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POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER SEPTEMBER 2013

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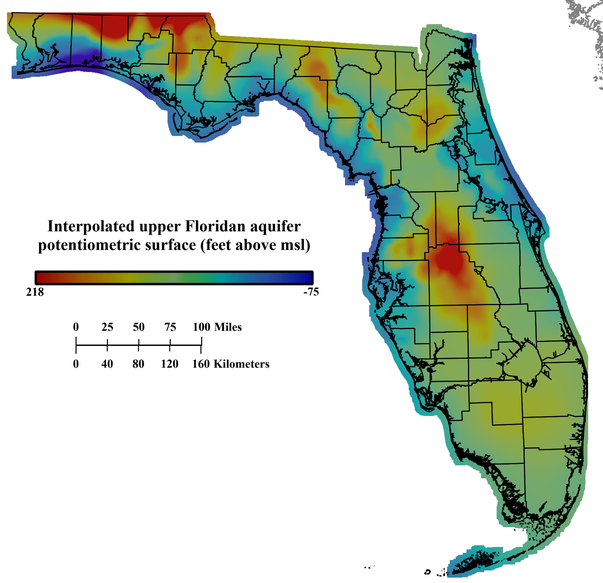

INTRODUCTION

The Floridan aquifer system (FAS) is comprised of a thick sequence of carbonate rocks that function regionally as a major aquifer system. It ranges from a fully-confined aquifer system, where overlain by the intermediate aquifer system or intermediate confining unit, to an unconfined aquifer system in areas where it occurs at or near land surface. The FAS extends throughout the state of Florida. However, in some parts of the southern peninsula and western panhandle, the FAS is not used as a source of public water supply due to its high salinity (Southeastern Geological Society, 1986). In general, the FAS is divided into upper and lower aquifers separated by strata of lower permeability. The highly permeable upper Floridan aquifer (UFA) is comprised of Eocene to Miocene carbonate rocks. The table to the right shows the correlation between lithostratigraphic units and hydrostratigraphic units in Florida. The UFA comprises formations from just below the intermediate aquifer system/ intermediate confining unit to the upper part of the Avon Park Formation, with the exception being in the western panhandle. In this region, the top of the Bucatunna Clay is the lower extent of the UFA.

POTENTIOMETRIC SURFACE

The potentiometric surface is an imaginary surface to which water will rise in tightly cased wells penetrating the upper Floridan aquifer (Lohman, 1979). In Florida, the UFA can be either confined or unconfined. In an unconfined aquifer, the potentiometric surface is at atmospheric pressure and is equivalent to a water-table aquifer. In a confined aquifer, the water-level elevation rises above the point at which it is first encountered because the confined aquifer is under pressure exceeding that of atmospheric pressure (National Ground Water Association). The potentiometric surface contours on this map represent lines of equal water-level altitude above mean sea level (NGVD29).

The contour lines are based on water-level measurements obtained from 1,133 wells collected from September 15 - October 16, 2013. The majority of water-level measurements occurred during the last two weeks of September 2013. In the Florida panhandle, 17 wells were measured in October 2013. The methodology used to generate the UFA potentiometric surface can be found in the *Florida Scientist* (Cichon, 2016). An interactive map can be found at: *http://fdep.maps.arcgis.com/home/index.html*. Potentiometric surface data containing wells, contour lines, and raster surfaces can be downloaded at: *http://geodata.dep.state.fl.us/*.

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Well location

Potentiometric surface contour
Shows altitude at which water level would have risen in tightly cased wells. Contour interval 10 feet. Vertical datum is National Geodetic Vertical Datum of 1929 (NGVD29).

Hachured depressions

0 25 50 75 100 Miles
0 40 80 120 160 Kilometers

SYSTEM	SERIES	PANHANDLE FLORIDA FORMATION	PANHANDLE FLORIDA HYDROSTRATIGRAPHIC UNIT	NORTHERN FLORIDA FORMATION	NORTHERN FLORIDA HYDROSTRATIGRAPHIC UNIT	SOUTHERN FLORIDA FORMATION	SOUTHERN FLORIDA HYDROSTRATIGRAPHIC UNIT
QUATERNARY	HOLOCENE	Undifferentiated sediments	sand-and-gravel aquifer; surficial aquifer system	Undifferentiated sediments Anastasia Formation	surficial aquifer system	Undifferentiated sediments Miami Limestone Key Largo Limestone Anastasia Formation	surficial aquifer system; Biscayne aquifer
	PLEISTOCENE						
TERTIARY	PLIOCENE	Citronelle Formation Miccosukee Formation Jackson Bluff Formation Intracoastal Formation Coarse Clastics		Undifferentiated sediments Miccosukee Formation Cypresshead Formation		Undifferentiated sediments Tamiami Formation Long Key Formation	
	MIOCENE	Coarse Clastics Alum Bluff Group Pensacola Clay Intracoastal Formation Hawthorn Group Chipola Formation Bruce Creek Limestone St. Marks Formation Chattahoochee Formation	intermediate aquifer system or intermediate confining unit	Hawthorn Group	intermediate aquifer system or intermediate confining unit	Hawthorn Group	intermediate aquifer system or intermediate confining unit
	OLIGOCENE	Bucatunna Clay Chickasawhay Formation Marianna Limestone Suwannee Limestone	Floridan aquifer system	St. Marks Formation Suwannee Limestone	Floridan aquifer system	Suwannee Limestone	Floridan aquifer system
	EOCENE	Ocala Limestone Avon Park Formation Lisbon Formation Tallahatta Formation Claiborne Group Undiff.		Ocala Limestone Avon Park Formation Oldsmar Formation		Ocala Limestone Avon Park Formation Oldsmar Formation	
	PALEOCENE	Wilcox Group Midway Group	undifferentiated aquifer systems and confining units	Cedar Keys Formation	undifferentiated aquifer systems and confining units	Cedar Keys Formation	undifferentiated aquifer systems and confining units
CRETACEOUS AND OLDER		Undifferentiated		Undifferentiated		Undifferentiated	

Color shading reflects hydrostratigraphic units

Limitations:
The potentiometric surface is an estimate of water-level measurements and only represents the period during which data was collected. The interpolated surface can be affected by many hydrologic conditions such as groundwater extraction, weather conditions prior to or during sampling events, wells that are only measured once over a two-week period, averaging of daily water-level measurements over a two-week period, and wells intersecting different hydrologic pressure zones within the aquifer. In addition, new wells added to the network have the potential to modify historic contour line patterns.

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