

WATER BUDGET SIMULATION IN THE APALACHICOLA- CHATTAHOOCHEE-FLINT RIVER BASIN AS PART OF THE USGS NATIONAL WATER CENSUS

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The Apalachicola-Chattahoochee-Flint River Basin (ACFB), which is home to multiple fish and wildlife species of conservation concern, is regionally important for water supply and has been a recent focus of complementary water-resources, ecological, and climate-change research. As part of the USGS (USGS) National Water Census, a water-availability study of the ACFB was conducted for the period 2008-2012. This study combined monthly estimates of water use with linked surface water and groundwater models to assess the effects of climate, land cover, and water use on the hydrologic behavior of the ACFB. Seven hydrologic models were developed for the ACFB using the USGS Precipitation Runoff Modeling System (PRMS); one coarse resolution model of the entire ACFB and six fine-resolution models in various watersheds across the basin (Upper Chattahoochee, Chestatee, and Chipola Rivers; and Ichawaynochaway, Potato, and Spring Creeks). As part of this effort, new modeling capabilities were developed for PRMS to incorporate various types of water-use information. In addition, four of the PRMS hydrologic models were loosely coupled with a MODFLOW groundwater model of the lower ACFB where the Upper Floridan Aquifer is at or near land surface. This coupling was needed to better understand surface-water/groundwater interactions in the lower ACFB and the impact of water use, primarily agricultural pumping, on streamflow. Water budget components from the coarse resolution model were summarized to the 12-digit Hydrologic Unit Code spatial resolution for inclusion in the National Water Census Data Portal (<https://cida.usgs.gov/nwc/>). Statistics of daily streamflow were computed for each stream segment in the fine-resolution model simulations for use in ecological response models.

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