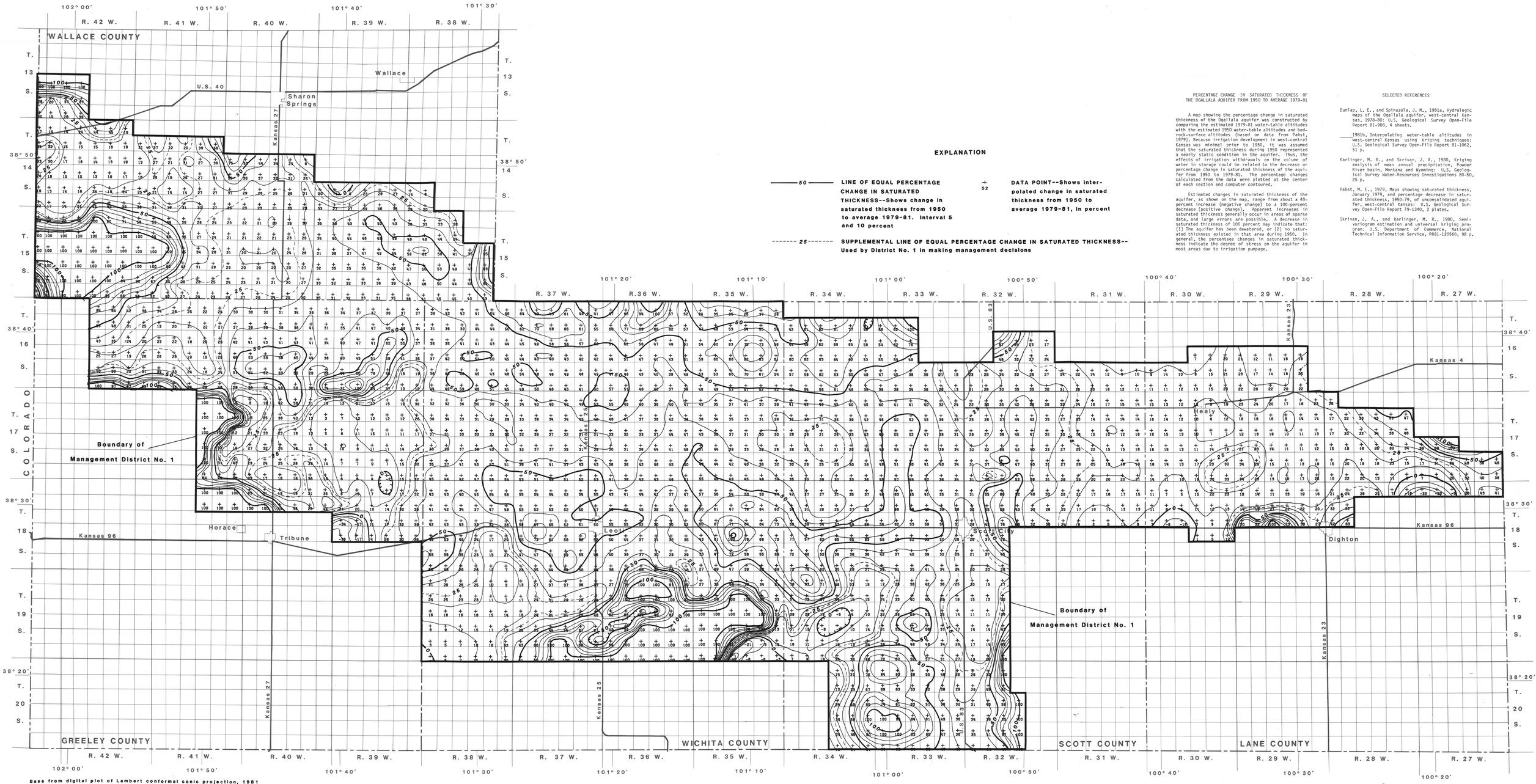
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared in cooperation with the
WESTERN KANSAS GROUNDWATER MANAGEMENT DISTRICT NO. 1

OPEN-FILE REPORT 82-258
SHEET 4 OF 4



Base from digital plot of Lambert conformal conic projection, 1981

0 2 4 MILES
0 2 4 6 KILOMETERS

EXPLANATION

—— 50 —— LINE OF EQUAL PERCENTAGE CHANGE IN SATURATED THICKNESS--Shows change in saturated thickness from 1950 to average 1979-81. Interval 5 and 10 percent

+ 52 DATA POINT--Shows interpolated change in saturated thickness from 1950 to average 1979-81, in percent

------ 25 ------ SUPPLEMENTAL LINE OF EQUAL PERCENTAGE CHANGE IN SATURATED THICKNESS--Used by District No. 1 in making management decisions

PERCENTAGE CHANGE IN SATURATED THICKNESS OF THE OGALLALA AQUIFER FROM 1950 TO AVERAGE 1979-81

A map showing the percentage change in saturated thickness of the Ogallala aquifer was constructed by comparing the estimated 1979-81 water-table altitudes with the estimated 1950 water-table altitudes and bedrock-surface altitudes (based on data from Pabst, 1979). Because irrigation development in west-central Kansas was minimal prior to 1950, it was assumed that the saturated thickness during 1950 represented a nearly static condition in the aquifer. Thus, the effects of irrigation withdrawals on the volume of water in storage could be related to the decrease or percentage change in saturated thickness of the aquifer from 1950 to 1979-81. The percentage changes calculated from the data were plotted at the center of each section and computer contoured.

Estimated changes in saturated thickness of the aquifer, as shown on the map, range from about a 40-percent increase (negative change) to a 100-percent decrease (positive change). Apparent increases in saturated thickness generally occur in areas of sparse data, and large errors are possible. A decrease in saturated thickness of 100 percent may indicate that: (1) The aquifer has been dewatered, or (2) no saturated thickness existed in that area during 1950. In general, the percentage changes in saturated thickness indicate the degree of stress on the aquifer in most areas due to irrigation pumpage.

SELECTED REFERENCES

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Skrivan, J. A., and Karlinger, M. R., 1980, Semivariogram estimation and universal kriging program: U.S. Department of Commerce, National Technical Information Service, PB81-120560, 98 p.

PERCENTAGE CHANGE IN SATURATED THICKNESS OF THE OGALLALA AQUIFER, 1950 TO AVERAGE 1979-81

HYDROLOGIC MAPS OF OGALLALA AQUIFER, WEST-CENTRAL KANSAS, 1979-81

By
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1982