

Georgia's Surface-Water Resources and Streamflow Monitoring Network, 2008

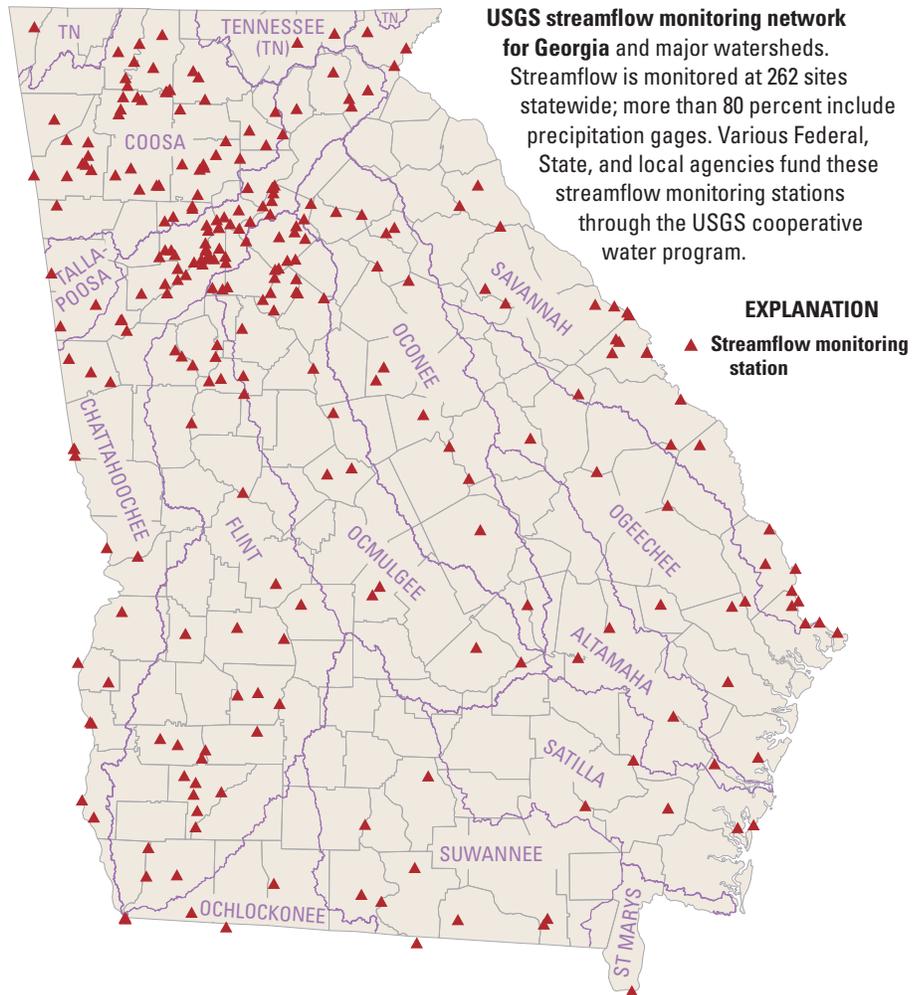
Surface-Water Resources

Surface water provides 5 billion gallons per day, or 78 percent, of the total fresh-water used (including thermoelectric) in Georgia (Fanning, 2003). Climate, geology, and landforms control the natural distribution of Georgia's water resources. Georgia is a "headwaters" State, with most of the rivers beginning in northern Georgia and increasing in size downstream (see map at right for major watersheds). Surface water is the primary source of water in the northern one-half of the State, including the Atlanta metropolitan area, where limited ground-water resources are difficult to obtain.

In Georgia, periodic droughts exacerbate competition for surface-water supplies. Many areas of Georgia also face a threat of flooding because of spring frontal thunderstorms and the potential for hurricanes from both the Atlantic Ocean and Gulf of Mexico. As the population of Georgia increases, these flood risks will increase with development in flood-risk zones, particularly in the coastal region.



A USGS hydrologist measuring streamflow using a **hydroacoustic current meter** on a tethered boat. Photo by Brian E. McCallum, USGS.



