



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 freshwater 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 2005. 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 55.19 inches for west-central Florida (from October 2004 through September 2005) was 2.00 inches above the historical cumulative average of 53.19 inches (Southwest Florida Water Management District, 2005). 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 maps 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 19-23, 2005. 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 Altamonte Springs, Florida (Kinnaman, 2006). 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 86 percent of the wells measured in September 2005 were lower than the September 2004 water levels (Blanchard and Seidenfeld, 2005). Data from 400 wells indicate the September 2005 water levels ranged from about 21 feet below to about 7 feet above the September 2004 water levels (fig. 1). The largest water-level declines occurred in south-central Hillsborough County and eastern Manatee County. The largest water-level rises occurred in east-central Sumter County, northeast Levy County, and northwest Marion County (fig. 1).

Water levels in about 86 percent of the wells measured in September 2005 were higher than the May 2005 water levels (Ortiz and Blanchard, 2006). Data from 398 wells indicate the September 2005 water levels ranged from about 7 feet below to 10 feet above the May 2005 water levels. The largest water-level decline was in north-central Pasco County and the largest rise in water levels was in west-central Hardee County.

ACKNOWLEDGMENTS

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SELECTED REFERENCES

Blanchard, R.A. and Seidenfeld, A.V., 2005, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, September 2004: U.S. Geological Survey Open-File Report 2005-1222, 1 sheet.

Kinnaman, S.L., 2006, Potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, September 2005: U.S. Geological Survey Open-File Report 2006-1108, 1 sheet.

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Ortiz, A.G., and Blanchard, R.A., 2006, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, May 2005: U.S. Geological Survey Open-File Report 2006-1009, 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, 2005, Hydrologic conditions for the month of September 2005: Brooksville, Fla., 79 p.

EXPLANATION

CHANGE IN THE POTENTIOMETRIC SURFACE, IN FEET

- 5 to 9.99
- 0 to 4.99
- <0 to -4.99
- 5 to -9.99
- ≤-10

(Positive values indicate an increase in water-level altitudes)

— SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT BOUNDARY

45 OBSERVATION WELL—Number is altitude of water level in feet above or below NGVD 1929.

29 OBSERVATION WELL—Number is altitude of water level in feet above or below NGVD 1929. Bold italic number indicates water level corrected for salinity.

VERNA MUNICIPAL WELL FIELD

SPRING

Port Charlotte CITY OR TOWN

NOTE: The potentiometric contours are generalized to synoptically portray the head in a dynamic hydrologic system, taking due account of the variations in hydrologic conditions, such as differing depths of wells, nonsimultaneous measurements of water levels, variable effects of pumping, and changing climatic influence. The potentiometric contours may not conform exactly with the individual measurements of water level.

0 10 20 30 MILES
0 10 20 30 KILOMETERS

Figure 1. Change in potentiometric surface of the Upper Floridan aquifer from September 2004 to September 2005 in west-central Florida. Positive values indicate an increase in water-level altitudes. Negative values indicate a decrease in water-level altitudes.

**POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER,
WEST-CENTRAL FLORIDA, SEPTEMBER 2005**

By
A.G. Ortiz

Base from U.S. Geological Survey digital data.
Albers Equal-Area Conic projection.
Standard Parallels 29°30' and 45°30', central meridian 83°00'.

Copies of this map can be purchased from:
U.S. Geological Survey
Branch of Information Services
Box 25286
Denver, Colorado 80225-0286