












Modified from Williamson, A.K., Grubb, H.F., and Weiss, J.S., 1990, Ground-water flow in the Gulf Coast aquifer systems, south-central United States—A preliminary analysis: U.S. Geological Survey Water-Resources Investigations Report 9-4071, 123 p.

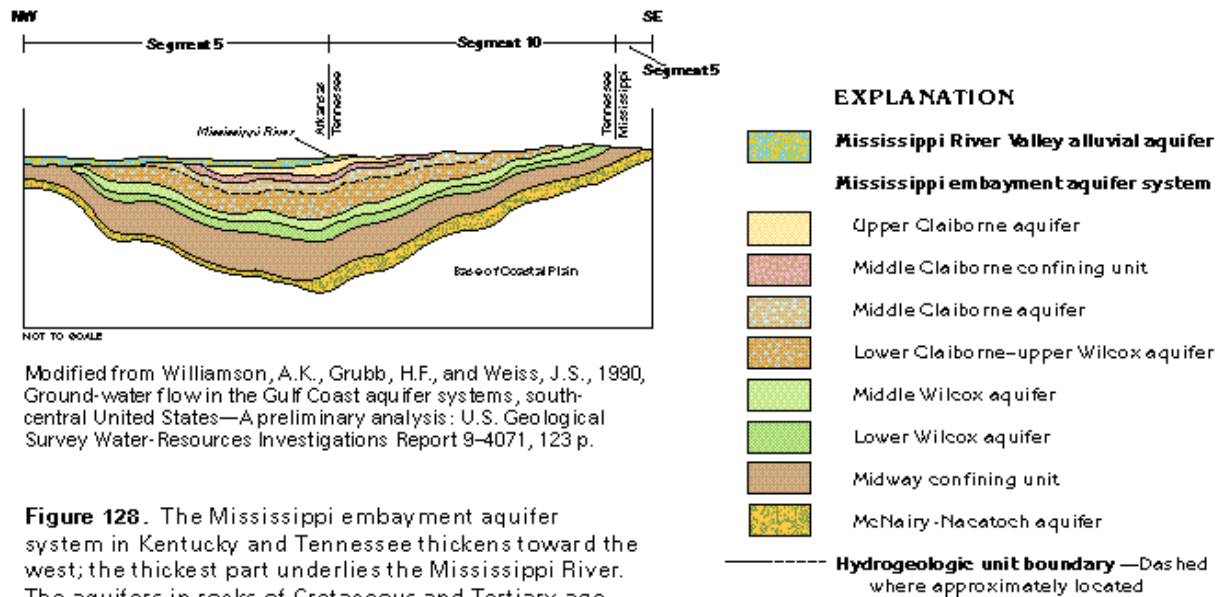
Figure 126. The aquifers and confining units of the Mississippi embayment aquifer system crop out in a sequence of arcuate bands in westernmost Kentucky and Tennessee and in southernmost Illinois. The aquifers are exposed on the east flank of the Mississippi Embayment, which is a large structural downwarp in the Coastal Plain Physiographic Province.



Modified from Hosman, R.L., and Weiss, J.S., 1991, Geohydrologic units of the Mississippi embayment and Texas Coastal Uplands aquifer systems, south-central United States: U.S. Geological Survey Professional Paper 1416-B, 19 p.

EXPLANATION

-  Mississippi River Valley alluvial aquifer
-  Mississippi embayment aquifer system
-  Upper Claiborne aquifer
-  Middle Claiborne aquifer
-  Lower Claiborne–upper Wilcox aquifer
-  Middle Wilcox aquifer
-  Lower Wilcox aquifer
-  McNairy–Nacatoch aquifer
-  Confining unit
-  Mississippi Embayment Province boundary
-  Line of hydrogeologic section
- 10** Atlas segment number



Modified from Williamson, A.K., Grubb, H.F., and Weiss, J.S., 1990, Ground-water flow in the Gulf Coast aquifer systems, south-central United States—A preliminary analysis: U.S. Geological Survey Water-Resources Investigations Report 9-4071, 123 p.

