

Can a non-profit effectively influence water policy?

Examples from Freshwater

Carrie Jennings, PhD, P.G.
Research and Policy
Director



Since 1968

– two years before the first
Earth Day –

Freshwater Society has
been a leading public
nonprofit organization
dedicated to **conserving,
restoring, and protecting
freshwater resources** and
their surrounding
watersheds.



- Educate community leaders, legislators and the public
- Compile relevant scientific research to influence policy decisions
- Facilitate conversations between key players
- Build community capacity for action



Reports and Factsheets

MARCH 2016
rev. Nov. 2016



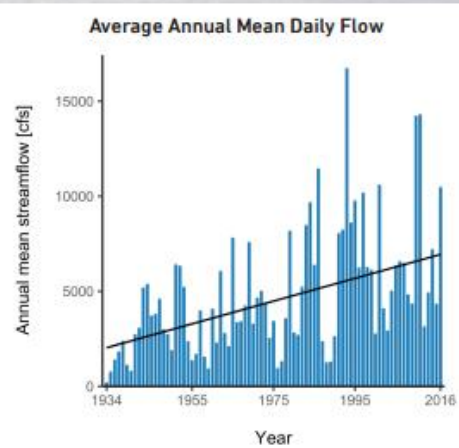
The Water Underground

The Minnesota River is growing

Let's agree on the facts. Minnesota River flows are increasing. Opinions about why this is happening vary, but include some combination of change in climate, ground cover, and drainage. We list references at the end of this document if you want to delve into the nuances. But the data show **Minnesota River flow has increased** at an alarming rate over the last 60 years.

River widening

The result has been river widening throughout the watershed that is consuming, on average, 80 acres of land a year. That is about 6" per year distributed over the **13,000 parcels** along the Minnesota River and its tributaries that have steep banks, ravines, and bluffs. Land is devalued, crops and productivity lost, and infrastructure costs increase for local governments. Ask a landowner if they are okay with losing 15' of river frontage over the course of a 30-year mortgage.

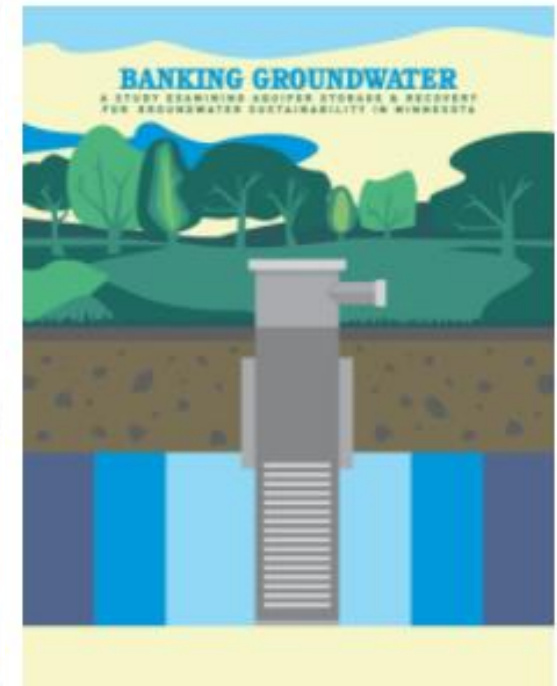


Source: Data from USGS 05330000 - MINNESOTA RIVER NEAR JORDAN, showing Average Annual Mean Daily Flow in cubic feet per second.



FRESHWATER FINAL REPORT

Hennepin County Bedrock Collapse Project



Announcing our fall 2021 Moos Speaker!

Dr. McGregor will deliver our next virtual Moos lecture on Wednesday, Nov. 17

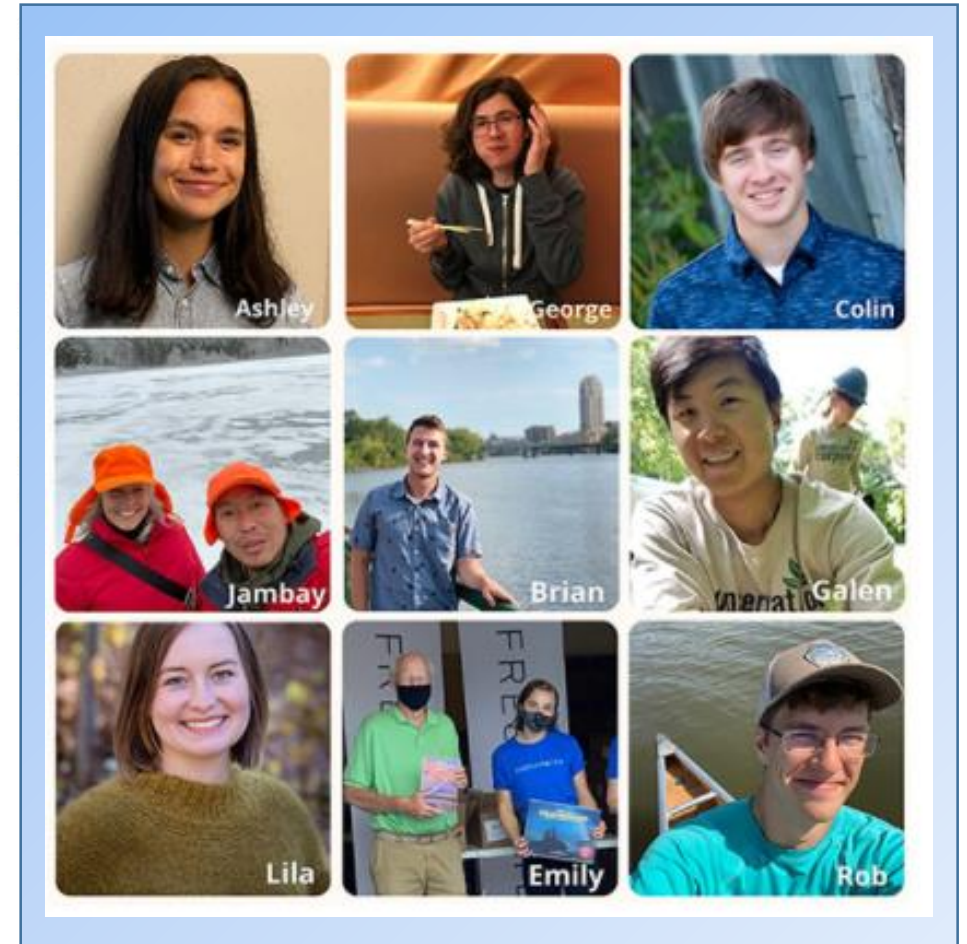
- Technical conferences
- Intern research program
- “Ted-Talk” quality speaker series
- Small research projects



The talk title is, "Indigenous participation in Great Lakes governance: an environmental justice perspective."



McGregor is from Whitefish River First Nation (Anishinaabe), Birch Island, Ontario, and has been at the forefront of Indigenous environmental justice and Indigenous research theory and practice

