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OPEN-FILE REPORT 92

Text to accompany geologic map of the western portion of the USGS Perry 30 x 60 minute quadrangle, northern Florida

By

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ABSTRACT

The accompanying 1:100,000 scale geologic map (Open-File Map Series 99-01) shows the areal distribution of bedrock and surficial geologic units for the western half of the Perry, Florida 30 x 60 minute quadrangle. The map was constructed using a combination of field mapping at 1:24,000 scale, compilation of data from existing maps (various scales), core and cuttings analyses and descriptions, and analyses of various Geographic Information System (GIS) data sources. The resulting data was compiled in ESRI's ArcGIS ArcMap 9.2 for publication as part of the Florida Geological Survey Open-File Map Series (OFMS). Mapped units in the area range in age from the Eocene Avon Park Formation to undifferentiated Quaternary sediments. Important resources in the area include groundwater, springs, sand, limestone, and dolostone. Numerous springs, sinking streams (swallets), and other karst features are present in the study area. Understanding of geologic units, karst, springs and their interactions within the map area aids land planners, environmental professionals, and citizens in making land-use decisions such as designing new construction projects, siting new water supply wells, locating sources of mineable resources for aggregate supply, and protection of springs and water quality.

Keywords: Florida, geologic map, Miccosukee Formation, Hawthorn Group, Torreya Formation, St. Marks Formation, Suwannee Limestone, Ocala Limestone, Avon Park Formation, environmental geology, geomorphology, springs, swallets, sinkholes, Floridan aquifer system, Taylor County, Madison County, Jefferson County, Cody scarp.

INTRODUCTION

This report accompanies Open-File Map Series (OFMS) 99. OFMS 99-01 depicts the near-surface geology of the western half of the Perry 30 x 60 minute quadrangle. OFMS 99-02 depicts seven geologic cross sections and a correlative stratigraphic chart for the lithologic units in the study area. OFMS 99-03 shows a geomorphology map, a digital elevation model (DEM), locations of known springs, sinkholes, swallets and photographs of selected outcrops within the study area.

The study area lies west of Madison, Florida and includes portions of Madison, Jefferson, and Taylor Counties (Figure 1). It lies west of the Lake City 30 x 60 minute quadrangle, part of which was mapped under a grant from the USGS STATEMAP program (Green et al., 2006), and is adjacent to the eastern portion of the USGS Perry 30 x 60 minute quadrangle which was mapped under the STATEMAP program (Green et al., 2007). Four regionally important rivers, the Econfina River, the Fenholloway River, the Aucilla River, and the Wacissa River, occur in the map area. Much of the area serves as recharge to the Floridan aquifer system, the primary source of drinking water in the region.

One objective for this report is to provide basic geologic information for the accompanying geologic map, cross sections, and geomorphology. Information provided by this report and these maps is intended for a diverse audience comprising professionals in geology, hydrology, engineering, environmental and urban planning, and laypersons, all of whom have varying levels of geologic knowledge. The map can help users identify and interpret geologic features which impact activities related to groundwater quality and quantity, location of mineral resources, land-use planning, and designing construction projects. Applied uses of the maps and data in this report include: 1) identifying potential new mineral resources, 2) characterizing zones of potential aquifer recharge and confinement, 3) aiding in water-management decisions on groundwater flow and usage, 4) providing information on aquifer vulnerability to potential pollution, 5) ecosystem, wetlands, and environmental characterization, and 6) recreational uses.

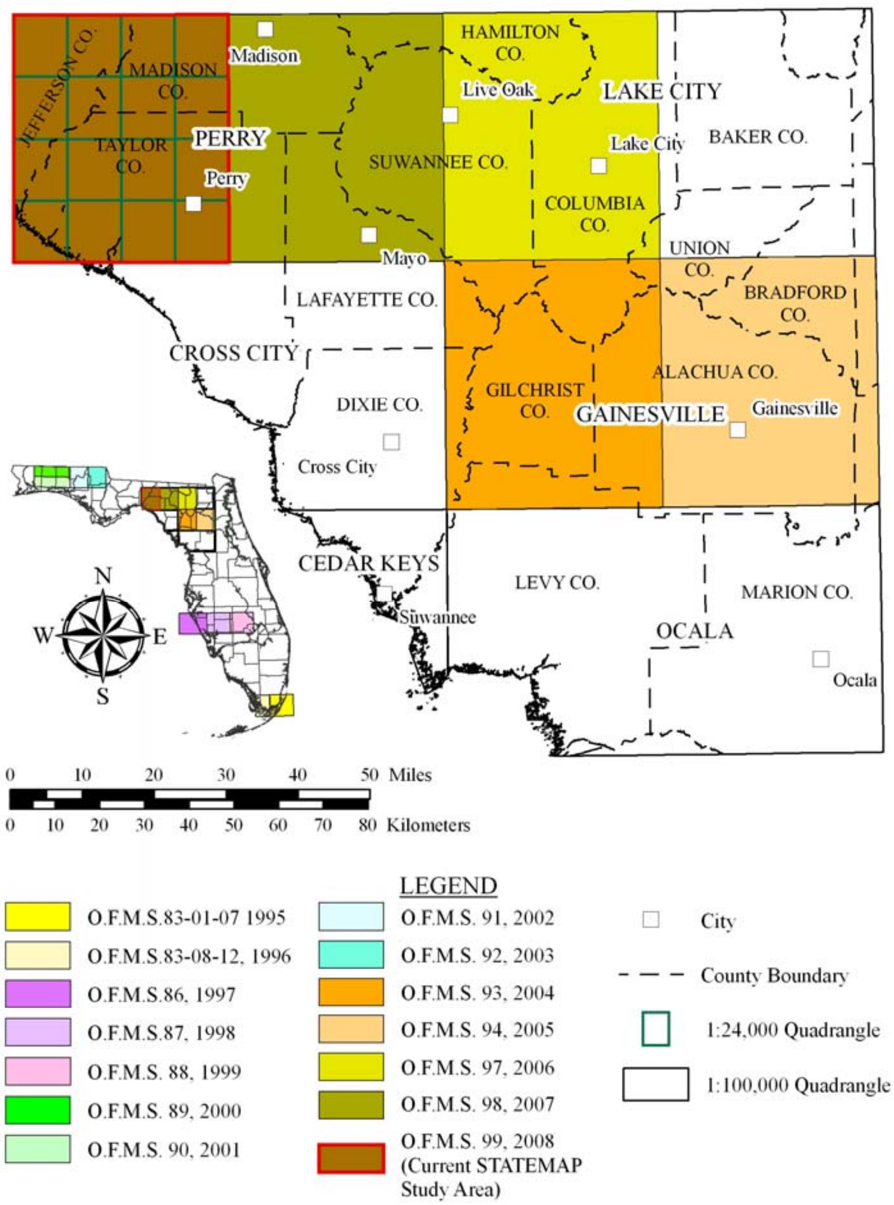


Figure 1. Areas mapped under the FGS STATEMAP Program.

Methods

The study consisted of 1) reviewing and compiling existing geologic literature and data, 2) mapping geologic units in the field at 1:24,000 scale using standard techniques, 3) core and cuttings analyses of existing samples, 4) new core drilling, 5) collecting and describing outcrop samples, and 6) preparing a geologic map, geological cross-sections, and geomorphic map of the area. Field work, performed during the fall of 2007 and the spring and summer of 2008, consisted of sampling and describing numerous outcrops, river and pit exposures. One hundred and twenty-four new samples of geologic material were added to the FGS surface-sample archives (M-Series), six new cores were drilled, and over 200 outcrops were examined during this project. All data, including data from over 350 wells, were compiled and analyzed by the authors. The map and accompanying plates were developed in ESRI's ArcGIS ArcMap 9.2 for publication as part of the Florida Geological Survey Open-File Map Series.

The study area is blanketed by a veneer of Quaternary sediments and soils. For this reason, and in keeping with geologic mapping practices developed by Scott et al. (2001), the authors have adopted the policy of mapping the first named geologic unit within 20 feet (6.1 meters) of the surface. If undifferentiated Quaternary (Qu) sediments attain a thickness greater than 20 feet (6.1 meters), then they appear as the mapped unit. If these undifferentiated sediments are less than 20 feet (6.1 meters) thick, then the underlying stratigraphic unit appears on the map.

The region is generally vegetated, and public access in the northern portion of the mapped area is hindered by the presence of numerous farms and privately owned land. Much of the southern portion of the study area is owned by a large timber company (Foley Land and Timber Company) and permission was obtained to access the area for field work and drilling operations. Fieldwork access was typically limited to public roads, State-owned lands, Foley property, and Suwannee River Water Management District-owned lands. Access to a large tract of land (the Avalon Plantation) located in the west-central portion of the study area was not granted by the owners of the property (Figure 1 on OFMS 99-01). Therefore, new field data in this region was limited to public-access roads.

Previous Work

The current study builds on many previous geologic investigations in and around the present map area. The Florida Geological Survey has previously published reports on the geology of Jefferson (Yon, 1966), Taylor (Rupert, 1996) and Madison (Hoenstine et al., 1990) Counties that were very useful in preparing this report. A statewide geologic map (Scott et al., 2001) was published by the FGS in digital format and provided much of the base map material. Preliminary county geologic maps have been published for Madison (Campbell, 1993a), Jefferson (Rupert and Yon, 1993), and Taylor (Campbell, 1993b) Counties at scales of 1:126,720. <u>It is important to point out, however, that each of these Open-File Map Series geologic maps were constructed in an average time-frame of two weeks utilizing selected in-house geologic data with little to no extra field work.</u> Although these maps provided an excellent starting point for the detailed geologic mapping undertaken for this project, significant refinement of the geologic maps was possible as a result of this project. This study also benefited from the work performed for geologic mapping in the eastern portion of the USGS Perry 30 x 60 minute quadrangle (Green et al., 2007). Many of the field relationships and stratigraphic problems were worked out during that project and data gathered during the project proved invaluable in its completion.

GEOLOGIC SUMMARY

The near surface geology of the western portion of the USGS 1:100,000 scale Perry quadrangle is composed of a complex mixture of Eocene to Holocene carbonate and siliciclastic sediments. A combination of factors, including fluvio-deltaic deposition, marine deposition, dissolution of underlying carbonates, erosion of sediments as a result of eustatic changes in sea level and structural features, have influenced the geology of the study area.

Much of the western portion of the Perry quadrangle is located within the Aucilla and Econfina River basins (Figure 2). In this area, the Aucilla, Econfina, Fenholloway, and Wacissa rivers and their tributaries contain numerous documented springs, including one first magnitude spring and 24 lesser magnitude springs. A first magnitude spring is defined as having a minimum average flow of 100 cubic feet per second, or 64.6 million gallons per day. Many of these springs have evidenced significant increases in pollutants in the last few decades, particularly nitrate (Scott et al., 2002). Detailed geologic mapping of lithostratigraphic units in this area provides critical data needed for future assessments of the vulnerability of the aquifer systems and these springs to contamination. The recharge areas for many of these springs are believed to be located in and around the current study area. Understanding the surficial geology of the map area is a key factor in developing management and protection plans, not only for the springs, but for the unconfined portions of the Floridan aquifer system (FAS).

