Great Lakes Commission des Grands Lacs

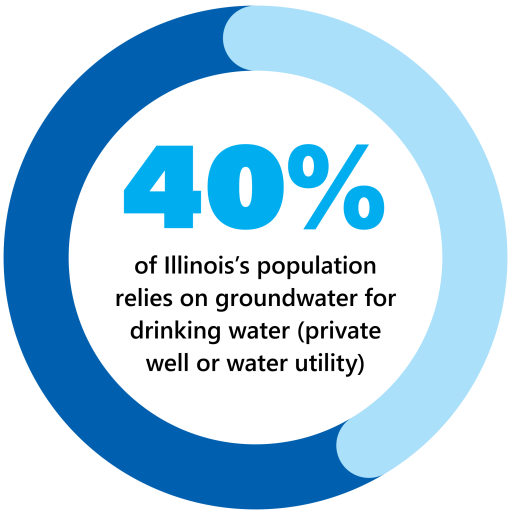
Illinois Groundwater Management Summary

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 Illinois, both statewide and within the Great Lakes basin.

State Agency Authority

The Illinois Department of Natural Resources (IDNR), Office of Water Resources (OWR) manages the state's water supply planning program, which was established by Executive Order 2006-1.[3] The program enables statewide and regional water supply planning, which includes groundwater sources, based on demand forecasts for water sustainability.[4] The State has been divided into 10 sections or regions, and stakeholders are convened to plan and address concerns. The IDNR provides technical and financial assistance to support these locally organized water planning activities, which are carried forward as funding allows and groups vary in their capacity to do the work.



The Illinois Groundwater Protection Act authorized the Illinois Environmental Protection Agency to conduct a groundwater protection program to enhance groundwater quality for the maximum use and benefit for the people of Illinois.[5] The Illinois Department of Public Health administers the licensing of water well and pump installation contractors and regulates the construction of water wells to protect them from contamination.[6] Local Soil and Water Conservation Districts (SWCD) can investigate high-capacity well impacts and, in some cases, make recommendations to limit withdrawals from high-capacity wells. Restrictions may be placed on high-capacity wells by the Department of Agriculture if an SWCD has investigated and recommended a limit.[7] **Table 1** highlights the state agencies in Illinois which play a role in managing groundwater in the state.

[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] State of Illinois. January 9, 2006. Executive Order for the Development of State and Regional Water-Supply Plans.
[4] Illinois Department of Natural Resources. Water Supply.
[5] Illinois Environmental Protection Agency. Groundwater Quality Protection Program.
[6] Illinois Department of Public Health. Private Water & Closed Loop Wells.
[7] Conservation (525 ILCS 45/) Water Use Act of 1983 Sec. 5.1. https://www.ilga.gov/Legislation/ILCS/Articles?ActID=1743&ChapterID=44

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

Agency	Illinois Environmental Protection Agency	Illinois Dept. of Agriculture	Illinois Dept. of Natural Resources	Illinois Dept. of Public Health	Soil and Water Conservation Districts
Groundwater Priority Area	Drinking water supply Groundwater quality oversight Industrial contamination	Agricultural pesticide and fertilizer contamination Limited well pumping restriction	State and regional water supply planning Groundwater availability and ecological impacts	Groundwater quality oversight Private well construction and sealing	High-capacity well impact investigations

Groundwater Science and Knowledge Production

The Illinois State Water Survey (ISWS) and the Illinois State Geological Survey (ISGS) support the production and advancement of groundwater science in the state of Illinois. Both are divisions of the Prairie Research Institute, which is a part of the University of Illinois.

ISWS is the state's primary repository of groundwater records and data, conducting several programs under its Groundwater Science section to inform groundwater management in Illinois.[8] The Illinois Water Inventory Program (IWIP) is an annual, statewide inventory of water use and withdrawals by high-capacity water wells and intakes from public water supplies, self-supplied industries, irrigation, fish and wildlife, and conservation.[9]

To support the regional water supply planning efforts overseen by IDNR mentioned above, the ISWS has interactive Water Supply Maps available.[10] ISWS's Data Management and Outreach Services house water survey data, metadata, and combines information from a variety of sources, including the Water and Atmospheric Resources Monitoring (WARM) program.[11]

The ISWS has also coordinated with Wisconsin and Iowa to share information to create the Illinois Groundwater Flow Model.[12] One regional parent model covers the northern half of Illinois and portions of Iowa, Indiana, and Wisconsin. This large model allows for the study of regional impacts of withdrawals from the sandstone aquifer system.

