DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

OPEN-FILE REPORT 87-35

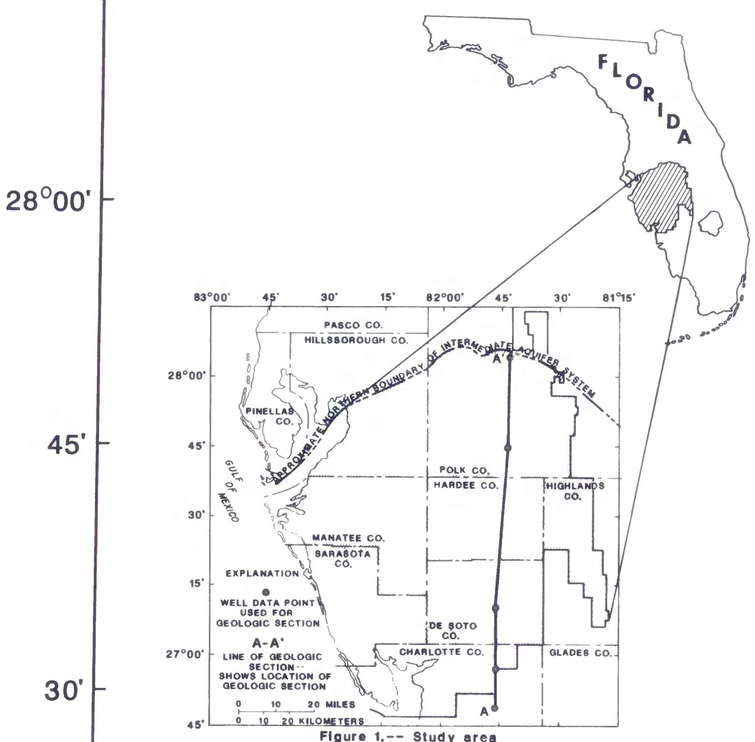


Figure 1.-- Study area

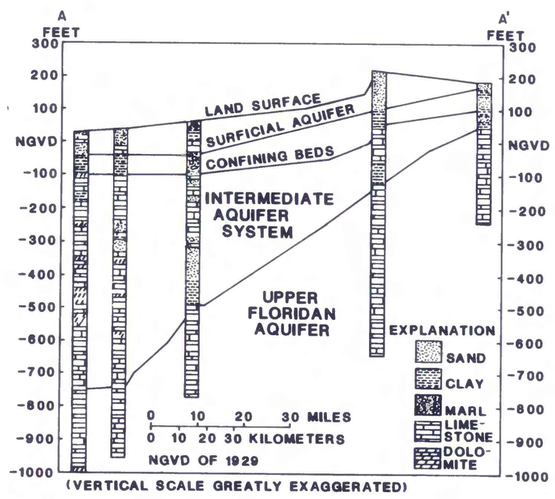


Figure 2.-- Geologic section A-A' through the study area.
(Location of section is shown in figs. 1 and 2.)
(Modified from Corral and Wolansky, 1984)

INTRODUCTION

The intermediate aquifer system of the Southwest Florida Water Management District underlies a 5,000-mi^2 area of Charlotte, De Soto, Sarasota, Hardee, Manatee, and parts of Hillsborough, Highlands, and Polk Counties (fig. 1). The aquifer system occurs between the overlying surficial aquifer system and the underlying Upper Floridan aquifer and includes all or part of the Tamiami, Hawthorn, and Tampa Formations (Southeastern Geological Society, 1986). The intermediate aquifer system consists of layers of sand, shell, clay, marl, limestone, and dolomite and contains up to three water-yielding units separated by relatively impermeable confining beds (fig. 2). The aquifer system is the principal source of potable water in the southwestern part of the study area and is widely used as a source of water in other parts where wells are open to the intermediate aquifer system or to both the intermediate and Upper Floridan aquifers. Yields of individual wells open to the intermediate aquifer system range from a few gallons to several hundred gallons per minute. The volume of water withdrawn from the intermediate aquifer system is considerably less than that withdrawn from the Upper Floridan aquifer in the study area (A. D. Duerr, U.S. Geological Survey, written commun., 1986).

The potentiometric surface of the intermediate aquifer system in September 1986 is shown on the large map. The potentiometric surface is an imaginary pressure surface represented by the level to which water will rise in tightly cased wells that tap the aquifer system. The surface is 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. In areas where more than one water-yielding unit occurs, network wells are generally open to the entire system and water levels represent a composite of all the units. This map is the second aquifer-wide potentiometric map based on synoptic measurements made in the study area (A. D. Duerr, U.S. Geological Survey, written commun., 1986). The potentiometric-surface map was prepared by the U.S. Geological Survey in cooperation with the Southwest Florida Water Management District. Water-level data are collected twice annually, in the months of May and September, which indicate, respectively, the potentiometric surface of the normally expected annual low and high water-level conditions. Most of the water-level data for this report were collected during September 15-19. Supplemental data were collected by other agencies and companies. The map represents water-level conditions near the end of the summer rainy season when ground-water withdrawals for agricultural use are low. Hence, the potentiometric surface is near its highest level for the year.

