

Potentiometric Surface of the Upper Floridan Aquifer September 2023

By
Gary D. Fowler III, Ph.D., P.G. #3327

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INTRODUCTION

The Floridan aquifer system (FAS) is comprised of a thick sequence of carbonate rocks, which function regionally as a major aquifer system. The FAS extends throughout the entire state of Florida and is commonly used as a source of public water supply. However, it is not used as a source of public water supply in some parts of the southern peninsula and western Panhandle due to high groundwater salinity (Southeastern Geological Society Ad Hoc Committee on Florida Hydrogeological Units, 1986). The FAS ranges from confined areas (where overlain by a confining unit of significantly lower permeability) to unconfined areas where water can freely move into and out of the system from land surface. In many areas where the FAS is confined, the intermediate aquifer system (IAS) will also be found between the surficial aquifer system (SAS) and the FAS. The FAS is generally divided into an upper and lower aquifer separated by strata of lower permeability. The highly permeable Upper Floridan aquifer (UFA) is comprised of Eocene to Miocene carbonate rocks. The UFA includes geologic formations between the upper part of the Avon Park Formation and some formations of the Hawthorn Group, except in the western Panhandle where the top of the Bucatunna Clay Member of the Byram Formation marks the lower extent of the UFA. The table below shows the correlation between lithostratigraphic and hydrostratigraphic units in Florida.

POTENTIOMETRIC SURFACE

A potentiometric surface is a hypothetical surface to which water will rise in tightly cased wells penetrating an aquifer's upper confining unit (Lohman, 1979). In Florida, the UFA can be either confined or unconfined. The potentiometric surface of an unconfined aquifer is at atmospheric pressure and is equivalent to a water-table aquifer. The confined portions of the UFA are typically artesian, which means the water level within a well will rise above the top of the aquifer formation because the hydraulic pressure is greater than the atmospheric pressure (Freeze and Cherry, 1979). The potentiometric surfaces for the IAS and SAS will typically vary from the UFA surface, sometimes by several feet. The potentiometric surface contours on this map represent lines of equal water-level elevation above mean sea level (NGVD 29) for the UFA only. The contour lines represent water-level measurements obtained from 1299 wells collected during September 2023. Data modeling was conducted using empirical Bayesian kriging to generate basic contours that were then edited based on interpretations of an area's hydrologic and geologic conditions.

