

Hydrology - SCWRC Report 158

Hydrogeology and Saltwater Contamination of the Floridan Aquifer in Beaufort and Jasper Counties, South Carolina

By
W. Brian Hughes, Michael S. Crouch, and A. Drennan Park
1989

ABSTRACT

The upper unit of the Floridan aquifer is the primary source of ground water supplies in the Beaufort-Jasper Counties area, S. C., because of its good water quality and high productivity. Ground water can also be obtained from formations of Late Cretaceous through Holocene age in the area.

Prior to 1880, the potentiometric surface of the Floridan aquifer was unaffected by pumping. Water levels were above or just below land surface and ground water flowed in an easterly direction, discharging in Port Royal Sound and the Atlantic Ocean. Owing to heavy pumping at Savannah, Ga., water levels are now below sea level as far north as Port Royal Sound and are 150 feet below sea level in the center of the cone of depression. These changes in water level have reversed the direction of ground water flow in the area between Port Royal Sound and Savannah.

Saltwater contamination occurs in many areas in the Floridan aquifer beneath eastern Beaufort and Jasper Counties, and present ground-water conditions could result in contamination on a regional scale.

Saltwater contamination of the aquifer can occur where brackish water

1. enters through a poorly confining bed or where the confining bed is thin or absent,
2. upcones from the lower part of an aquifer as a result of pumping,
3. enters through improperly constructed wells, or
4. moves laterally through an aquifer in response to a reduction in freshwater head.

All of these mechanisms occur in the study area, but lateral movement is the dominant regional mechanism.

Saltwater is present in the aquifer beneath Port Royal Sound between Hilton Head Island and Parris Island. The saltwater is moving with the regional flow toward Hilton Head Island and the Savannah pumping center. Interstate cooperation in ground-water management could prevent the contamination of the Floridan aquifer beneath Hilton Head Island.

Copies of this report are available in the SCDNR's Columbia office.