



WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY GROUND-WATER STUDIES IN GEORGIA

GROUND-WATER ISSUES

Ground water is an abundant resource in Georgia and supplies about 18 percent of the total freshwater used in the State. Georgia's aquifers provide water for more than 2.6 million people or nearly one-half the State's population. Most ground-water withdrawals occur in the southern half of the State where the aquifers are very productive. In 1985, withdrawals totaled more than one billion gallons per day. Rapid development and population growth in Georgia have placed increasing demands on the State's ground-water resources, especially in the northern half of Georgia where growth is greatest and ground-water resources are limited. Also, ground-water pumping for irrigation is depleting the principal aquifer in southwestern Georgia. Owing to Georgia's rapid development and population growth, its dependency on ground water, and the vulnerability of the aquifers to contamination, the major ground-water issues in Georgia include:

- Availability in limited-resource, high-growth regions, and in areas of heavy irrigation pumping,
- Saltwater intrusion and encroachment in coastal areas due to heavy pumping, and
- Contamination by naturally occurring organic compounds, agricultural chemicals, and land-disposed wastes.

U.S. GEOLOGICAL SURVEY PROGRAMS

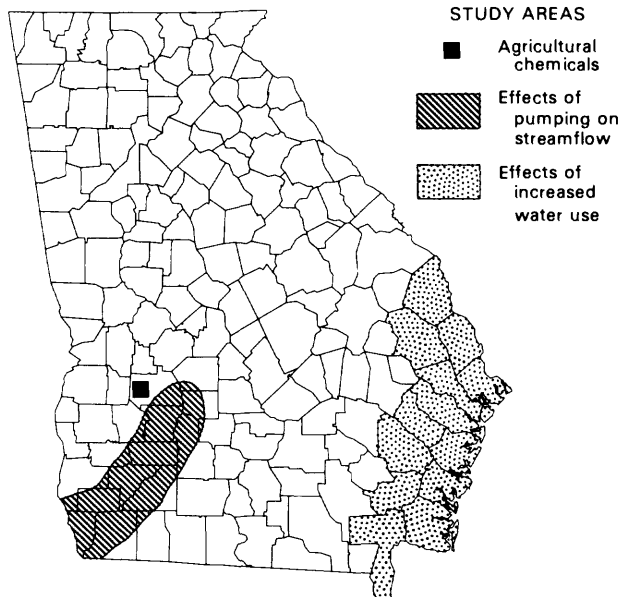
The U.S. Geological Survey (USGS), established in 1879, is the principal source of scientific and technical expertise in the earth sciences within the Federal government. USGS activities include research and services primarily in the fields of geology, hydrology, and cartography. The mission of the Water Resources Division of the USGS is to develop and disseminate scientific information on the Nation's water resources. The activities of the Water Resources Division in Georgia are conducted by scientists, technicians, and support staff in offices in Doraville, Savannah, Albany, and Tifton.

The USGS program in Georgia includes an extensive data-collection and monitoring network that provides long-term records and information necessary to assess Georgia's ground-water resources and to support interpretive studies. During 1987, ground-water levels were measured continuously in 142 wells and periodically in about 750 wells. Water samples were collected monthly from 12 wells and semiannually from 92 wells in coastal areas of Georgia. The samples were analyzed for chloride and dissolved-solids concentrations to support saltwater-intrusion monitoring and interpretive studies.

During fiscal year 1987, the USGS in Georgia entered into cooperative agreements with 24 Federal, State, and local agencies involving 29 hydrologic investigations, 15 of which concerned ground-water issues. These investigations, most of which contain a significant research component, help provide data and information needed to solve hydrologic problems related to Georgia's ground-water issues. Some investigations also provide data, information, and solutions applicable on a statewide, multistate, and national scale. The following three examples describe current (1988) investigations that address specific ground-water issues in Georgia.

Movement and Fate of Agricultural Chemicals, Southwestern Georgia

Growing demand for agricultural products has resulted in increased applications of organic and inorganic chemicals, some of which are being applied in aquifer-recharge areas. Information is needed about the movement and fate of agricultural chemicals in the ground, and their potential to degrade the quality of ground water. The USGS, in cooperation with the U.S. Department of Agriculture, Agricultural Research Service (ARS), and with support from the USGS Toxic Waste—Ground Water Contamination Program, is using computer models to



investigate the geohydrology of a study site in an aquifer-recharge area; the movement and fate of agricultural chemicals in the unsaturated and saturated zones; and methods to describe infiltration rates and quality of ground-water recharge in the unsaturated zone. This information will enable the ARS to advise the County Extension Services and the remainder of the agricultural community on the prudent use of pesticides.

