Revised OFR 01-15
(Replace, please.) Rec'd 6/29/01
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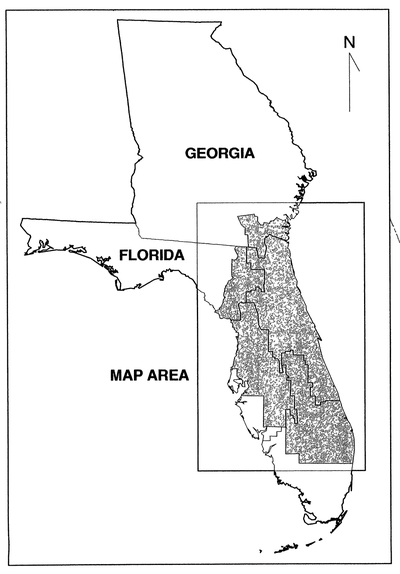
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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

REVISED
OPEN FILE REPORT 01-15

Leel Knowles, Jr., 2001, Potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, May 2000



EXPLANATION

50 ----- POTENTIOMETRIC CONTOUR -- Shows altitude at which water level would have stood in tightly cased wells. Hachures indicate depressions. Contour intervals 5 and 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

40 SURVEYED WELL OR SINK -- Measuring-point datum is leveled from a benchmark. Number is altitude of water level in feet above or below sea level

29 UNSURVEYED WELL -- 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

43 SINKHOLE -- Surface collapse feature exposing the Upper Floridan aquifer. Where measured, number is altitude of water level in feet above sea level

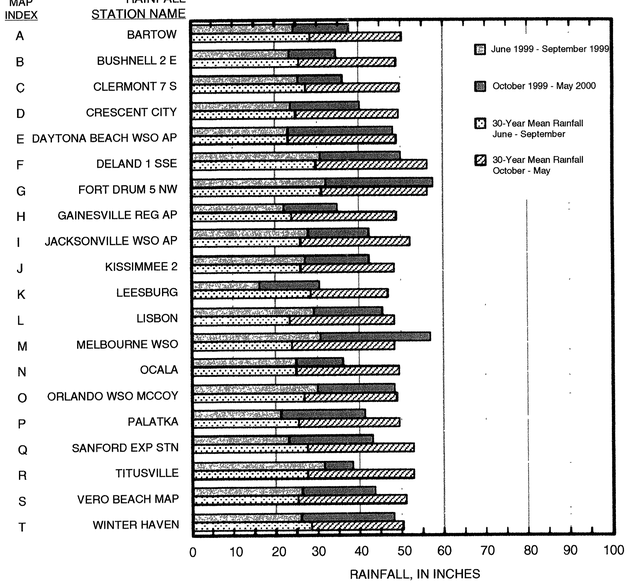
A RAINFALL STATION -- Letter is index to bar graph

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 and do not take into account variations in hydrogeologic conditions such as well-depth differences, non-simultaneous measurements of water levels, variable effects of pumping, and changing climatic influence.

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



Rainfall data provided by the National Oceanic and Atmospheric Administration, 1970-2000 (monthly summaries), Climatological Data, Florida, Asheville, NC, except for Leesburg provided by the National Weather Service, Melbourne, FL internet site http://www.srh.noaa.gov/mlb/mlbclimat.html

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	485[a]	792
Rainbow Springs	30	510[a]	711
Blue Springs (Volusia County)	1	101[a]	150
Silver Glen Springs	0.4	93[b]	104
Alexander Springs	10	60[b]	103

These altitudes do not necessarily reflect the potentiometric surface at the spring pool.
[a]Mean-daily discharge for May 2000.
[b]Instantaneous discharges measured May 22-24, 2000.

INTRODUCTION

This map depicts the potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity in May 2000. Potentiometric contours are based on water-level measurements collected at 574 wells during the period of May 9 - June 9, near the end of the meteorological dry season. The shapes of some contours have been inferred from previous potentiometric maps with larger well networks. Changes in the potentiometric surface of the carbonate Upper Floridan aquifer respond 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. Areas of discharge are reflected by depressed potentiometric contours. Natural discharge areas are prevalent along the St. Johns River. 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 21 feet below sea level near Fernandina Beach, Florida, to 124 feet above sea level in Polk County, Florida. Below-average rainfall during the preceeding 12 months across interior sections of the area contributed to increased pumpage and a widespread decrease of water levels from September 1999 to May 2000. Water-level decreases were smaller along the coastal areas south of Daytona Beach which had near- or above-average rainfall. Since September 1999, the largest water-level decreases (20 to 30 feet) were in southwest Polk County and were attributed to large agricultural ground-water withdrawals. Water levels increased by 1 to 4 feet only in extreme northeast Florida and southeast Georgia. The average water level of the network in May 2000 was about 5 feet lower than the average in September 1999, and about 3 feet lower than the average in May 1999.

Water levels in May 2000 were 5 to 13 feet lower than water levels in May 1999 at many wells in the Southwest Florida Water Management District and in other wells throughout the remainder of the area. Many wells were at or below historical lows in the Southwest Florida Water Management District, in the south part of the St. Johns River Water Management District, and in the north part of the South Florida Water Management District, particularly in Orange and Osceola Counties.

ADDITIONAL REFERENCES

Long-term hydrographs of ground-water levels for continuous and periodic wells are published in: U.S. Geological Survey, 2000, Water resources data - Florida, v. 1B. Northeast Florida ground water, p. 3-26; and available at internet site: http://waterdata.usgs.gov/nwis-w/FL/

0 10 20 30 40 50 MILES
0 10 20 30 40 50 KILOMETERS

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 2000

By
Leel Knowles, Jr.
2001

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