Clean Water Council Meeting Agenda

Monday, January 23, 2023

9:00 a.m. to 2 p.m.

IN PERSON with Webex Available (Hybrid Meeting)

9:00 Regular Clean Water Council Business

- **(INFORMATION ITEM)** Introductions
- **(ACTION ITEM)** Agenda - comments/additions and approve agenda
- **(ACTION ITEM)** Meeting Minutes - comments/additions and approve meeting minutes
- **(INFORMATION ITEM**) Chair and Council Staff update
    - **Policy & Budget and Outcomes Committee Updates**
    - **Staff update**
        - **Legislative update**
        - **Council recommendations submitted**

9:30 Minnesota Drought of 2021

This session will address the 2021 drought, through the DNR's perspective, by exploring science, planning and effects. Presenters will describe the drought and the DNR's planning, communication, and coordination efforts. Effects of the drought will be shared, including permit suspensions, well interferences, and conservation efforts. The session includes a case study, in northwestern Minnesota, illustrating the effects of water shortage. Presenters will discuss lessons learned, challenges and opportunities, ending with a group discussion.

- Pooja Kanwar, Luigi Romolo, Dan Miller, Ellen Considine, Amanda Yourd, Carmelita Nelson, Minnesota Department of Natural Resources

10:45 BREAK

11:00 Revisiting the 2020 Strategic Plan

- Small group discussion
    - What is complete?
    - What is missing?
    - What metrics do we need or need to improve on to measure success?
    - When is the CWF the right tool and when is something else better?

12:00 LUNCH

12:30 Strategic Plan Discussion (Full Group)

1:30 Adjourn

Immediately after: Steering Committee

Clean Water Council
December 19, 2022 Meeting Summary

Members present: John Barten (Chair), Steven Besser, Richard Biske, Richard Brainerd, Gary Burdorf, Tannie Eshenaur, Warren Formo, Justin Hanson, Kelly Gribauval-Hite, Rep. Josh Heintzeman, Frank Jewell, Jen Kader (Vice Chair), Peder Kjeseth, Holly Kovarik, Sen. Jennifer McEwen, Jason Moeckel, Jeff Peterson, Victoria Reinhardt, Todd Renville, Peter Schwagerl, Patrick Shea, Glenn Skuta, Phillip Sterner, and Marcie Weinandt.
Members absent: Raj Rajan, Sen. Carrie Ruud, and Jordan Vandal.

To watch the WebEx video recording of this meeting, please go to https://www.pca.state.mn.us/clean-water-council/meetings, or contact Brianna Frisch.

Regular Clean Water Council Business
- Introductions
  - Frank Jewell is retiring and will no longer be an elected official starting January 2. He will retain his place on the Council until a new member is elected to replace him, but this may be his last in-person meeting.
- Approval of the December 19 meeting agenda and November 21 meeting summary, motion by Steve Besser, and seconded by Peter Schwagerl. Motion carries.
- Chair and Council Staff update
  - Policy & Budget and Outcomes Committee updates
  - Staff update
    - Legislative update

November 2022 Budget Forecast Update/Clean Water Fund Reduction *(WebEx 00:26:00)*
- The back of the envelope math for the November budget forecast predicted more money than the $337 million from February. Then, Minnesota Management and Budget (MMB) showed $315 million. Two contributing factors were some funds not obligated in February but were now obligated. In addition, it sounds like there was an error that needed to be corrected. This means there needs to be $21.7 million in reduction from the Council's tentative recommendations.
- The Budget and Outcomes Committee (BOC) and the Council previously identified items to protect if there was a deficit, as well as items to scale up if there was additional funding.
- There are three items to review. There is a memo to review from the Interagency Coordination Team (ICT) that proposed revisions and a spreadsheet. One spreadsheet is of the Council's recommendations. The other is a summary document, which also includes pie charts.

Discussion:
- Holly Kovarik: What was the rationale on the Lake Superior Basin Soil and Water Conservation District (SWCDs) BIL Leverage Funding elimination? It seemed like there was a lot of leverage potential. *Answer:* This was leverage funding to mostly work ahead on projects in that area. The project can continue without the SWCD specific work because the federal funds are available.
- Steve Besser: Regarding the new Culvert Replacement Incentive Program reduction, with cutting funding again, many of the culverts are going to end up in a river. So, there may be federal funding available if they are in the Minnesota or Mississippi Rivers, connected to the US Army Corps of Engineers. *Answer:* Yes, as part of the Infrastructure Bill, there is funding coming in for transportation. It is unknown how much, or how it will play out. When we were looking for reductions, this is a new program that needs to ramp up, so it had some more flexibility. Hopefully, in the next budget cycle, it will work out to have more funding. It would be good to have these designs implemented without an incentive, but it isn't there yet, so hopefully it moves in that direction, and this program could go away completely. It will take some time.
- Frank Jewell: It would be good to make sure whatever has caused the glitch that led to the Clean Water Funds (CWFs) reduction is resolved. *Answer:* This took us by surprise. Even throughout Covid-19 pandemic, the CWFs continued to perform well. For all of the state entities, they were each mindful of the stakeholders, and everyone at the table was aware of paring back those budgets would impact those partners. Everyone gave up something. They did not want to cut the new items, so they worked to only trim, and make sure the new

programs had a meaningful investment. The feedback from the Council was useful and appreciated. We are all working together, and these funds go towards amazing work.

- Todd Renville: Regarding the Wetland Restoration and Easements reduction, it was highlighted as a priority for the Council. Why was there a reduction? These are important investments. *Answer:* It was just being equitable across the budget. They tend to be more scalable.
- Rich Biske: Regarding Enhancing Landowner Adoption of Soil Health Practices for Drinking Water and Groundwater Protection has a $2 million dollar cut. Can you provide more clarity on what is included on it and how it relates to the funding?
    - *Answer Justin Hanson, Board of Water and Soil Resources (BWSR):* I'm not sure which would be cut, so we will have to follow up on it. I'm not sure it was discussed. It is more about shaving off a part of the budget overall. Regarding the relationship to soil health, locally the districts have been doing a good job of setting these goals for what they want to do with soil health. They all have different ideas that fit for them. They are working within their plans.
    - *Answer from Annie Felix-Gerth, BWSR:* The cuts would be from funds that go to the local government units. This was to accommodate the decreases and being fair regarding the cuts across the state agencies.
- Holly Kovarik: How many new watersheds will be eligible for Watershed Based Implementation Funding (WBIF) for FY24-25? *Answer:* The BWSR anticipates that the FY24-25 WBIF will include 15 new watersheds that were not previously eligible for the funding.
- John Barten: It is important for us to work together to try to have the same recommendations from the Council and the state agencies. If the Council makes changes at this meeting, this may go to the Legislature with slight differences, because the Interagency Coordination Team (ICT) does not have a lot of time to meet to go over these recommendations again. So, it would be good to come to a consensus. It is still the Council's responsibility to make these recommendations.
- Steve Besser: Regarding Lori Cox's email included in the meeting packet, she is self-critiquing the Minnesota Ag Water Quality Certification Program (MAWQCP) program. The Council has allocated $7 million this year. Given her critique, I think we should cut $3.5 million. Motion to cut $3.5 million, restoring $1.5 to the Wetland Restoration Easement program and $2 million to Implementation funding for watersheds with approved comprehensive watershed plans.
    - Peter Schwagerl: I have gone through the certification process. I do not believe the previous discussions share that this was a scalable program. I would like to speak in defense of it. It is a starting point for many farms, and you will not see perfection. It helps people get into the door, so there is a baseline. Part of it is to change access, and get to the next step, to help move that needle forward. It is not economically viable. Taking a drastic cut, for a program not identified as scalable, would be hard to that program and set that trust back. In addition, looking to see how they are measuring success in this program is difficult.
    - Holly Kovarik: This is an important program. There are conversations happening field by field, looking at a whole farm aspect. There are areas that do not come up in other programs. That allows for these conversations to come forward. These conversations are happening. The smaller practices are happening, and those all start to build. I would hate to see it pulled; this is a tool at the local level. I appreciate the suggestion but would like to organically hear where to pull this funding from. This has been in deliberation for some time, they are all great, and that is what makes these decisions hard.
    - Brad Redlin, Minnesota Department of Agriculture (MDA): First, I am not entitled to any CWFs, and we need to earn these funds and are thankful for the funds. In the structure of risk assessment, we go out on the land on every parcel to check out the risks to water. They directly intervene actual impairments to water on the entire landscape across the entire farm. For every acre they complete, it reduces the appropriation cost further.
    - John Barten: Does all of the $7 million go towards implementation practices? *Answer:* Two-thirds go towards implementing practices on the land.
    - John Barten: If there was a reduction, would it come out of the implementing practices? *Answer:* Yes.
    - Steve Besser: It would be good to have a presentation on what has been accomplished by this program in the future. Motion withdrawn.
    - Holly Kovarik: Looking at several line items, the ones that have bonding opportunities are 24, 42, 20, and 21. Additionally, there is funding from Lessard-Sams Outdoor Heritage Fund and these items could receive

funding from them. Therefore, *if* funding needs to be redistributed, a closer look could be for these items. It is a bonding year, so they may receive funding from other areas.

- Jen Kader: Going back to the $2 million for WBIF, could we discuss taking it from item #25, the competitive grants. Could we restore the $2 million for noncompetitive grants from the competitive grant pool (to #17)? Would it be feasible to maintain that WBIF level? It is an option to explore.
  - Rich Biske: I appreciate Holly's comments to use more of the bonding dollars for any kind of permanent conservation. However, they have not gone there in recent years. I want to recognize the place for CWFs in this area.
- Marcie Weinandt: To confirm, if we change our recommendations, there is no time for the state agencies to change theirs? So, there would be two proposals that would move forward? *Answer:* The ICT will not have time to reconvene. Likely, whatever comes out of the Council's decision today will go back to the agencies, and they will look at it, deciding what is agreeable or not. If not, there will be two separate proposals. More likely, they will adopt the Council's proposal because they want to be aligned.
- Steve Besser: Thank you to the ICT. You have protected the programs that the Council requested. These are hard decisions, and we appreciate the work. Perhaps, we should accept it as it is presented so we are in line with the state agencies. Now, in the next biennium, we can revisit this to recommend where any additional funds are placed.
  - Paul Gardner: Yes, if there are additional funds, we may submit supplemental recommendations. The Governor uses the November budget forecast, while the Legislature uses the February budget forecast. So, you may want to consider that as well.
  - Dick Brainerd: We have spent a lot of time on this, and ultimately, we are talking about a small percentage of funds being adjusted. We may want to keep it the way it has been presented, coming back to it in the future if additional funds become available.
- Peter Schwagerl: Regarding the AgBMP loan program proposed cut, I would like to point out it is a large increase, but mostly because those extra millions are mostly going into a revolving loan fund. This is a great use of one-time funds, as it will be recycled ongoing. It is a huge opportunity. Potentially beyond the Council.
- Todd Renville: Motion to approve the revised budget recommendations by the ICT, with the exception to take $3.5 million from the AgBMP loan program (#33) and restore $2 million to the WBIF (#17) and restoring $1.5 million to the wetland restoration easement program (#21). Seconded by Frank Jewell. The motion carries with thirteen votes in favor, with Peter Schwagerl and Warren Formo in opposition.
  - Peter Schwagerl: I would like to speak in opposition. There are positive impacts to the AgBMP loan program, and this is scalable. This was a significant cut. It seems reasonable to take a slight trim instead.
  - Holly Kovarik: If the budget forecast shows there is an increase down the line, I would motion that the Council recommends restoring the funds for the AgBMP loan program, up to $10 million. Motion seconded Jen Kader. Motion carries unanimously.

Plans for 2023 *(WebEx 03:01:30)*

- Re-establish the Steering Committee, which includes the Council leadership and state agencies in attendance. This meeting is to setup the upcoming meetings, suggesting the speakers and content. This change is because we have shifted to hybrid versus only virtual meetings.
- Meetings:
  - Selection of presentation topics for first quarter 2023, and a list is included in the meeting packet.
  - The schedule is open for any topics that folks want to hear about right away in the first three months. It sounds like the AgBMP programs, groundwater impacts and sustainability, drainage, and environmental justice.
  - Bring back the "Taking Note" forms, following up on actions from the speaker topics. Potentially, a programs portfolio, looking at measurements and strategic alignments of what "success" looks like.
  - Use the meeting intents document from Jen Kader as a guide.
  - Identify Council meetings when in-person attendance is greatly desired.
- Plans for revisiting the 2020 Strategic Plan (anticipated in August). There will be a broader discussion planned on the sweet spot of regulation versus voluntary. Many members are new on the Council, and it would be good to revisit this about every five years. With new members, as well as seasoned members, it would be good to go over state efforts for different topics (i.e., groundwater, vegetative cover), which would be at a

higher level from the different state agencies. It would be good to have a glossary of the acronyms for new members too. 03:50:00

- 2023 Metro Field Tour Ideas for 2023/Retreat Possibilities
  - Dick Brainerd: The day trips (Rainy Lake in Voyageurs, and the mussel farm with the DNR) lend greatly to the Council's knowledge base. It helps connect the programs to the work.
  - Steve Besser: Warren mentioned something about drainage in the Northwestern part of the state, which would be great to see, including checking out drainage tile. *Response from Dan Stoddard, MDA:* There are also Discovery Farms, which would be incredibly educational. There is also a drainage site that would be good to check out too.
  - Phil Sterner: It would be good to do a Metro tour, involving the University of Minnesota (agronomics work on apples, grapes, turkeys; water reuse; water storage), the Minnesota Department of Health, and the Metropolitan Council on various topics.
  - Rich Biske: Learning more about what is going on in the Metro would be good. Items like stormwater management, groundwater issues, because there is a lot going on, which is relevant to the Council's work. There are a variety of things packed into an area, that could be done well.
  - Victoria Reinhardt: If the Council decides on a Metro tour, there is a lot that happens at the county level, just do not hold it on a Tuesday (lots of boards held on those days).
  - There is a calendar invite. The field tour replaces the September Council meeting. It is typically a Sunday meeting and Monday bus tour. However, it could be adjusted.
    - John Barten: There could be some partial day Metro tours as well.
    - Glenn Skuta, Minnesota Pollution Control Agency (MPCA): Watershed based implementation funding is the biggest in the budget. So, it may be useful to go to a watershed that has received increments of the watershed-based implementation. This would not just be to see the location but hear from the local partners. Firsthand, listen to how that automatic funding works for them versus the competitive funding.
    - Justin Hanson, BWSR: The SWCDs have changed a lot over the last ten years, and it would be good to hear their story. The BWSR has a lot of pass-through funding, so it would be good to hear from them directly.

Adjournment *(WebEx 04:04:10)*

Strategic Plan

As Approved by the Clean Water Council

4/20/2020

Mission

Protect and Restore Minnesota's Waters throughout Our Diverse State for Generations to Come

Vision

- Minnesota will have fishable and swimmable waters throughout the state.
- Drinking water sources statewide will be protected, and drinking water at the tap for both public water system users and private well owners will be available and safe for all Minnesotans.
- Minnesotans will be aware of crucial issues impacting water quality and availability, and will understand the need for protecting, restoring, and conserving water.

Guiding Values and Requirements

Several values and state statutes will guide the Council's strategies through 2034. First, the Council uses the Clean Water Legacy Act (Minnesota Statutes 114D) for guidance on the following topics.

- Effectively leverage other sources of funding for protection and restoration projects, including federal, state, local, and private sources of funds, the Environment & Natural Resources Trust Fund, and the Outdoor Heritage Fund. Leverage may include coordination and partnerships in addition to matching funds.[1]
- Within Minnesota's major watersheds, prioritize protection and restoration funding according to approved water and watershed management plans.[2]
- Prioritize projects that show a high potential for early restoration and delisting [from impaired waters list] based upon scientific data developed through public agency and citizen monitoring or other means.[3]
- There will be no net increases in impairments after 2019 when the first statewide testing cycle was completed, and there will be a substantial reduction in impairments overall
- Continue to develop policy advice that would improve outcomes from Clean Water Fund appropriations and the strategies in this plan.[4]

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[1] Minnesota Statutes 114D.20, subdivision 6(3) and subdivision 7.

[2] "Comprehensive local water management plan," "comprehensive water plan," "local water plan," and "local water management plan" mean the plan adopted by a county under sections 103B.311 and 103B.315. "Watershed management plan" is defined in sections 103D.401.

[3] Minnesota Statutes 114D.20, subdivision 6(4).

[4] Minnesota Statutes 114D.30, subdivision 1 and 114D.20, subdivision 3(6). Past examples include buffers/continuous living cover and chloride recommendations.

In addition, the Council has developed strategies in this document that are "SMART": (Specific, Measurable, Attainable, Relevant and Time-bound). This level of specificity will maintain continuity through 2034.

Finally, the Council acknowledges that many of the strategies listed below will not solely be funded or supported by the Clean Water Fund and the Clean Water Council. However, state statute requires the Council to "advise on the administration and implementation of [the Clean Water Legacy Act], and foster coordination and cooperation" among public agencies and private entities. This strategic plan will serve as guidance as those agencies and entities in order to complete the listed strategies, whether or not the Clean Water Fund is the sole or partial funding source.[5]

Goals & Strategies

Goal 1: Drinking water is safe for everyone, everywhere in Minnesota

- Protect public drinking water sources
- Ensure that users of public water systems have safe water
- Ensure that private well users have safe water

Strategies to Achieve Goal 1

1. Spend a minimum of five percent of the Clean Water Fund exclusively on drinking water as required in the State Constitution.
2. Support widespread and routine testing of private well water and help private well owners achieve safe limits at the tap, beginning with a pilot project in FY2020-2021.
3. Prioritize implementation funding that supports the Ground Water Protection Rule, so no additional municipal water supply wells exceed the drinking water standard for nitrate.
4. Implement the Nitrogen Fertilizer Management Plan (NFMP) to promote vegetative cover and advanced nitrogen fertilizer management tools to protect private wells in vulnerable areas.
5. Protect the approximately 400,000 acres of vulnerable land surrounding drinking water wellhead areas statewide by 2034.
6. Source Water Protection Planning
    - Conduct ongoing source water protection planning and implementation for the state's 500 vulnerable community public water systems;
    - Complete first generation source water protection plans for the remaining 420 community public water systems by 2025;
    - Complete revised source water assessments for all 23 surface water systems by 2025;
    - Complete source water intake protection planning by 2027;
    - Complete pilot source water protection planning for 10 non-community public water systems with at-risk populations by 2027.
7. Provide financial assistance for source water implementation activities through grants to satisfy 50% of demand through 2034.
8. Increase public water supply efficiency in the Twin Cities Metropolitan Area by reducing groundwater use by 150 million gallons per day to accommodate future population growth. Sustain the quantity and quality of the resources through water reuse, alternative supplies, efficiency, technology, intergovernmental collaboration, and technical assistance.

[5] Minnesota Statutes 114D. 30, subdivision 1.

Goal 2: Groundwater is clean and available to all in Minnesota

- Protect groundwater from degradation.
- Support effective measures to restore degraded groundwater.[6]
- Ensure groundwater use is sustainable
- Avoid adverse impacts to surface water features due to groundwater use

Strategies to Achieve Goal 2

1. Complete Groundwater Restoration and Protection Strategies (GRAPS) for all major watersheds engaged in comprehensive watershed planning by 2025.
2. Complete groundwater atlases for all Minnesota counties by 2029.
3. Achieve a goal of 1,600 state-owned and managed long-term groundwater monitoring wells statewide by 2034.
4. Prioritize the sealing of unused groundwater wells that present a risk to drinking water aquifers by 2034.
5. Maintain a compliance rate for subsurface septic treatment (SSTS) systems at a minimum of 80 percent, and to attain a goal of 90 percent annually.
6. Adopt BMPs for water efficiency, water use reduction, and irrigation water management, , and prioritize them in areas of high water use intensity by agricultural irrigators, highly sensitive areas, Groundwater Management Areas (GWMAs), and highly vulnerable Drinking Water Source Management Areas (DWSMAs).
7. Identify significantly contributing groundwater recharge areas to the aquifers in the Twin Cities Metropolitan Area by 2025, and develop protection and management strategies for these aquifers by 2034 to ensure continuous orderly and economic development.

Goal 3: Surface waters are swimmable and fishable throughout the state[7]

- Prevent and reduce impairments in surface waters
- Maintain and improve the health of aquatic ecosystems
- Protect and restore hydrologic systems
- Incorporate climate considerations into planning for water quality

Strategies to Achieve Goal 3

1. Fund the completion of Watershed Restoration and Protection Strategies (WRAPS) for all 80 major watersheds by 2023.[8]

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[6] Minnesota Statutes 114D.20, subdivision 2(7) and 2(8). Also refer to degradation prevention goal in Minnesota Statutes 103H.001.

[7] The state's "swimmable" goal set in 2014 is to increase the percentage of Minnesota lakes with good water quality, as measured by acceptable Trophic State Index, from 62% to 70% by 2034. The "fishable" goal is to increase the percentage of Minnesota's rivers and streams with healthy fish communities, as measured by the Index of Biotic Integrity, from 60% to 67% by 2034. *Minnesota's Clean Water Road Map: Setting Long-Range Goals for Minnesota's Water Resources, 2014*.

[8] As required in Minnesota Statutes 114D.26, subdivision 3.

2. Fund the completion of comprehensive watershed management plans for all 80 major watersheds, including those under One Watershed One Plan, by 2025.[9]
3. Protect 100,000 priority acres and restore 100,000 priority acres in the Upper Mississippi River headwaters basin with a combination of public and private funding to ensure high quality water by 2034.[10]
4. Invest in activities and research that can accelerate improvement in water quality through new approaches (e.g., perennial crops and other "landscape drivers", chloride management or alternatives, etc.).
5. Include climate impacts as one of multiple benefits of protection and restoration, and incorporate climate resilience into comprehensive watershed management plans.[11]
6. Support effective science-based responses to emerging threats or contaminants of emerging concern.
7. Support cities to upgrade wastewater treatment facilities to address specific water quality goals by reducing the discharge of nutrients and other pollutants based on total maximum daily loads (TMDL) and regulatory requirements.[12]
8. Support technical assistance and construction financing to help small communities replace failing septic systems with community subsurface systems.[13]
9. Achieve a goal of five million acres of row crop agriculture that use cover crops or continuous living cover by 2034.[14]
10. Enroll 6,500,000 acres and 5,100 Minnesota farms in the Minnesota Agricultural Water Quality Certification Program (MAWQCP) by 2030.[15]
11. Fund technical assistance and local demonstration sites to assure that application of crop fertilizer uses the best available science.
12. Support in-lake treatment and restoration activities that only address water quality impairments and are supported by comprehensive plans, including One Watershed One Plan.
13. Support state-federal cooperative programs, actions, and priorities outlined in the Great Lakes Restoration Initiative's Action Plan.

Goal 4: All Minnesotans value water and take actions to sustain and protect it

- Build capacity of local communities to protect and sustain water resources
- Encourage systems and approaches that support, protect, and improve water

[9] As required in Minnesota Statutes 103B.801, subdivision 5.
[10] The Nature Conservancy, Water Fund Prioritization, 2019 & *Multiple Benefits for People and Nature: Mapping and Modeling Tools to Identify Priorities for The Nature Conservancy's Freshwater Program and the Minnesota Headwaters Fund*.
[11] Minnesota Statutes 114D.50 subdivision 4: "A project receiving funding from the clean water fund must meet or exceed the constitutional requirements to protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater and drinking water from degradation. Priority may be given to projects that meet more than one of these requirements."
[12] As described in Minnesota Statutes 446A.073
[13] As described in Minnesota Statutes 446A.075
[14] Minnesota Environmental Quality Board/Center for Climate Strategies, Minnesota Climate Strategies and Economic Opportunities, March 2016, p. XVI-40 (301), https://www.eqb.state.mn.us/sites/default/files/documents/CCS%20Appendix%20with%20policy%20details%20and%20results.pdf.
[15] As described in Minnesota Statutes 17.9891

- Provide education and outreach to inform Minnesotans' water choices
- Encourage citizen and community engagement on water issues
- Incorporate the needs and assets of Minnesota's diverse communities

Strategies to Achieve Goal 4

1. Develop cultural competency on the Council to incorporate the strengths of diverse communities in Minnesota. Develop an inclusion plan by 2021 in consultation with the state's four ethnic councils (Councils for Minnesotans of African Heritage, Minnesota Council on Latino Affairs, Minnesota Indian Affairs Council, and Minnesota Council on Asian Pacific Minnesotans), Women Caring for the Land/Women Food & Ag Network, Hmong American Farmers Association, Center for Health Equity at the Minnesota Department of Health, and others.
2. Support agency efforts to inform, educate, and encourage the participation of citizens, stakeholders, and others in the protection and restoration of Minnesota's waters.[16] Efforts should include the biennial Clean Water Fund Performance Report, traveling exhibits, more integrated presentation of projects and outcomes supported by the Clean Water Fund on state web sites, etc.
3. Develop a set of questions by 2021 that can be used in occasional statewide surveys to determine the public's understanding of water resources and quality in Minnesota. The Council will work with agencies and/or the University of Minnesota on a cost-effective method of surveying Minnesotans regularly on the same questions through 2034.
4. Plan for program resilience after expiration of Legacy Amendment in 2034 and discourage Clean Water Fund applicants from relying on 100% CWF funding.

Recommended "Portfolio Mix" for Biennial Clean Water Fund Appropriations

1. Recommend a minimum of 20% of available Clean Water Fund revenue for projects that protect groundwater and drinking water from degradation, with five percent that is *exclusively* dedicated to drinking water.[17] Groundwater and drinking water projects may count as implementation activities as described in the next paragraph, when applicable.
2. Recommend spending a minimum of available Clean Water Fund revenue for implementation of priorities in approved comprehensive watershed management plans, including those under One Watershed One Plan, and implementation that fulfills other strategies in this plan, according to the following schedule.
    a. 30 percent in FY22-23
    b. 40 percent in FY24-25
    c. 50 percent in FY26-27
    d. 55 percent in FY28-29
    e. 60 percent in FY30-31
    f. 60 percent in FY32-33

[16] As required in Minnesota Statutes 114D.35, subdivision 3.