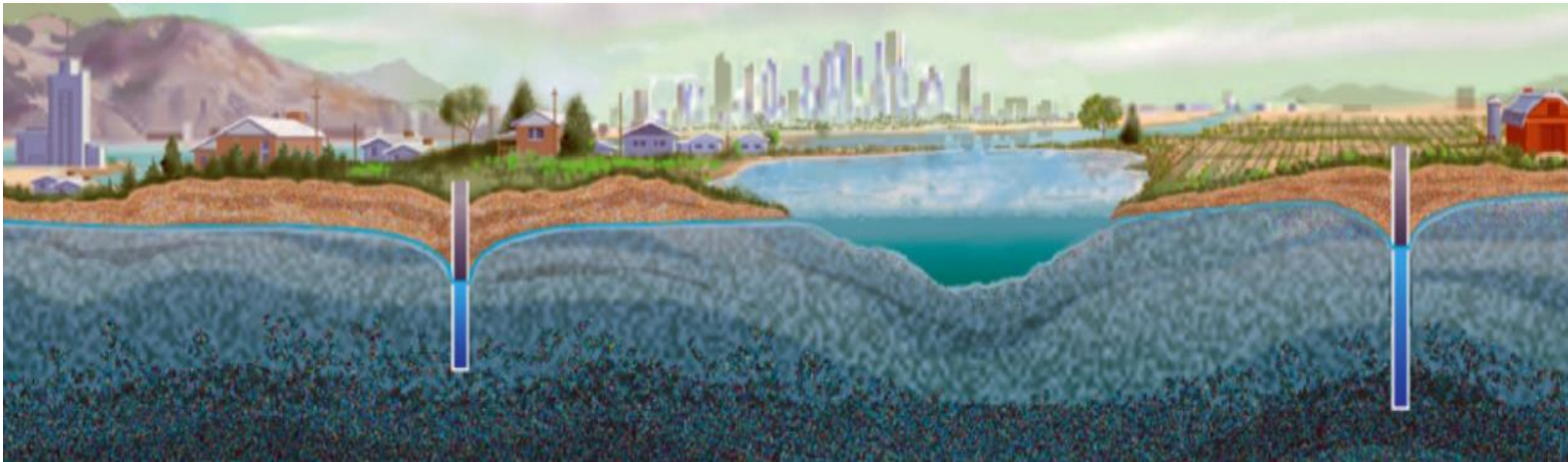


Groundwater Focus

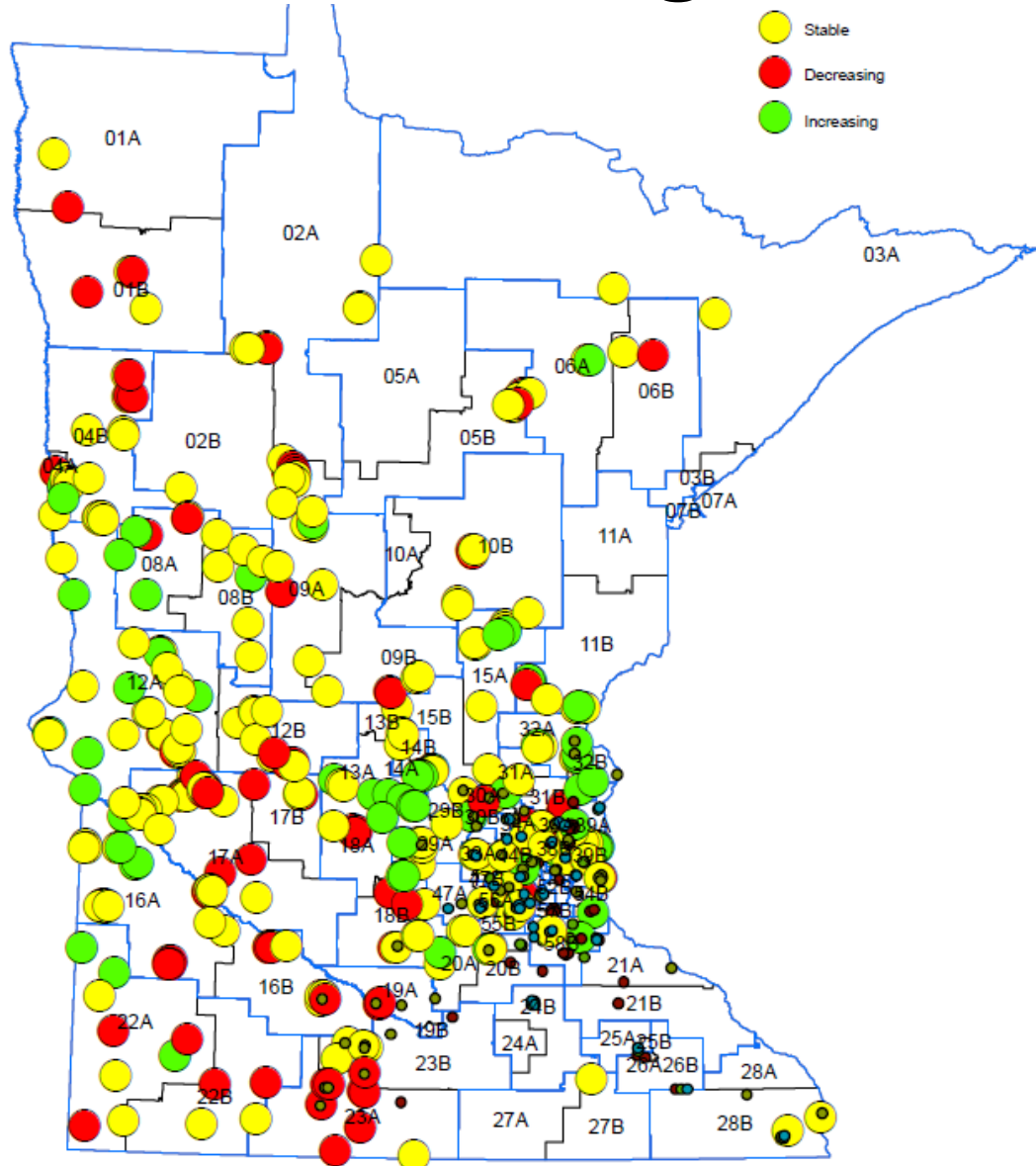


Who do you share your
groundwater with?

Will there be enough?

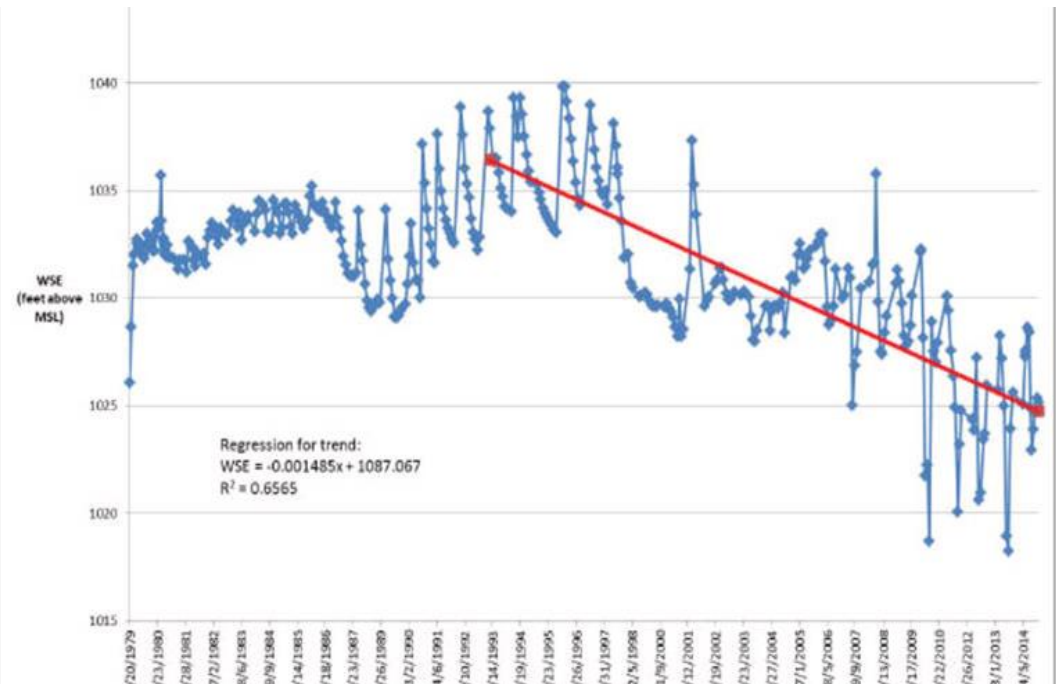


Are regional trends understood?

