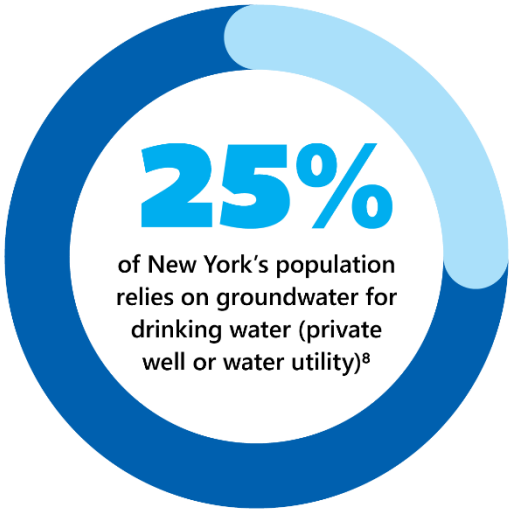
# Wisconsin Groundwater Management Summary

## Background

The Great Lakes Commission (GLC) passed a policy resolution in March 2024 which called upon partners and agencies to engage with the GLC toward a better understanding of the current state of groundwater management in the Great Lakes basin.[1] Then, in December 2024, the GLC received funding from the Joyce Foundation to develop groundwater management summaries for each Great Lakes jurisdiction, building upon previous reports supported by the Joyce Foundation.[2] This report summarizes groundwater management in Wisconsin, both statewide and within the Great Lakes basin.

## State Agency Authority

Groundwater management in Wisconsin is coordinated through the Groundwater Coordinating Council, that works to ensure the sustainable use and quality of Wisconsin's groundwater resources.[3] The Council is chaired by the Wisconsin Department of Natural Resources and other members include, Department of Agriculture, Trade and Consumer Protection; Department of Health Services; Department of Transportation; Department of Safety and Professional Services; a Governor's representative, the Universities of Wisconsin and the Wisconsin Geological and Natural History Survey. The Wisconsin Department of Natural Resources (DNR) establishes state drinking water and groundwater quality standards, manages groundwater quantity and coordinates groundwater law implementation to protect Wisconsin's groundwater and public health, oversees groundwater withdrawal and permitting, groundwater availability, groundwater quality standards, and drinking water supply.[4] The Wisconsin DNR Water Use Section oversees water quantity management through the implementation of the Great Lakes Water Resources Compact and regulation and management of groundwater withdrawals through the review of high-capacity well applications.[5]




The DNR has broad authority to review high-capacity well applications for potential harm to waters of the State, and condition or deny applications in accordance with its review of environmental impacts. High capacity well approvals are required for properties with the capacity to withdraw more than 100,000 gallons per day. Properties with wells below this threshold are still required to provide notification to the DNR when installing

[1] Great Lakes Commission. March 6, 2024. Understanding Impacts to Great Lakes Agriculture and Water Use Under Changing Climate Conditions.

[2] The Joyce Foundation. Groundwater Governance in EPA Region 5.

[3] Wisconsin Groundwater Coordinating Council, Report to the Legislature, 2025. GCC_Report_2025.pdf

[4] Wisconsin Department of Natural Resources. Groundwater Quality.

[5] Wisconsin Department of Natural Resources. High Capacity Well Application Review Process.

new wells.[6] The Wisconsin Department of Agriculture, Trade, and Consumer Protection regulates potential agricultural contamination of groundwater resources.[7] **Table 1** highlights the state agencies in Wisconsin which play a role in managing groundwater in the state

***Table 1.*** *Wisconsin state agency authorities on groundwater management priority areas.*

| Agency | Wisconsin Dept. of Natural Resources | Wisconsin Dept. of Agriculture, Trade, and Consumer Protection |
|---|---|---|
| Groundwater Priority Area | Implementing drinking water and groundwater quality standards<br><br>Private well construction and contamination<br><br>High capacity well regulation<br><br>Groundwater withdrawal registration, water use reporting and permitting<br><br>Groundwater availability and ecological impacts<br><br>Groundwater impacts to agriculture, landfills, and metallic mining<br><br>Remediation of sites with groundwater contamination | Agricultural pesticide and fertilizer contamination |

## Groundwater Science and Knowledge Production

The Wisconsin Geological and Natural History Survey (WGNHS) – part of the University of Wisconsin-Madison – and the U.S. Geological Survey (USGS) Upper Midwest Region Water Resources Center both provide basic information related to hydrology, hydrogeology, and geology in Wisconsin. The USGS maintains a statewide groundwater level monitoring network in coordination with the Wisconsin DNR and WGNHS.[8] WGNHS has a well database used primarily to map the geology and hydrology of the state.[9] WGNHS and USGS also collaborate with municipal, county, state, and federal partners in regional hydrogeologic studies.

