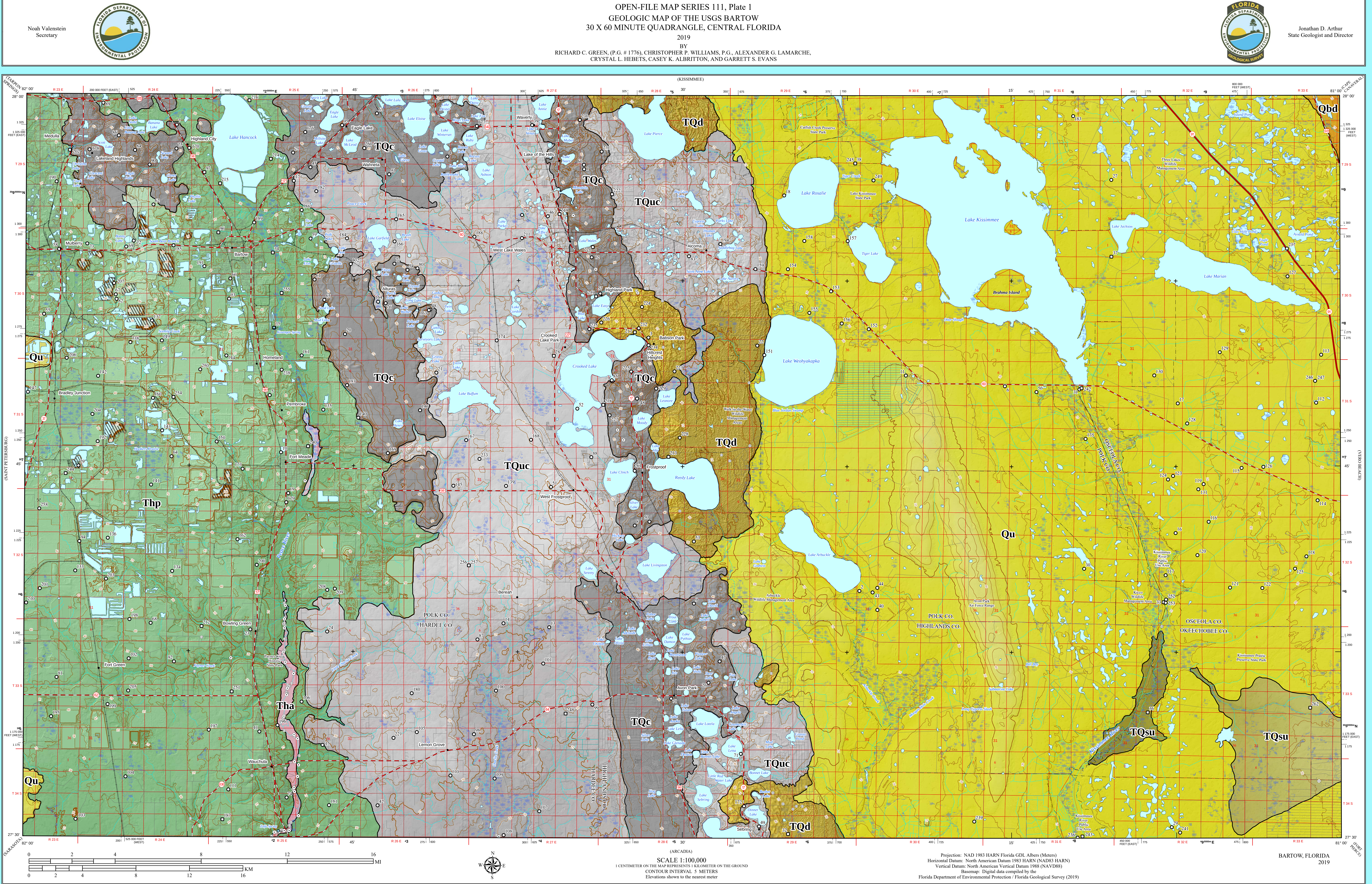




Quaternary beach ridge and dune
Qbd Quaternary beach ridge and dune sediments (Qbd) are a subdivision of the undifferentiated Quaternary sediments that are noted on the basis of surficial expression of relict beach ridges and dunes. While not a formally recognized lithostratigraphic unit, Qbd is mapped 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 matrix, roots and plant debris, carbonized remains, or charcoal.

Quaternary sediments
Qu 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 unfossiliferous sands, sandy clays and clays with variable admixtures of organics.