SUMMARY OF CONDITIONS

The hydrographs for selected wells shown in figure 3 generally indicate that the annual and seasonal fluctuations of the water levels are large in interior regions, where water use is large, and small in coastal areas, where water use is small. Daily maximum water levels for selected wells from September 1985 to September 1986 are shown in figure 4.

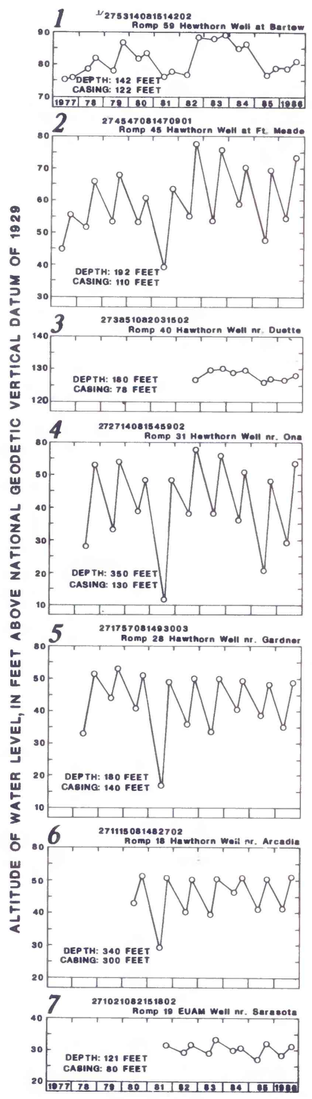
Water levels in most wells measured in September 1986 were higher than those measured in May 1986. September water levels averaged about 10 feet higher than May levels. Water levels rose about 8 feet or less along coastal and extreme southern regions and 1 to 25 feet in other areas. The largest rises were in Hardee County where seasonal water use is normally heavy.

Water levels in September 1986 averaged about 2 feet higher than September 1985. The rise was as much as 9 feet in some interior regions and about 2 feet or less in the coastal and extreme southern regions.

REFERENCES

Corral, M. A., Jr., and Wolansky, R. M., 1984, Generalized thickness and configuration of the top of the intermediate aquifer, west-central Florida: U.S. Geological Survey Water-Resources Investigations Report 84-4018, 1 sheet.

Southeastern Geological Society, 1986, Hydrogeological units of Florida: Florida Bureau of Geology Special Publication 28, 7 p.



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

Figure 3.-- Hydrographs showing May and September water levels in selected wells, 1977-1986.

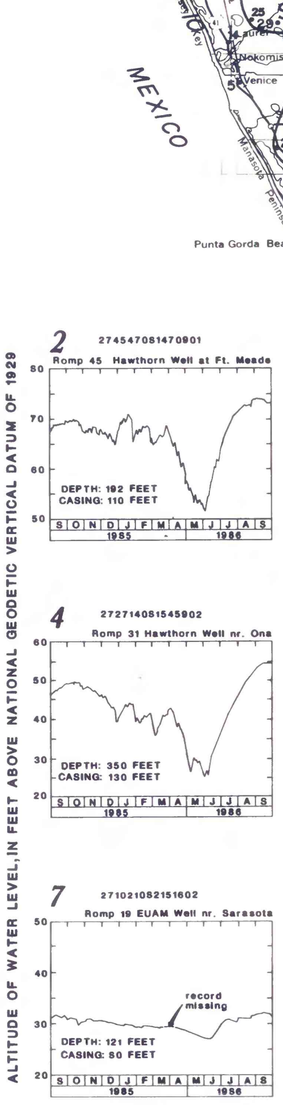


Figure 4.-- Hydrographs showing maximum daily water levels from September 1985 to September 1986.

EXPLANATION

40 — POTENTIOMETRIC CONTOUR-- Shows altitude at which water level would have stood in tightly cased wells. Contour interval 10 feet. National Geodetic Vertical Datum of 1929 (NGVD). Hachures indicate depressions. Dashed where approximate.

3 128 — OBSERVATION WELLS-- Large number identifies hydrograph (figs. 3 and 4). Small number is altitude of water level in feet above NGVD.

BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

APPROXIMATE NORTHERN BOUNDARY OF THE INTERMEDIATE AQUIFER SYSTEM (A.D. Duerr, written comm., 1986)

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.

SCALE 1:500 000

0 10 20 30 MILES
0 10 20 30 KILOMETERS

DRAFTED BY: A. Seidenfeld

Base from U.S. Geological Survey
State of Florida map 1967 1:500 000

POTENTIOMETRIC SURFACE OF THE INTERMEDIATE AQUIFER SYSTEM, WEST-CENTRAL FLORIDA, SEPTEMBER 1986

By
B.R. Lewelling

1986

Copies of this map can be purchased from:
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