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Michael W. Sole
Secretary

OPEN-FILE MAP SERIES 100, Plate 3

GEOMORPHOLOGY, SPRINGS, AND KARST FEATURES OF THE EASTERN PORTION OF THE USGS OCALA 30 X 60 MINUTE QUADRANGLE, NORTH-CENTRAL FLORIDA

2009

BY

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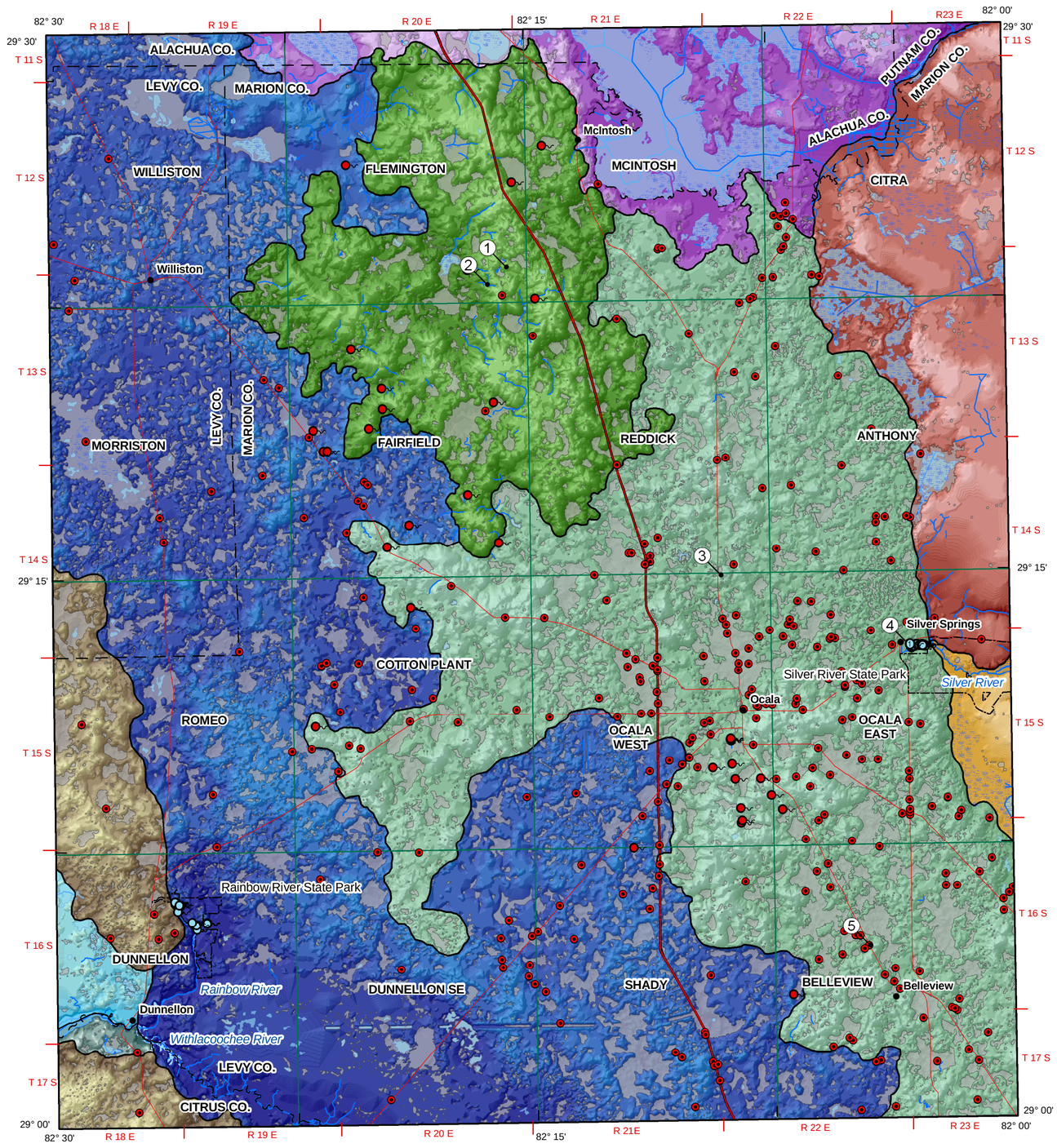
Figure 1. Geomorphic Provinces (modified from Scott and Paul, in preparation), Springs, and Karst features Shown with 15 Meter Digital Elevation Model (DEM).



