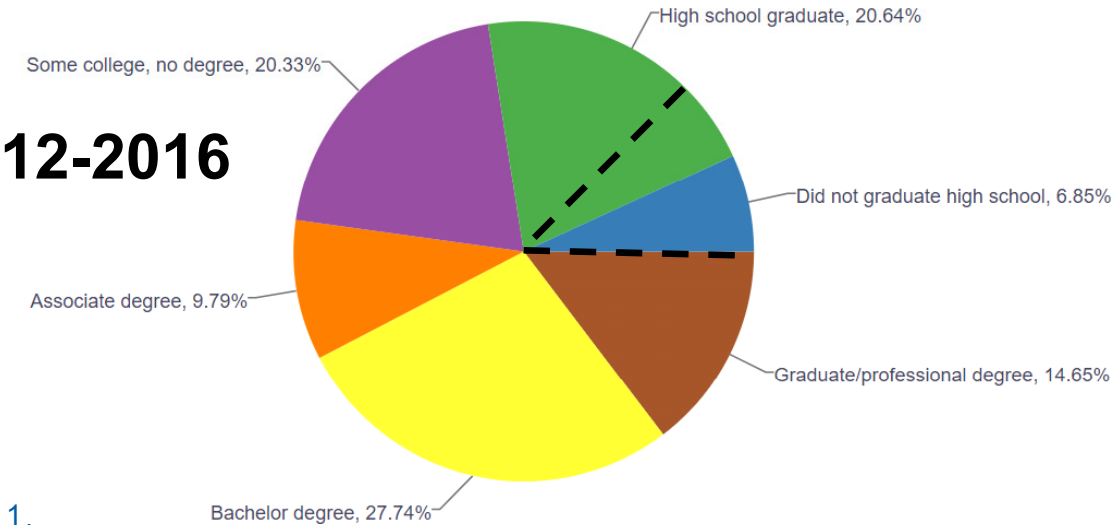
Highest Level of Education Attained in the Twin Cities Region (7-County)

1990



2012-2016



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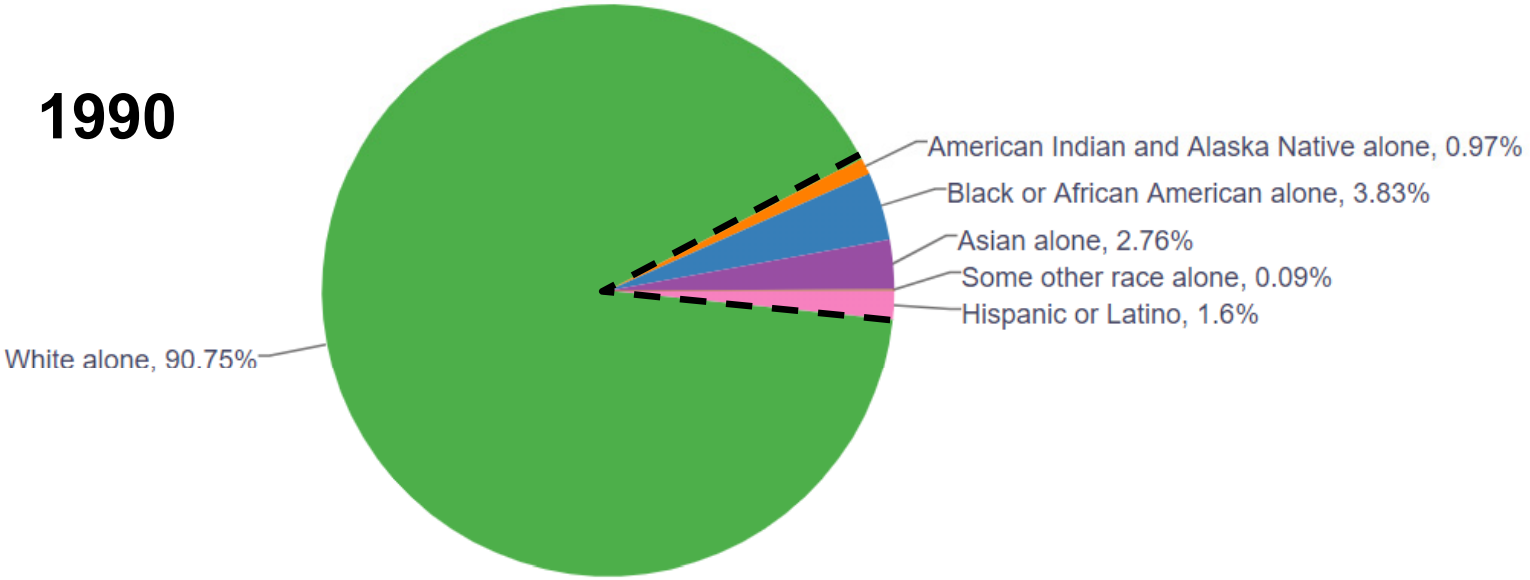
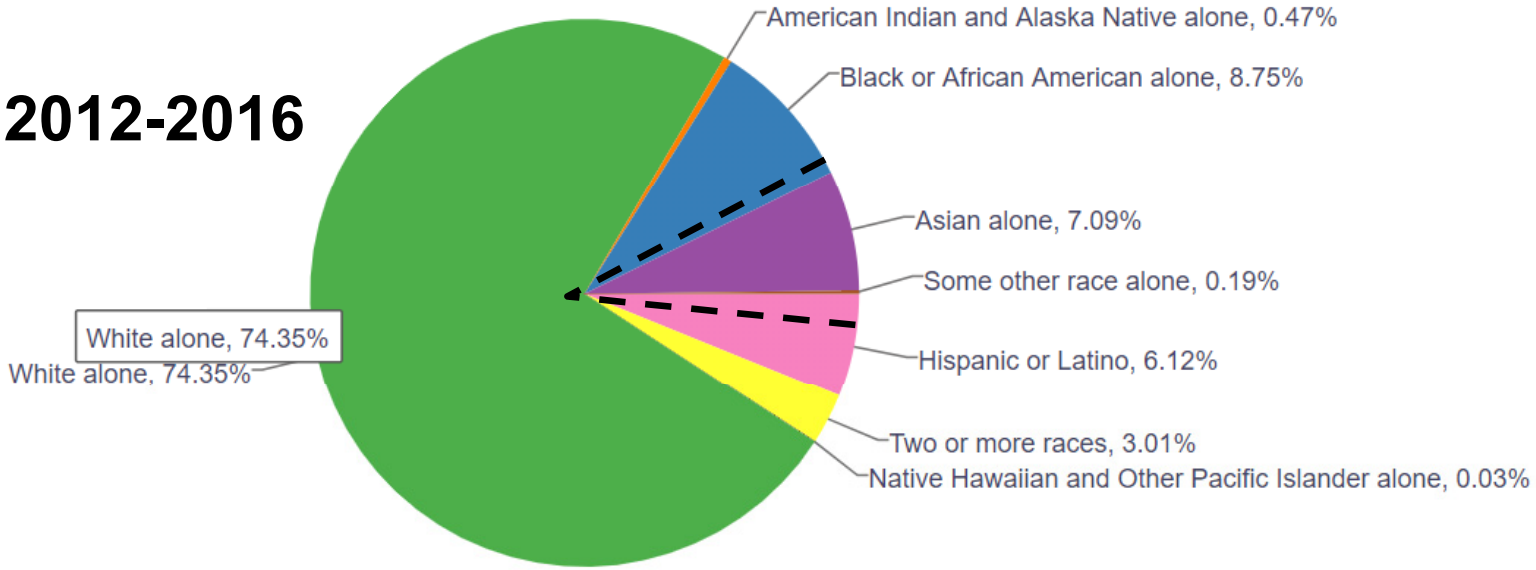
Population by Race & Ethnicity in the Twin Cities Region (7-County)

