

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.

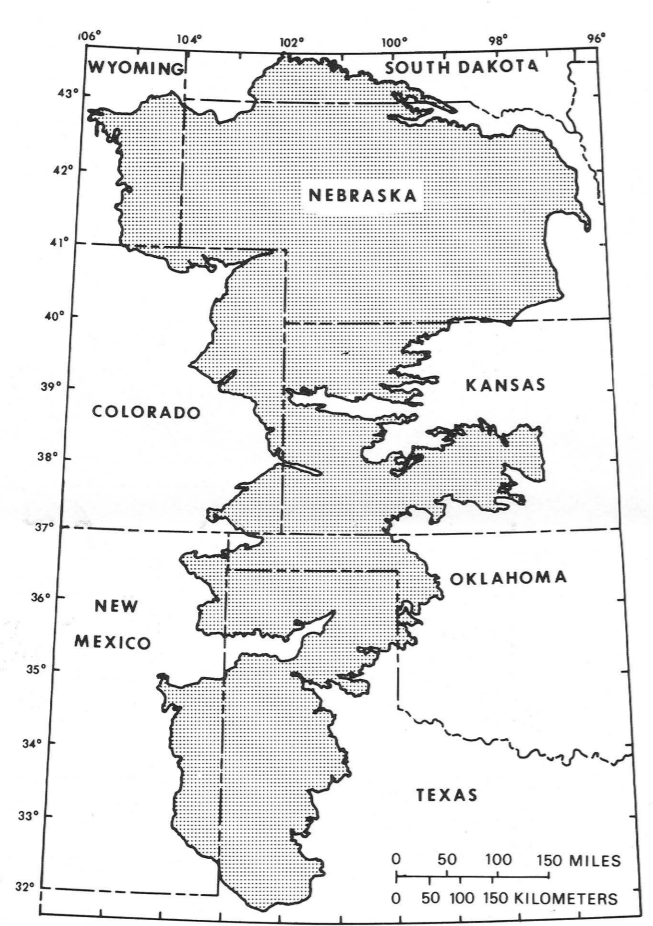
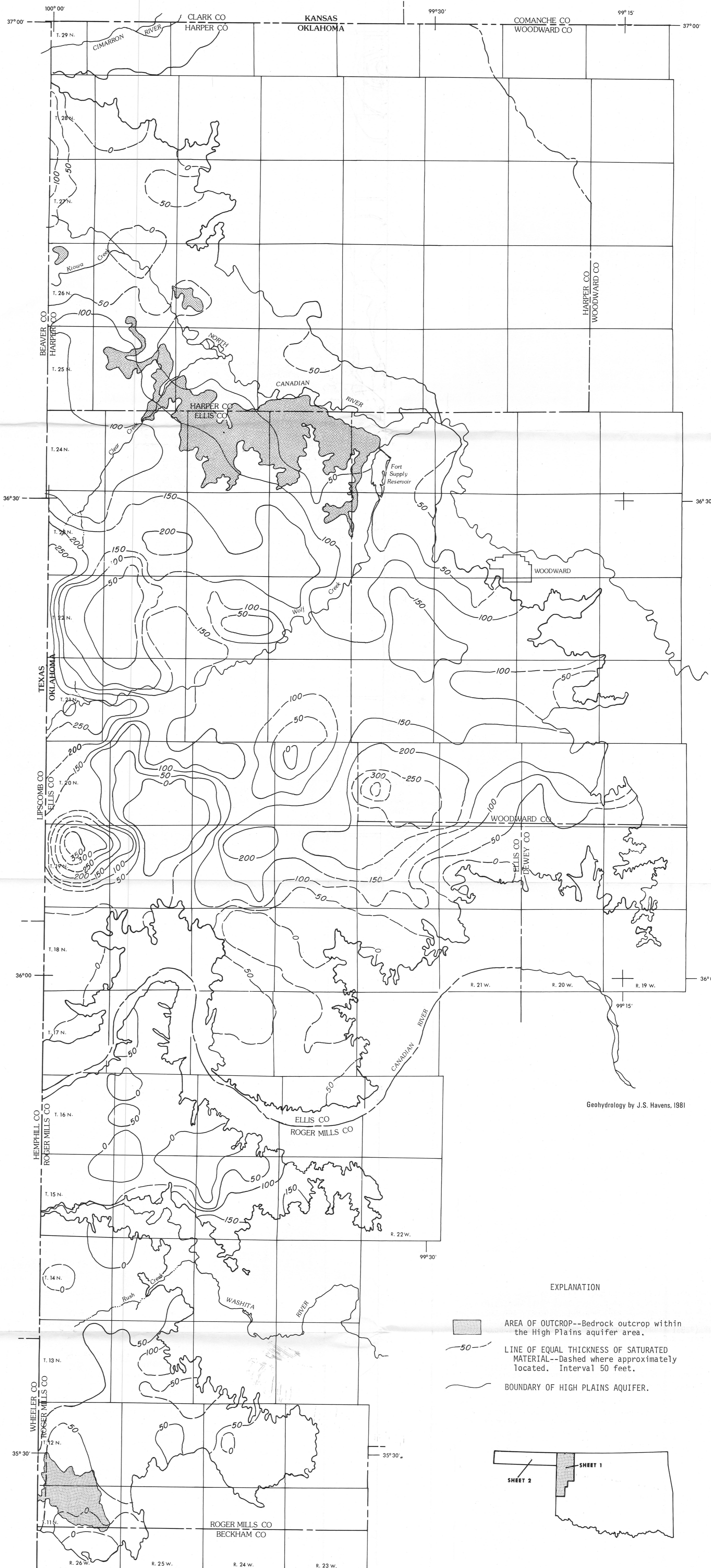
The 1980 saturated thickness of the High Plains regional aquifer in Oklahoma is shown for the eastern area (plate 1), consisting of Harper, Ellis, Woodward, Dewey, and Roger Mills Counties, and for the Panhandle area (plate 2), consisting of Cimarron, Texas, and Beaver Counties.

