

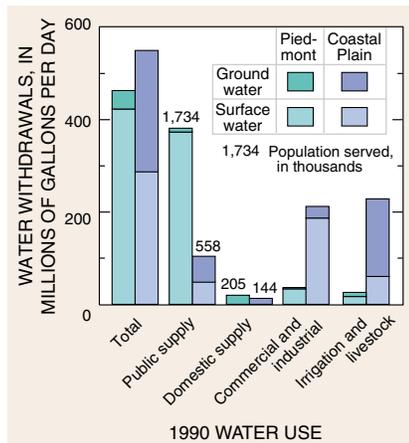
ENVIRONMENTAL SETTING

The ACF River Basin covers approximately 20,000 square miles in the Blue Ridge, Piedmont, and Coastal Plain Physiographic Provinces. The Chattahoochee and Flint Rivers converge at Lake Seminole to form the Apalachicola River, which flows into Apalachicola Bay and the Gulf of Mexico. Basin hydrology, water quality, and aquatic ecosystems are influenced by 16 main-stem reservoirs (13 of which are on the Chattahoochee River), 14 associated hydropower operations, and dredged navigational channels. The reservoirs and dams transform riverine environments into lacustrine environments, impede migration of many aquatic species, and trap transported sediment and sediment-bound contaminants.

Physiography, climate, and hydrology in the ACF River Basin provide natural conditions that support a rich

and abundant diversity of plants and animals. Despite widespread alteration by people, the basin's environment is noteworthy for its remaining biological

diversity and support of commercial fisheries for oysters, shrimp, blue crabs, and a variety of fin fish in Apalachicola Bay (Couch and others, 1996).



Surface-water quality in the Piedmont of the ACF River Basin is of utmost importance because surface water provides about 93 percent of public water supplied to more than 1.7 million people. Rapidly spreading urban development and poultry production in headwater watersheds create added stresses in maintaining sufficient surface-water supplies of good quality.

In the Coastal Plain, ground water provides more than 50 percent of public-water supply and more than 70 percent of irrigation water. Forty-four percent of all ground water used within the basin was from the Upper Floridan aquifer, a karst limestone aquifer that is susceptible to contamination.

Data from: <http://h2o.usgs.gov/public/watuse>



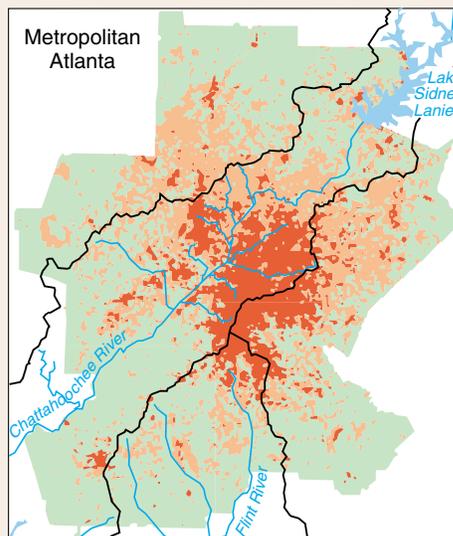
Forest land is the predominant land use in the ACF River Basin and consists mainly of second-growth hardwoods and planted pine. Agricultural land is used for poultry production and pasture in the headwaters and for cropland in the Coastal Plain. Most wetlands are forested and located in flood plains of the Flint and Apalachicola Rivers and their tributaries.

Although urban and suburban land use accounts for only 5 percent of the basin, it has the most significant effect on stream-water quality. Metropolitan Atlanta, the largest and fastest growing metropolitan area in the Southeast, is in the basin's headwaters.

EXPLANATION

Land use—Number is percentage of ACF River Basin

- Urban and suburban, 5 percent
- Agriculture—Includes Piedmont poultry and Coastal Plain cropland, 29 percent
- Forest, 58 percent
- Forested wetland, 5 percent
- Water, 3 percent



Metropolitan Atlanta suburbs continue to expand into the headwaters of the Chattahoochee River, the region's main source of drinking water. Population in the 13-county area (shown to the left) increased 97 percent from 1970 to 3.1 million people in 1995; land area devoted to residential, commercial, and other urban uses more than tripled during the same period.

EXPLANATION

Land use

- Urban area as of mid-1970's
- Urban area developed from mid-1970's to 1995
- Other land use, predominantly forested

Data from U.S. Geological Survey, 1977–80; U.S. Bureau of the Census, 1991; Atlanta Regional Commission, digital data, 1995; <http://www.census.gov/population/www/estimates/countytyp.html>



Urban land use within the Study Unit is defined as dense commercial areas and transportation networks associated primarily with the city of Atlanta. Urban watersheds contain substantial impervious areas that are connected to streams by storm sewers. Streams also receive inputs from combined sewers and leaking or overflowing sanitary sewers. Chemical and microbial contaminants from point and nonpoint sources are the primary water-quality issues within the urban watersheds.



Suburban land use within the Study Unit is defined as established and developing residential areas, associated commercial areas, and transportation networks. It differs from urban land use by the amount of impervious land cover and the lack of known point sources but has the same water-quality issues of contaminants from nonpoint sources.



Since the 1930's, large areas of agricultural land in the Piedmont have been abandoned and have reverted to forests. The remaining agricultural land currently is used for **poultry** production and livestock grazing. Nutrient inputs from poultry litter applied to sloping pasture land and soil erosion are water-quality issues in the headwaters of the Chattahoochee River.



Unlike parts of the United States where large, continuous tracts of land often are farmed to streambanks, **cropland** in the ACF River Basin generally is limited to well-drained upland areas. The long growing season and center-pivot irrigation support a broad range of cash crops and several plantings of some crops on the same fields during the year. Cropland commonly is bordered by extensive **forested wetlands** (inset). In this study, cropland was further subdivided into areas underlain by clastic deposits (sands and shales) and carbonate bedrock (karst) to investigate any differences in hydrogeology. Excess nutrients and pesticides in ground water and streams are the primary water-quality issues within this land use. (Photograph of cotton field is by L. Elliott Jones, USGS.)



Most **forested** land in the ACF River Basin is silvicultural land owned and managed by individuals or corporations for pulp and lumber production. These mostly second-growth forests are the best available representation of background water-quality conditions in the Study Unit. Erosion, sedimentation, and release of nutrients following timber harvests are the primary water-quality issues in these forested watersheds. (Photograph of Chattahoochee National Forest is by Alan M. Cressler, USGS.)

