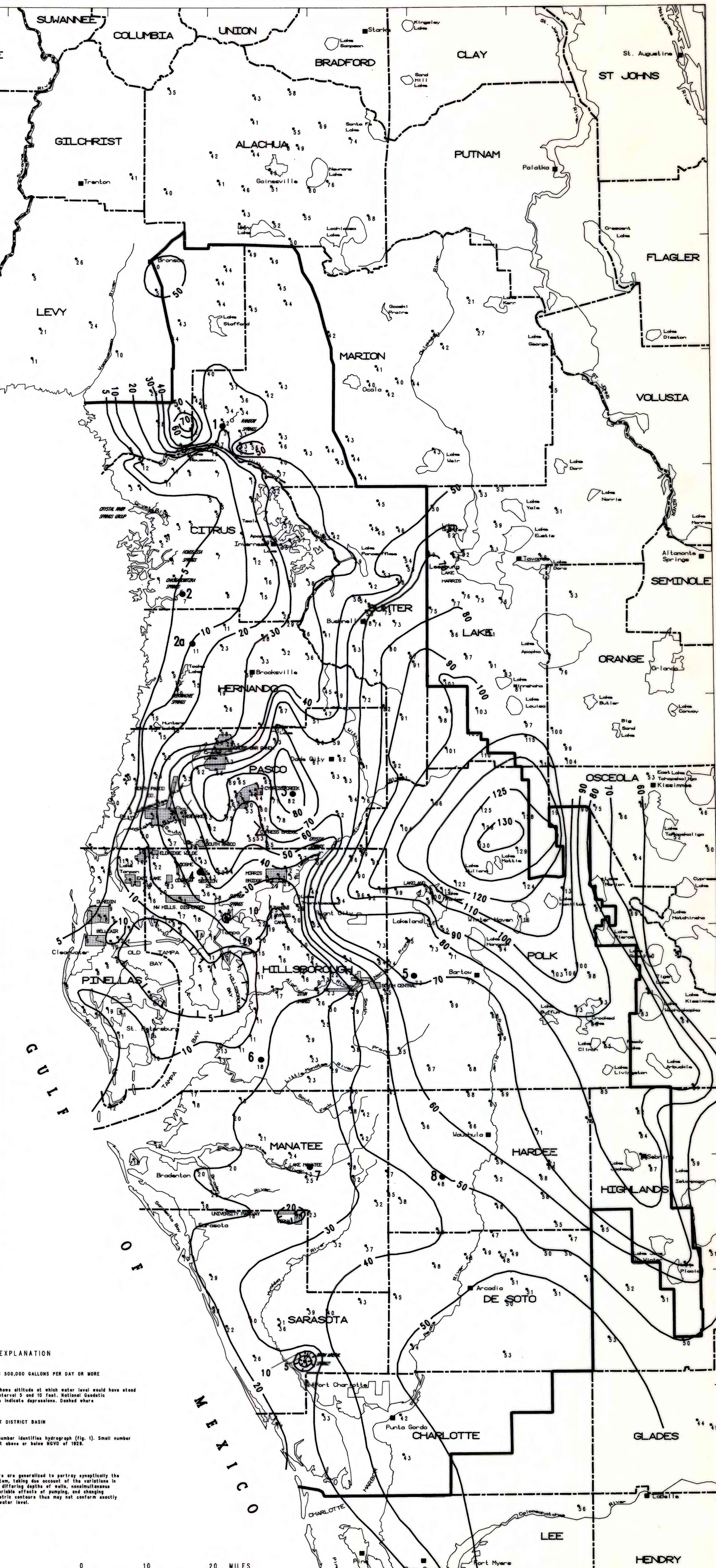
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

OPEN-FILE REPORT 93-49



INTRODUCTION

The Floridan aquifer system in west-central Florida consists of the Upper and Lower Floridan aquifers separated by a "tight" middle confining unit. The middle confining unit and the Lower Floridan aquifer generally contain saltwater in this area. In most reports on the hydrology of southwest Florida, the term "Floridan aquifer" has been applied to the water-bearing rocks herein referred to as the Upper Floridan aquifer. The Upper Floridan aquifer is the most productive aquifer in southwest Florida. It supplies at least 10 times the combined volume of water pumped from the overlying surficial and intermediate aquifer systems in most of the study area and discharges hundreds of millions of gallons of water daily to five first magnitude springs.

This report presents the potentiometric surface of the Upper Floridan aquifer in September 1992. The potentiometric surface represents the level to which water would have risen in tightly cased wells that tap this confined aquifer in September 1992. The surface was mapped by determining the altitude of water levels in a network of wells and is represented on maps by contours that connect points of equal altitude. This map represents water-level conditions near the end of the wet season when ground-water withdrawals for agricultural use are low. The cumulative rainfall for the study area was 5.42 inches below normal for the 12-month period from October 1991 through September 1992 (Southwest Florida Water Management District, 1992).