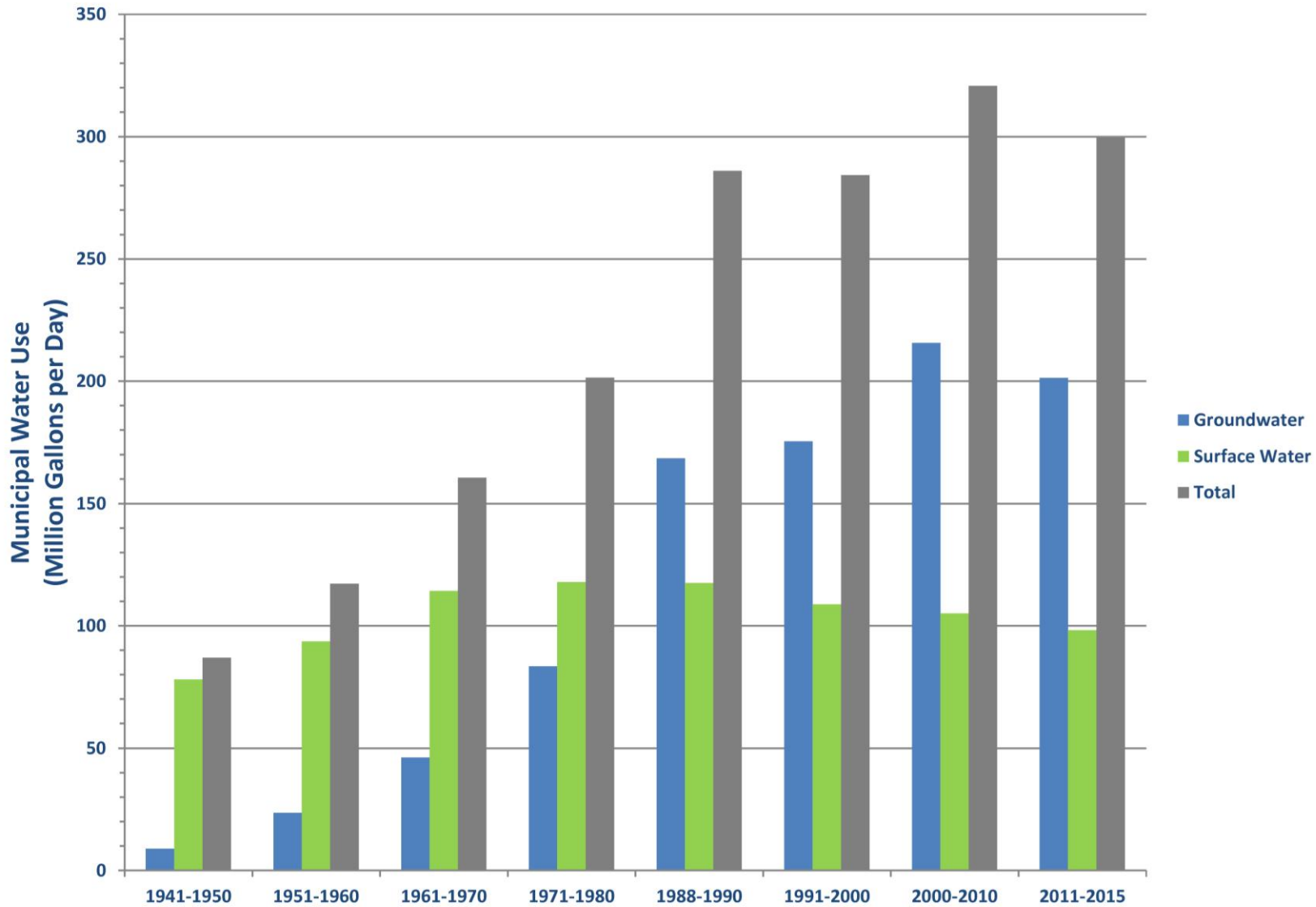


DNR monitoring well data

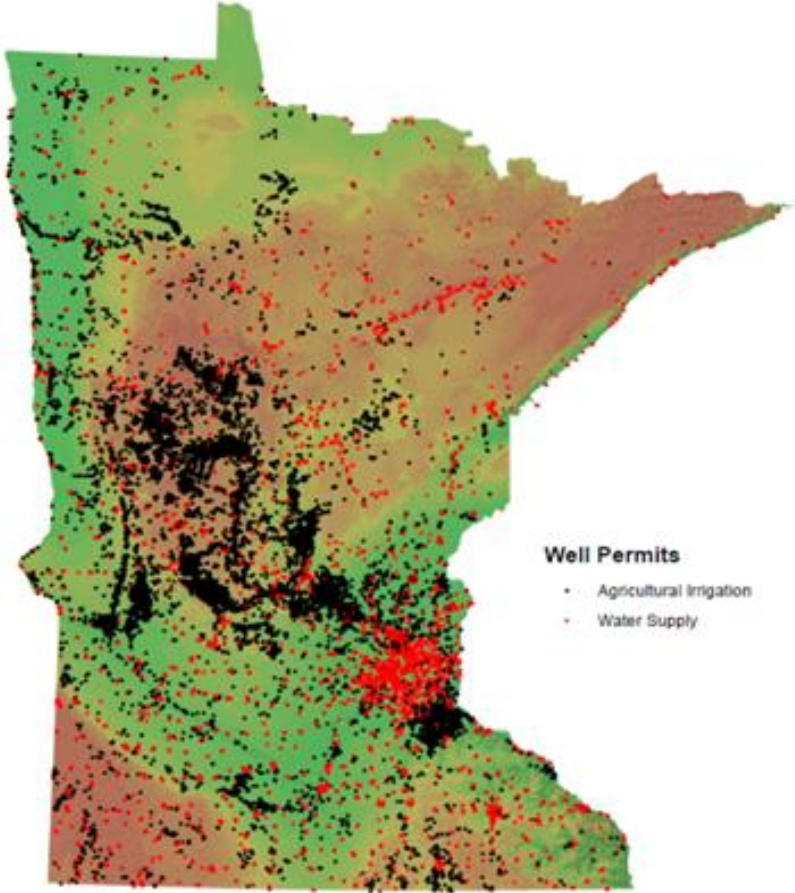
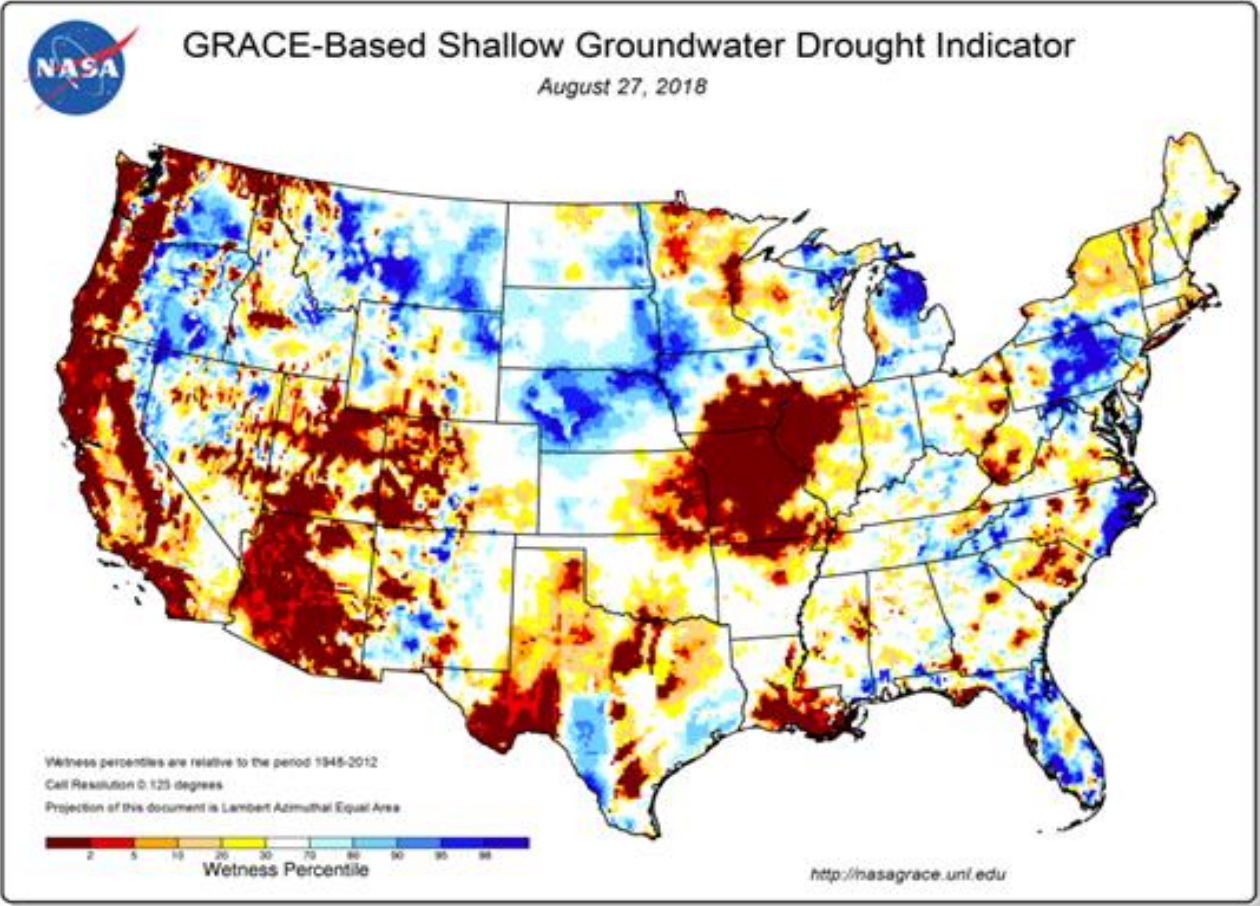
Groundwater levels in the Benson area have been in decline since the mid-1990s. The main aquifer has declined 15'.
March 17th, West Central Tribune



Municipal Water Use in the 7-County Metro Area



Who is planning for climate change?