[17] Minnesota Constitution, article XI, section 15: "33 percent of the [Legacy Amendment] receipts shall be deposited in the clean water fund and may be spent only to protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater from degradation, and at at least five percent of the clean water fund must be spent only to protect drinking water sources."

g. 60 percent in FY2034 through expiration of the Legacy Amendment.

3. Recommend a maximum of 15% of available Clean Water Fund revenue for ongoing monitoring of Minnesota's surface waters on a ten-year cycle that measures progress against water quality goals, monitoring for nitrate concentrations and trends in vulnerable groundwater and private wells, monitoring of aquifers for water supply planning, monitoring of stream flow, and assessment of groundwater.
4. Recommend spending a minimum of 5% for innovation and activities that focus on "landscape drivers" and pollution prevention.
5. Recommend spending a maximum of 5% for a small grants program, administered by a state agency, modeled on the Conservation Partners Legacy program that furthers the objectives of the Clean Water Legacy Act.[18]
6. Require all applicants for Clean Water Fund support to show anticipated and actual measureable outcomes and to use approved attribution to the Clean Water Fund and Legacy Amendment. [19]
7. Recommend periodic third-party reviews of programs supported by the Clean Water Fund with appropriations more than $2 million per biennium.

[18] Refer to Minnesota Statutes 114D.30 subdivision 6 and 114D.50 subdivision 3 for guidance on eligibility.
[19] Minnesota Statutes 114D.50 subdivision 4(a) and 4(f).

Prompting Questions for Strategic Plan Discussion

January 23, 2023

[These items have been raised by individual members over the last few months.]

What ADDITONAL items might be strategies in a future Strategic Plan?

- Finding ways to promote more conservation drainage/multi-purpose drainage management during already planned drainage improvement projects
- Integrate policy into strategic plan
- Have a strategy to engage non-operating landowners of cropland
- How should the CWC and CWF intersect with state's Climate Action Framework, including equitable resilience?
- How can we promote more precision application of manure and treat it as a resource instead of just a waste?
- How will a labor shortage impact water quality work and what can be done about it?
- Should we include monitoring and TMDLs as strategies in the plan?
- Should we look at protection and restoration of peatlands?
- Will cumulative impact of all strategies accomplish the big goals? If not, should we add/remove/edit strategies? De-emphasize output/plans?
- Can biennial recommendations be specific about how much of the cumulative goal will be achieved?
- Many strategies are a list of what we are already are funding—should we be doing that.
- Could use more specificity on some metrics in strategies—some too "squishy"

What guiding values and requirements might CHANGE in a future Strategic Plan?

- Are we addressing symptoms or root causes?
- What is the right mix between regulatory and voluntary?
- Let's identify where regulation would be appropriate.
- Defining when CWFs will work faster than policy
- What norms will have changed from 2008 to 2034 that can be credited to CWF?
- What would be lost in the first two years after 2034 without biennial "care and feeding"
- What role—if any—should the Council have regarding potential renewal of the Legacy Amendment
- List what won't get done if the Legacy Amendment lapses.
- Target high profile waters
- Explore system changes vs. "buying out of the problem"
    - Is conservation delivery moving toward systemic change instead of just BMPs'
    - Consider innovations as part of system changes
- Clarity/discussion about how plans are focusing on bigger change and take time rather than "shotgun" approach (e.g., spreading money thinly statewide vs. targeting smaller group of waters)

- Will strategic plan constrain # of programs or be flexible to support new ideas that could meet goals?
- What does CWF fund that other funding source CAN'T? Focus on those. Look at the total "water portfolio" and how CWF fits
- When is it appropriate to use the CWF as "first dollar on the table" to help leverage other sources even if project has other funding sources?
- Should CWF support/prioritize people with financial need (SSTS, private well testing, etc.)
- Should we have a SWOT analysis? Expiration of Amendment is a threat.
- ENRTF renewal may change what the lottery funds vs. now, which could impact the CWF.

WHO should we engage with to accomplish our goals?

- How can we best engage with communities that have often been excluded from government planning?
- Let's engage local public health officials
- What relationships will help—co-ops? Tribes? Women landowners?

What factors should be considered for the Clean Water Fund's "Portfolio Mix"?

- More emphasis on protection instead of restoration
- Should we move bondable projects to capital investment proposals/bills or Outdoor Heritage Fund (easements but not for working lands, PSIG, SCWT)
- There is some disagreement among agencies on the BWSR Watershed-Based Implementation Funding and how much of all implementation funding it should be through 2034.
- Encourage basic research from ENRTF (atlases, others?)
- Can the Council understand the Watershed-Based Implementation Funding formula for each watershed

How do want to MEASURE or ANALYZE better?

- Integrate e-Link and Tableau better so viewers can make the connection from monitoring through implementation funding.
- How do we measure progress in agriculture?
- Where are we making gains in water quality?
- What should our return-on-investment expectations be?
- How do we distinguish between outputs and outcomes?
- Show us examples of how data creates better decisions.
- Report Card is still pretty fuzzy and overwhelming—we need a storyteller to tell the story.
- What do we want to know by January 2024 before agencies submit proposals?
- Are impairments really the best measure of success since we have catalogued more than we can afford to fix?

The Minnesota Drought of 2021 & 2022

Pooja Kanwar, PhD | Water Policy Consultant

Clean Water Council

January 23, 2023

DEPARTMENT OF NATURAL RESOURCES

Drought in Minnesota

Crop-loss figures are conflicting for season stunted by drought

By Warren Wolfe
Staff Writer

The 1976 drought, which parched large sections of Minnesota farmland, cut the value of state crops by $1.45 billion.

Or was it a loss of $1 billion—or $850 million—or $541 million—or even a gain of $188 million?

State officials have been using the $1.45-billion loss figure since late last fall, when the estimate was made by the Farmers Union Drought Aid Task Force, which polled officials of all 87 counties.

But new government reports on the value of 1976 crops offer several other ways to calculate the difference between the potential value of last year's crop if there had been normal weather and the actual value of the crop harvested.

And while the figures do not disprove the task force's estimate, they do show that the loss may have been less than was thought.

"The important thing is not so much what the actual dollar loss was," said Bill Walker of Red Wing, Minn., chairman of the Governor's Drought Aid Task Force. The task force was started last summer by the Farmers Union and Gov. Rudy Perpich made it a state task force earlier this month.

"What the task force tried to show was the severity of the situation farmers are facing," Walker said. "I really don't care if you come up with $900 million or $1 billion or $1.45 billion. You get into figures that high and you know farmers are hurting."

The value of a crop-loss estimate is that it offers a measure of the severity of the drought and of the financial problems facing farmers who reaped fewer dollars from their harvests last year than expected.

It also can be used to prove to politicians that they need to help farmers by altering disaster-aid programs or government policies.

In fact, that is precisely how the task force figures were used.

It is not a measure of farm income, however, because a farmer's marketing year extends from harvest to harvest, so that much of the grain sold in 1976 actually was harvested in 1975.

The main problem in calculating the difference between the poten-

Crops continued on page 18C

$1.5-billion state crop loss estimated

By JOE BLADE
Minneapolis Star Staff Writer

Because of the drought, Minnesota farmers will lose about $1.5 billion in income they could have expected this year under ideal growing conditions, Minnesota Agriculture Commissioner Jon Wefald has estimated.

That would bring total farm income from crops in the state to about $1.9 billion, about the same as last year, Wefald said today.

Wefald said that if growing conditions had matched those that produced record crops in 1972 and 1973, Minnesota farmers could have received from $3.2 billion to $3.4 billion for their crops.

His estimates released yesterday are considerably below those given for crops as of Aug. 1 by the federal-state crop and livestock reporting service.

"We're saying virtually a month later that we've lost an additional 100 million bushels (of corn)," said Wefald. "The reason for that is the hot, dry, windy weather. Even the crops that looked great three weeks ago are now set back."

Wefald said he made the most recent estimates after talking to county agents, agriculture emergency boards, banks, weather forecasters, a soil specialist and "hundreds of farmers."

He did not check his most recent estimates of crops with the crop and livestock reporting service.

The value for crops given by Wefald was obtained by multiplying the mid-July price for each particular crop by the potential production and his estimate of the production loss.

His figures do not include damage to pastures from drought and income from potatoes, sunflower seeds, fruits and vegetables, seed crops and honey.

Wefald made these loss estimates:

Corn—Exactly half of an estimated potential production of 566.8 million bushels, for a loss of $803.9 million. The all-time record corn harvest in Minnesota was 513 million bushels in 1973. The latest official crop and livestock reporting service estimate was 384.3 million bushels.

Soybeans — 28.8 million bushels of a potential crop of 82.3 million bushels for a loss of $102.5 million. The official forecast was 83.8 million bushels as of Aug. 1.

Hay—A loss of 4.6 million tons of a potential of 8.3 million tons for lost value of $284.1 million. Record production in 1962 was 8.5 million tons. The latest official forecast was for a 1976 harvest of 5.3 million tons.

Wheat—Loss of 28.7 million bushels from a potential harvest of 143.7 million bushels, lost value of $110.3 million. The official forecast is that the 1976 wheat harvest will be a record 124.7 million bushels.

Oats—A loss of 34.8 million bushels from a potential crop of 116.2 million bushels, costing farmers a possible $58.4 million. The official forecast is 80.9 million bushels as of Aug. 1.

Barley, sugar beets, flaxseed and rye losses were estimated to cost farmers $25 million in lost potential harvest.

St. Paul Pioneer Press Tues., April 19, '77

is rolling along at 30,900 cubic feet a second compared with a normal April flow of 96,000 cfs. "Unless we get some really heavy rains we'll get by without any flooding at all," Gustafson said.

At St. Louis, the river must flow faster than 54,000 cfs to maintain the 9-foot deep navigation channel, said James Butery, chief of hydraulics for the St. Louis Corps office. The present rate is 90,000 cfs "so we've got about twice what we need for the moment," he added. " . . . but in April 1976 the flow ranged from 230,000 to 440,000 cfs . . . and the average level for April is 277,000."

Butery added: "Last fall I was predicting if we did not get at

lengthened from eight days to about two weeks.

Parts of southern Illinois and Missouri were flooded briefly in mid-March when thunderstorms dumped from 2 to 9 inches of rain. Most of Illinois received about 50 per cent more rain than normal in March, ending a 12-month period of below-average precipitation.

"Here in St. Louis we've gotten no rain at all in April," Butery said. . . . Now everything is back to below normal."

Barge traffic on the Illinois River is little affected by the drought because the corps releases enough water from Lake Michigan to maintain the river channel.

Minnesota Statute 103G.293

The commissioner shall ***establish a plan*** to respond to drought-related emergencies and to prepare a ***statewide framework for drought response***.

The plan must consider metropolitan water supply plans of the Metropolitan Council prepared under section 473.1565.

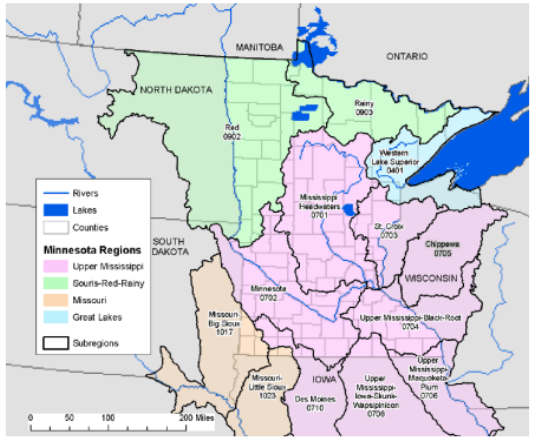
The plan must provide a framework for implementing drought response actions in a staged approach related to decreasing levels of flows.

Permits issued under section 103G.271 must provide conditions on water appropriation consistent with the drought response plan established by this section.

Minnesota Statewide Drought Plan

Minnesota Statewide Drought Plan

This plan provides a framework for preparing for and responding to droughts to minimize conflicts and negative impacts on Minnesota's natural resources and economy.



Statewide Drought Plan watersheds:

- Red 0902
- Rainy 0903
- Western Lake Superior 0401
- Mississippi Headwaters 0701
- St. Croix 0703
- Minnesota 0702
- Upper Mississippi-Black-Root 0704
- Upper Mississippi-Maquoketa-Plum 0706
- Upper Mississippi-Iowa-Skunk-Wapsipinicon 0708
- Des Moines 0710
- Missouri-Little Sioux 1023
- Missouri-Big Sioux 1017

STATEWIDE DROUGHT PLAN MATRIX

Drought Phase/Triggers	State and Federal Actions	Water Users and Suppliers Actions
NON-DROUGHT PHASE A significant portion of the watershed (see map) is not under drought conditions according to the U.S. Drought Monitor. The U.S. Drought Monitor is a weekly index depicting the location and intensity of drought conditions using a blend of quantitative and qualitative indicators. Drought conditions referenced in this plan are keyed to the U.S. Drought Monitor. http://drought.unl.edu/dm/monitor.html	➢ Develop/maintain precipitation, stream flow, ground water and water quality monitoring programs. ➢ Conduct state and regional water studies and coordinate actions. ➢ Assist water suppliers and other users in developing conservation measures. ➢ Continue and improve water conservation education.	➢ Develop/update/implement water supply plans (including drought preparedness and response and water conservation programs). ➢ Adopt conservation rate structures and ordinances. ➢ Establish mutual aid agreements, interconnections, conservation education, redundant/alternative supplies, etc. ➢ Minimize water supply system losses and improve water use efficiency.
DROUGHT WATCH PHASE A significant portion of the watershed (see map) is "**Abnormally Dry**" or in a "**Moderate Drought**".	➢ Inform Drought Task Force of conditions. ➢ Intensify selected monitoring activities. ➢ Initiate public awareness. ➢ Notify water suppliers of moderate drought conditions. ➢ Monitor Mississippi River flows and coordinate with the U.S. Army Corps of Engineers (USACE) and hydropower facility owners.	➢ Monitor potential conflicts and problems and notify DNR of source conflicts. ➢ Public water suppliers provide conservation information and request customers to implement voluntary measures to reduce water use.
DROUGHT WARNING PHASE A significant portion of the watershed (see map) is in a "**Severe Drought**", or for public water suppliers using the Mississippi River, the average daily flow at the USGS gage near Anoka is at or below 2000 cfs for five consecutive days.	➢ Convene Drought Task Force. ➢ Increase public drought awareness. ➢ Notify water suppliers of severe drought conditions. ➢ Monitor implementation of the Mississippi River System-Wide Low-Flow Management Plan.	➢ Public water suppliers implement appropriate water use restrictions contained in their water supply plans. ➢ Other water users implement appropriate conservation measures. ➢ Public water suppliers implement water use reduction actions with a goal of reducing water use to 50% above January levels. ➢ Dam operators implement the Mississippi river System-Wide Low-Flow Management Plan.
RESTRICTIVE PHASE A significant portion of the watershed (see map) is in an "**Extreme Drought**", or for public water suppliers using the Mississippi River, the average daily flow at the USGS gage near Anoka is at or below 1500 cfs for five consecutive days.	➢ Notify water suppliers of extreme drought conditions. ➢ Closely monitor river flows. ➢ Continue drought awareness efforts to encourage conservation.	➢ Follow MDNR allocation restrictions. ➢ Public water suppliers implement water use reduction actions with a goal of reducing water use to 25% above January levels. ➢ All appropriators conserve water and minimize non-essential water uses.
EMERGENCY PHASE A significant portion of the watershed (see map) is in an "**Exceptional Drought**", or highest priority water supply needs are not being met, or there are threatened or actual electricity shortages due to cooling water supply shortages, or for public water suppliers in the Twin Cities, the average daily flow of the Mississippi River USGS gage near Anoka is at or below 1000 cfs for five consecutive days.	➢ Advise Governor on need for emergency declaration. ➢ Minnesota Division of Homeland Security and Emergency Management implements MN Emergency Operations Plan (MEOP). ➢ Consider request to the USACE for the release of water from the Mississippi River Headwaters Reservoirs.	➢ Public water suppliers implement mandatory water use reduction actions with a goal of reducing water use to January levels. ➢ Limit water used based on highest priorities defined in **Minnesota Statutes 103G.261**. ➢ Implement measures consistent with an emergency declaration. ➢ Provide bottled water, hauled water, and sanitations supplies to users, as needed.

Responsibilities, Plans and Actions Related to Drought Planning

Minnesota Statewide Drought Plan

Legislation enacted in 1990 mandated the Department of Natural Resources (DNR) to prepare a drought plan. Minnesota Statutes (MS), Section 103G.293 states:

> "The commissioner shall establish a plan to respond to drought-related emergencies and to prepare a statewide framework for drought response. The plan must consider metropolitan water supply plans of the metropolitan council prepared under section 473.156. The plan must provide a framework for implementing drought response actions in a staged approach related to decreasing levels of flow. Permits issued under 103G.261 must provide conditions on water appropriation consistent with the drought response plan established by this section."

The attached Drought Plan table outlines the staged approach for implementing drought response actions.

Major Participants

State, Federal and local agencies, along with water users and suppliers in Minnesota, all have responsibilities before and during times of drought. In addition to ongoing studies and coordination efforts, the primary responsibilities of the major participants are:

- MN DNR – DNR Waters is responsible for maintaining and updating the StatewideDrought Plan, monitoring and communicating drought conditions, as well as for convening the State Drought Task Force. DNR Waters regulates water use by permit (water appropriation) and by requiring Water Supply Plans for public water suppliers serving more than 1,000 people. Other DNR divisions monitor drought impacts on forestry, wildlife and fisheries.
- Metropolitan Council – the Metropolitan Council is responsible for development of a regional master water supply plan for the seven-county metropolitan area and reviews local water supplies as part of community comprehensive plans.
- U.S. Army Corps of Engineers – the USACE operates reservoirs in 3 river systems in Minnesota primarily for commercial navigation, flood control and/or navigation (Minnesota River, Red River of the North and the Mississippi River). The Mississippi River headwaters reservoirs have been studied for purposes of water releases during times of drought. Under the USACE operations plans, emergency releases may be done only under certain conditions to meet health and safety needs and in consultation with the federal Bureau of Indian Affairs, the Minnesota Chippewa Tribal government, and the MN DNR. The USACE also helps with preparedness and equipment.
- Water Users and Suppliers – local communities and water users must implement conservation measures as required by DNR Waters and Met Council.
- Governor of Minnesota – the Governor is empowered to declare a critical water deficiency by executive order. (103G.291 Subd.1)

Other Participants and their capabilities

Department of Public Safety, Homeland Security and Emergency Management (HSEM) – Public information and response coordination
Pollution Control Agency – Public information, response procedures, exercise capabilities, data collection
National Weather Service – Weather and hydrologic forecasts and warnings
Department of Agriculture – Assistance with crop and other farming-related drought issues
Department of Health – Public Water Supply
Board of Water and Soil Resources (BWSR) – technical and financial assistance to agricultural producers

Related Plans

- Local Water Supply Plans – address projected demands, adequacy of the water supply system and planned improvements, existing and future water sources, natural resource impacts or limitations, emergency preparedness, water conservation, supply and demand reduction measures, and allocation priorities. Met Council oversees those in the 7-county metro area.
- Mississippi River System-Wide Low-Flow Management Plan – A plan conceived by the DNR, the USACE and the hydropower facilities along the Mississippi River upstream of St. Paul, the primary purpose of which is to help ensure run-of-river operations during low flow periods and coordination among the hydropower facility operators.
- MN Emergency Operations Plan (MEOP) – The MEOP addresses drought as well as other natural hazards. The plan responds to potential emergencies (nuclear power plants, etc.) as they relate to extreme drought conditions.

STATE DROUGHT TASK FORCE

Purpose and Role

The State Drought Task Force is convened, as defined in the Restrictive Phase of the Drought Table, to provide coordination and communication between agencies and institutions affected by drought and to provide a central source for the news media. The Task Force could also be called together at other times as needed to serve as a forum for discussion of drought management plans and policies. In cases of more localized drought conditions, the Director of DNR Waters may bring appropriate parties together on a Regional Drought Task Force for the same purposes.

Members

DNR Waters	Director/Assistant Director
DNR Waters	State Climatologist
DNR Wildlife	Director
DNR Forestry	Wildfire Suppression Supervisor
Board of Water and Soil Resources	Executive Director
Department of Agriculture	Director, Agronomy & Plant Protection
Department of Agriculture	State Statistician
Department of Health	Director, Drinking Water Protection
Department of Public Safety	Director, Homeland Security and Emergency Mgmt
Department of Transportation	Director, Environmental Services
Minnesota Planning	Director, Local Planning Assistance
Pollution Control Agency	Director, Environmental Outcomes
University of Minnesota	Climatologist/Meteorologist, Extension Service
Metropolitan Council	General Manager, Environmental Services
National Weather Service	Meteorologists-in Charge
North Central River Forecast Center	Hydrologist-in-Charge, Chanhassen
U.S. Army Corps of Engineers	Chief, Water Control Section
U.S. Department of Agriculture	Executive Director, MN Farm Service Agency
U.S. Department of Agriculture	State Conservationist, NRCS
U.S. Geological Survey	Director, Minnesota Water Science Center
American Waterworks Association	Water Utilities Council
Association of Minnesota Counties (AMC)	Executive Director
Hospitality Minnesota	Executive Vice President

Last modified: April 29, 2009 - MNDNR Division of Waters

Drought Planning Team

- Internally - led by Ecological and Water Resources staff
  - Climatology
  - Water Conservation
  - Communications
  - Permitting
  - Hydrology
  - Leadership and Management
- Externally – partner agencies, impact sectors across the state
- Drought task force

Drought of 2021

- Worst drought since 1988
- Impacts
  - Lake Levels
  - Stream Flows
  - Permit Suspensions
  - Well Interferences
  - Livestock and Rangelands
  - Burning Restrictions
  - Recreation
    - Boat Launches
    - Waterfowl hunters

The Story of the 2021/2022 Drought

- Background
- The Climate Science of Drought
- Groundwater and Well Interferences
- Warren Case Study
- Appropriations and Permit Suspensions
- Water Conservation
- Your Stories

DEPARTMENT OF NATURAL RESOURCES

Minnesota Drought Summary: A Tale of Two Droughts?