Effects of Ground-Water Pumping on Streamflow

The limited water resources of the Apalachicola-Chattahoochee-Flint (AFC) River basin have caused concern that possible water-resources problems could result in conflicts over water use in Georgia, Alabama, and Florida. The principal aquifer is hydraulically connected with surface water throughout the basin, and ground-water pumping could affect streamflow. Problems associated with recent drought conditions, fisheries production, navigation, wetlands, and freshwater-saltwater conditions in Apalachicola Bay, Florida, have caused concern about use and management of the basin's water resources. The U.S. Army Corps of Engineers (COE), the utility industry, and water managers in the three States need geohydrologic information to manage the water resources of the basin. The USGS, in cooperation with the COE, Mobile District, and State agencies in Georgia, Alabama, and Florida, is investigating surface- and ground-water relations in those parts of the AFC River basin where ground-water pumping is substantial. The study will develop an understanding of the flow system, and use a computer model to simulate the surface- and ground-water systems and test alternative water-management schemes. The results of the study will be used as part of a comprehensive basin study conducted by the COE, who also will incorporate the computer model into models of larger scope for the entire ACF River basin.

Effects of Increased Water Use, Coastal Georgia

Ground water is the major source of freshwater for coastal Georgia, and withdrawals, including those in extreme north-eastern Florida, total more than 400 million gallons per day. This heavy withdrawal has caused water-level declines and saltwater contamination of the freshwater aquifer. The USGS, in cooperation with the Georgia Geological Survey, is conducting an investigation to define the geohydrology of the fresh ground-water flow system; determine the occurrence, movement, and quality of water underlying and infiltrating the freshwater flow system; determine the influence of geologic structures on the flow system; and evaluate the effects of increased water use on the flow system. A computer model will be used to characterize the flow system and to evaluate the effects of increased pumping on the quantity and quality of water in the flow system. The model will enable the State's water managers to assess alternative ground-water development plans, and, thus, to evaluate future ground-water development options in Georgia's coastal region.

GROUND-WATER MANAGEMENT

The State agency responsible for ground-water management in Georgia is the Department of Natural Resources, Environmental Protection Division, Water Resources Management Branch. The agency is responsible for maintaining ground-water quality by managing, through permitting of wastewater discharges, landfill siting, mining operations, surface- and ground-water withdrawals, water-well contractor licensing, well-construction standards and compliance, and interbasin transfers of water. To ensure development of sound resources-management practices, the agency relies on ground-water data and results of interpretive geohydrologic investigations provided and conducted by the USGS in cooperation with the Department of Natural Resources, Environmental Protection Division, Georgia Geological Survey. During 1987, the following agencies entered into joint-funding agreements with the USGS to support ground-water studies in Georgia:

Georgia Department of Natural Resources
Environmental Protection Division
Water Resources Management Branch
Georgia Geological Survey
City of Albany Water, Gas, and Light Commission
City of Brunswick
Glynn County
Alabama Department of Economic and Community Affairs
State Planning Division
Florida Department of Environmental Regulation

SELECTED REFERENCES

- Casteel, C.A., and Ballew, M.D., 1988, Water resources activities, Georgia District, 1987: U.S. Geological Survey Open-File Report 88-185, 62 p.
- Clarke, J.S., and McConnell, J.B., 1988, Georgia ground-water quality: U.S. Geological Survey Open-File Report 87-0720, 9 p.
- U.S. Geological Survey, 1984, National water summary 1983—Hydrologic events and issues: U.S. Geological Survey Water-Supply Paper 2250, 243 p.
- 1985, National water summary 1984—Hydrologic events, selected water-quality trends, and ground-water resources: U.S. Geological Survey Water-Supply Paper 2275, 467 p.

Information on technical and interpretive reports and data related to ground water in Georgia can be obtained from:

District Chief
U.S. Geological Survey
Water Resources Division
6481-B Peachtree Industrial Blvd.
Doraville, Georgia 30360

State Geologist
Department of Natural Resources
Environmental Protection Division
Georgia Geological Survey
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