

2025 Groundwater Areas of Concern

Minnesota's groundwater is not distributed evenly across the state. Some parts of the state, like Groundwater Province 1 in the Metro Area, have relatively abundant groundwater. Conversely Groundwater Province 5 in the west has limited groundwater, and Groundwater Province 6 in the northeast has very scarce groundwater. But even where groundwater is more abundant, high rates of groundwater use can damage ecosystems or cause domestic well interference.

The DNR is responsible for managing groundwater use in Minnesota so that it is sustainable, meaning that the use does not harm ecosystems, leaves water for future generations, does not degrade water, and does not reduce water levels beyond the reach of drinking water supply wells. There are some places in Minnesota where the DNR is concerned about the sustainability of groundwater use, either because of limited groundwater supply, because groundwater quality limits use, or both. The attached map shows where the DNR is concerned about groundwater now. Five datasets were used to generate this map; each of them is described below.

Areas of concern

The Areas of Concern shown on the map are indexed for reference. A brief description of the DNR's concern in each area is provided below.

1. Bemidji. Some residential wells in Northern Township in Bemidji County have been contaminated since the 1990s by chemicals leaching from the former Kummer Sanitary Landfill, a Superfund site. The City of Bemidji's wells source water from an aquifer that is contaminated with PFAS, which has necessitated the city upgrading its water treatment facility. In addition, the state Health Department has established a special well construction area due to nitrate contamination in a shallow aquifer in Eckles Township.
2. Bonanza Valley. This agricultural area, north of Willmar, has been heavily irrigated since the 1980's. Early irrigation wells were completed in the shallow water table aquifer. As well yields declined due to pumping, irrigators installed deep wells into the underlying confined aquifers. Groundwater levels in the confined aquifers dip significantly during summertime pumping. Historically the area had high rates of well interference, and the high rate of seasonal pumping may be negatively impacting wetlands. This is one of three designated groundwater management areas. Increased monitoring is underway and groundwater flow models are in development.
3. Buffalo Aquifer. In a typical year, the City of Moorhead relies on this aquifer for about 20% its water supply. The aquifer, which has limited water available, is critically important when drought lowers the flow in the Red River, which supplies about 80% of the City's water during non-drought years.
4. Interstate 94 Corridor. The U.S. Geological Survey conducted research from 2012-2014 (Scientific Investigation Report 2017-5114) on this fast-growing area between the Twin Cities and St. Cloud because of its limited groundwater and the vulnerability of shallow aquifers to contamination from the land's surface.

5. Little Rock Creek, north and a little east of St. Cloud, is a trout stream in a heavily irrigated area. Seasonally intensive pumping from high-capacity wells is diverting groundwater that would have otherwise flowed underground into Little Rock Creek. The DNR has determined that this diversion of groundwater is not sustainable as it has negatively impacted the habitat and contributed to water quality impairments in this unique, cold water stream. The DNR has determined that a water use conflict exists in Little Rock Creek and is working with the community of users to find a sustainable solution.
6. Luverne/Rock County Rural Water District. The City of Luverne and the Rock County Rural Water District draw water from a shallow aquifer that is connected to the Rock River. The presence of herbicides, their metabolites, and nitrates in the river plus the adequacy of the water supply in the event of a drought are concerns identified by the DNR. U.S. Geological Survey research suggested that groundwater pumping could lower flows in the river, threatening a population of Topeka Shiners, a minnow species that is listed as endangered. The City of Luverne now receives a portion of its municipal supply from wells in South Dakota via the Lewis and Clark Rural Water System.
7. Mankato. The City of Mankato pumps its water both from the deep Mt. Simon aquifer and from shallow wells beneath the Blue Earth River. At certain times of the year, water from the shallow aquifer is contaminated with nitrates and has to be blended with the Mt. Simon water. A 2011 DNR report examined the sustainability of the Mt. Simon water supply and concluded it was sustainable at then-current pumping levels, but could be over-extended by population growth, industrial development or drought.
8. Marshall. The City of Marshall appropriates water from multiple aquifers that supply the majority of the water for their community. Locally the City pumps from two shallow glacial sand and gravel aquifers. Near Camden State Park, municipal and industrial pumping from a deep confined aquifer have reportedly affected springs along the east side of the Redwood River, a designated trout stream. The limited capacity of all these aquifers have led to development of a fourth well field, 15 miles north of Marshall near the town of Wood Lake.
9. Straight River and Park Rapids. Park Rapids has nitrate contamination from farm fertilizers that is above MDH's Health Risk Limit in some of the city's wells. The DNR established a Groundwater Management Area (GWMA) in the Straight River basin and has determined that, in specific locations in the Straight River GWMA, pumping reduces groundwater flow to the stream. However, in its 2024 monitoring report the DNR concluded that groundwater use was not harming the aquifers or ecosystem.
10. Perham. The city is in an agricultural area and includes agricultural fields within the City's Wellhead Protection Area and Drinking Water Source Management Area. The Minnesota Departments of Agriculture and Health are working with the city to address nitrate contamination of city wells.
11. Chippewa and Pomme de Terre Rivers. These are areas of intensive groundwater use, mostly for crop irrigation, which has historically been sourced from the shallow aquifers that also supply the rivers.
12. Rochester. Groundwater modeling completed to date has shown that pumping groundwater for Rochester's municipal supply is likely having a negative impact on some calcareous fens and streams. The DNR is working with Rochester's water supplier, Rochester Public Utilities, to evaluate how Rochester can meet current and future water needs sustainably.
13. Seminary Fen. The Minnesota River fens, between Chaska and Chanhassen, are threatened by increasing withdrawals from the bedrock and glacial materials. The seepage faces are decreasing in size and number, which causes reduced flow to all groundwater-fed resources of this area including the calcareous fens and springs along the river, especially during times when wells are pumping at peak rates.

