

Groundwater levels decline in western, central Kansas

February 11 2015, by Brownie Wilson

Average groundwater levels in western Kansas continued to decline in 2014 but at a slower rate than over the past four years. Levels in central Kansas declined in 2014 after increases in 2013. That's according to preliminary data compiled by the Kansas Geological Survey (KGS), based at the University of Kansas.

The KGS and the Division of Water Resources (DWR) of the Kansas Department of Agriculture measured groundwater level in approximately 1,400 water wells in early 2015 as part of a program to monitor the health and sustainability of the state's most important groundwater resources.

Ninety percent of the wells measured draw from the High Plains aquifer, the primary source of irrigation, municipal and industrial water for much of western and central Kansas. The High Plains aquifer is an underground water-bearing formation that includes the Equus Beds and Great Bend Prairie aquifer in south-central Kansas and the expansive Ogallala aquifer.

"Although regional average groundwater elevations declined across most of the High Plains aquifer in Kansas, this is the third year in a row where that rate of decline for the aquifer overall was less than the previous year," said Brownie Wilson, KGS water-data manager.

Water levels in the 1,400-well network as a whole declined an average of 0.87 [feet](#) in 2014. The average decline was 0.9 feet in 2013, 2.7 feet in

2012, 2.8 feet in 2011, and 1.18 feet in 2010.

Southwest Kansas continued to show the greatest declines, with average levels there falling 1.92 feet. Northwest Kansas had the lowest average declines at 0.4 feet. Like the network as a whole, [water levels](#) in both areas showed smaller declines than in the previous year.

Summer rains in much of western Kansas helped to moderate declines brought on by higher pumping rates during the growing season when precipitation was low, Wilson said. However, areas in south-central Kansas that had received beneficial rains in 2013 missed out in 2014.

Water levels in the Equus Beds—a major source of water for Wichita, Hutchinson, and surrounding towns—fell 1.25 feet in 2014 after rising 2.57 feet in 2013. Levels in the Great Bend Prairie aquifer just to the west of the Equus Beds fell 0.63 feet in 2014 after rising 0.55 feet in 2013.

Such fluctuations are not as unusual in the middle of the state as they would be farther west.

"South-central Kansas has more extremes than western Kansas in terms of groundwater declines and groundwater recharge events," Wilson said. "The area responds to large precipitation and recharge events, which typically helps average out groundwater declines over time."

In western Kansas, where normal precipitation is much less, declines often overshadow recharge events. For example, water levels in southwest Kansas have dropped every year, totaling more than 34 feet, since the state began administering the water-level program in 1996.

Despite periods of higher than normal precipitation in some areas during the summer, the drought pretty much stayed constant in western and

south-central Kansas, and parts of southwest Kansas remained under extreme drought conditions, Wilson said.

Every year the KGS and DWR measure the same wells, spread over 48 counties, to determine the long-term behavior of the High Plains aquifer as well as the deeper Dakota aquifer and shallower alluvial aquifers along streams and rivers.

The KGS measures approximately 550 wells in western Kansas each January, and DWR staff from field offices in Stockton, Garden City and Stafford measure about 850 in western and central Kansas. Most of the wells are used for irrigation and many have been measured for decades.

Measurements are taken primarily in January because water levels are least likely to fluctuate when irrigation wells aren't in use. Infrequently, however, later-than-normal pumping due to dry conditions may unduly affect measurement results.

Most of the wells in the network monitored by KGS and DWR are within the boundaries of the state's five Groundwater Management Districts (GMDs), which are organized and governed by area landowners and large-scale water users to address water-resource issues.

In southwestern Kansas GMD 3, the 1.92-foot decline in 2014 was preceded by declines of 2.31 feet in 2013, 3.6 feet in 2012 and 3.7 feet in 2011.

The wells monitored in GMD 3 pull water from the Ogallala aquifer except in a few areas where they draw from the Dakota aquifer. The district includes all or part of Grant, Haskell, Gray, Finney, Stanton, Ford, Morton, Stevens, Seward, Hamilton, Kearny and Meade counties. In 2014, declines were greatest in eastern Stanton County, Haskell and southern Finney counties.

Western Kansas GMD 1 includes portions of Wallace, Greeley, Wichita, Scott and Lane counties, where the majority of wells are drilled into the Ogallala aquifer. In GMD 1, groundwater levels declined 0.62 feet in 2014 compared with 0.79 in 2013 and 1.66 feet in 2012.

Northwest GMD 4, where average water levels declined 0.4 feet in 2014 compared with 0.76 in 2013, covers Sherman, Thomas, Sheridan, and parts of Cheyenne, Rawlins, Decatur, Graham, Wallace, Logan and Gove counties. Groundwater there is pumped mainly from the Ogallala aquifer and alluvial sources.

Big Bend GMD 5 is centered on the Great Bend Prairie aquifer underlying Stafford and Pratt counties and parts of Barton, Pawnee, Edwards, Kiowa, Reno and Rice counties, where the 0.63-foot decline in 2014 followed a 0.55-foot gain in 2013.

Equus Bed GMD 2, where [groundwater](#) levels declined 1.25 feet in 2014 after rising 2.57 feet in 2013, includes parts of Sedgwick, McPherson, Harvey and Reno counties.

Measurement results are provisional and subject to revision based on additional analysis. The data is scheduled to be available [online](#) in late February.

Provided by University of Kansas

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