Structure

Several structural variables have affected the geology of the region. The Peninsular Arch (Figure 3), a structurally high area which affected deposition from the Cretaceous to the early Cenozoic, is the dominant subsurface feature in the Florida peninsula (Applin, 1951; Puri and Vernon, 1964; Williams et al., 1977; Schmidt, 1984; Miller, 1986; Scott, 1997). The axis of the Peninsular Arch extends from southeastern Georgia to the vicinity of Lake Okeechobee in southern Florida in a general northwest to southeast trend. The crest of the arch passes beneath Alachua County south and east of the study area and is highest in Union and Baker Counties east of the study area. The arch was a topographic high during most of the Cretaceous Period and had Upper Cretaceous sediments deposited over it (Applin, 1951). It formed a relatively stable base for Eocene carbonate deposition except during times of periodic land emergence due to lowered sea levels (Williams et al., 1977). The arch did not affect late Tertiary to Holocene sediment deposition (Williams et al., 1977; Scott, 1997).

The Ocala Platform is the most prominent structure affecting the near surface depositional and post-depositional environments within the map area. Hopkins (1920) originally named this feature the Ocala Uplift. Vernon (1951) described the Ocala Uplift as a gentle flexure developed in Tertiary sediments with a northwest-southeast trending crest. Because there is continuing uncertainty about the origin of this feature, Scott (1988) used the term Ocala Platform, rather than Ocala Uplift or Ocala Arch, since it does not have a structural connotation.

The Ocala Platform exerted its influence on late Tertiary sediment deposition, and Miocene sediments of the Hawthorn Group are thought to have been deposited across the platform (Scott, 1981a; Scott, 1988). Post-Miocene erosion, however, has removed sediments of the Hawthorn Group from much of the crest of the Ocala Platform, exposing Eocene and Oligocene carbonates (Cooke, 1945; Espenshade and Spencer, 1963; Brooks, 1966; and Scott, 1981b). This is evident in the southern portion of the map area (see OFMS 99-01). Undifferentiated sediments have subsequently been deposited on the exposed Oligocene carbonates. These consist of residual clays, sands, and aeolian sands deposited during the Pliocene to Holocene (Scott, 1997).

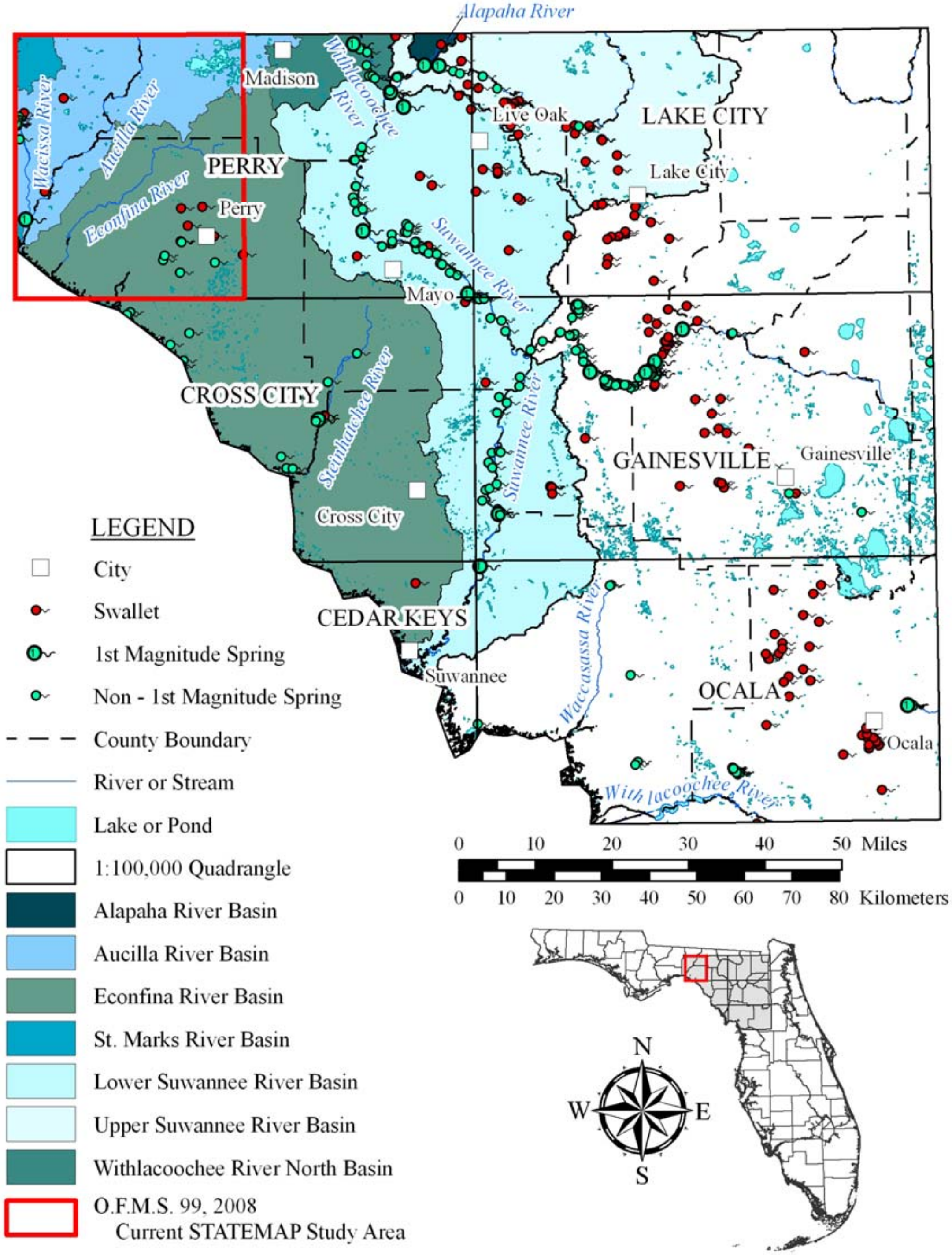


Figure 2. Location of selected river basins, springs, swallets, and other water bodies.

Vernon (1951), utilizing aerial photographs, mapped fracture patterns throughout northern peninsular Florida. Regionally, these fractures generally trend parallel to the axis of the Ocala Platform in a northwest-southeast orientation. A secondary system of fractures intersects these primary fractures at high angles in a northeast-southwest trend (Vernon, 1951). Orientation of stream meanders along portions of the Wacissa and Aucilla Rivers suggests that these fracture patterns may be a controlling factor in stream location (Yon, 1966).

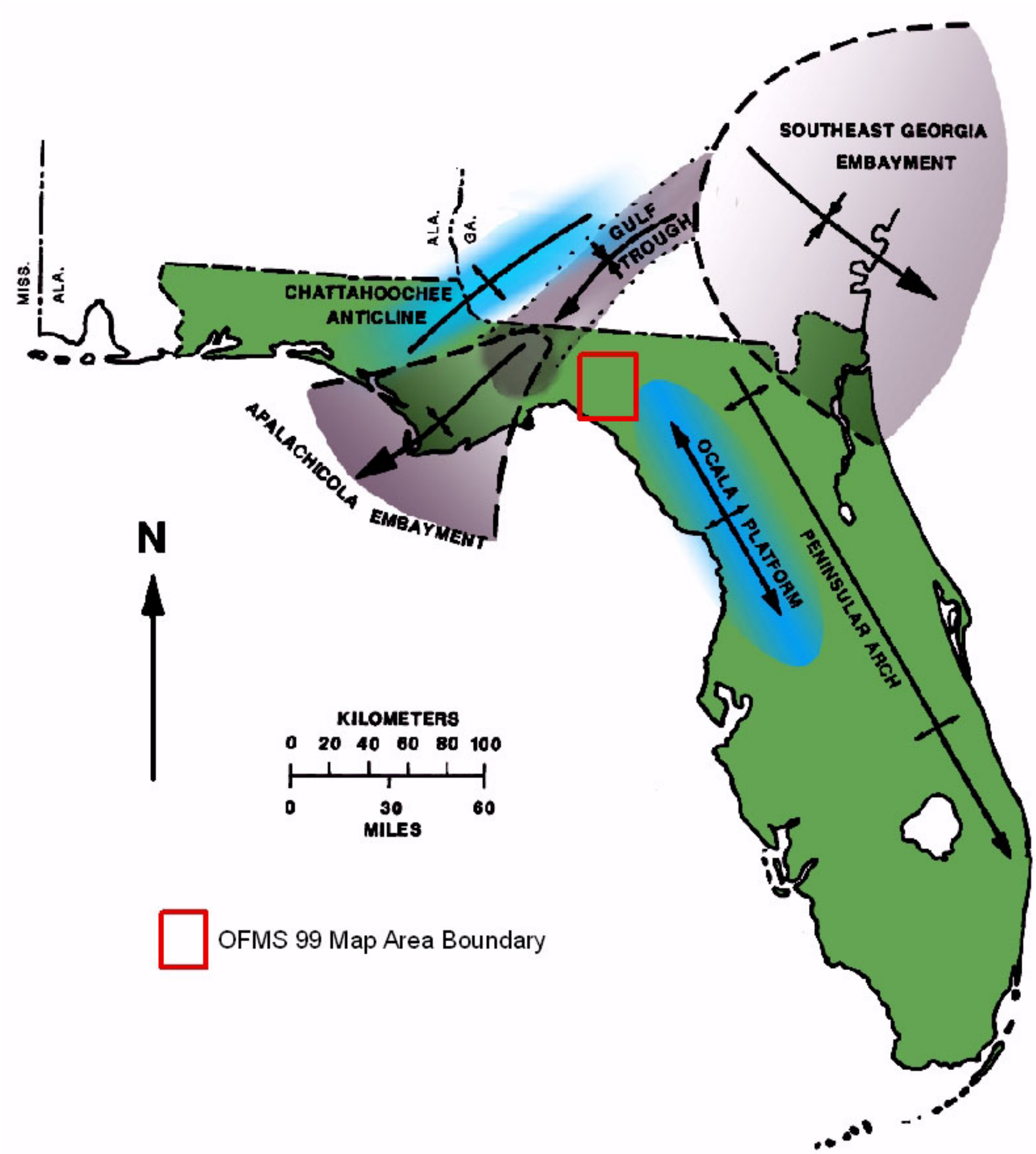


Figure 3. Principal subsurface structures of north Florida (modified from Puri and Vernon, 1964, and Schmidt, 1984).

Geomorphology

Several relict Neogene coastal terraces, which developed as a result of fluctuating sea levels, have been documented in the study area. Healy (1975) recognized seven marine terraces within the study area (Figure 4): the Silver Bluff terrace at elevations of between 1 and 10 feet (.30 meters to 3.0 meters) above mean sea level (MSL), the Pamlico terrace at elevations between 10 and 25 feet (3.1 meters and 7.6 meters) above MSL, the Talbot terrace at elevations between 25 and 42 feet (7.6 and 12.8 meters) above MSL, the Penholoway terrace at elevations between 42 and 70 feet (12.8 and 21.3 meters) above MSL, the Wicomico terrace at elevations of 70 to 100 feet (21.3 to 30.5 meters) above MSL, the Sunderland/Okefenokee terrace at elevations between 100 and 170 feet (30.5 and 51.8 meters) above MSL, and the Coharie terrace at elevations between 170 and 215 feet (51.8 and 70.5 meters). Detailed discussions and correlations of these marine terraces and relict shorelines have been attempted by many authors, including Matson and Sanford (1913), Cooke (1931, 1939), Flint (1940, 1971), MacNeil (1950), Alt and Brooks (1965), Pirkle et al. (1970), and Healy (1975).

