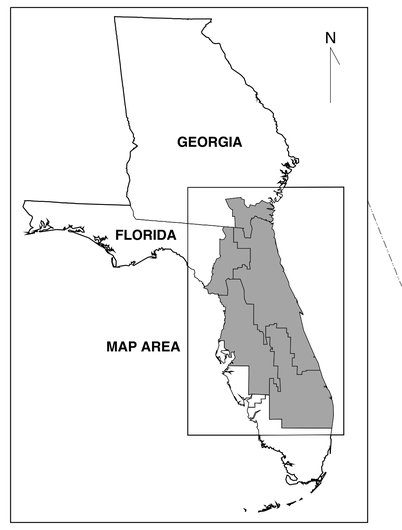
Prepared in cooperation with
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

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

OPEN FILE REPORT 01-160
Leel Knowles, Jr., 2001, Potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, September 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

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 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.

32 — 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.

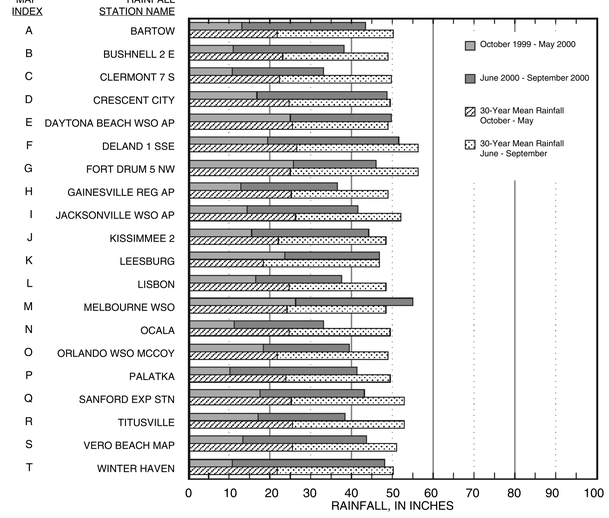
42 — SINKHOLE -- Surface collapse feature exposing the Upper Floridan aquifer. Where measured, number is altitude of water level in feet above sea level.

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 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



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	461[a]	788
Rainbow Springs	30	549[a]	708
Blue Springs (Volusia County)	2	101[b]	156
Silver Glen Springs	2	90[b]	106
Alexander Springs	10	98[b]	106

These altitudes do not necessarily reflect the potentiometric surface at the spring pool.
[a]Mean-daily discharge for September 2000.
[b]Instantaneous discharge measured on September 19, 2000.

INTRODUCTION

This map depicts the potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity in September 2000. Potentiometric contours are based on water-level measurements collected at 637 wells during the period of September 4 - 28, near the end of the meteorological wet 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 126 feet above sea level in Polk County, Florida. Near-average rainfall during the summer months following an usually dry winter/spring season across most of the area increased water levels only slightly from May 2000 to September 2000. The average water level of the network in September 2000 was about 2 feet higher than the average in May 2000. Water levels in September 2000 were 5-10 feet or more lower than water levels in September 1999 at many of the wells in the Southwest Florida Water Management District, in west-central parts of Orange and Alachua Counties, and in areas of Southeast Georgia as the combined result of cumulative rainfall deficits and increased ground-water withdrawals. During the preceeding 30 months, rainfall deficits of about 27 inches across interior Florida have resulted in a widespread decrease in water levels of about 4 feet since May 1998; 3 feet of this decrease has occurred since September 1999. Water-level decreases of 10 feet or more have been measured in nearly all counties located west of the St. Johns River from May 1998 to September 2000.

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 are 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, SEPTEMBER 2000

By
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2001

Copies of this map can be purchased from:
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