

**POTENTIOMETRIC MAP OF THE EUTAW-McSHAN AQUIFER
IN NORTHEASTERN MISSISSIPPI, FALL 1982**

The U.S. Geological Survey, in cooperation with the Mississippi Department of Natural Resources, Bureau of Land and Water Resources, has prepared a series of maps of major aquifers in Mississippi to show the potentiometric surface and the effects of withdrawals from the aquifer on the potentiometric surface. This map, the second in the series for the Eutaw-McShan aquifer, follows a map that delineated the potentiometric surface of the aquifer in 1978 (Wasson, 1980).

The Eutaw-McShan aquifer is composed of thin-bedded sands and clays which act as one aquifer. The upper part of the aquifer is the Tombigbee Sand Member of the Eutaw Formation. The basal part of the aquifer is the McShan Formation. Both formations are Cretaceous age. Thickness of the aquifer ranges from about 400 feet in Noxubee County to less than 50 feet in northern Tishomingo County. The aquifer overlies the Gordo Formation and underlies the Selma Group.

Precipitation recharges the Eutaw-McShan aquifer in the outcrop area in Tishomingo, Itawamba, and Monroe Counties, southeastern Prentiss and Lee Counties, and in adjacent parts of Alabama. The regional ground-water movement, southwestward into the subsurface from the outcrop area, is influenced markedly by the Tombigbee River, and has also been modified by large centers of pumping at West Point and Tupelo. As water moves down dip from the outcrop, mineralization increases. The approximate down dip extent of freshwater in the Eutaw-McShan aquifer, about 60 miles

southwest of the outcrop area, marks a boundary of this map.

In northeastern Mississippi, the Eutaw-McShan aquifer contains freshwater (less than 1,000 milligrams per liter of dissolved solids) in 20 counties. The aquifer is the source of ground water for industrial and municipal wells and many domestic wells in the study area.

This water-level map is based on water-level measurements made in about 120 wells in the Eutaw-McShan aquifer in fall 1982, and on the altitudes of water surfaces in some streams. Water-level measurements made in nearby wells in Alabama, not shown on this map, provided additional control. The contours show altitudes at which water levels would have stood in tightly cased unpumped wells in fall 1982.

In and near the outcrop area, water levels in the Eutaw-McShan aquifer have continued stable since 1978. Where wells are sparse and withdrawals small in the west and southwest, water levels have declined about 2 feet per year. The largest declines, about 4 feet per year, have occurred in the Tupelo area (see hydrographs of wells in Lee County). Lower water levels have resulted in a deeper cone of depression spreading westward into Pontotoc County. In the West Point area, between 1972 and 1978, water level declines of about 3 feet per year have resulted in an increase in the cone of depression. Water levels have declined about 1 foot per year since 1978 because of a reduction in pumping.

ADDITIONAL INFORMATION

This map showing the results of the Fall 1982 water-level measurements for the Eutaw-McShan aquifer is the second map showing ground-water levels in the aquifer. These maps are part of a series of maps that show water levels in the major aquifer in Mississippi. Data describing the individual wells used in this study may be obtained from the following:

Mississippi Department of Natural Resources Bureau of Land and Water Resources Post Office Box 10631 Jackson, Mississippi 39209 (601) 961-5200	District Chief U.S. Geological Survey Water Resources Division Suite 710, Federal Building 100 W. Capitol Street Jackson, Mississippi 39269 (601) 960-4600
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Copies of this report can be purchased from:

