

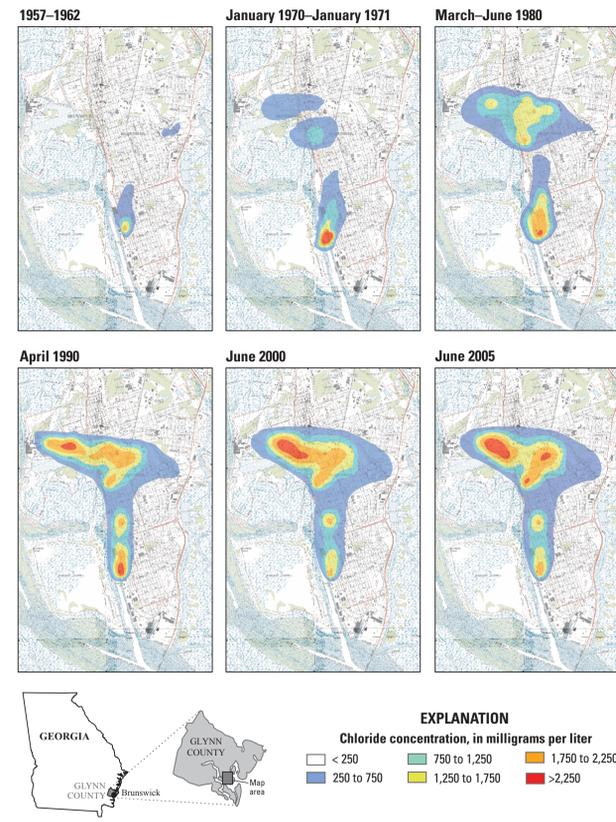
# Monitoring Saltwater Contamination in the Upper Floridan Aquifer, Brunswick, Georgia

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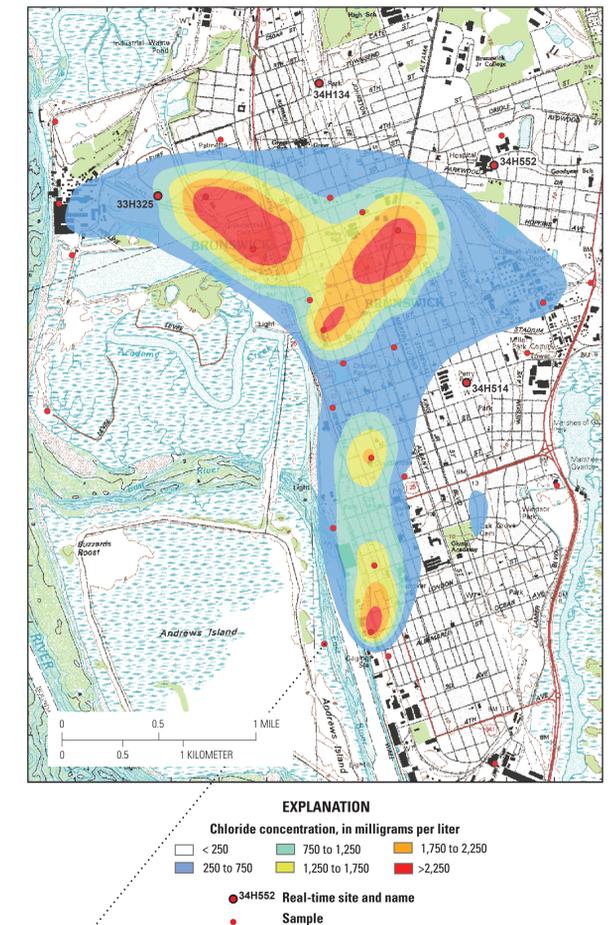
Saltwater intrusion in Brunswick, Georgia, has impacted the Upper Floridan aquifer (UFA) in an approximate 2-square-mile area limiting future groundwater use. Since the late-1950s, the U.S. Geological Survey (USGS) in cooperation with local government has performed annual sampling of wells in and near the affected area. Previous studies and sampling results indicate saltwater has migrated upward from deep saline zones in the Fernandina permeable zone of the Lower Floridan aquifer. This migration occurs through breaches in confining units as a result of groundwater pumping in the UFA that has reduced hydraulic head in the water-bearing zones. During October 2014, 52 wells were sampled for chloride in the Brunswick–Glynn County area. Data from 31 of those wells were used to construct a map delineating the chloride distribution in the upper water-bearing zone of the UFA near downtown Brunswick.

