

HYDROLOGIC CONDITIONS IN WEST-CENTRAL FLORIDA

The Floridan aquifer system consists of the Upper and Lower Floridan aquifers separated by a middle confining unit. The middle confining unit and the Lower Floridan aquifer generally contain highly mineralized water in west-central Florida. In most reports on the hydrology of west-central Florida, the term "Floridan aquifer" has been applied to the water-bearing units 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 (Duerr and others, 1988).

This map report shows the potentiometric surface of the Upper Floridan aquifer in west-central Florida measured in May 2003. The potentiometric surface represents the level to which water will rise in tightly-cased wells that tap a confined aquifer system. The surface is mapped by measuring the altitude of water levels in a network of wells and is represented on maps by contours that connect points of equal water-level altitude. 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 (63.31 inches) for west-central Florida (from June 2002 through May 2003) was 10.36 inches above the historical mean of 52.95 inches (Southwest Florida Water Management District, May 2003).

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 of 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 19-23, 2003. 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, S. L. and Knowles, Leel, Jr., 2004). Most water-level measurements were made over 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

In about 97 percent of the wells, water levels measured in May 2003 were higher than in May 2002 (Blanchard and others, 2002). Using data from 422 wells, the May 2003 levels ranged from about 3 feet below to about 27 feet above the May 2002 levels (fig. 1). The largest water-level decline was in northeastern Pasco County. The largest water-level rise was in southwestern Hardee County.

In about 77 percent of the wells, water levels measured in May 2003 were lower than in September 2002 (Blanchard and others, 2002). Using data from 420 wells, the May 2003 levels ranged from about 25 feet below to about 10 feet above the September 2002 levels. The largest water-level decline was in northern Highlands County and the largest water-level rise was in northern Pasco County.

ACKNOWLEDGMENTS

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SELECTED REFERENCES

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- Duerr, A.D., Hunt, J.D., Lewelling, B.R., and Trommer, J.T., 1988, Geology and hydrology and 1985 water withdrawals of the aquifer systems in southwest Florida, with emphasis on the intermediate aquifer system: U.S. Geological Survey Water-Resources Investigations Report 1987-4259, 115 p.
- Kinnaman, S.L., and Knowles, Leel, Jr., 2004, Potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, May 2003: U.S. Geological Survey Open-File Report 2004-1077, 1 sheet.
- Knochenmus, L.A., Blanchard, R.A., Seidenfeld, A.V., and McCulloch, D.S., 2002, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, May 2002: U.S. Geological Survey Open-File Report 2002-266, 1 sheet.
- Southwest Florida Water Management District, 2003, Hydrologic conditions for the month of May 2003, 79 p.

EXPLANATION

Areas where potentiometric surface changed, in feet

- 10 AND GREATER
- 5 TO 9.99
- 0 TO 4.99
- LESS THAN 0 TO -5

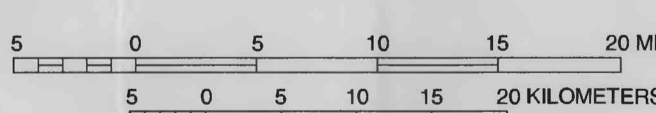
(Positive values indicate an increase in water-level elevations)

EXPLANATION

- MUNICIPAL WELL FIELD
- POTENTIOMETRIC CONTOUR - - Shows altitude at which water would have stood in tightly cased wells. Contour interval is 10 feet. National Geodetic Vertical Datum (NGVD) of 1929. Hachures indicate depressions. Dashed where approximately located.
- BOUNDARY OF SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
- OBSERVATION WELL - - Number is altitude of water level in feet above or below NGVD of 1929.
- OBSERVATION WELL - - Number is altitude of water level in feet above or below NGVD of 1929. *Italic number* indicates water levels corrected for salinity.
- SPRING
- 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.

SCALE 1:500,000



POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER,
WEST-CENTRAL FLORIDA, MAY 2003
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