Luigi Romolo PhD

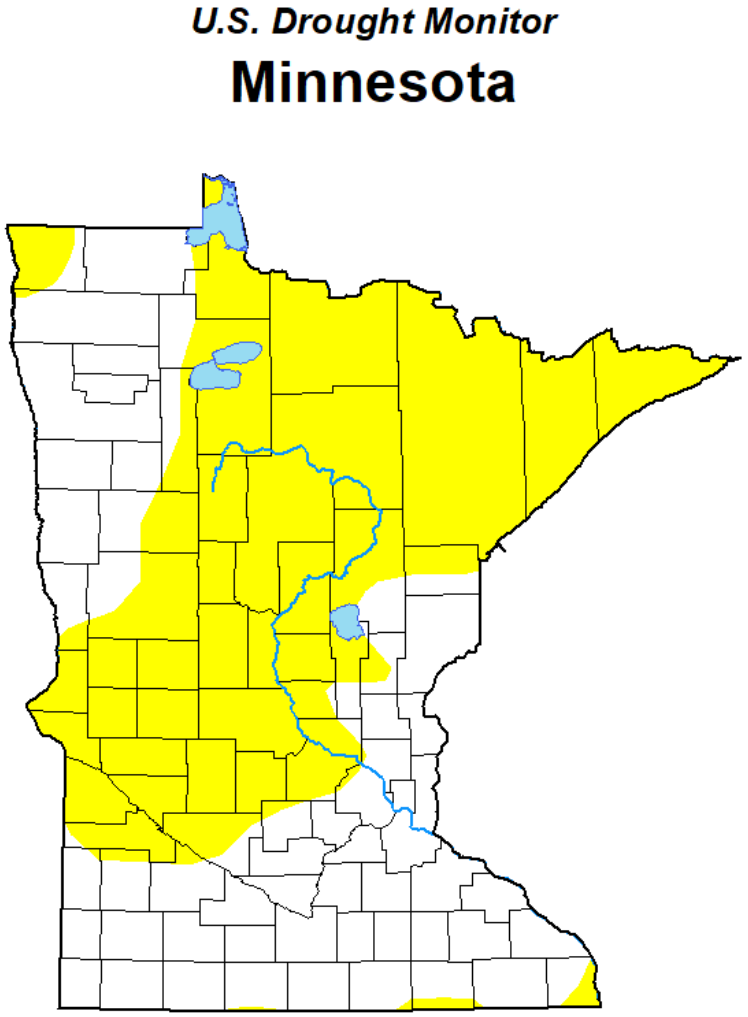
Minnesota State Climatologist

Overview

- Summary of 2021 Drought
- Current drought

Photo Credit: Pete Boulay

Minnesota had been in drought for a while



May 26, 2020

(Released Thursday, May. 28, 2020)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	43.88	56.12	0.00	0.00	0.00	0.00
Last Week *05-21-2020*	48.54	51.46	0.00	0.00	0.00	0.00
3 Months Ago *02-27-2020*	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year *01-02-2020*	100.00	0.00	0.00	0.00	0.00	0.00
Start of Water Year *10-03-2019*	100.00	0.00	0.00	0.00	0.00	0.00
One Year Ago *05-30-2019*	92.83	7.17	0.00	0.00	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

Curtis Riganti

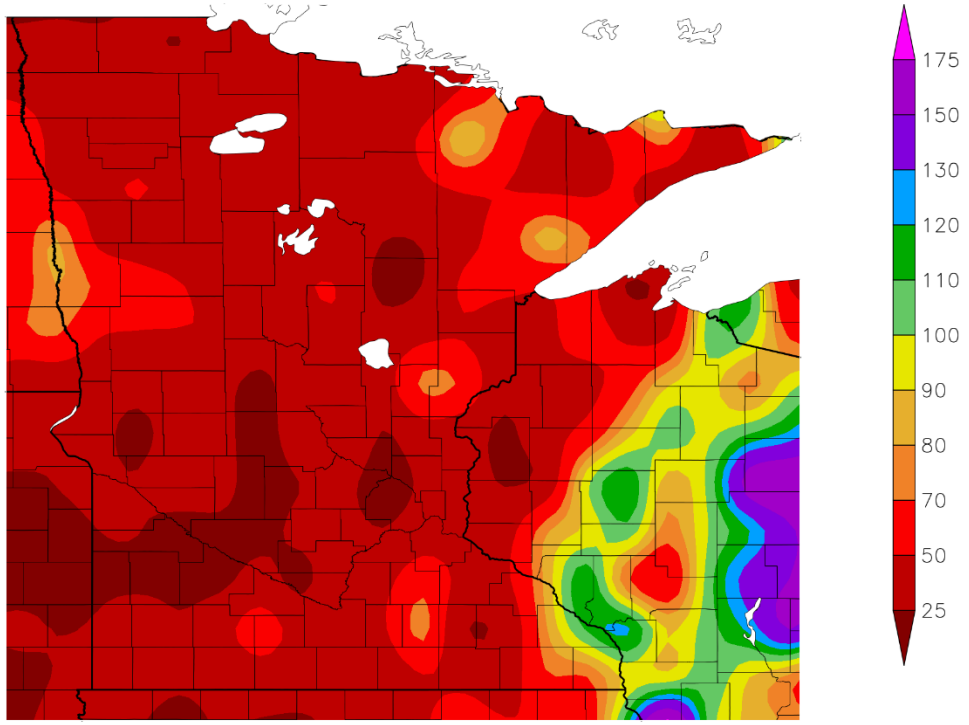
National Drought Mitigation Center

droughtmonitor.unl.edu

Source: National Drought Mitigation Center

June 2021 was 7th driest and 3rd warmest going back to 1895

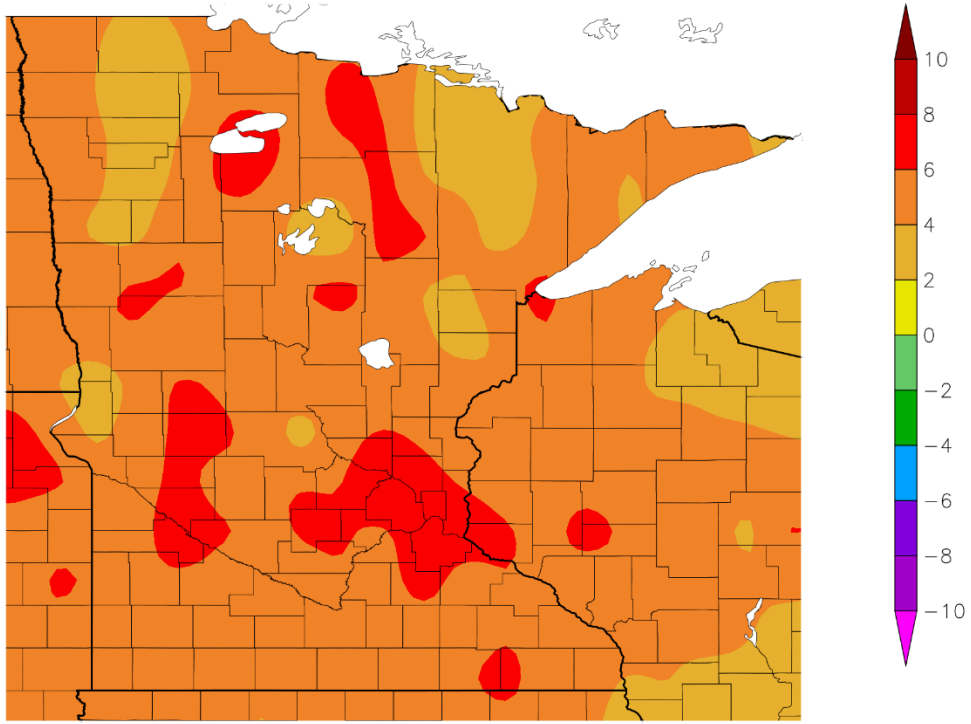
Percent of Normal Precipitation (%)
6/1/2021 – 6/30/2021



Generated 7/20/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Temperature (F)
6/1/2021 – 6/30/2021



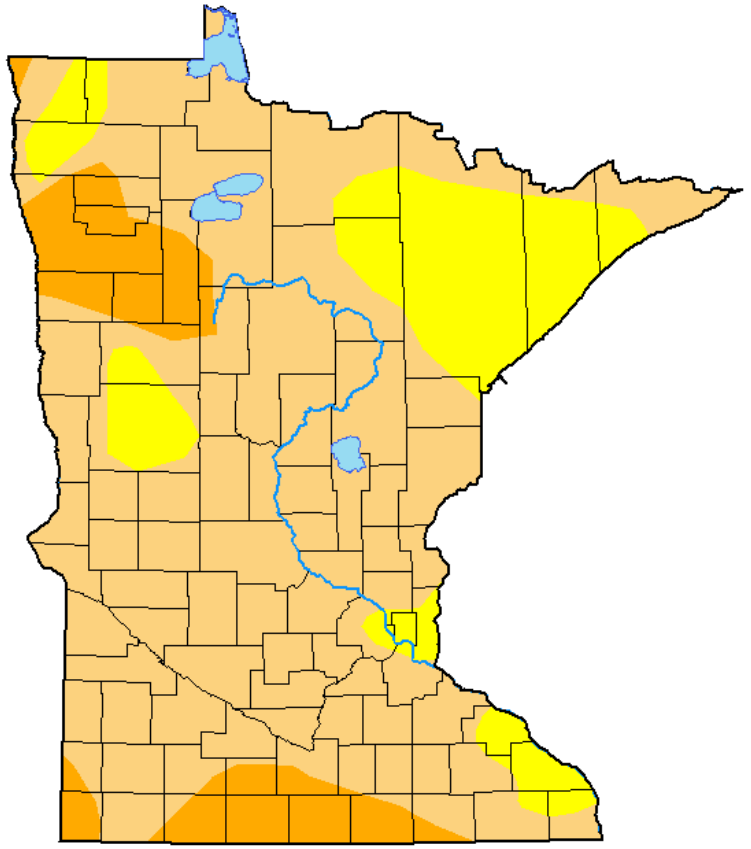
Generated 7/20/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

Lack of Rain and Warm Temps is the recipe for drought

U.S. Drought Monitor

Minnesota



June 29, 2021

(Released Thursday, Jul. 1, 2021)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	82.14	11.14	0.00	0.00
Last Week *06-22-2021*	0.00	100.00	74.75	13.75	0.00	0.00
3 Months Ago *03-30-2021*	14.87	85.13	38.80	0.89	0.00	0.00
Start of Calendar Year *12-29-2020*	1.60	98.40	23.40	0.28	0.00	0.00
Start of Water Year *09-29-2020*	54.95	45.05	8.39	0.00	0.00	0.00
One Year Ago *06-30-2020*	55.35	44.65	19.21	0.00	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

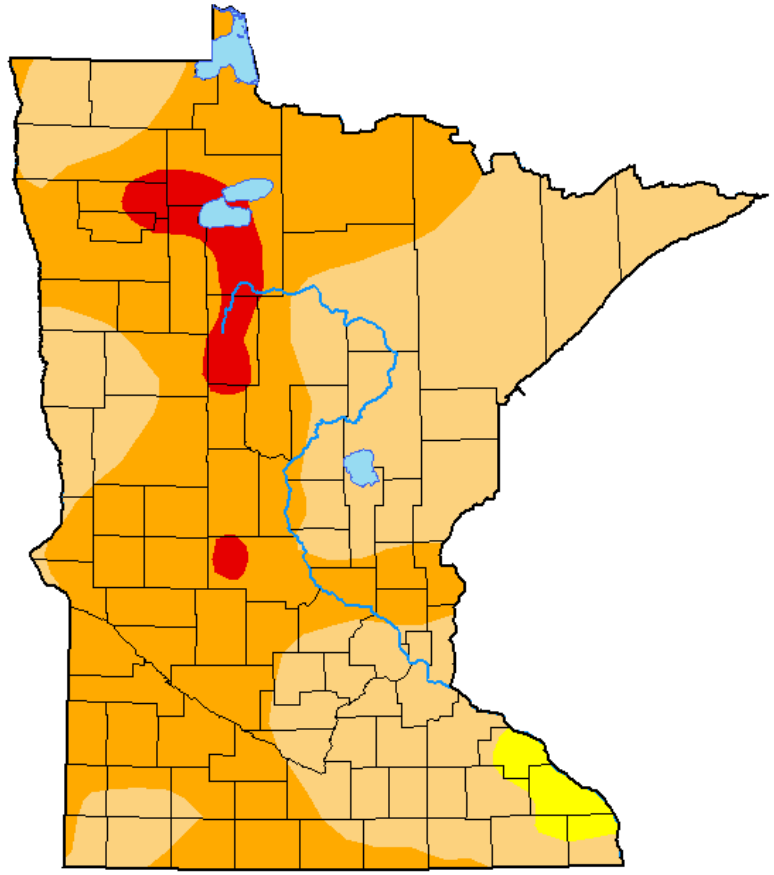
Deborah Bathke
National Drought Mitigation Center

droughtmonitor.unl.edu

Source: National Drought Mitigation Center

By July 31, 2021 things got even worse

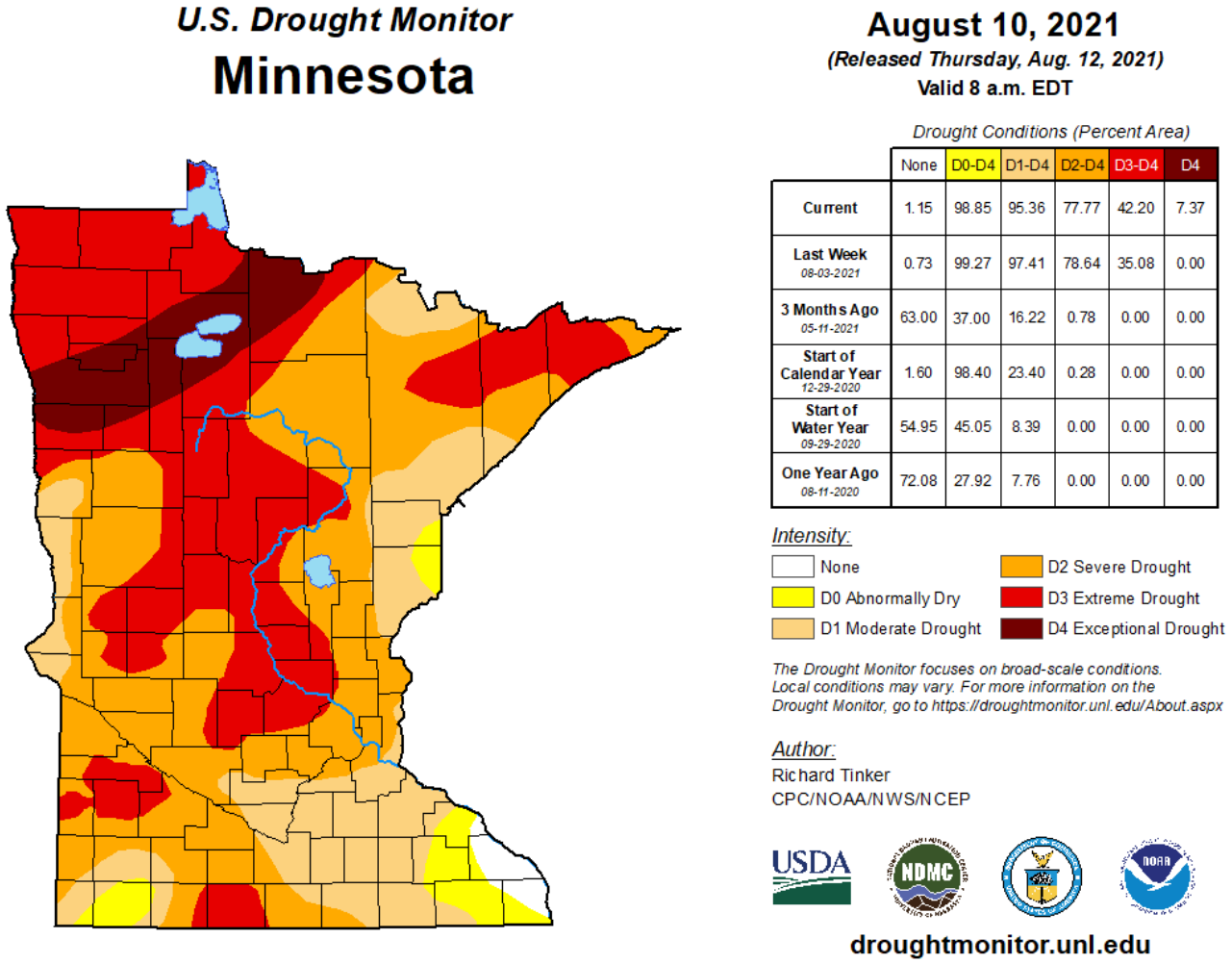
- Impacts
  - Hay shortages
  - Corn 4% good to excellent (76% on June 1)
  - Soybeans 43% good to excellent (76% on June 1)
  - Reduced Streamflow (most basins in reduced flow or minimized flow
  - Low lake levels
  - Tourism



Source: National Drought Mitigation Center

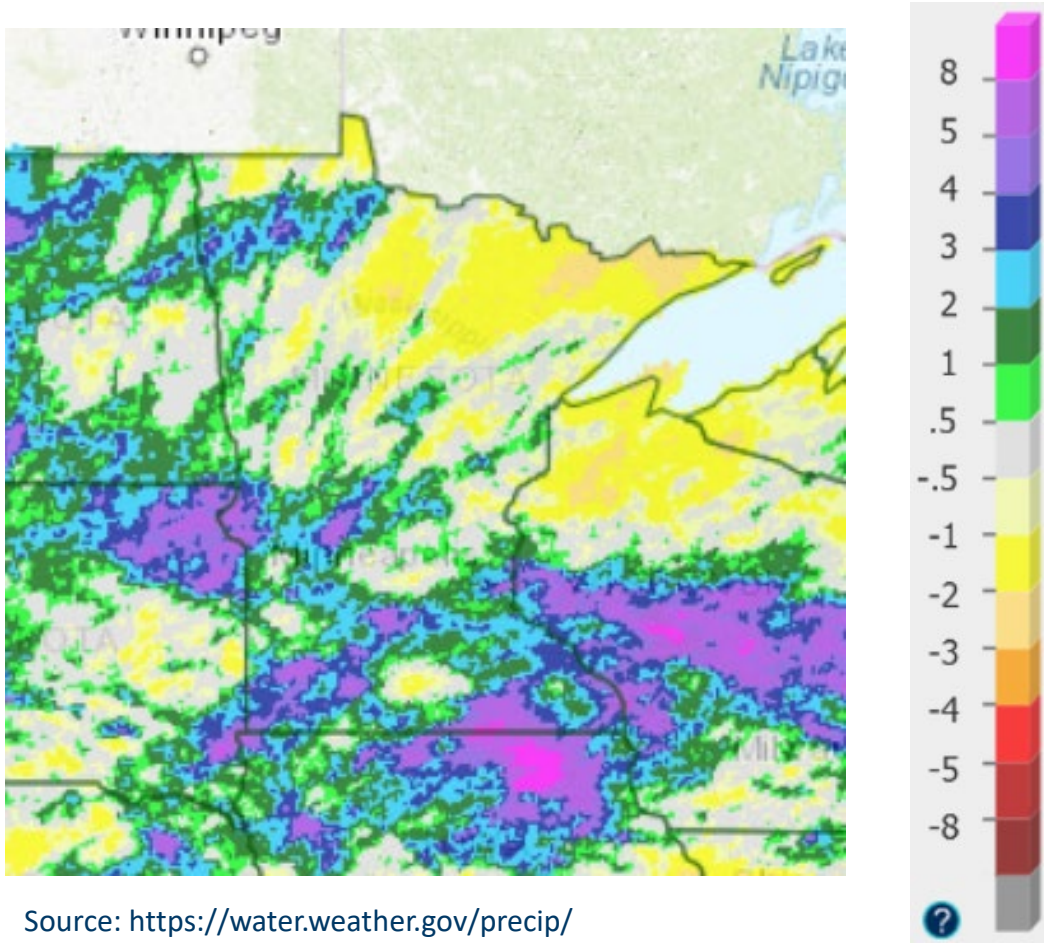
…and worse

- First instance of exceptional drought in Minnesota since the inception of the USDM Drought Map.
- Over three quarters of the state in severe drought or worse.



Source: National Drought Mitigation Center

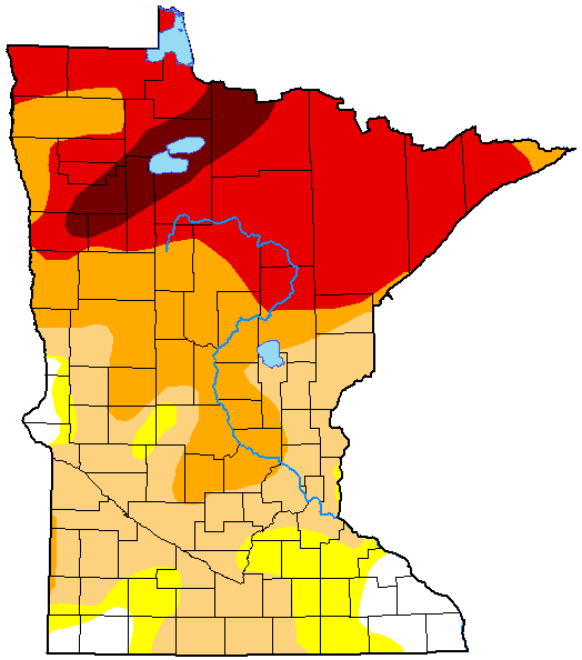
We got some drought relieving rainfall in late August 2021



Source: https://water.weather.gov/precip/

More rainfall in the fall helped improve the drought

U.S. Drought Monitor
Minnesota



September 7, 2021
(Released Thursday, Sep. 9, 2021)
Valid 8 a.m. EDT

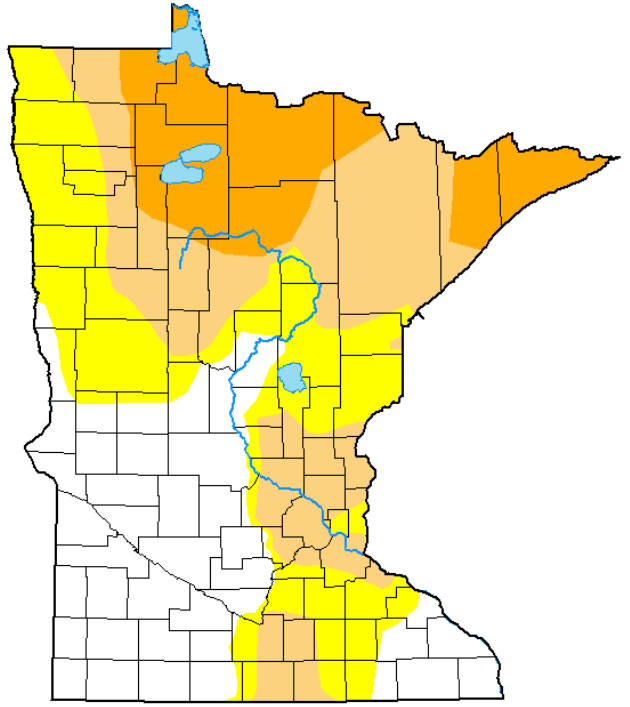
Intensity:
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
David Simeral
Western Regional Climate Center

droughtmonitor.unl.edu

U.S. Drought Monitor
Minnesota



December 21, 2021
(Released Thursday, Dec. 23, 2021)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	29.99	70.01	44.09	17.66	0.00	0.00
Last Week 12-14-2021	28.11	71.89	48.86	26.58	1.36	0.00
3 Months Ago 09-21-2021	6.50	93.50	76.21	50.44	23.58	0.00
Start of Calendar Year 12-29-2020	1.60	98.40	23.40	0.28	0.00	0.00
Start of Water Year 09-28-2021	6.50	93.50	76.21	50.44	23.58	0.00
One Year Ago 12-22-2020	1.60	98.40	23.40	0.28	0.00	0.00

Intensity:
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

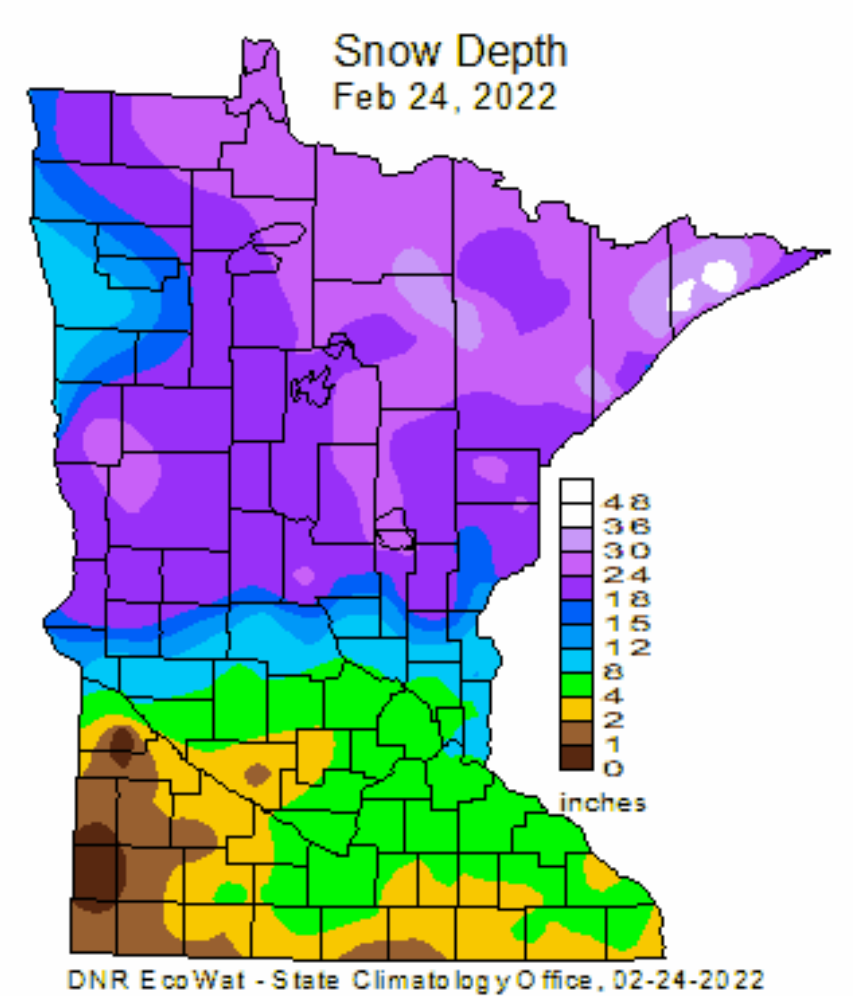
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

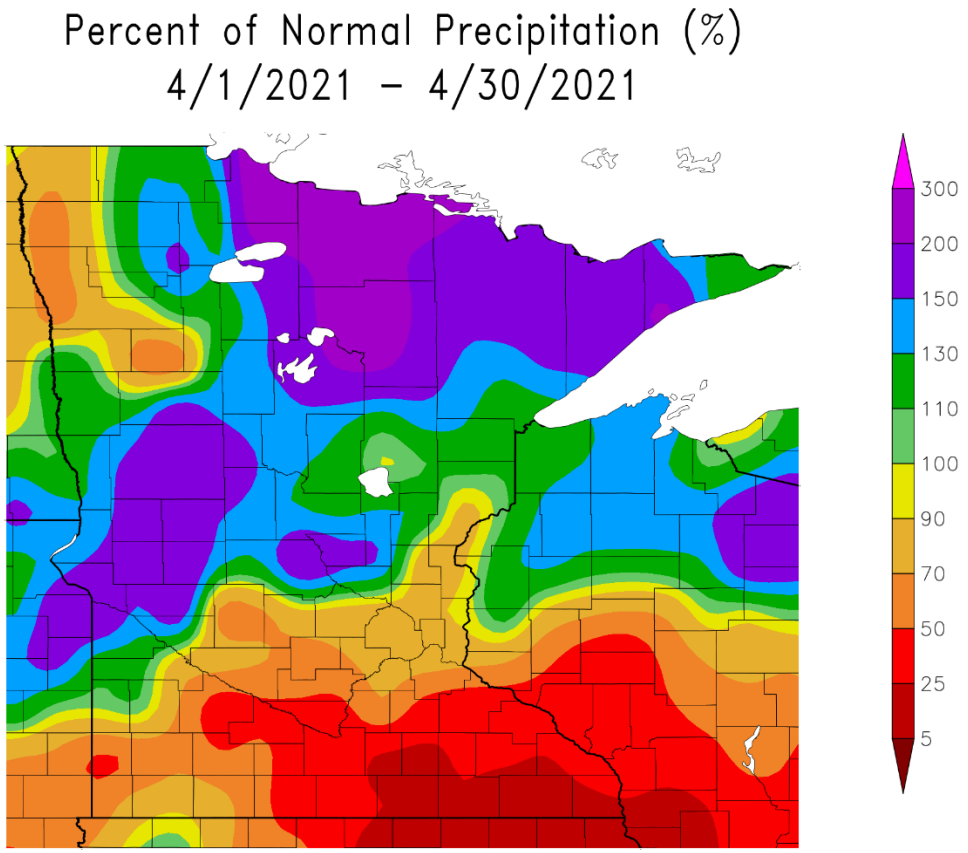
Author:
Brad Pugh
CPC/NOAA

droughtmonitor.unl.edu

Source: National Drought Mitigation Center

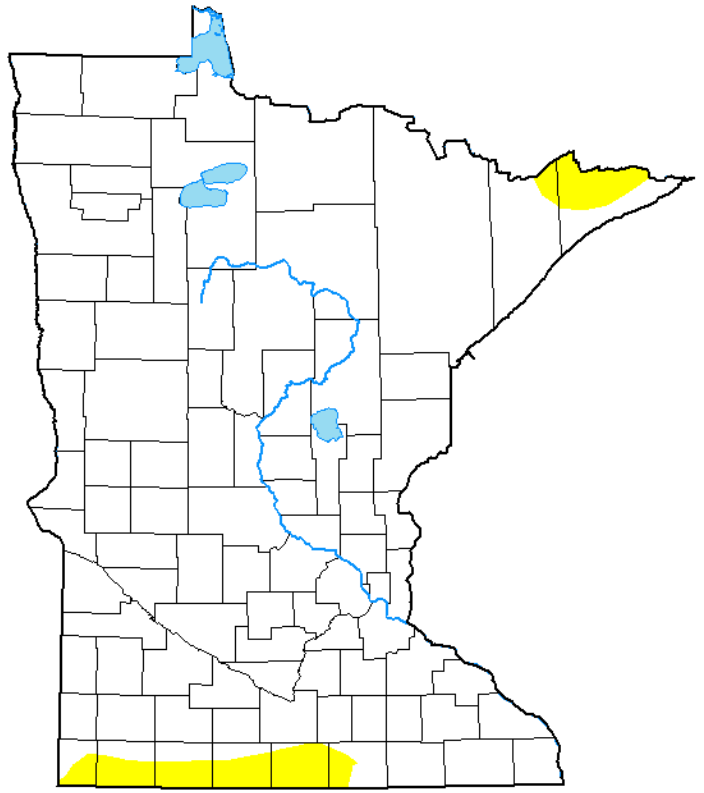
More improvement over the winter and spring





By early May 2022, the drought was over….or was it?