1990



2012-2016



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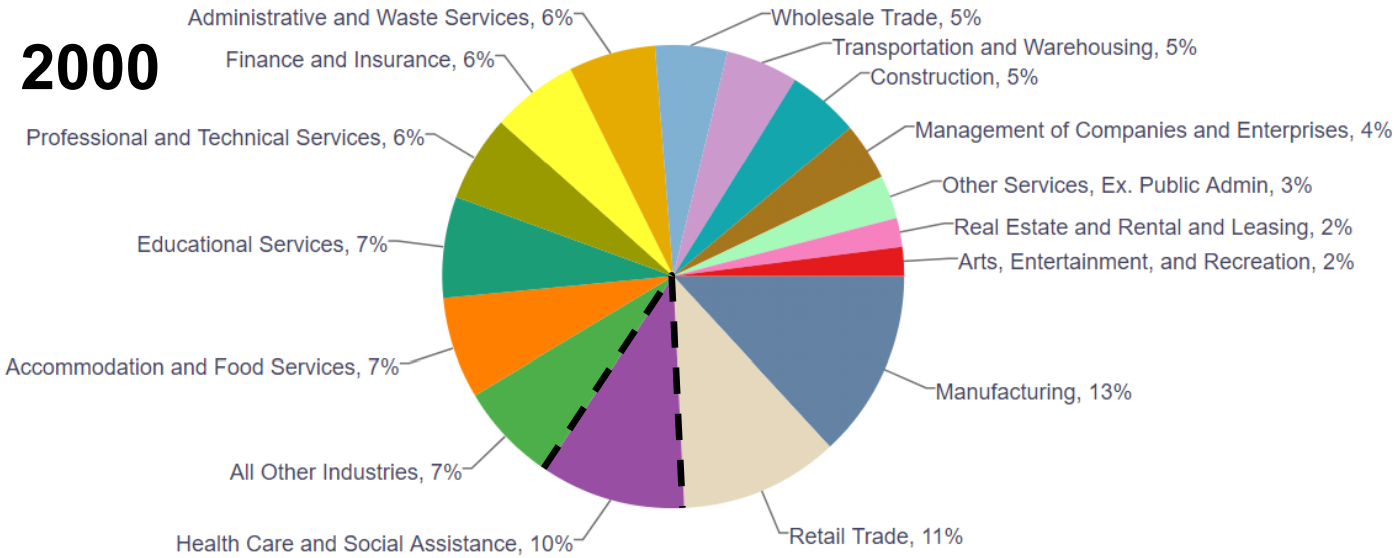
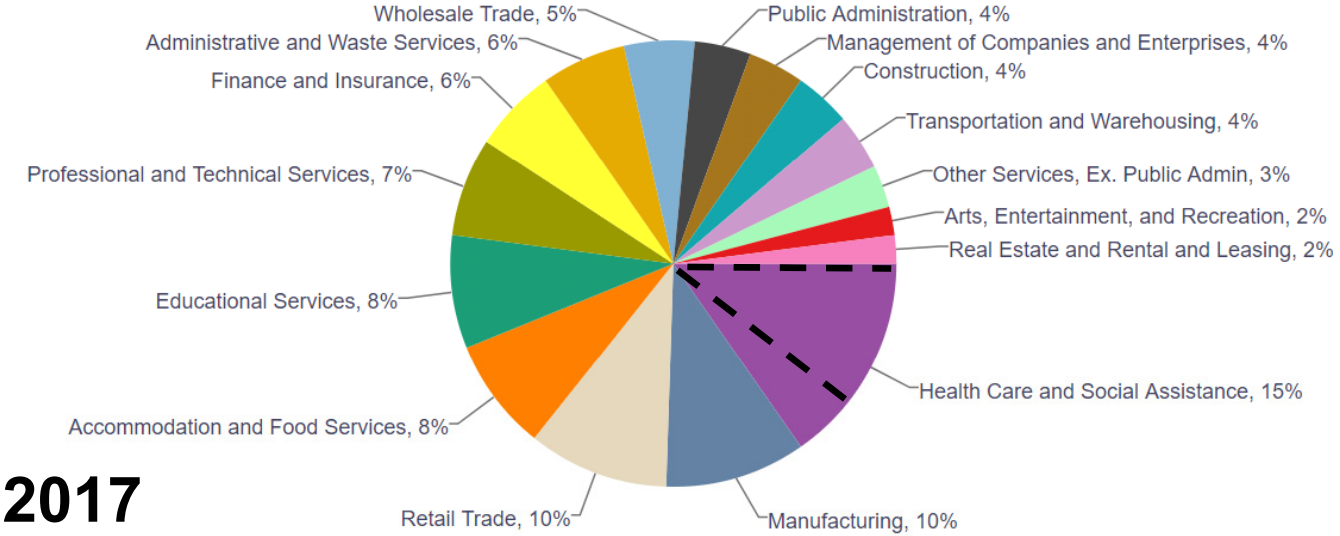
Employment by Industry in the Twin Cities Region (7-County)

