

## Groundwater Resources Program Publication Brief

The High Plains aquifer underlies 111.8 million acres (175,000 square miles) in parts of eight States—Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming. The area overlying the High Plains aquifer is one of the primary agricultural regions in the United States. Water-level declines began in parts of the High Plains aquifer soon after the onset of substantial irrigation with groundwater, about 1950 (the period prior to 1950 is called “predevelopment”). In 1986, because of declining water levels, Congress directed the U.S. Geological Survey (USGS), in collaboration with numerous Federal, State, and local water-resources entities, to access and track water-level changes in the aquifer. To assess changes through 2011, USGS report “Water-Level and Storage Changes in the High Plains Aquifer, Predevelopment to 2011 and 2009–11” used data from 3,322 wells for the predevelopment to 2011 comparison period and 7,376 wells for the 2009–11 comparison period. The report’s findings are:

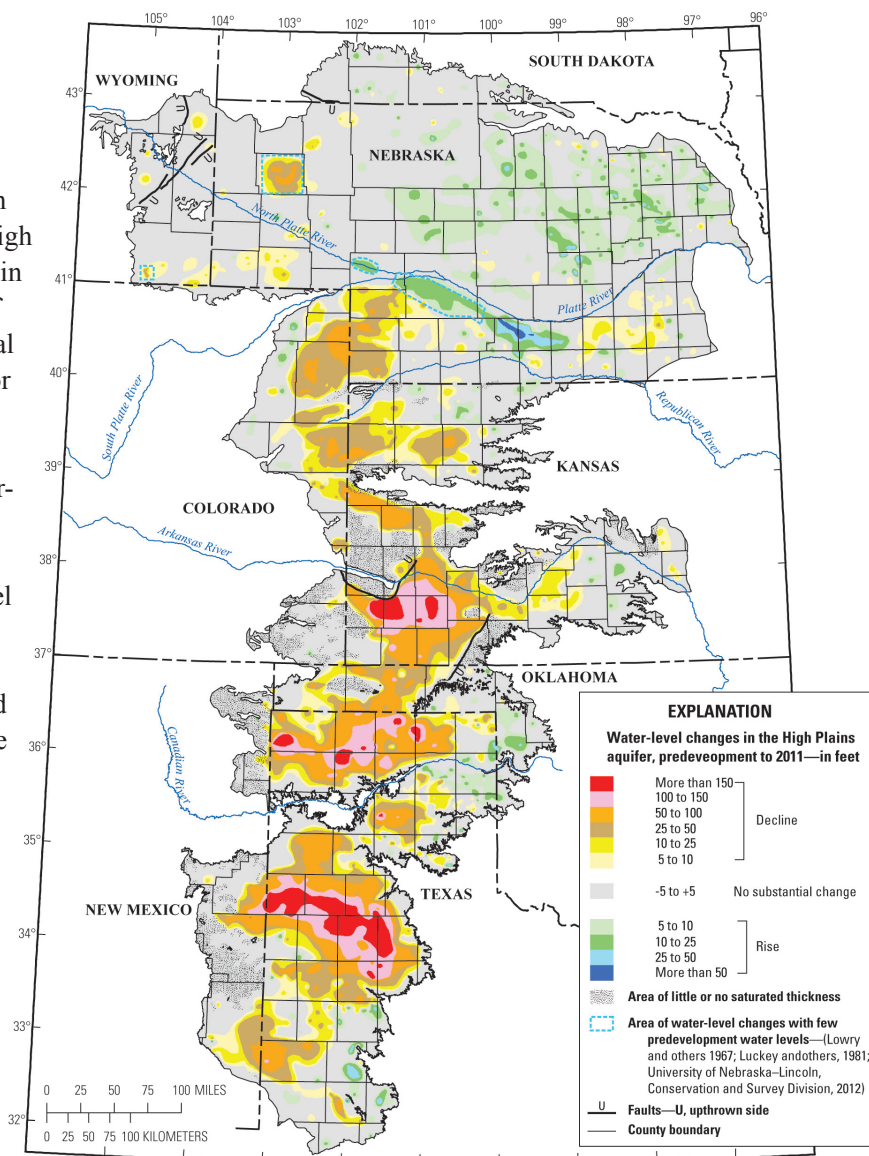
- Area-weighted, average water-level changes in the aquifer were an overall decline of 14.2 feet from predevelopment to 2011; and a decline of 0.1 foot from 2009–11;
- Total water in storage in the aquifer in 2011 was about 2.96 billion acre-feet;
- Changes in water in storage, predevelopment to 2011, was an overall decline of about 246 million acre-feet; and
- Changes in water in storage, 2009–11, was an overall decline of 2.8 million acre-feet.

The methods to calculate area-weighted, average water-level changes; change in water in storage; and total water in storage for this report used geospatial data layers organized as rasters with a cell size of about 62 acres. These methods were modified from methods used in previous reports in an attempt to improve estimates of water-level changes and change in water in storage.

### Acknowledgments

Most of the water-level data used in this report were provided by the following local, State, and Federal entities: Colorado: Division of Water Resources (also known as the Office of the State Engineer); Kansas: Department of Agriculture—Division of Water Resources and the Kansas Geological Survey; Nebraska: Central Nebraska Public Power and Irrigation District, Natural Resources Districts, and University of Nebraska—Lincoln, Conservation and Survey Division;

New Mexico: Office of the State Engineer; Oklahoma: Water Resources Board; South Dakota: Department of Environment and Natural Resources; Texas: Groundwater Conservation Districts and the Water Development Board; Wyoming: State Engineer’s Office; and Federal: Bureau of Reclamation and U.S. Fish and Wildlife Service. The author thanks the above entities for providing their water-level data.



### USGS Scientific Investigations Report 2012–5291

McGuire, V.L., 2012, Water-level and storage changes in the High Plains aquifer, predevelopment to 2011 and 2009–11: U.S. Geological Survey Scientific Investigations Report 2012–5291, 15 p.

This report is available at <http://pubs.usgs.gov/sir/2012/5291/>.

### For more information, contact:

Director  
USGS Nebraska Water Science Center  
5231 S. 19th Street  
Lincoln, NE 68512  
(402) 328-4100  
<http://ne.water.usgs.gov>