UNDERGROUND TREASURE TROVE

A 'groundwater mound' lying below south-central Nebraska may provide some relief from drought.

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For decades, water has been diverted from the Platte River into more than 500 miles of canals and pipelines to irrigate thousands of acres of crops in south-central Nebraska.

But in 2005, for the first time in its 65-year history, the Central Nebraska Public Power and Irrigation District reduced the amount of surface water delivered to farmers. The district also shortened by four weeks the irrigation season, which usually runs from late June to early September.

The reason: Lake McConaughy, from which water flows through the district's canals, had shrunk to about a third of its maximum capacity since 1999, when the drought began.

The district may be hurting for surface water, but a wealth of groundwater lies beneath much of its three-county irrigated area. This so-called groundwater mound is symbolic of the state's new efforts to manage groundwater and surface water as one resource.

Since the district's irrigation canals began drawing surface water from McConaughy in the early 1940s, the groundwater table in parts of Gosper, Phelps and Kearney counties has risen more than 50 feet, said Mark Burbach, assistant geoscientist with the University of Nebraska-Lincoln.

"We saw it beginning about a decade after the project began," he said.

Burbach said the majority of this water came from leakage from canals. In recent years, the district has reduced the leakage by lining its canals and converting some to pipelines.

According to Burbach, the amount of water in the mound is equal to four or five full-capacity Lake McConaughys. At full capacity, McConaughy holds 1.75 million acre-feet. An acre-foot is the amount of water it takes to cover 1 acre with a foot of water; 1.75 million acre feet would cover Nebraska with one-eighth inch of water

So, if the mound holds four to five times as much water as McConaughy, that means it could hold nearly 8 million acre-feet, which would cover the entire state with water one-half inch deep.

Many of the district's customers tap into that resource. Jeff Buettner, the district's information and communications officer, said 60 to 70 percent of the district's surface-water irrigators also have groundwater wells.

Farmers with both types of irrigation have an advantage during droughts. In a typical year, the district delivers 15 to 18 inches of water to its surface-water customers, but farmers have not been limited on how much groundwater they use. Even though the drought has led the district to reduce allocations by two-thirds, to 6.7 inches, it is trying to help its customers get enough water.

"You can't grow a normal yield with 6.7 inches of water," said Dudley Nelson, who sits on the district's board and grows corn and soybeans in Kearney County. "But farmers who also have groundwater irrigation can transfer their allotted surface water to those who only use surface-water irrigation. This will help everyone get close to normal yields."

2005 was the first year the district used a transfer program.

"There is not a lot of concern among farmers about the transfer program," Nelson said. "Everybody had the opportunity to get extra wells."

However, farmers west of U.S. 183, which runs through Holdrege, are an exception. Under the state's water law, LB962, the Nebraska Department of Natural Resources determined that the area including the groundwater mound west of U.S. 183 is over-appropriated, meaning the demand for water exceeds the amount available.

In September of 2004, the department banned the drilling of new wells in that area. Yet the groundwater mound extends well east of U.S. 183.

Ann Bleed, acting director of Nebraska's Department of Natural Resources, said that even with the mound, water use is exceeding the groundwater supply.

"The mound is like a tributary," she said. "It provides water to the Platte River and the Republican River. If more of the groundwater is used, there will be less water in the rivers."

Her answer reflects the state's policy for managing groundwater and surface water together.

In the winter of 2004, the district asked the department whether the ban on new wells could be lifted.

"Our project put the water there," Buettner said. "So, as a matter of equity, our customers should be allowed to use groundwater from it."

In January 2005, the department said farmers in the over-appropriated areas could drill wells if they offset the wells or retired a water use to make up for the new water they would be using. For example, farmers could offset a new well by not irrigating a portion of their crop and turning it into pasture.

Jason Lavene, who grows corn and soybeans west of U.S. 183 in Gosper County, was disappointed by the well moratorium.

"I had planned on putting in new wells," he said. "Now I have to spend more money out of my pocket on bringing in surface water."

But Lavene said he thought the transfer program will help. He said a lot of farmers switched to shorter-season corn and soybeans that don't need as much water.

Farmers aren't the only ones interested in the groundwater mound. Conservationists would like to divert some of its water to the Platte River to benefit wildlife.

Duane Hovorka, executive director of the Nebraska Wildlife Federation, is a member of a committee preparing a program to improve and conserve habitat for four threatened and endangered Platte River wildlife species in Nebraska. The plan is required as part of an agreement among Nebraska, Colorado, Wyoming and the U.S. Department of the Interior to address habitat and water issues in the Platte River basin. If all goes as expected, the plan should take effect in October 2006.

Rather than continue to let the groundwater mound rise, Hovorka said, the committee would like to pump out some of the surplus water with high-capacity wells. That extra water would be pumped into tributaries of the Platte during dry periods to supplement flows for wildlife on the river.

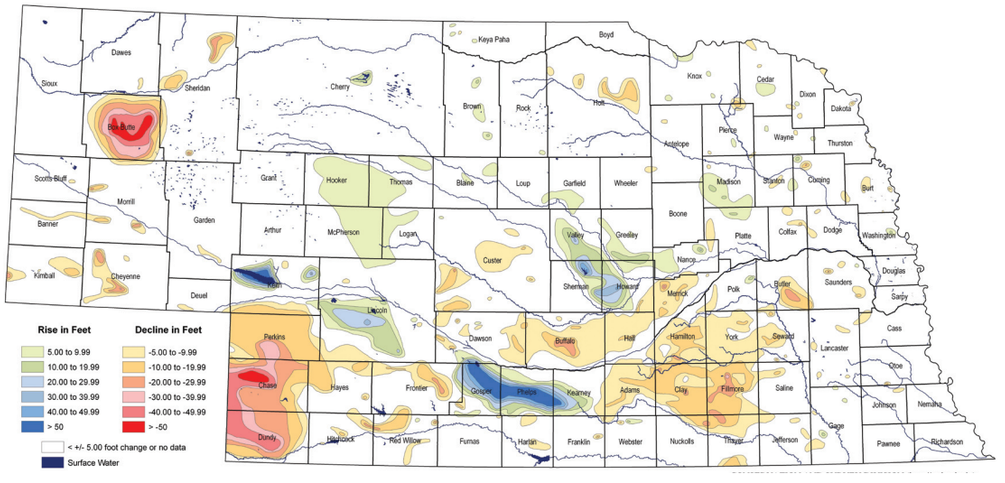
However, the groundwater mound already benefits farmers and wildlife to some extent.

"The groundwater table is so high in some areas that cornfields are irrigated from below," Hovorka said. "The mound also recharges wet meadows and wetlands. We would have to be careful so we don't pump out too much water and dry out the fields and meadows."

If done correctly, though, Hovorka said, he believes the plan would benefit wildlife during times of drought.

Groundwater-level changes

This map shows the change in levels from predevelopment to Spring 2005.



Source: University of Nebraska-Lincoln Conservation and Survey Division