Figure 128. The Mississippi embayment aquifer system in Kentucky and Tennessee thickens toward the west; the thickest part underlies the Mississippi River. The aquifers in rocks of Cretaceous and Tertiary age are exposed at land surface in most of Tennessee but are covered by Quaternary sediments that compose the Mississippi River Valley alluvial aquifer in westernmost Tennessee and in Arkansas. The approximate location of of this generalized section is shown in figure 126.

| System | Series | Geologic unit | | | General lithology | Hydrogeologic unit* | | |
|------------|--------------------------|-------------------------------|-----------------------------|-----------------------------|-----------------------------------|---|-----------------------|---------------------------------|
| | | Illinois | Kentucky | Tennessee | | | | |
| Quaternary | Holocene and Pleistocene | Alluvium and terrace deposits | Alluvium and loess deposits | Alluvium and loess deposits | Sand, gravel, and loess | Mississippi River Valley alluvial aquifer | | |
| Tertiary | Eocene | [Gray Area] | Jackson Formation | Jackson Formation | Sand, silt, and clay | Upper Claiborne aquifer | | |
| | | | Claiborne Group | Cookfield Formation | | Cookfield Formation | Clay and silt | Middle Claiborne confining unit |
| | | | | Cook Mountain Formation | Cook Mountain Formation | Middle Claiborne aquifer | | |
| | | | Sparta Sand | Memphis Sand | Sand and minor clay. Some lignite | Lower Claiborne-upper Wilcox aquifer | | |
| | | | Tallahatta Formation | | | Lower Wilcox aquifer | | |
| | Paleocene | Wilcox Formation | Wilcox Formation | Wilcox Group | Flour Island Formation | Middle Wilcox aquifer | | |
| | | | | Wilcox Group | Fort Pillow Sand | Lower Wilcox aquifer | | |
| | | | | | Old Breastworks Formation | Clay and minor sand | Midway confining unit | |
| | | | | McNairy Group | Porters Creek Clay | | McNairy Group | McNairy Sand |
| | | | | | Clayton Formation | | | |
| Cretaceous | Upper | McNairy Sand | McNairy Sand | McNairy Sand | Sand | McNairy-Nacatoch aquifer | | |
| | | | | | | | Nacatoch Sand | Nacatoch Sand |

*Hydrogeologic unit names apply to the entire Mississippi embayment aquifer system. Local names may differ.

Modified from:

Brahana, J.V., Bradley, M.W., and Mulderink, Dolores, 1986, Preliminary delineation and description of the regional aquifers of Tennessee—Tertiary aquifer system: U.S. Geological Survey Water-Resources Investigations Report 83-4011, 23 p.

Hosman, R.L., and Weiss, J.S., 1991, Geohydrologic units of the Mississippi embayment and Texas Coastal Uplands aquifer systems, south-central United States: U.S. Geological Survey Professional Paper 1416-B, 19 p.

Parks, W.S., and Carmichael, J.K., 1990, Geology and ground-water resources of the Memphis Sand in western Tennessee: U.S. Geological Survey Water-Resources Investigations Report 88-4182, 30 p.

Williamson, A.K., Grubb, H.F., and Weiss, J.S., 1990, Ground-water flow in the Gulf Coast aquifer systems, south-central United States—A preliminary analysis: U.S. Geological Survey Water-Resources Investigations Report 9-4071, 123 p.

Figure 127. Geologic units that range in age from Late Cretaceous to late Eocene are separated into regional aquifers and confining units that compose the Mississippi embayment aquifer system. Not all the aquifers are separated by confining units; rather, fine-grained material in the lower parts of some aquifers restricts vertical ground-water movement. The gray area represents missing rocks.