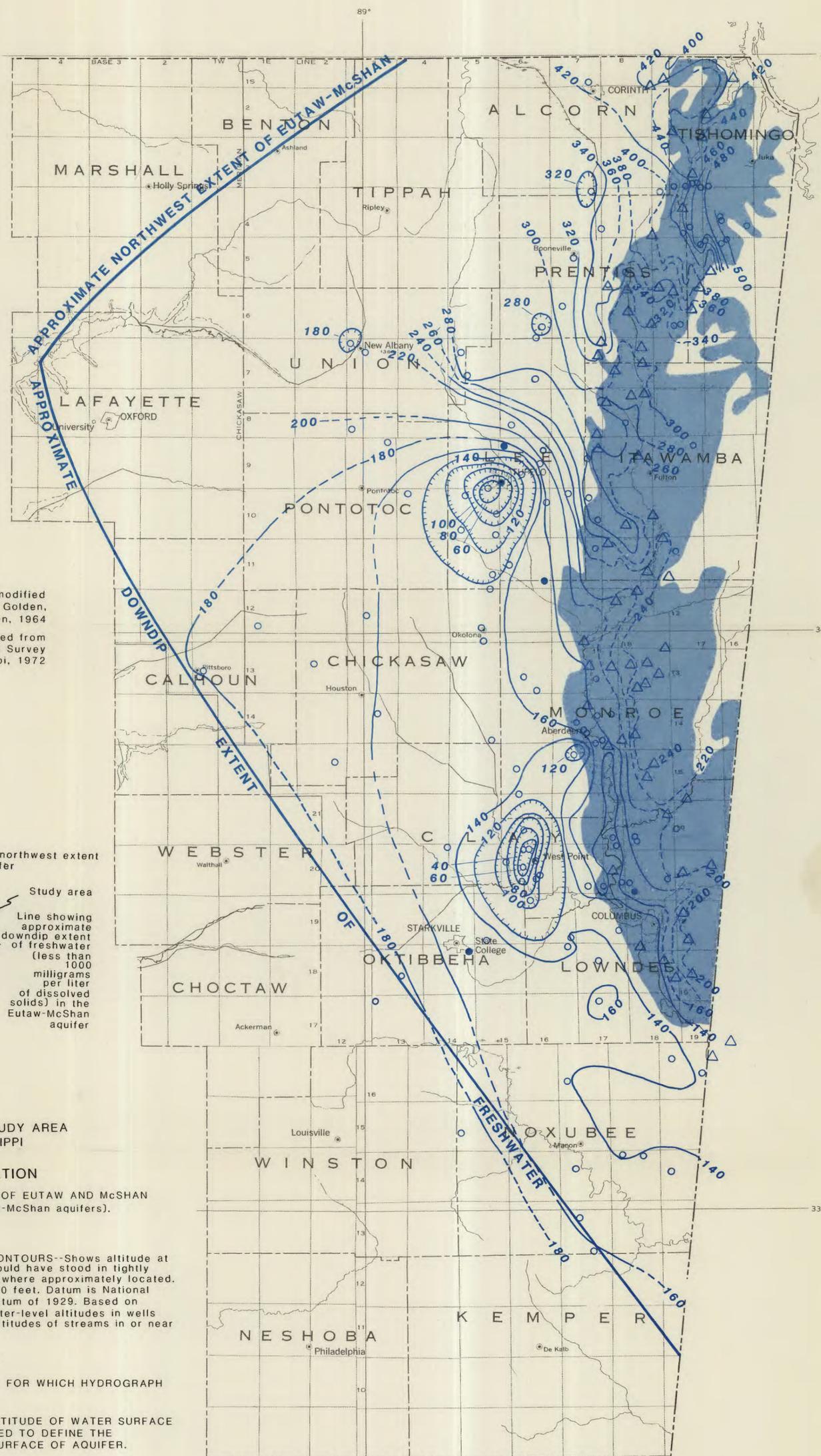
Open-File Services Section
Western Distribution Branch
U.S. Geological Survey
Box 25425, Federal Center
Lakewood, Colorado 80225
(303) 234-5888

SELECTED REFERENCES

- Boswell, E. H., 1963, Cretaceous aquifers of northeastern Mississippi: Mississippi Board of Water Commissioners Bulletin 63-10, 202 p.
- 1977, The Eutaw-McShan aquifer in Mississippi: U.S. Geological Survey Water-Resources Investigations Report 76-134, map.
- Wasson, B. E., 1980, Potentiometric map of the Eutaw-McShan aquifer in northeastern Mississippi, September, October, November 1978: U.S. Geological Survey Water-Resources Investigations Report 79-1584, map.

Geology modified from Speer, Golden, and Patterson, 1964

Base map modified from U.S. Geological Survey Map of Mississippi, 1972



Line showing approximate northwest extent of the Eutaw-McShan Aquifer

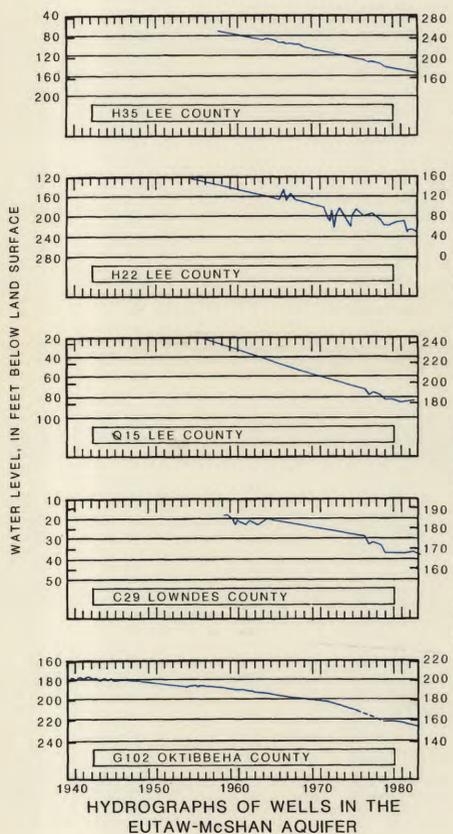


Study area
Line showing approximate down dip extent of freshwater (less than 1000 milligrams per liter of dissolved solids) in the Eutaw-McShan aquifer

LOCATION OF STUDY AREA IN MISSISSIPPI

EXPLANATION

- AREA OF OUTCROP OF EUTAW AND McSHAN FORMATIONS (Eutaw-McShan aquifers).
- POTENTIOMETRIC CONTOURS--Shows altitude at which water level would have stood in tightly cased wells. Dashed where approximately located. Contour interval is 20 feet. Datum is National Geodetic Vertical Datum of 1929. Based on measurements of water-level altitudes in wells and water-surface altitudes of streams in or near outcrop area.
- OBSERVATION WELL
- OBSERVATION WELL FOR WHICH HYDROGRAPH IS SHOWN.
- POINT AT WHICH ALTITUDE OF WATER SURFACE IN STREAM WAS USED TO DEFINE THE POTENTIOMETRIC SURFACE OF AQUIFER.



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JACKSON, MISSISSIPPI