GROUND-WATER MONITORING AND EFFECTS OF THE 1998–2000 DROUGHT ON GROUND-WATER LEVELS IN GEORGIA

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Abstract. During the drought period of 1998–2000, ground-water levels throughout Georgia were affected by reduced recharge and increased ground-water pumpage. These combined effects caused record-low ground-water levels in some areas and near record lows in other areas. The drought has been notable not only for extreme low ground-water levels, but also because of the length of time these low ground-water levels have persisted.

Drought conditions began during summer 1998 in central Georgia and then extended into southwestern Georgia. During 1998, new period-of-record lows were recorded in 26 wells in 10 aquifers. During 1999, rainfall deficits exceeded 11 inches, and new period-of-record lows were recorded in 36 wells in 12 aquifers. By December 1999, the drought effects extended eastward to the Atlantic coast. When significant winter rains did not occur in early 2000, the drought effects extended northward, covering nearly all of Georgia. Ground-water levels declined rapidly during summer 1999, and with little or no recovery during the fall and winter, these declines continued into 2000.

In cooperation with the Georgia Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey, and city and county governments, the U.S. Geological Survey monitors ground-water levels throughout Georgia. A statewide water-level-measurement program began in 1938 and consisted of an observation-well network in the coastal area of Georgia that monitored variations in ground-water storage and quality. Since then, additional wells were added to the monitoring network (fig. 1) throughout Georgia to assist in water-resources management.

During 2000, continuous water-level measurements were obtained from 175 wells, of which 133 have a period of record that encompasses the drought period of 1998–2000. Twelve of the wells are equipped with electronic data recorders that transmit data via satellite. Data for these wells are displayed in near real-time on the World Wide Web and can be accessed at **http://water.usgs.gov/ga/nwis/current?type=gw**.

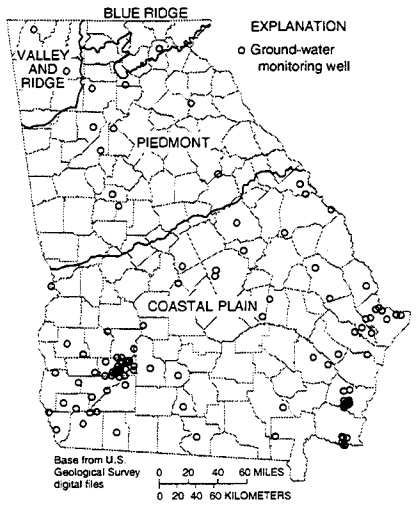

Figure 1. Continuous-recording observation well network.

In the Coastal Plain physiographic province, the rate of water-level decline was especially high near large agricultural areas that have extensive ground-water withdrawals for irrigation. In the Cretaceous aquifer systems, new record low water levels were recorded in 10 of 14 wells monitored during 2000. Increased pumpage for agricultural, industrial, and public supply in the Albany area and reduced recharge resulted in water-level declines in the Clayton and Claiborne aquifers. In 8 of 11 wells monitored in the Clayton aquifer and in 11 of 12 wells monitored in the Claiborne aquifer, new record low water levels were recorded during 2000.

New period-of-record lows were recorded during 2000 for 35 of 66 observation wells completed in the Floridan aquifer system. Although many wells in the Floridan aquifer system have shown downward trends in water levels for a number of years due to continuing increased pumpage, steeper declines in water levels occurred from 1998–2000 as a result of the drought.

Ground-water levels in the Piedmont Province of northern Georgia were below normal during the 1998–2000 drought. Water levels in crystalline-rock aquifers declined to record lows in 4 of 9 wells monitored during 2000—mostly located in the Metropolitan Atlanta area.