2000



2017



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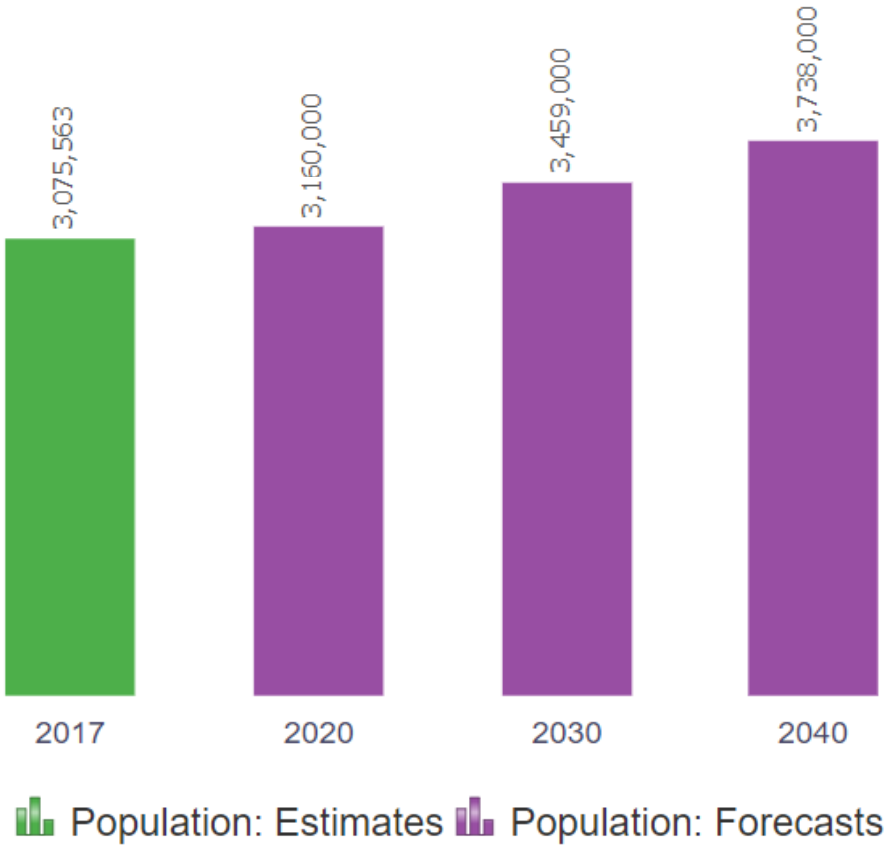
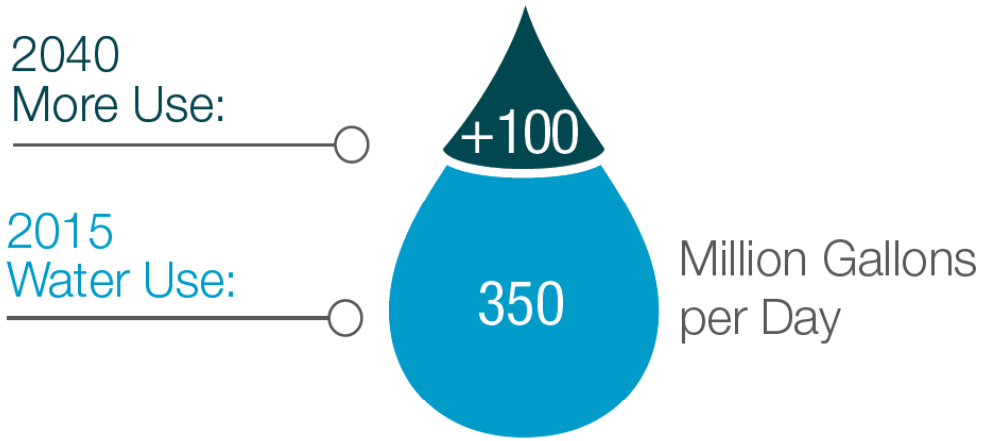
Climate Change Trends in Minnesota Through 2099

