

Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida, September 2007

A.G. Ortiz

Hydrologic Conditions in West-Central Florida

The Floridan aquifer system consists of the Upper and Lower Floridan aquifers separated by the middle confining unit. The middle confining unit and the Lower Floridan aquifer in west-central Florida generally contain highly mineralized water. The water-bearing units containing fresh water are herein referred to as the Upper Floridan aquifer. The Upper Floridan aquifer is the principal source of water in the Southwest Florida Water Management District and is used for major public supply, domestic use, irrigation, and brackish water desalination in coastal communities (Southwest Florida Water Management District, 2000).

This map report shows the potentiometric surface of the Upper Floridan aquifer measured in September 2007. The potentiometric surface is an imaginary surface connecting points of equal altitude to which water will rise in tightly-cased wells that tap a confined aquifer system (Lohman, 1979). This map represents water-level conditions near the end of the wet season, when ground-water levels usually are at an annual high and withdrawals for agricultural use typically are low. The cumulative average rainfall of 39.50 inches for west-central Florida (from October 2006 through September 2007) was 13.42 inches below the historical cumulative average of 52.92 inches (Southwest Florida Water Management District, 2007). Historical cumulative averages are calculated from regional rainfall summary reports (1915 to most recent complete calendar year) and are updated monthly by the Southwest Florida Water Management District.

This report, prepared by the U.S. Geological Survey in cooperation with the Southwest Florida Water Management District, is part of a semi-annual series of Upper Floridan aquifer potentiometric-surface map reports for west-central Florida. Potentiometric-surface maps have been prepared for January 1964, May 1969, May 1971, May 1973, May 1974, and for each May and September since 1975. Water-level data are collected in May and September each year to show the approximate annual low and high water-level conditions, respectively. Most of the water-level data for this map were collected by the U.S. Geological

Survey during the period September 17-21, 2007. Supplemental water-level data were collected by other agencies and companies. A corresponding potentiometric-surface map was prepared for areas east and north of the Southwest Florida Water Management District boundary by the U.S. Geological Survey office in Orlando, Florida (Kinnaman and Dixon, 2008). Most water-level measurements were made during a 5-day period; therefore, measurements do not represent a "snapshot" of conditions at a specific time, nor do they necessarily coincide with the seasonal high water-level condition.

Water-Level Changes

Water levels in about 89 percent of the wells measured in September 2007 were lower than the September 2006 water levels (Ortiz, 2007a). Data from 407 wells indicate the September 2007 water levels ranged from about 17 feet below to about 10 feet above the September 2006 water levels (fig. 1). Significant water level declines occurred over the region comprised of northeast Manatee County, southeast Hillsborough County, southwest Polk County, and northwest Hardee County. The largest water level rise occurred along the eastern span of the border between Pasco County and Hernando County (fig. 1).

Water levels in about 88 percent of the wells measured in September 2007 were higher than the May 2007 water levels (Ortiz, 2007b). Data from 407 wells indicate the September 2007 water levels ranged from about 3 feet below to 28 feet above the May 2007 water levels. The largest water level decline was in northwest Marion County and the largest rise in water levels was in north-central Manatee County.

Acknowledgments

The author thanks Tampa Bay Water and CF Industries for their assistance with the collection of data used to prepare this report.

Selected References

Kinnaman, S.L., and Dixon, J.F., 2007, Potentiometric Surface of the Upper Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida, September 2007: U.S. Geological Survey [Open-File Report 2008-1085](#), 1 sheet.

Lohman, S.W., 1979, Ground-Water Hydraulics: U.S. Geological Survey

[Professional Paper 708](#), 72 p.

Ortiz, A.G., 2007a, Potentiometric surface of the Upper Floridan Aquifer, West-Central Florida, September 2006: U.S. Geological Survey [Open-File Report 2007-1228](#), 1 sheet.

Ortiz, A.G., 2007b, Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida, May 2007: U.S. Geological Survey [Open-File Report 2007-1380](#), 1 sheet.

Southwest Florida Water Management District, 2000, Aquifer characteristics within the Southwest Florida Water Management District: Brooksville, Fla., 123 p.

Southwest Florida Water Management District, 2007, Hydrologic conditions for the month of May 2007: Brooksville, Fla., 81 p.

Suggested Citation:

Ortiz, A.G., 2008, Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida, September 2007: U.S. Geological Survey Open-File Report 2008-1105, 1 sheet.

For additional information, contact:

U.S. Geological Survey
Florida Integrated Science Center
Suite 215
10500 University Center Dr.
Tampa, FL 33612-6427
813-975-8620

agourlay.gov Anita Ortiz