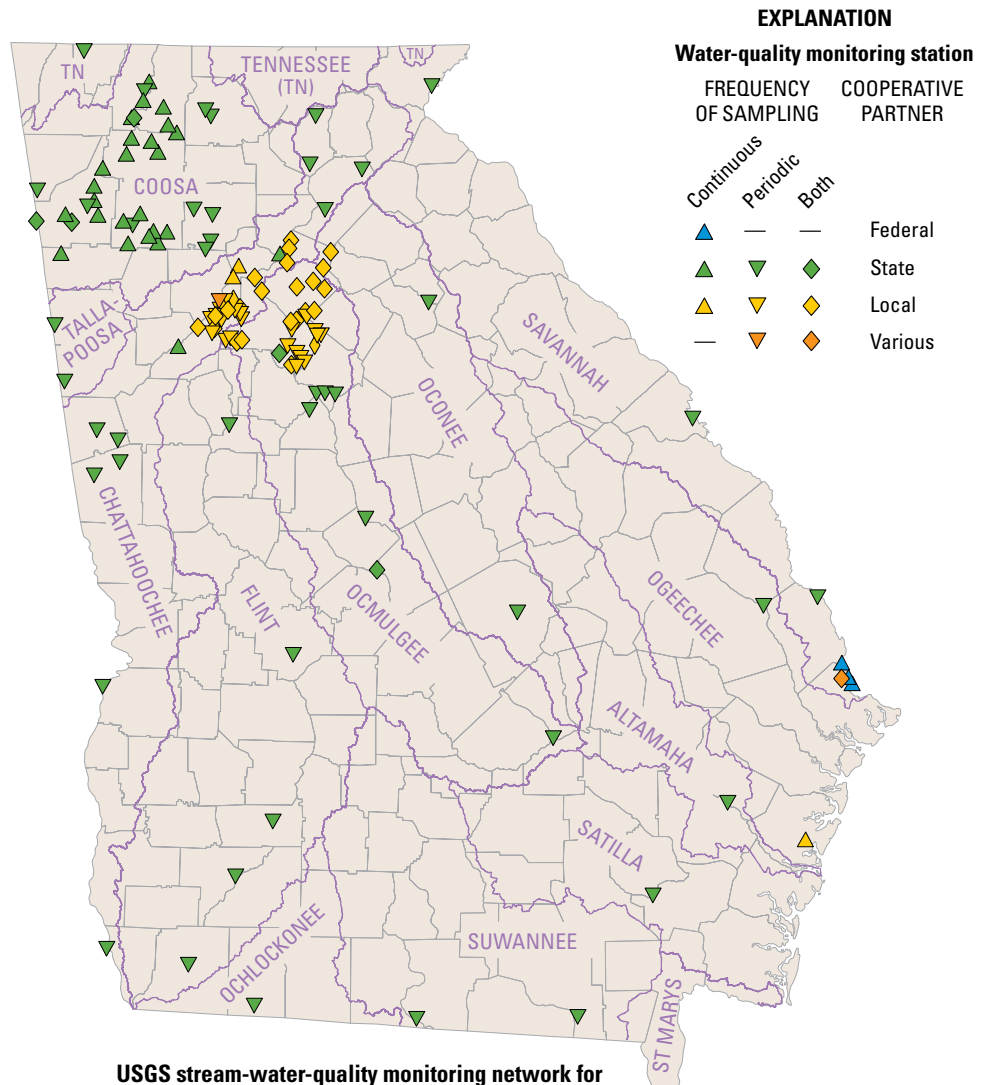


# Georgia's Stream-Water-Quality Monitoring Network, 2006

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 distribution of Georgia's water resources. Major watersheds are shown on the map at right.

Stream-water-quality data are essential for water-resource assessment and management. Each year, water-quality data collected by the U.S. Geological Survey (USGS)—in cooperation with local, State, and other Federal agencies—provide information to water managers to determine whether streams in Georgia meet standards for the designated uses of these waters. The network of water-quality monitoring stations provides the necessary information to:

- Assess the quality of surface waters used for drinking water
- Determine wasteload allocations for business, industry, and municipal sewer systems
- Meet the monitoring requirements of the Federal Clean Water Act and other regulations administered by Georgia Environmental Protection Division (GaEPD)
- Compute Total Maximum Daily Loads—a determination of how much of a constituent can be carried by a stream before the water quality is severely impacted
- Develop stormwater management plans
- Control runoff of chemicals, trace metals, and microbial contaminants that may harm humans and aquatic life
- Control urban runoff to mitigate flooding hazards, stream erosion, and destruction of stream habitat and aquatic communities
- Limit nutrient loads to avoid eutrophication of sensitive water bodies such as reservoirs and coastal estuaries



**USGS stream-water-quality monitoring network for Georgia and major watersheds.** The network represents an aggregation of smaller networks and individual monitoring stations that collectively provide data from 130 sites.