Tertiary/Quaternary dunes
TQd 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 contain fine-to-medium quartz sand with varying amounts of disseminated organic matter. They are generally found at elevations above 100 feet (30.5 meters) mean sea level, although there are areas along the flanks of the Lake Wales Ridge where elevations of these dune sands can be lower. Sands forming these dunes are derived from reworking of sediments from the Cypresshead Formation (TQc) and undifferentiated Quaternary sediments (Qu).

Undifferentiated reworked Cypresshead sediments
TQuc Sediments mapped as undifferentiated reworked Tertiary/Quaternary Cypresshead Formation (TQuc) in the study area are the result of post-depositional reworking of Cypresshead Formation sediments. The reworked Cypresshead Formation sediments can range from white to gray to orange to light brown to grayish brown. They are fine to coarse quartz sands with scattered quartz gravel and varying percentages of clay in the matrix.

Cypresshead Formation
TQc The Pliocene/Pleistocene Cypresshead Formation (TQc) is a mottled reddish-brown to reddish-orange to white, unconsolidated to poorly consolidated, fine- to very- coarse 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, and mica, are often present. Ghosts of nearshore marine mollusks are rare. The Cypresshead Formation is present throughout much of the study area and forms the core of the various ridges present in the region. The lower portion of the Cypresshead Formation frequently 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 throughout the sand. Occasional coarse sand beds may occur.

Undifferentiated Tertiary/Quaternary shelly sediments
TQsu Undifferentiated Pliocene/Pleistocene shelly sediments (TQsu) typically consist of fine-to-medium quartz sand with variable amounts of calcareous silt, 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, mica, heavy minerals, and phosphate sand and gravel. A basal phosphate lag is often present. Colors range from light gray to light-olive gray. In the study area, TQsu is predominantly in the form of unconsolidated sands with varying percentages of shell fragments.

Hawthorn Group, Peace River Formation
Thp The middle Miocene to lower Pliocene Peace River Formation (Thp) is comprised of yellowish gray to olive gray, interbedded sands, clays and carbonates with the siliceous component being dominant. Phosphate sand and gravel are most common in the uppermost beds, although they are generally interspersed throughout the unit. The Peace River Formation contains a diverse fossil assemblage of marine and terrestrial fauna (e.g., shark teeth, ray spines, horse teeth, dugong, and whale ribs). Porosity types in the formation are generally intergranular.

Hawthorn Group, Arcadia Formation
Tha The upper Oligocene to middle Miocene Arcadia Formation (Tha) is a yellowish gray to white, variably sandy (quartz and phosphoric) carbonate, intercalated with beds of siliceous-dominant sediments. Although limestone is present, dolomites are most common, ranging in grain size from micritic to medium, with the coarsest material being sucrosic. Minor

Gypsum stack
Mining activities in the central Florida phosphate district have created numerous "gypstacks" which are mounds of phosphogypsum derived sand and gravel. A basal phosphate lag is often present. Colors range from light gray to light-olive gray. In the study area, TQsu is predominantly in the form of unconsolidated sands with varying percentages of shell fragments.

LEGEND
Primary highway
Secondary highway
Light duty road, principal street
Railroad
County boundary
State lands and parks
Contours (5m)
Index
Intermediate
Core
Cuttings
M-Series sample
Outcrop/exposure
Borrow pit
Quarry / sand mine
Spring
City/town
Index
USGS 1:24,000
Quadrangle tick mark
Area affected by mining
Waterbody
Wetland
River or stream
Cross section line
U.S. Public Lands Survey Township/Range
U.S. Public Lands Survey Section
Bartow, Florida
2019

CROSS-SECTION REFERENCE MAP (see Plate 2 and OFR108)
1 Tarpon Springs (OFMS 104)
2 Kissimmee (OFMS 110)
3 Cape Canaveral
4 Saint Petersburg (OFMS 109)
5 Vero Beach (to be mapped 2020)
6 Sarasota (OFMS 86)
7 Arcadia (OFMS 87/88)
8 Fort Pierce

ADJOINING MAPS
1 2 3
4 5 6
7 8

For more information or to order maps contact:
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<https://floridadep.gov/fgs/research/content/statemap>

This map was created using Florida Department of Environmental Protection (DEP) databases and data obtained by the Florida Geological Survey (FGS). It was completed August 31, 2019, by the DEP 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 use-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. Cooperatively funded by the DEP/FGS and the U.S. Geological Survey (USGS), National Cooperative Geologic Mapping Program, under USGS assistance award number G18AC00295. 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.