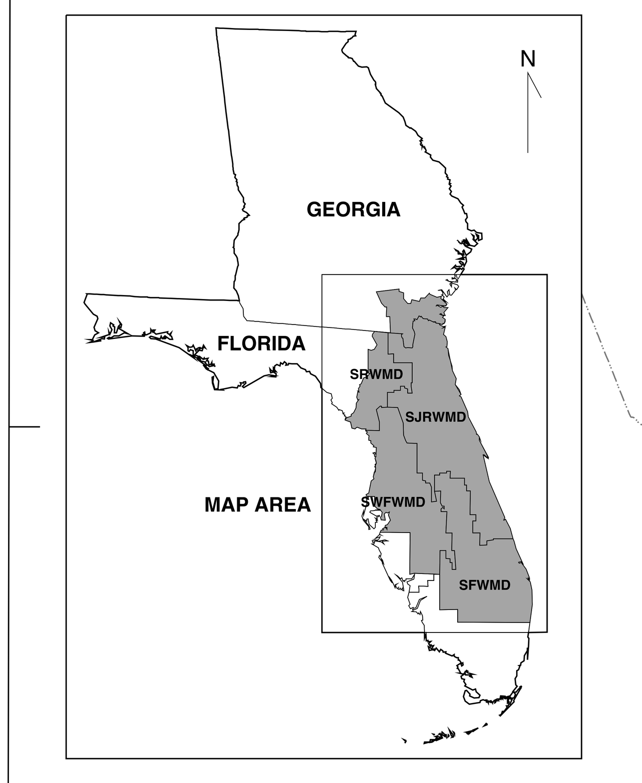
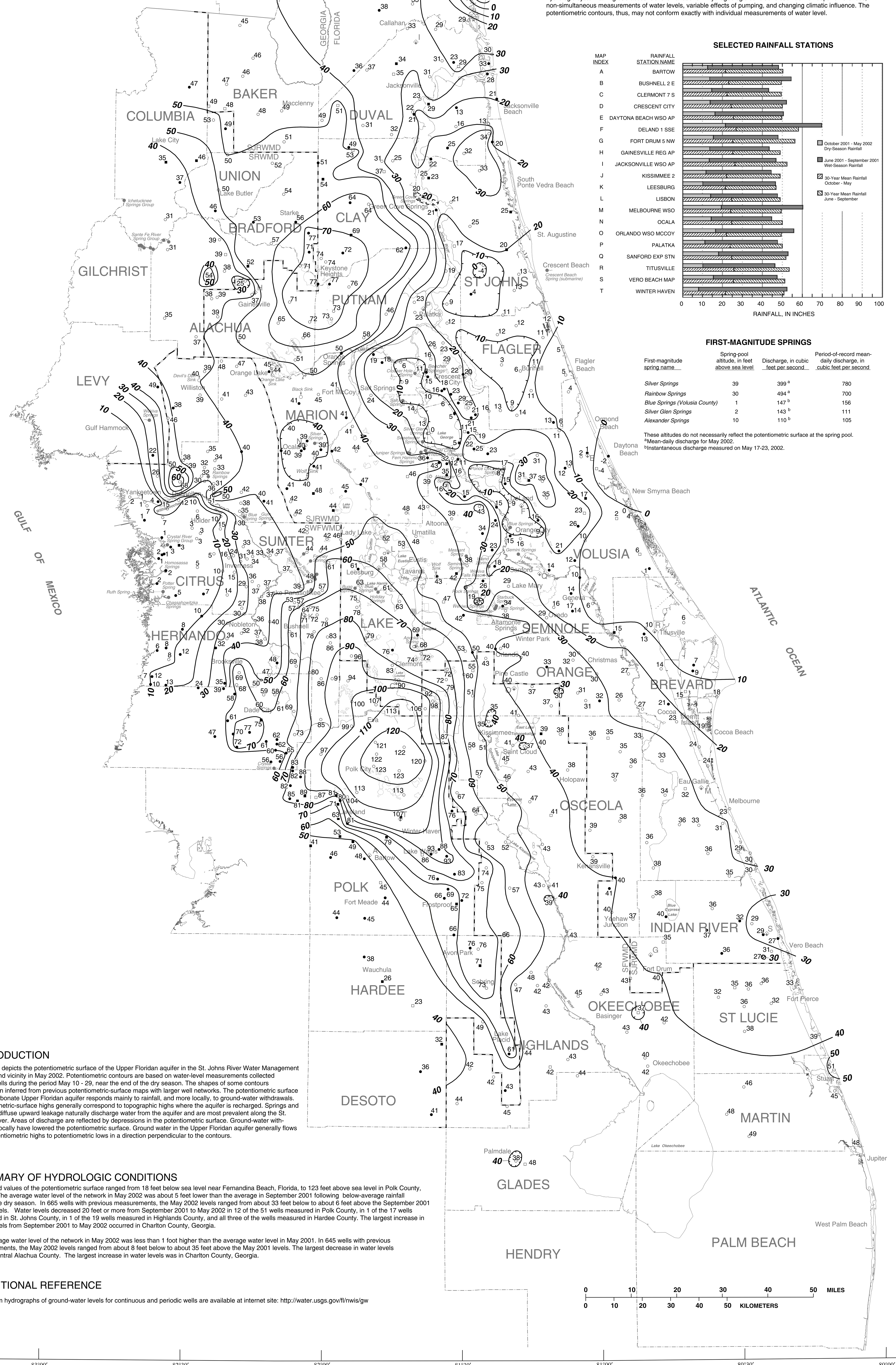
Prepared in cooperation with
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