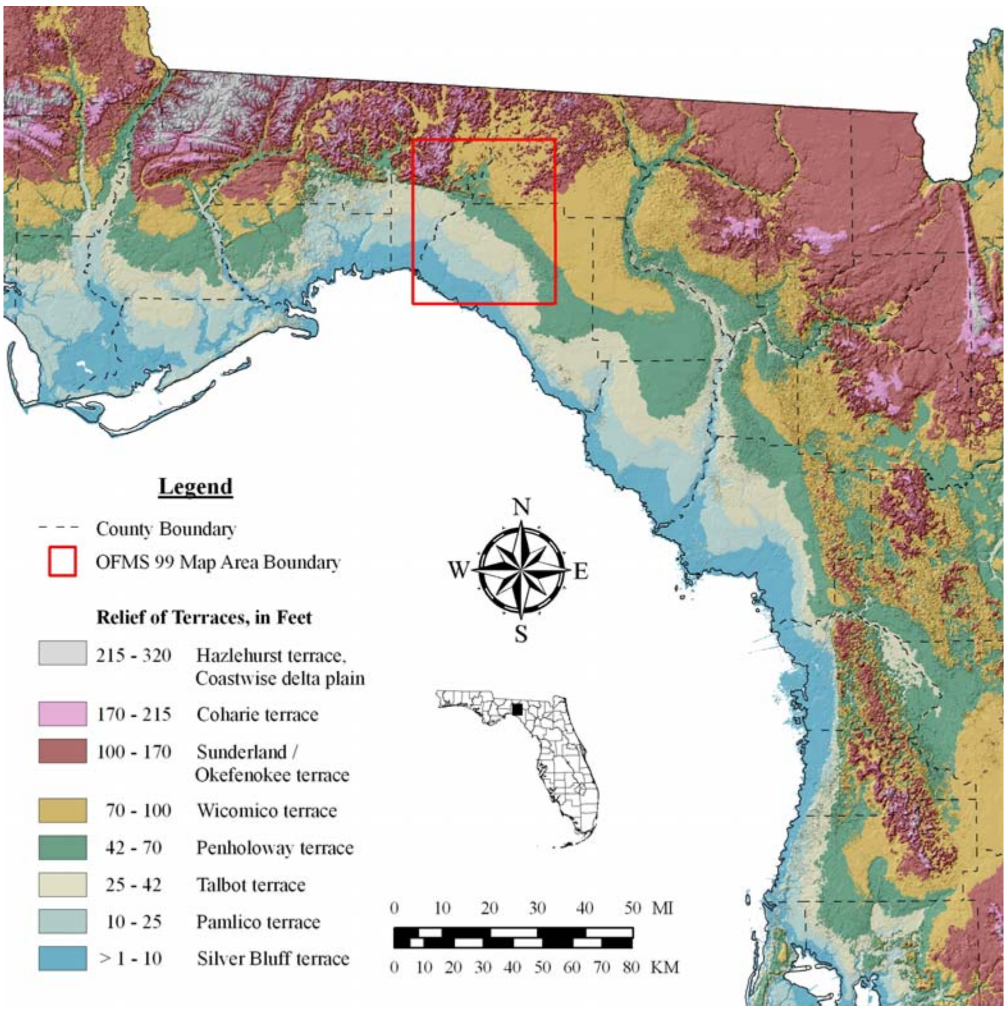


Figure 4. Terraces in Florida (after Healy, 1975).

According to Scott (in preparation), the study area contains parts of two geomorphic districts – the Ocala Karst District and the Tifton Upland District (Figure 2; OFMS 99-03). Within the map area, these districts have been further subdivided topographically into four regional physiographic units: the Perry Karst/San Pedro Bay, the Woodville Karst Plain (Ocala Karst District), the Madison Hills and the Tallahassee Hills (Tifton Upland District). The Cody Scarp forms the boundary between the two districts within the map area (Figure 1 on OFMS 99-03).

Ocala Karst District

The Ocala Karst District encompasses a broad area from Wakulla County in the panhandle of Florida, south to Hillsborough and Pinellas Counties in the west-central peninsula and inland to nearly the center of the peninsula (Figure 3 on OFMS 99-03). Elevations within the district range from sea level along the coast to in excess of 300 feet (91.4 meters) above mean sea level (MSL) on the Brooksville Ridge. Within the study area, elevations range from sea level to 105 feet (32.0 meters) above MSL along the central eastern edge of the map area. In this area, the Ocala Karst District is subdivided into the Perry Karst/San Pedro Bay and the Woodville Karst Plain.

Carbonate sediments, ranging from the Lower Oligocene Suwannee Limestone to the Lower Miocene St. Marks Formation, lie at or near the land surface within the study area. The Ocala Karst District is dominated by dissolution sinkholes and shallow bowl-shaped depressions, producing a rolling topography. Generally, a variably permeable siliciclastic cover allows downward percolating groundwater to slowly dissolve the underlying limestone, leading to cover-collapse sinkholes and cover-subsidence features. Cover-collapse sinkholes form rather abruptly from the structural failure of an underlying cavern roof. An excellent example of this is Devil’s Mill Hopper, located in Alachua County southeast of the present study area (Evans et al., 2004).

Cover subsidence features generally occur in areas where sediments sag as carbonates dissolve underneath. Typically, areas such as these have shallow sinks formed by the downward movement of the siliciclastic overburden filling voids created by slow dissolution of underlying carbonates or by slow dissolution of the carbonate surface. Springs, sinking (swallets) and resurgent streams, and caverns commonly occur within the Ocala Karst District.

Perry Karst/San Pedro Bay

Regionally, the Perry Karst/San Pedro Bay complex extends from Madison County southward to the Gulf of Mexico in Dixie County (Figure 3 on OFMS 99-03). The Perry Karst subdivision is a narrow transitional zone between the Woodville Karst Plain to the west and San Pedro Bay on the east. Elevations within the study area range from less than 5 feet (1.5 meters) to in excess of 100 feet (30.5 meters) above MSL. The elevations in San Pedro Bay are generally higher than in the Perry Karst area or the Branford Karst Plain. Elevations decline to the south toward the Gulf Coast. The Perry Karst area is poorly to moderately drained, while San Pedro Bay is extremely poorly drained. Copeland (2005) provides an excellent discussion of the San Pedro Bay, its origin and surrounding areas. The Perry Karst/San Pedro Bay complex occupies the central eastern portion of the study area. Within the map area, elevations of the Perry Karst/San Pedro Bay range from 45 feet (13.7 meters) to over 100 feet (30.5 meters) above MSL.

The Suwannee Limestone underlies the Perry Karst/San Pedro Bay in this area. In the San Pedro Bay, a clay layer up to five feet (1.5 meters) thick overlies the limestone, providing confinement to the Floridan aquifer system (FAS) (Copeland, 1982). Plio-Pleistocene sediments cover the entire area, and the unit is poorly to very poorly drained. Recharge to the FAS is low to moderate in San Pedro Bay, while recharge to the FAS may be moderate to high along the transition from San Pedro Bay to the Perry Karst.

Woodville Karst Plain

The Woodville Karst Plain, which has very common karst features, springs, disappearing streams (swallets), and resurgent streams, extends from Wakulla and Leon Counties southward to the Taylor-Dixie County line (Figure 3 on OFMS 99-03). Elevations, in general, range from sea level to approximately 50 feet (15.2 meters) above MSL. A number of rivers and streams traverse the Woodville Karst Plain, including the St. Marks, Aucilla, Wacissa, and Econfina Rivers. Relief is very low over the entire area and drainage is poor, resulting in vast swamps. Sand dunes occur in various portions of the karst plain. An impressive dune field lies in the south-central portion of the study area, with dune crest elevations exceeding 65 feet (19.8 meters) above MSL.

Tertiary carbonates underlie the entire area beneath a thin siliciclastic cover. The Lower Oligocene Suwannee Limestone underlies the karst plain in Taylor and Jefferson Counties. The Lower Miocene St. Marks Formation occurs in one small area along the central-west edge of the map area in the headwaters of the Wacissa River. Springs, swallets and river rises commonly occur in this area (Scott et al., 2004).

Tifton Upland District

The Tifton Upland occurs from the Apalachicola River on the west to northwestern Hamilton County between the Alapaha and Withlacoochee Rivers and extends into Georgia (Figure 3 on OFMS 99-03). Topographically, the upland is characterized by broad, undulating hills with a well developed dendritic drainage pattern. Elevations range from less than 100 feet (30.5 meters) above MSL in the major stream and river valleys and in the swamps of the eastern portion of the district, to 300 feet (91.4 meters) above MSL on the hilltops. Elevations decrease toward the southern limit of the district. Within the study area, elevations range from approximately 40 feet (12.2 meters) to nearly 230 feet (70.1 meters) above MSL. Where the uplands make the transition to the Ocala Karst District, the boundary is marked by the Cody Scarp at elevations ranging from approximately 50 feet (15.2 meters) to 125 feet (38.1 meters) above MSL. Within the study area, the Tifton Upland District is subdivided into the Madison Hills and the Tallahassee Hills.

Siliciclastic sediments belonging to the Hawthorn Group and the Miccosukee Formation underlie the Tifton Upland in the map area. The Miocene Hawthorn Group occurs as the near-surface unit in the lower lying areas, while the Pliocene Miccosukee Formation forms the hilltops within the map area. Sinkholes occur in this district but are much less abundant than in the Ocala Karst District. Karst features are more common in the Madison Hills than in the Tallahassee Hills.

Madison Hills

The Madison Hills extend from the eastern end of the Tallahassee Hills in central Jefferson County, eastward to eastern Madison County on the west side of the Withlacoochee River. Within

Florida, a small area of the Madison Hills in northwestern Hamilton County is separated from the main body of this zone by the Withlacoochee River Valley (Figure 3 on OFMS 99-03). The elevation of the hills is generally lower than in the Tallahassee Hills with hill tops often below 200 feet (61.0 meters) above MSL. In the study area, elevations range from 50 feet (15.2 meters) to slightly more than 200 feet (61.0 meters) above MSL. The valleys are broad and poorly drained. The Miccosukee Formation forms the higher areas while the Hawthorn Group sediments underlie the lower portions of the landscape. Karst features occur most commonly in the eastern part of the district. The Lower Oligocene Suwannee Limestone underlies the Hawthorn Group in the Madison Hills.

Tallahassee Hills

The Tallahassee Hills extend from the Apalachicola Bluffs and Ravines in Gadsden and Liberty Counties on the west to eastern Jefferson County (Figure 3; OFMS 99-03). The lowest elevations are approximately 50 feet (15.2 meters) above MSL along the Cody Scarp, the boundary between the Tallahassee Hills and the Woodville Karst Plain, while elevations of hill tops range to more than 300 feet (91.4 meters) above MSL. Well drained valleys have local relief often exceeding 150 feet (45.7 meters) above MSL. In general, the hill top elevations decrease from west to east and north to south. A number of large lakes exist in this area, including Lake Jackson and Lake Miccosukee. This area is generally well drained with swampy conditions existing in the lower elevations. In the study area, the Tallahassee Hills are developed on the Hawthorn Group and Miccosukee Formation siliciclastic sediments. Karst features are present within this zone where the carbonates of the St. Marks Formation and Suwannee Limestone occur near the surface.