This report, prepared by the U.S. Geological Survey, in cooperation with the Southwest Florida Water Management District, is one of a series of Upper Floridan aquifer potentiometric-surface map reports made for the study area based on synoptic water-level measurements. Potentiometric surface maps have been prepared for January 1964, May 1969, May 1971, May 1972, May 1973, May 1974, and for each May and September since 1975. Water-level data are collected in May and September to depict near annual low and high water-level conditions. Most of the water-level data for this map were collected by U.S. Geological Survey personnel during the period of September 14-18, 1992. Supplemental data were collected by other agencies and companies.

SUMMARY OF HYDROGEOLOGIC CONDITIONS

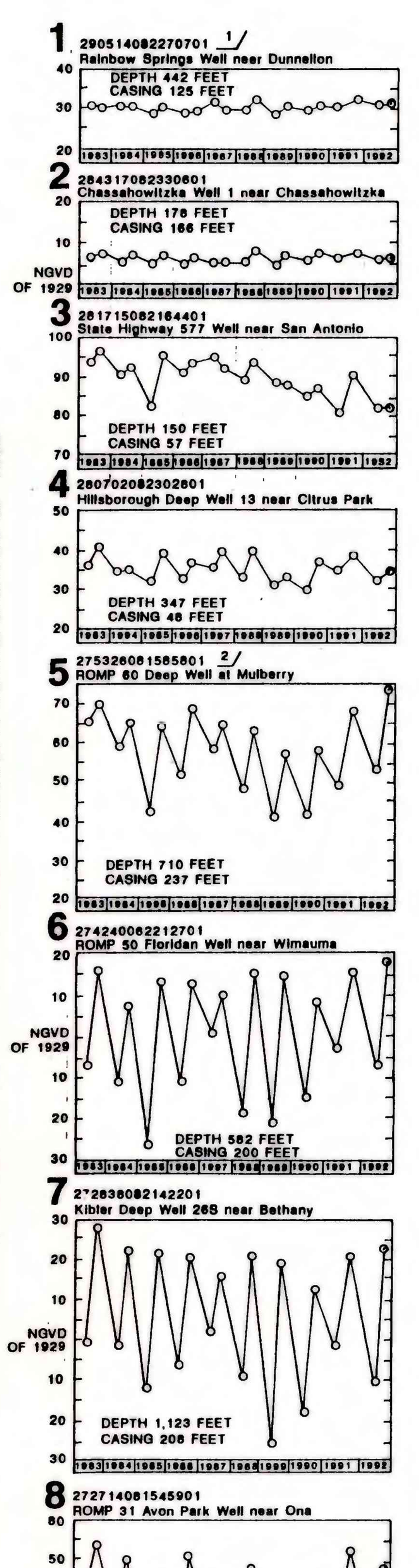
Annual and seasonal fluctuations of the potentiometric surface at selected wells are shown in hydrographs in figure 1. The hydrographs generally indicate that water levels in latitudes north of the Hillsborough-Pasco County line (northern area), where ground-water withdrawal usually is moderate, remain fairly uniform from year to year and from season to season, whereas water levels south of the county line (southern area), where withdrawal is substantially greater, indicate large year-to-year and seasonal fluctuations. Maximum daily water levels for selected wells from September 1991 through September 1992 are shown in figure 2.

Water levels in most wells measured in September 1992 were higher than those measured in May 1992 (Mularoni, 1992a). In 578 wells with paired measurements, the September 1992 level ranged from 5.81 feet below to 35.80 feet above the May 1992 level and averaged 5.24 feet above the May level. The greatest rise in water levels occurred in southern Hillsborough and northeast Manatee counties as a result of reduced pumping for irrigation.

Water levels measured in September 1992 were generally lower than those reported for September 1991 (Mularoni, 1992b). In 549 wells with paired measurements, the September 1992 level ranged from 11.15 feet below to 10.56 feet above the September 1991 level and averaged 1.21 feet below the September 1991 level. The general decline in water levels during this period was caused largely by below normal rainfall, that resulted in increased pumping.

SELECTED REFERENCES

Mularoni, R.A., 1992a, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, May 1992: U.S. Geological Survey Open-File Report 92-472, 1 sheet.
Mularoni, R.A., 1992b, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, September 1991: U.S. Geological Survey Open-File Report 92-170, 1 sheet.
Southwest Florida Water Management District, 1992, Summary of hydrologic conditions, September 1992: 3 p.



1/ Station number based on the latitude and longitude of the site

2/ ROMP 60 (Regional Observation and Monitor Well Program) a Southwest Florida Water Management District monitor well and identifying number

Figure 1.-- Water levels in selected wells for May and September 1983-92.

