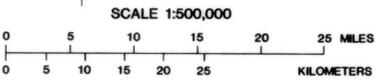


Base from U.S. Geological Survey  
Clinton 1:250,000, 1955;  
Dahart 1:250,000, 1954;  
Perryton 1:250,000, 1954; and  
Woodward 1:250,000, 1955



**EXPLANATION**

- AREA OF OUTCROP—Bedrock outcrop within the High Plains aquifer area.
- LINE OF EQUAL WATER-LEVEL CHANGE—Dashed where approximately located. Interval 25 feet.
- AREA OF FEW OR INSUFFICIENT DATA
- BOUNDARY OF HIGH PLAINS AQUIFER

**GENERAL DESCRIPTION**

The High Plains aquifer in Oklahoma is part of a regional aquifer system extending from South Dakota, on the north, through Wyoming, Colorado, Nebraska, Kansas, and Oklahoma to Texas and New Mexico on the south (index map). The principal aquifer, the Ogallala Formation of late Tertiary age, is hydraulically connected with other unconsolidated deposits, principally of Quaternary age. Alluvium and terrace deposits in hydraulic continuity with the Ogallala are included in the High Plains aquifer in Oklahoma. Parts of the underlying bedrock also are hydraulically connected with the Ogallala. The High Plains aquifer in Oklahoma has been eroded on the west to expose rocks of Cretaceous age and on the east to expose rocks of Permian age.

During 1978, the U.S. Geological Survey began a 5-year study of the High Plains regional aquifer system to provide hydrologic information for evaluation of the effects of long-term development of the aquifer and to develop computer models for prediction of aquifer response to alternative changes in ground-water management (Weeks, 1978). This report is one of a series presenting hydrologic information on the High Plains aquifer in Oklahoma.

The predevelopment to 1980 water-level changes in the High Plains regional aquifer in Oklahoma are shown for Harper, Ellis, Woodward, Dewey, and Roger Mills Counties, on the east, and for the Oklahoma Panhandle, consisting of Cimarron, Texas, and Beaver Counties, on the west. About 1,470 water-level measurements in the Panhandle were used in compiling the predevelopment water-table map (Havens, 1982c). These measurements date from the late 1930's and early 1940's. In the remaining area to the east, about 150 water-level measurements from the 1950's to the 1970's are representative of predevelopment water levels. For the 1980 water-table map, about 330 measurements were made in the Panhandle and about 350 measurements in the eastern area by the Oklahoma Water Resources Board (Havens, 1982b).

The water-level change map was generated by a computer-graphics program using these predevelopment water-table altitudes and 1980 water-table altitudes. The two sets of maps were overlaid by a grid and altitudes were interpolated at the grid intersections. Altitude differences at the grid intersections of the two sets of maps gave the water-level change at those points. From the altitude differences at these points, the computer program generated the map of the water-level change. The water table extends through areas of bedrock high and outcrops that are hydraulically continuous with the High Plains aquifer and water-level changes in these areas generally reflect changes within the bedrock.

**CONVERSION TABLE**

The inch-pound units of measurement given in this report are listed with equivalent International System (SI) of units using the following conversion factors:

Inch-pound unit	Multiply by	SI (metric) unit
foot	0.3048	meter
mile	1.609	kilometer

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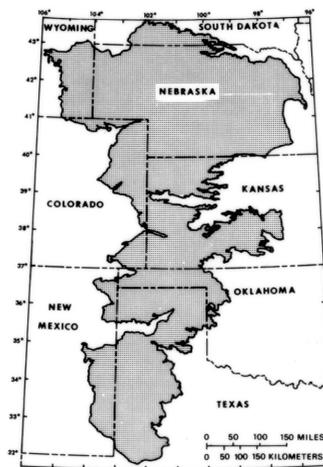
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Index map showing location of the High Plains aquifer (shaded)

**WATER-LEVEL CHANGES IN THE HIGH PLAINS REGIONAL AQUIFER, NORTHWESTERN OKLAHOMA, PREDEVELOPMENT TO 1980**

By  
**John S. Havens**  
1983