Cody Scarp

The Cody Scarp has been described as "…the most persistent topographic break in the State" (Puri and Vernon, 1964). White (1970) interpreted the scarp as being a combination of fluvial and karst erosion and shoreline development. The scarp is a multiphasic scarp in that it may have initially been a sea-level scarp but subsequently was highly modified, at least in part, by karstification and surficial erosion. It is named for the community of Cody in Jefferson County which is just west of the map area. Upchurch (2007) describes the Cody Scarp as "a classic example of a karst escarpment with numerous poljes, uvalas, sinkholes, sinking streams, siphons, springs, and other karst features along its length." The difference between a karst escarpment and any other topographic scarp is that the toe of the scarp is characterized by limestone or dolostone that is dissolved by the surface water and groundwater as the scarp retreats (Upchurch, 2007).

The scarp is very well developed near Wacissa (Photo 1; OFMS 99-03), where it appears to be primarily a sea-level scarp, and separates the Tallahassee Hills from the Woodville Karst Plain. Further east, where the scarp forms the boundary between the Madison Hills and the subdivisions of the Ocala Karst District, it becomes less distinct as more karstification and surficial erosion have altered it. Where the Cody Scarp occurs between the Tallahassee Hills and the Woodville Karst Plain, the toe of the scarp is at approximately 50 feet (15 meters) and the crest is at 125 feet (38 meters) above MSL. In the eastern portion of the map area, the scarp is less distinct with the toe at approximately 75 feet (23 meters) and the crest at more than 125 feet (38 meters) above MSL.

LITHOSTRATIGRAPHIC UNITS

Tertiary System

Eocene Series

Avon Park Formation

The Middle Eocene Avon Park Formation (Tap), first described by Applin and Applin (1944), is the oldest unit investigated in the present study area. The unit, which only occurs in the subsurface in the study area, consists of cream to light-brown to tan, poorly-indurated to well-indurated, variably fossiliferous limestone (grainstone to wackestone, with rare mudstone). The limestones are interbedded with tan to brown, very poorly-indurated to well-indurated, very fine to medium crystalline, fossiliferous (molds and casts), vuggy dolostones. Fossils present in the unit include mollusks, foraminifera, echinoids, algae and carbonized plant remains.

The Avon Park Formation was only encountered in a few wells in the study area. The top of the Avon Park ranges from 177 feet (53.9 meters) below MSL in W-18832 to 165 feet (50.3 meters) below MSL in W-4497 (cross-section G-G' on OFMS 99-02). No wells utilized for cross-sections penetrated the entire section of the Avon Park Formation. The Avon Park Formation forms part of the FAS (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Ocala Limestone

The Upper Eocene Ocala Limestone (To), first described by Dall and Harris (1892), is a biogenic marine limestone comprised largely of foraminifera, mollusks, echinoids and bryozoans. The unit, which sits unconformably on the Avon Park Formation, may be dolomitized to varying degrees within the study area, making the contact between the two units difficult to discern in cuttings. Based on lithologic differences, the Ocala Limestone can be informally subdivided into an upper and lower unit (Scott, 1991a). This subdivision, while often apparent in cores and quarries, is difficult to ascertain in cuttings. As a consequence of this, the geologic cross sections do not break out the upper and lower Ocala Limestone.

The upper unit is typically a white to cream, fine- to coarse-grained, poorly- to well-indurated, poorly-sorted, very fossiliferous limestone (wackestone, packstone, and grainstone). Fossils commonly include foraminifera, 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 limestone (grainstone to packstone). Fossils include foraminifera, bryozoans, algae, mollusks, echinoids, and crabs.

The top of the Ocala Limestone, which is often karstified, ranges from 42 feet (12.8 meters) above MSL in W-15930 (cross sections C-C' and G-G' on OFMS 99-02) to 89 feet (27.1 meters) below MSL in W-620 (cross section D-D' on OFMS 99-02). Only a few wells penetrated the entire thickness of the Ocala Limestone in the study area. In these wells, the thickness of the Ocala Limestone ranges from 155 feet (47.2 meters) in W-4497 (cross-section G-G' on OFMS 99-02) to a projected thickness of 215.5 feet (65.7 meters) in W-15930 (cross-section G-G' on OFMS 99-02). The Ocala Limestone is unconformably overlain by the Suwannee Limestone (Ts) throughout the study area. The Ocala Limestone forms part of the FAS (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Oligocene Series

Suwannee Limestone

The Lower Oligocene Suwannee Limestone (Ts), named by Cooke and Mansfield (1936) for exposures of limestone along the Suwannee River from White Springs to Ellaville, unconformably overlies the Ocala Limestone throughout the study area. It is exposed in the bed of the Wacissa River from just below the headwaters of the river to the confluence of the Aucilla River just above Nutall Rise (Yon, 1966). Numerous additional exposures of the Suwannee Limestone also occur within the southern one-third of the map area (see OFMS 99-01). The Suwannee Limestone is primarily a white to cream, poorly- to well-indurated packstone to grainstone comprised of foraminifera, miliolid tests, pelecypods, gastropods and echinoids. The echinoid *Rhyncholampas gouldii*, an index fossil for the Suwannee Limestone, is commonly seen in outcrops. The lithology is variably recrystallized and may range from poorly-indurated, friable limestone to well-indurated limestone cemented by calcite spar. Dolomitization of the Suwannee Limestone is common in the area, particularly in the vicinity of the Aucilla River. The Suwannee Limestone forms the bottom of the Gulf of Mexico offshore of the study area (Yon, 1966). Silicified residual boulders of the Suwannee Limestone (“float”) are commonly found in the south-central to southeastern portion of the study area, indicating that it was once thicker than wells indicate (OFMS 99-01).

The top of the Suwannee Limestone ranges from 84 feet (25.6 meters) above MSL in W-6925 (cross section B-B’ on OFMS 99-02) to 63 feet (19.2 meters) below MSL in W-6906 (cross section E-E’ on OFMS 99-02). The Suwannee Limestone ranges in thickness from approximately 27 feet (8.2 meters) in W-15930 (cross section G-G’ on OFMS 99-02) to 113 feet (34.4 meters) in W-18841 (cross sections B-B’ and G-G’ on OFMS 99-02).

The unit is unconformably overlain by sediments of the Miocene Hawthorn Group, Torreya Formation (Tht) in the northern portion of the study area, sediments of the St. Marks Formation (Tsmk) in the west-central portion of the study area, and undifferentiated Quaternary sediments (Qu) throughout the middle portions of the study area. The Suwannee Limestone forms part of the FAS (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Miocene Series

St. Marks Formation

The Lower Miocene St. Marks Formation (Tsmk), named by Finch (1823), is exposed west of the study area in Wakulla, Leon and western Jefferson Counties along the northwestern flank of the Ocala Platform (Scott, 2001). The St. Marks Formation, which unconformably overlies the Suwannee Limestone, was only recognized in a few wells within the northwestern region of the study area (see cross sections A-A’, B-B’ and E-E’ on OFMS 99-02) and no outcrops of the formation were observed within the study area. The St. Marks Formation is a white to yellowish-gray, poorly- to moderately-indurated, quartz sandy, fossiliferous limestone (packstone to wackestone). Mollusk molds and casts are common and may be abundant. Common foraminifera present in the St. Marks Formation include *Sorites* sp. and *Archaias floridana*.

The top of the St. Marks Formation ranges from 68 feet (20.7 meters) above MSL (W-15882, cross-section E-E’ on OFMS 99-02) to 8 feet (2.4 meters) above MSL in W-1854 (cross-section B-B’ on OFMS 99-02) within the study area. A maximum thickness of 88 feet (26.8 meters) was penetrated in W-6906 of cross-section E-E’ (OFMS 99-02), with a projected thickness of up to 105 feet in W-15882 (cross-section E-E on OFMS 99-02). The unit pinches out against the Suwannee Limestone towards the east and south (see cross sections A-A’, B-B’ and E-E’; OFMS 99-02). Where present, the St. Marks Formation forms part of the FAS (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Hawthorn Group

Sediments of the Hawthorn Group (Th) are encountered throughout much of the northern one-third of the study area where they unconformably overlie the Suwannee Limestone or the St. Marks Formation (OFMS 99-01). Sediments of the Hawthorn Group are thought to have been deposited over the Ocala Platform throughout the area, but post-Miocene erosion removed sediments from the crest of the Ocala Platform exposing the Oligocene carbonates in the southern portion of the map area (Cooke, 1945; Espenshade and Spencer, 1963; Brooks, 1966; and Scott, 1981b). Fossils in the Hawthorn Group are sparse but may include vertebrate remains, corals, and mollusks. Williams et al. (1977) report that the most commonly found fossils are oysters and coral heads. Within the map area, the Miocene Hawthorn Group (Th) is composed of the Lower Miocene Torreya Formation (Tht).

Torreya Formation

The Lower Miocene Torreya Formation of the Hawthorn Group (Tht) is typically a siliciclastic unit with increasing amounts of carbonate in the lower portion of the unit. The majority of Torreya Formation outcrops expose the siliciclastic part of the unit which varies from white to light olive gray, unconsolidated to poorly-indurated slightly clayey sand to light gray to bluish-gray, poorly-consolidated silty clay often containing a variable but minor component of carbonate (calcareous or dolomitic). Phosphate grains, while a common but minor lithologic component of the unit, are often absent (Scott, 1988).

Several field samples (M-Series) were collected in the southeast quadrant of the Lamont quadrangle (T 01 S, R 05 E, S 10 and 15), and one sample was collected along the Aucilla River (T 02 S, R 05 E, S 02) which, at first glance, appeared to be from the Miccosukee Formation (Tmc). These samples were red to orange clayey sands to sandstones. Upon further examination under a binocular microscope, however, these samples were determined to have secondary wavellite cement binding the sands. In these cases, the samples were deemed to be deeply weathered Torreya Formation siliciclastics (Tht) in which secondary wavellite was precipitated (Figure 2, OFMS 99-02). Field mapping suggests that the upper surface of the Torreya Formation is irregular, and the central portions of some hills in the northern part of the mapped area, which are mapped as Miccosukee Formation, are likely formed by the Torreya Formation. Where this situation is present, the contact between the two units is difficult to verify due to downslope migration of Miccosukee Formation sediments as they weather and cover Torreya Formation sediments.

The carbonate sediments of the Torreya Formation are white to light olive gray, poorly-indurated, variably sandy and clayey limestones. The limestone (mudstone and wackestone) often contains molds and casts of mollusks. The Torreya Formation overlies the FAS and forms part of the intermediate aquifer system/intermediate confining unit (IAS/ICU) (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

The top of the Torreya Formation ranges from 145 feet (44.2 meters) above MSL in W-10713 (cross section A-A' on OFMS 99-02) to approximately 45 feet (13.7 meters) above MSL in the vicinity of where it pinches out on the Aucilla River in the Lamont SE quadrangle (see OFMS 99-02). The unit ranges from less than 5 feet (1.5 meters) in the vicinity of the Aucilla River up to 155 feet (47.2 meters) thick in W-6558 in the Greenville quadrangle (see Appendix A for well location).

Tertiary-Quaternary Systems

Pliocene Series

Miccosukee Formation

The Pliocene Miccosukee Formation (Tmc), named by Hendry and Yon (1967), is a prodeltaic siliciclastic unit composed of grayish-orange to grayish-red, mottled, poorly- to moderately-indurated, interbedded clay, sand and gravel of variable coarseness and admixtures. The unit has limited distribution in the eastern panhandle of Florida and occurs from central Gadsden County (west of the study area) to eastern Madison County (Scott et al., 2001).