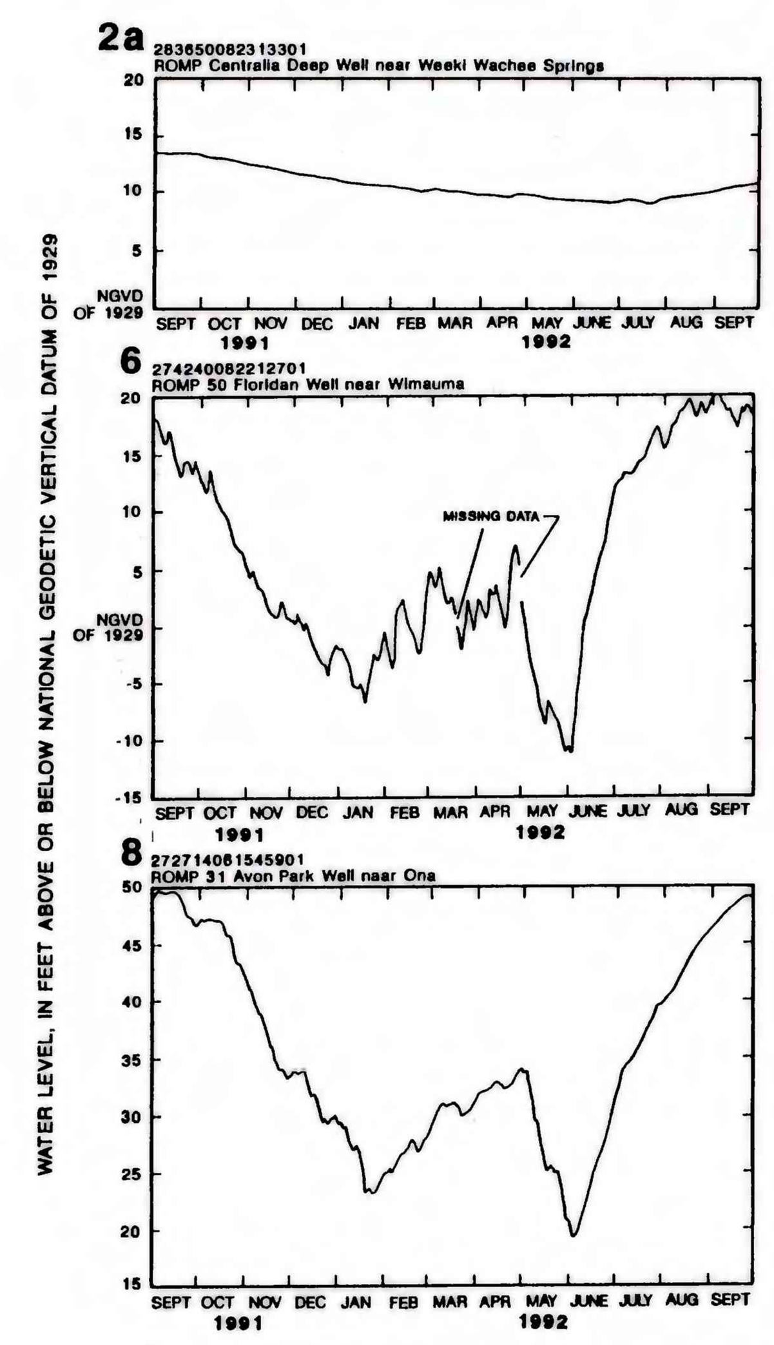


Figure 2.-- Maximum daily water levels from September 1991 to September 1992.

EXPLANATION

VERNA — MUNICIPAL WELL FIELD PRODUCING 500,000 GALLONS PER DAY OR MORE

— 20 — POTENTIOMETRIC CONTOUR -- Shows altitude at which water level would have stood in tightly cased wells. Contour interval 5 and 10 feet. National Geodetic Vertical Datum of 1929. Hachures indicate depressions. Dashed where approximately located.

BOUNDARY OF WATER MANAGEMENT DISTRICT BASIN

5 ● 68, •42 — OBSERVATION WELLS -- Large number identifies hydrograph (fig. 1). Small number is altitude of water level in feet above or below NGVD of 1929.

SPRING

NOTE: The potentiometric contours are generalized to portray synoptically the head in a dynamic hydrologic system, taking due account of the variations in hydrogeologic conditions, such as differing depths of wells, nonsimultaneous 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.

Base from digital data (Lambert projection) derived from U.S. Geological Survey State base map of Florida 1:500,000, 1967
Digital data provided by Southwest Florida Water Management District

POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA, SEPTEMBER 1992

By

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1993

Copies of this map can be purchased from:
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