Central Lakes District

Fort McCoy Plain

Elevation Range (MSL): 90 FT (27.4 M) – 40 FT (12.2M)

The Fort McCoy Plain is a relatively flat, poorly to moderately drained area east of the Ocala Karst Hills and southeast of the Hawthorne Lakes Region (Figure 3). Scattered sinkholes are present within the province and elevations range from approximately 40 feet (12.2 meters) to approximately 90 feet (27.4 meters) above MSL. The Fort McCoy Plain is underlain by sediments of the Hawthorn Group, which are mantled with variable thicknesses of Undifferentiated Quaternary sediments.

Hawthorne Lakes Region

Elevation Range (MSL): 130 FT (39.6 M) – 50 FT (15.2 M)

The Hawthorne Lakes Region is bounded to the north in Bradford County by the Southern Okefenokee Basin and the western flank of Trail Ridge, and to the west in Alachua County by the Alachua Karst Hills and the Williston Karst Plain (Figure 3). The lakes in the Hawthorne Lakes Region formed through karst processes and were modified by subsequent surficial erosion, which has caused formerly closed basins to develop outflow streams. Elevations in the northern portion of the region range from approximately 100 feet (30.5 meters) above MSL for the water levels in the lakes to over 200 feet (61 meters) above MSL on the hills. In the northern part of the mapped area, elevations range from 50 feet (15.2 meters) to 130 feet (39.6 meters) above MSL.

Oklawaha River Valley

Elevation Range (MSL): 70 FT (21.3 M) – 40 FT (12.2 M)

The Oklawaha River Valley is a narrow valley extending from the Lake-Marion County line northward to the Marion County line. To the south, the valley abuts the Tavares Lakes Region. To the north, it merges with the St. Johns Offset Valley. The headwaters of the Oklawaha River occur in the Tavares Lakes Region, a broader and more karstic portion of the Central Lakes District. As it enters the Oklawaha River Valley the river becomes narrowly confined, bounded by the Ocala Karst Hills and the Fort McCoy Plain on the west and the Mt. Dora Ridge on the east (Figure 3). The province is underlain by Hawthorn Group and Undifferentiated Quaternary sediments. Elevations range from 40 feet (12.2 meters) to 70 feet (21.3 meters) above MSL.

Ocala Karst District

Brooksville Ridge

Elevation Range (MSL): 180 FT (54.9 M) – 50 FT (15.2 M)

The Brooksville Ridge, described by White (1970) as "the most massive of the ridges which rise above the general level of the Central Upland", stands out in stark contrast to the surrounding karst plains. The Brooksville Ridge is divided by the Withlacoochee River, which forms the boundary between Marion and Citrus Counties. Elevations in the northern, narrower, portion range from approximately 50 feet (15.2 meters) to greater than 150 feet (45.7 meters) above MSL. Elevations in some sinkholes are less than 50 feet (15.2 meters) above MSL. The southern broader part of the ridge ranges in elevation from approximately 50 feet (15.2 meters) to 300 feet (91 meters) above MSL. In a few sinkholes, elevations of approximately 10 feet (3 meters) above MSL occur.

