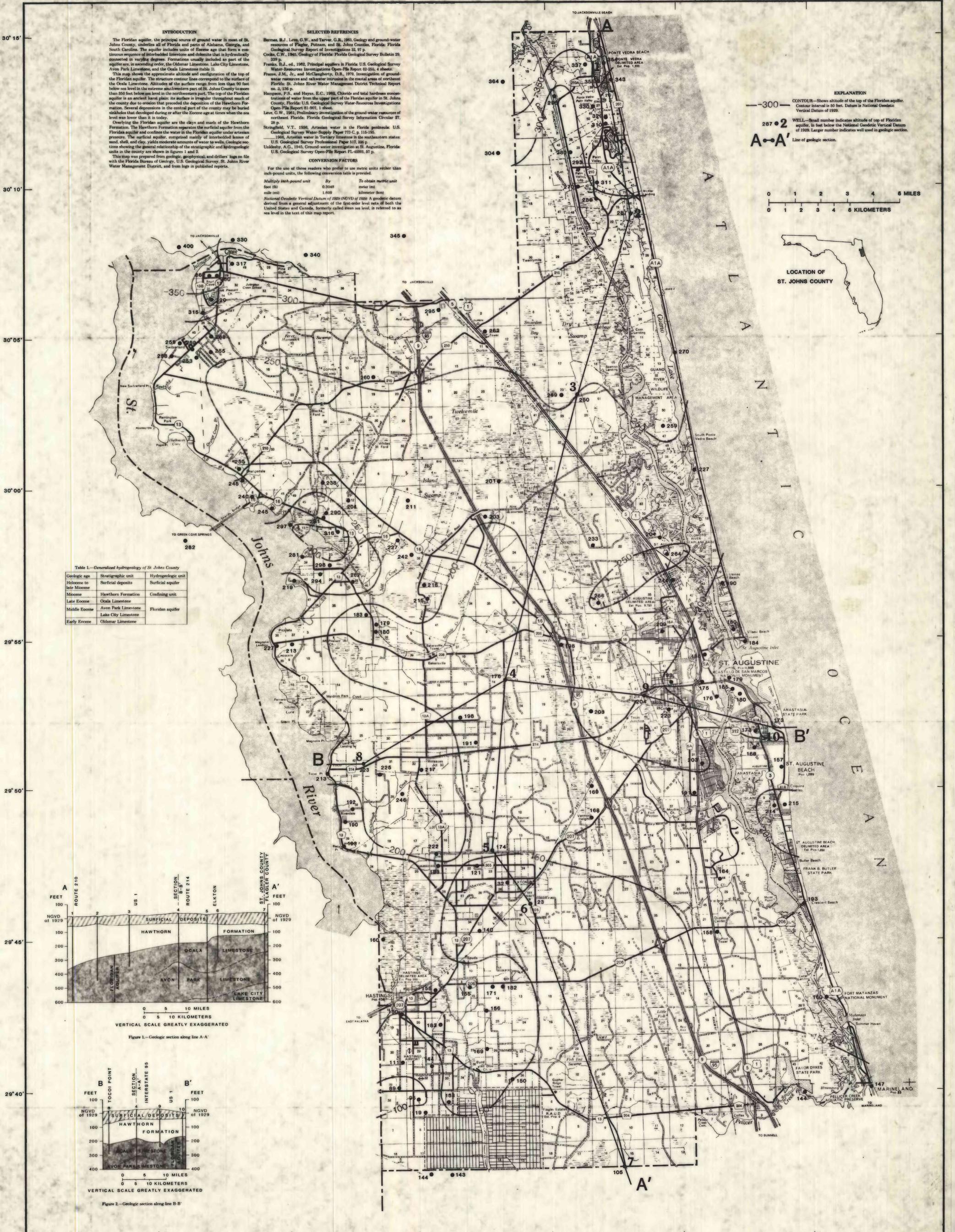


81°45' 81°40' 81°35' 81°30' 81°25' 81°20' 81°15' 81°10'



**INTRODUCTION**

The Floridan aquifer, the principal source of ground water in most of St. Johns County, underlies all of Florida and parts of Alabama, Georgia, and South Carolina. The aquifer includes units of Eocene age that form a continuous sequence of interbedded limestone and dolomite that is hydraulically connected in varying degrees. Formations usually included as part of the aquifer, in ascending order, are the Oldimar Limestone, Lake City Limestone, Avon Park Limestone, and the Ocala Limestone (table 1).

This map shows the approximate altitude and configuration of the top of the Floridan aquifer. The structure contour lines correspond to the surface of the Ocala Limestone. Altitudes of the surface range from less than 90 feet below sea level in the extreme southwestern part of St. Johns County to more than 350 feet below sea level in the northwestern part. The top of the Floridan aquifer is an ancient land plain; its surface is irregular throughout much of the county due to erosion that preceded the deposition of the Hawthorn Formation. Several depressions in the central part of the county may be buried sinkholes that developed during or after the Eocene age at times when the sea level was lower than it is today.