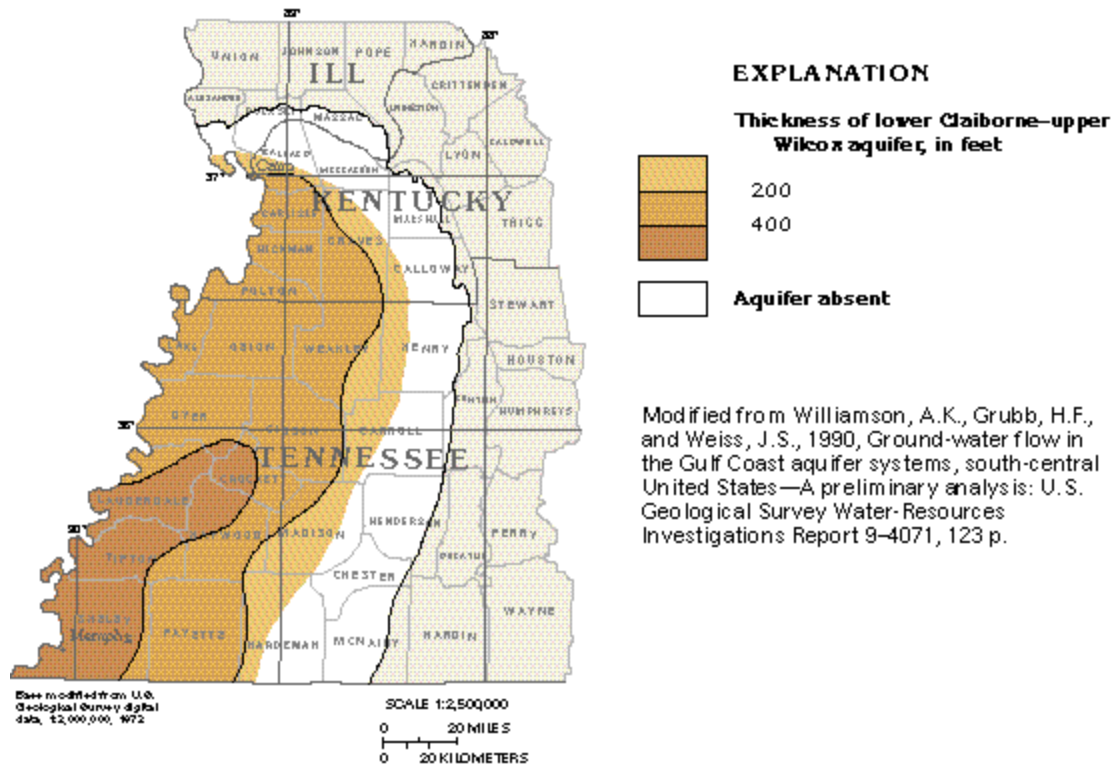


Figure 133. The lower Claiborne–upper Wilcox aquifer is more than 400 feet thick in large parts of several counties in southwestern Tennessee and thins to a featheredge near its updip limit.

