

Saltwater Intrusion in the Floridan Aquifer System Near Downtown Brunswick, Georgia

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Abstract. Since 1959, the U.S. Geological Survey (USGS) has lead a cooperative water program (CWP) with local government to assess the effect of groundwater development on saltwater intrusion within the Floridan aquifer system (FAS) near Brunswick. Saltwater was first detected in wells completed in the Upper Floridan aquifer (UFA) near the southern part of the city in late 1957. By the 1960s, a plume of saltwater had migrated northward toward two major industrial pumping centers, and since 1965, chloride concentrations have steadily increased in the northern part of the city. In 1978, a 2,720-foot-deep test well drilled south of Brunswick suggests the source of saltwater was located below the UFA in the Fernandina permeable zone of the Lower Floridan aquifer. During calendar year 2014, the CWP included continuous water-level recording at 13 wells completed in either the Floridan, Brunswick, or surficial aquifer systems; synoptic water-level measurements in 56 wells to map the potentiometric surface of the UFA in the Brunswick/Glynn County area during October 2014; and sampling a total of 52 wells completed in the FAS for chloride concentrations. Results from thirty-one of the wells sampled indicate the shape of the chloride plume in the UFA near downtown Brunswick has remained relatively unchanged in recent years. Results from nine additional samples collected at industrial wells located near the northern part of the chloride plume indicate vertical migration of chlorides between the upper and lower water-bearing zones of the UFA.