



**HYDROLOGIC CONDITIONS IN WEST-CENTRAL FLORIDA**

The Floridan aquifer system is 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 a highly productive aquifer and supplies more than 10 times the amount of water pumped from either the surficial aquifer system or the intermediate aquifer system in most of the study area (Durr and others, 1988).

This map report shows the potentiometric surface of the Upper Floridan aquifer measured in May 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, 1973). This map represents water-level conditions near the end of the dry season, when ground-water levels usually are at an annual low and withdrawals for agricultural use typically are high. The cumulative average rainfall of 67.27 inches for west-central Florida (from June 2004 through May 2005) was 14.20 inches above the historical cumulative average of 53.07 inches (Southwest Florida Water Management District, 2005). The above average precipitation is attributed to the active hurricane season for Florida in 2004. Historical cumulative averages are calculated from regional rainfall summary reports (1915 to the most recent completed 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 May 23-27, 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 low water-level condition.

**WATER-LEVEL CHANGES**

Water levels in about 19 percent of the wells measured in May 2005 were lower than the May 2004 water levels (Blanchard and others, 2004). Data from 409 wells indicate that the May 2005 water levels ranged from about 5 feet below to about 18 feet above the May 2004 water levels (fig. 1). The largest water-level declines occurred in southwestern Hernando County, northeastern Hillsborough County, and portions of Hillsborough, Sumter, and Sarasota Counties. The largest water-level rises occurred in southeastern Hillsborough County, eastern Manatee County, and western Hardee County (fig. 1).

Water levels in about 95 percent of the wells measured in May 2005 were lower than the September 2004 water levels (Blanchard and Seidenfeld, 2005). Data from 405 wells indicate the May 2005 water levels ranged from about 22 feet below to 14 feet above the September 2004 water levels. The largest water-level decline was in eastern Manatee County and the largest water-level rise was in central Sarasota County.

**ACKNOWLEDGMENTS**

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**EXPLANATION**

CHANGE IN THE POTENTIOMETRIC SURFACE, IN FEET

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

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

— SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT BOUNDARY

0 10 20 30 MILES  
0 10 20 30 KILOMETERS

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

**EXPLANATION**

- 20 — POTENTIOMETRIC CONTOUR—Shows altitude at which water would have stood in tightly cased wells. Contour interval is 10 feet. National Geodetic Vertical Datum of 1929 (NGVD of 1929). Hatchures indicate depressions. Dashed where approximately located.
- SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT BOUNDARY
- 45 OBSERVATION WELL—Number is altitude of water level in feet above or below NGVD of 1929.
- 29 OBSERVATION WELL—Number is altitude of water level in feet above or below NGVD of 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 hydrogeologic 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.

5 0 20 MILES  
5 0 20 MILES

# POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA, MAY 2005

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Base from Southwest Florida Water Management District digital data, 1992  
Universal Transverse Mercator projection, Zone 17, Datum NAD27

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