



ALTITUDE AND CONFIGURATION OF THE WATER TABLE
IN THE HIGH PLAINS AQUIFER IN KANSAS, 1980
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GENERAL DESCRIPTION

The High Plains aquifer in Kansas is part of a regional system that extends into Colorado, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming. The aquifer in Kansas underlies an area of 31,000 square miles in the western and south-central part of the State. This aquifer is a hydraulically connected assemblage of unconsolidated water-bearing deposits. In western Kansas, the High Plains aquifer consists principally of the Ogallala Formation of late Tertiary age and the overlying deposits of Quaternary age. In south-central Kansas, the aquifer consists of unconsolidated deposits principally of Quaternary age. Valley alluvium of Quaternary age also is included in the deposits in both areas. The High Plains aquifer is delimited on the east by outcrops of Permian or Cretaceous rocks and by unsaturated deposits of Quaternary age.

The U.S. Geological Survey began a 5-year study of the High Plains regional aquifer in 1978 to provide: (1) Hydrologic information for evaluating the effects of continued ground-water development and (2) computer models for predicting aquifer response to changes in ground-water development. This report is one of a series that presents hydrologic information on the aquifer in Kansas for a specific time.

The altitude and configuration of the water table of the High Plains aquifer in Kansas during 1980 are shown. Data used in preparing the map include: (1) Water levels measured by the U.S. Geological Survey, as part of a continuing cooperative program with the Kansas Geological Survey and the Kansas State Board of Agriculture, Division of Water Resources; (2) water-level measurements published in county reports by the Kansas Geological Survey, and (3) water levels reported by private drilling contractors. In irrigated areas, measurements were made during the winter when water levels generally had recovered from pumping during the irrigation season.

The water table slopes generally from west to east at an average of 10 feet per mile. The altitude of the water table ranges from about 3,850 feet in the southwest corner of Sherman County, northwestern Kansas to about 1,350 feet in northern Sedgewick County, south-central Kansas. Ground water moves perpendicularly to the water-table contours from higher altitudes in the western part of the High Plains to lower altitudes in the east. Contours that cross stream valleys without flexure may indicate that the water table lies well below the streambed. Upgradient flexures of the water-table contours along stream valleys indicate that ground water flows toward, and discharges into, streams. This is most evident along the South Fork Republican River in Cheyenne County, northwestern Kansas, and the South Fork Neosho River in Pratt and Kingman Counties, south-central Kansas.

CONVERSION TABLE

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

Inch-pound unit	Multiply by	SI unit
foot	0.3048	meter
mile	1.609	kilometer
square mile	2.590	square kilometer
foot per mile	0.1894	meter per kilometer

The National Geodetic Vertical Datum of 1929 (NGVD) is a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada. NGVD of 1929 refers to sea level in this report.

SELECTED REFERENCES

- Borman, R. G., 1979, Altitude and configuration of the water table and depth to water in the northern High Plains of Colorado, January 1978: U.S. Geological Survey Water-Resources Investigations 79-54, scale 1:500,000, 1 sheet.
- Gutentag, E. D., and Weeks, J. B., 1980, Water table in the High Plains aquifer in 1978 in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Hydrologic Investigations Atlas HA-642, scale 1:2,500,000, 1 sheet.
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- Weeks, J. B., 1978, Plan of study for the High Plains Regional Aquifer-System Analysis in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Water-Resources Investigations 78-70, 26 p.

EXPLANATION

- AREA OF BEDROCK OUTCROP WITHIN AQUIFER BOUNDARY
- AREA WHERE WATER TABLE IS AT OR NEAR BEDROCK SURFACE--Contours not shown
- WATER-TABLE CONTOUR--Shows altitude of water table, 1980. Solid where accurately located (type 1); long dash where approximately located (type 2); and short dash where location is speculative (type 3). Contour interval 50 feet. Datum is National Geodetic Vertical Datum of 1929
- BOUNDARY OF HIGH PLAINS AQUIFER