MnDNR data

Why throw money down the drain? Reduce, Reuse and Recharge



Are our agencies working in siloes ?



Current state of reuse systems

		Roles of Regulatory Agencies in a Reuse System				
		Source	Storage	Treatment	Distribution	End Use
Sources of Reuse Water	Rainwater	<i>Not explicitly regulated</i>	DLI regulates the drainage or collection of rainwater from roofs and downspouts.	MDH has broad authority over drinking water quality and public health but nothing specific about evaluating the safety of reuse systems. DLI has water quality treatment requirements for rainwater.	DLI regulates collection and drainage systems. DNR regulates if volumes collected/used >10,000 gallons per year (some residential exceptions).	MDH regulates injection wells, has controls on infiltration in vulnerable areas (VWAS, ERAs, and some WHPAs). DLI requires backflow preventers to day or one million gallons per year to prevent cross-contamination with other water sources.
	Graywater	DLI regulates the collection of the discharge of graywater as well as the use of graywater. DLI issues permits for graywater systems up to 10,000 gal/day.	MPCA regulates graywater, wastewater, and stormwater. Technical requirements include septic tanks, pumps, trenches, seepage basins, mounds, at-grade systems.	DLI mandates that public sewer and water be used if available, requiring a variance for graywater projects.	MDH requires graywater disposal to be certain distances from wells. DLI requires graywater and backup systems to be separated through plumbing code for piping, make-up water, backflow provisions, cross connections, testing requirements, and setbacks.	MDH regulates injection wells and vulnerable DWAS, ERAs, and WHPAs. DLI requires backflow preventers to be installed with MDH well code to prevent cross-contamination. DLI issues permits for stormwater collection and infiltration.
	Stormwater	<i>Not explicitly regulated</i>	MPCA provides guidance in capture and storage of stormwater in the Stormwater Manual.	MDH regulates the safety of collection and installation.	DLI regulates use within buildings (and has broad authority to regulate stormwater conveyance systems, but does not regulate irrigation systems unless combined with indoor use). DLI regulates if volumes collected >10,000 gallons per year (some residential exceptions).	MDH regulates injection wells and vulnerable DWAS, ERAs, and WHPAs. DLI requires backflow preventers to be installed with MDH well code to prevent cross-contamination. DLI issues permits for stormwater collection and infiltration.
	Wastewater	MPCA regulates the collection and disposal of industrial and commercial wastewater. County or City regulates for volumes < 10,000 gallons per year. DLI would require a permit for all wastewater systems.	MPCA regulates the disposal of wastewater including specific technical requirements for septic tanks, pumps and disposal in trenches, seepage basins, mounds, or at-grade systems.	Lack of standardized treatment, though DLI can set treatment requirements through variance.	MPCA regulates industrial and commercial waters, subsurface injection. Metro regulates use within buildings and property lines.	MDH regulates discharge to surface waters and land discharge (including irrigation), issues guidance on reuse. MDH applies drinking water standards to potable end uses; a variance would be needed for aquifer injection. DLI requires a variance for use in buildings, and upholds MPCA design requirements. USEPA involved in aquifer injection.

Obvious First Steps

- Encourage conservation
- Eliminate barriers to water re-use
- If some areas still come up short, add tools

Recharge

- Enhancing natural recharge is all but banned
- We studied and are promoting managed aquifer recharge
 - Passive
 - Active
- It is time to add these tools to ensure long-term water sustainability

Find out more:

Aquifer recharge as a tool to replenish groundwater reserves

by Freshwater

Are we using too much groundwater too fast?

Minnesotans want and need assurances that they will have dependable groundwater supplies. Replenishment of groundwater should keep up with withdrawals. Where groundwater is overdrafted, we may need recharge as a tool to augment groundwater supply.

Groundwater at risk

Some groundwater reserves are shrinking: groundwater is being used faster than it is being replenished by rainfall.

Minnesota needs to fund an aquifer recharge study to understand the range of options and costs involved to enhance and replenish our groundwater resources.

Building groundwater resilience

Three sequential steps build groundwater resilience:

- 1) Reduce groundwater use
- 2) Reuse groundwater before discarding it
- 3) Recharge groundwater

We are already working on the first two but some parts of the state may need to have the third tool — recharging groundwater — in place in order to avert an economic crisis.

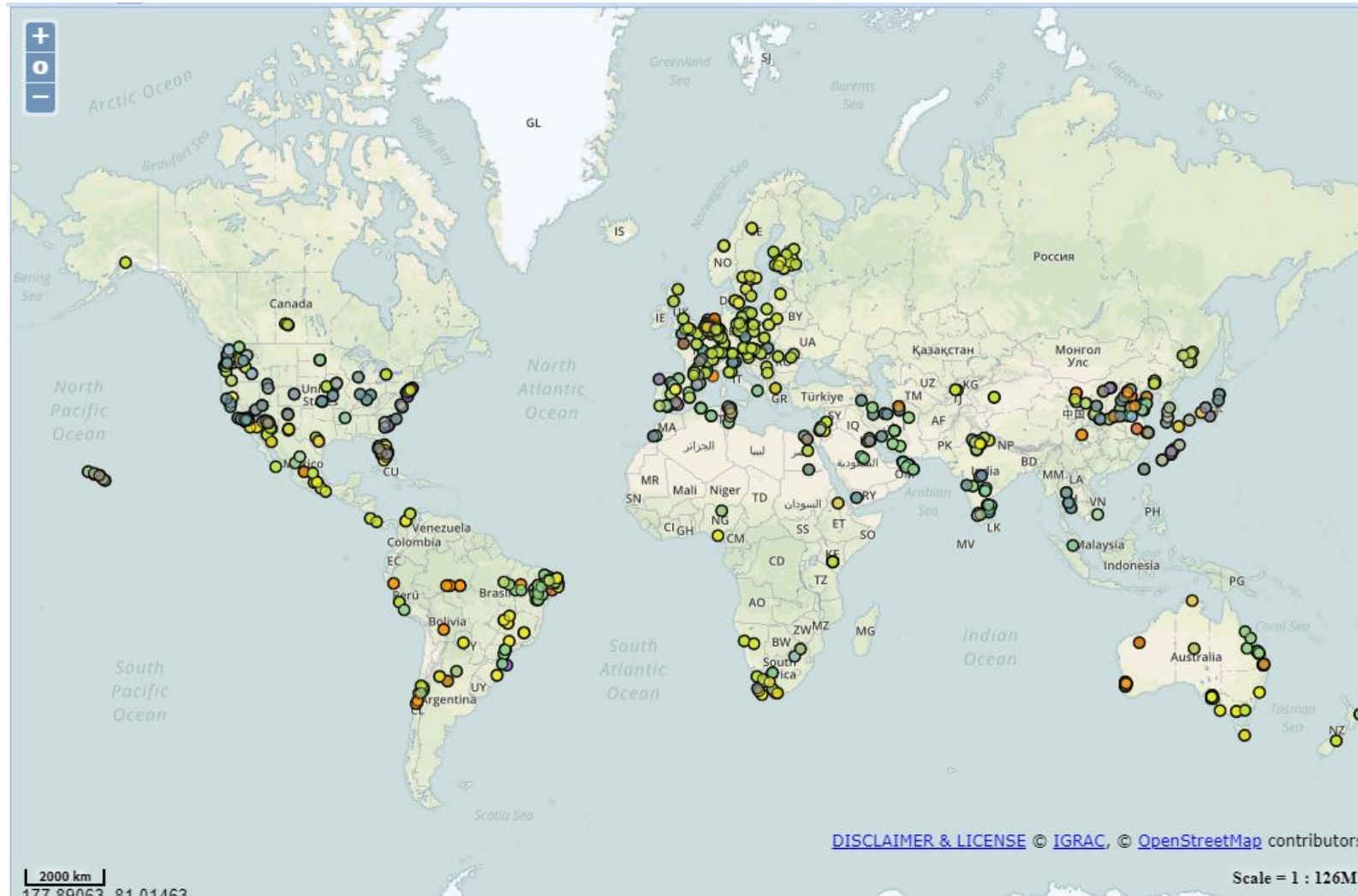
Given the uneven distribution of groundwater across the state, each region requires its own solutions. Freshwater is asking the Legislature to direct the Water Resources Center to conduct a two-year, interdisciplinary study including a stakeholder process to identify areas where groundwater recharge makes both economic and geologic sense and report back to the Legislature during the 2020-21 session.



