

NORTHEAST ILLINOIS WATER SUPPLY

Illinois is a water-rich state, with resources such as Lake Michigan, inland lakes, bountiful rivers, and many productive aquifers. Water resources have long been vital to driving Illinois' economy, in power generation, industrial, and agricultural sectors. However, this abundance should not be taken for granted, and there are areas of the state with serious water supply issues. Currently the most pressing water supply issue in Illinois is the depletion of deep sandstone aquifers in the southern and western suburbs of Chicago. There are hundreds of thousands of residents and many major industries who rely on these aquifers.

The problem is currently most acute in Will and Kendall Counties, centered around the City of Joliet, where decades of over-extraction have depleted the deep aquifers well below their ability to recharge naturally. Because there are abundant water resources in the region, there are options for new water supplies. However, solutions are very costly and transcend local political and budgetary boundaries. Solutions based on incomplete understanding of the complex factors at play can lead to huge financial mistakes.

A regional-level comprehensive strategy is required to better understand and maximize water supplies. Similarly, a fact-based scientific approach to identifying alternatives is needed to provide objectivity.

Prairie Research Institute scientists have studied the aquifers and groundwater flow in northern Illinois for generations and are actively providing information and evaluating potential future scenarios to help policy makers determine the most cost-effective and lasting solutions for securing a healthy water supply. These aquifers will continue to be heavily used in the future, because switching drinking water supplies is a time-consuming enterprise that could take upwards of ten years. Thus the aquifers will need to be managed carefully and intelligently, and on a regional scale so they can be used to their maximum potential in the long term.

The most viable water source alternatives for northeastern Illinois are Lake Michigan, shallow aquifers, and the Fox, Des Plaines, and Kankakee Rivers. All alternatives have significant limitations. While there is water available from Lake Michigan, infrastructure costs to get the water to distant suburbs are daunting. Shallow groundwater resources and surface streams are hydraulically connected and withdrawal of water from the shallower systems is likely to have an effect on stream flow and wetlands.

Population growth is expected to increase in the Chicago metroplex, especially in collar counties farther away from Lake Michigan. Although there are seemingly plentiful water resources in the Chicago region, limits on withdrawals, increasing water demands, and pollution are influencing water supplies in the Chicago metro area.

Providing adequate and high quality water for residential and industrial water users in these areas requires long-term and expensive planning. High demands have already produced serious depletion of groundwater resources. Science-based decision making will be essential in choosing the best long-term solutions.

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In addition, shallow aquifers are vulnerable to surface-derived contaminants, and the intensity of urban development in the region has contributed to shallow groundwater quality degradation in much of the region. Urban rivers such as the Des Plaines and Fox, suffer from water quality impairments.

Rivers, in general, are susceptible to climatic conditions and as a result may not carry sufficient water during droughts to maintain needed water supply. River-based water supplies in this region require a backup supply for times of drought, the most obvious alternative being the currently overexploited deep aquifer.

New technologies may potentially help in alleviating the region's current and future water shortfalls. Water reuse, where wastewater is treated to drinking water standards, is already being used in many parts of the world, and continued innovations should make this a cost-effective technique in the near future. Another approach that may have potential in the region is managed aquifer recharge, where excess water from other sources is injected back into an aquifer for later use.

Although there are scientific uncertainties about the type of climate change that will occur in Illinois, the state's precipitation and temperatures are likely to change. If we indeed have a warmer, drier climate, as some models suggest, it will place additional stress on water supplies.

The solutions to water shortages in Northeastern Illinois will require comprehensive and progressive strategies for land use, storm water management, water supply, conservation, treatment, and new resource development.

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Illinois State Water Survey

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