Hazard	Projections through 2099	Confidence in Projected Changes
Warming Winters	Continued loss of cold extremes and dramatic warming of coldest conditions	Highest
Extreme Rainfall	Continued increase in frequency and magnitude; unprecedented flash-floods	Highest
Heat Waves	More hot days with increases in severity, coverage, and duration of heat waves	High
Drought	More days between precipitation events, leading to increased drought severity, coverage, and duration	Moderately High
Heavy Snowfall	Large events less frequent as winter warms, but occasional very large snowfalls	Moderately Low
Severe Thunderstorms & Tornadoes	More "super events" possible, even if frequency decreases	Moderately Low

Data Source: MN DNR State Climatology Office. Projected and expected trends among common weather hazards in MN, and confidence that those hazards will change through 2099 in response to climate change. Graphic based on information from the 2014 National Climate Assessment.

Growing Population Increases Municipal Water Use





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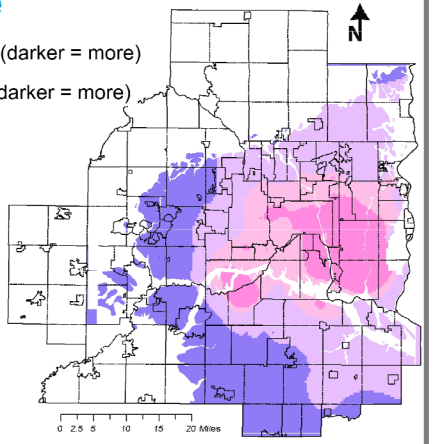
Regional Plans & Supporting Analyses

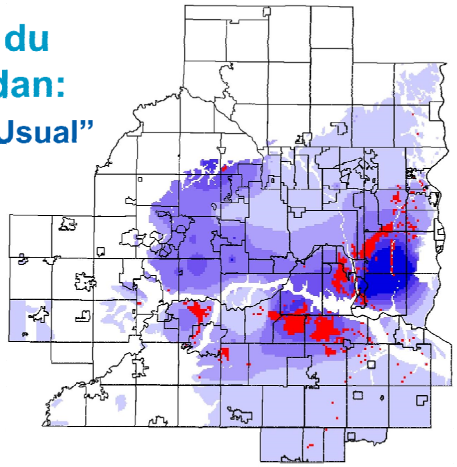
New Approaches can be Sustainable

Aquifer rebound (darker = more)

Aquifer decline (darker = more)



2040 Prairie du Chien – Jordan: "Business as Usual"



Aquifer decline (darker = more)

Drawdown exceeds 50% available head

METRO WATER SUPPLY PLANNING

Updating the Master Plan

A community forum on planning sustainable water supplies

Tuesday, June 10, 2014
8:30 to 10:30 a.m.

Golden Valley City Hall
7800 Golden Valley Road, Golden Valley

The Metropolitan Council is initiating the process for updating the Twin Cities Metropolitan Area Master Water Supply Plan, with the goal of engaging city staff from the beginning of the process.

This forum is meant to provide local planning and water utility staff with information about the scope and schedule of the update, including the connection between the Master Plan and local water supply plans. Participants are asked to provide feedback about the format of the Master Plan and recommendations to make the plan as useful as possible.

8:30 to 9:00 a.m.	Coffee and networking
9:00 to 9:05 a.m.	Welcome *Kelley Janes, Golden Valley Utility Supervisor*
9:05 to 9:10 a.m.	The importance of water supply planning *Sandy Rummel, Metropolitan Council Member, Metro Area Water Supply Advisory Committee Chair*
9:10 to 9:15 a.m.	Connection to local comprehensive planning *Ali Elhassan, Metropolitan Council Water Supply Planning Manager*
9:15 to 9:20 a.m.	Connection to local water supply planning *Julie Ekman, DNR Conservation Assistance and Regulations Manager*
9:20 to 9:35 a.m.	Need for Master Plan Update *Ali Elhassan, Metropolitan Council Water Supply Planning Manager*
9:35 to 9:50 a.m.	Update process, schedule, what's new *Lanya Ross, Metropolitan Council Water Supply Planning Scientist*
9:50 to 10:20 a.m.	Feedback: Questions and recommendations

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Minnesota DEPARTMENT OF NATURAL RESOURCES

Local Response to Regional Plan and Model Updates

"The membership of CEAM are concerned that the direction of the Metropolitan Council on water supply issues is based on limited data and some undocumented assumptions. Modeling efforts that have been completed of the aquifer system appear overly conservative, and conclusions are being made without considering all alternatives and possible responses."