Chiefland Karst Plain

Elevation Range (MSL): 100 FT (30.5 M) – 30 FT (9.1 M)

The Chiefland Karst Plain lies east of the southern portion of the Perry Karst-San Pedro Bay province, south of the Branford Karst Plain and west of the northern extension of the Brooksville Ridge (Figure 3). It occurs from northern Gilchrist County to southern Levy County and is present in a small part of the southwestern corner of the mapped area between the northern portion of the Brooksville Ridge and the Crystal River Karst Plain (Figure 1). Elevations in this area range from 30 feet (9.1 meters) to 100 feet (30.5 meters) above MSL. Many springs occur within the karst plain, which is underlain by the Upper Eocene Ocala Limestone and the Middle Eocene Avon Park Formation. Undifferentiated Quaternary siliciclastics overlie the limestone in varying thicknesses.

Crystal River Karst Plain

Elevation Range (MSL): 50 FT (15.2 M) – 30 FT (9.1 M)

The Crystal River Karst Plain occurs between the Gulf Coast and the southern Brooksville Ridge in Citrus and Hernando Counties, south of the Withlacoochee River (Figure 3). It is an area of low relief with mature karst features and elevations ranging from sea level to 50 feet (15.2 meters) above sea level. Within the mapped area, elevations range from 30 feet (9.1 meters) to 50 feet (15.2 meters) above MSL. Springs are very common. The area is often well drained. Sand dunes are common along the boundary with the Brooksville Ridge. The Upper Eocene Ocala Limestone underlies most of the karst plain, often topped by a thin layer of Undifferentiated Hawthorn Group sediments. Undifferentiated Tertiary and Quaternary sediments cover much of the karst plain.

Fairfield Karst Hills

Elevation Range (MSL): 210 FT (64 M) – 20 FT (6.1 M)

The Fairfield Karst Hills occur in southernmost Alachua County and northwestern Marion County, south of the Hawthorne Lakes Region, and to the west of the Ocala Karst Hills (Figure 1). Elevations in this area range from 20 feet (6.1 meters) to over 200 feet (61 meters) above MSL. The area has greater relief than the Ocala Karst Hills and is well drained. Swampy conditions exist only in low-lying karst features. Springs are generally not present. The Fairfield Karst Hills developed in response to karstification of the Ocala Limestone and subsequent erosion of the Hawthorn Group sediments. Hills composed of Hawthorn Group sediments are common in the province where the karst is less mature. Quaternary siliciclastic sediments of varying thicknesses blanket the area.

Ocala Karst Hills

Elevation Range (MSL): 190 FT (57.9 M) – 20 FT (6.1 M)

The Ocala Karst Hills occur from north-central Marion County southward to northeastern Sumter County (Figure 3). Elevations in the province within the mapped area range from 20 feet (6.1 meters) to 190 feet (57.9 meters) above MSL, with overall lesser relief than the Fairfield Karst Hills. Several springs are present in the Ocala Karst Hills, including Silver Springs, which occurs near the eastern edge of the province along the boundary with the Central Lakes District. The karst in this province is more mature than in the Fairfield Karst Hills province, and the Hawthorn Group sediments are thin to absent. There are isolated hills of remnant Hawthorn Group sediments scattered throughout the province (see Plate 1). Quaternary siliciclastic sediments of varying thicknesses blanket the area.

Williston Karst Plain

Elevation Range (MSL): 140 FT (42.7 M) – 10 FT (3 M)

The Williston Karst Plain, located to the east of the Brooksville Ridge, extends eastward to the Hawthorne Lakes Region, the Fairfield Karst Hills and the Ocala Karst Hills. It is underlain by the Ocala Limestone and variable thicknesses of undifferentiated Quaternary sediments. It merges with the Branford Karst Plain and Chiefland Karst Plain northwest of the study area (Figure 3). Within the mapped area, elevations of the Williston Karst Plain range from 10 feet (3.1 meters) to over 100 feet (30.5 meters) above MSL. Outlier hills composed of weathered Hawthorn Group sediments are present and may locally exceed 140 feet (42.7 meters) above MSL. Much of the plain is well drained and a number of springs, including Rainbow Springs, occur within this area.