The top of the unit, present predominantly within the northwestern and northeastern corners of the map area, with minor outliers in the north-central portion of the map area, ranges from approximately 100 feet (30.5 meters) above MSL to approximately 230 feet (70.1 meters) above MSL in field exposures (see OFMS 99-01 and OFMS 99-02). The Miccosukee Formation ranges from a few feet thick to approximately 130 feet (39.6 meters) in thickness in this area. The unit is relatively impermeable due to its high clay content, but is considered to be part of the surficial aquifer system (SAS) (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Pleistocene Series

Undifferentiated Quaternary

Undifferentiated Quaternary sediments (Qu) lie unconformably on the Oligocene Suwannee Limestone (Ts), the Miocene St. Marks Formation (Tsmk) and the Miocene Torreya Formation (Tht) throughout much of the middle portion of the study area. These sediments, which generally consist of sandy clays and clayey sands, often include weathered and silicified boulders of the Suwannee Limestone ("float"). The undifferentiated Quaternary sediments (Qu) are part of the SAS (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Quaternary Beach Ridges and Dunes

Sediments mapped as Quaternary beach ridges and dunes (Qbd) exhibit discernable beach ridges and dune features. These sediments consist of unconsolidated, light gray to tan, fine to medium quartz sand with variable percentages of organic material. They are only present in a small area in the extreme south-central portion of the map area. The Quaternary beach ridges and dunes (Qbd) sediments are part of the SAS (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

HYDROGEOLOGY

The hydrogeology of the map area consists of (in ascending order) the Floridan aquifer system (FAS), the intermediate aquifer system/intermediate confining unit (IAS/ICU), and the surficial aquifer system (SAS) (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986). The FAS, which is the primary source of drinking water in the region, is generally comprised of carbonate units of the Avon Park Formation, the Ocala Limestone, the Suwannee Limestone, and the St. Marks Formation. The sands, silts, clays and carbonates of the Hawthorn Group comprise the IAS/ICU. The SAS is comprised of the Miccosukee Formation, undifferentiated Quaternary sediments and Quaternary beach ridge and dune sediments.

Where siliciclastic sediments of the Hawthorn Group and Miccosukee Formation are thick, they provide confinement for the FAS, but where the siliciclastic sediments of the Hawthorn Group and younger units are thin or missing, karst features often occur. “Swallets” (stream-to-sink features) are of particular concern to geoscientists and hydrogeologists in the area. Several swallets occur along the edge of the Cody Scarp and in the southern half of the map area and provide avenues for direct recharge to the FAS by surface water and runoff from agricultural and urban areas (Figure 1 on OFMS 99-03).

DERIVATIVE PRODUCTS

Several derivative products will come from this project. During the mapping project, data from several hundred wells (Appendix A) were analyzed. Formation picks, made on all available wells, will allow for the creation of a structure contour map of the top of rock in the study area, along with an isopach map of overburden for the area. Several Florida Geological Survey staff members are working on an additional publication, which is beyond the scope of the original project, which will depict these maps. Additional derivative data that is anticipated to come from this mapping effort includes an aquifer vulnerability assessment map. Data derived from prior STATEMAP products has often been used to augment other FGS and Florida Aquifer Vulnerability Assessment (FAVA) projects in the state (Arthur et al., 2008 (in review); Baker et al., 2007).

FIELD HAZARDS

The authors have been performing fieldwork in Florida for over 50 years between them. Some of the things that the authors have always been cognizant of are the various hazards which may pose a safety threat while doing field work in Florida. Among these are heat stroke, lightning, plants and wildlife. For example, thunderstorms and the accompanying lightning are a particular hazard while drilling and often led to shutting down of the drilling rigs until the lightning passed. The lightning photo below was taken by Tom Scott while doing fieldwork in Florida Bay several years ago. Florida is known as “the lightning capital of the world” for good reason.

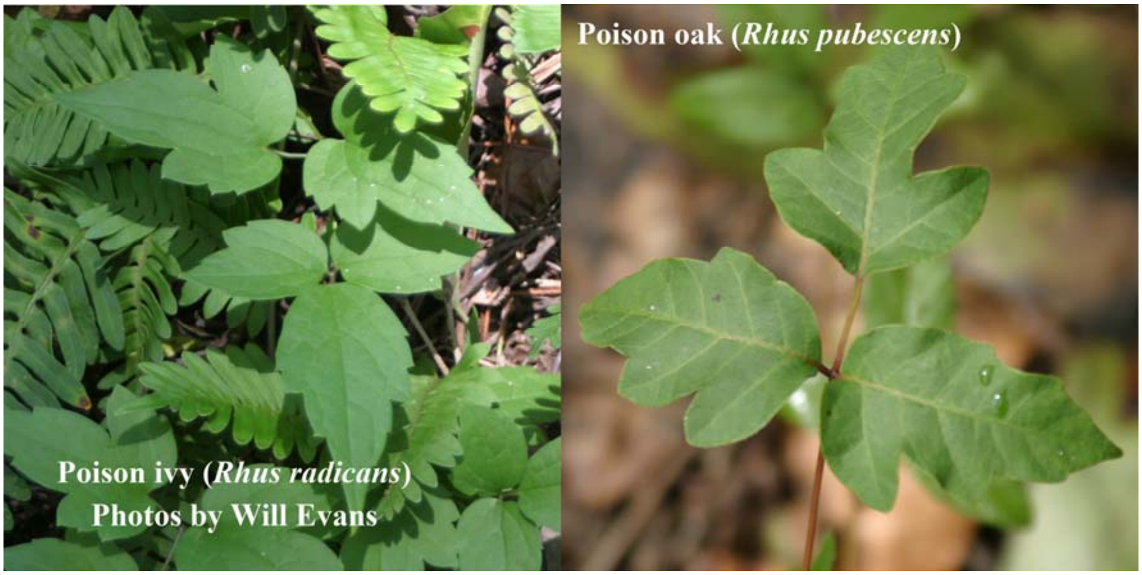
In the current study area, there were an abundance of field hazards encountered. Fortunately, through the use of telephoto lenses, images of some of these hazards were captured from a safe distance. Brief descriptions and photos are included to aid future workers in the proper identification of these dangerous flora and fauna.

Plants

Poisonous plants including poison ivy (*Rhus radicans*) and poison oak (*Rhus pubescens*) are very common in Florida. The leaves, roots, and fruit of these plants contain a poisonous sap which can cause severe itching, inflammation and blisters in people susceptible to the poison.

Poison ivy usually grows as a vine on tree trunks or sprawling over the ground and is easily recognized by the presence of three leaves (“leaves of three, let it be”). The leaflets are elliptical, wider near the base, and the middle leaf is longer than the other two. The leaves may vary greatly in size. They are reddish in the spring, turn green during the summer, and may become various shades of yellow, orange, or red in the autumn.

Poison oak is an erect shrub that can grow several feet tall. The leaves resemble oak leaves and usually (but not always) occur in groups of three. The berries are generally yellow and grow in clusters.



Reptiles

A wide variety of snakes, including the eastern diamondback rattlesnake (*Crotalus adamanteus*), the timber rattlesnake (*Crotalus horridus*), the cottonmouth water moccasin (*Agkistrodon piscivorus*), the pygmy rattlesnake (*Sistrurus milarius*), and the eastern coral snake (*Micrurus fulvius*) were encountered this year while doing fieldwork. Bites from any of these snakes are serious and can be fatal in some cases. The photos below of various snakes are provided in order to help in identifying them.

Note the distinctive diamond pattern on the eastern diamondback rattlesnake versus the pattern for the timber rattlesnake as seen in the photos on the next page. Both snakes are highly poisonous, but are rarely aggressive unless stepped on or cornered. The timber rattlesnake can reach 5 feet (1.5 meters) in length and the eastern diamondback 7 feet (2.1 meters). The pygmy rattlesnake is much smaller than the other two rattlers, generally less than 2 feet (0.6 meters), but is still quite venomous. The cottonmouth water moccasin, however, can be particularly aggressive and has been known to approach people. This snake has a very distinctive white mouth and throat, from whence its name is derived. The eastern coral snake can easily be identified by two features: the black snout, and the red and yellow bands which touch each other. While generally nonaggressive, bites from this snake are often fatal unless treated with antivenin within a few hours.

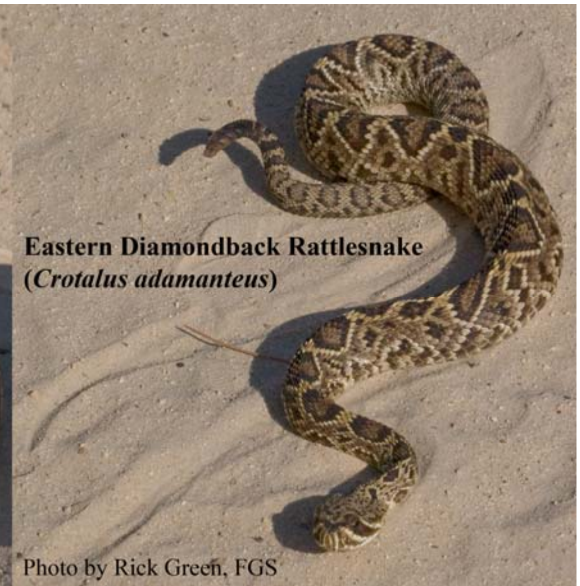
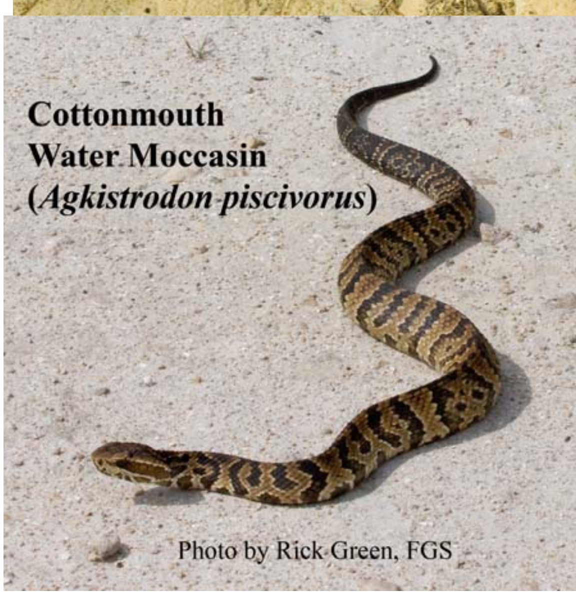

Eastern Diamondback Rattlesnake
(*Crotalus adamanteus*)
Photo by Rick Green, FGS


Photo by Tom Scott, FGS
Timber Rattlesnake (*Crotalus horridus*)