## Stream-Water-Quality Monitoring Network

The USGS stream-water-quality monitoring network for Georgia is an aggregation of smaller networks and individual monitoring stations that have been established in cooperation with Federal, State, and local agencies. These networks collectively provide data from 130 sites, 62 of which are monitored continuously in real time using specialized equipment that transmits these data via satellite to a

centralized location for processing and storage. These data are made available on the Web in near real time at <http://waterdata.usgs.gov/ga/nwis/>

Ninety-eight stations are sampled periodically for a more extensive suite of chemical and biological constituents that require laboratory analysis. Both the continuous and the periodic water-quality data are archived and maintained in the USGS National Water Information System and are available to cooperators, water-resource managers, and the public.



**Sixty-two of the 130 sites** monitored for water quality in Georgia are equipped with streamflow and water-quality instruments that collect and transmit data via a satellite linkup. These data are updated several times each day and displayed on a USGS Web site at <http://ga.water.usgs.gov/> Photograph by Andrew C. Hickey, USGS.

## Stream-Water Quality

Impairments to stream-water quality can occur from point and nonpoint sources of pollutants. Point sources of pollutants, such as permitted municipal sewer outfalls or permitted industrial outfalls, can be readily assessed and their impacts to water quality can be managed because their sources and quantities are known.

The origin and quantity of nonpoint sources of stream pollutants are much more difficult to characterize. Human-made changes to land use and land cover due to urbanization affect the quality and quantity of water by increasing the area of impervious surfaces (roads, parking lots, rooftops) covering the land within a watershed. These impervious areas contribute to increases in the velocity and volume of surface-water runoff, which carry constituents that impact water quality. In agricultural areas, runoff from land used for animal-raising operations

contributes to increases in the bacteriological contaminant concentrations in streams.

Just as stream-water quality is affected by watershed land use, aquatic organisms also are affected (Landers and others, 2002). Stream communities are composed of a diverse group of organisms that spend all or parts of their life cycles in aquatic environments; these include fish, insects, crayfish, snails, mussels, and aquatic worms. The aquatic “health” of a stream may be assessed by the number and diversity of aquatic species contained in the stream.

## Outlook

The USGS stream-water-quality monitoring network for Georgia is operated by the USGS and is funded largely through the Cooperative Water Program — a joint funding partnership between the USGS and State or local agencies (see Clarke, 2006). Funding for this program is renewable on an annual basis and is subject to changes in Federal, State, and local governmental budget appropriations. Portions of the USGS stream-water-quality monitoring network have undergone significant reductions during recent years primarily due to decreases in State funding. The number of ambient water-quality monitoring stations in this network has decreased steadily, from a high of 211 during 1999, to only 49 during 2006.

Stable funding sources are essential to ensure the continuity of data collection. As Georgia’s population increases, the demand for water will increase. The network to monitor water quality will need to expand to provide the information necessary to manage properly water resources.

**USGS scientists collecting biological samples** in the Metropolitan Atlanta area. The aquatic “health” of a stream may be assessed by the number and diversity of aquatic species contained in the stream. Photograph by W. Brian Hughes, USGS.



## References Cited

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- Landers, M.N., Ankcorn, P.D., McFadden, K.W., and Gregory, M.B., 2002, Does land use affect our streams? A watershed example from Gwinnett County, Georgia, 1998–2001: U.S. Geological Survey Water Resources Investigations Report 02-4281, 6 p.



**USGS scientist processing stream-water samples** for analysis of water chemistry. Data are stored in the USGS National Water Information System database and are accessible on the Web at <http://ga.water.usgs.gov/waterquality.html> Photograph by M. Brian Gregory, USGS.

### For more information on the USGS stream-water-quality monitoring network for Georgia

Visit the USGS Georgia Water Science Center Web site at <http://ga.water.usgs.gov/> or contact the USGS at 3039 Amwiler Road Peachtree Business Center, Suite 130 Atlanta, Georgia 30360-2824 phone: 770-903-9100

Edited by Patricia L. Nobles  
Layout and design by Caryl J. Wipperfurth  
U.S. Geological Survey Georgia Water Science Center