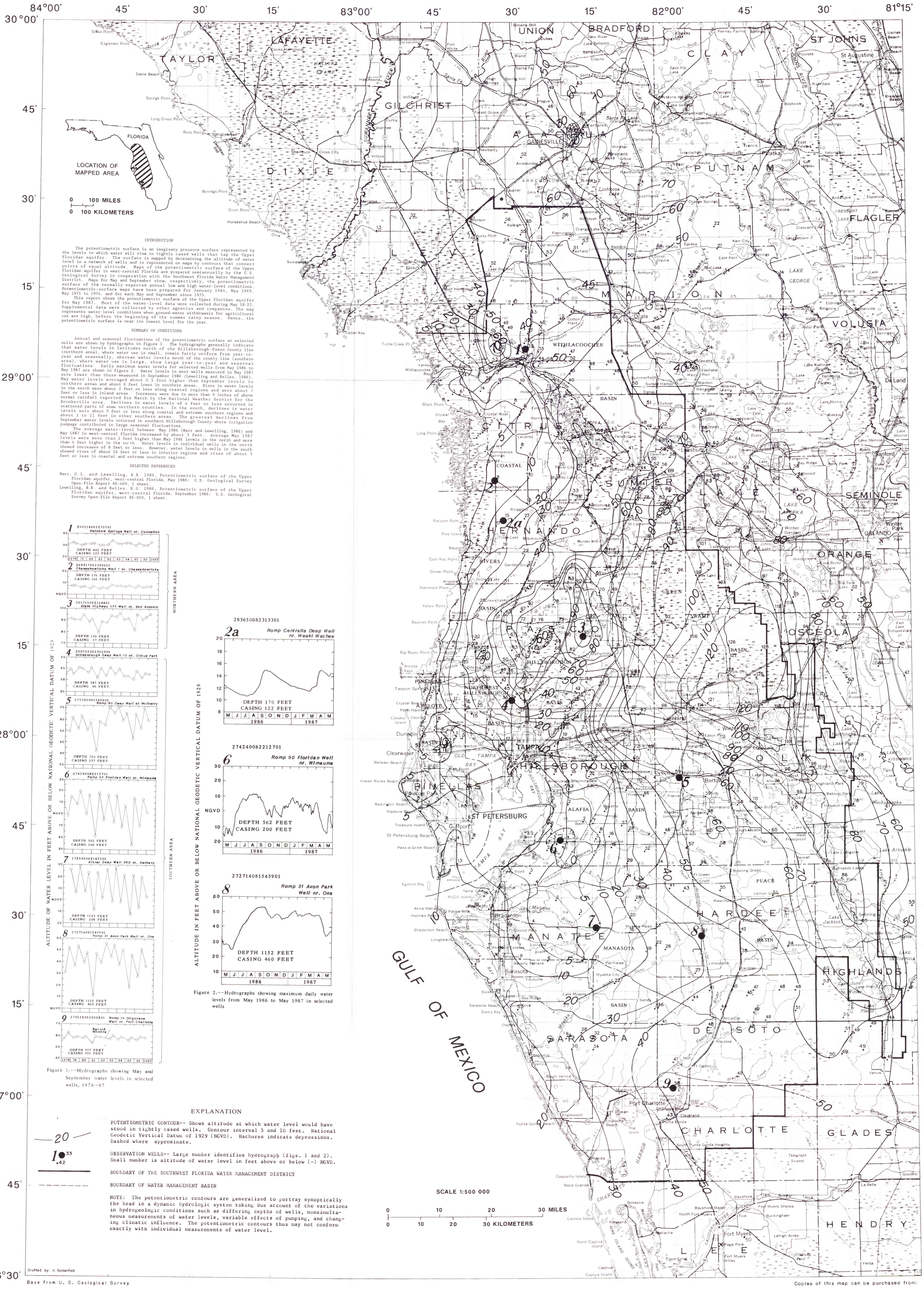
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

OPEN FILE REPORT 87-451



INTRODUCTION

The potentiometric surface is an imaginary pressure surface represented by the levels to which water will rise in tightly cased wells that tap the Upper Floridan aquifer. The surface is mapped by determining the altitude of water level in a network of wells and is represented on maps by contours that connect points of equal altitude. Maps of the potentiometric surface of the Upper Floridan aquifer in west-central Florida are prepared semiannually by the U.S. Geological Survey in cooperation with the Southwest Florida Water Management District. Maps for May and September show, respectively, the potentiometric surface of the normally expected annual low and high water-level conditions. Potentiometric-surface maps have been prepared for January 1964, May 1969, May 1971 to 1974, and for each May and September since 1975.

This report shows the potentiometric surface of the Upper Floridan aquifer for May 1987. Most of the water-level data were collected during May 18-22. Supplemental data were collected by other agencies and companies. The map represents water-level conditions when ground-water withdrawals for agricultural use are high, before the beginning of the summer rainy season. Hence, the potentiometric surface is near its lowest level for the year.

SUMMARY OF CONDITIONS

Annual and seasonal fluctuations of the potentiometric surface at selected wells are shown by hydrographs in figure 1. The hydrographs generally indicate that water levels in latitudes north of the Hillsborough-Pasco County line (northern area), where water use is small, remain fairly uniform from year-to-year and seasonally, whereas water levels south of the county line (southern area), where water use is large, show large year-to-year and seasonal fluctuations. Daily maximum water levels for selected wells from May 1986 to May 1987 are shown in figure 2. Water levels in most wells measured in May 1987 were lower than those measured in September 1986 (Lewelling and Belles, 1986). May water levels averaged about 0.5 foot higher than September levels in northern areas and about 6 feet lower in southern areas. Rises in water levels in the north were about 2 feet or less along coastal regions and were about 7 feet or less in inland areas. Increases were due to more than 9 inches of above normal rainfall reported for March by the National Weather Service for the Brooksville area. Declines in water levels of 4 feet or less occurred in scattered parts of some northern counties. In the south, declines in water levels were about 9 feet or less along coastal and extreme southern regions and about 1 to 21 feet in other southern areas. The greatest declines from September water levels occurred in southern Hillsborough County where irrigation pumpage contributed to large seasonal fluctuations.

The average water-level between May 1986 (Barr and Lewelling, 1986) and May 1987 in west-central Florida increased by about 3 feet. Average May 1987 levels were more than 2 feet higher than May 1986 levels in the north and more than 4 feet higher in the south. Water levels in individual wells in the north showed increases of 8 feet or less. However, water levels in wells in the south showed rises of about 16 feet or less in interior regions and rises of about 3 feet or less in coastal and extreme southern regions.

SELECTED REFERENCES

Barr, G.L. and Lewelling, B.R. 1986, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, May 1986: U.S. Geological Survey Open-File Report 86-409, 1 sheet.

Lewelling, B.R. and Belles, R.G. 1986, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, September 1986: U.S. Geological Survey Open-File Report 86-603, 1 sheet.

Figure 1.--Hydrographs showing May and September water levels in selected wells, 1978-87

Figure 2.--Hydrographs showing maximum daily water levels from May 1986 to May 1987 in selected wells

EXPLANATION

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 (NGVD). Hachures indicate depressions. Dashed where approximate.

OBSERVATION WELLS-- Large number identifies hydrograph (figs. 1 and 2). Small number is altitude of water level in feet above or below (-) NGVD.

BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

BOUNDARY OF WATER MANAGEMENT BASIN

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.

Drafted by: A. Seidenfeld

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

POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA, MAY 1987

By
B.R. Lewelling

1987

Copies of this map can be purchased from:
Open-File Services Section
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