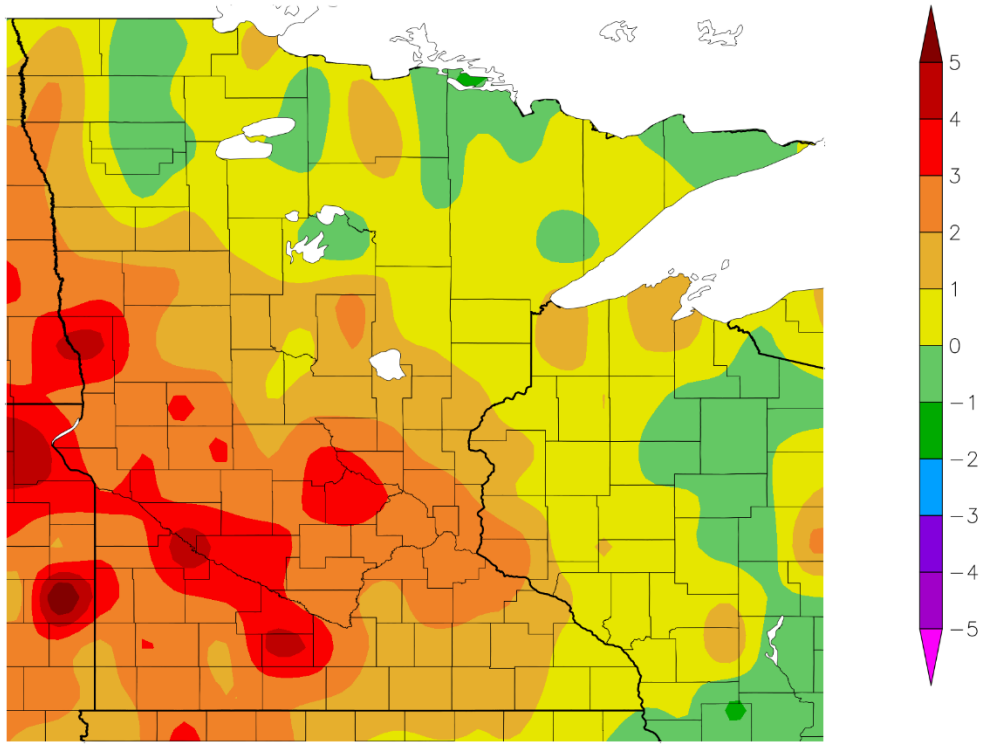
- Drought ended in May 2022.
- Proved to be the worst drought since 1988 for the state, worse than 1988 in some areas.
- First drought since 1988 that encompassed the entire growing season.



Source: National Drought Mitigation Center

June 2022 was very dry and very warm in southern Minnesota

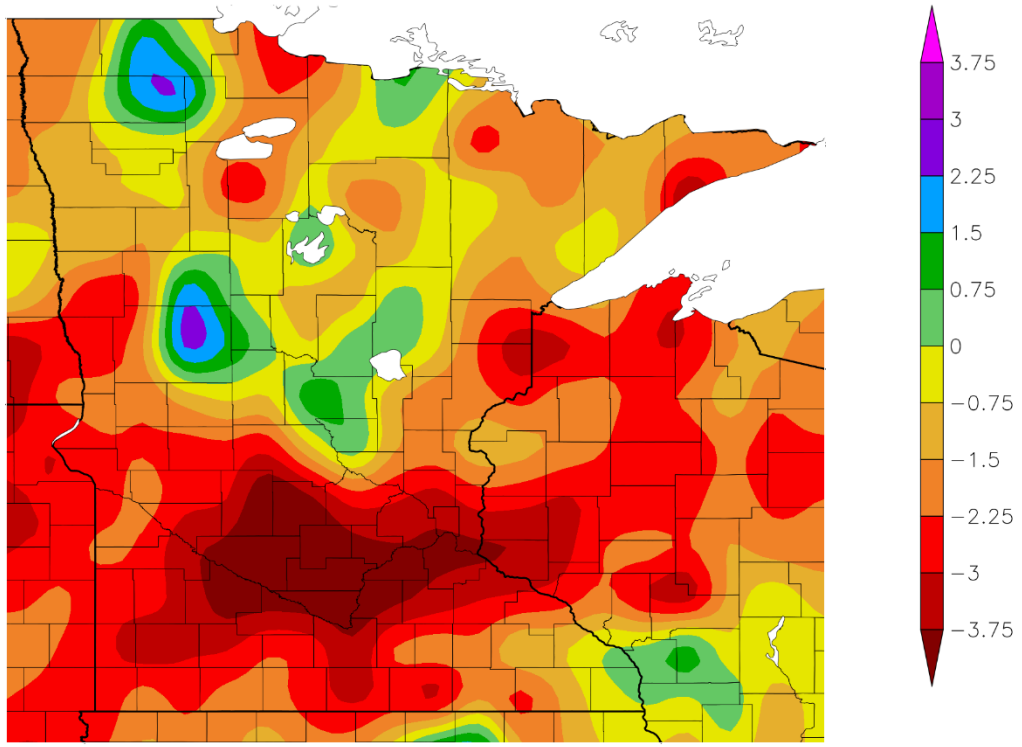
Departure from Normal Temperature (F)
6/1/2022 – 6/30/2022



Generated 7/20/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Precipitation (in)
6/1/2022 – 6/30/2022

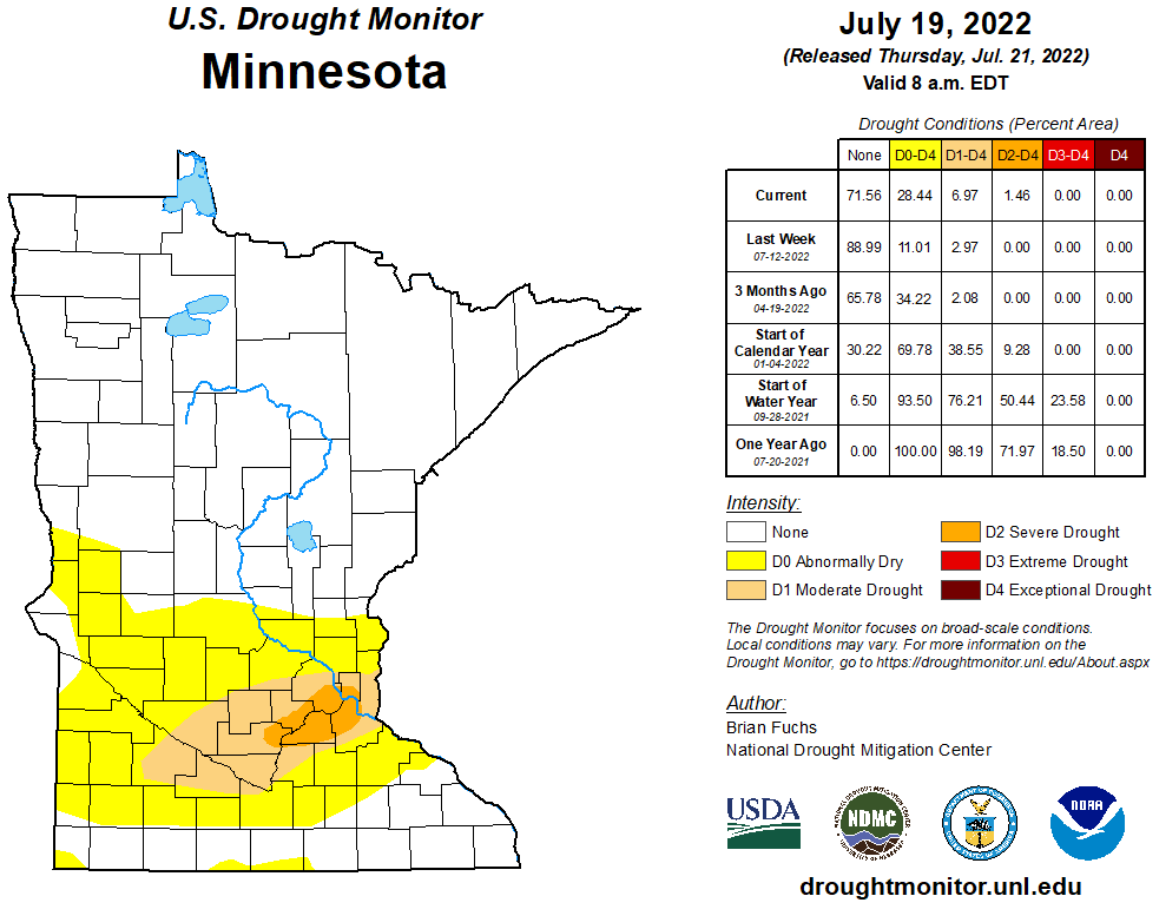


Generated 7/20/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

Drought….again?? Not surprising

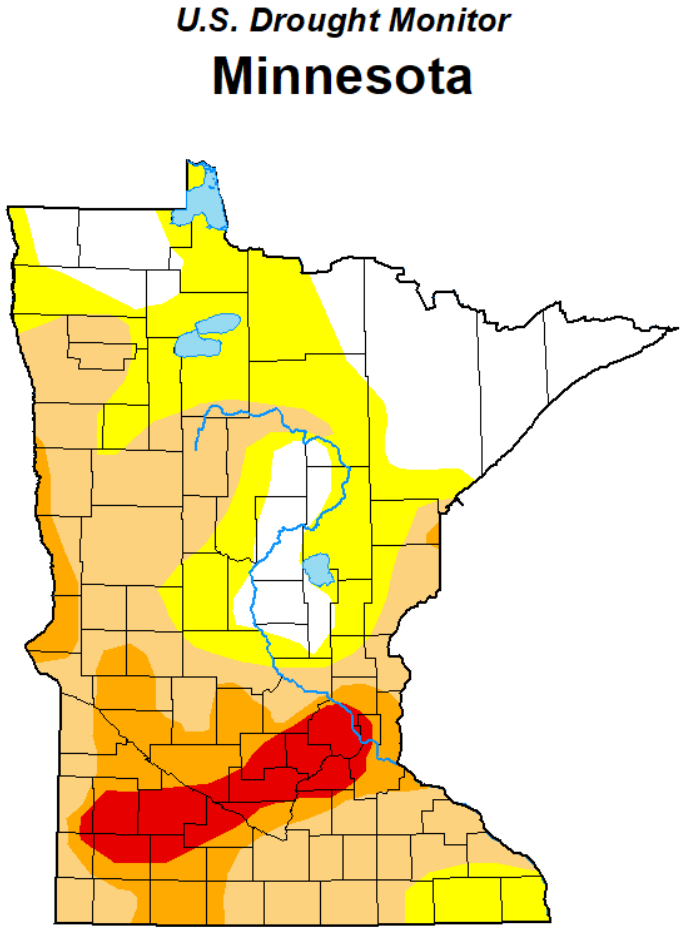
- You are never more vulnerable to drought than that moment when you first recover from drought.
- Lake levels
- Soil Moisture
- Ground Water



Source: National Drought Mitigation Center

2022 Drought Worsens

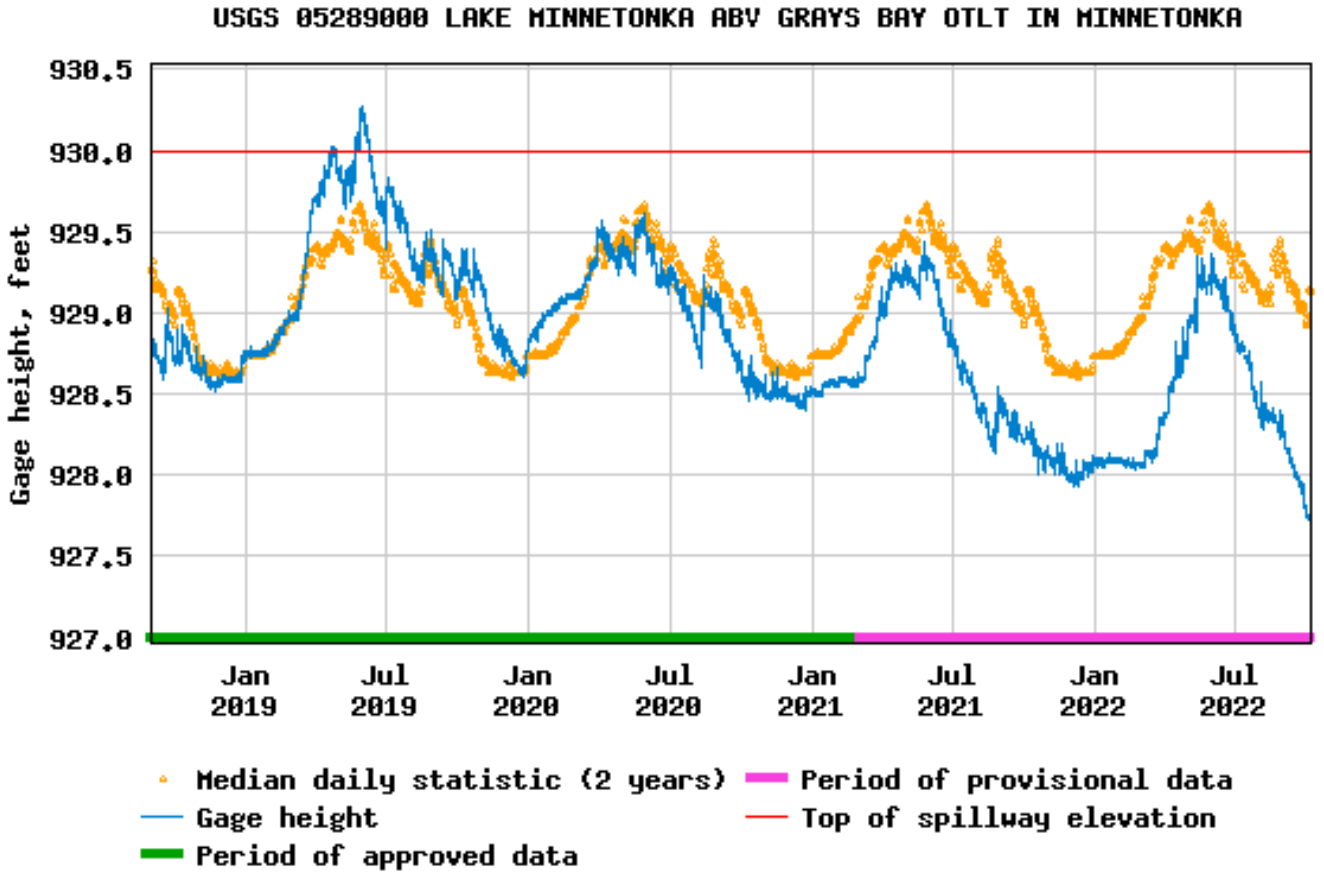
- Lack of rainfall in the south, particularly in the seven county metro area has lead to a worsening of drought conditions.
- Impacts mostly to lakes and rivers.
- Some minor agricultural impacts.



Source: National Drought Mitigation Center

Lake Minnetonka

- Lower than it was in 2021.
- As of Dec 13, 2022: 927.34’.
- Driest September on record for the Twin Cities.
- Previously low levels of Lake Minnetonka:
  - October 1, 2009 (927.78')
  - October 27, 2000. (927.37')
- January 19, 2023 (927.64’)



Source: USGS.gov

Drought has a memory

- Drought of 2021 really started with dryness in 2020 and less snow storage during the winter.
- If water shortages are not replenished over the winter, it could pose consequences for the growing season.
- It is important to remember that drought is a naturally occurring part of our climate.
- Regardless of how wet and how moist our soils are, you are never really more than 4 to 6 weeks away from the start of what could be the worst drought we've ever seen.

DEPARTMENT OF NATURAL RESOURCES

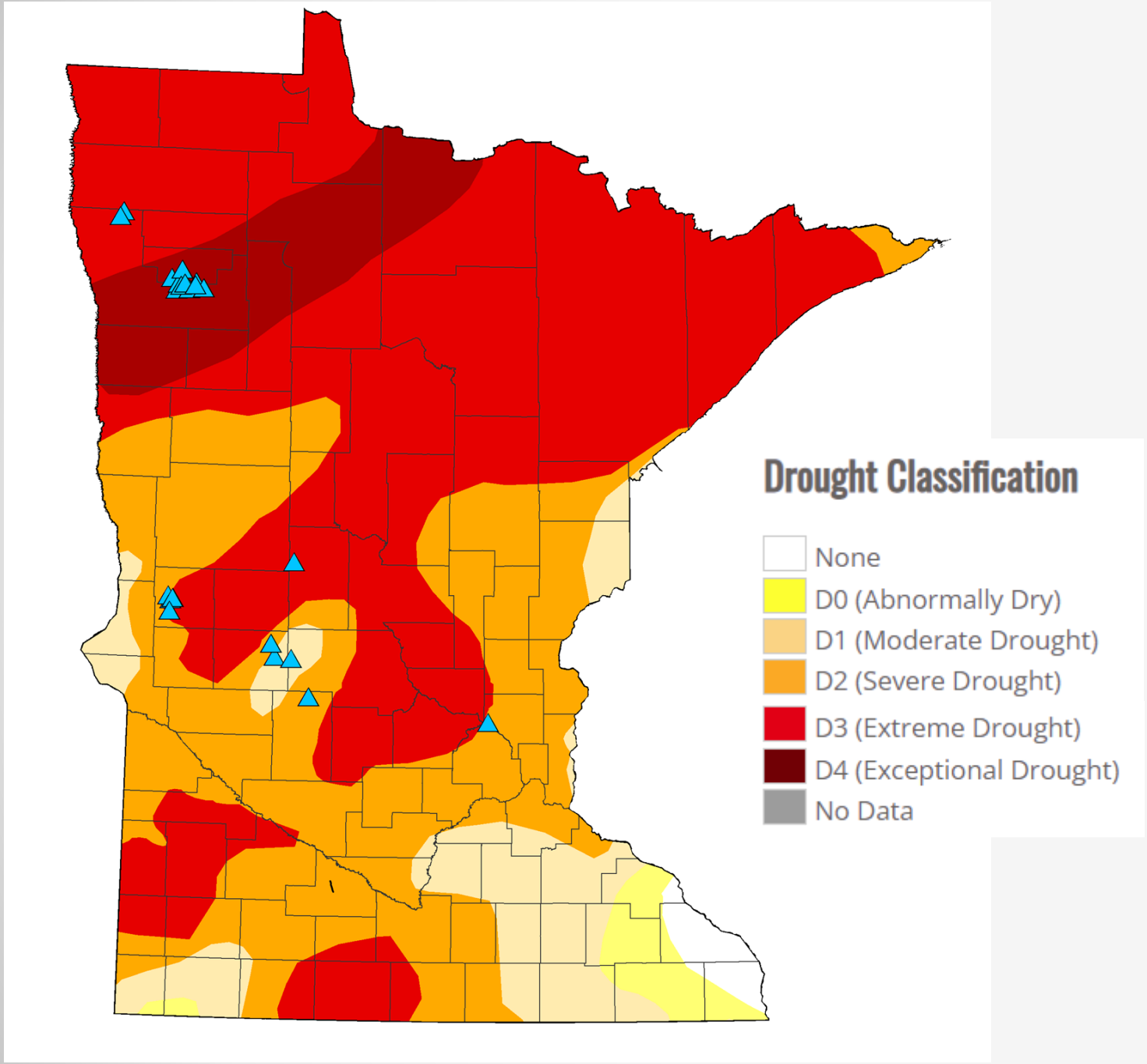
Thank You!

Drought and well interference in northwest Minnesota

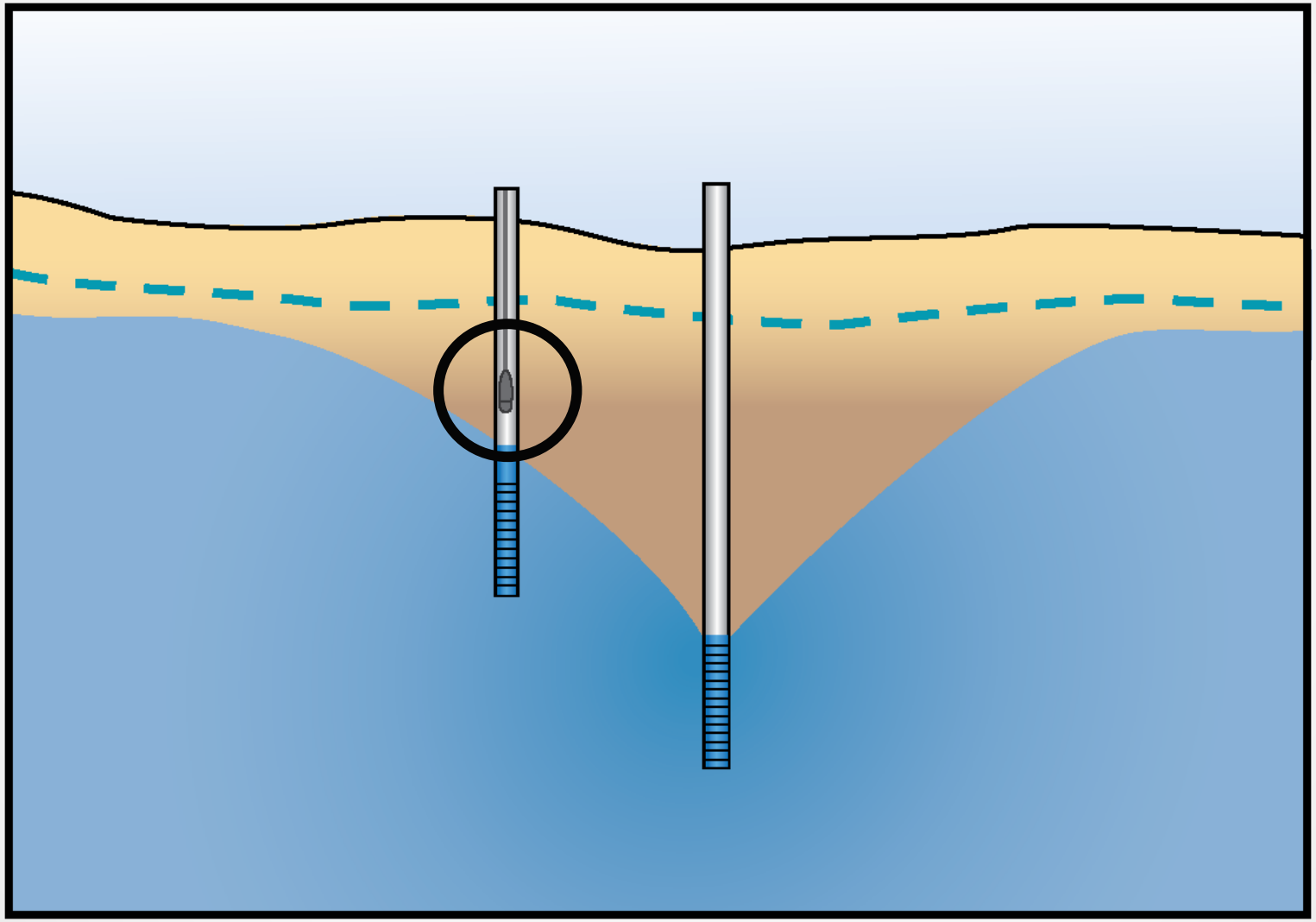
Ellen J Considine, PG | Hydrologist Supervisor