The ISGS provides background geologic information and research organized in several focus areas, including county and regional mapping, and produces the ILWATER mapping application containing more than 700,000 wells drilled in Illinois.[13] While county and regional mapping efforts have incomplete coverage of the state, some limited three-dimensional mapping does exist, and some counties have also developed aquifer sensitivity maps.

[8] Illinois State Water Survey. Groundwater Science.

[9] Illinois State Water Survey. Illinois Water Inventory Program.

[10] Illinois State Water Survey. Illinois Water Supply Planning.

[11] Illinois State Water Survey. Shallow Groundwater Wells Network.

[12] Illinois State Water Survey. The Illinois Groundwater Flow Model.

[13] Illinois State Geological Survey. Illinois Water and Related Wells.

Legislation and Regulations

The Water Use Act of 1983 established reasonable use doctrine, as well as high-capacity well review for groundwater in Illinois. The Act defines reasonable use as "the use of water to meet natural wants and a fair share for artificial wants," and states that reasonable use "does not include water used wastefully or maliciously" (525 ILCS 45/3).

Registration with the local Soil and Water Conservation District (District) is required for high-capacity wells (525 ILCS § 45/5.1), and these wells must participate in the Illinois Water Inventory Program (IWIP) and submit an annual report. (525 ILCS § 45/5.3). Illinois groundwater protection programs are mainly authorized by the Illinois Groundwater Protection Act, which addresses the management of groundwater quality and drinking water (415 ILCS 55/1 et seq.). The Act's groundwater protection program sets forth a groundwater protection policy, framework, standards, regulations, roles of various state and local agencies and groups and establishes protection zones. Additionally, county and local governments have groundwater protection authority under the Illinois Counties Code (55 ILCS 5), the Illinois Municipal Code (65 ILCS 5/20), and the Local Land Resource Management Planning Act (50 ILCS 805).

The Water Authorities Act, established in 1951, allows local authorities to establish groundwater controls. Seventeen of these local authorities have been created, primarily in central Illinois. The authorities have formed an intergovernmental group called the Illinois Water Authority Association (IWAA) whose mission is dedicated to maintaining local authority and management of groundwater

While the Water Use Act of 1983 established a reasonable use rule for groundwater, Illinois has not extended the public trust doctrine[14] to cover groundwater.

Great Lakes Basin Groundwater Management

The Illinois General Assembly ratified the Great Lakes-St. Lawrence River Basin Water Resources Compact (Compact) in 2008 (45 ILCS 147/5). Under the Compact, the terms of the Supreme Court consent decree in Wisconsin v. Illinois (1967) govern Illinois' use and diversion of Lake Michigan water. The Consent Decree limits the amount of water Illinois may divert to 3,200 cubic feet per second, or 2.1 billion gallons per day. As a result, Illinois is only required to comply with the Compact's conservation and registration requirements in areas using Lake Michigan water. The IDNR is charged with implementing Illinois' Compact provisions, and the US Army Corps of Engineers is responsible for tracking Illinois' diversion limit. Illinois incorporated the terms of the Compact using its existing statutes and programs.

Participation in the Illinois State Water Survey is required for high capacity well and intake owners withdrawing more than 100,000 GPD and no fee is assessed. An allocation permit is required for all users diverting water from Lake Michigan (surface water only) and no fee is assessed.

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

Illinois has had a Lake Michigan water conservation and efficiency program since 1977. The unique nature of Illinois' Lake Michigan water use and diversion as allowed under a U.S. Supreme Court Decree has resulted in a water conservation and efficiency program that is implemented primarily as a regulatory program, with additional measures, such as encouraging conservation pricing, conservation education and information sharing, implemented through a non-regulatory effort.

