

Simulation of Groundwater Flow in the Upper Floridan Aquifer in the Lower Apalachicola–Chattahoochee–Flint River Basin, Southwestern Georgia and Parts of Alabama and Florida, 2008-2012

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Abstract. The primary goal of the Apalachicola–Chattahoochee–Flint River Basin (ACFB) Focus Area Study, part of the USGS National Water Census, was to evaluate water availability at the scale of a subwatershed (12-digit hydrologic unit, averaging about 31 square miles in the ACFB). Initially, a Precipitation-Runoff Modeling System (PRMS) watershed model of the entire basin was developed for this purpose. However, in the lower part of the ACFB, groundwater in the Upper Floridan aquifer is the primary source for agricultural irrigation and public supply and a major component of the hydrologic budget. A groundwater model was needed to better understand the dynamics of the groundwater-flow system and to assess the flow of water in the Upper Floridan aquifer to pumped wells and to and from streams in the lower ACFB. Groundwater-withdrawal rates for irrigation in Georgia were estimated using an extensive network of water meters, installed and maintained by the Georgia Soil and Water Conservation Commission. Groundwater use in Florida and Alabama was estimated using available meter data and other records. A MODFLOW groundwater model was developed for the lower ACFB to simulate comprehensively aquifer-stream flow in the main-stem rivers and in 94 tributary streams. Estimates of recharge to the Upper Floridan aquifer, another major component of the hydrologic budget, were obtained from the PRMS watershed model. Linking the PRMS and MODFLOW models into a unified modeling system to evaluate water availability in the lower part of the ACFB was a critical element of this study.