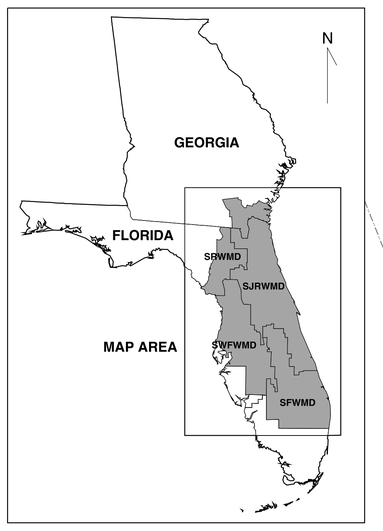
Prepared in cooperation with
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN FILE REPORT 2004-1077
Sandra L. Kinnaman and Leel Knowles, Jr., 2003, Potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, May 2003



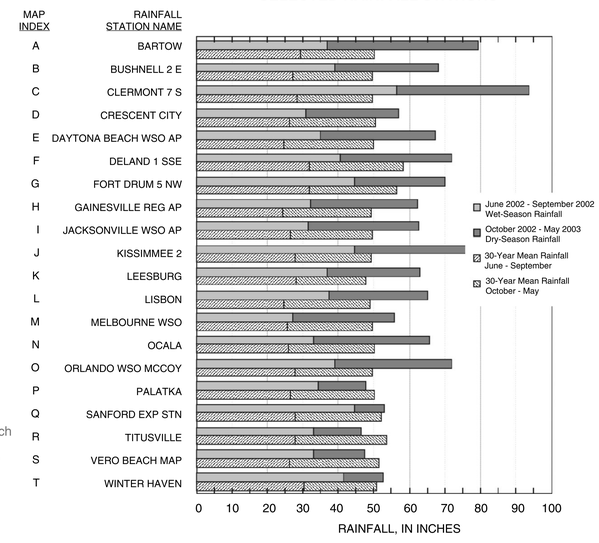
EXPLANATION

- 50 ----- POTENTIOMETRIC CONTOUR -- Shows altitude at which water level would have stood in tightly cased wells. Hachures indicate depressions. Contour intervals 10 feet. Vertical datum is NGVD of 1929. Dashed where inferred
- STATE WATER MANAGEMENT DISTRICT BOUNDARY
  SJRWMD -- St. Johns River Water Management District
  SRWMD -- Suwannee River Water Management District
  SFWMD -- South Florida Water Management District
  SWFWMD -- Southwest Florida Water Management District
- 37 SURVEYED WELL WITH KNOWN OPEN-HOLE INTERVAL -- Measuring-point datum is referenced to benchmark datum. Number is altitude of water level in feet above or below NGVD of 1929
- 31 SURVEYED WELL WITH UNKNOWN OPEN-HOLE INTERVAL -- Measuring-point datum is referenced to benchmark datum. Number is altitude of water level in feet above or below NGVD of 1929
- 46 UNSURVEYED WELL WITH KNOWN OPEN-HOLE INTERVAL -- Measuring-point datum is estimated from topographic map. Number is altitude of water level in feet above or below NGVD of 1929
- 36 UNSURVEYED WELL WITH UNKNOWN OPEN-HOLE INTERVAL -- Measuring-point datum is estimated from topographic map. Number is altitude of water level in feet above or below NGVD of 1929
- SPRING -- Line indicates direction of spring outflow
- FLOWING BOREHOLE
- 42 SINKHOLE -- Surface collapse feature exposing the Upper Floridan aquifer. Where measured, number is altitude of water level in feet above NGVD of 1929
- A RAINFALL STATION -- Letter is index to bar graph.

NOTE: The potentiometric contours are generalized on a regional scale to portray water levels in a dynamic hydrologic system taking due account of the variations in hydrogeologic conditions such as well-depth differences, non-simultaneous 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.