Why ASR?

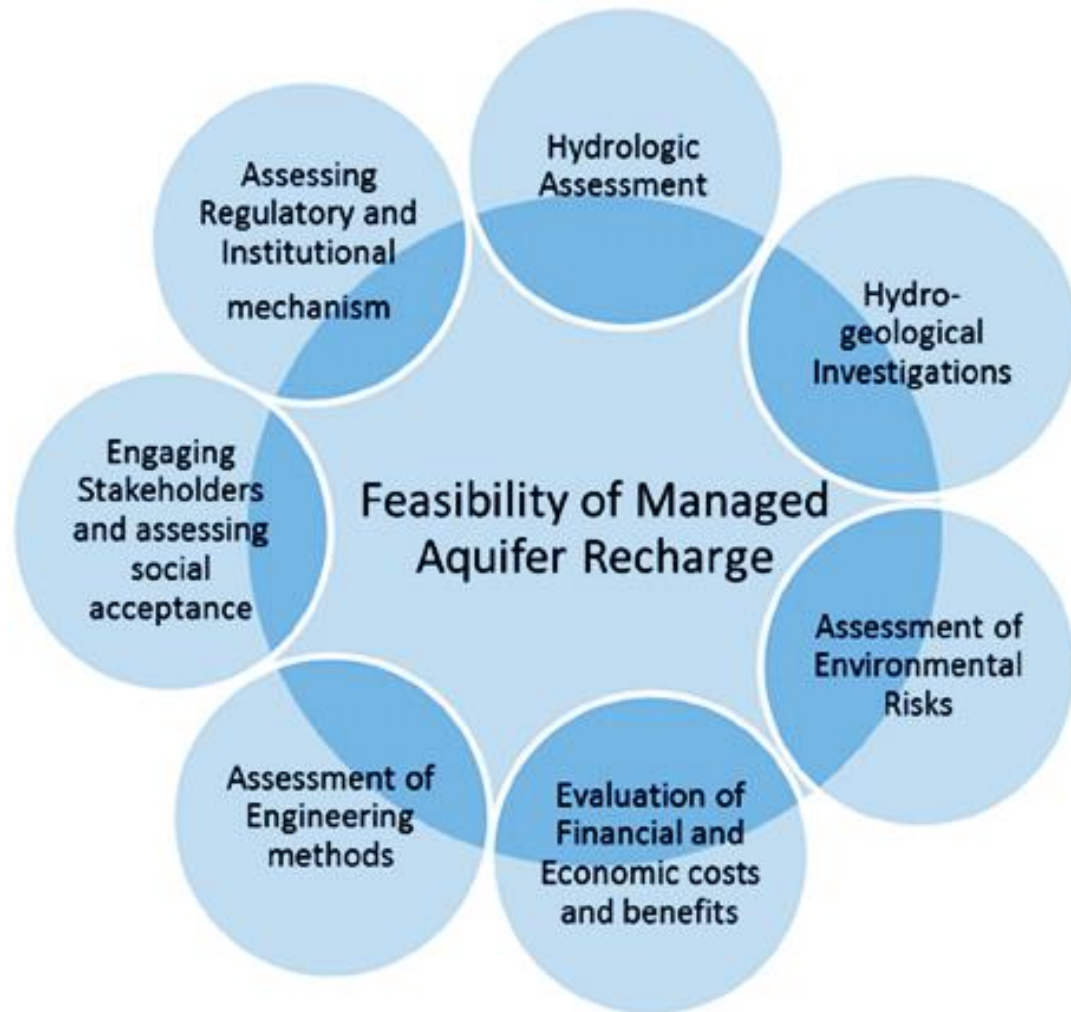
- Create reliable seasonal water sources
- Meet peak demand without building a larger treatment plant
- Make water reserves less vulnerable to contamination
- Conserve land area used for water storage
- Sustain groundwater-fed ecosystems like trout streams, lakes and fens.

Aquifer Recharge Around the World

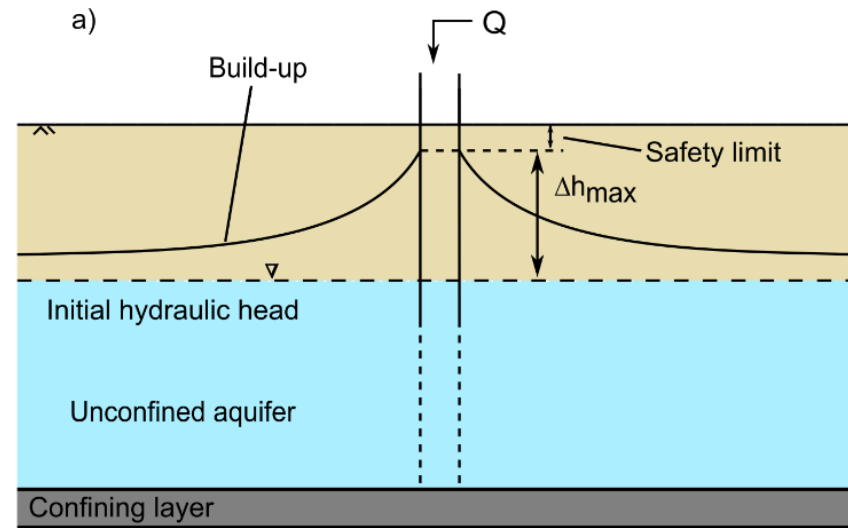
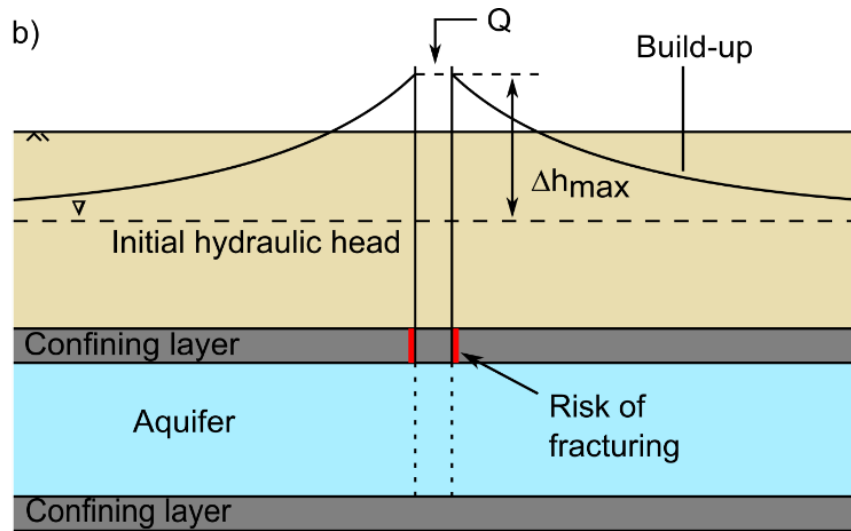


<https://apps.geodan.nl/igrac/ggis-viewer/viewer/globalmar/public/default>

Banking Groundwater through Aquifer Storage and Recovery



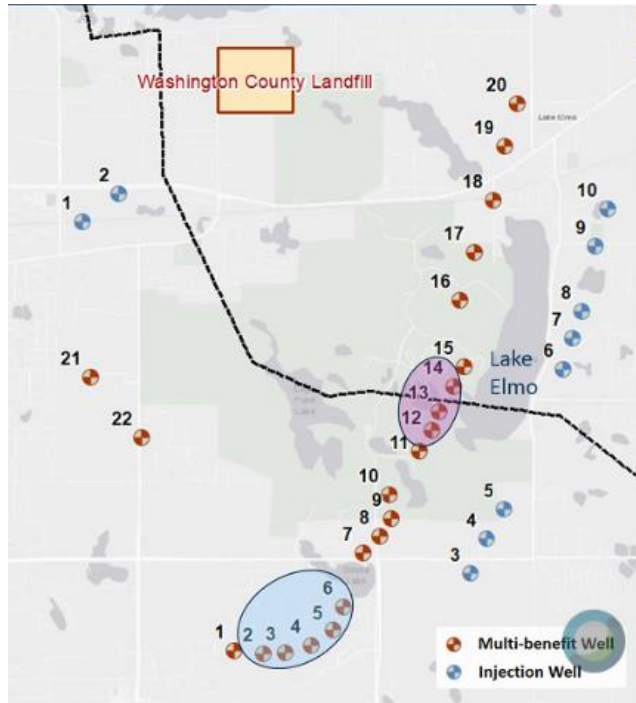
Estimated Injection Capacity of 3 Aquifers