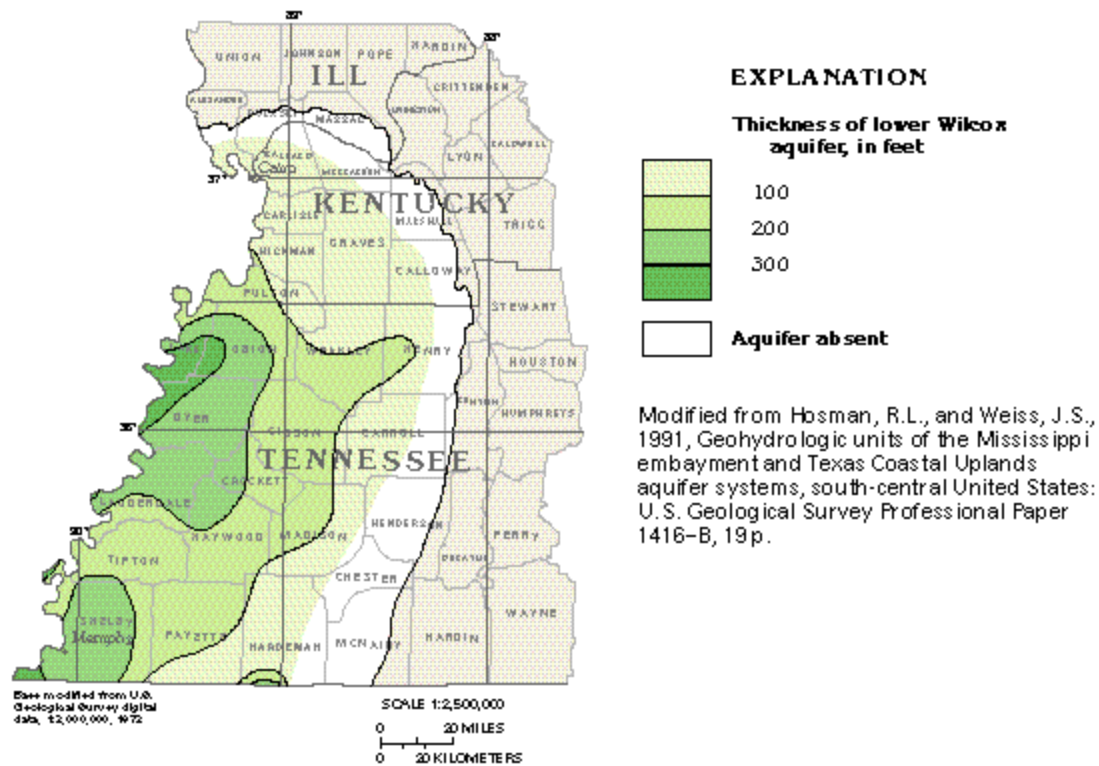


Figure 135. The lower Wilcox aquifer thickens from a thin edge in its outcrop areas to about 300 feet in parts of Dyer, Lake, and Obion Counties, Tenn.