Cottonmouth
Water Moccasin
(*Agkistrodon piscivorus*)
Photo by Rick Green, FGS

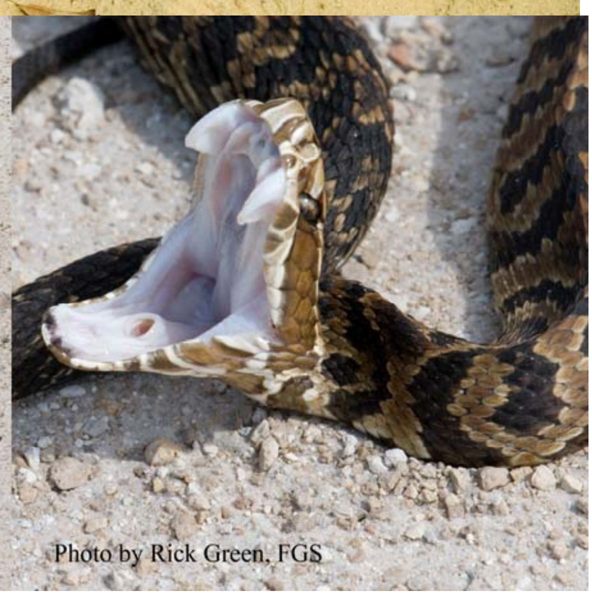
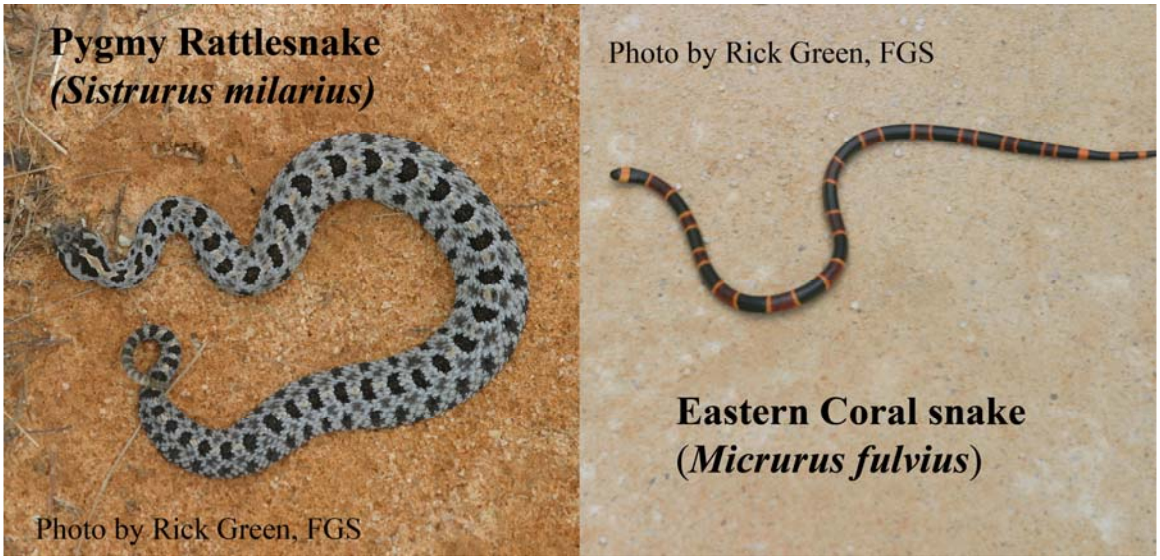


Photo by Rick Green, FGS



The American Alligator (*Alligator mississippiensis*) is very common in the waterways within Florida and encounters with these reptiles were a regular occurrence in the field this season. While they are generally not aggressive, nesting female alligators can be quite dangerous, particularly during mating season (generally May through September). The alligator in the right-hand photo below was estimated to be up to 12 feet (3.7 meters) long and aggressively approached an 18 foot (5.5 meter) boat while in the field.

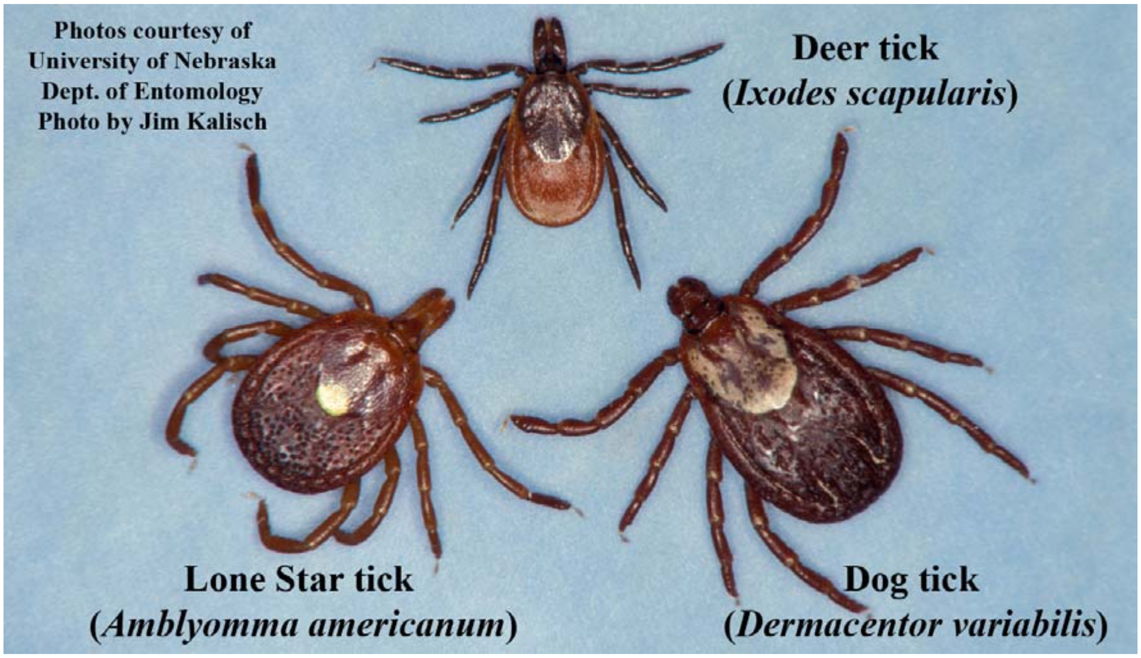
Mammals

Another significant danger this year was the presence of numerous American black bears (*Ursus americanus*) in the wildlife refuges in the area. Although no photos were captured of bears, several sightings were made by field and drilling crews while in the field. While these bears tend to be shy and retreat from humans, they have been known to attack and can be dangerous when with cubs.

Insects

Ticks are a significant hazard in North Florida. Two of the most common tick-borne diseases of concern are Lyme disease and Rocky Mountain spotted fever. Lyme disease is a bacterial infection caused by a spirochete (*Borrelia burgdorferi*) which is transmitted via the tick bite (CDC, 2008a). Lyme disease can have symptoms (rash, muscle aches, fever, and mild-flu-like symptoms) which may mimic other diseases and can often be misdiagnosed.

Rocky Mountain spotted fever (RMSF) is caused by a bacteria (*Rickettsia rickettsii*) which is spread through tick bites. Common ticks in Florida which may transmit these diseases include the American dog tick (*Dermacentor variabilis*), the lone star tick (*Amblyomma americanum*), and the deer tick (*Ixodes scapularis*). Initial signs and symptoms of the disease include sudden onset of fever, headache, and muscle pain, often followed by development of a rash (CDC, 2008b).



Three FGS staff members (two samplers for the springs team and one of the drillers) have contracted RMSF due to tick bites. The photos on the next page are of: 1) the rash resulting from RMSF (left) from the bite of a lone star tick (*Amblyomma americanum*) and 2) the site of a tick bite (right) which resulted in the infection of one of our staff members with RMSF.

Spiders can pose another hazard and one spider, in particular, is dangerous and common in Florida. The black widow (*Latrodectus mactans*) is considered to be the most venomous spider in North America, with venom that is reportedly 15 times stronger than a rattlesnake’s venom (National Geographic, 2008). Black widow spiders are easily recognized by the presence of a red “hourglass” marking on the underside of the abdomen. The photos of the black widow were taken when a piece of Suwannee Limestone was rolled over to look at the underside. Fortunately, the sample was turned over with a rock hammer and not a bare hand, something that is a good habit to get into to avoid being bitten. The bite of the black widow spider may feel like a pin prick, but the initial pain goes away rapidly, leaving localized swelling and two tiny red marks at the site of the bite. Cramps in the shoulder, thigh and back muscles generally begin within 15 minutes to a few hours. In severe cases of a black widow bite, pain may spread to the abdomen, blood pressure may rise, there may be nausea, sweating and difficulty in breathing. Death can result, depending on the victim's age, physical condition, and the location of bite. Death seldom occurs, however, if a physician is consulted and treatment is promptly sought.

Another very common spider encountered while doing field work in Florida is the golden silk spider (*Nephila clavipes*). While this spider is not poisonous, its web does pose an annoyance when hiking through the woods. During the summer and late fall, the large webs of this species are extremely common and it is not uncommon for hikers to walk through the webs and have the spider end up on them as in the case of FGS staff member Tom Greenhalgh in the photo below. The bite from this spider is generally less painful than a bee sting and produces only localized pain and redness, which quickly dissipates.


Black Widow Spider
(Lactrodectus mactans)
Photos by Rick Green, FGS
Golden Silk Spider
(Nephila clavipes)
Photo by Rick Green, FGS
Photo by Rick Green, FGS

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Appendix A: Wells utilized for study.