Identified barriers to the practice

1. Sufficient and organized aquifer pump test data
2. State authority for injection from EPA
3. Clear permitting path by MDH
4. Coordination among agencies regulating groundwater (MDH, MPCA, DNR)
5. City leading needs assessment

ASR role in PFAS remediation is being explored

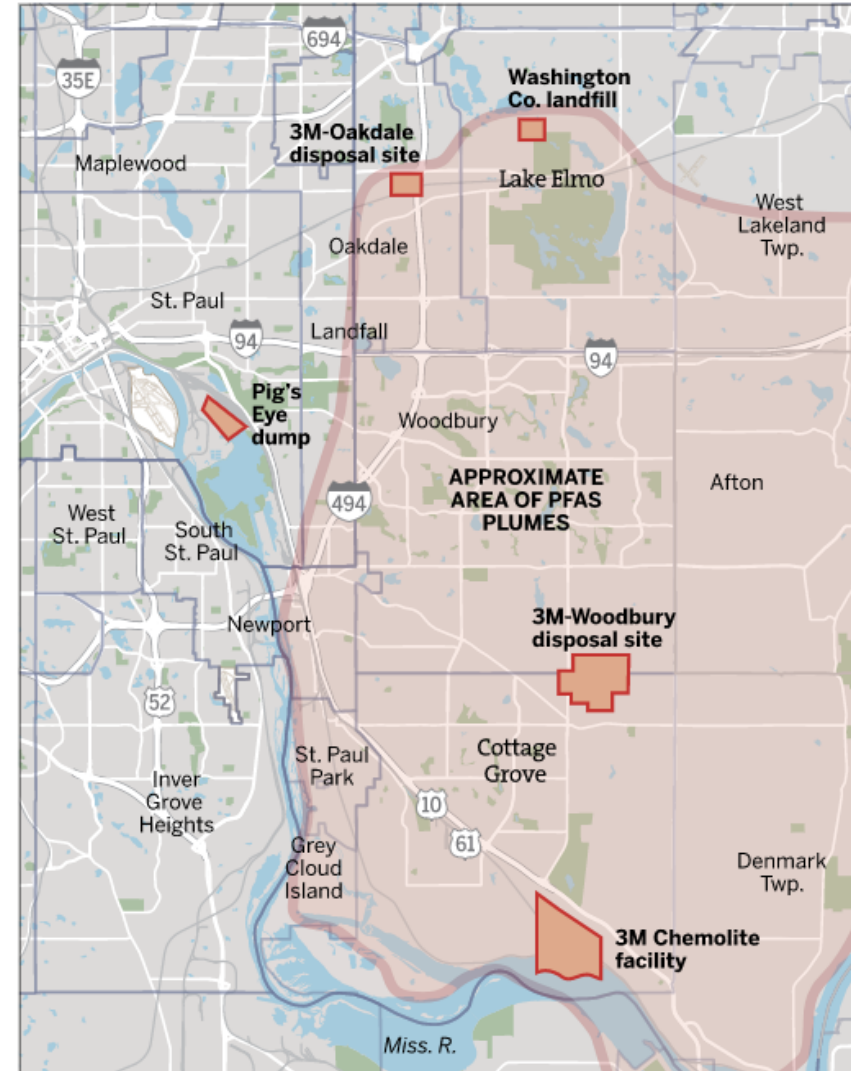


Potential pumping and injection well array. Source: Wood Consulting Group and MPCA

PFAS plume area in East Metro

Recent state tests found a large plume of contaminated groundwater beneath several East Metro suburbs, where 3M disposed of waste contaminated with PFASs decades ago. Within the outlined area, contamination levels vary greatly; spots where PFAS concentration levels exceed state health standards are much smaller.

3M PFAS dump sites PFAS Plume



Source: Star Tribune

Groundwater Governance in the Great Lakes Region: A Comparative Study with Engagement

**Hydrogeologic
data**

**Technical
Management
Framework**

**Groundwater
Governance
Structure**

**Legal Recourse
and Precedent**

**Informal Power
Structure**

**Where is the
water?**

**How do we
manage the
water?**

**Who sets the
management
rules?**

**What legal
tools exist?**

**What is missing
from our
analysis?**

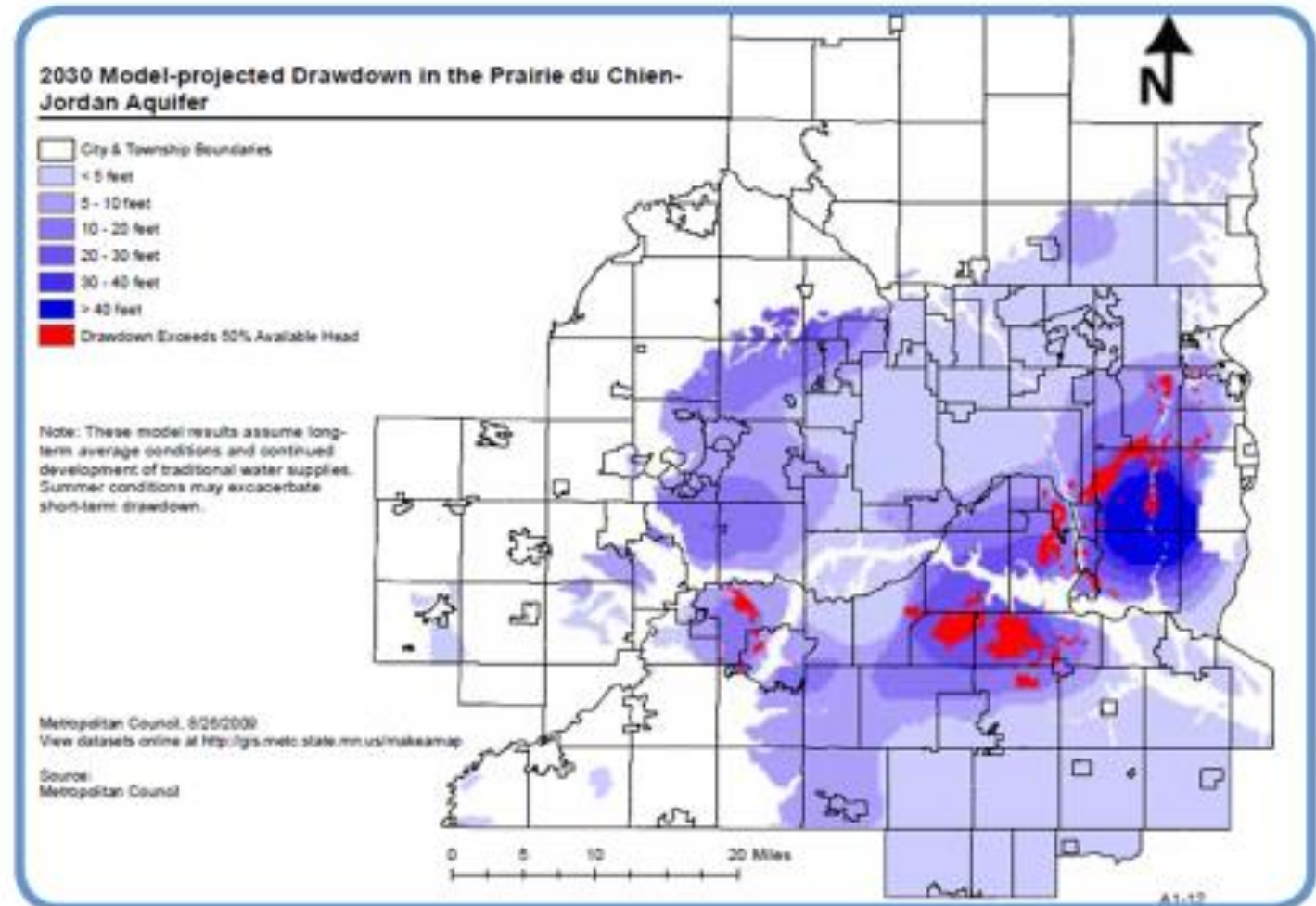
Purpose

To improve our shared understanding of the current status of groundwater policy and help create the conditions which would allow state and tribal groundwater actors to learn from each other and have the tools they need for long-term water stewardship in our region.



