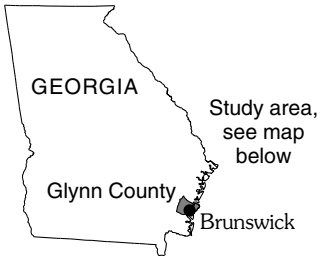
City of Brunswick and Glynn County Cooperative Water-Resources Program

Study Chief James L. Labowski
Cooperator City of Brunswick/Glynn County
Year Started 1959



Problem

In the Brunswick area, saltwater has contaminated the Upper Floridan aquifer for nearly 50 years. Currently (2001) within an area of several square miles of downtown Brunswick, the aquifer yields water that has a chloride concentration greater than 2,250 milligrams per liter and is above State and Federal drinking-water standards (Georgia Environmental Protection Division, 1997; U.S. Environmental Protection Agency, 2000). Saltwater contamination has constrained further development of the Upper Floridan aquifer in the Brunswick area and prompted interest in the development of alternative sources of water supply, primarily from the shallower surficial and upper and lower Brunswick aquifers, and from the deeper Lower Floridan aquifer.

Objectives

- Better define mechanisms of ground-water flow and movement of saltwater in the Floridan aquifer system;
- Define the vertical geometry of the high-chloride plume;
- Assess alternative sources of water supply from the surficial aquifer, Brunswick aquifer system, and the Lower Floridan aquifer; and
- Monitor long-term ground-water levels and quality, and develop and maintain a comprehensive ground-water database.

Progress and Significant Results, 2001

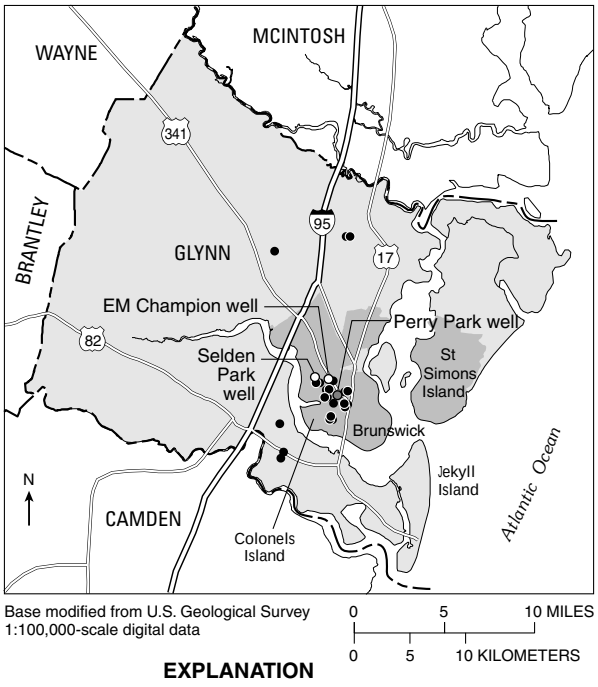
- Continued operating the 22-well continuous ground-water-level monitoring network (13 in the Upper Floridan aquifer, 4 in the Lower Floridan aquifer, 4 in the Brunswick aquifer system, and 1 well in the surficial aquifer).
- Collected samples from 65 wells during June 2001 for analysis of chloride concentration, and prepared chloride and water-level maps.
- Incorporated new well information into the U.S. Geological Survey (USGS) National Water Information System (NWIS) database, including 18 upper and lower Brunswick aquifer wells and 2 Upper Floridan aquifer wells.
- Obtained vertical specific conductance profiles at two well sites to better define the vertical geometry of the high-chloride plume at Brunswick. These data are being evaluated to determine applicability of similar efforts in the future.
- Compiled hydraulic properties of hydrogeologic units. Aquifer tests were conducted in wells completed in the Lower Floridan aquifer at a new test-well site in Brunswick.
- Developed aquifer test specifications for a combined test/production well to be completed in the Lower Floridan aquifer on St. Simons Island, east of Brunswick. Data from this well will be evaluated to determine the water quality and water-bearing properties of the Lower Floridan aquifer.
- Developed a Web site for the Brunswick program that may be accessed at URL: *http://ga2.er.usgs.gov/brunswick/*.

