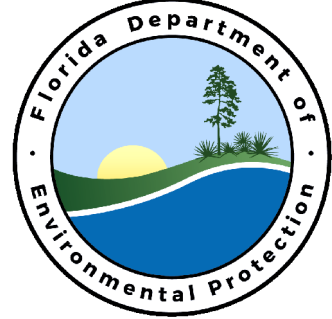
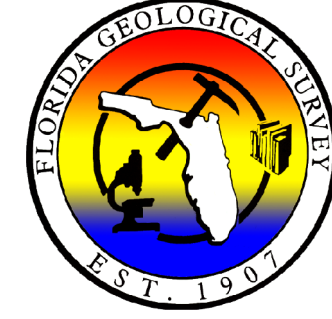


Jonathan P. Stevenson
Secretary

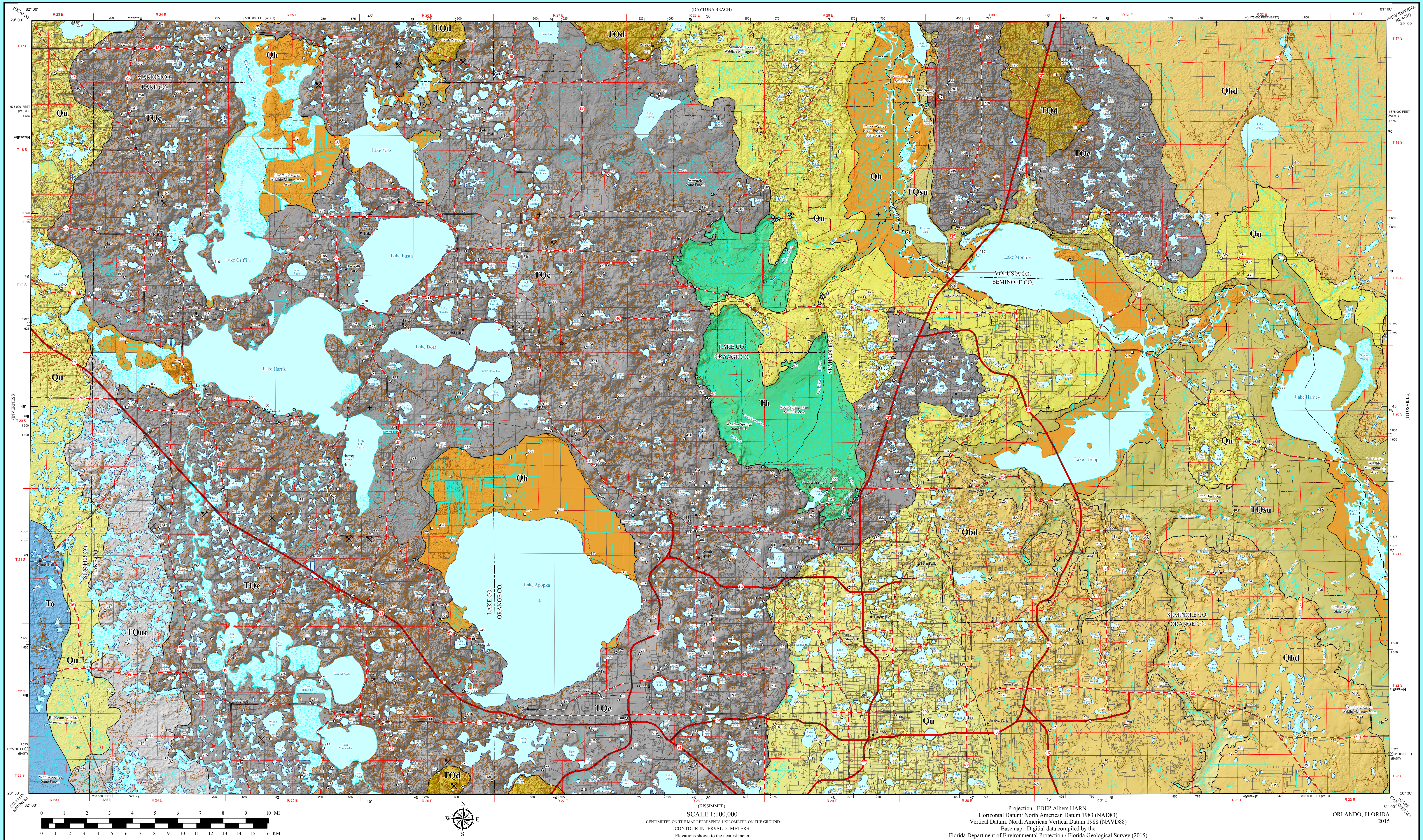


OPEN-FILE MAP SERIES 107, Plate 1
GEOLOGIC MAP OF THE USGS ORLANDO
30 X 60 MINUTE QUADRANGLE, CENTRAL FLORIDA
2015

BY
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State Geologist and Director