DEPARTMENT OF NATURAL RESOURCES

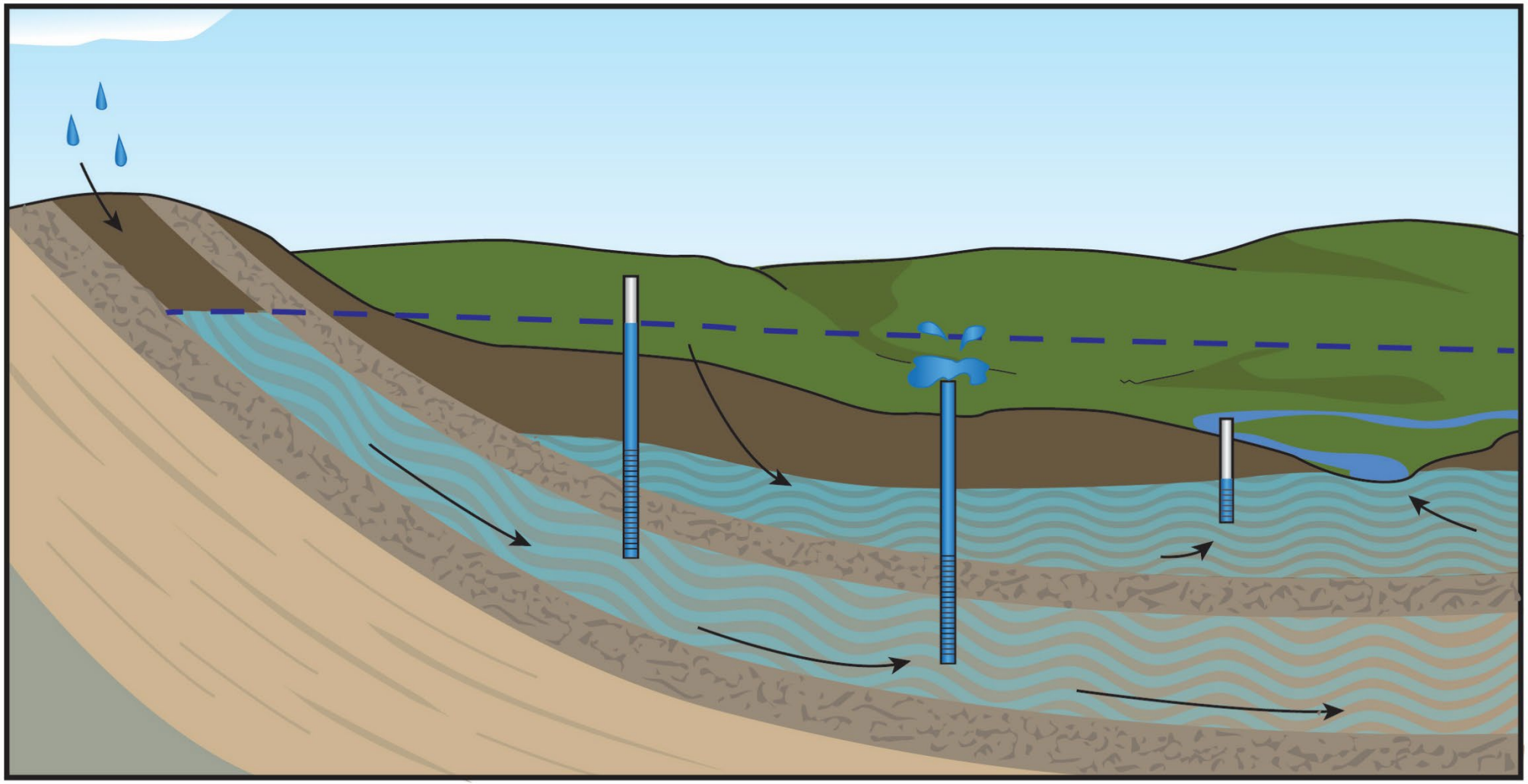
2021 drought



Well interference



Drought and groundwater



Takeaways

1. High groundwater use → well interference
   - Drought = 1 to 2 feet
   - Pumping = 5 to 50 feet

Takeaways

1. High groundwater use → well interference
   - Drought = 1 to 2 feet
   - Pumping = 5 to 50 feet
2. Well interference is hardest on disadvantaged people
   - Elderly, low-income, disabled

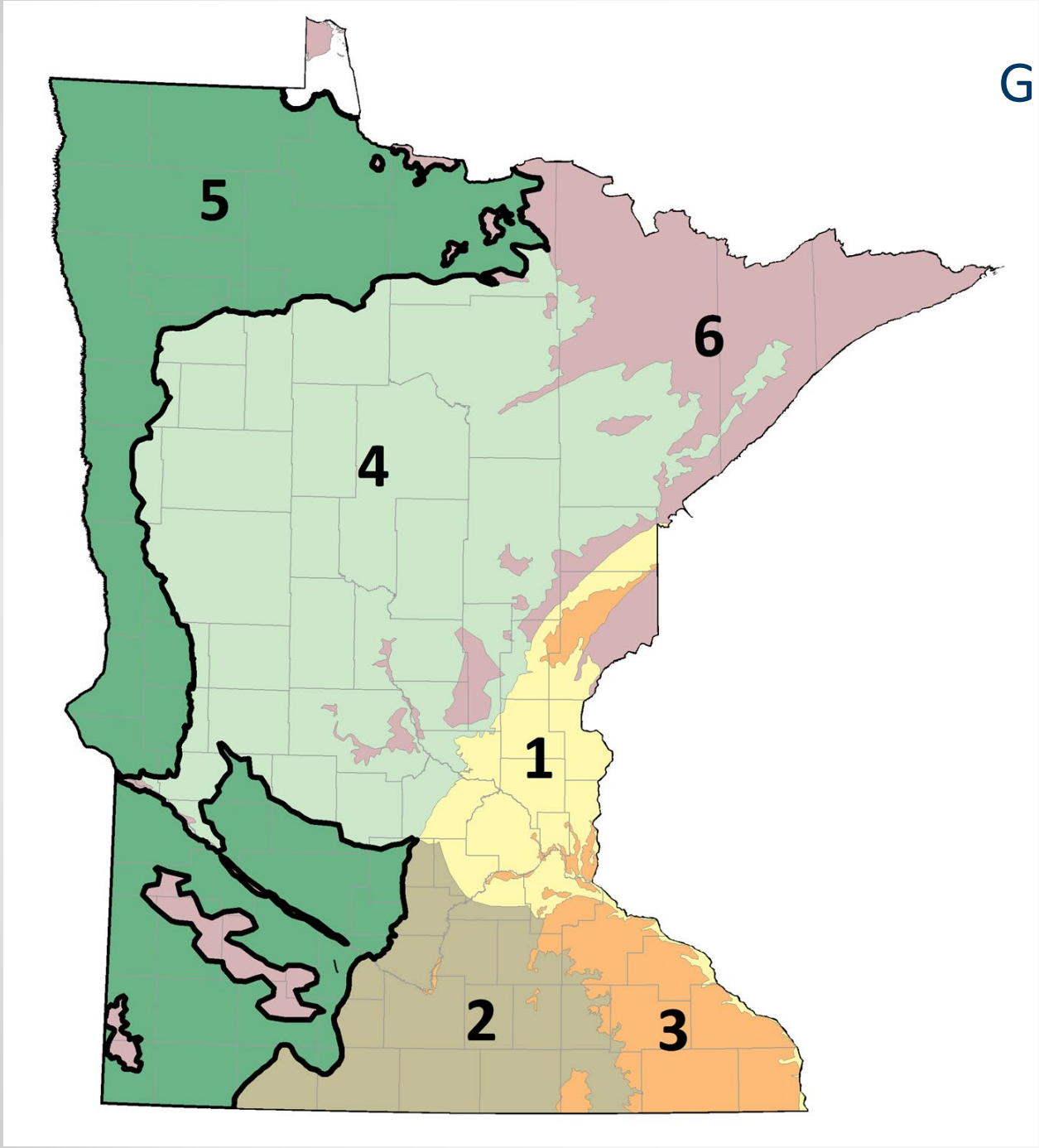
Living without water

25	26	27	28 Rationing water	29	30	31
1	2	3	4	5 Out of water	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27 Applied for a loan	28
29	30	31 New well: water again	1	2	3	4

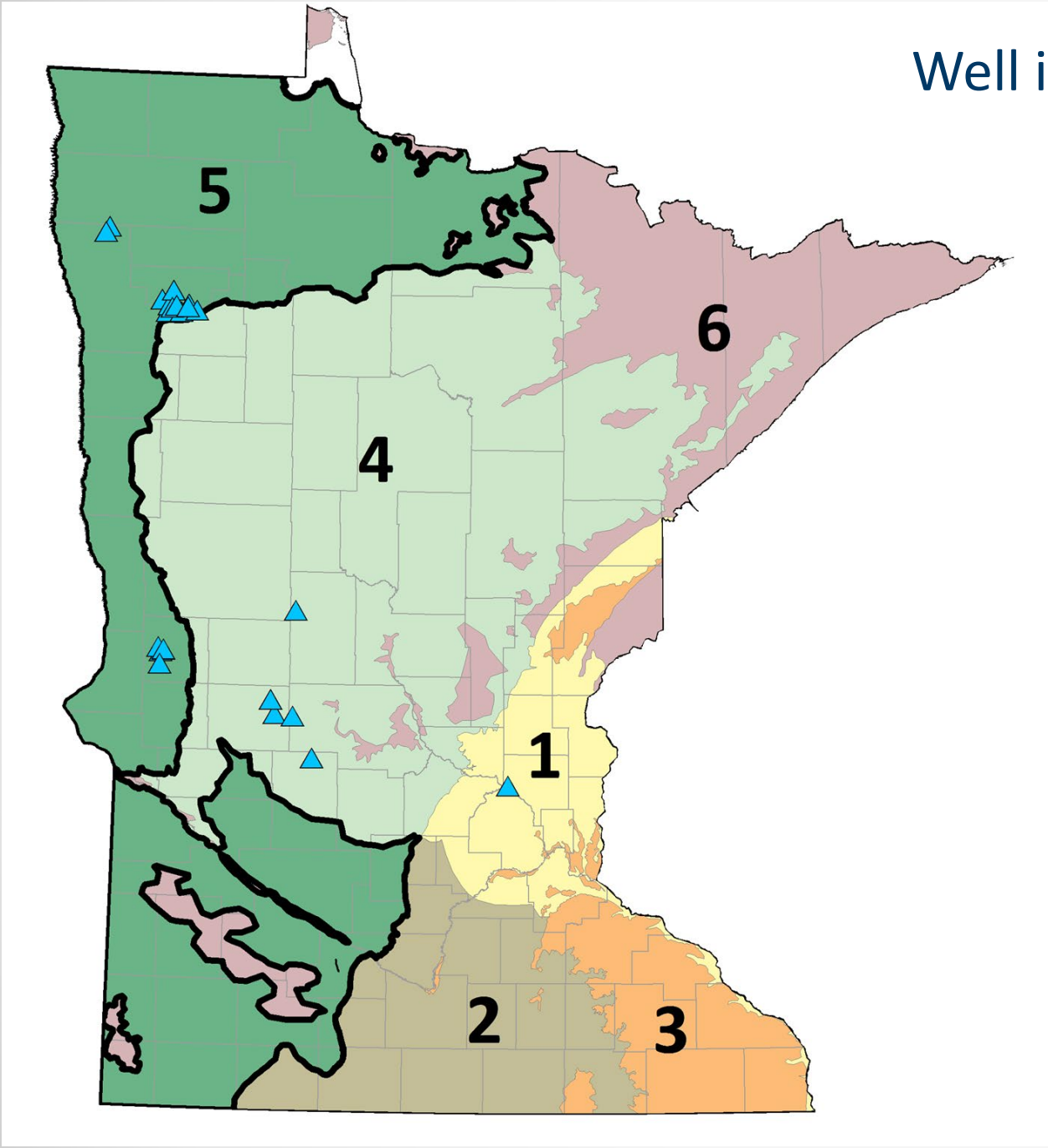
Takeaways

1. High groundwater use → well interference
2. Well interference is hardest on disadvantaged people
   - Elderly, low-income, disabled
3. Well owners don't want to complain to DNR

Groundwater in western Minnesota

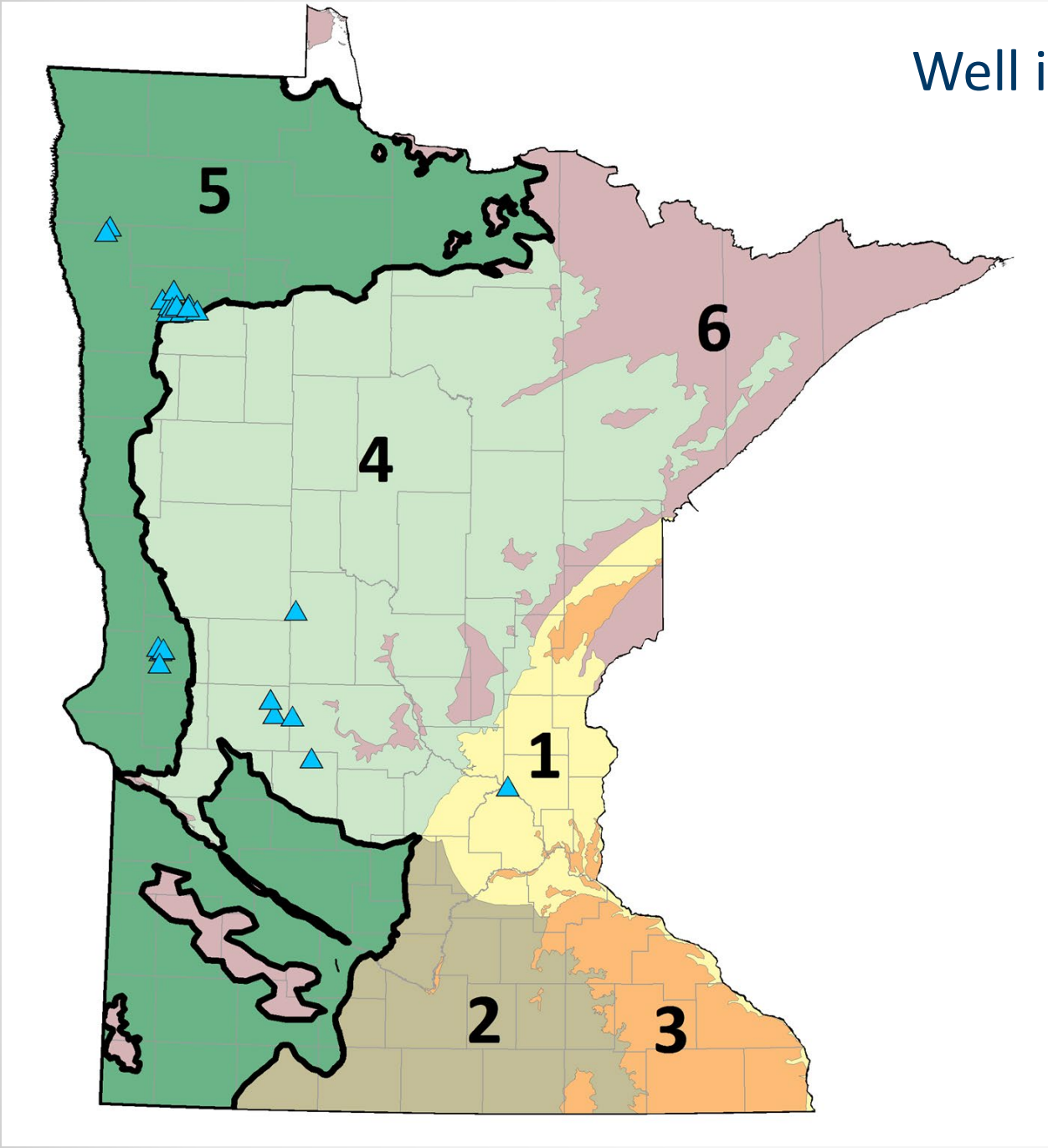


Well interference in western Minnesota



- Unprecedented groundwater use for agriculture

Well interference in western Minnesota



- Unprecedented groundwater use for agriculture
- More rigorous evaluation by DNR to prevent well interference
- More collaboration and conservation among users to leave water for future generations

Takeaways

1. High groundwater use → well interference
2. Well interference is hardest on disadvantaged people
3. Well owners don’t want to complain to DNR
4. Evaluate groundwater use carefully in western Minnesota

DEPARTMENT OF NATURAL RESOURCES

Thank you

Ellen J Considine, PG | Hydrologist Supervisor

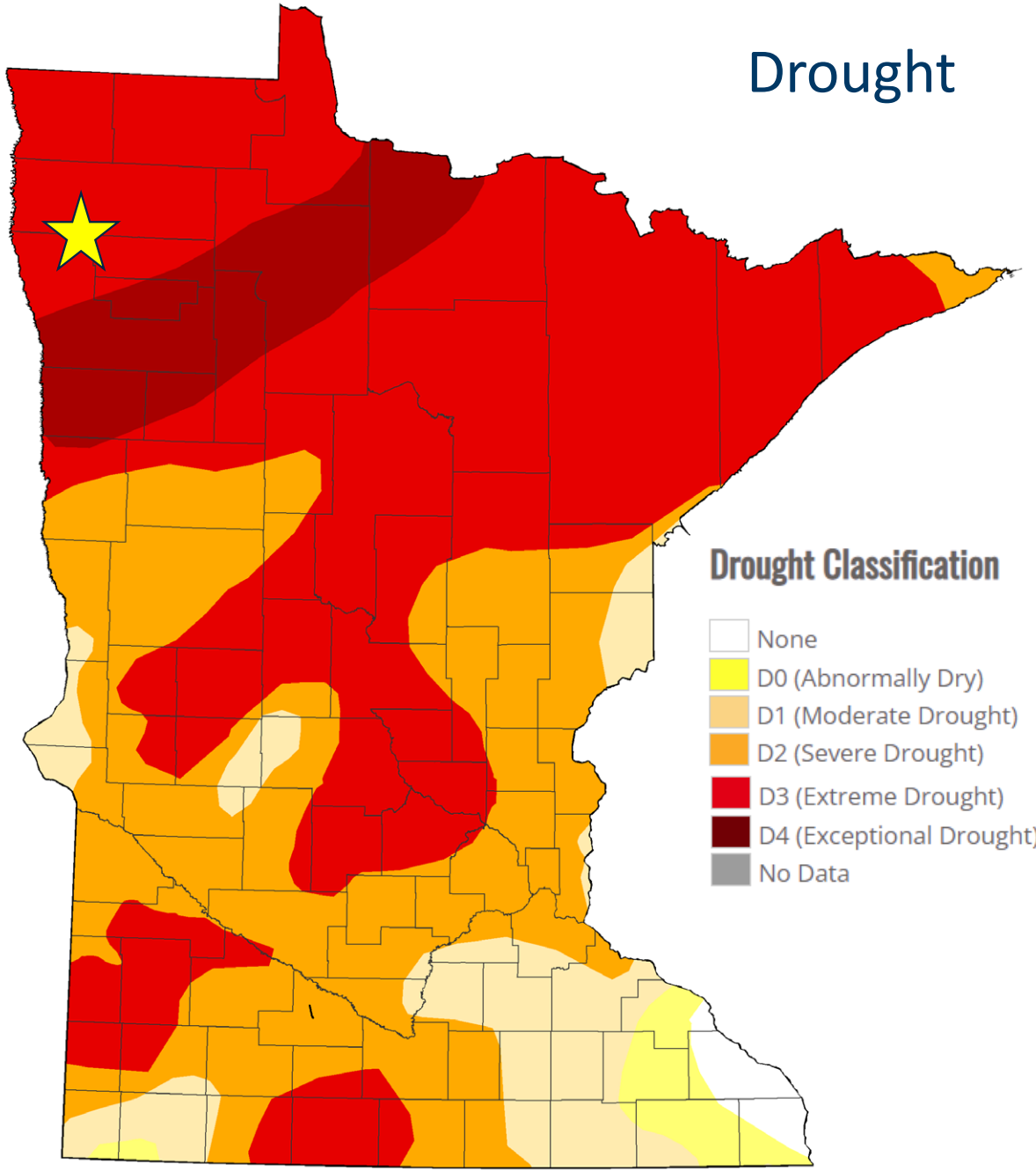
Drought and Limited Aquifers
A Case Study from Warren, Minnesota

Amanda Yourd | Groundwater Specialist

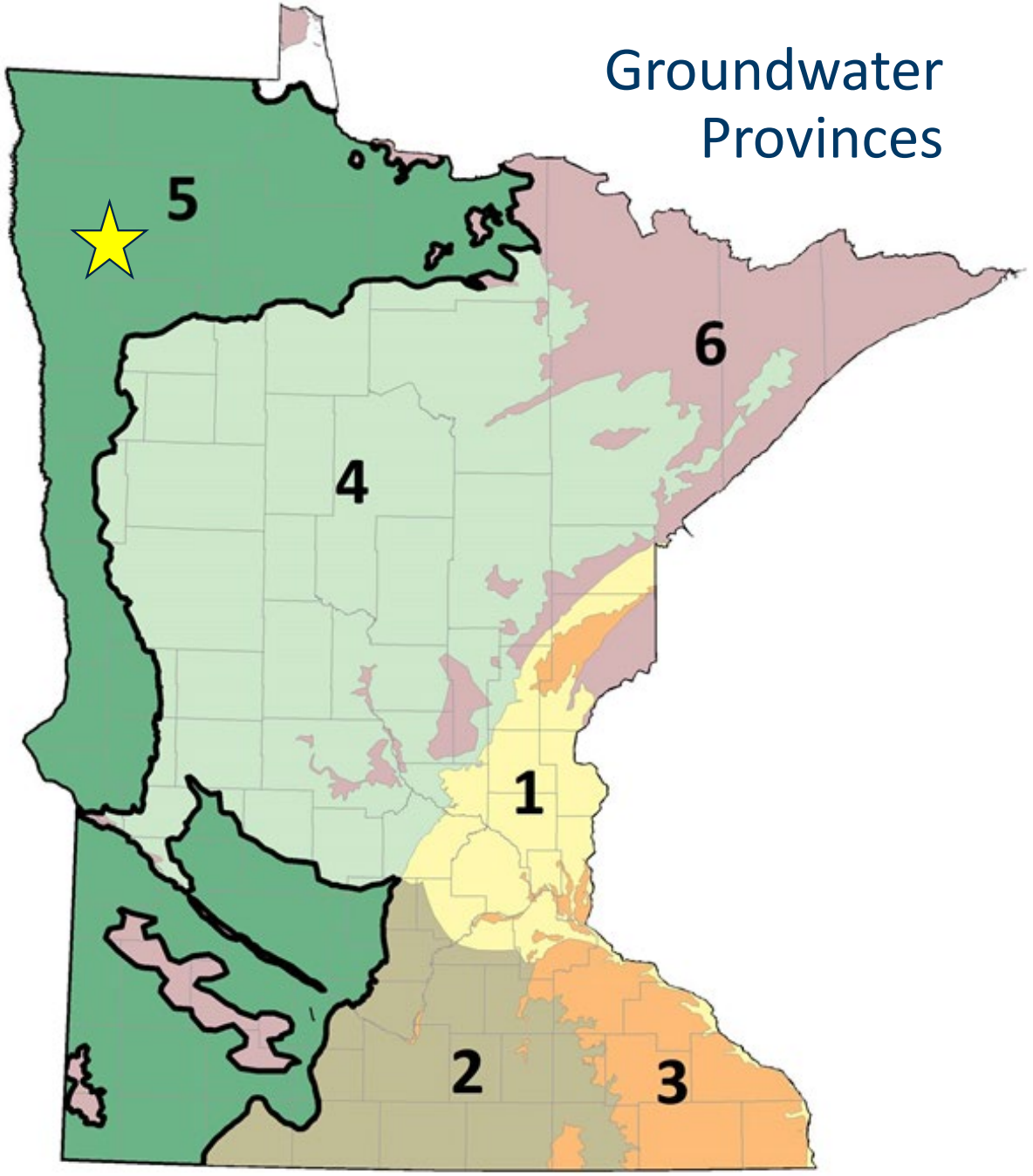
January 23, 2023

DEPARTMENT OF NATURAL RESOURCES

Drought



Groundwater Provinces



Takeaways

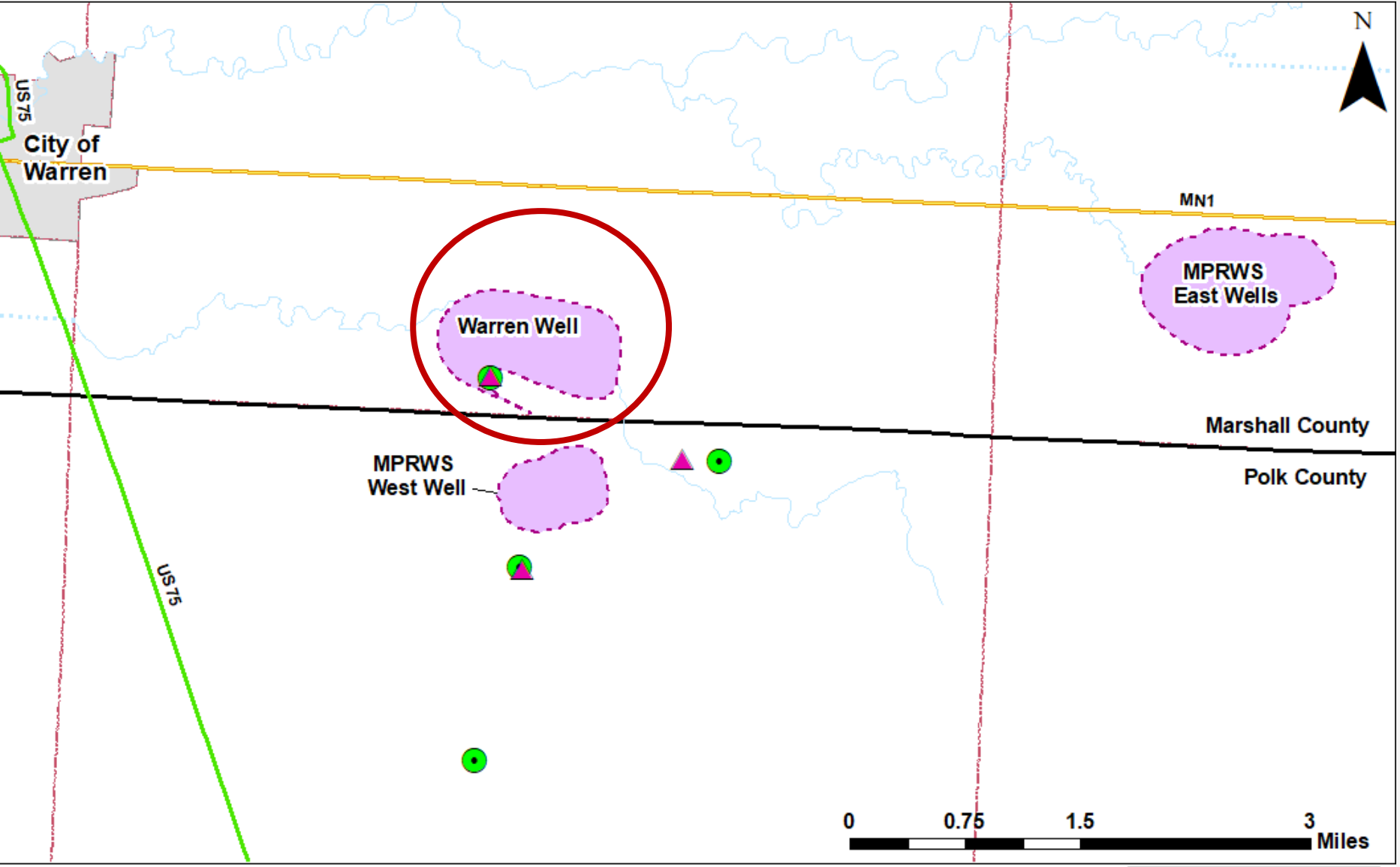
1. Water supply for over 6,000 people was threatened near Warren.