Steve Bot, CEAM President
August 12, 2014

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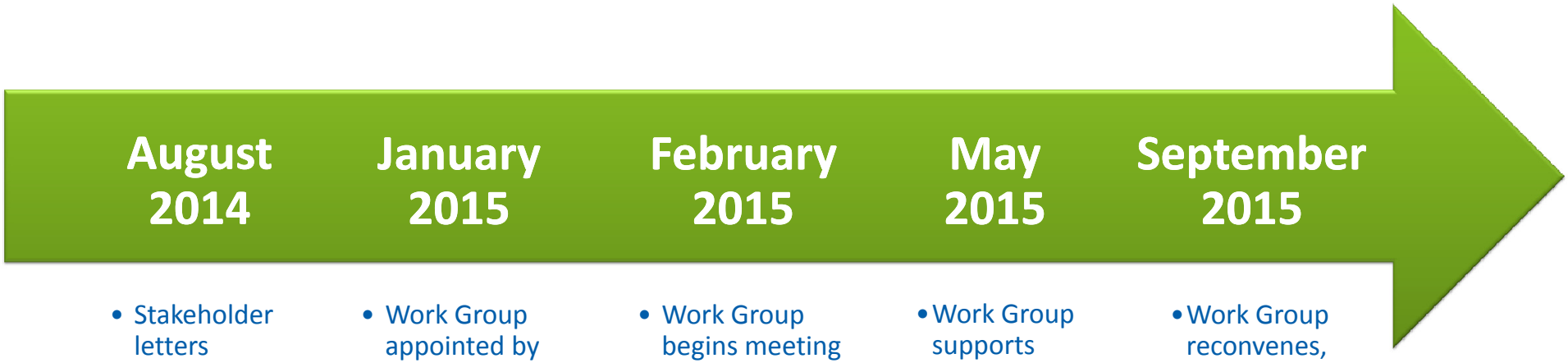
DRAFT: Coon Rapids Well Locations
JOE
RICHTER
DNR

Community Technical Work Group Milestones



- August 2014
  - Stakeholder letters
  - Work Group scoped
- January 2015
  - Work Group appointed by Metro Cities
- February 2015
  - Work Group begins meeting
- May 2015
  - Work Group supports release of plan for review
- September 2015
  - Work Group reconvenes, supports plan adoption

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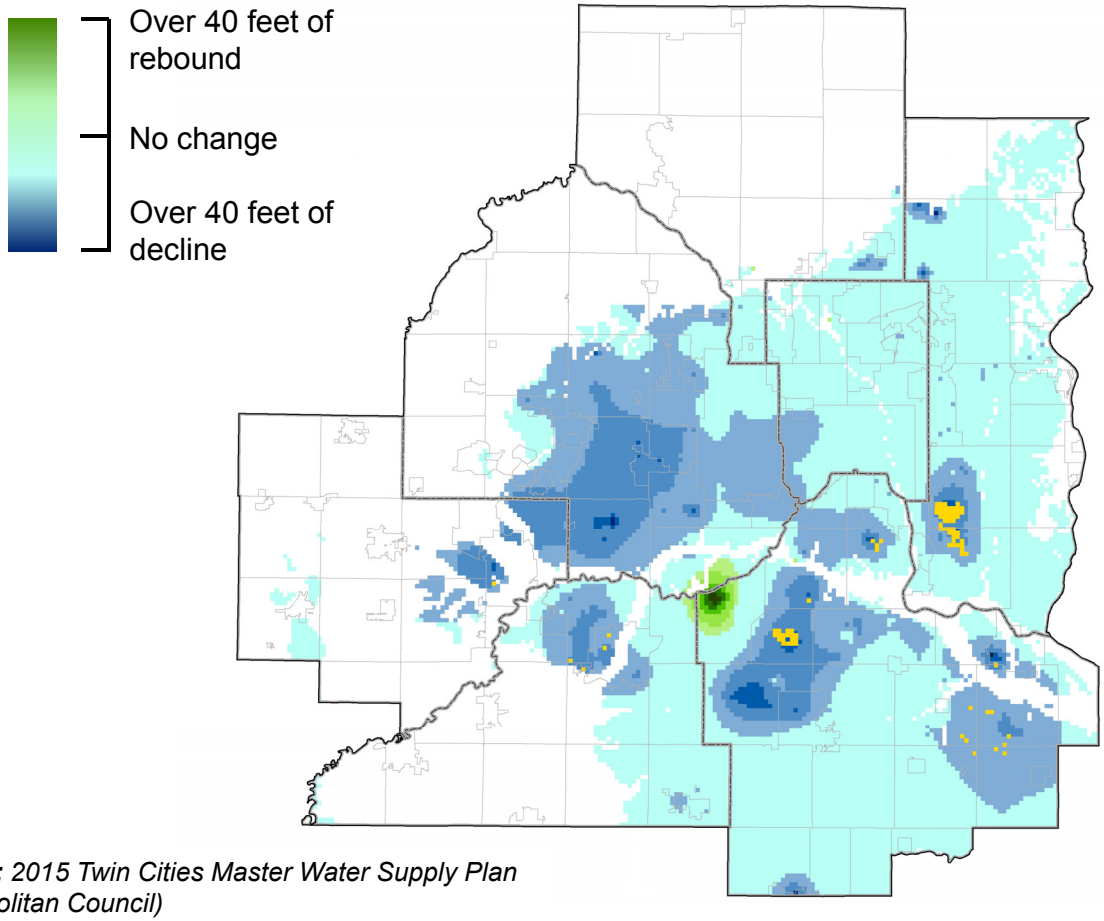
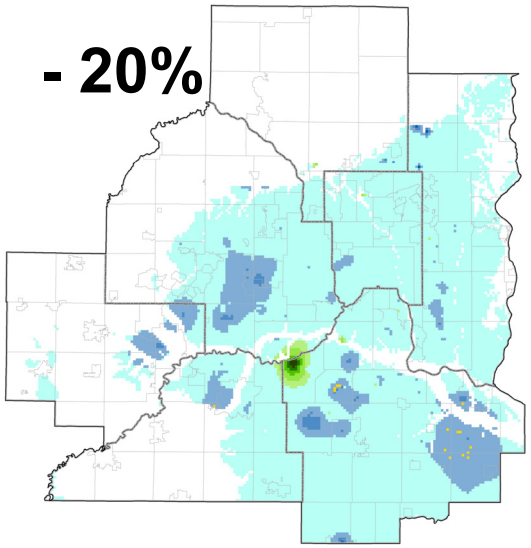
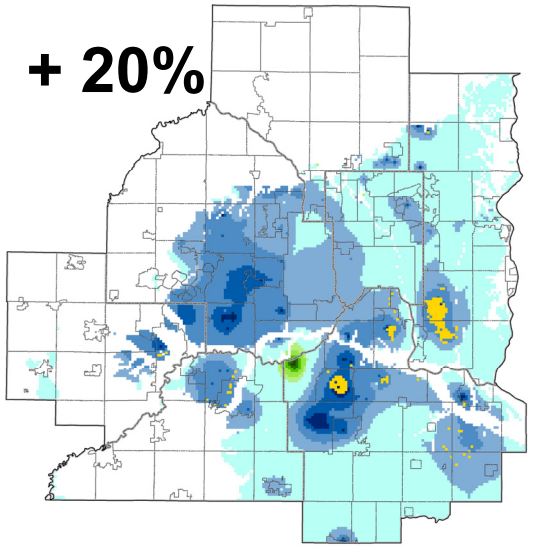
UPDATED: Change in PDCJ Aquifer Levels from 2040 Pumping