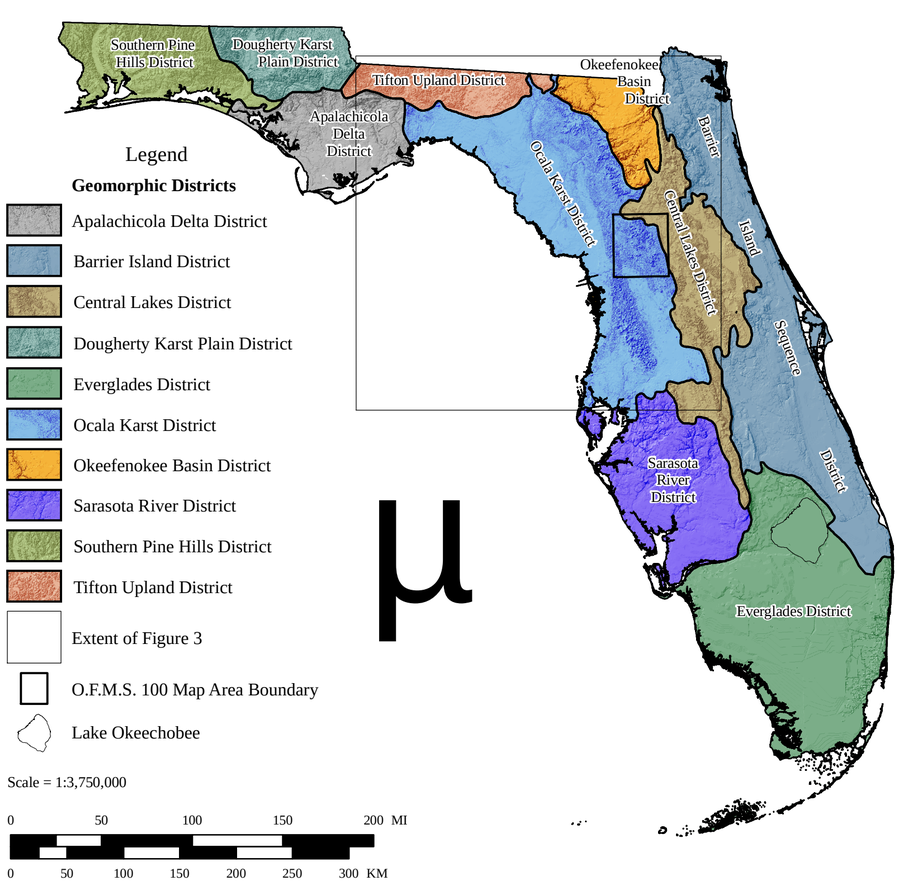
Legend for Figure 1

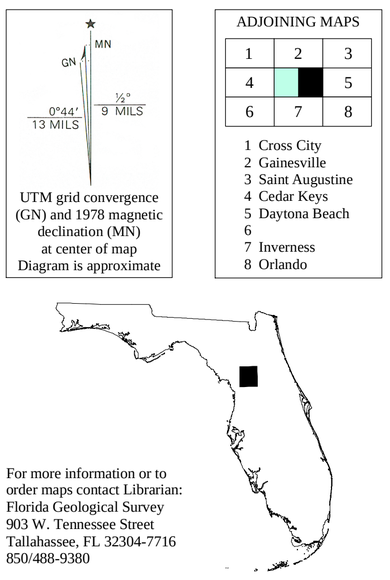
- ! City
- Interstate
- Primary Road
- State Park
- County Boundary
- River, Stream or Canal
- Lake or Pond
- Swamp or Marsh
- Photo Location Callout
- 7.5 Minute Quadrangle
- Closed Topographic Depressions (CTDs)
- MSL = Mean Sea Level

Karst Features

- First Magnitude Spring
- Second, Third, or Fourth Magnitude Spring
- Swallet
- ! Sinkhole

Figure 2. Geomorphic Districts (modified from Scott, 2005).