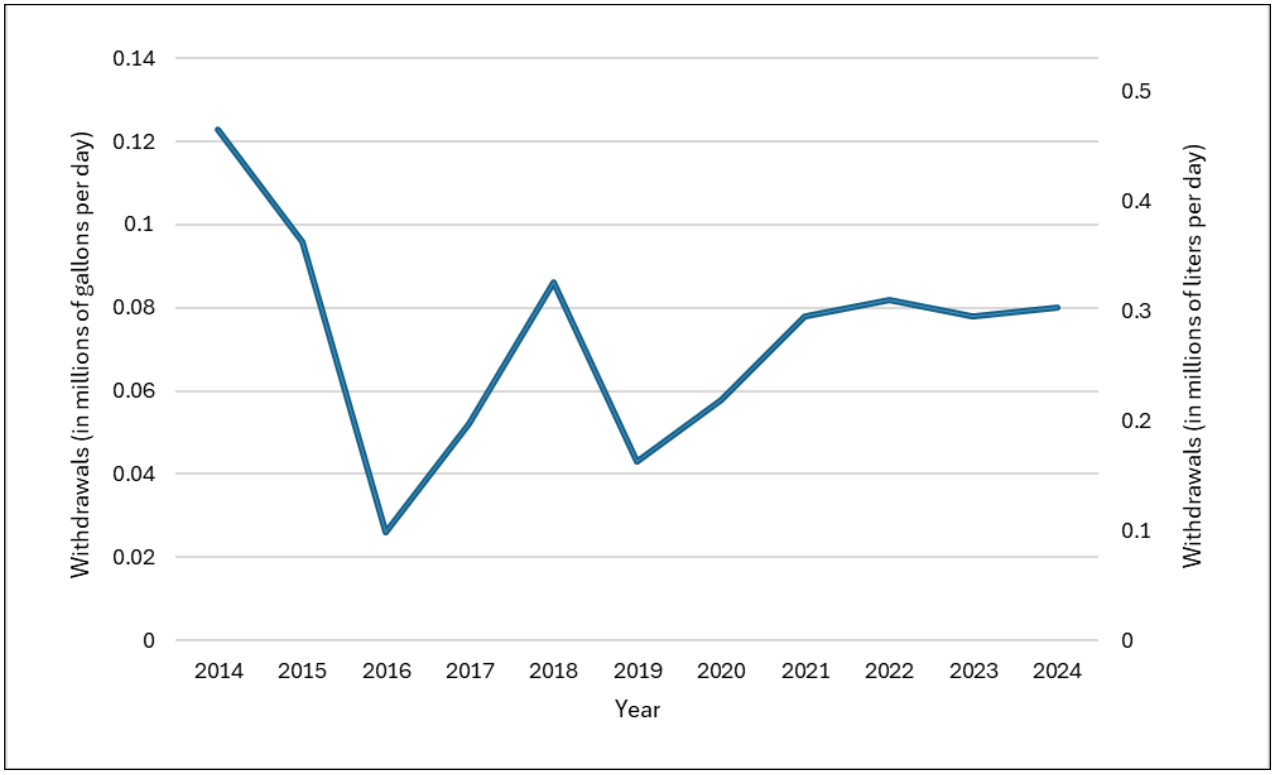
[14] National Sea Grant Law Center. Overview of the Public Trust Doctrine.

Per the Compact, its party states commit to the development of a collaborative strategy to guide the collection and application of scientific information to support the "improved understanding of the role of groundwater in basin water resources management."

Great Lakes Basin Groundwater Usage

Illinois's groundwater withdrawals from the Great Lakes basin have varied in volume between 20,000 and 130,000 gallons per day over the last decade. This interannual variation is primarily due to changes in water use for irrigation – which heavily relies on groundwater – depending on factors such as weather conditions. See **Figure 1** below to view trends in Illinois's reported groundwater withdrawals within the Great Lakes basin from each facility withdrawing at least 100,000 gallons per day from 2014 to 2024.

Figure 1. *Illinois Great Lakes Basin Groundwater Withdrawals from 2014-2024.*[15]



Statewide Definitions

Groundwater: Illinois defines groundwater as "[u]nderground water which occurs within the saturated zone and geologic materials where the fluid pressure in the pore space is equal to or greater than atmospheric pressure." (525 ILCS 45/4).

High-capacity well: a high-capacity well or intake is any well or intake that is rated to pump 70 gallons per minute (gpm) or greater. In addition, any facility which owns or operates multiple wells or intakes that when combined are rated to pump 70 gpm is classified as a high-capacity operation.[16]

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

[16] Illinois State Water Survey. Illinois Water Inventory Program.