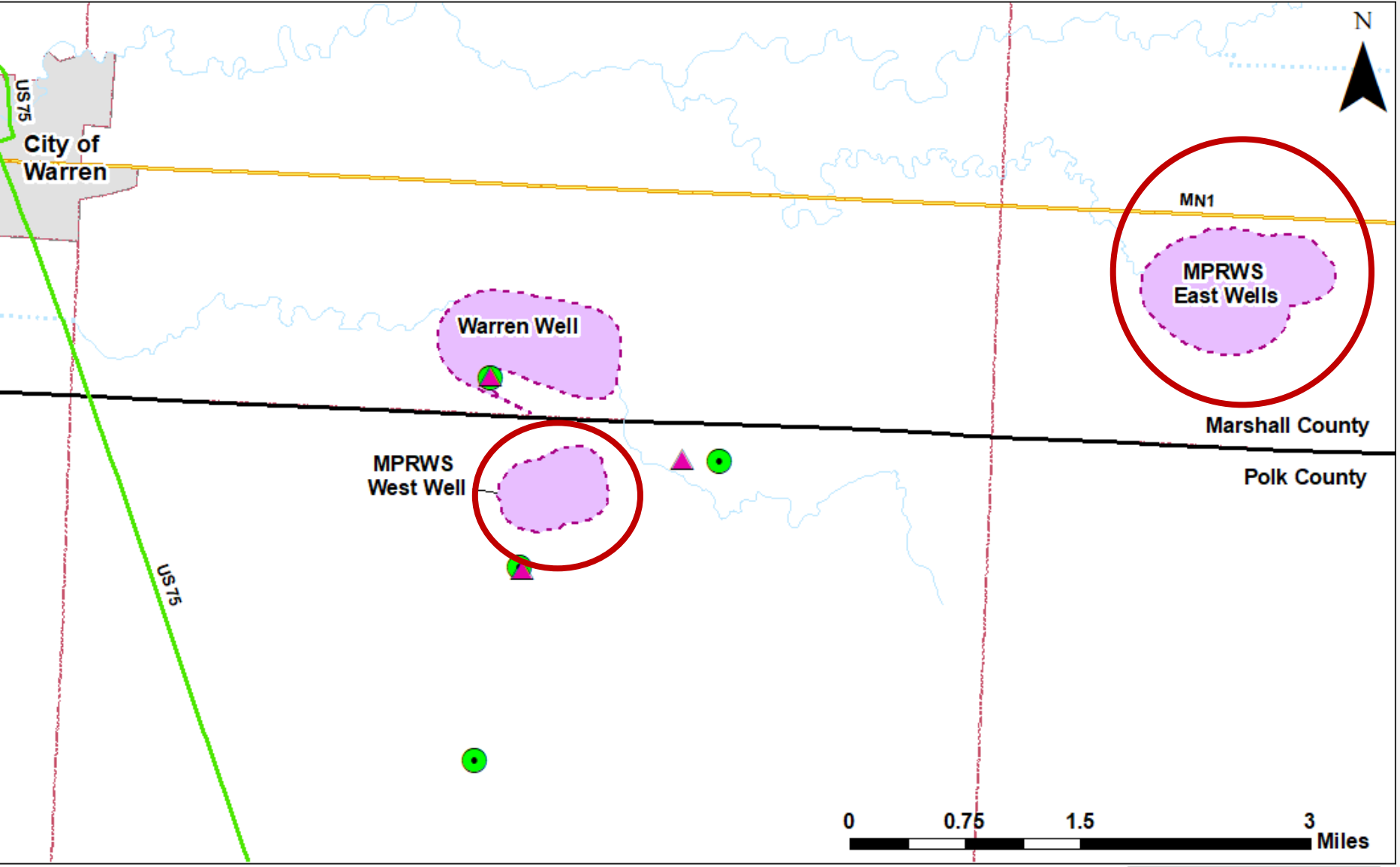
2. The Warren aquifer system is over-allocated. More water is being pumped out of the ground than is going back in.

3. Increasing use of limited aquifer systems calls for creative regulatory solutions by DNR and community of groundwater users.

Permitted Water Users

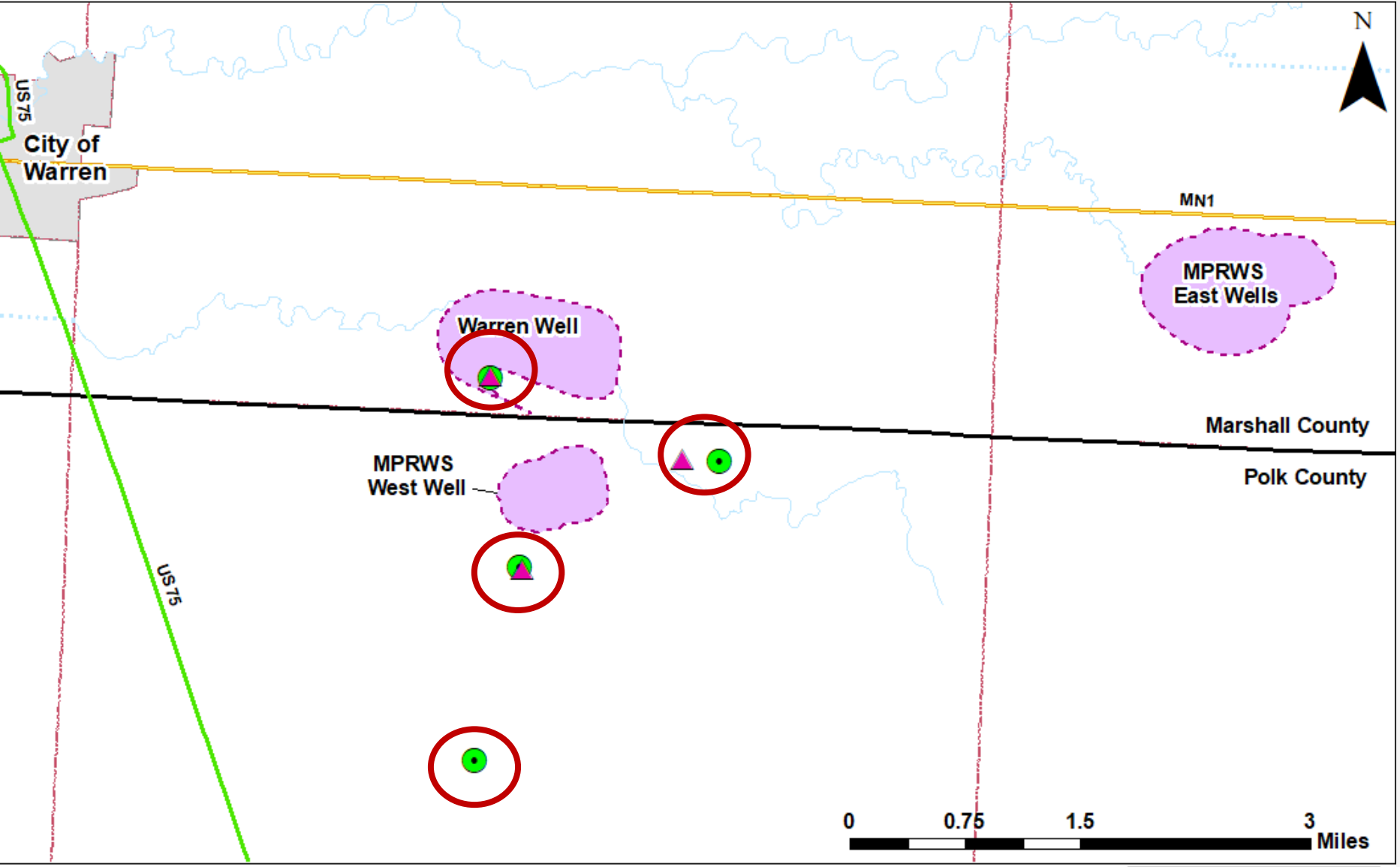
- City of Warren





Permitted Water Users

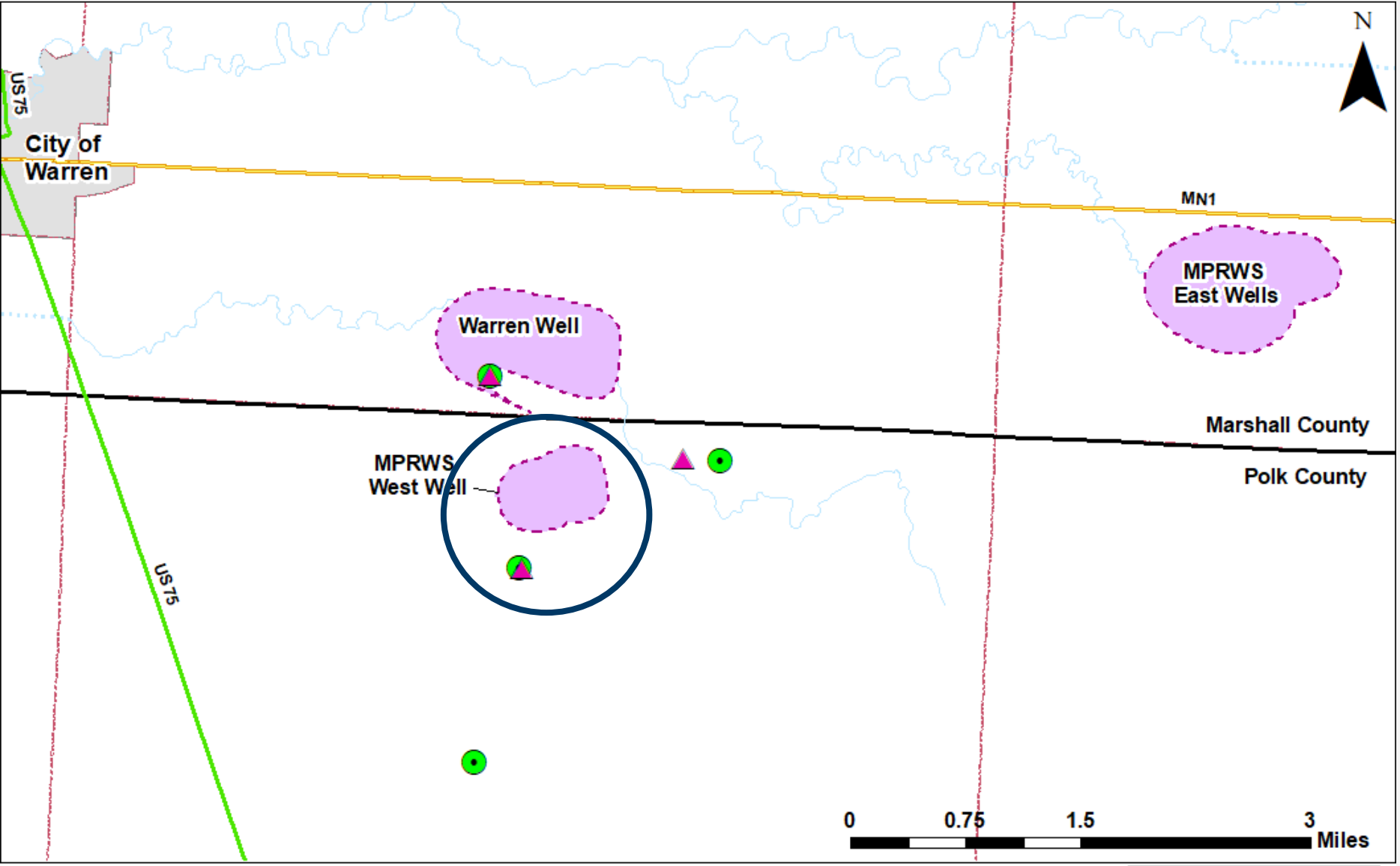
- City of Warren
- Marshall-Polk Rural Water System (MPRWS)



Permitted Water Users

- City of Warren
- Marshall-Polk Rural Water System (MPRWS)
- Four Agricultural Irrigation Permits

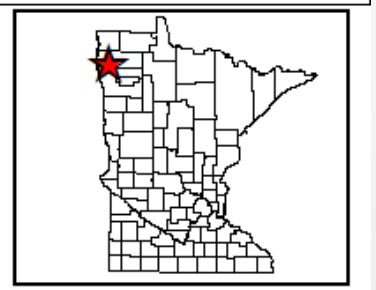
Water Levels Tell a Story



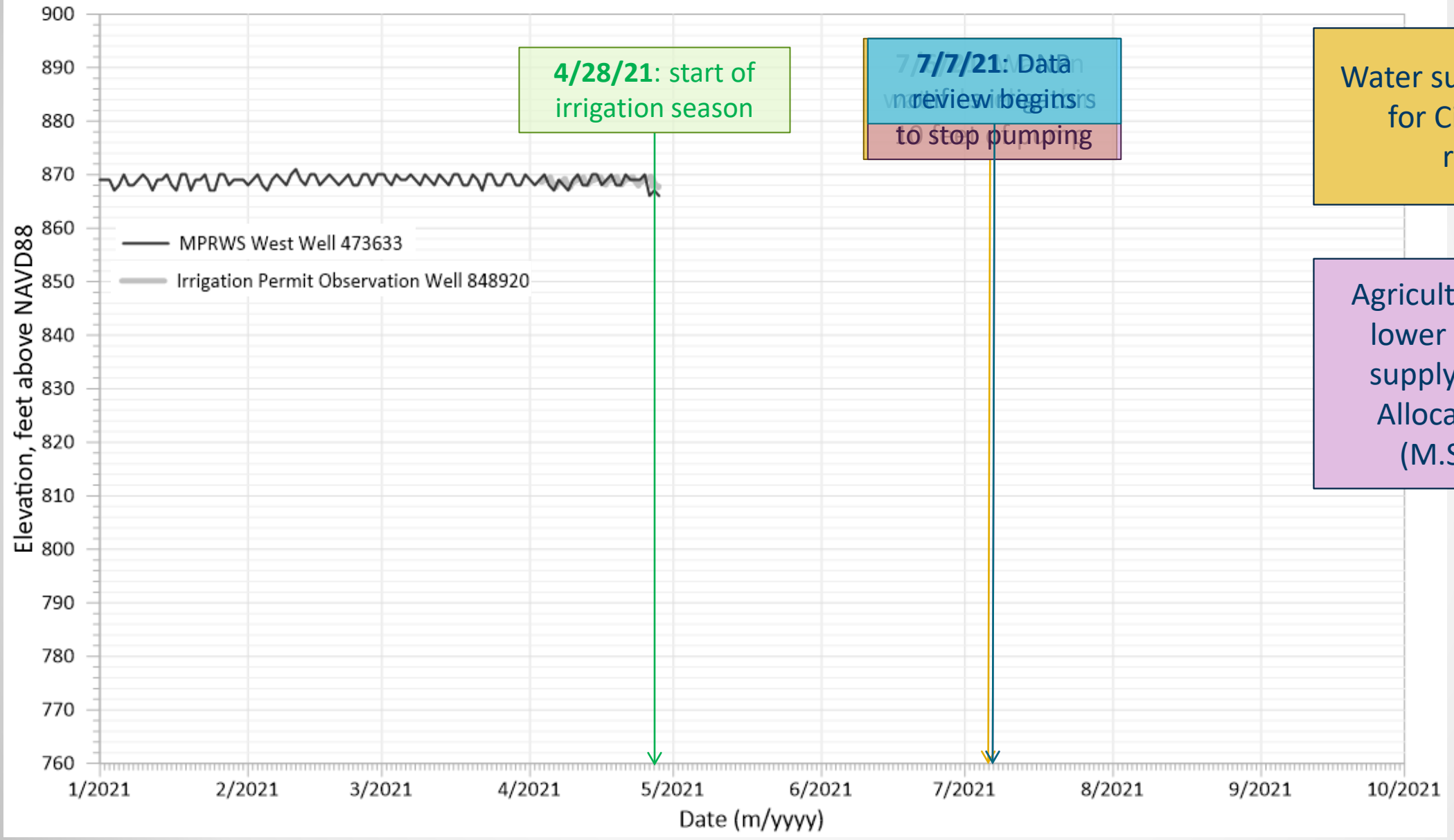
Well type

- Permitted Irrigation Well
- Permittee Monitoring Well
- Municipal Well Area
- Public Water Watercourse
- Public Ditch/Altered Natural Watercourse
- CITY
- TOWNSHIP

DEPARTMENT OF NATURAL RESOURCES



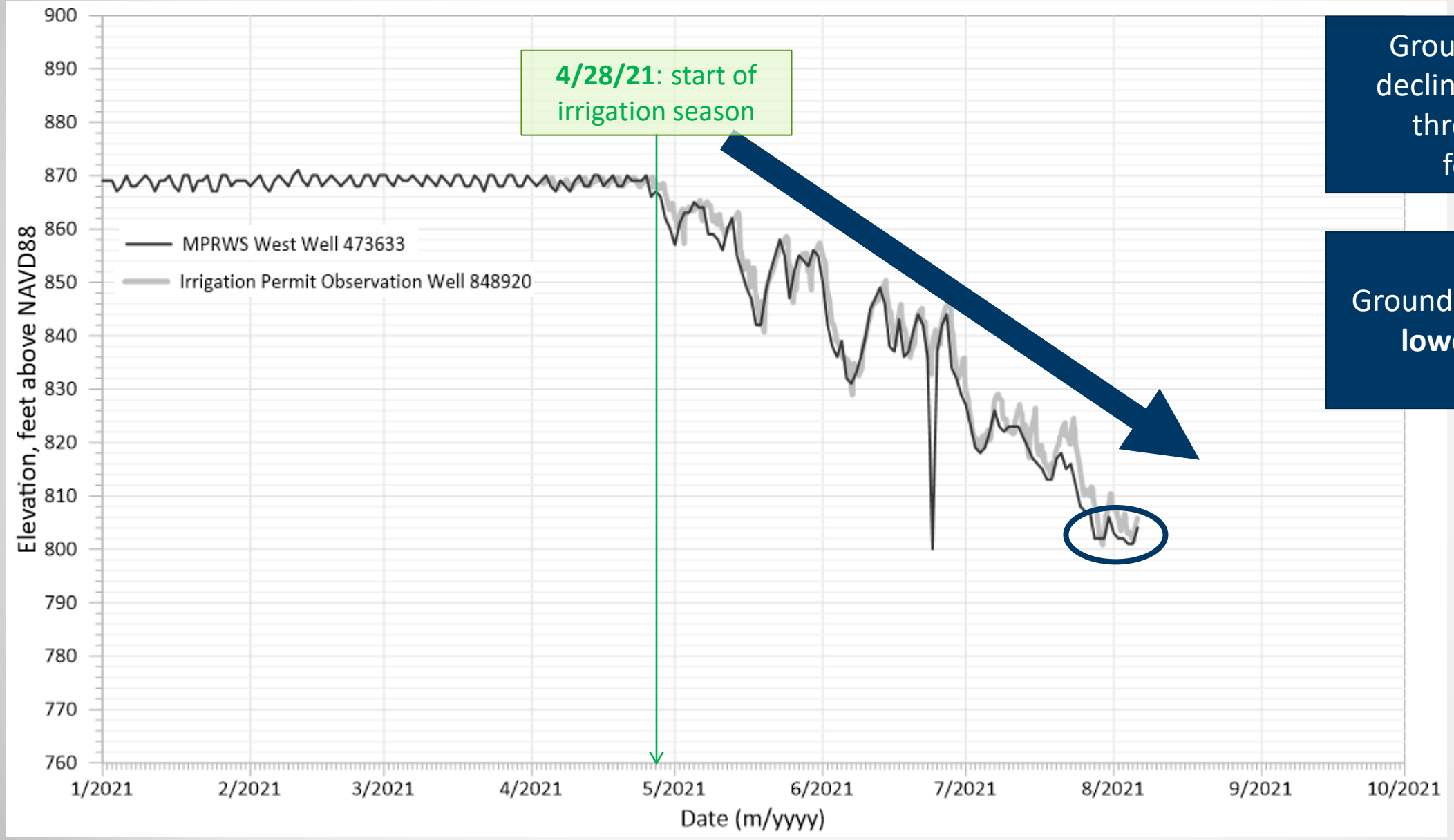
2021 Water Levels



Water supply threatened for City of Warren residents.

Agricultural irrigation is lower than domestic supply on MN Water Allocation Priorities (M.S. 103G.261)

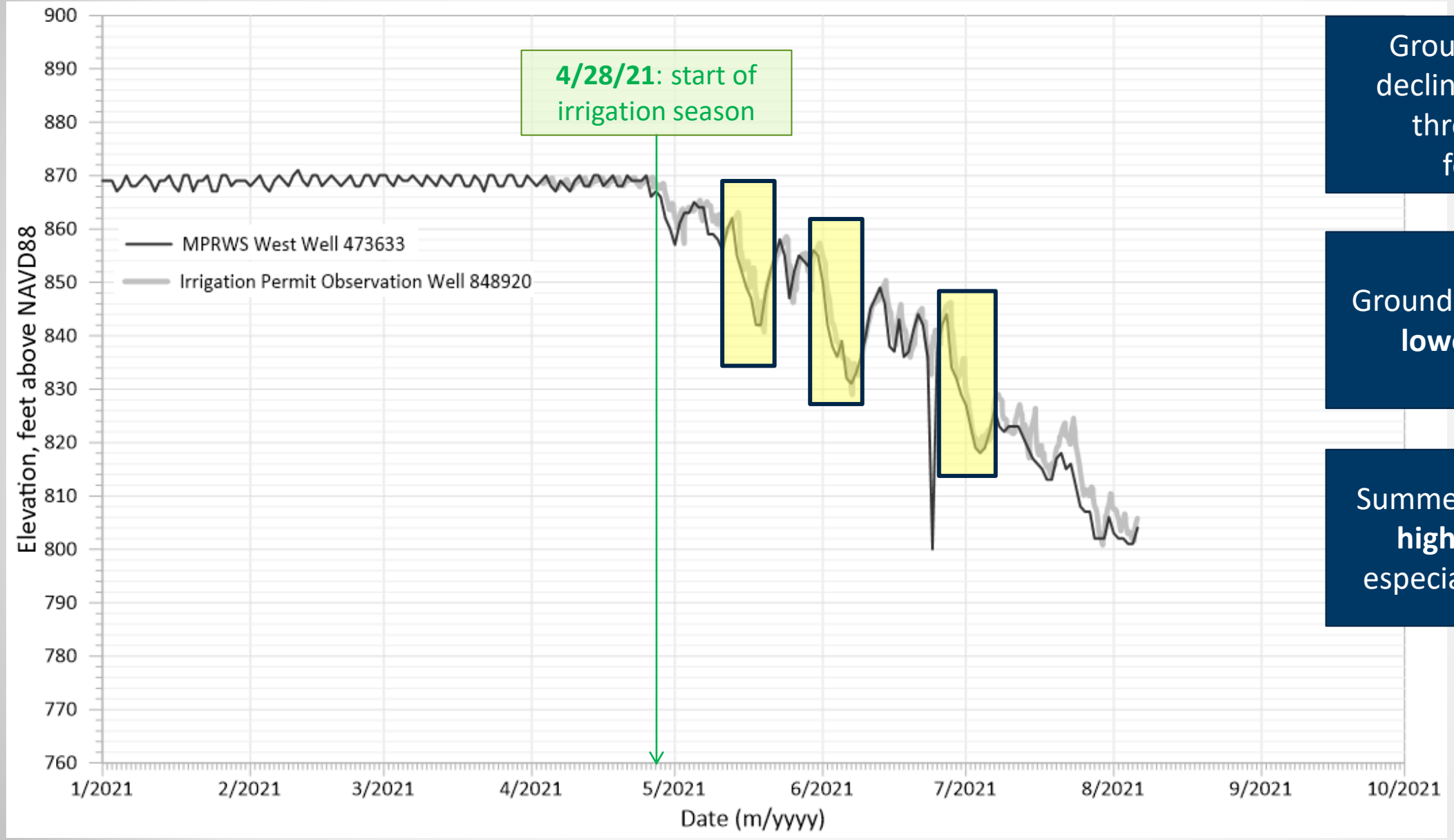
2021 Water Levels



Groundwater levels declined by 70 feet in three months (5 feet/week).

