Potentiometric Surface of the Floridan and Tertiary Sand Aquifers in South Carolina, November 2013

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The Floridan aquifer and its updip clastic equivalent, the Tertiary sand aquifer, is the source of water for many public, industrial, and agricultural suppliers in much of the South Carolina Coastal Plain. This important resource is monitored by regularly measuring nearbottom water levels in selected wells. The potentiometric surface of an aquifer is defined by the elevations at which water stands in tightly cased wells completed in the aquifer.

The boundaries of the Floridan aquifer and the Tertiary sand aquifer used in this investigation are those defined by Aucott and others (1987); The Floridan aquifer generally includes the Cooper Formation, the Oolite Limestone, and the Sapelo Formation (Aucott and others, 1987).

The Tertiary sand aquifer is divided into upper and lower units. The upper unit is the sand facies equivalent of clastic sediments of Early Eocene and Paleocene ages and includes part of the Black Mingo Formation. The lower unit consists of the Floridan aquifer, and extends from northwestern Allendale County to Orangeburg and curves eastward along the coastline of South Carolina. The Tertiary sand aquifer is divided into upper and lower units. The upper unit is the sand facies equivalent of clastic sediments of Early Eocene and Paleocene ages and includes part of the Black Mingo Formation. The lower unit consists of the Floridan aquifer, and extends from northwestern Allendale County to Orangeburg and curves eastward along the coastline of South Carolina.

For this map, water level data from upper Floridan wells in Beaufort and Jasper Counties and from St. Johns River (Jasper County) were used. Data from wells inside and below Floridan wells were used within the boundary shown for the Floridan aquifer. Likewise, data from wells in the Tertiary sand aquifer were used.

The potentiometric map presented here was constructed using water levels measured in 212 wells in late October–November 2013. Data were collected primarily by the South Carolina Department of Natural Resources, with assistance from the U.S. Department of Energy, the South Carolina Department of Health and Environmental Control, and the U.S. Geological Survey. Similar maps have been produced for the Floridan and Tertiary sand aquifers describing the potentiometric surface in 2010 (Hockenmuth and others, 2011, 2013; Hockenmuth, 2009, 1999; Hockenmuth and others, 1986). Although water levels in wells located near the coast can be influenced by tides and, to a lesser extent, barometric conditions, the water-level elevations used for this potentiometric map have not been corrected to mean sea level.

Potentiometric profiles for the Floridan aquifer and for updip clastic equivalents of the Tertiary sand aquifer, the potentiometric surface for late 2013 indicates a generally southeastward ground-water flow. Unlike earlier maps, however, no significant areas of depression are delineated on the 2013 map. OFHEO (1992) noted that depression is likely to exist for the 2013 map. Similar maps and studies (1997–2007) note higher water levels in late 2013 than in previous years. Yet, although a few wells showed slightly higher water levels, probably owing to reductions in local pumping rates.

References