The Wisconsin DNR uses monthly water use reporting information from approved high-capacity wells to develop annual summaries of statewide water use and in communication tools to address specific water use questions. Additionally, the DNR maintains a statewide spring inventory, initially developed by the WGNHS, that identifies springs statewide with a flow greater than 0.25 cubic feet per second and provides relevant information for managing state groundwater resources. The DNR provides access to information on groundwater quality and quantity through story maps, a water quantity data viewer, a statewide annual report, and a groundwater quality database.[10]

[6] Wisconsin Department of Natural Resources. Well and Heat Exchange Notification.

[7] State of Wisconsin Department of Agriculture, Trade and Consumer Protection. Surface and Groundwater Monitoring.

[8] Wisconsin Geological and Natural History Survey. Groundwater-Level Monitoring Network.

[9] Wisconsin Geological and Natural History Survey. Research & Data.

[10] Wisconsin Department of Natural Resources. Wisconsin Water Quantity Monitoring.

## Water Quantity Legislation and Regulations

The Wisconsin Supreme Court's decision in *State v. Michels Pipeline Construction Inc.* (1974) establishes the Restatement (Second) of Torts approach to groundwater management in the state.[11] The Court provides that a landowner who withdraws groundwater from the land and uses it for a beneficial purpose is not subject to liability for interference with the use of water by another, unless it causes unreasonable harm through lowering the water table or reducing artesian pressure; the groundwater forms an underground stream; or the withdrawal has a direct and substantial effect upon the water of a watercourse or lake.

The state of Wisconsin utilizes public trust doctrine[12] to protect the people of Wisconsin's use and enjoy its water resources through permitting requirements for water projects and enforcement actions to stop unauthorized impacts.[13] The Wisconsin Supreme Court's decision in *Clean Wisconsin v. Wisconsin Department of Natural Resources* (2021) affirmed the Wisconsin DNR's constitutional duty and statutory authority to consider potential harm from cumulative environmental effects on the waters of the state when reviewing high capacity well applications. This decision affirmed the court's previous ruling in *Lake Beulah Management District v. Wisconsin Department of Natural Resources* (2021). Based on this decision, the DNR considers environmental impacts to the waters of the state when reviewing a proposed high capacity well application and makes a fact-specific determination for each application when presented with sufficient concrete, scientific evidence of potential harm to waters of the state.[14] Wisconsin DNR's brief in *Clean Wisconsin* outline's the agency's view of the public trust doctrine's application to groundwater.[15] The answer to whether the public trust doctrine applies to groundwater depends on how broadly the *Lake Beulah* decision is interpreted and applied moving forward.

Registration and annual water use reporting to the DNR is required for new and existing high-capacity wells. A water loss permit is required for a well that proposes to make consumptive withdrawals at an average of more than two million gallons per day in any 30-day period.[16]

## Great Lakes Basin Groundwater Management

The Wisconsin Legislature ratified the Great Lakes–St. Lawrence River Basin Water Resources Compact (Compact) in 2007 Wisconsin Act 227. Section 281.346 of the Wisconsin Statutes details Wisconsin's program for managing and regulating new or increased water withdrawals, diversions and consumptive uses consistent with the provisions of the Compact. Wisconsin DNR requires registration for users with the capacity to withdraw 100,000 gallons per day and a water use permit for users that withdraw 100,000 gallons per day. While registration is required statewide, water use permitting is required only for users within the Great Lakes basin (a separate permit from the high-capacity well approval that is required statewide).

Wisconsin has adopted the water conservation and efficiency provisions of the Compact. The State of Wisconsin's program is consistent with, and fully supports, the goals and objectives of the Compact, including

---

[11] Linda Reid et al. (n.d.). High-Capacity Wells: A Survey of Groundwater Withdrawal Rights and Regulations. In *https://nationalaglawcenter.org*. The National Agricultural Law Center. Retrieved July 2, 2025, from https://nationalaglawcenter.org/wp-content/uploads/assets/articles/highcapacity-wells-report-reid.pdf

[12] National Sea Grant Law Center. Overview of the Public Trust Doctrine.

[13] Wisconsin Department of Natural Resources. Waterway Regulations and the Public Trust Doctrine.