Holocene Sediments
Sediments mapped as Holocene (Qh) may include quartz sands, marls, peats and mucks, and minor carbonate sands and mud. They may also include fresh-water mollusks. Within the study area, they are mapped as lacustrine and floodplain deposits in the vicinity of Lake Apopka and other lakes, the St. Johns River and the Ocklawaha River.
Quaternary Beach Ridge and Dune
Quaternary beach ridge and dune sediments (Qbd) are a subdivision of the undifferentiated Quaternary sediments that are noted on the basis of surficial expression of reflect beach ridges and dunes. While not a formally recognized lithostratigraphic unit, Qbd is mapped in order to facilitate a better understanding of Florida's geology. Beach ridge and dune sediments are dominantly siliceous sands and are unconsolidated to poorly consolidated. Organics typically occur as disseminated organic matter, roots and plant debris, carbonized remains or charcoal.
Quaternary Sediments
While not a formally recognized lithostratigraphic unit, Undifferentiated Quaternary (Qu) sediments are mapped in order to better understand Florida's geology. These undifferentiated Quaternary sediments consist of white to gray to orange, fine to coarse-grained, clean to clayey unconsolidated sands, sandy clays and clays with variable admixtures of organics.

Undifferentiated Pleistocene/Pleistocene Shelly Sediments
Undifferentiated Pleistocene/Pleistocene shelly sediments (TQsu) typically consist of fine-to-medium quartz sand with variable amounts of calcareous, marine mollusk shells and clay. Shells, which may vary from whole to fragments, are normally highly weathered and abraded and may occasionally become the dominant lithology. Other accessory minerals may include calcite, aragonite, clay, mica, heavy minerals and minor phosphate sand and gravel. A basal phosphate lag is often present. Colors range from light gray to light olive gray. In the northeastern portion of the study area, TQsu is predominantly in the form of calcic cemented sands with varying percentages of shell fragments.
Tertiary/Quaternary Dunes
Tertiary/Quaternary dunes (TQd), while not a formally recognized lithostratigraphic unit, are mapped in order to facilitate a better understanding of Florida's geology. Where LIDAR is available these dunes are readily differentiated from other units by their distinct topographic expression. These dune sediments are fine-to-medium quartz sand with varying amounts of disseminated organic matter. They are generally found at elevations above 100 feet (30.5 meters) MSL, although there are areas along the flanks of the Mt. Dora and Deland ridges where elevations of these dune sands can be lower. Sands forming these dunes are derived from re-working of sediments from the Cypresshead Formation (TQc) and undifferentiated Quaternary sediments (Qu).

Undifferentiated reworked Cypresshead Sediments
Sediments mapped as undifferentiated reworked Cypresshead Formation (TQc) in the study area are the result of post-depositional reworking of Cypresshead Formation sediments. They are fine to coarse quartz sands with scattered quartz gravel and varying percentages of clay in the matrix. They are generally lower in elevation and have less relief than Cypresshead Formation sediments.
Cypresshead Formation
The Pleistocene/Pleistocene Cypresshead Formation (TQc) is a mottled reddish-brown to reddish-orange to white, unconsolidated to poorly consolidated, fine- to medium-grained, variably clayey to clean quartz sand. Cross-bedded sands and bimodal sand size distributions are common within this formation. Discoid quartz pebbles, heavy mineral grains, mica, and ghosts of nearshore marine mollusks are often present. The Cypresshead Formation is present throughout much of the study area and forms the core of the various ridges present in the region. In the northeastern portion of the study area, east of the St. Johns River, it typically becomes a more weathered, finer-grained, well-sorted sand and silt. In cores, the unit is often characterized by beds of fine grained, well sorted sand with thin layers of clay dispersed through the sand.

