

Recharge Estimates and Baseline Hydrologic Data for the Surficial Aquifer, Jekyll Island, Georgia

Debbie W. Gordon

Affiliation: Hydrologist, U.S. Geological Survey South Atlantic Water Science Center, Norcross Georgia 30093

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Abstract. The U.S. Geological Survey, in cooperation with the Jekyll Island Authority, conducted a study from October of 2012 through December 2013, investigating shallow groundwater flow, recharge, and water-quality on Jekyll Island. Twenty-six shallow, surficial-aquifer wells were installed to monitor fluctuations in water levels. Water-level and water-quality data were collected from a network of existing and newly constructed wells, continuous groundwater-level data, stage levels in two island ponds, and climatic data from three nearby sites were compiled. Seasonal groundwater recharge/discharge was estimated using these data. Rainfall during 2013 was approximately 5 inches above average which contributed to up to two feet of water-level rise in the surficial aquifer. Potentiometric-surface maps suggest that groundwater in the surficial aquifer flows from recharge areas primarily in the center of the island towards discharge areas at the coastline, the Jekyll River, and ponds on the island. Average estimated daily volume of loss (negative) or recharge (positive) to the surficial aquifer ranged from about 5.2 to 9.3 million gallons. The difference in the volume of available water in the surficial aquifer between wetter (November 8, 2012) and drier (April 17, 2013) periods was approximately 387,000 gallons per day. Water samples were collected from the surficial aquifer and analyzed for chlorides, total dissolved solids, and field parameters. Chloride concentrations ranged from 17 to 555 milligrams per liter. The relationship between chloride and specific conductance suggests that specific conductance could be used as a reasonable surrogate for chloride to monitor possible degradation of the fresh-water resources.