Overlying the Floridan aquifer are the clays and marls of the Hawthorn Formation. The Hawthorn Formation separates the surficial aquifer from the Floridan aquifer and confines the water in the Floridan aquifer under artesian pressure. The surficial aquifer, composed mainly of interbedded lenses of sand, shell, and clay, yields moderate amounts of water to wells. Geologic sections showing the general relationship of the stratigraphic and hydrogeologic units in the county are shown in figures 1 and 2.

This map was prepared from geologic, geophysical, and drillers' logs on file with the Florida Bureau of Geology, U.S. Geological Survey, St. Johns River Water Management District, and from logs in published reports.

**SELECTED REFERENCES**

Barnes, B.J., Lee, G.W., and Tarver, G.R., 1963. Geology and ground-water resources of Flagler, Putnam, and St. Johns Counties, Florida. Florida Geological Survey Report of Investigations 52, 97 p.

Cook, C.W., 1946. Geology of Florida. Florida Geological Survey Bulletin 29, 339 p.

Frank, H.J., ed., 1962. Principal aquifers in Florida. U.S. Geological Survey Water-Resources Investigations Open-File Report 62-256, 4 sheets.

Prater, J.M., Jr., and McCaughy, D.R., 1979. Investigation of ground-water resources and saltwater intrusion in the coastal areas of northeast Florida: St. Johns River Water Management District Technical Report no. 3, 136 p.

Hampson, P.S., and Hayes, E.C., 1968. Chloride and total hardness concentrations of water from the upper part of the Floridan aquifer in St. Johns County, Florida. U.S. Geological Survey Water-Resources Investigations Open-File Report 68-1007, 1 sheet.

Lee, G.W., 1961. Preliminary investigation of the ground-water resources of northeast Florida. Florida Geological Survey Information Circular 27, 29 p.

Stringfield, V.T., 1966. Artesian water in the Florida peninsula. U.S. Geological Survey Water-Supply Paper 773-C, p. 115-155.

1966. Artesian water in Tertiary limestone in the southeastern states. U.S. Geological Survey Professional Paper 117, 289 p.

Unklesby, A.G., 1940. Ground-water investigation at St. Augustine, Florida. U.S. Geological Survey Open-File Report FL-40001, 57 p.

**CONVERSION FACTORS**

For the use of those readers who prefer to use metric units rather than inch-pound units, the following conversion table is provided.

Multiply inch-pound unit	By	To obtain metric unit
feet (ft)	0.3048	meter (m)
miles (mi)	1.609	kilometer (km)

National Geodetic Vertical Datum of 1929 (NGVD) of 1929: A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called mean sea level, is referred to as sea level in the text of this map report.

**EXPLANATION**

—300— CONTOUR—Shows altitude of top of the Floridan aquifer. Contour interval is 50 feet. Datum is National Geodetic Vertical Datum of 1929.

267 • 2 WELL—Small number indicates altitude of top of Floridan aquifer, in feet below the National Geodetic Vertical Datum of 1929. Larger number indicates well used in geologic section.

A—A' Line of geologic section.

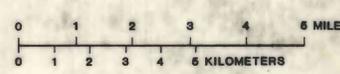


Table 1.—Generalized hydrogeology of St. Johns County

Geologic age	Stratigraphic unit	Hydrogeologic unit
Holocene to late Miocene	Surficial deposits	Surficial aquifer
	Hawthorn Formation	Confining unit
Late Eocene	Ocala Limestone	Floridan aquifer
Middle Eocene	Avon Park Limestone	
Early Eocene	Lake City Limestone	
	Oldimar Limestone	

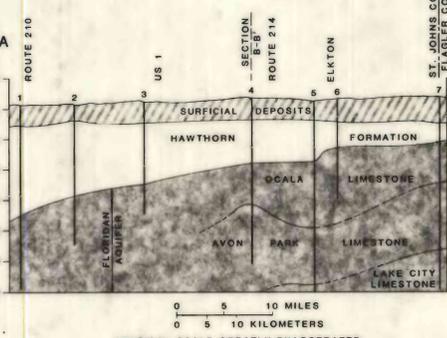


Figure 1.—Geologic section along line A-A'

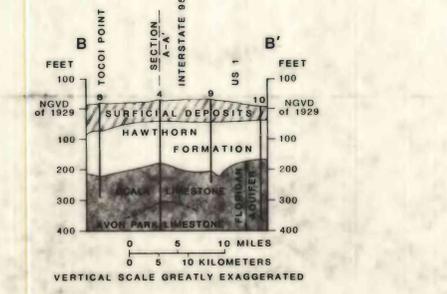


Figure 2.—Geologic section along line B-B'

**ALTITUDE AND GENERALIZED CONFIGURATION OF THE TOP OF THE FLORIDAN AQUIFER, ST. JOHNS COUNTY, FLORIDA**

By  
Rick M. Spechler  
1984

Black & White Copies of this report can be purchased from:  
Open-File Services Section  
Western Distribution Branch  
U.S. Geological Survey  
Box 2460, Federal Center  
Denver, Colorado 80223  
(Telephone, (303) 231-8800)