Groundwater levels were **lowest on record.**

2021 Water Levels



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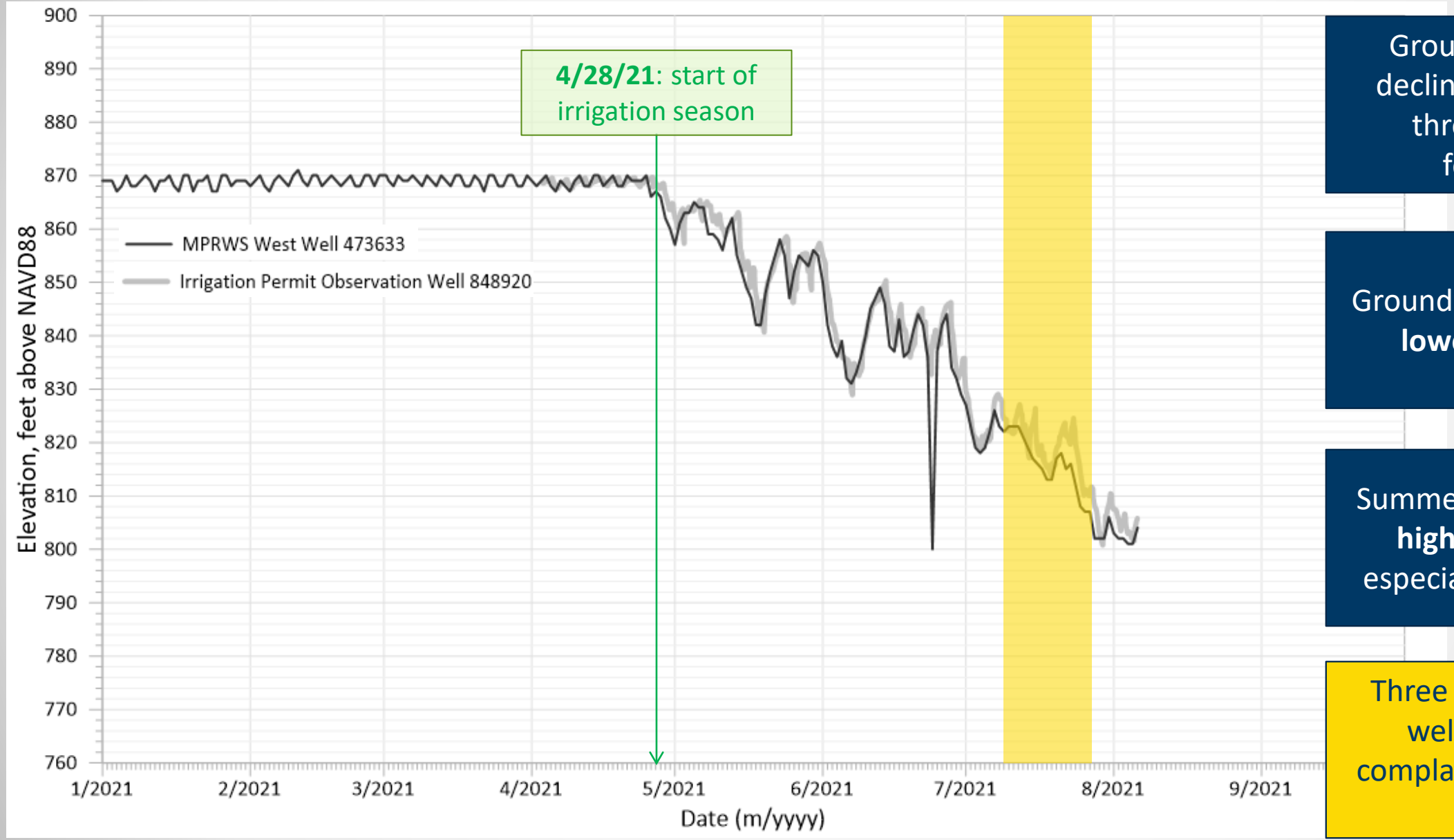
Groundwater levels were **lowest on record.**

Summer 2021 water use **highest on record**, especially for irrigation.

2021 Water Levels



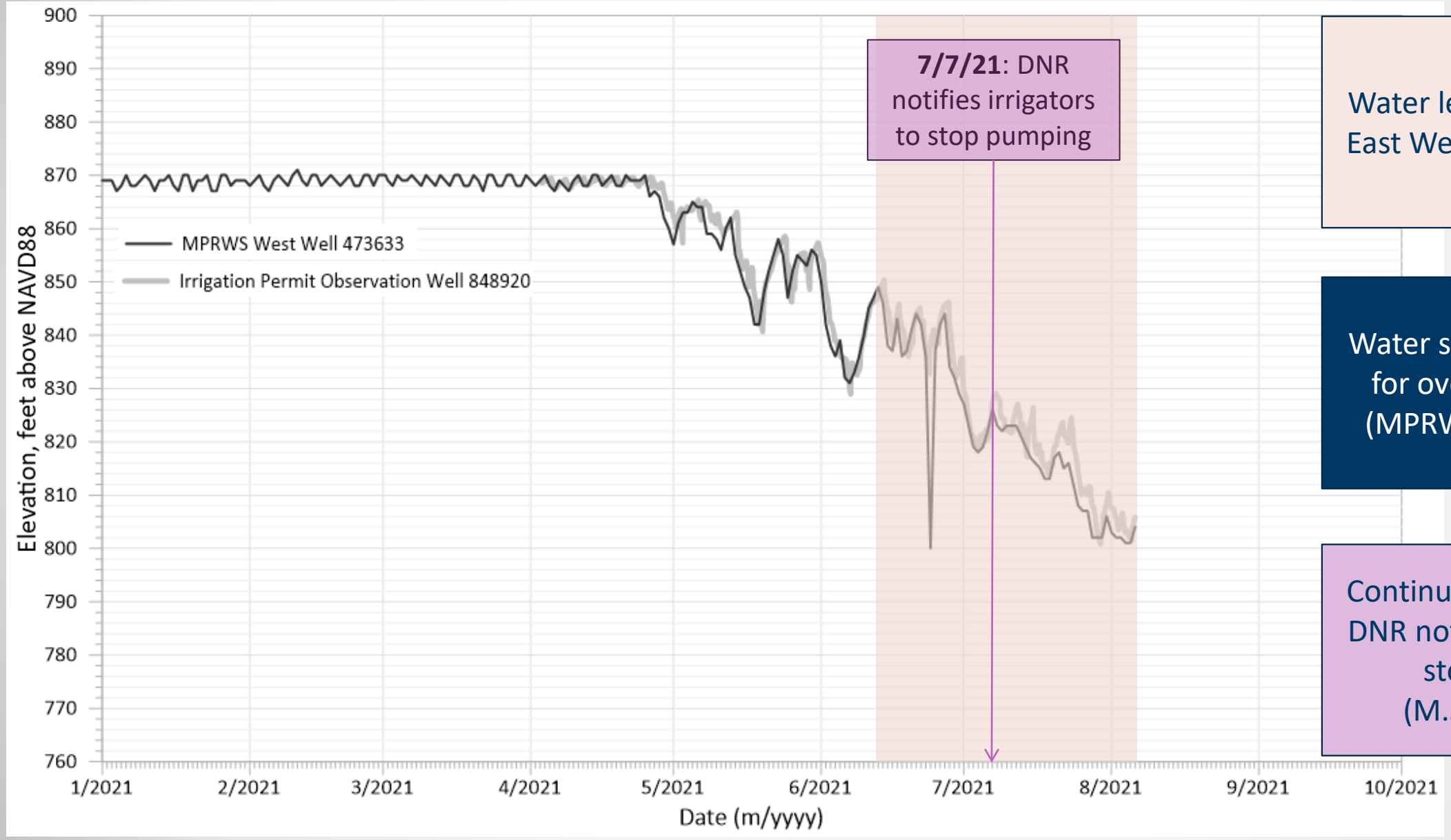
Groundwater levels declined by 70 feet in three months (5 feet/week).

Groundwater levels were **lowest on record.**

Summer 2021 water use **highest on record**, especially for irrigation.

Three verbal domestic well interference complaints submitted to DNR.

2021 Water Levels



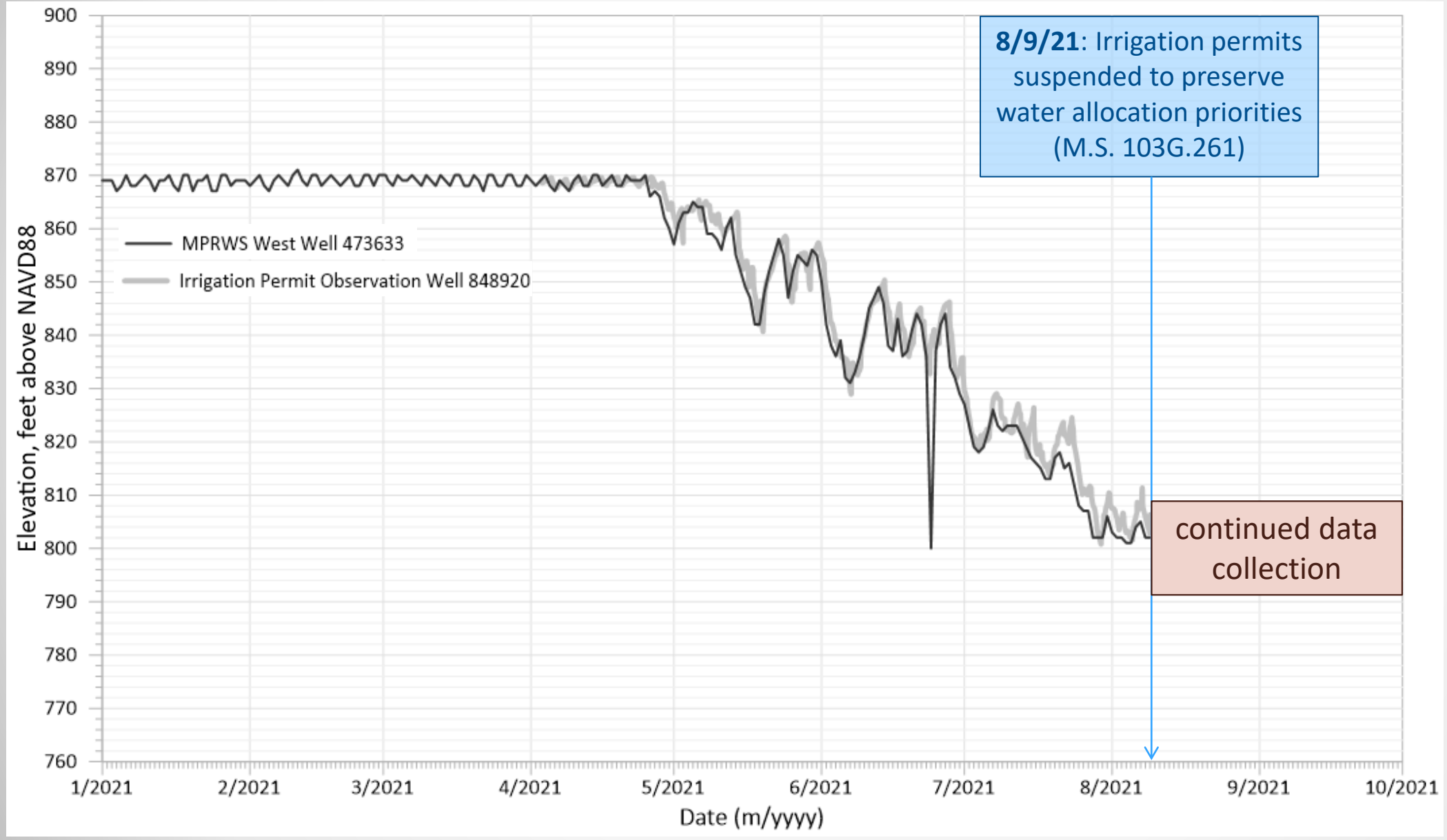
7/7/21: DNR notifies irrigators to stop pumping

Water level near MPRWS East Wellfield well pump.

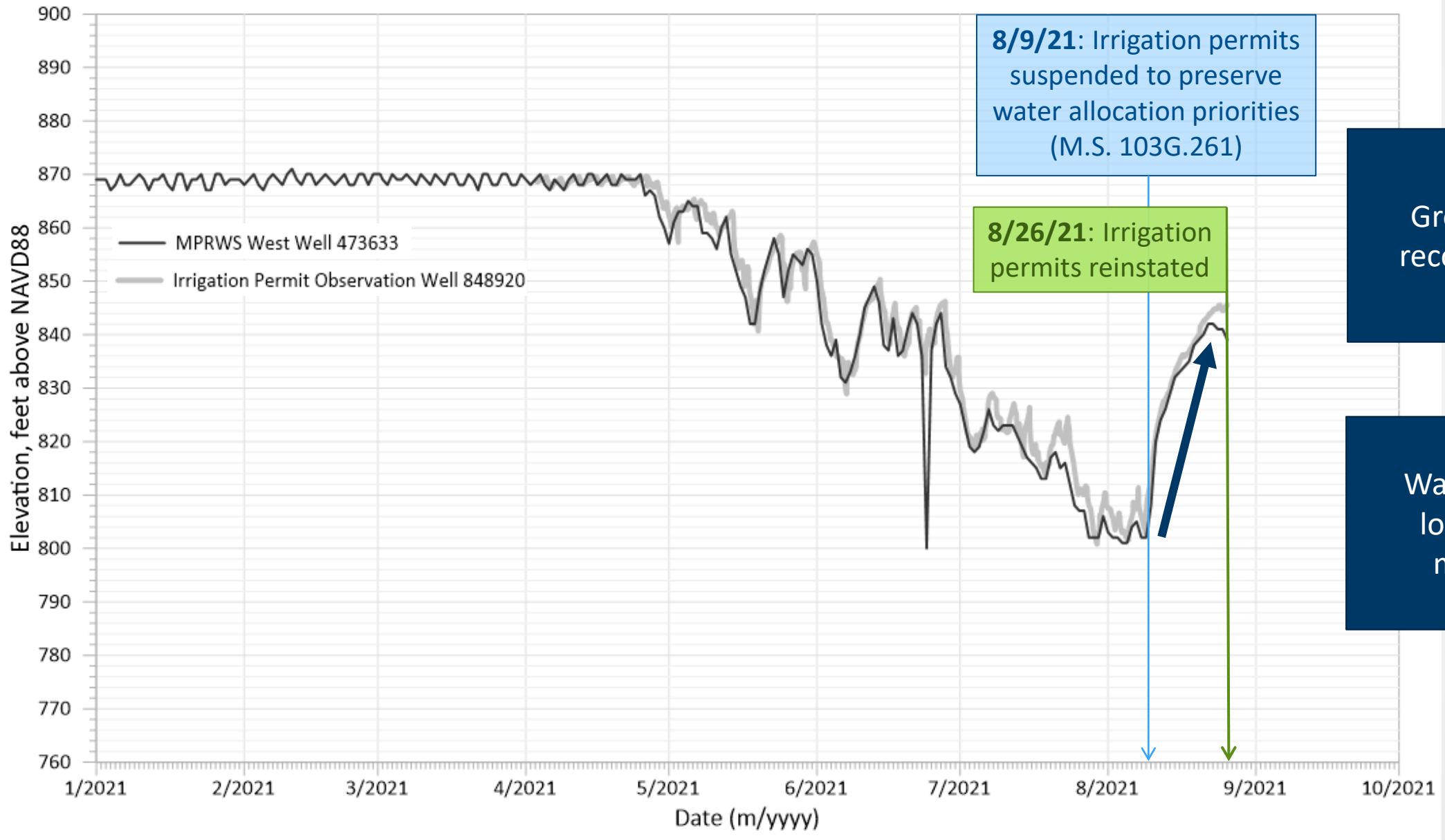
Water supply threatened for over 6,000 people (MPRWS and Warren).

Continued pumping after DNR notified irrigators to stop pumping (M.S. 103G.261).

2021 Water Levels

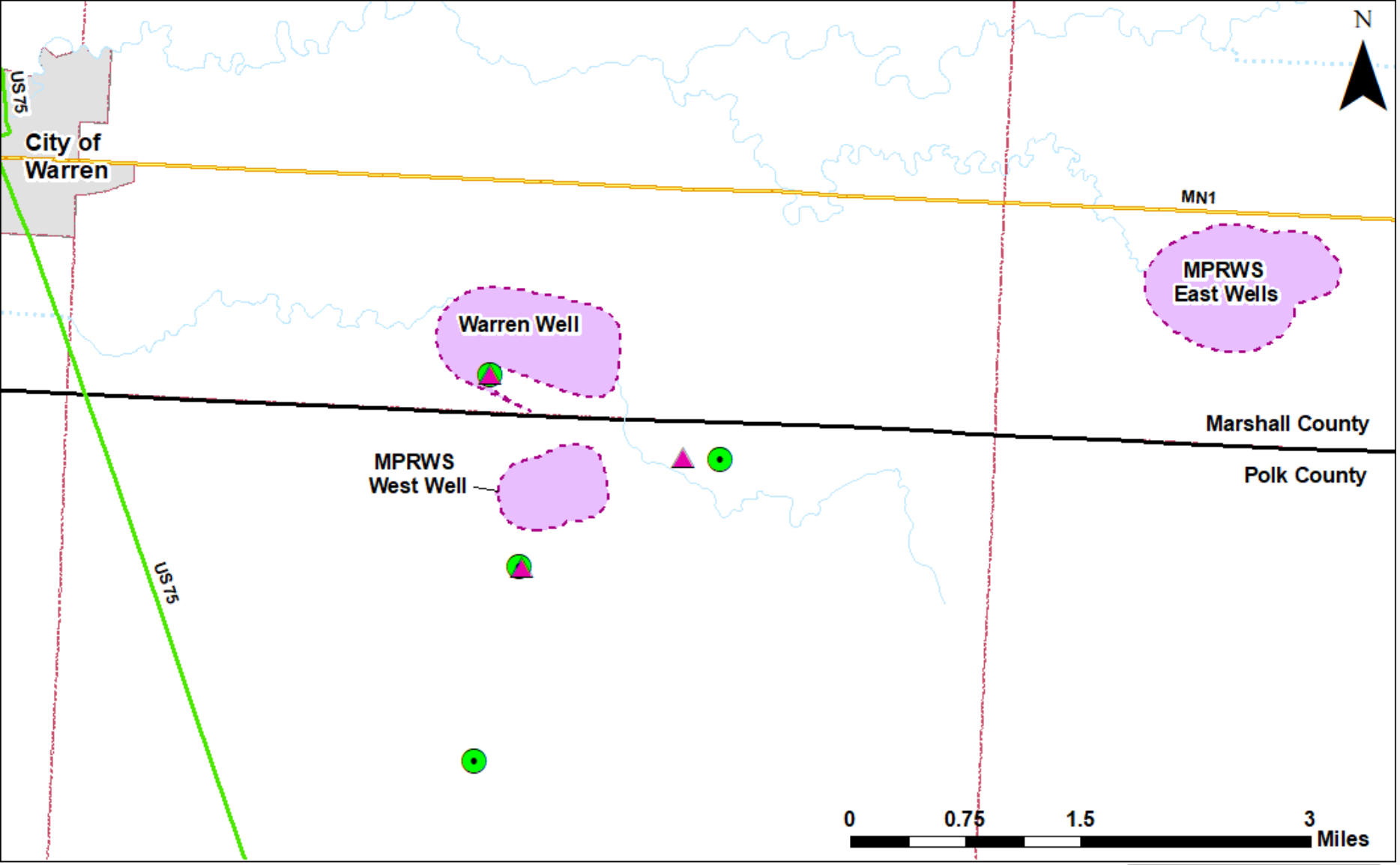


2021 Water Levels



Groundwater levels recovered by 40 feet.

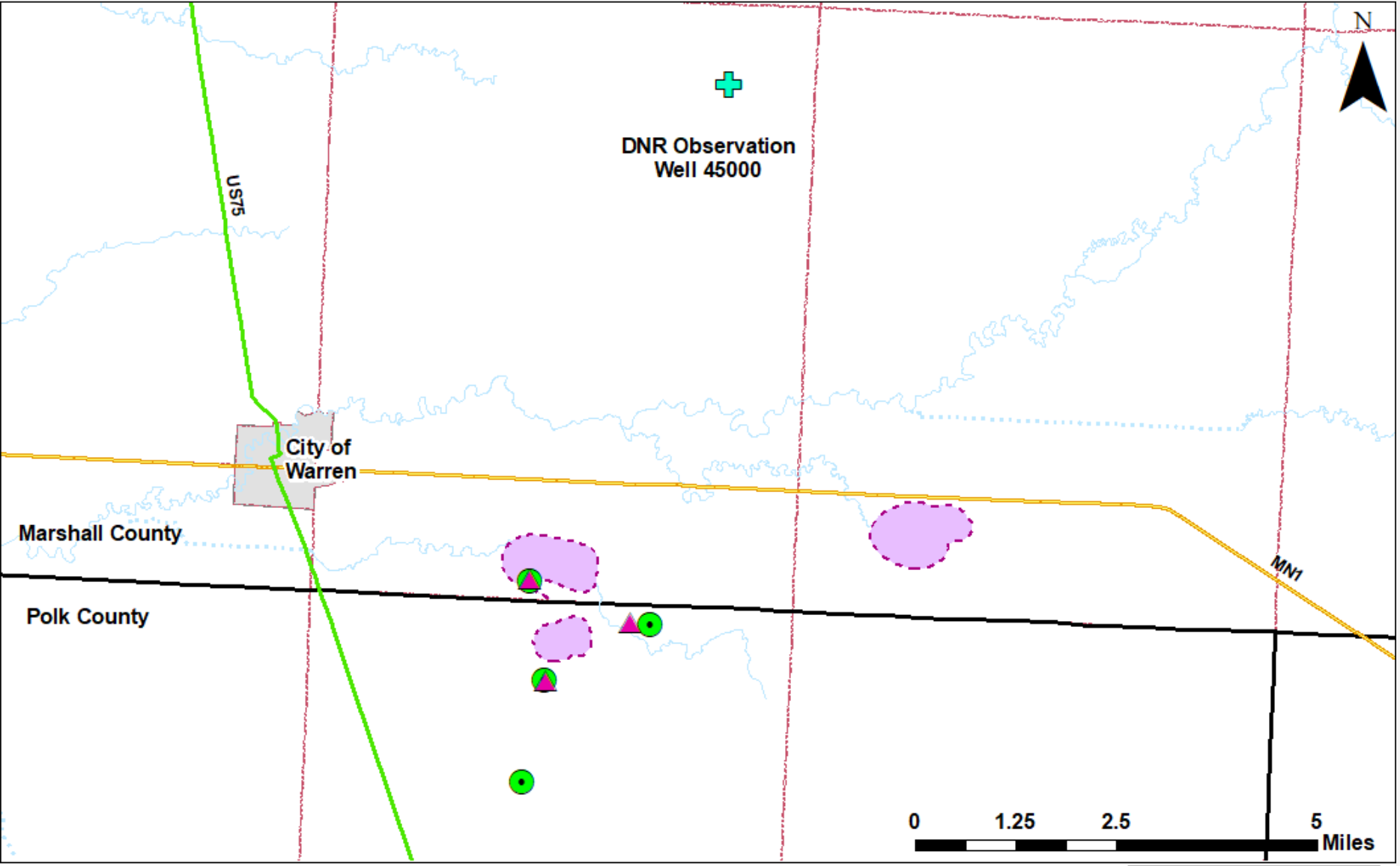
Warren and MPRWS lowered pumps in municipal wells.



What are we learning?

- All wells showed the same trends.
- One aquifer system in area.
- Aquifer system is limited.
  - Small
  - Slow to recharge

Regional view



Well type

- Permitted Irrigation Well
- Permittee Monitoring Well
- DNR Observation Well 45000 (219329)
- Municipal Well Area
- Public Water Watercourse
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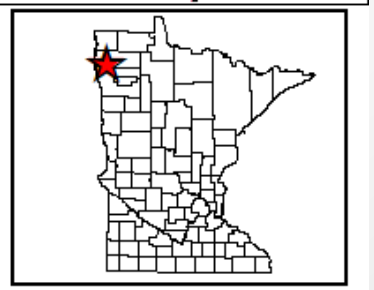
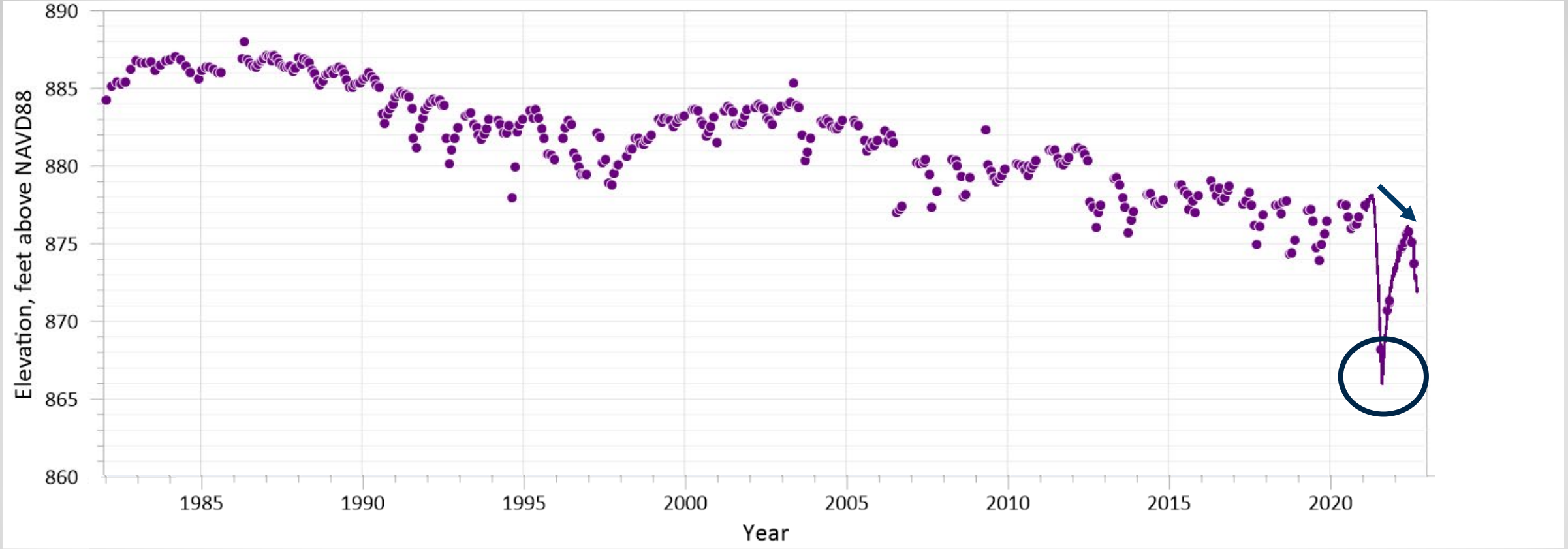
- CITY
- TOWNSHIP

DEPARTMENT OF NATURAL RESOURCES



Historic Records from DNR Observation Well 45000

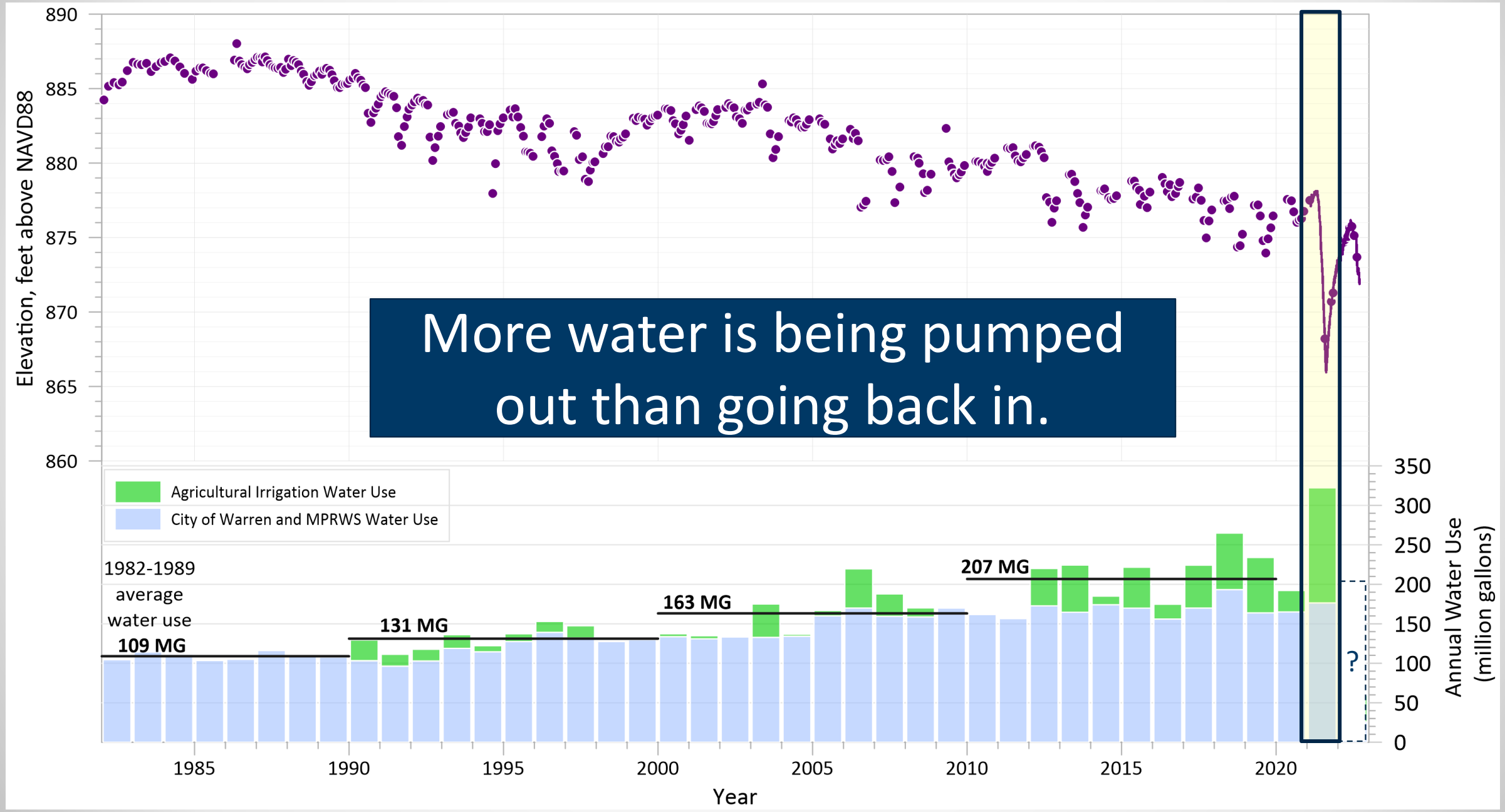


Over 10 feet of decline since 1985.