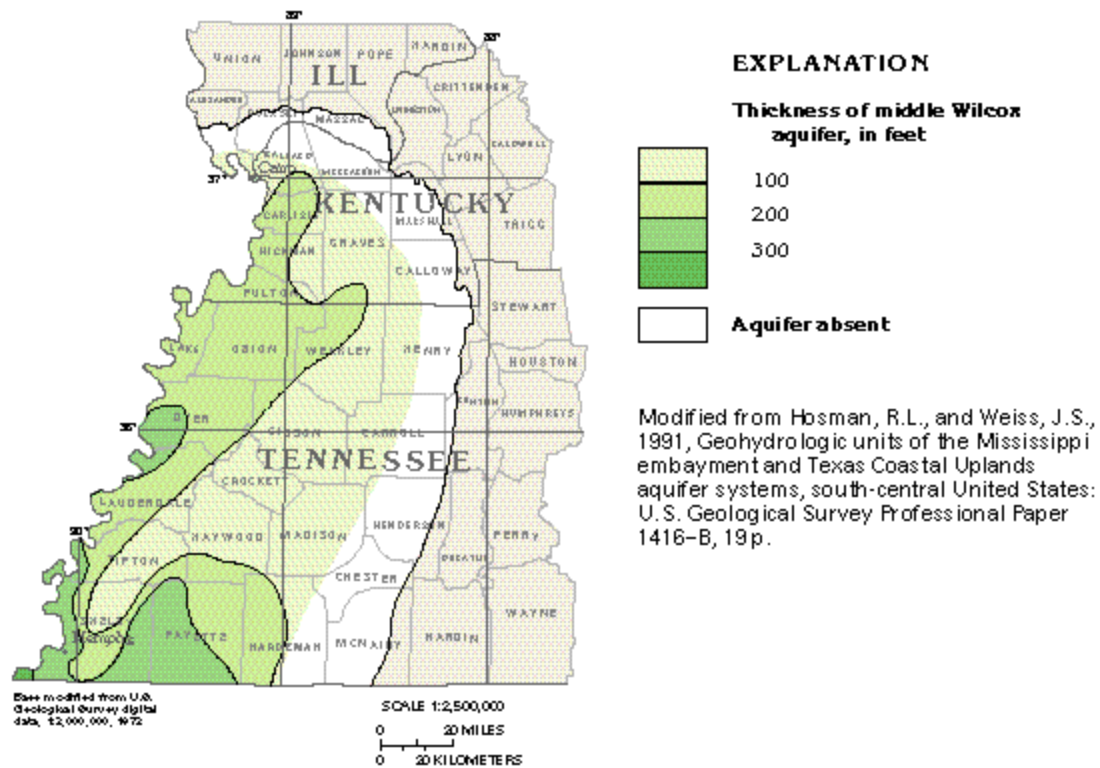


Figure 134. The middle Wilcox aquifer generally is less than 100 feet thick but might locally be more than 200 feet thick. Because of its small thickness and fine-grained character, the aquifer is not extensively used for water supply in Segment 10.

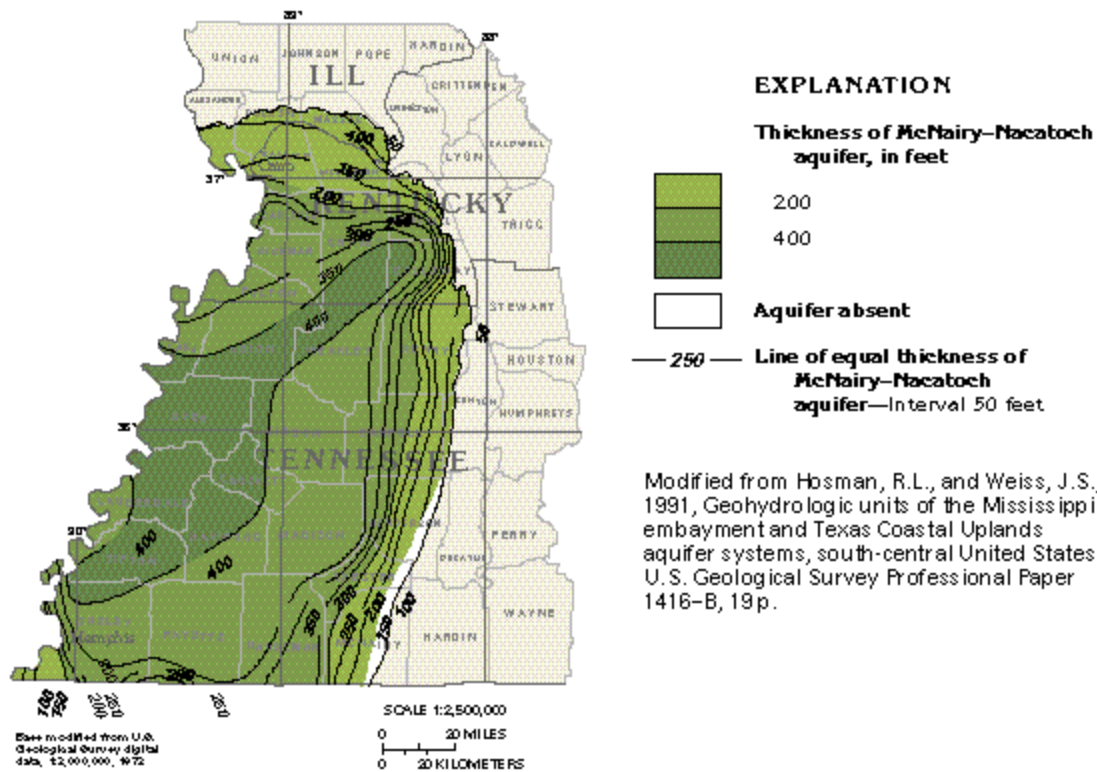


Figure 136. The McNairy–Nacatoch aquifer thins toward its outcrop area from a maximum thickness of more than 400 feet in western Tennessee. Facies change to clay and other low-permeability materials is responsible for the aquifer thinning to the south and southwest.