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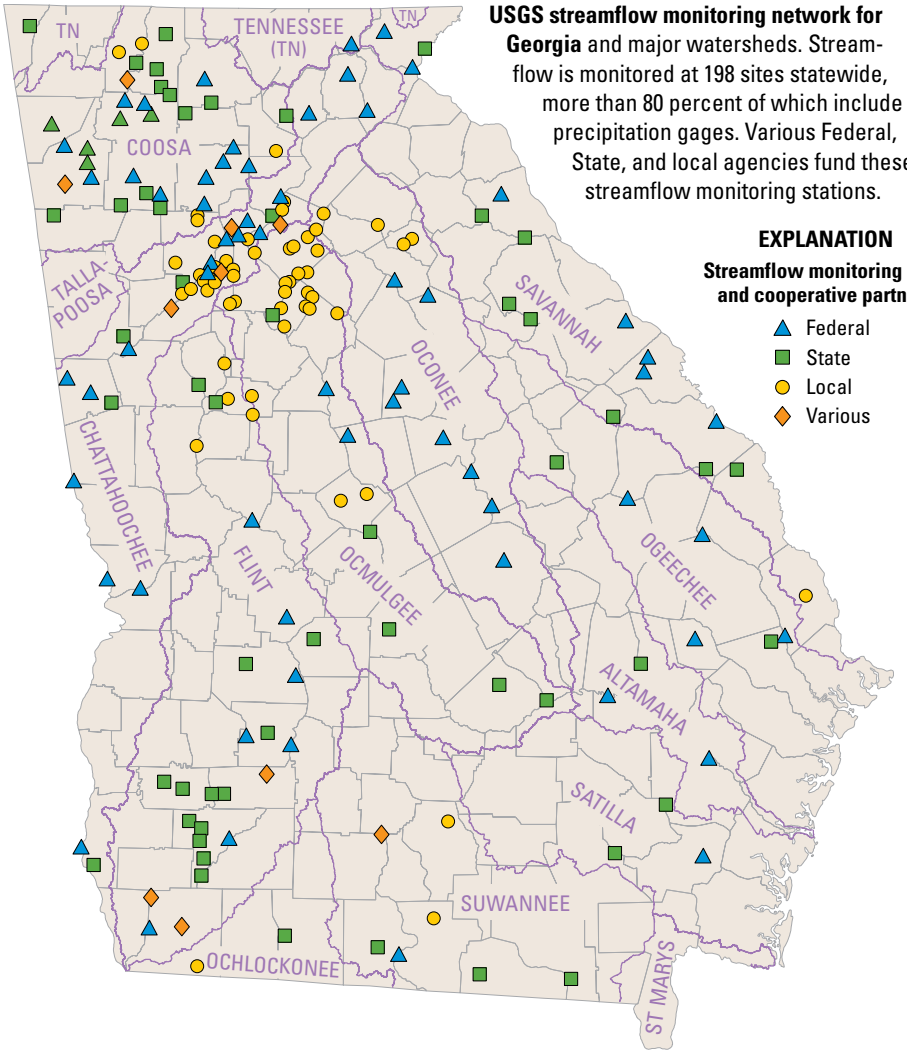
Georgia's Surface-Water Resources and Streamflow Monitoring Network, 2006

Surface-Water Resources

Surface water provides 5 billion gallons per day, or 78 percent, of the total freshwater used (including thermoelectric) in Georgia (Fanning, 2003). Climate, geology, and landforms control the 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 due to 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 streamflow monitoring station (middle left) measures water level of a stream; from this, streamflow can be computed.



USGS streamflow monitoring network for Georgia and major watersheds. Streamflow is monitored at 198 sites statewide, more than 80 percent of which include precipitation gages. Various Federal, State, and local agencies fund these streamflow monitoring stations.

Georgia HydroWatch — Streamflow Monitoring Network

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

Discharge and streamflow data are essential for numerous water-resource management issues, including:

- Flood forecasting and warning
- Water-supply allocations
- Flood control
- Delineating and managing floodplains
- Characterizing current water-quality conditions
- Operating and designing water-supply, recreational, and other reservoirs
- 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

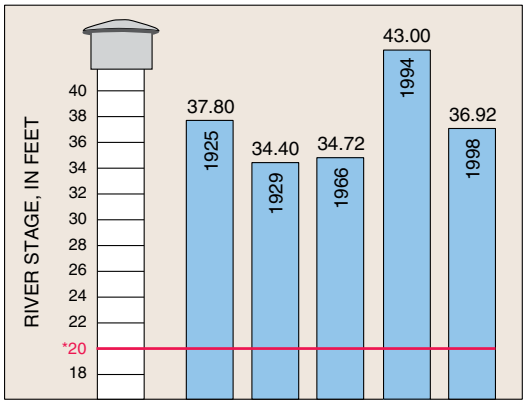
The U.S. Geological Survey (USGS) network of 223 real-time monitoring stations, the "Georgia HydroWatch," provides real-time water-stage data, with streamflow computed at 198 locations, and rainfall recorded at 187 stations. These sites continuously record data on 15-minute intervals and transmit the data via satellite to be incorporated into the USGS National Water Information System database. These data are automatically posted to the USGS Web site for public dissemi-nation (*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.

Flooding from Tropical Storm Alberto along the Flint River at Newton, Georgia, on July 9, 1994. The 1994 flood was the most devastating flood in recent history, having from 100-year to greater than 200-year recurrence interval discharges in most of the Flint and Ocmulgee River Basins. Data from the USGS streamflow monitoring network for Georgia supplied the latest real-time hydrologic information to water-resource managers and emergency-management officials to enable informed decisions regarding public safety.

Outlook

The Georgia HydroWatch streamflow monitoring network is operated by the USGS in cooperation with more than 50 different partners at the Federal, State, and local government levels. Funding for the streamflow monitoring network is provided by the Federal Government and by State and local agencies in cooperation with the USGS. Some of the funding is provided by the USGS Cooperative Water Program, a joint funding mechanism between the USGS and State or local agencies (see Clarke, 2006). Funding for this program is renewable on an annual basis and, thus, is subject to economic conditions and changes in Federal, State, and local governmental appropriations.

These partnerships are extremely valuable but are vulnerable to fluctuations in funding that have resulted in the loss of monitoring stations in Georgia and throughout the Nation. Three monitoring stations in Georgia were discontinued during December 2005 due to loss of funding. Stable funding sources for monitoring stations in Georgia are essential to ensure continuity of data. 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 wise management of Georgia's important water resources.



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.

USGS streamflow monitoring station on the Ogeechee River, Georgia, during July 2000. **Low streamflow during drought periods** affects the quantity and quality of streamwater and reduces the assimilative capacity of the stream to handle waste discharges. Data from the USGS streamflow monitoring network for Georgia provides real-time information on streamflow during drought periods to enable water-resource managers to make informed decisions regarding water withdrawal and waste discharges.

References Cited

Clarke, J.S., 2006, Helping solve Georgia's water problems—The USGS Cooperative Water Program: U.S. Geological Survey Fact Sheet 2006-3032, 4 p., Web-only publication at *http://pubs.usgs.gov/fs/2006/3032/pdf/fs2006-3032.pdf*

Fanning, J.L., 2003, Water use in Georgia by county for 2000 and water-use trends for 1980–2000: Georgia Geologic Survey Information Circular 106, 176 p.

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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