

BUILDING HEALTHY COMMUNITIES

Water: Protecting Our Region's Most Valued Asset

January 31, 2014

Minnesota is the most water-rich state in the continental United States, with abundant groundwater and surface water resources, but it faces significant issues of water quantity and quality in the coming years as the population grows and changes.

"We don't have a crisis yet statewide," said Deborah Swackhamer, co-director of the Water Resources Center at the University of Minnesota <http://wrc.umn.edu>. "But we certainly have a lot of red flags.

Swackhamer and Ali Elhassen, manager of water supply planning at the Metropolitan Council, outlined the state and metro water issues in a discussion January 31, the third in a ULI Minnesota series about building better, healthier communities.

The Challenges Ahead

Despite nearly 12,000 lakes, 92,000 miles of streams, more than 13 million acres of surface water and 9.3 million acres of wetlands, Minnesota may not have enough clean water to meet its future needs as the population grows and changes. Individual use of water is down, and Minnesota doesn't use as much water for agriculture as many of the drought-troubled Western states, but electricity use has increased—and the largest use of water in Minnesota is cooling of thermoelectric power plants, Swackhamer said. Irrigation use of water is increasing "almost exponentially" because of drought conditions in some parts of the state and the higher price of corn.

Challenges facing the state's water supply include:

- Water quality. About 40 percent of the state's lakes and rivers do not meet water quality standards. This includes nitrates in drinking water in some parts of the state, generally from agricultural usage; mercury—"If you fish, you can catch all you want, but be careful how many you eat," Swackhamer said; and discarded pharmaceuticals and other chemicals, such as those in cosmetics and personal products, in both surface and groundwater.
- Drawing too much from groundwater resources. Swackhamer said we don't know as much as we should about groundwater; "We know how much we use, but not how much we have."
- Changes in the water cycle. Human-engineered changes, such as tiling, dams and wetland drainage (half of the state's wetlands have been drained), change the hydrological cycle in ways that are both known and unknown.

It's All One System

Although groundwater and surface water can be talked about separately, both Swackhamer and Elhassen emphasized that water is one natural system. "We have been managing surface water totally separately from groundwater," said Elhassen. "Only when we have a problem in one of them do we make the connection."

White Bear Lake's water level has dropped significantly over the past few years as nearby communities pumped increasing amounts of groundwater from the Prairie du Chien/Jordan aquifer, which underlies the lake. This dramatically illustrates the connection between groundwater and surface water, Elhassan said—and on the dependence on groundwater for the Metro area's water needs.

Although Minneapolis and St. Paul (and a few close-in suburbs) draw their municipal water from the Mississippi River, most of the Metro population—75 percent—is supplied through groundwater. Those percentages have switched fairly dramatically over the past 70 years; in the 1940s, about 80 percent of Metro municipal water use was from surface water, 20 percent from groundwater.

Groundwater is cleaner than surface water, it's present in areas far from any major river and the Prairie du Chien aquifer is "very productive," Elhassan said. But in many places, the aquifer levels are going down.

Change Is Possible But Not Easy

In the 1990s, the Savage Fen wetland saw huge reductions in water. The City of Savage managed to reduce its reliance on groundwater by a dramatic 80 percent, Elhassan said, working with the City of Burnsville to use surface water from quarries instead. Savage also put in water conservation requirements for residents and took other actions to reduce its reliance on groundwater.

That kind of collaboration across city boundaries is still relatively unusual. "In many communities, they talk to each other about many things, but not groundwater," Elhassan said. There is no regional water system, but rather a series of municipal systems. Yet, ultimately, they are all drawing from connected water resources.

The Metropolitan Council estimates an increase in water use of 130 million gallons per day by 2030. If nothing changes, about 80 percent of that would be drawn from groundwater, Elhassan said. He said the region needs to balance water use, recharge aquifers and conserve water, and that the Metropolitan Council should work with stakeholders to make these things happen—none of which would be easy. It would require sophisticated research, engineering—and political connections.

- The Minnesota Water Sustainability Framework, commissioned by the 2009 Minnesota Legislature, is a legislative roadmap with timelines and benchmarks for investments in water resources—including about \$86 million a year provided through Minnesota's Clean Water, Land and Legacy Act.
http://wrc.umn.edu/prod/groups/cfans/@pub/@cfans/@wrc/documents/asset/cfans_asset_292471.pdf
- The Metropolitan Area Master Water Supply Plan was produced after a 2005 directive by the Minnesota Legislature to guide sustainable water use for the Metropolitan area.
<http://www.metrocouncil.org/getattachment/8f3ca36c-2aa2-4e0b-ab70-6b27a5f8a48c.aspx>. It includes community water supply profiles.

For more information about Swackhamer and Elhassan's presentations:

[Swackhamer Presentation](#)

[Elhassan Presentation](#)