The saturated thickness maps were generated by a computer graphics program using bedrock altitudes (Havens, 1982a) and water-table altitudes from measurements made in 1980 by the Oklahoma Water Resources Board (Havens, 1982b). 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 saturated thickness at those points. From these points, the computer program generated a contour map of the saturated thickness.

For those who use the International System (SI) of measurement rather than the inch-pound system, the foot may be converted to meter by using the multiplication factor 0.3048.

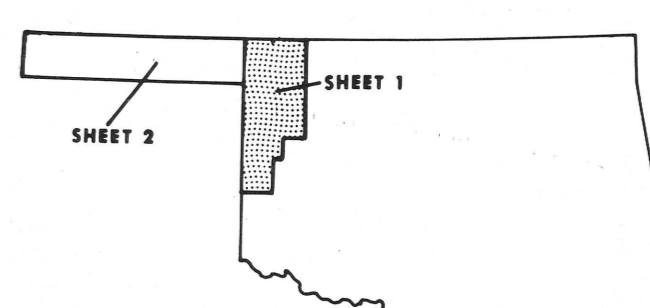
SELECTED REFERENCES

Dougenick, J.A., and Sheehan, D.E., 1975, SYMAP user's reference manual: Cambridge, Harvard University, 187 p.
Havens, John S., 1982a, Generalized altitude and configuration of the base of the High Plains regional aquifer, northwestern Oklahoma: U.S. Geological Survey Water-Resources Investigations Open-File Report 81-1117, scale 1:250,000, 2 sheets.
1982b, Altitude and configuration of the 1980 water table in the High Plains regional aquifer, northwestern Oklahoma: U.S. Geological Survey Water-Resources Investigations Open-File Report 82-100, scale 1:250,000, 2 sheets.
1982c, Altitude and configuration of the predevelopment water table in the High Plains regional aquifer, northwestern Oklahoma: U.S. Geological Survey Water-Resources Investigations Open-File Report 82-275, scale 1:250,000, 2 sheets.
Knowles, T., Nordstrom, P., and Klemt, W.B., 1982, Evaluating the ground-water resources of the High Plains of Texas, final report; Volume 2, Basic data for northern third of region: Texas Department of Water Resources LP-173, 451 p.
Weeks, J.B., 1978, Plan of study for the High Plains regional aquifer systems analysis in parts of Colorado, Kansas, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Water-Resources Investigations 78-70, 28 p.
Weeks, J. B., and Gutentag, E. D., 1981, Bedrock geology, altitude of base, and 1980 saturated thickness of the High Plains aquifer in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Hydrologic Investigations Atlas HA-648, 2 sheets.



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

- EXPLANATION
- AREA OF OUTCROP--Bedrock outcrop within the High Plains aquifer area.
 - LINE OF EQUAL THICKNESS OF SATURATED MATERIAL--Dashed where approximately located. Interval 50 feet.
 - BOUNDARY OF HIGH PLAINS AQUIFER.



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

SCALE 1:250,000

0 5 10 15 20 25 30 MILES
0 5 10 15 20 25 30 KILOMETERS

MAP SHOWING 1980 SATURATED THICKNESS OF THE HIGH PLAINS REGIONAL AQUIFER
IN HARPER, ELLIS, WOODWARD, DEWEY, AND ROGER MILLS COUNTIES, OKLAHOMA

**SATURATED THICKNESS OF THE HIGH PLAINS
REGIONAL AQUIFER IN 1980, NORTHWESTERN OKLAHOMA**
By
John S. Havens
1982