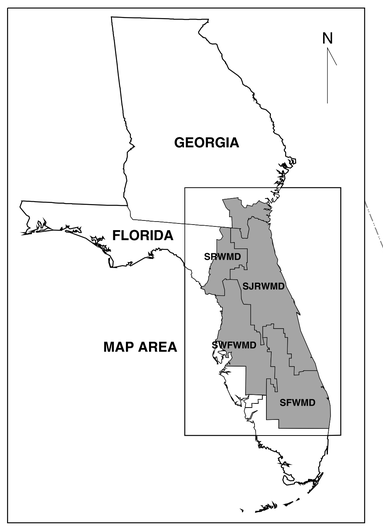
Prepared in cooperation with
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

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

OPEN FILE 2004-1288
Sandra L. Kinnaman and Leel Knowles, Jr., 2004, Potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, September 2003



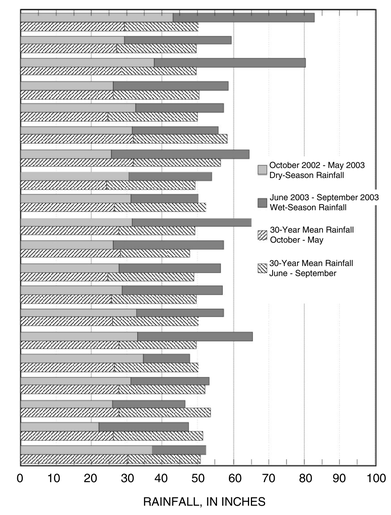
EXPLANATION

- 50 (dashed) — 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 29. 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
- 38 — 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 29
- 35 — 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 29
- 49 — 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 29
- 41 — 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 29
- SPRING -- Line indicates direction of spring outflow
- FLOWING BOREHOLE
- 6 — SINKHOLE -- Surface collapse feature exposing the Upper Floridan aquifer. Where measured, number is altitude of water level in feet above NGVD 29
- 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 29	Discharge, in cubic feet per second	Period-of-record mean-daily discharge, in cubic feet per second
Silver Springs	41	800 [a]	778
Rainbow Springs	33	780 [a]	700
Blue Springs (Volusia County)	3	175 [a]	156
Silver Glen Springs	2	121 [a]	107
Alexander Springs	11	122 [b]	106

These altitudes do not necessarily reflect the potentiometric surface at the spring pool.
[a] Mean-daily discharge for September 2003.
[b] Instantaneous discharge measured on September 23, 2003

INTRODUCTION

This map depicts the potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity in September 2003. Potentiometric contours are based on water-level measurements collected at 666 wells during the period September 8-25, near the end of the wet 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 4 feet below NGVD 29 near Fernandina Beach, Florida, to 130 feet above NGVD 29 in Polk County, Florida. The average water level of the network in September 2003 was about 3 feet higher than the average in May 2003 following above-average rainfall at most stations during the wet season. For 644 wells with previous measurements, the September 2003 levels ranged from about 7 feet below to about 20 feet above the May 2003 water levels. Water levels increased 15 feet or more from May 2003 to September 2003 in 1 of 18 wells measured in St. Johns County and all 3 wells measured in Hardee County.

Above-average rainfall during the preceding 12 months across most interior sections contributed to the average water level of the network in September 2003 being about 2 feet higher than the average water level in September 2002. For 620 wells with previous measurements, the September 2003 levels ranged from about 8 feet below to about 23 feet above the September 2002 levels. The largest decrease in water levels was in southwest Flagler County. The largest increase in water levels was in Camden County, Georgia mainly in response to a reduction in ground-water withdrawals.

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, SEPTEMBER 2003

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2004

Copies of this map can be purchased from:
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