Source: *2015 Twin Cities Master Water Supply Plan (Metropolitan Council)*

Community Technical Work Group Member:

“I'm very encouraged by the changes and also would say I think the tone is changing here. It's positioning the Met Council to be an… impactful player in terms of all these diverse interests in water. I think the fear was of another regulator getting involved. The document is now leaning toward third-party, to help facilitate solutions. The Met Council can play an important role in helping us get to those solutions.”

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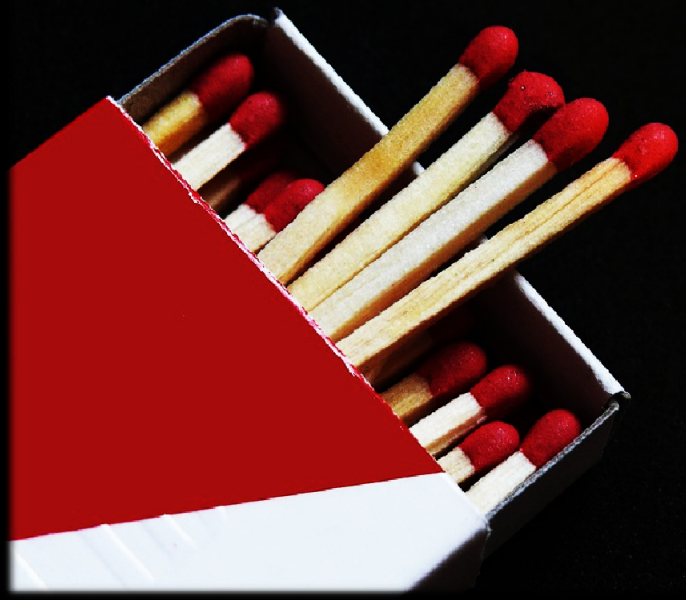
Sparking and Sustaining Collaboration



Moving Forward

There are two possible outcomes:

1) *If the result confirms the hypothesis, then you've made a measurement.*

2) *If the result is contrary to the hypothesis, then you've made a discovery.*

-Enrico Fermi

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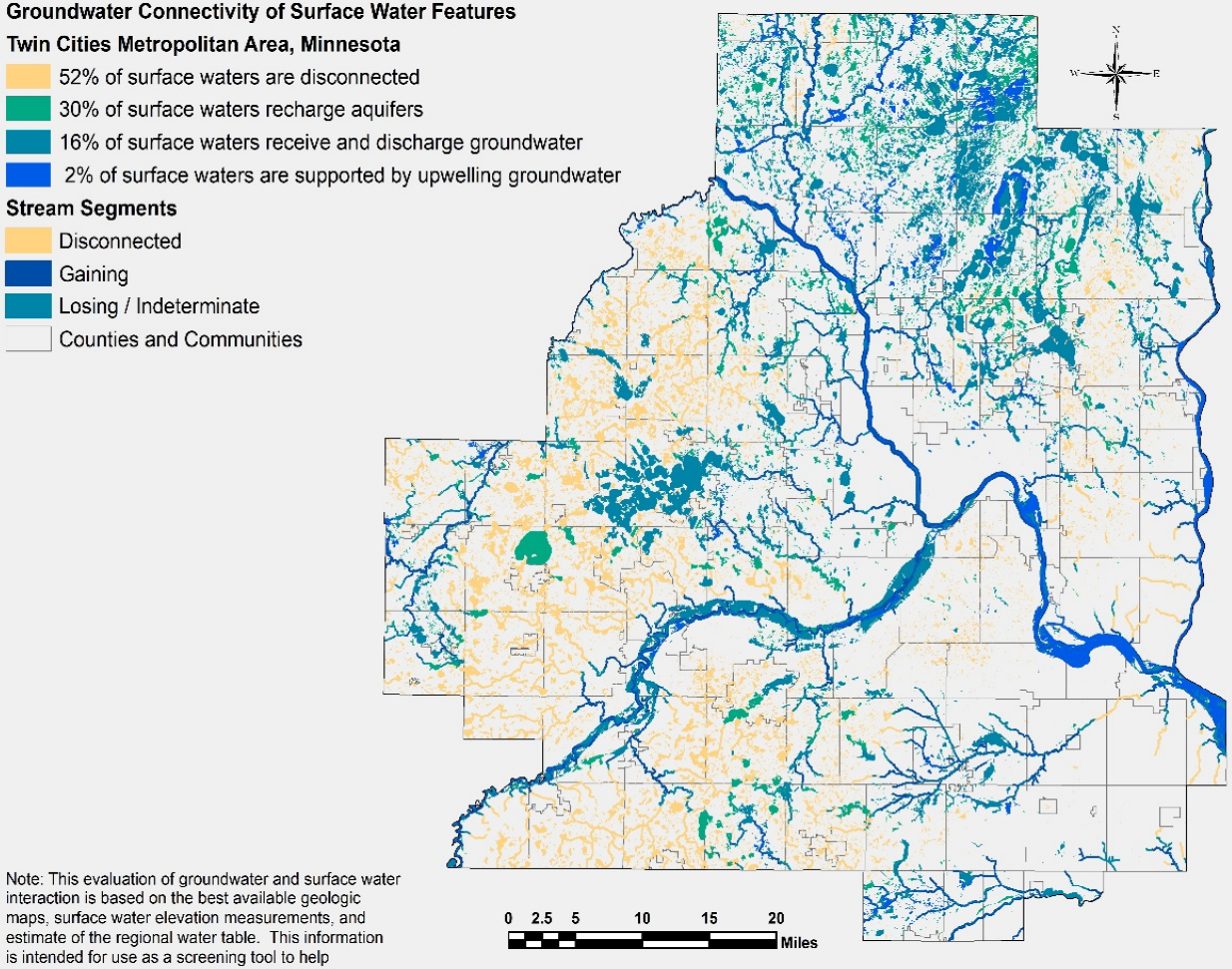
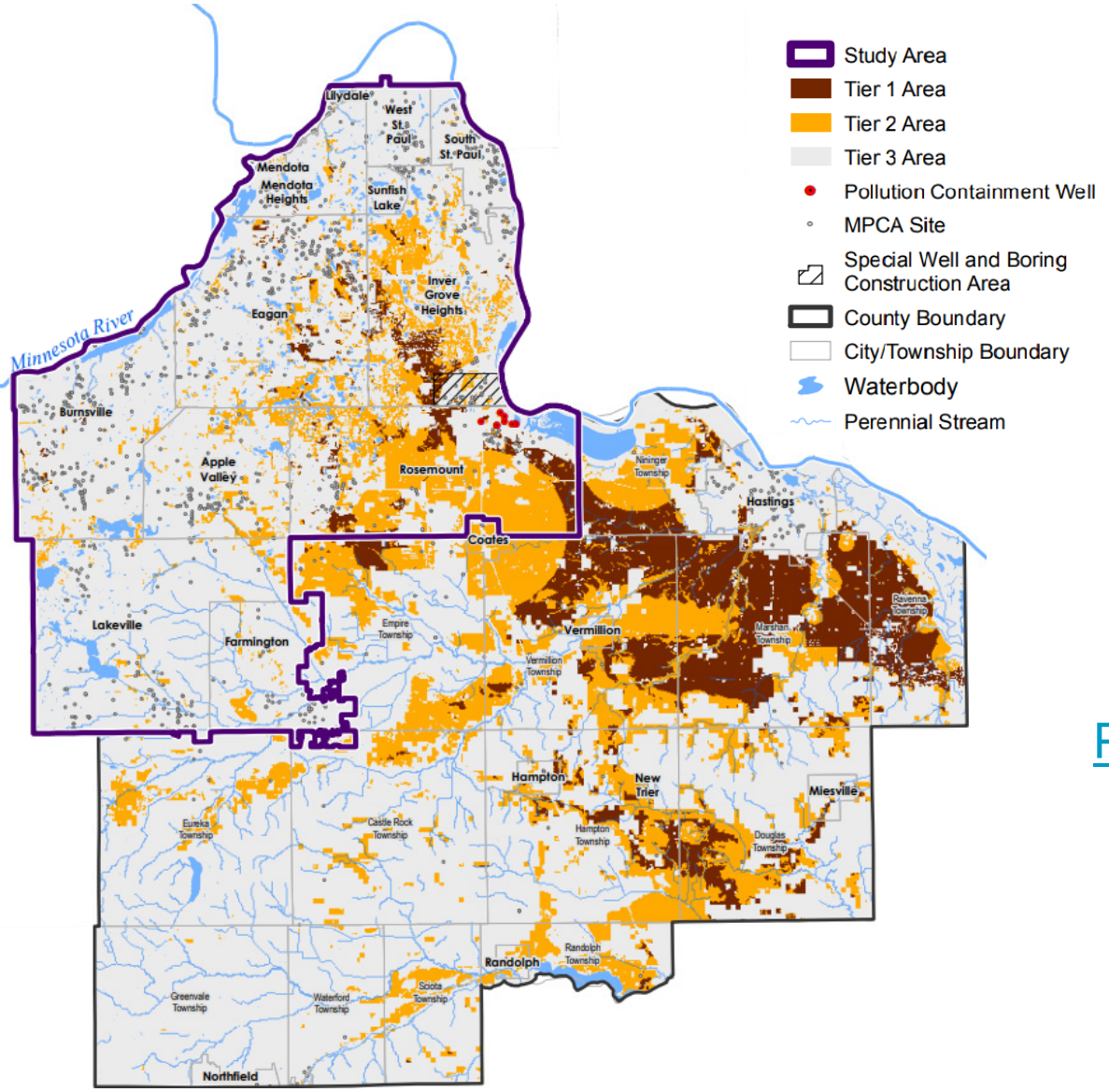
What if…

