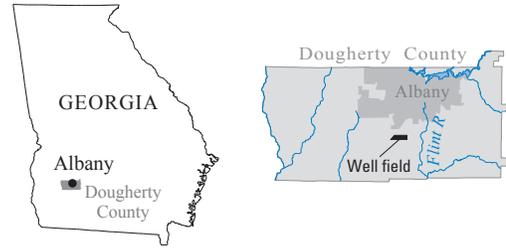


City of Albany Cooperative Water Program

Study Chief Debbie Warner Gordon
 Cooperator Albany Water, Gas, and Light
 Commission
 Year Started 1977



Problem

Long-term heavy pumping from the Claiborne and Clayton aquifers and the Cretaceous aquifer system (includes the Providence aquifer), which underlie the Upper Floridan aquifer, has resulted in substantial water-level declines in these deep aquifers in the Albany area. To provide additional water supply and reduce the demand on the deep aquifers, the Albany Water, Gas, and Light Commission (WGL) developed a large well field southwest of Albany with wells completed in the Upper Floridan aquifer, a karstic unit that is the uppermost reliable source of water in the area. Because of local recharge to the aquifer, water quality may be affected by land-use practices. Concentrations of nitrate plus nitrite as nitrogen exceeding the 10-milligrams per liter (mg/L) maximum contaminant level (U.S. Environmental Protection Agency, 2000) have been detected in some wells upgradient from the well field.

Objectives

- Monitor water-level fluctuations in the five aquifers in the Albany area and relate water-level trends to changes in climatic conditions and pumping patterns.
- Describe the groundwater flow and water quality of the Upper Floridan aquifer near the new well field in the southwestern Albany area.

Progress and Significant Results, 2008–2009

- Continued operation of the 14-well continuous groundwater-level monitoring network in the surficial, Upper Floridan, Claiborne, Clayton, and Providence aquifers.
- Continued groundwater-quality monitoring program. Water samples were collected and analyzed for major cations and anions, and selected nutrients during November 2008 (25 wells), and November, 2009 (17 wells). The USGS sampled wells 12L010 and 12L018 (map facing page), two of WGL's municipal supply wells, for pesticides in November 2008 and well 12L018 for pesticides in 2009.
- Constructed potentiometric-surface maps for the Upper Floridan aquifer near the well field based on measurements from 81 wells during November 2008, and 64 wells during November 2009. Both maps indicate that water generally flows from northwest to southeast near the well field. Water

levels were higher during 2009 than during 2008. The well-field pumping did not result in the formation of a cone of depression surrounding the well field.

- Continued to map sinkholes at the well field. No new sinkholes formed during 2008; however, during 2009, six new sinkholes developed, two on January 12, 2009, two on April 26, 2009, and two on July 6, 2009.
- Began to study the reasons for sinkhole formation at the well field with regard to precipitation and water-level changes within the Upper Floridan aquifer.
- Continued development of a groundwater model to simulate flow in the vicinity of the Albany well-field area.

Reference

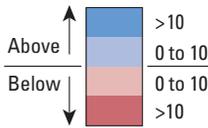
U.S. Environmental Protection Agency, 2000, Maximum contaminant levels (Part 143, National Secondary Drinking Water Regulations): U.S. Code of Federal Regulations, Title 40, Parts 100–149, rev. as of July 1, 2000, p. 612–614.



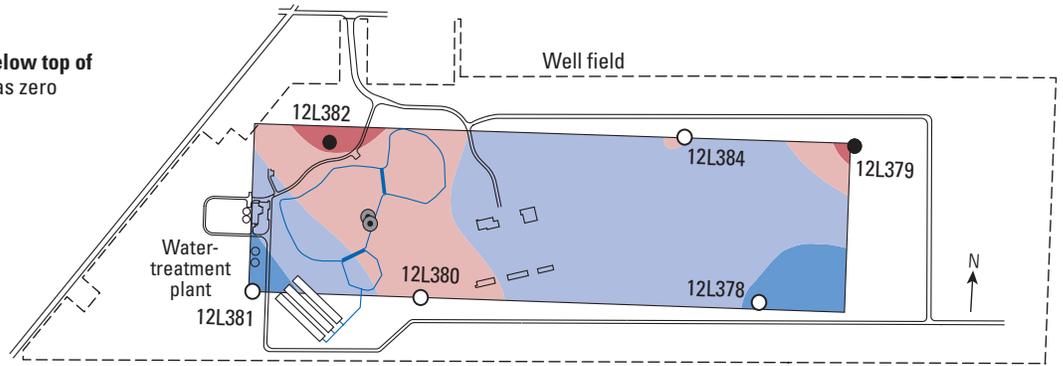
Albany Water, Gas, and Light Commission well field, Albany, Georgia, April 21, 2009. Photo by Debbie Warner Gordon, USGS.