Currently, the Georgia Office of the USGS South Atlantic Water Science Center, in cooperation with the Georgia Department of Natural Resources, Environmental Protection Division, and the Brunswick–Glynn County Joint Water and Sewer Commission, continuously monitor specific conductance in four wells equipped with satellite telemetry. Specific conductance is used as a surrogate for chloride concentrations. Data are recorded and transmitted hourly and are available at the project site (<http://ga.water.usgs.gov/projects/intrusion/brunswick.html>) via the Data Center, Real-time data links. Continuous data collected from the Brunswick Villa well (34H134) indicate a steady rise in specific conductance from about 500 microsiemens per centimeter at 25 degrees Celsius during late-2009 to values above 700 by the end of 2014.

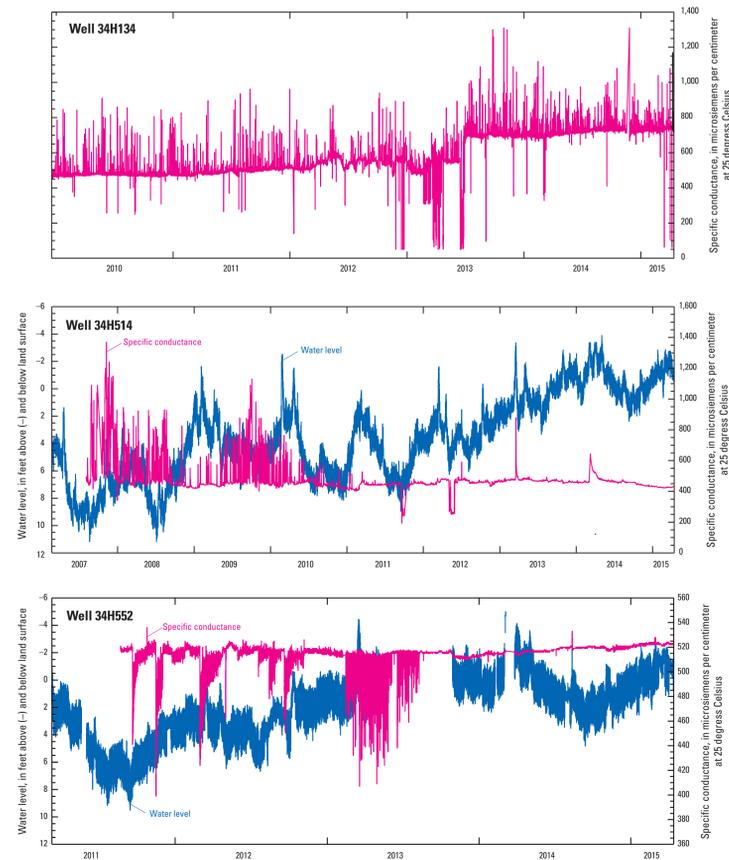
## Chloride Plumes from 1957–1962 to June 2005



## Chloride Plume October 2014

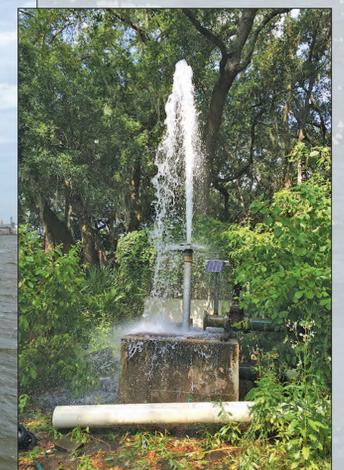


## Water Levels and Specific Conductance



## Methods

Each year chloride samples are collected from about 55 wells, most tapping the upper water-bearing zone of the Upper Floridan aquifer. Using Esri's ArcMap™ Spatial Analyst extension and the Spline interpolation method, along with the general shape of the chloride plumes previously published, these interpretive chloride concentration maps were generated. Some of the maps are composite maps because the data collection did not occur at a regular schedule until 1990 (Jaime Painter, U.S. Geological Survey, written commun., April 2015).



Jekyll Island