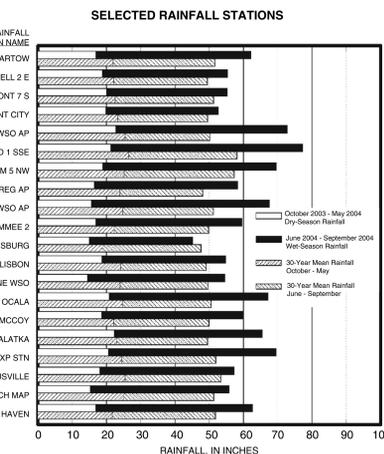


- EXPLANATION**
- 50 — POTENTIOMETRIC CONTOUR -- Shows altitude at which water level would have stood in tightly cased wells. Hatchures indicate depressions. Contour intervals 10 feet. Vertical datum is NGVD29. Dashed where inferred.
 - STATE WATER MANAGEMENT DISTRICT BOUNDARY
 - 37 SURVEYED WELL WITH KNOWN OPEN-HOLE INTERVAL -- Measuring-point datum is referenced to benchmark datum. Number is altitude of water level in feet above or below NGVD29
 - 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 NGVD29
 - ▲ 40 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 NGVD29
 - 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 NGVD29
 - 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 NGVD29
 - 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.



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 | 42 | 635 ^a | 775 |
| Rainbow Springs | 32 | 756 ^a | 697 |
| Blue Springs (Volusia County) | 5 | 180 ^b | 156 |
| Silver Glen Springs | 4 | 259 ^b | 107 |
| Alexander Springs | 11 | 102 ^b | 106 |

^a These altitudes do not necessarily reflect the potentiometric surface at the spring pool.
^b Mean-daily discharge for September 2004.
^c Instantaneous discharge measured on September 21-30, 2004.

INTRODUCTION

This map depicts the potentiometric surface of the Upper Floridan aquifer in the St. Johns River Water Management District and vicinity in September 2004. Potentiometric contours are based on water-level measurements collected at 608 wells during the period September 14 - October 1, 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

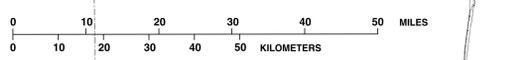
Measured values of the potentiometric surface ranged from 4 feet below NGVD29 near Fernandina Beach, Florida, to 132 feet above NGVD29 in Polk County, Florida. For 597 wells with previous measurements, the September 2004 levels ranged from about 7 feet below to about 21 feet above the May 2004 water levels. Water levels increased 15 feet or more from May 2004 to September 2004 in 1 of 16 wells measured in St. Johns County, 9 of 49 wells measured in Polk County, and all 3 wells measured in Hardee County.

The average water level of the network in September 2004 was only about 4 feet higher than the average in May 2004, despite above-average rainfall during the wet season. Seasonal water level differences generally range from 4 to 6 feet. The average seasonal water-level differences are likely attributed to extremely dry conditions during the dry season and the first half of the wet season, which lead to below-average water levels in the aquifer during the early summer months. The second half of the wet season experienced well above-average rainfall including 3 hurricanes in approximately 6 weeks, from August 13 to September 26. Although rainfall totals for the wet season reflect above-average rainfall through the end of September, some water levels were measured prior to the third hurricane and possibly before recharge from the second hurricane could fully affect the Upper Floridan aquifer.

Below-average rainfall during the dry season and above-average rainfall during the wet season contributed to the average water level of the network in September 2004 being about the same as the average water level in September 2003. For 591 wells with previous measurements, the September 2004 levels ranged from about 9 feet below to about 8 feet above the September 2003 levels. The largest decrease in water levels was in central Sumter County. The largest increase in water levels was in southeast Flagler 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>



Based on 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 2004

By
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2005

Copies of this map can be purchased from:
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