

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 trackless 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 May 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 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 41.21 inches for west-central Florida (from June 2006 through May 2007) was 11.63 inches below the historical cumulative average of 52.84 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 May 21-25, 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 (Kinman and Dixon, 2007). 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 71 percent of the wells measured in May 2007 were lower than the May 2006 water levels (Ortiz, 2007). Data from 494 wells indicate the May 2007 water levels ranged from about 21 feet below to about 8 feet above the May 2006 water levels (Fig. 1). Significant water level declines occurred in north-central Pasco County and south-central Hernando County. The largest water level rises occurred in the southern half of Hardee County (Fig. 1).

Water levels in about 98 percent of the wells measured in May 2007 were lower than the September 2006 water levels (Ortiz, 2007). Data from 494 wells indicate the May 2007 water levels ranged from about 42 feet below to 7 feet above the September 2006 water levels. The largest water level decline was in north-central Manatee County and the largest rise in water levels was in south-central Sarasota 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

Kinman, 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, May 2007. U.S. Geological Survey Open-File Report 2007-1371, 1 sheet.

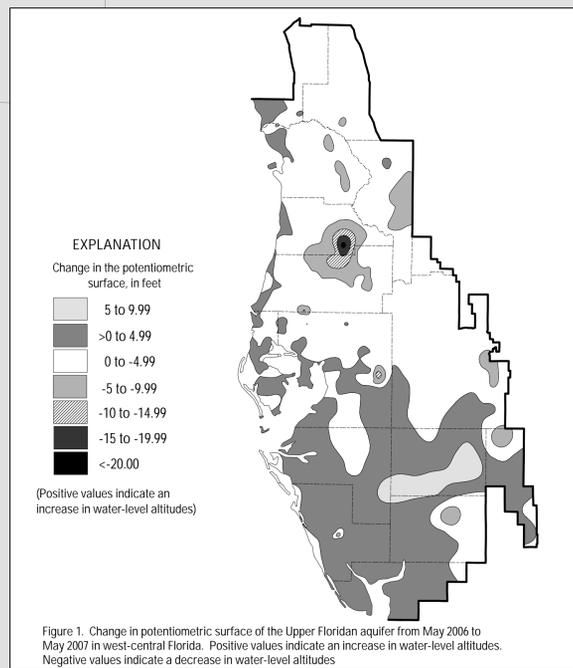
Lohman, S.W., 1979. Ground-water hydraulics. U.S. Geological Survey Professional Paper 708, 72 p.

Ortiz, A.G., 2007. Potentiometric surface of the Upper Floridan aquifer, west-central Florida, May 2006. U.S. Geological Survey Open-File Report 2007-1032, 1 sheet.

Ortiz, A.G., 2007. Potentiometric surface of the Upper Floridan aquifer, west-central Florida, September 2006. U.S. Geological Survey Open-File Report 2007-1228, 1 sheet.

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

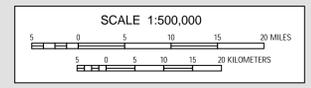
Southwest Florida Water Management District, 2007. Hydrologic conditions for the month of May 2007. Brooksville, Fla., 81 p.



EXPLANATION

- VERNA 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.



POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER,
WEST-CENTRAL FLORIDA, MAY 2007
By A.G. Ortiz

Base from Southwest Florida Water Management District digital data, 1992. State Plane Florida East projection, NAD83

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