ACKNOWLEDGMENTS

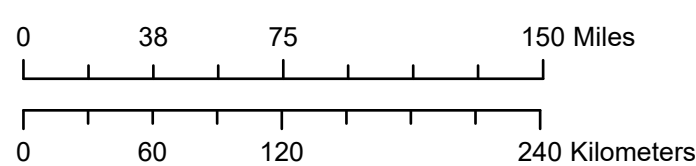
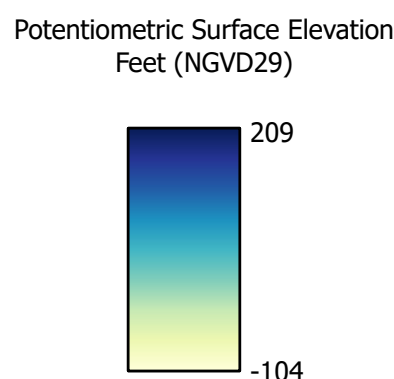
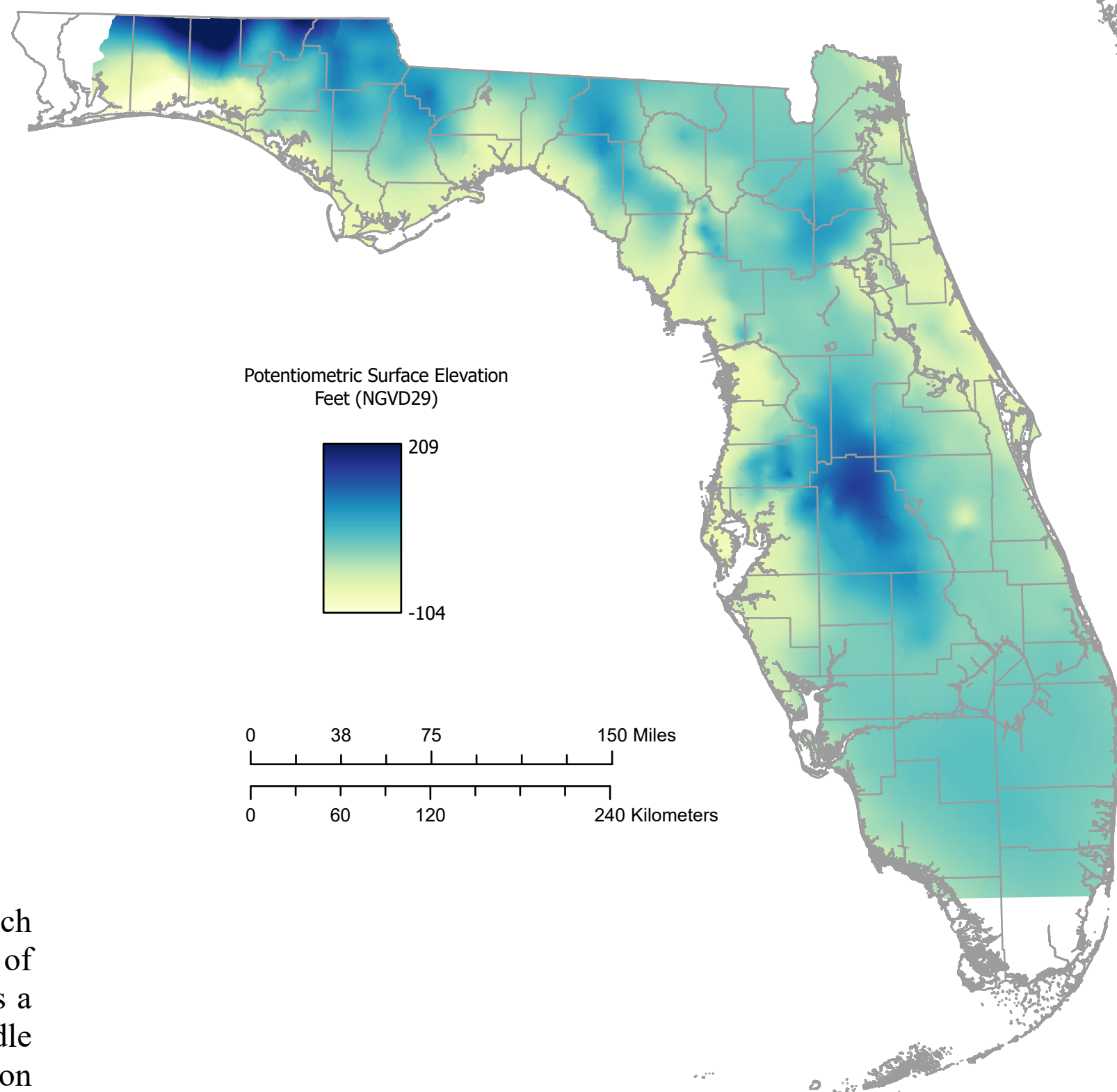
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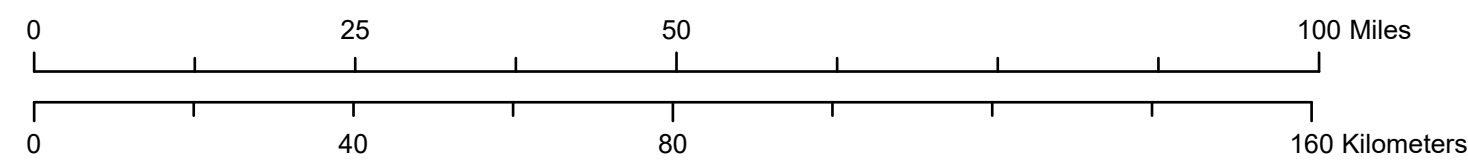
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- Well location
- Potentiometric surface contours (10' interval)
- Index contours (50' interval)
- Hachured depressions



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

Modified from FGS Special Publication 28.

Disclaimer: The potentiometric surface estimates of water-level measurements only represent the period during collection. The surface can be affected by many hydrologic conditions including but not limited to, groundwater extraction, weather conditions before and during sampling events, wells that are only measured once during sampling interval, average daily water-level measurements over sampling interval, 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. With respect to publications, documents, and information available from the Florida Department of Environmental Protection (DEP), Florida Geological Survey (FGS), or the State of Florida, no warranty is made, expressed or implied, including the warranties of merchantability and fitness for a particular purpose arising out of the use or inability to use the data or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. As a professional courtesy, the DEP/FGS asks credit to be given when other individuals or entities use its data sets. Further, since some or all of the data yielded from each FGS project were deployed using public funds, no proprietary rights may be attached to FGS products wholly or in part, nor may FGS products be sold to the U.S. government or the Florida state government as part of any procurement of products or services.