Groundwater and Surface Water Interaction



Note: This evaluation of groundwater and surface water interaction is based on the best available geologic maps, surface water elevation measurements, and estimate of the regional water table. This information is intended for use as a screening tool to help planners prioritize data collection and resource protection measures. The results presented in this map should be verified by local data collection.



Regional Drinking Water Supply, Groundwater Recharge and Stormwater Capture and Reuse Study

Explore more on our website at https://metrocouncil.org/Wastewater-Water/Publications-And-Resources/WATER-SUPPLY-PLANNING/Regional-Drinking-Water-Supply,-Groundwater-Rechar.aspx

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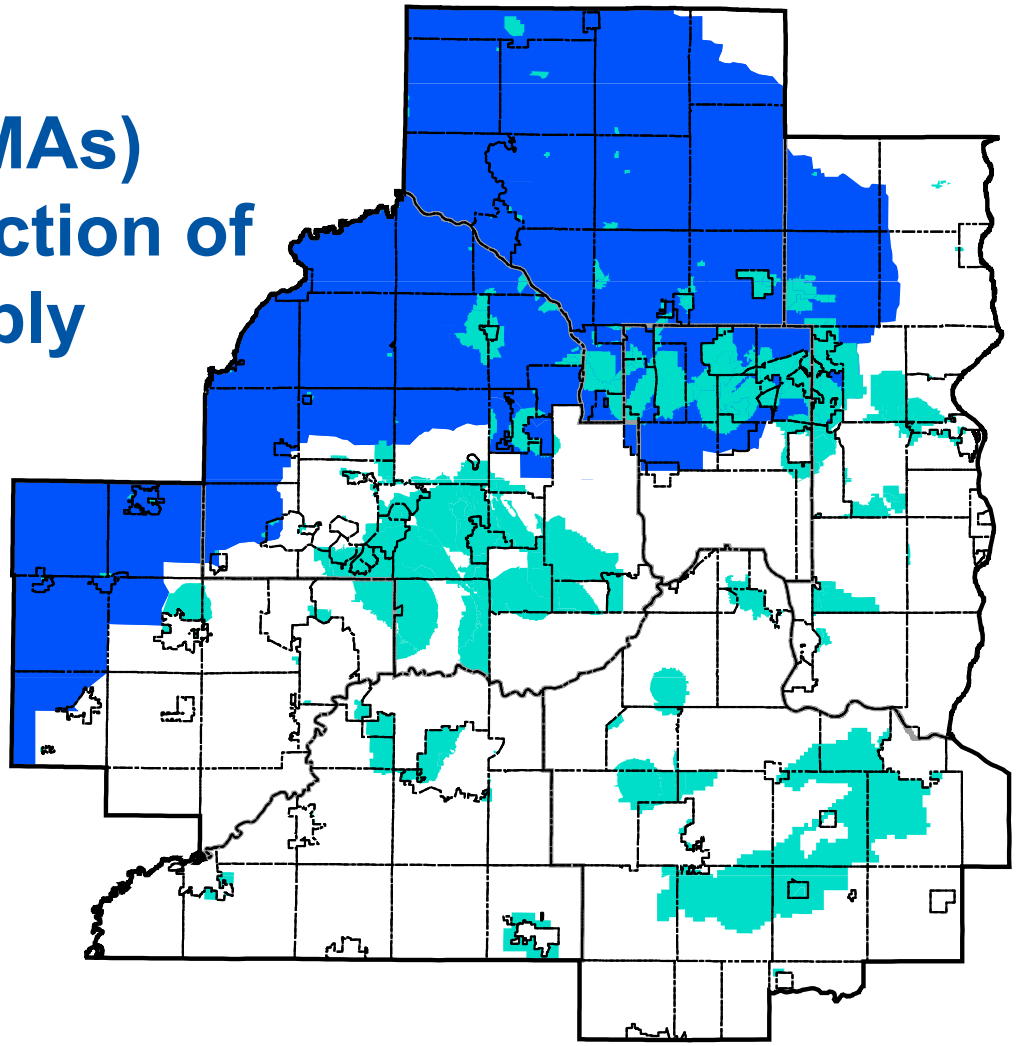
Source Water Protection & Drinking Water Supply Management Areas (DWSMAs) that fall outside the jurisdiction of the communities they supply



Surface water source area that extend beyond the source community's boundaries

Groundwater DWSMAs that extend beyond the source community's boundaries