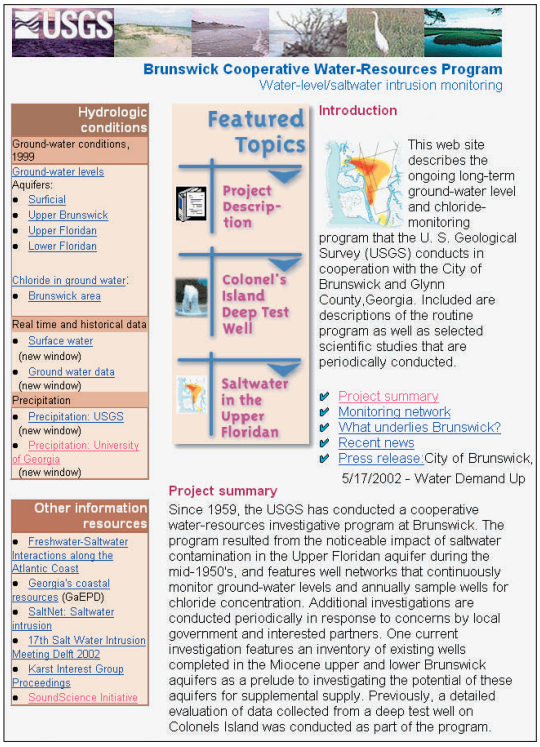
References Cited

Georgia Environmental Protection Division, 1997, Secondary maximum contaminant levels for drinking water: Environmental Rule 391-3-5-19, revised October 1997: Official Code of Georgia Annotated Statutes, Statute 12-5-170 (Georgia Safe Drinking Water Act), variously paginated.

Jones, L.E., Prowell, D.C., and Maslia, M.L., 2002, Hydrogeology and water quality (1978) of the Floridan aquifer system at U.S. Geological Survey TW-26, on Colonels Island, near Brunswick, Georgia: U.S. Geological Survey Water-Resources Investigations Report 02-4020, 44 p.

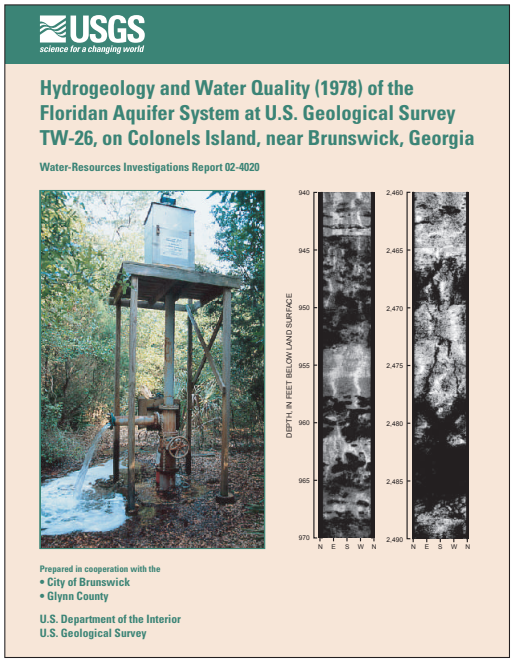
U.S. Environmental Protection Agency, 2000, Maximum contaminant levels (Part 143, National Secondary Drinking Water Regulations): U.S. Code of Federal Regulations, Title 40, Parts 100–149, revised as of July 1, 2000, p. 612–614.



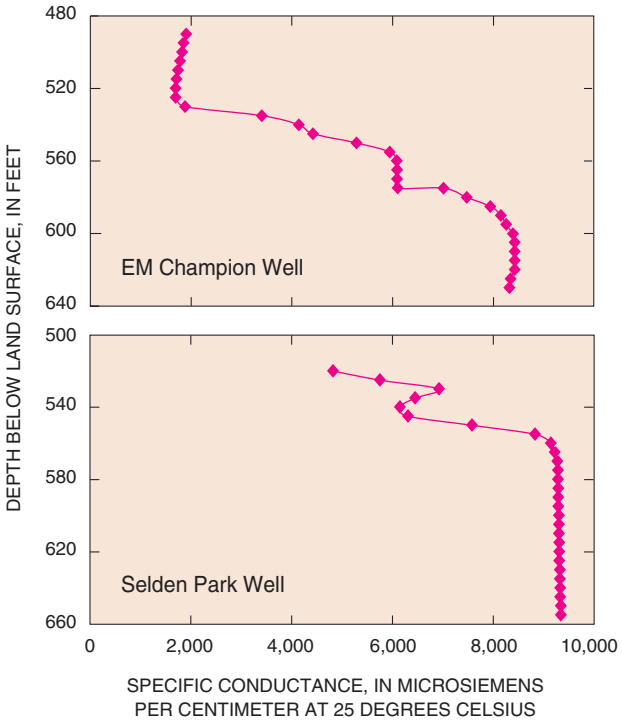


The USGS Brunswick Web site describes the ongoing long-term ground-water-level and chloride monitoring program that the USGS conducts in cooperation with the city of Brunswick, Glynn County, and industry partners. Included are descriptions of the core program, special scientific studies that are conducted periodically, and historical chloride concentration maps. The Web site can be accessed at URL: ***http://ga2.er.usgs.gov/brunswick/****.*

The Perry Park production well is an example of how high-chloride ground water can be withdrawn from depth with pumping. The well is located near the boundary of the saltwater plume. Here, the well is being prepared for Hydrophysical™ logging in an attempt to identify the entrance depth of the high-chloride water. Photo by Welby L. Stayton, USGS.



A recently published USGS report (Jones and others, 2002) describes data from the deep test well on Colonels Island (cover shown above).



Vertical profiles of specific conductance within the open interval of two wells (shown above) indicate stratification of chloride concentration in Upper Floridan aquifer wells located in or near to the high-chloride plume at Brunswick.