14. South Washington County. Widespread contamination from PFAS in southern Washington County limits where and how much communities there can use groundwater. New treatment facilities are under construction and long-term mitigation plans are being developed.
15. White Bear Lake. In August 2017, the Ramsey County District Court concluded that the DNR permitted too much groundwater use near White Bear Lake, causing the lake water levels to drop unacceptably. The court ordered the DNR to amend existing permits, implement a resident irrigation ban for municipalities, refrain from authorizing new appropriations and investigate alternative sources of water. Subsequent analyses have found that groundwater use does affect lake levels and at times affects recreational uses of the lake. The Metropolitan Council is currently leading a workgroup of communities and agencies to evaluate options for meeting the long-term needs of the surrounding communities while also complying with the protective elevation for White Bear Lake.
16. Fairmont: All municipal water comes from Budd Lake, a shallow lake that is susceptible to drought and contamination. Presently the City has a single bedrock well, with limited capacity as a back-up supply.
17. Worthington: Groundwater is severely limited here. The city utilizes shallow wells adjacent to Lake Bella which acts as a recharge basin. This supply is limited in both quality and quantity. The city sources much of its water supply from Lewis and Clark Rural Water.

Well interferences

The well interference locations shown are where DNR has received out-of-water complaints from domestic well owners that were either validated by the DNR or resolved by a nearby appropriator. Only complaints received since 2020 are shown.

Groundwater levels trending downward

The locations shown are DNR observation wells where groundwater levels trended downward in at least three of the five statewide trend analyses that have been completed since 2012. DNR has conducted trend analyses for the following time periods: 1993 – 2012, 1997-2016, 2000-2019, 2003 – 2022, and 2005-2024.

Beach ridge aquifers

These sinuous shapes in northwest Minnesota show where land types mapped as ‘beach ridges’ occur (ECS Land Type Associations of Minnesota, 2025). These beach ridges are narrow sand deposits that were emplaced along the edges of an ancient lake (Glacial Lake Agassiz). Calcareous fens, a protected and rare type of wetland which is dependent on a continuous supply of groundwater, often occur on beach ridges in the northwest. Because those same beach ridges comprise aquifers that supply the calcareous fens with groundwater, pumping groundwater from those aquifers can degrade calcareous fens. Generally in the northwest, the DNR discourages high-capacity pumping from source aquifers within about 2 miles of a calcareous fen.

Groundwater provinces

The Minnesota Groundwater Provinces layer shows regional differences in aquifers and groundwater resources. In general, groundwater availability in Groundwater Provinces 1, 2, 3 and 4 are considered good. Groundwater

Provinces 5 and 6 have significantly less groundwater availability (insert [GWProvince_table.png](#)) due to limited glacial sand and gravel aquifers and bedrock geology that is not considered aquifer material.

In 2025, Groundwater Province 5 is an area of concern for the DNR because groundwater availability is limited there, and geologic mapping has not been done in many parts of Groundwater Province 5. Limited geologic information means that it takes DNR longer than usual to evaluate groundwater appropriation permit applications. Limited groundwater availability means that some proposed projects with high rates of groundwater use are incongruent with DNR's mandate to ensure the sustainability of groundwater use.