Hawthorn Group, Undifferentiated
Undifferentiated Hawthorn Group (Th) sediments within the mapped area consist of poorly to moderately consolidated, clayey sands to silty clays and occasional relatively pure clays, silt sized dolomitic cemented sands and variably quartz sandy dolostones. Phosphate sand and gravel is a highly variable but consistent component. Phosphate grains present range from curdy white in color (highly weathered) to progressively darker browns and blacks (less weathered). The upper portion of the undifferentiated Hawthorn Group is often highly weathered and may contain little to no phosphate due to leaching.
Ocala Limestone
The Upper Eocene Ocala Limestone (To) is a biogenic marine limestone comprised largely of foraminifera, mollusks, echinoids and bryozoans. Based on lithology, the Ocala Limestone can be informally subdivided into an upper and lower unit. This subdivision, while often apparent in cores and quarries, is often not readily apparent in cuttings. The upper unit is typically a white to cream, fine to coarse-grained, poorly to well-indurated, poorly to well-sorted, very fossiliferous limestone (predominantly packstone, and grainstone). Fossils commonly include foraminifera (*Lepidocyclus ocalaensis*, *Nummulites (Cameria) vanderzouli*, *Nummulites (Operculinoides) ocalaensis* and abundant miliolids), bryozoans, mollusks, and a rich diversity of echinoids. The lower unit is typically a white to cream, fine- to medium-grained, poorly to moderately indurated, moderately to well-sorted limestone (grainstone to packstone). Fossils include foraminifera (*Amphistegina pinnaensis*, and abundant miliolids), bryozoans, algae, mollusks, echinoids, and crustaceans.

LEGEND
Primary highway
Secondary highway
Light duty road, principal street
Railroad
County boundary
National or state reservation boundary
Contours
Index
Intermediate
River or stream
Core
Cuttings
M-Series sample
Outcrop / exposure
Quarry / sand mine
Borrow pit
Swallet
City/town
Lake or pond
Wetland
U.S. Public Lands Survey Township/Range
U.S. Public Lands Survey Section
7.5 Minute quadrangle
10,000-meter grid, zone 17, Universal Transverse Mercator
25,000-foot grid ticks based on Florida coordinate system, east and west zones
+ 400,000E
+ 1,600 - 1,600,000 FEET (WEST)
+ 1,600 - 1,600,000 FEET (EAST)

1:24,000 QUADRANGLE GRID											
LADY LAKE	EMERALDA ISLAND	UMATILLA	POWLEY	PINE LAKES	ORANGE CITY	LAKE HULEN	LAKE ARROW				
LEEBURG WEST	LEEBURG EAST	EUSTIS	SORRENTO	SANFORD SW	SANFORD	OSTEN	ONEIDA				
CENTER HILL	HOPKIN IN THE HILLS	ASTORIA	APOPKA	FOREST CITY	CANALBERRY	OWIEDO	GENOVA				
MASCOTTE	CLEMONT WEST	CLEMONT EAST	WINTER GARDEN	ORLANDO WEST	ORLANDO EAST	OTTELEY SW	BITHOLD				

ADJOINING MAPS
1 Ocala
2 Daytona Beach
3 New Smyrna Beach
4 Inverness
5 Orlando
6 Titusville
7 Tarpon Springs
8 Kissimmee
9 Cape Canaveral
For more information or to order maps contact:
Library, Florida Geological Survey
3000 Commonwealth Blvd., Suite 1
Tallahassee, FL 32303
850/617-0316
<http://www.dep.state.fl.us/geology/programs/stateramp.htm>

This map was created using Florida Department of Environmental Protection (FDEP) databases and data obtained by the Florida Geological Survey (FGS). It was completed August 31, 2015, by the FDEP/FGS, Geological Investigations Section. This document was prepared for the presentation of the geologic information shown and is not intended to replace site-specific or user-specific investigations. The FGS does not guarantee this document to be free from errors or inaccuracies and disclaims any responsibility or liability for inappropriate change of scale, interpretations, or decisions based thereon. It was cooperatively funded by the FGS and the U.S. Geological Survey (USGS), National Cooperative Geologic Mapping Program, under USGS assistance award number G14AC00358. The views and conclusions in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.