What principles guide the sharing of groundwater?

- Among different users
- Across political jurisdictions
 - Cities
 - Counties
 - States
 - Tribal jurisdictions
- Across groundwater divides
 - Not the same as surface water
 - Divides move with pumping

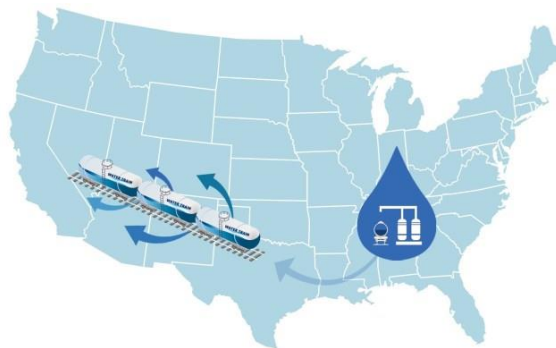


Projected groundwater drawdown across Minneapolis-St. Paul metropolitan area

Are there policies in place?

- Does water level monitoring drive permit decision-making?
- Is attention being paid to the ecosystem services that groundwater provides?
 - Lake levels
 - Cold-water streams
 - Wetlands and fens
- Are local conservation and planning efforts prioritized?
- Are tools available when pressure comes from outside the basin?
 - Water Train?

<https://www.watertrain.us/>



How are conflicts addressed?

- Constitution
- Common Law - Court Decisions
- Statutes and Ordinances
- Administrative Rules and Regulations
- Others such as:
 - Treaties
 - Compacts
 - Executive Orders

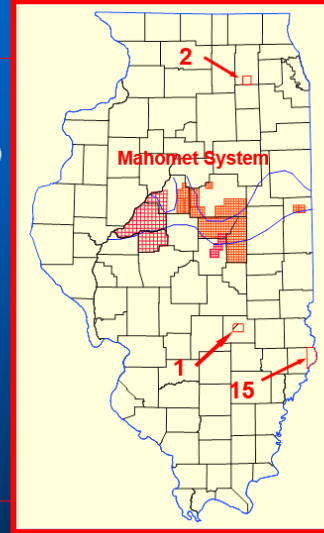


Research existing documents

Current Water Authorities

Water Authorities as of 1999

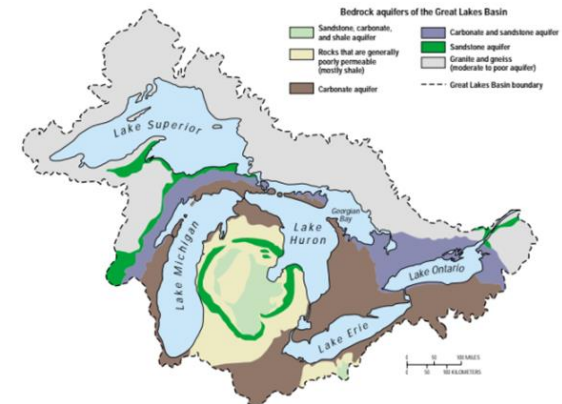
- 1) Lake Sarah near Effingham PWS
- 2) Sugar Grove Township - Kane Co.
- 3) Mackinaw Valley Water Authority (seven townships)
- 4) Mahomet Aquifer (Decatur) Water Authority
- 5) Piatt & De Witt Counties
- 6) Imperial Valley Water - Mason Co.
+ 4 townships in Tazewell
- 7) Danvers Township
- 8) Allin Township
- 9) Hudson Township
- 10) Mount Hope & Funks Grove
- 11) S-E Logan (8 townships)



U.S. Department of the Interior
U.S. Geological Survey

The Importance of Ground Water in the Great Lakes Region

Water-Resources Investigations Report 00-4008



The Future of Minnesota Drinking Water: A Framework for Managing Risk

February 3, 2020

A project report prepared by staff and faculty of the University of Minnesota Humphrey School of Public Affairs and the University of Minnesota Water Resources Center, with funding from the Minnesota Department of Health.

Authors: Peter Calow (UMN Humphrey School of Public Affairs); Ann Lewandowski, Lucia Levers, Eileen Kirby (UMN Water Resources Center)

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UMPHREY SCHOOL
OF PUBLIC AFFAIRS

Engage each tribe and state

- Who is doing the work
 - Formally designated
 - Informally
- Establish a community of practice to share
 - Best practices
 - Lessons learned
 - Capacity challenges
 - Data gaps



Engagement Process

First Round Interviews:

- Nineteen, 60-minute interviews June - July
- Total of 27 people
- Focus on federal and state agency employees with some academic, contractors, lawyer, nonprofit, water planning group
 - USGS
 - Engineering contractors
 - State water and geological surveys
 - State environmental and natural resource agencies

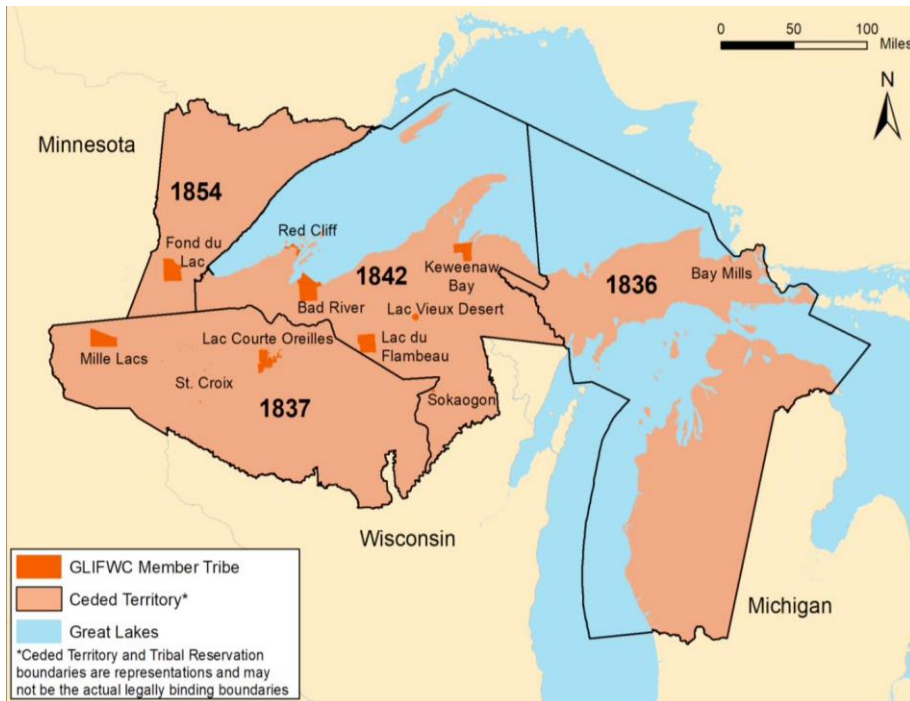
Impressions so far:

- Clarified the hydrogeological landscape
- Identified issues, barriers, and opportunities for water governance from interviewee's perspectives
- Some areas struggle with baseline geological data, others have data but have capacity and staffing concerns
- Significant interest in a convening across states to discuss best practices

Engagement Process

Native Nations:

- 25 of 35 Tribal Nations
- BIA and GLIFWC helped



Impressions so far:

- Funding and capacity concerns common
- Environmental staff wear many hats
 - Difficulty filling vacant positions
 - Soft money positions of limited duration
 - Difficulty finding grants for work that are worth the administrative burden
- Transparency and knowledge of on-reservation water activities vary
 - State-tribal communication
- Both on- and off reservation (ceded territory) activities important
 - Neighboring agriculture
 - Water fluctuations that impact gathering and fishing rights
 - Bottling plants



What Have We Heard So Far?

Surface/groundwater interaction is key.