Map ID #	*Archived ID #	Data Source	Data Type	Latitude DD	Latitude MM	Latitude SS	Longitude DD	Longitude MM	Longitude SS	1:24,000 Quadrangle	Elev. (Feet)	Total Depth (Feet)
1	W-620	FGS	Cuttings	30	00	44.99	83	46	01.99	Manlin Hammock	6	115
2	W-621	FGS	Cuttings	30	02	27.99	83	43	29.99	Hampton Springs	19	120
3	W-705	FGS	Cuttings	30	20	15.90	83	44	22.14	Shady Grove	79	175
4	W-1854	FGS	Cuttings	30	20	15.67	83	58	58.31	Wacissa	37	7,913
5	W-4497	FGS	Cuttings	30	04	05.09	83	30	00.99	Perry	61	460
6	W-5455	FGS	Cuttings	30	25	47.00	83	51	36.00	Lamont	74	141
7	W-5859	FGS	Cuttings	30	09	49.00	83	36	51.00	Boyd	47	145
8	W-6061	FGS	Cuttings	30	27	24.99	83	57	52.00	Waukeenah	147	250
9	W-6559	FGS	Cuttings	30	27	36.06	83	47	10.16	Lamont	85	112
10	W-6906	FGS	Cuttings	30	24	16.22	83	59	23.93	Waukeenah	165	250
11	W-6925	FGS	Cuttings	30	21	08.00	83	51	18.00	Lamont SE	134	69
12	W-6932	FGS	Cuttings	30	26	37.00	83	54	00.00	Waukeenah	214	265
13	W-7122	FGS	Cuttings	30	20	02.79	83	47	55.28	Lamont SE	114	60
14	W-10459	FGS	Core	30	02	29.99	83	36	49.99	Perry	31	70
15	W-10713	FGS	Cuttings	30	26	35.00	83	54	31.00	Waukeenah	205	280
16	W-13129	FGS	Cuttings	30	02	40.08	83	41	49.34	Hampton Springs	22	30
17	W-13206	FGS	Cuttings	30	12	37.99	83	52	24.00	Johnson Hammock	30	10
18	W-15279	FGS	Cuttings	30	10	20.00	83	41	16.00	Secotan	40	400
19	W-15300	FGS	Cuttings	30	10	12.00	83	40	27.00	Secotan	40	401
20	W-15882	FGS	Core	30	22	13.00	83	58	11.00	Wacissa	184	144
21	W-15884	FGS	Core	30	25	23.13	83	42	03.20	Greenville	90	73
22	W-15906	FGS	Core	30	17	49.00	83	59	03.00	Wacissa	32	31
23	W-15907	FGS	Core	30	20	49.00	83	55	33.00	Wacissa	43	31
24	W-15911	FGS	Core	30	21	33.48	83	36	18.12	Greenville SE	95	94
25	W-15912	FGS	Core	30	23	42.00	83	48	45.00	Lamont	70	70
26	W-15922	FGS	Core	30	17	02.76	83	46	42.22	Lamont SE	47	45
27	W-15930	FGS	Core	30	11	11.87	83	31	58.91	Boyd	89	65
28	W-15931	FGS	Core	30	26	16.41	83	37	14.81	Greenville NE	100	102
29	W-15943	FGS	Core	30	17	22.71	83	32	09.52	Greenville SE	92	59
30	W-15946	FGS	Core	30	11	19.00	83	45	18.00	Johnson Hammock	36	29
31	W-15960	FGS	Core	30	20	13.44	83	42	19.81	Shady Grove	83	97
32	W-15986	FGS	Core	30	26	13.14	83	30	55.81	Greenville NE	125	101
33	W-18095	FGS	Core	30	07	43.00	83	57	41.00	Nutall Rise	5	90
34	W-18108	FGS	Core	30	06	10.00	83	53	23.00	Snipe Island	5	50
35	W-18830	FGS	Core	30	13	18.87	83	56	53.79	Nutall Rise	18	114
36	W-18831	FGS	Core	30	12	05.00	83	50	00.80	Johnson Hammock	32	128
37	W-18832	FGS	Core	30	13	43.80	83	32	33.06	Boyd	93	330
38	W-18839	FGS	Core	30	14	56.50	83	45	22.20	Johnson Hammock	44	128
39	W-18840	FGS	Core	30	07	15.20	83	44	58.10	Hampton Springs	27	110
40	W-18841	FGS	Core	30	22	49.80	83	32	58.44	Greenville NE	152	439.5
41	W-105	FGS	Cuttings	30	04	16.07	83	31	43.02	Perry	52	90
42	W-185	FGS	Cuttings	30	04	35.99	83	40	16.99	Hampton Springs	24	60
43	W-186	FGS	Cuttings	30	06	06.62	83	34	22.85	Perry	47	90
44	W-525	FGS	Cuttings	30	28	26.36	83	40	10.39	Greenville	95	229
45	W-607	FGS	Cuttings	30	07	10.15	83	35	07.68	Perry	44	364
46	W-732	FGS	Cuttings	30	04	46.95	83	34	18.79	Perry	44	255
47	W-905	FGS	Cuttings	30	22	10.67	83	58	42.63	Wacissa	187	200
48	W-1063	FGS	Cuttings	30	06	35.00	83	35	05.00	Perry	37	9
49	W-1257	FGS	Cuttings	30	02	47.00	83	55	06.00	Snipe Island	4	16
50	W-1258	FGS	Cuttings	30	05	20.40	83	53	09.57	Snipe Island	4	9
51	W-1877	FGS	Cuttings	30	04	00.99	83	40	32.99	Hampton Springs	21	6,254
52	W-2687	FGS	Cuttings	30	04	07.00	83	30	39.00	Perry	52	370
53	W-2743	FGS	Cuttings	30	04	13.68	83	31	24.65	Perry	54	375
54	W-2905	FGS	Cuttings	30	04	12.07	83	30	45.00	Perry	50	345
55	W-3664	FGS	Cuttings	30	04	25.01	83	33	45.99	Perry	46	100
56	W-3820	FGS	Cuttings	30	05	58.99	83	35	02.99	Perry	43	55
57	W-4334	FGS	Cuttings	30	03	02.25	83	33	05.15	Perry	52	44
58	W-4335	FGS	Cuttings	30	03	51.77	83	31	23.26	Perry	45	28
59	W-4336	FGS	Cuttings	30	04	22.72	83	33	27.08	Perry	43	18
60	W-4337	FGS	Cuttings	30	04	15.12	83	31	04.08	Perry	54	28
61	W-4338	FGS	Cuttings	30	03	58.69	83	31	59.06	Perry	50	18

Map ID #	*Archived ID #	Data Source	Data Type	Latitude			Longitude			1:24,000 Quadrangle	Elev. (Feet)	Total Depth (Feet)
				DD	MM	SS	DD	MM	SS			
62	W-4339	FGS	Cuttings	30	04	34.47	83	31	17.15	Perry	59	33
63	W-4340	FGS	Cuttings	30	04	47.01	83	32	14.98	Perry	52	18
64	W-4341	FGS	Cuttings	30	03	15.31	83	31	47.79	Perry	52	18
65	W-4342	FGS	Cuttings	30	04	48.32	83	33	35.91	Perry	45	8
66	W-4343	FGS	Cuttings	30	03	48.59	83	33	25.80	Perry	43	18
67	W-4344	FGS	Cuttings	30	03	43.73	83	32	01.04	Perry	48	14
68	W-5325	FGS	Cuttings	30	25	29.27	83	46	51.05	Lamont	87	151
69	W-5356	FGS	Cuttings	30	08	47.99	83	36	44.99	Boyd	44	70
70	W-6174	FGS	Cuttings	30	23	06.92	83	48	42.90	Lamont	68	80
71	W-6402	FGS	Cuttings	30	24	35.00	83	54	33.00	Waukeenah	205	161
72	W-6517	FGS	Core	30	29	10.13	83	49	39.64	Lamont	90	93
73	W-6525	FGS	Cuttings	30	06	58.42	83	58	40.58	Snipe Island	3	24
74	W-6558	FGS	Cuttings	30	29	41.98	83	43	20.75	Greenville	116	230
75	W-6635	FGS	Cuttings	30	04	42.00	83	31	46.00	Perry	69	240
76	W-6930	FGS	Cuttings	30	24	11.12	83	53	49.67	Waukeenah	128	200
77	W-6931	FGS	Cuttings	30	22	17.83	83	56	38.34	Wacissa	200	127
78	W-7120	FGS	Cuttings	30	22	17.83	83	56	38.34	Wacissa	200	192
79	W-7130	FGS	Cuttings	30	24	42.70	83	52	53.74	Waukeenah	100	65
80	W-7134	FGS	Cuttings	30	24	42.70	83	52	53.74	Waukeenah	100	78
81	W-7135	FGS	Cuttings	30	23	00.00	83	48	50.00	Lamont	62	65
82	W-7137	FGS	Cuttings	30	18	41.54	83	52	46.75	Wacissa	44	90
83	W-7139	FGS	Cuttings	30	19	30.00	83	49	55.00	Lamont SE	45	85
84	W-7140	FGS	Cuttings	30	24	42.70	83	52	53.74	Waukeenah	100	70
85	W-7141	FGS	Cuttings	30	23	05.02	83	55	55.99	Waukeenah	106	97
86	W-7155	FGS	Cuttings	30	27	23.00	83	53	52.00	Waukeenah	220	70
87	W-7225	FGS	Cuttings	30	28	10.00	83	35	15.00	Greenville NE	120	74
88	W-7226	FGS	Cuttings	30	28	51.38	83	32	16.17	Greenville NE	95	59
89	W-7228	FGS	Cuttings	30	28	43.53	83	33	15.32	Greenville NE	115	89
90	W-7229	FGS	Cuttings	30	28	42.55	83	31	21.61	Greenville NE	95	42
91	W-7236	FGS	Cuttings	30	28	26.00	83	34	49.00	Greenville NE	95	43
92	W-12697	FGS	Cuttings	30	05	29.00	83	49	03.00	Manlin Hammock	15	7,467
93	W-12981	FGS	Cuttings	30	28	07.00	83	53	31.00	Waukeenah	200	124
94	W-13027	FGS	Cuttings	30	10	23.00	83	35	49.00	Boyd	55	70
95	W-13130	FGS	Cuttings	30	05	32.04	83	31	07.97	Perry	61	73
96	W-13196	FGS	Cuttings	30	25	30.00	83	37	57.00	Greenville	105	90
97	W-13215	FGS	Cuttings	30	25	42.87	83	55	50.32	Waukeenah	175	270
98	W-13297	FGS	Cuttings	30	26	32.00	83	38	45.00	Greenville	90	130
99	W-13302	FGS	Cuttings	30	08	42.80	83	38	54.07	Secotan	36	30
100	W-13317	FGS	Cuttings	30	29	12.00	83	35	45.00	Greenville NE	100	130
101	W-13369	FGS	Cuttings	30	19	33.00	83	41	48.00	Shady Grove	75	120
102	W-13370	FGS	Cuttings	30	17	33.11	83	41	04.38	Shady Grove	72	63
103	W-13522	FGS	Cuttings	30	01	36.04	83	42	10.24	Hampton Springs	62	56
104	W-14692	FGS	Cuttings	30	20	31.81	83	48	51.81	Lamont SE	80	78
105	W-14693	FGS	Cuttings	30	29	20.00	83	41	45.00	Greenville	84	180
106	W-14867	FGS	Cuttings	30	07	26.00	83	58	12.00	Snipe Island	5	20
107	W-15273	FGS	Cuttings	30	08	58.00	83	40	48.00	Secotan	37	808
108	W-15852	FGS	Core	30	11	33.00	83	38	58.00	Secotan	48	30
109	W-15856	FGS	Core	30	05	38.94	83	34	19.00	Perry	45	25
110	W-15868	FGS	Core	30	25	33.84	83	55	03.01	Waukeenah	205	238
111	W-15934	FGS	Core	30	16	01.58	83	39	46.69	Shady Grove	68	64
112	W-15947	FGS	Core	30	07	39.23	83	35	46.81	Boyd	44	39
113	W-15959	FGS	Core	30	15	55.75	83	39	40.55	Shady Grove	70	55
114	W-15985	FGS	Core	30	16	51.00	83	49	50.00	Lamont SE	40	35
115	W-16755	FGS	Core	30	06	18.00	83	58	55.00	Snipe Island	1	2
116	W-16757	FGS	Core	30	04	53.00	83	58	17.00	Snipe Island	2	7
117	W-16758	FGS	Core	30	05	33.00	83	58	02.00	Snipe Island	2	2
118	W-16767	FGS	Core	30	05	00.00	83	57	54.00	Snipe Island	3	6
119	W-16769	FGS	Core	30	05	27.00	83	58	56.00	Snipe Island	1	6
120	W-16771	FGS	Core	30	07	12.21	83	59	39.28	Snipe Island	0	5
121	W-16772	FGS	Core	30	06	18.00	83	59	10.00	Snipe Island	1	1
122	W-16774	FGS	Core	30	05	39.00	83	58	41.00	Snipe Island	2	3
123	W-16780	FGS	Core	30	04	33.00	83	57	54.00	Snipe Island	1	4
124	W-17769	FGS	Core	30	11	37.00	83	57	00.00	Nutall Rise	12	8