SELECTED RAINFALL STATIONS

MAP INDEX	RAINFALL STATION NAME
A	BARTOW
B	BUSHNELL 2 E
C	CLERMONT 7 S
D	CRESCENT CITY
E	DAYTONA BEACH WSO AP
F	DELAND 1 SSE
G	FORT DRUM 5 NW
H	GAINESVILLE REG AP
I	JACKSONVILLE WSO AP
J	KISSIMMEE 2
K	LEESBURG
L	LISBON
M	MELBOURNE WSO
N	OCALA
O	ORLANDO WSO MCCOY
P	PALATKA
Q	SANFORD EXP STN
R	TITUSVILLE
S	VERO BEACH MAP
T	WINTER HAVEN



FIRST-MAGNITUDE SPRINGS

First-magnitude spring name	Spring-pool altitude, in feet above NGVD of 1929	Discharge, in cubic feet per second	Period-of-record mean-daily discharge, in cubic feet per second
Silver Springs	41	647 [a]	778
Rainbow Springs	31	634 [b]	698
Blue Springs (Volusia County)	1	158 [b]	156
Silver Glen Springs	1	117 [b]	107
Alexander Springs	10	99 [c]	105

These altitudes do not necessarily reflect the potentiometric surface at the spring pool.
[a] Instantaneous discharge measured on May 5, 2003.
[b] Mean-daily discharge for May 2003.
[c] Instantaneous discharge measured on June 10, 2003

INTRODUCTION

This map depicts the potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity for May 2003. Potentiometric contours are based on water-level measurements collected at 664 wells during the period May 13 - 28, near the end of the dry season. The shapes of some contours have been inferred from previous potentiometric-surface maps with larger well networks. The potentiometric surface of the carbonate Upper Floridan aquifer responds mainly to rainfall, and more locally, to ground-water withdrawals. Potentiometric-surface highs generally correspond to topographic highs where the aquifer is recharged. Springs and areas of diffuse upward leakage naturally discharge water from the aquifer and are most prevalent along the St. Johns River. Areas of discharge are reflected by depressions in the potentiometric surface. Ground-water withdrawals locally have lowered the potentiometric surface. Ground water in the Upper Floridan aquifer generally flows from potentiometric highs to potentiometric lows in a direction perpendicular to the contours.

SUMMARY OF HYDROLOGIC CONDITIONS

Measured values of the potentiometric surface ranged from 8 feet below sea level near Fernandina Beach, Florida, to 129 feet above sea level in Polk County, Florida. The average water level of the network in May 2003 was only about 1 foot lower than the average in September 2002 following above-average rainfall during the dry season of 2002-03. Seasonal differences generally range from 4 to 6 feet. For 630 wells with previous measurements, May 2003 levels ranged from about 19 feet below to about 22 feet above September 2002 water levels. Water levels decreased 10 feet or more from September 2002 to May 2003 in 1 of the 47 wells measured in Polk County, in 1 of the 19 wells measured in St. Johns County, in 1 of the 17 wells measured in Highlands County, and 2 of the 3 wells measured in Hardee County. The largest increase in water levels from September 2002 to May 2003 were measured in Camden County, Georgia in response to a combination of above-average rainfall and the closing of a local industrail water user.

Above-average rainfall during the preceding 12 months, particularly across interior sections, contributed to the average water level of the network in May 2003 being about 4 feet higher than the average water level in May 2002. For 643 wells with previous measurements, May 2003 water levels ranged from about 3 feet below to about 25 feet above May 2002 water levels. The largest decrease in water levels were measured in eastern Pasco County. Water levels increased 20 feet or more from May 2002 to May 2003 in 8 of the 47 wells measured in Polk County and in all 3 of the wells measured in Hardee County.

ADDITIONAL REFERENCE

Long-term hydrographs of ground-water levels for continuous and periodic wells are available at internet site: http://waterdata.usgs.gov/fl/nwis/gw

Base from U.S. Geological Survey digital data, 1:100,000, 1983
Universal Transverse Mercator projection,
Zone 17

POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, MAY 2003

By
Sandra L. Kinnaman and Leel Knowles, Jr.
2004

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