[14] "Waters of the state" are defined as "those portions of Lake Michigan and Lake Superior within the boundaries of this state, and all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, watercourses, drainage systems and other surface water or groundwater, natural or artificial, public or private, within this state or its jurisdiction." Wis. Stat. § 281.01(18)

[15] Clean Wisconsin, Opening Brief and Appendix of Respondent-Appellant, Wisconsin Department of Natural Resources (pp. 36-43) available at: https://acefiling.wicourts.gov/document/eFiled/2018AP000059/212452

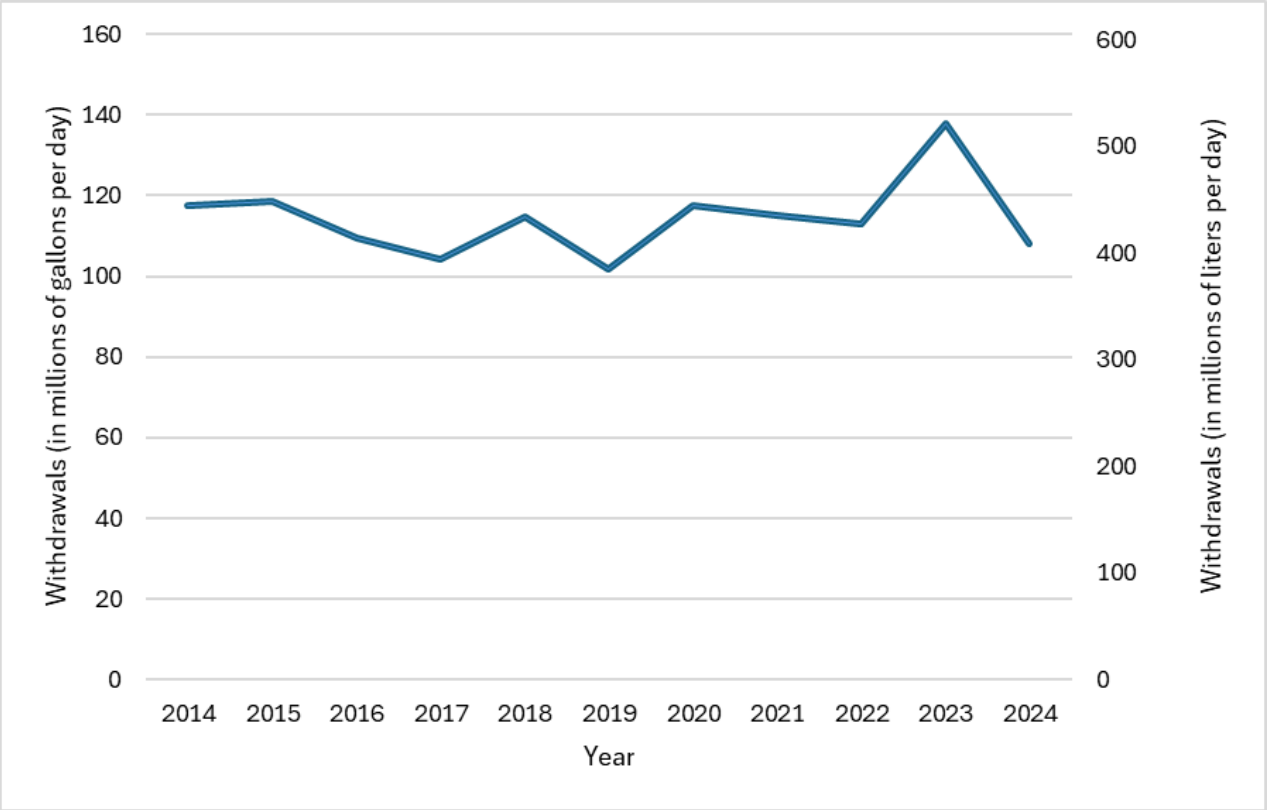
[16] Wis. Stat. § 281.35

promoting the efficiency of use and reducing losses and waste of water in the basin and retaining the quantity of surface water and groundwater in the basin.

## Great Lakes Basin Groundwater Usage

Wisconsin's groundwater withdrawals from the Great Lakes basin have remained relatively stable over the last decade. Groundwater withdrawals for irrigated agriculture are the largest source of interannual variation, due to changing irrigation needs based on precipitation and temperature during the growing season. See **Figure 1** below to view trends in Wisconsin's reported groundwater withdrawals within the Great Lakes basin from each facility withdrawing at least 100,000 gallons per day between the years of 2014 and 2024.

***Figure 1.*** *Wisconsin Great Lakes Basin Groundwater Withdrawals from 2014-2024. Note that the most significant drought during this period was in 2023.*[17]




## Statewide Definitions

**Groundwater**: any of the waters of the state, as defined in Wis. Stat. § 281.01 (18), occurring in a saturated subsurface geological formation of rock or soil.[18]

**High-capacity well**: a well that, together with all other wells on the same property, has a capacity of more than 100,000 gpd or 70 gallons per minute.[19]

[17] As reported to the Great Lakes Regional Water Use Database.

[18] Wis. Stat. § 160.01

[19] Wis. Stat. § 281.34(1)(b)