Impacts to wild rice beds, fisheries and tribal resources are a priority

Wide range in quality of interactions with non-Tribal municipalities, states, and agencies



Legal Review

Work to date:

- Created state-by-state chart listing main doctrines, regulating agencies, statutes, rules, and regulations as well as specific permitting and reporting requirements
- Prepared overviews for each state, consisting:
 - Governing agencies
 - State statutes
 - Administrative rules
 - Additional resources
- “Law 101 for Groundwater Researchers”
- Conducted legal research regarding federal reserved rights and tribal issues

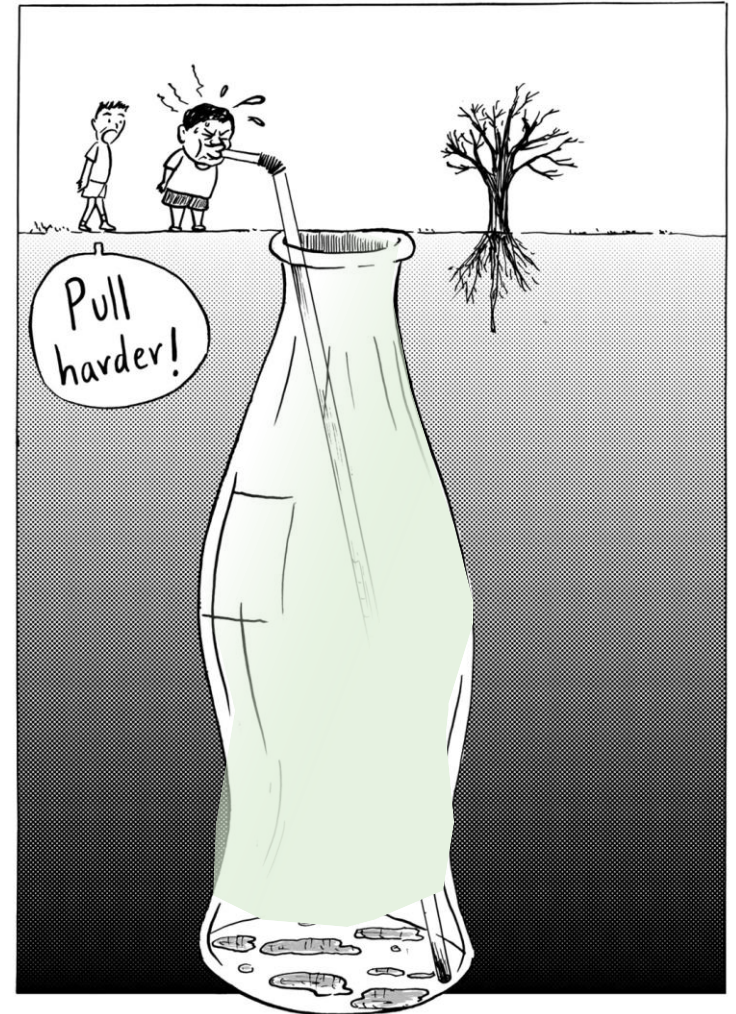
Impressions so far:

- Legal and governance frameworks vary widely as does the way the law (including rules and regs) are tied to or influenced by the available scientific data
- There are existing water governance frameworks that can be borrowed from as comparisons
- Following up on specific statutes and regulations mentioned during interviews

States generally follow one of five

States regulate groundwater rights through application of common law, state statutes and regulations, or judicial precedent.

- Absolute ownership
- Reasonable use
- Correlative rights
- Restatement of Torts Reasonable Use
- Prior Appropriation



Under the absolute ownership doctrine, landowners have an unlimited right to withdraw any water beneath their land

- Oldest and simplest doctrine.
- Gives landowners unlimited right to withdraw.
- Many early adopters have moved away from this rule.
- Removes possibility for legal action if an individual is harmed by a neighbors use.
- Some states enacted registration or permitting to prevent unregulated withdrawals.

CT, GA, IN, LA, ME, MA, MS, RI, TX

The reasonable use rule modifies the absolute ownership doctrine

- Similar to Absolute Ownership with the additional qualifier that groundwater use is “reasonable.”
- Reasonable use = groundwater extractions that are not wasteful or for off-site use.
- Landowner may still make unlimited withdrawals.
- Offers legal remedy for landowner affected by use found to be unreasonable.

AL, AZ, AR, **CA, FL, IL, KY, MD, MO, NE, NH, *NJ, NY, NC, **OK, PA, **TN, VA, WV

**Common law unclear*

***Also follows Correlative Rights*

The correlative rights doctrine requires an equitable sharing of groundwater among landowners

- Landowner is permitted to withdraw a reasonable amount of groundwater in relation to the amount of land owned over the aquifer.
- Water use rights are correlative, or coequal, limited to a “fair and just proportion of underlying supply.”
- State legislature or judiciary may proportionally reduce all rights in event of water deficit.
- Does not permit use that interferes with the use of water of adjacent landowners.

**CA, DE, HI, IA, **NE, MN *NJ, **OK, **TN, VT

**Common law unclear*

***Also follows Reasonable Use Rule*



The Restatement (second) of torts combines absolute ownership with reasonable use

- Adds consideration to the nature of competing uses and the relative burdens imposed on groundwater users.
- Attempts to provide specific criteria for comparing reasonableness and competing uses.
- Imposes liability for withdrawals that unreasonably affect other users.

MI, OH, WI

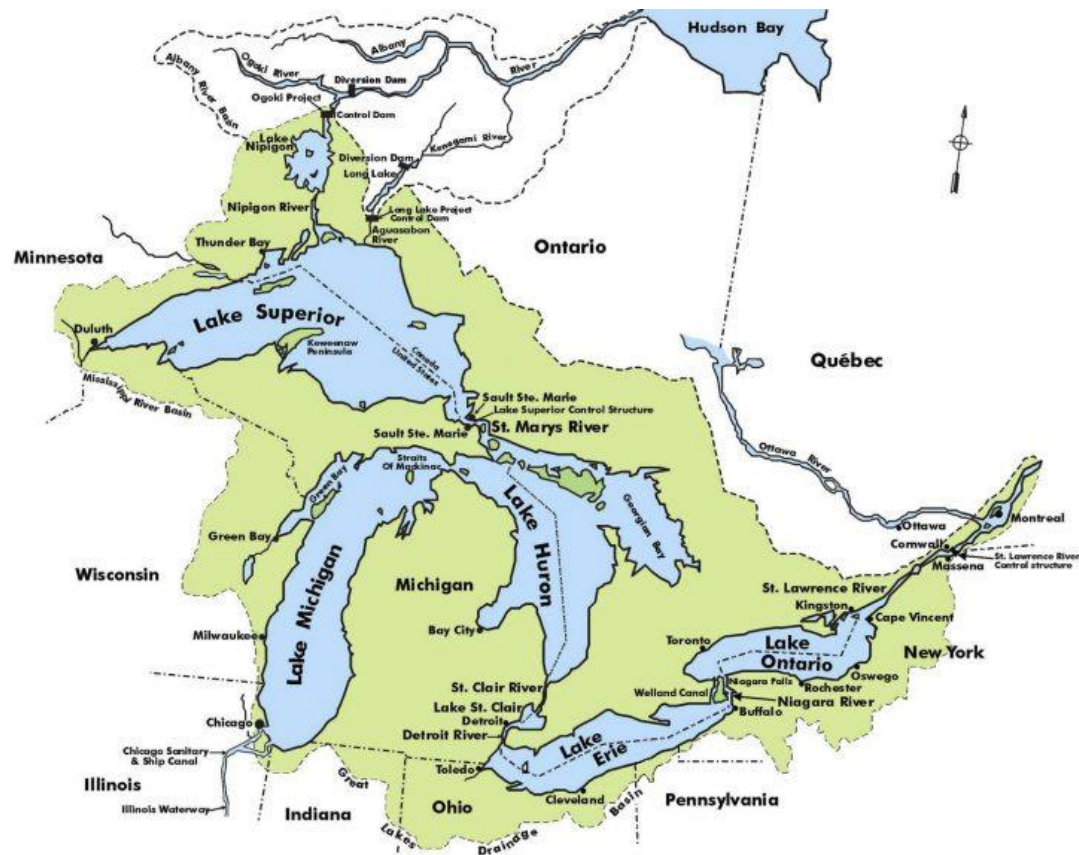


Well Management

- Registration
- Permitting
- Adjudication



Role of the Great Lakes Compact



U.S. Army Corps of Engineers, Detroit District

- New or increased surface water or groundwater withdrawals from the Great Lakes watersheds will be regulated.
- Some states adopted statewide (WI)
- Origin of the threshold volumes (100,000/day)

Project-Year-End Convening

- St. Patrick's Day Week, 2022
- Chicago
- EPA Region 5 Headquarters Tribal Gathering, Monday
- Joyce Foundation Headquarters, Wednesday



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Examples from Freshwater

Carrie Jennings
cjennings@freshwater.org

