

Introduction

This map depicts the potentiometric surface of the Upper Floridan aquifer in the Suwannee River Water Management District (SRWMD) during May 2005. Potentiometric contours are based on water-level measurements taken at more than 400 observation wells during the period of May 1-31, 2005. A potentiometric surface is defined as an areal representation of the levels to which water would rise in tightly cased wells open to an aquifer (Fetter, 1988). Since these water-level measurements from the Upper Floridan aquifer were taken over a 31-day period, they do not represent a "snapshot" of the conditions at a specific date and time.

Upper Floridan Aquifer

The Upper Floridan aquifer is a thick unit of carbonate rock and extends beneath most of Florida and southern parts of Alabama, Georgia, and South Carolina. The aquifer is highly permeable because of widening fractures that develop over geologic time and the formation of conduits within the aquifer through dissolution of the limestone. Numerous karstic features, such as springs, disappearing streams, and sinkholes, have also formed in northern Florida as a result of this process. These features influence the ground-water flow direction throughout the aquifer (Sepúlveda and others, 2006). The Upper Floridan aquifer is the primary source of freshwater throughout the SRWMD.

Summary of Hydrologic Conditions

Water levels in observation wells that penetrate the Upper Floridan aquifer are typically at their lowest levels during late spring following the dry season. Monthly water-level fluctuations of up to 4 ft (feet) are common in some observation wells within the SRWMD and are in response to rainfall and pumpage (Mahon and others, 1997). Measured water levels ranged from 1.08 ft above the National Geodetic Vertical Datum of 1929 (NGVD 1929) at Steinhatsee to 93.48 ft above NGVD 1929 southwest of Madison during May 2005. The average water level measured in wells was 41.29 ft above NGVD 1929 within the SRWMD during May 2005. Water levels measured in May 2005 averaged above normal and fell in the 72nd percentile (Tom Mirti, Suwannee River Water Management District, written commun., 2006); that is, an average of 72 percent of historic water levels fall below those levels measured in May 2005.

Precipitation was above average within the SRWMD during the preceding 12 months (May 2004 – April 2005). Precipitation in Lake City (Columbia County), for example, totaled 83.62 in. (inches), which was 30.02 in. above normal (table 1). The greatest departure from normal rainfall in Lake City occurred in September 2004 (23.34 in. above normal), and was the result of Hurricanes Frances and Jeanne and a stationary frontal system situated over southern Georgia (Verdi, 2005).

Acknowledgments

The authors wish to acknowledge the contributions of the Suwannee River Water Management District. Their collection and compilation of the water-level data used in the construction of this potentiometric surface map were invaluable.

References

Fetter, C.W., 1988, Soil moisture and ground water, in Applied Hydrogeology: Macmillan Publishing Company, chap. 4, p. 63-114.

Mahon, G.L., Sepúlveda, A.A., and Choquette, A.F., 1997, Potentiometric surface of the Upper Floridan aquifer in Florida, May and June 1995: Florida Geological Survey Map Series Number 140, 1 sheet.

Sepúlveda, A.A., Katz, B.G., and Mahon, G.L., 2006, Potentiometric surface of the Upper Floridan aquifer in the Ichetucknee Springshed, northern Florida, September 2003: U.S. Geological Survey Open-File Report 2006-1031.

Verdi, R.J., 2005, Hydrologic effects of the 2004 hurricane season in northwest Florida: U.S. Geological Survey Open-File Report 2005-1277, 18 p.

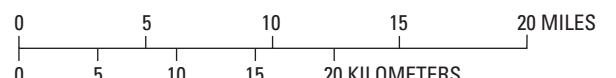
Table 1. Precipitation data from May 2004 to April 2005 at Lake City showing monthly rainfall totals and departures from normal. [Amounts are in inches]

Month and year	Precipitation	
	Total	Departure from normal
May 2004	1.79	-1.92
June 2004	8.09	1.18
July 2004	9.04	2.30
August 2004	8.39	1.20
September 2004	28.01	23.34
October 2004	2.03	-0.79
November 2004	3.49	1.07
December 2004	4.21	1.25
January 2005	1.95	-2.57
February 2005	4.12	0.51
March 2005	7.20	2.30
April 2005	5.30	2.15
Total	83.62	30.02

EXPLANATION

- POTENTIOMETRIC CONTOUR— Shows altitude at which water level would have stood in tightly cased wells. Hachures indicate depressions. Contour interval 10 feet. Datum is NGVD 29. Dashed were inferred.
- SUWANNEE RIVER WATER MANAGEMENT DISTRICT BOUNDARY
- OBSERVATION WELL

NOTE: The potentiometric contours are generalized to portray synoptically the head in a dynamic hydrologic system taking into account 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 thus may not conform exactly with individual measurements of water level.



Base from U.S. Geological Survey digital data, 1:2,000,000, 1995. Albers Equal-Area Conic projection. Standard parallels 29°30' and 45°30', central meridian 83°.

POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN THE SUWANNEE RIVER WATER MANAGEMENT DISTRICT, FLORIDA, MAY 2005

by
Richard Jay Verdi and A. Alejandro Sepúlveda

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