

Natural Areas Depend on Groundwater Too



Photo Courtesy of Kurt Thomsen

All life depends on a clean, plentiful water supply for survival. Great egrets, chorus frogs and dragonflies need clean water in lakes, streams and wetlands. Although the process is invisible, aquifers often transmit water horizontally and upwards through pressure and natural flow processes.

Much of the surface water you see is supplied by groundwater. If the groundwater levels decline, streams, tributaries, wetlands and fens may dry up or disappear, and plant and animal communities may be changed irreparably.

Human-introduced contaminants such as motor oils, solvents, chemicals and salts can seep into and damage the clean groundwater. Tainted water is not only consumed by humans but also taken up by wildlife, birds, fish and plants. In high enough concentrations, contaminants in the environment can cause changes to the ecosystem and wildlife mutations or losses.

Groundwater is one of our area's most precious resources. Protecting and preserving its viability as a source of safe drinking water for this and future generations is a high priority of the Barrington Area Council of Governments.

The Barrington Area Council of Governments is a regional planning organization whose members are the Villages of Barrington, Barrington Hills, Deer Park, Lake Barrington, North Barrington, South Barrington and Tower Lakes, and the Townships of Barrington and Cuba.

Know Your Water

Water Supply Edition

We Rely on Groundwater

It is everyone's responsibility to protect water resources.

Since the BACOG area is dependent on one shallow aquifer system, we must be mindful that human actions on the land surface directly affect water quantity and quality below ground. Because parts of the aquifer system are interconnected, excessive water use anywhere can lower groundwater levels across the area.

Excessive water use during a drought can contribute to wells drying up, causing economic impacts to residents. Dumping motor oil on lawns can contaminate neighbors' drinking water wells or wildlife areas. In addition to health issues, contaminated wells and shrinking natural areas can threaten property values. Managing our water resources wisely is in everyone's best interest.

BACOG Aquifer Model



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Groundwater: The Basics

Groundwater supplies all of the BACOG area's water needs. Groundwater is defined as all water found below land surface, but only a small amount of this water is available for us to extract and use. The BACOG area relies almost exclusively on the shallow aquifer system; here this system lies within 250-350 feet of ground surface.

Our Water: The Shallow Aquifer

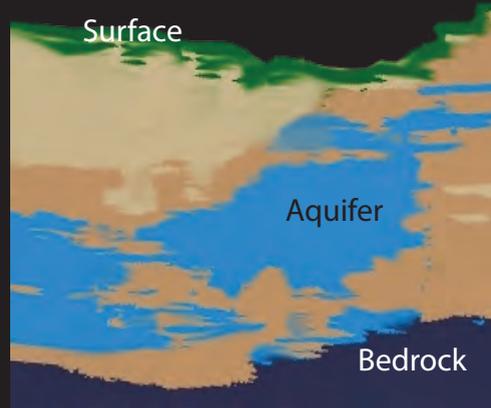
The shallow aquifer system is comprised of sand and gravel aquifers and the shallow bedrock aquifer they rest on. When the last glaciers receded 10,000 years ago, they left behind a mix of sand, silt, gravel and clay; these materials hold water in the tiny spaces between soil particles.

There are no "underground rivers or lakes" in our area from which water is pumped. The aquifer system is an interconnected set of saturated soil and rock formations, where water moves vertically and horizontally.



A Shared Resource

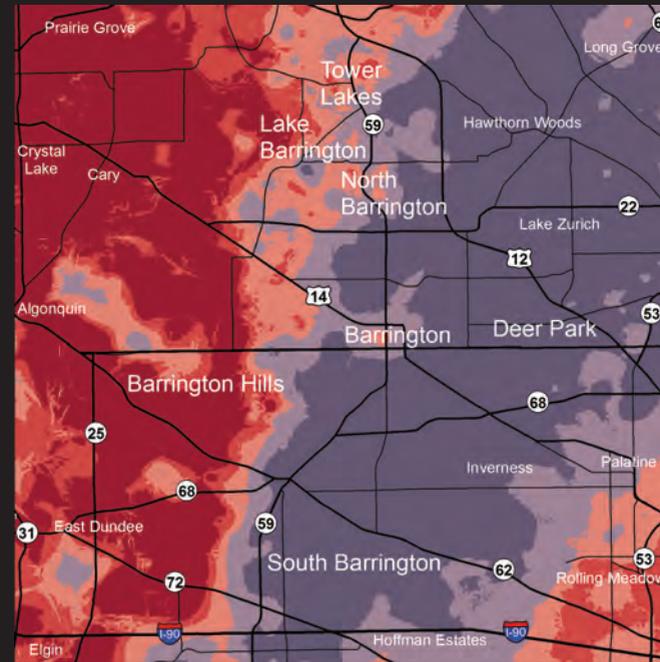
The illustration shows how your water use can affect surrounding areas. Drawing down or contaminating the shallow aquifer in one location can affect not only your well water but the entire neighborhood's. And even if another source were to become available, such as water from Lake Michigan or a deep aquifer (900+ feet deep), most BACOG communities lack the infrastructure needed to distribute that water to residents.



BACOG used historical well drilling logs to construct a 3-D model of the area's shallow aquifer system. The model illustrates where **aquifers** exist, as shown in a cross-section of the Barrington area above. While all soil materials below the water table are saturated, aquifers are formations where water can be readily extracted from a well. Other soil materials like **clay** do not yield water to wells.

Recharge: Replenishing the Source

Whether by natural processes or pumping, water is continually flowing out of our aquifers. They must be replenished to remain sustainable. BACOG created a groundwater recharge map that shows how areas differ in their ability to recharge the aquifer system.



The shallow aquifer is recharged by surface water seeping down through the soil into the aquifer. Only a small amount of rain and snowmelt penetrates to the aquifer. Most precipitation is lost to evaporation, plant absorption and storm water runoff. Surface water that reaches the aquifer travels through the soil at different rates.

All areas contribute to recharge, but in **highly sensitive recharge areas**, water moves quickly down from the land surface, reaching the aquifer in hours to days. In **lighter red areas**, recharge is still significant but can take weeks to years. **Purple areas** indicate poor recharge where water from the surface can take decades to centuries to reach and replenish the aquifer.

The Bottom Line: Sustainability

Knowing where sensitive recharge areas are located helps us to make better-informed planning decisions. Protecting these areas not only insures sufficient supply by protecting groundwater recharge but also prevents groundwater contamination where it could do the most harm. Covering the ground with buildings or pavement will not allow a recharge area to absorb water. At the same time, recharge areas can transport contaminants such as road salts and pesticides along with water to aquifers.

Groundwater sustainability means having enough water for present and future needs and maintaining water quality over time.