Georgia HydroWatch— Streamflow Monitoring Network

Stage is the fundamental hydrologic measurement of a stream—representing the water height or elevation of a stream above an arbitrary datum. Stage data are used to compute streamflow (discharge)—the total volume of water that flows past a specific point on a stream during a period of time. Stream stage is measured at each streamflow monitoring station shown on the map above.

Streamflow data are essential for numerous water-resource management issues, including:

- Delineating and managing floodplains
- Characterizing current water-quality conditions
- Operating and designing water-supply, recreational, and other reservoirs
- Cost-effective design of bridge crossings, roadways, water systems, and flood-control infrastructure
- Determining permit requirements for discharge of treated wastewater
- Monitoring compliance with minimum flow requirements
- Fisheries habitat protection
- Thermoelectric-power generation
- Administering compacts or resolving conflicts on interstate rivers
- Navigation and recreational uses
- Flood forecasting and warning
- Water-supply allocations

The U.S. Geological Survey (USGS) network of 262 real-time monitoring stations, the “Georgia HydroWatch,” provides real-time water-stage data, with streamflow computed at 221 locations, and rainfall recorded at 211 stations. These sites continuously record data on 15-minute intervals and transmit the data by satellite to be incorporated into the USGS National Water Information System (NWIS) database. These data are automatically posted to the USGS Web site for public dissemination (<http://waterdata.usgs.gov/ga/nwis/nwis>). The real-time capability of this network provides information to help emergency-management officials protect human life and property during floods, and mitigate the effects of prolonged drought.

Outlook

The Georgia HydroWatch streamflow monitoring network is operated by the USGS in cooperation with more than 50 different Federal, State, and local government partners. Recent studies by the National Hydrologic Warning Council show that the benefits of the USGS streamgaging program far exceed the

cost of operating the network of gages (see Hester and others, 2006a, 2006b). Some of the funding is provided by the USGS Cooperative Water Program (<http://water.usgs.gov/coop/>), a joint funding mechanism between the USGS and State or local agencies (see Clarke, 2006). Additional Federal funding for real-time monitoring stations is appropriated through the USGS National Streamflow Information Program (NSIP) to provide a stable funding source for a base network of these stations (<http://water.usgs.gov/nsip/>). Funding for these programs are renewable on an annual basis and are subject to changes in Federal, State, and local governmental appropriations.

Stable funding sources for monitoring stations in Georgia are essential to ensure continuity of data. Three monitoring stations in Georgia were discontinued during December 2005 because of loss of funding. There are significant gaps in the network coverage throughout the State, especially in the coastal region. As population and water demand in the State increase, expanded streamflow monitoring will enable informed management of Georgia’s limited water resources.

Hydrologic events, like the **flooding** from Hurricane Dennis during 2005 (A) and the current historic **drought** affecting Lake Allatoona during the spring of 2008 (B) have devastating economic and safety impacts on the citizens of Georgia. USGS streamflow data provide critical information in real time so water-resource managers and emergency-management officials can make informed decisions during severe hydrologic events. Photo (A) by Arthur C. Day, USGS, and (B) by Brian E. McCallum, USGS.



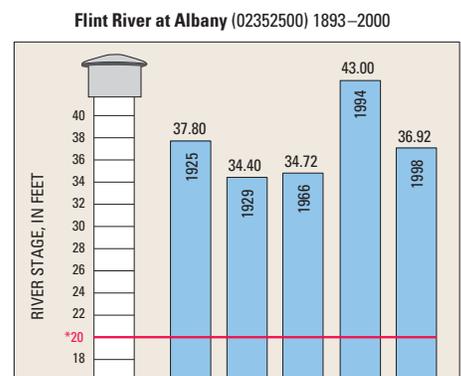
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For more information on Georgia’s surface-water resources and monitoring network

Visit the USGS Georgia Water Science Center Web site at <http://ga.water.usgs.gov/>

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Peak flood stages of the Flint River at Albany, Georgia, for major floods during 1925–1998. The red line indicates flood stage as designated by the National Weather Service. Stage at or above this red line indicates flooding conditions in the area. The USGS streamflow monitoring network for Georgia provides real-time stage data that are used by emergency-management officials to enable informed decisions regarding public safety during flood events.