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

OPEN FILE REPORT 02-434
Sandra L. Kinnaman and Leel Knowles, Jr., 2002, Potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, May 2002





EXPLANATION

50 - - - - POTENTIOMETRIC CONTOUR -- Shows altitude at which water level would have stood in tightly cased wells. Hachures indicate depressions. Contour intervals 10 feet. Datum is sea level. 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 sea level

○ 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 sea level

■ 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 sea level

□ 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 sea level

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 sea level

A RAINFALL STATION -- Letter is index to bar graph.

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929) -- a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929

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
October 2001 - May 2002 Dry-Season Rainfall
June 2001 - September 2001 Wet-Season Rainfall
30-Year Mean Rainfall October - May
30-Year Mean Rainfall June - September
0 10 20 30 40 50 60 70 80 90 100
RAINFALL, IN INCHES

FIRST-MAGNITUDE SPRINGS

First-magnitude spring name	Spring-pool altitude, in feet above sea level	Discharge, in cubic feet per second	Period-of-record mean-daily discharge, in cubic feet per second
Silver Springs	39	399 [a]	780
Rainbow Springs	30	494 [a]	700
Blue Springs (Volusia County)	1	147 [b]	156
Silver Glen Springs	2	143 [b]	111
Alexander Springs	10	110 [b]	105

These altitudes do not necessarily reflect the potentiometric surface at the spring pool.
[a] Mean-daily discharge for May 2002.
[b] Instantaneous discharge measured on May 17-23, 2002.

INTRODUCTION

This map depicts the potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity in May 2002. Potentiometric contours are based on water-level measurements collected at 682 wells during the period May 10 - 29, 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 18 feet below sea level near Fernandina Beach, Florida, to 123 feet above sea level in Polk County, Florida. The average water level of the network in May 2002 was about 5 feet lower than the average in September 2001 following below-average rainfall during the dry season. In 665 wells with previous measurements, the May 2002 levels ranged from about 33 feet below to about 6 feet above the September 2001 water levels. Water levels decreased 20 feet or more from September 2001 to May 2002 in 12 of the 51 wells measured in Polk County, in 1 of the 17 wells measured in St. Johns County, in 1 of the 19 wells measured in Highlands County, and all three of the wells measured in Hardee County. The largest increase in water levels from September 2001 to May 2002 occurred in Charlton County, Georgia.

The average water level of the network in May 2002 was less than 1 foot higher than the average water level in May 2001. In 645 wells with previous measurements, the May 2002 levels ranged from about 8 feet below to about 35 feet above the May 2001 levels. The largest decrease in water levels was in central Alachua County. The largest increase in water levels was in Charlton County, Georgia.

ADDITIONAL REFERENCE

Long-term hydrographs of ground-water levels for continuous and periodic wells are available at internet site: http://water.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 2002

By
Sandra L. Kinnaman and Leel Knowles, Jr.
2002

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