ADJOINING MAPS

1	2	3
4		5
6	7	8

1 Cross City
2 Gainesville
3 Saint Augustine
4 Cedar Keys
5 Daytona Beach
6
7 Inverness
8 Orlando

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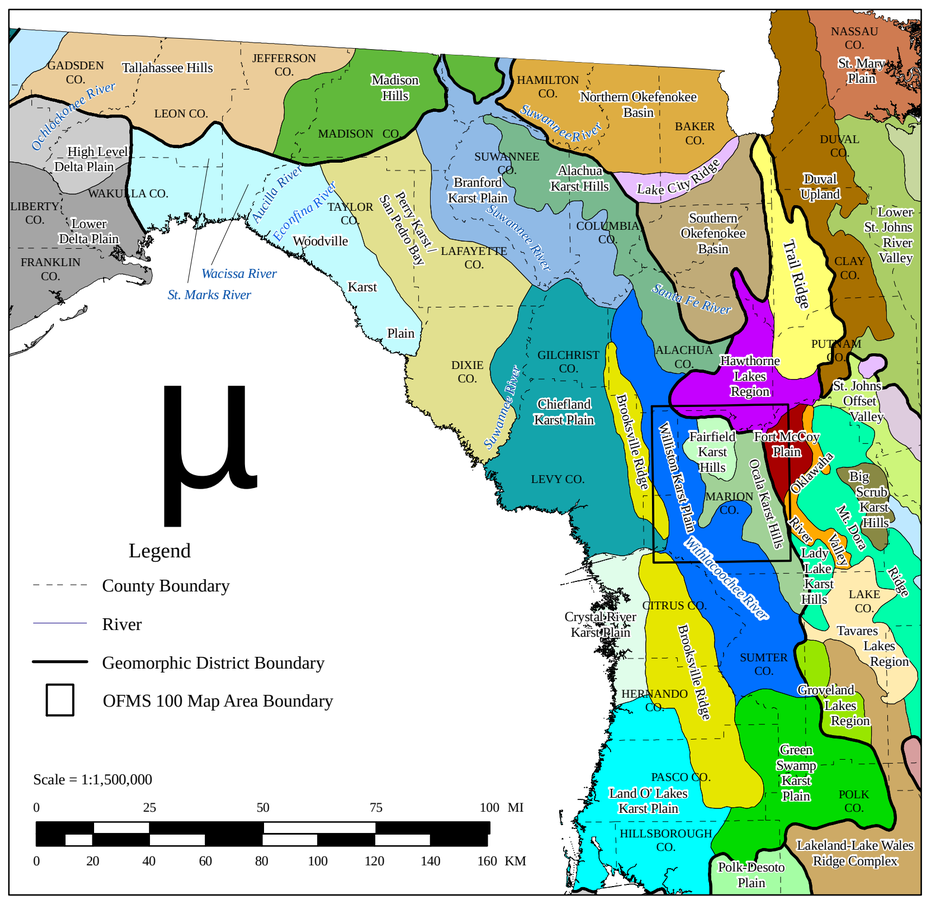
Figure 3. Geomorphic Provinces (modified from Scott, 2005).



SELECTED PHOTOGRAPHS



Photo 1. The FGS' Schramm T450MIIA drill rig coring W-18877 at the Mid-Florida Mine.
Location: T 13 S, R 20 E, S 01
Photo by Richard C. Green
Date taken: 2/20/2009



Photo 2. Exposure of Hawthorn Group, Coosawhatchie Formation in Mid-Florida Mine.
Location: T 13 S, R 20 E, S 01
Photo by Richard C. Green
Date taken: 6/16/2008



Photo 3. Heavily karsted surface of Ocala Limestone exposed in Counts Construction 441 Mine.
Location: T 14 S, R 22 E, S 30
Photo by Richard C. Green
Date taken: 11/20/2008



Photo 4. Aerial view of Silver Springs main vent, Silver Springs, Florida.
Location: T 15 S, R 23 E, S 06
Photo by Guy "Harley" Means
Date taken: 8/21/2003



Photo 5. Christopher Williams examines Ocala Limestone exposed in Ocala Caverns.
Location: T 16 S, R 22 E, S 23
Photo by Richard C. Green
Date taken: 7/21/2009

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