Lowest recorded levels in summer 2021.

Two to five feet of water level decline between 2021 and 2022.

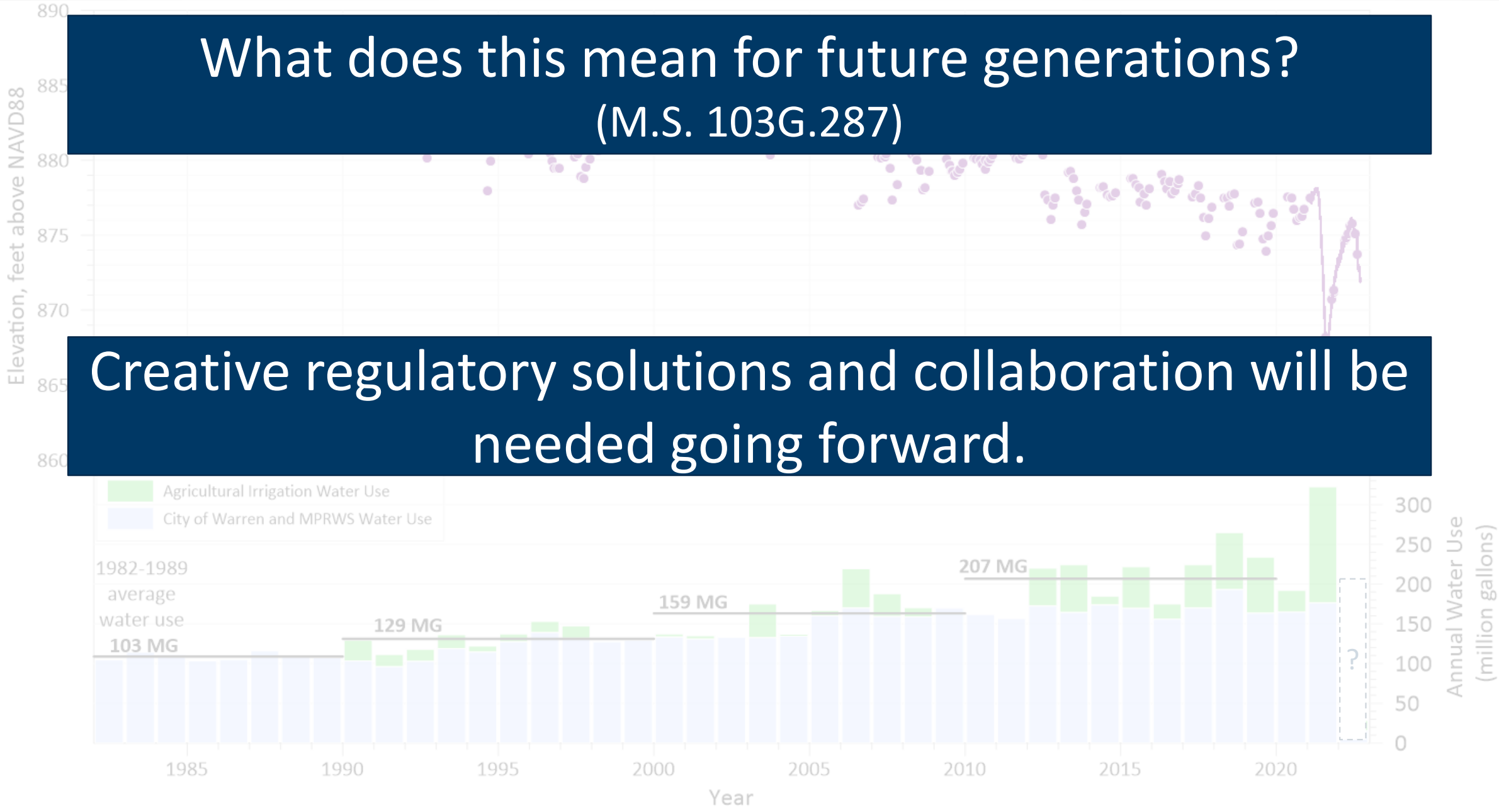
Historic Records from DNR Observation Well 45000



Historic Records from DNR Observation Well 45000

What does this mean for future generations?
(M.S. 103G.287)

Creative regulatory solutions and collaboration will be needed going forward.



Thank You!

Amanda Yourd

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612-390-1097

Water Appropriations and Permit Suspensions

Dan Miller | Water Use Specialist

Clean Water Council, January 2023

DEPARTMENT OF NATURAL RESOURCES

Water Regulations Unit
Division of Ecological and Water Resources

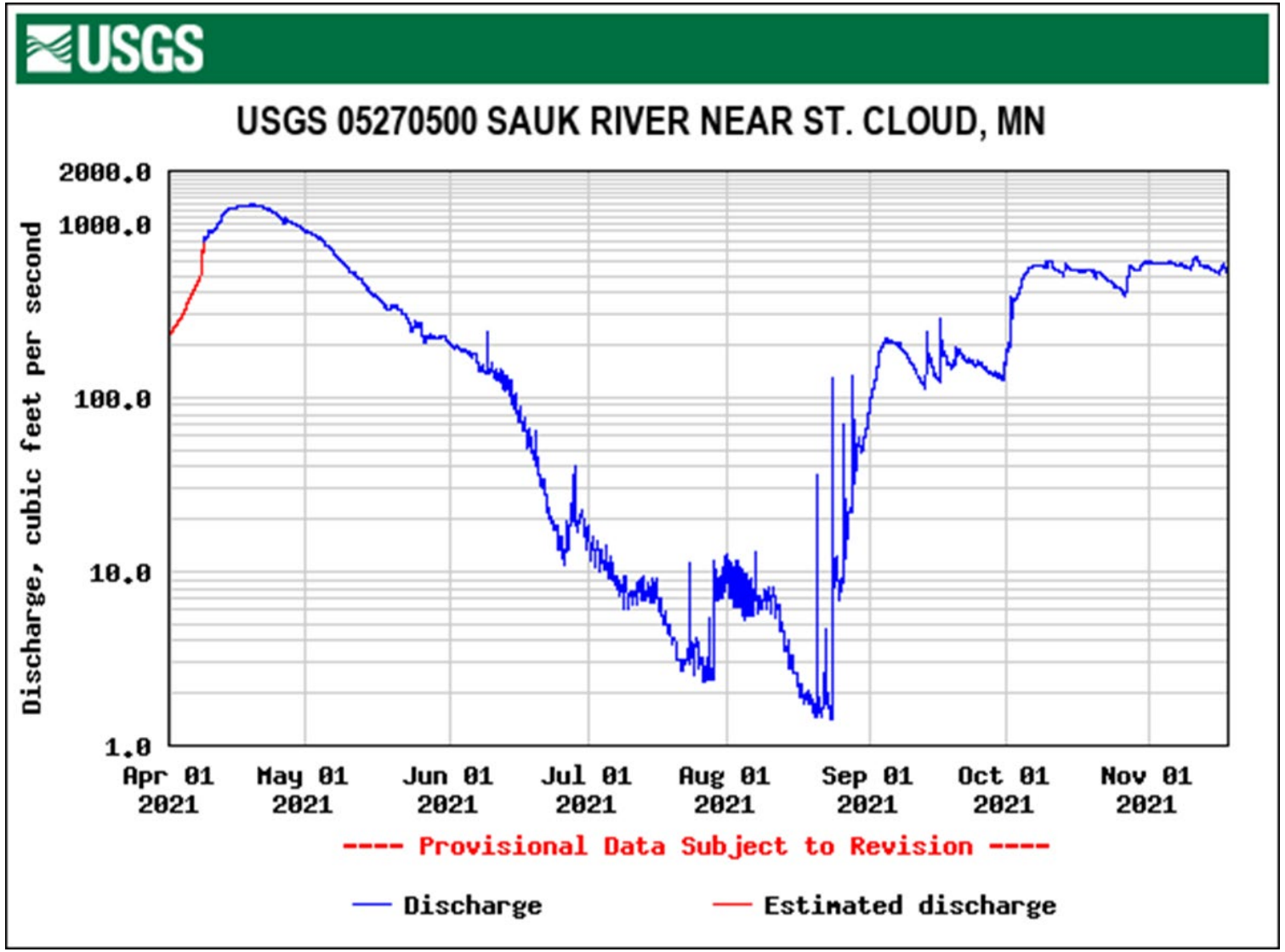
Permit Requirements

- Appropriation of surface water or groundwater
- 10,000 GPD or 1 MGY
- Protect drinking water, natural resources, current and future generations

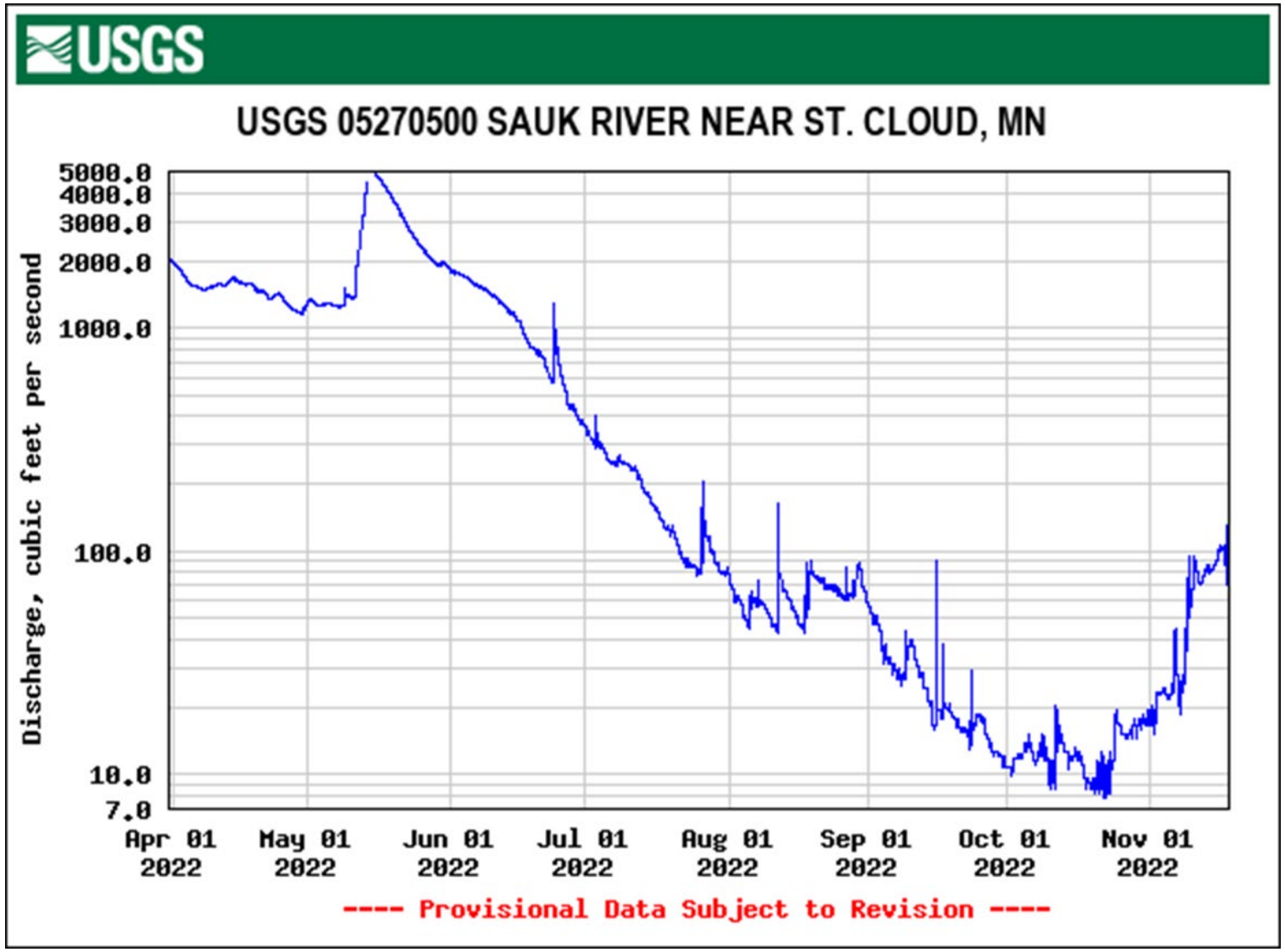
Permit Suspensions

- Watershed flows
- 248 suspended
- Rain in fall
- Flows improved

2021 Stream Hydrograph: Sauk River Watershed



2022 Stream Hydrograph: Sauk River Watershed



- Over 4,000 cfs in late May
- Between 10 - 20 cfs in fall
- Median 140 cfs
- Compounding dry periods

Responding & Adapting

- Suspension for Ag. Irrigation
- Stressful Situation
- Collaborative Solution

Thank you!

dan.w.miller@state.mn.us
651-259-5731

DEPARTMENT OF NATURAL RESOURCES

When in Drought Save Water

Carmelita Nelson

DNR - Water Conservation Consultant

Drought Phase Conservation Requirements

Non-drought → Watch → Warning → Restrictive → Emergency

Implementation of Water Conservation Measures

- Limited customer lawn watering
- City parks watered every 4 days, golf course every 2 days
- Reduced splash pad hours
- Shut down all city irrigation systems except for a few ballfields
- School district turned off irrigation until mid-August
- Contacted 10 largest users, all HOAs
- Banned bulk water sales; theft

- Rebate programs for water saving appliances and devices
- Implemented rate increases for high water users
- Reduced system water loss
- Water saving door hangers/mailings
- More cities are moving to AMI/smart meters – can notify excessive water users

Challenges Meeting Demand

- Many cities saw their highest peak demand days ever in June/July 2021. Some near maximum pumping capacity.
- Drought caused increased water main breaks
- Some cities had to use interconnections with other cities to meet demand
- Complaints about high water bills—showed them the data
- Well drillers struggled to keep up with demand for water; shortage of pumps

Utility Staffing

- Drought response activities may take priority over other routine tasks and maintenance and can increase staff workloads.
- Overtime expenses may increase, which can impact the budget.
- During a drought, utility staff may need to:
  - Respond to increased customer calls.
  - Enforce water restrictions and respond to variance requests.
  - Communicate regularly with local media and the public.

Rural Water Systems felt the Strain

- Lincoln Pipestone Rural Water asked all 36 member cities to conserve water in June 2021. Many of these cities set restrictions on non-essential water use.
- The water system's service area includes Lac qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Rock, Yellow Medicine and Jackson counties.

Lincoln Pipestone RURAL WATER

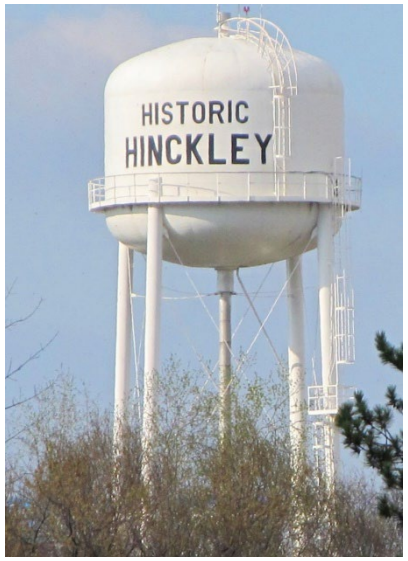
- The city of Lynd announced a water ban on watering lawns or gardens, washing cars or filling pools.
- Many feedlots and ag producers rely on rural water systems too.
- Vulnerabilities are not always obvious until tested by a drought.

Zimmerman

- 5 Days straight – Low Level Tower Alarms continually running
- Door hangers for violators
- If a citizen complained about the cost of a watering fine, the city would reduce it by 50% if the homeowner toured the water treatment plant to learn about the issues

Experiences and Lessons Learned

- Need to align water supply plans with drought plan
- Continue to drive demand down, even in times of abundance
- Compliance and enforcement can be challenging - may need to pivot messaging as drought gets worse
- Expect the unexpected and plan for worst-case scenarios



- May need incentives for redevelopment of landscapes to be more waterwise
- Look to energy sector example of comparing usage with neighbors
- Important to set reasonable target – cities need to balance budgets

Thoughts for the Future

- Reduction of lawn irrigation and an increase in drought tolerant species.
- Partnership is key to expanding programs and changing landscapes
- Need more demand reduction in residential and business sectors
- Irrigation meters for commercial and multifamily properties
- Investing in water saving rebate programs helps manage demand
- Consider EPA WaterSense fixture requirement for new construction
- More recycled water
- More *water is life* and *every drop matters* ethic - Long-term success requires buy-in

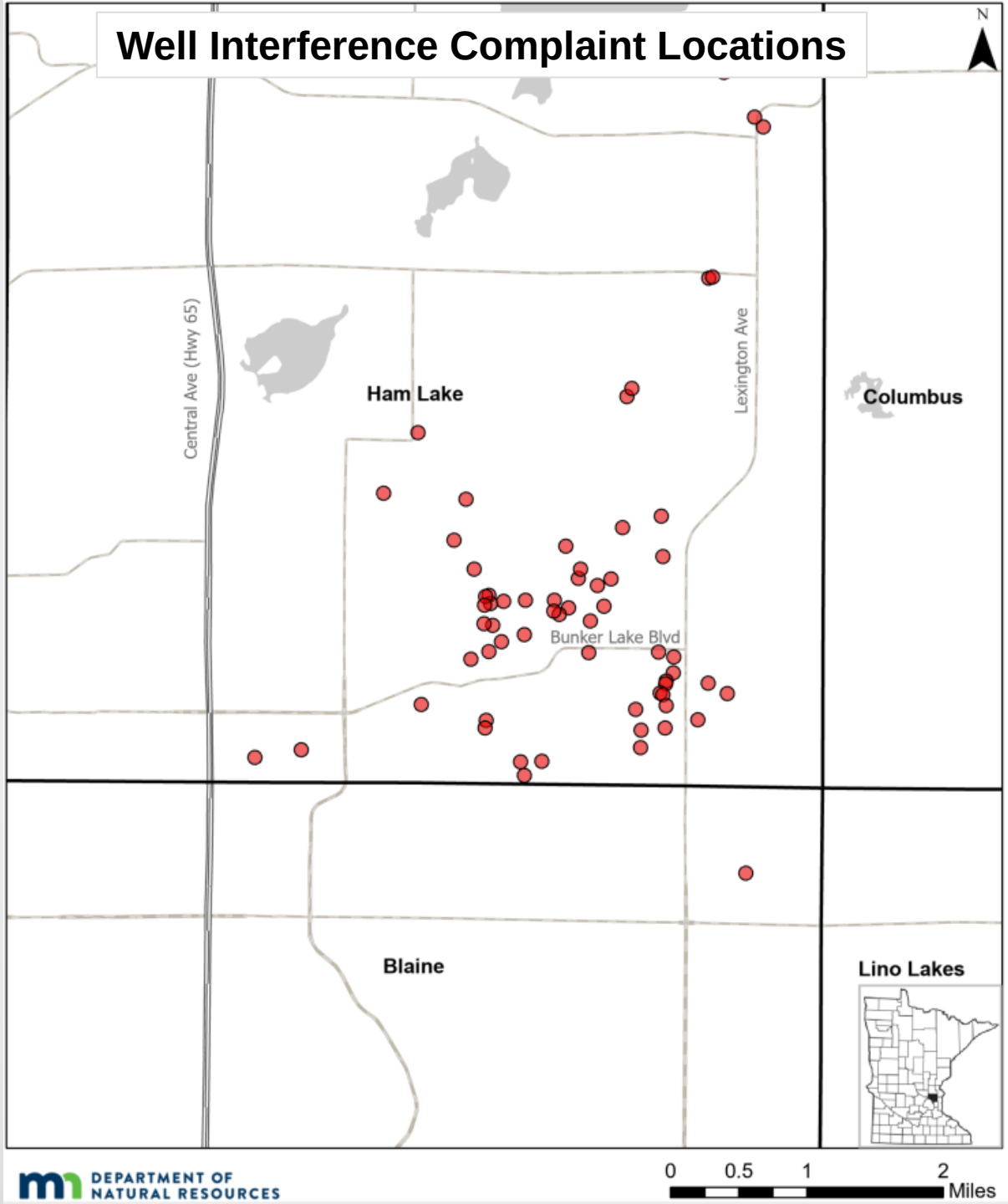
DEPARTMENT OF NATURAL RESOURCES

Thank you

Carmelita Nelson

Carmelita.nelson@state.mn.us

Since the drought….



Ongoing Well Interferences in Anoka County

- 65 Complaints in 2022.
- Unpermitted pumping by the City of Blaine.
- DNR is currently investigating.

Drought Relief Funds

- Budget to Move Minnesota Forward $13.35 million to adverse effects of the 2021 drought
  - Water
  - Trees
- $300,000 funding for well interferences

After Action Report

- Lessons Learned: Successes, Improvements and Actions
  - Communications
  - Drought Plan
  - Well Interferences
  - Permit Suspensions
  - Water Conservation

Drought Plan Revision

- Move forward with drought plan revision in future
- Lessons learned, and actions from After Action Report
- Add new components: mitigation strategies, vulnerability assessment, hazard profile
- Subjective language in plan
- Watershed basin scale
- Stakeholder engagement

Thank You!

Pooja Kanwar – Water Policy Consultant	poojakanwar@state.mn.us
Luigi Romolo – State Climatologist	luigi.romolo@state.mn.us
Ellen Considine –Hydrologist Supervisor	ellen.considine@state.mn.us
Amanda Yourd – Hydrogeologist	amanda.yourd@state.mn.us
Dan Miller – Water Appropriations Consultant	dan.w.miller@state.mn.us
Carmelita Nelson – Water Conservation Consultant	carmelita.nelson@state.mn.us

TAKING NOTE: KEEPING TRACK OF IMPORTANT IDEAS FOR THE CLEAN WATER COUNCIL

This is a note taking tool that will help Clean Water Council members keep track of important ideas offered during presentations given to the Council.

Please Return to CWC Staff after the Meeting

Topic: **Minnesota Drought of 2021** Date: January 23, 2023

What are some of the key ideas being offered by the presenters?

-
-
-
-
-
-
-

How do these ideas relate to the work of the Clean Water Council?

- ➢
- ➢
- ➢
- ➢
- ➢

What are key questions you have about the ideas presented?

- ❖
- ❖
- ❖
- ❖
- ❖

What are some possible actions the Council should take as a follow-up to this presentation?

- ✓
- ✓
- ✓
- ✓
- ✓

Do you want more Information? Yes____ No_____

Short-term follow up? ☐ Long-term follow-up ☐