EXPLANATION

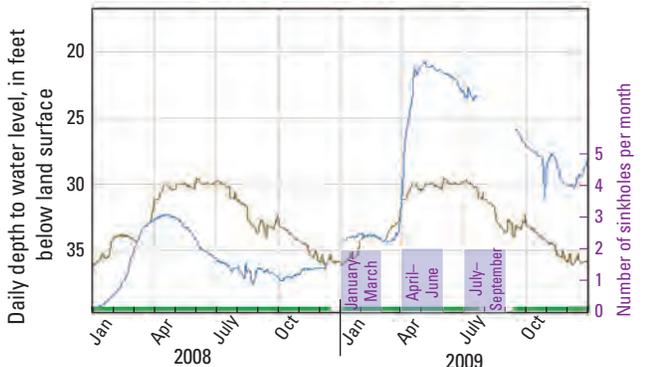
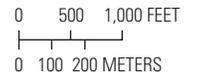
Water level, in feet, above or below top of Floridan aquifer—Indicated as zero



Production well
 ○ Not pumping ● Pumping
 ● Sinkhole



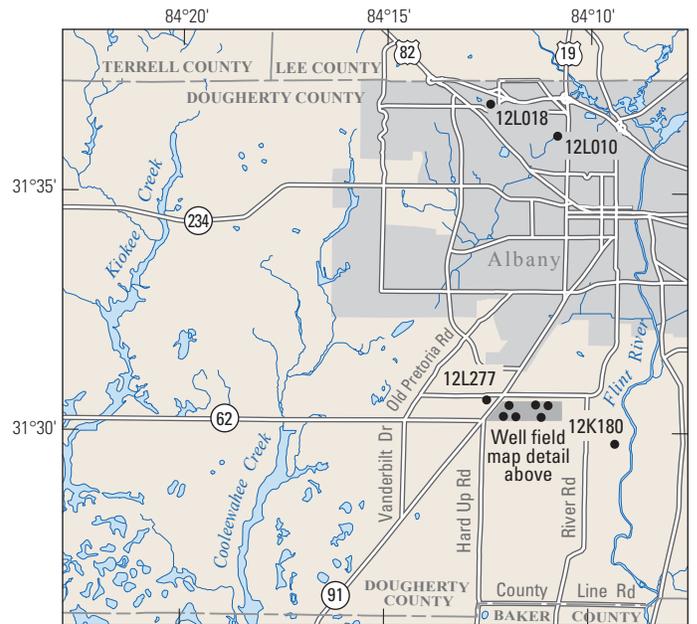
Water levels relative to the top of the Upper Floridan aquifer at the Albany well field during January 12, 2009. Water levels were below the top of the aquifer in much of the western part of the well field and in the northeast corner. Two production wells in the field were pumping during the period when two sinkholes formed.



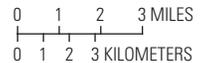
EXPLANATION

— Mean daily statistic (8 years) — Period of approved data
 — Daily mean depth to water level

Water level in well 12L277 (see map on right for location). No sinkholes formed in the well field during 2008, but six sinkholes formed in the well field during 2009.



Base modified from U.S. Geological Survey
 1:24,000-scale digital data



EXPLANATION

● Well

Site map and well locations, Albany area.



Well 12K180 located on Victory Street, Albany, Georgia, April 21, 2009, following more than 15 inches of rain during March and April 2009. Photo by Debbie Warner Gordon, USGS.