Map ID #	*Archived ID #	Data Source	Data Type	Latitude DD	Latitude MM	Latitude SS	Longitude DD	Longitude MM	Longitude SS	1:24,000 Quadrangle	Elev. (Feet)	Total Depth (Feet)
125	W-18096	FGS	Core	30	07	43.00	83	56	50.00	Nutall Rise	5	70
126	W-18097	FGS	Core	30	07	20.00	83	57	12.00	Snipe Island	5	60
127	W-18098	FGS	Core	30	06	54.00	83	57	36.00	Snipe Island	5	55
128	W-18100	FGS	Core	30	08	05.00	83	57	10.00	Nutall Rise	5	65
129	W-18101	FGS	Core	30	08	38.00	83	56	44.00	Nutall Rise	5	75
130	W-18102	FGS	Core	30	07	46.00	83	55	47.00	Nutall Rise	5	65
131	W-18103	FGS	Core	30	08	31.00	83	56	09.00	Nutall Rise	5	66
132	W-18104	FGS	Core	30	07	38.00	83	53	37.00	Nutall Rise	5	85
133	W-18105	FGS	Core	30	07	02.00	83	54	02.00	Snipe Island	5	60
134	W-18106	FGS	Core	30	06	14.00	83	54	20.00	Snipe Island	5	70
135	W-18107	FGS	Core	30	05	00.00	83	54	46.00	Snipe Island	5	70
136	-50831002	SRWMD	Water Well	30	00	13.99	83	33	44.99	Perry	45	45
137	-50536001	SRWMD	Water Well	30	00	32.99	83	46	43.99	Manlin Hammock	5	19
138	-50827001	SRWMD	Water Well	30	00	42.29	83	30	45.69	Perry	50	49
139	-50828007	SRWMD	Water Well	30	00	46.99	83	31	42.99	Perry	51	57
140	-50529001	SRWMD	Water Well	30	00	54.28	83	51	01.93	Manlin Hammock	8	36
141	-50726003	SRWMD	Water Well	30	00	53.99	83	35	45.99	Perry	40	24
142	-50723002	SRWMD	Water Well	30	01	05.99	83	35	42.99	Perry	40	40
143	-50723003	SRWMD	Water Well	30	01	05.99	83	35	30.99	Perry	40	50
144	-50828002	SRWMD	Water Well	30	01	06.99	83	31	58.99	Perry	50	79
145	-50830002	SRWMD	Water Well	30	01	23.99	83	33	25.99	Perry	45	36
146	-50623009	SRWMD	Water Well	30	01	39.99	83	41	39.99	Hampton Springs	26	30
147	-50820003	SRWMD	Water Well	30	01	40.99	83	32	20.99	Perry	41	37
148	-50721003	SRWMD	Water Well	30	01	48.32	83	38	02.38	Hampton Springs	31	35
149	-50720002	SRWMD	Water Well	30	02	07.99	83	39	04.99	Hampton Springs	26	25
150	-50723004	SRWMD	Water Well	30	02	09.99	83	35	28.99	Perry	40	47
151	-50819002	SRWMD	Water Well	30	02	11.38	83	34	00.07	Perry	45	64
152	-50614002	SRWMD	Water Well	30	02	50.99	83	41	45.99	Hampton Springs	25	31
153	-50817001	SRWMD	Water Well	30	02	51.00	83	32	28.75	Perry	52	63
154	-50815001	SRWMD	Water Well	30	03	04.99	83	30	34.99	Perry	56	38
155	-50808005	SRWMD	Water Well	30	03	40.99	83	33	13.99	Perry	45	31
156	-50710002	SRWMD	Water Well	30	03	42.99	83	36	37.99	Perry	30	49
157	-50711001	SRWMD	Water Well	30	03	52.99	83	35	56.99	Perry	36	37
158	-50702006	SRWMD	Water Well	30	04	12.99	83	35	30.99	Perry	34	28
159	-50806014	SRWMD	Water Well	30	04	30.99	83	33	57.99	Perry	45	28
160	-50702013	SRWMD	Water Well	30	04	32.99	83	35	22.99	Perry	40	30
161	-50701006	SRWMD	Water Well	30	04	38.99	83	34	48.99	Perry	45	20
162	-50702004	SRWMD	Water Well	30	04	49.99	83	36	07.99	Perry	40	33
163	-50806018	SRWMD	Water Well	30	04	54.99	83	33	58.99	Perry	40	150
164	-40436003	SRWMD	Water Well	30	05	04.99	83	53	26.00	Snipe Island	10	36
165	-50804011	SRWMD	Water Well	30	05	02.89	83	31	40.29	Perry	60	50
166	-40636004	SRWMD	Water Well	30	05	06.99	83	40	46.99	Hampton Springs	25	30
167	-40736011	SRWMD	Water Well	30	05	11.99	83	34	23.99	Perry	45	47
168	-40731007	SRWMD	Water Well	30	05	20.99	83	40	04.99	Hampton Springs	27	57
169	-40633001	SRWMD	Water Well	30	05	24.46	83	44	03.81	Hampton Springs	21	25
170	-40833012	SRWMD	Water Well	30	05	22.99	83	31	57.99	Perry	58	74
171	-40832009	SRWMD	Water Well	30	05	26.99	83	32	17.99	Perry	55	80
172	-40736016	SRWMD	Water Well	30	05	28.99	83	34	38.99	Perry	45	40
173	-40736010	SRWMD	Water Well	30	05	39.99	83	35	00.99	Perry	45	27
174	-40831007	SRWMD	Water Well	30	05	46.99	83	33	30.99	Perry	54	51
175	-40736019	SRWMD	Water Well	30	05	49.99	83	34	52.99	Perry	45	55
176	-40733002	SRWMD	Water Well	30	05	50.99	83	37	28.99	Perry	31	31
177	-40726004	SRWMD	Water Well	30	06	08.99	83	35	41.99	Perry	40	28
178	-40628001	SRWMD	Water Well	30	06	08.99	83	30	53.99	Perry	26	70
179	-40726005	SRWMD	Water Well	30	06	09.99	83	35	22.99	Perry	35	25
180	-40829003	SRWMD	Water Well	30	06	09.99	83	32	33.99	Perry	55	295
181	-40725011	SRWMD	Water Well	30	06	17.99	83	34	55.99	Perry	41	85
182	-40829002	SRWMD	Water Well	30	06	24.99	83	33	01.99	Perry	60	40
183	-40726001	SRWMD	Water Well	30	06	26.99	83	35	57.99	Perry	25	28
184	-40830006	SRWMD	Water Well	30	06	35.99	83	33	31.99	Perry	46	72
185	-40529001	SRWMD	Water Well	30	06	46.60	83	50	33.92	Manlin Hammock	15	25
186	-40727001	SRWMD	Water Well	30	06	46.99	83	36	24.99	Perry	35	28
187	-40819002	SRWMD	Water Well	30	06	51.99	83	33	27.99	Perry	45	34

Map ID #	*Archived ID #	Data Source	Data Type	Latitude DD	Latitude MM	Latitude SS	Longitude DD	Longitude MM	Longitude SS	1:24,000 Quadrangle	Elev. (Feet)	Total Depth (Feet)
188	-40721001	SRWMD	Water Well	30	06	52.99	83	37	34.99	Hampton Springs	30	16
189	-40724002	SRWMD	Water Well	30	06	58.99	83	34	19.99	Perry	50	48
190	-40723016	SRWMD	Water Well	30	07	05.99	83	36	06.99	Perry	35	30
191	-40723019	SRWMD	Water Well	30	07	12.99	83	35	37.99	Perry	35	55
192	-40722008	SRWMD	Water Well	30	07	15.99	83	36	33.99	Perry	38	28
193	-40820001	SRWMD	Water Well	30	07	19.99	83	32	44.99	Perry	43	53
194	-40724027	SRWMD	Water Well	30	07	23.99	83	35	11.99	Perry	35	42
195	-40419006	SRWMD	Water Well	30	07	33.99	83	58	26.00	Nutall Rise	5	32
196	-40724015	SRWMD	Water Well	30	07	32.99	83	34	36.99	Boyd	47	40
197	-40716004	SRWMD	Water Well	30	07	40.99	83	37	34.99	Secotan	35	33
198	-40713014	SRWMD	Water Well	30	07	41.99	83	35	12.99	Boyd	40	35
199	-40713001	SRWMD	Water Well	30	07	43.99	83	34	17.99	Boyd	45	31
200	-40818002	SRWMD	Water Well	30	07	48.15	83	33	48.89	Boyd	49	43
201	-40714002	SRWMD	Water Well	30	08	08.99	83	35	39.99	Boyd	43	23
202	-40518003	SRWMD	Water Well	30	08	24.99	83	52	20.00	Johnson Hammock	15	15
203	-40713010	SRWMD	Water Well	30	08	31.99	83	34	35.99	Boyd	43	35
204	-40717003	SRWMD	Water Well	30	08	35.99	83	39	03.99	Secotan	35	72
205	-40712011	SRWMD	Water Well	30	08	37.99	83	35	05.99	Boyd	47	35
206	-40807010	SRWMD	Water Well	30	08	41.01	83	33	55.35	Boyd	45	63
207	-40807002	SRWMD	Water Well	30	08	45.99	83	33	32.99	Boyd	60	118
208	-40407002	SRWMD	Water Well	30	08	51.99	83	58	08.00	Nutall Rise	4	17
209	-40408004	SRWMD	Water Well	30	09	05.99	83	57	03.00	Nutall Rise	10	62
210	-40711001	SRWMD	Water Well	30	09	16.99	83	35	20.99	Boyd	51	29
211	-40711006	SRWMD	Water Well	30	09	21.70	83	35	35.12	Boyd	48	34
212	-40704001	SRWMD	Water Well	30	09	27.99	83	37	51.99	Secotan	40	32
213	-40806005	SRWMD	Water Well	30	09	28.99	83	33	36.99	Boyd	65	31
214	-40703013	SRWMD	Water Well	30	09	38.99	83	36	54.99	Boyd	44	55
215	-40702007	SRWMD	Water Well	30	09	42.79	83	35	32.89	Boyd	50	28
216	-40702014	SRWMD	Water Well	30	09	45.99	83	35	44.99	Boyd	50	27
217	-40702003	SRWMD	Water Well	30	09	56.99	83	35	47.99	Boyd	50	31
218	-40806008	SRWMD	Water Well	30	09	58.99	83	33	28.99	Boyd	65	50
219	-40701001	SRWMD	Water Well	30	10	01.99	83	34	49.99	Boyd	55	26
220	-40702002	SRWMD	Water Well	30	10	16.99	83	35	21.99	Boyd	57	48
221	-40403001	SRWMD	Water Well	30	10	22.99	83	55	20.00	Nutall Rise	15	38
222	-30736006	SRWMD	Water Well	30	10	32.99	83	34	52.99	Boyd	55	119
223	-30736008	SRWMD	Water Well	30	10	37.59	83	34	40.49	Boyd	60	42
224	-30730004	SRWMD	Water Well	30	11	59.99	83	39	19.99	Secotan	50	200
225	-30419001	SRWMD	Water Well	30	12	04.14	83	58	09.95	Nutall Rise	13	30
226	-30424003	SRWMD	Water Well	30	12	39.99	83	52	35.00	Nutall Rise	33	40
227	-30704003	SRWMD	Water Well	30	15	05.99	83	37	25.99	Greenville SE	82	185
228	-20732004	SRWMD	Water Well	30	16	12.99	83	39	11.00	Shady Grove	80	95
229	-20732003	SRWMD	Water Well	30	16	12.99	83	38	48.00	Shady Grove	75	130
230	-20433001	SRWMD	Water Well	30	16	17.12	83	55	37.90	Wacissa	30	30
231	-21335011	SRWMD	Water Well	30	16	23.99	83	55	48.00	Wacissa	95	95
232	-20729001	SRWMD	Water Well	30	17	04.12	83	39	15.25	Shady Grove	70	72
233	-20629001	SRWMD	Water Well	30	17	11.99	83	44	59.00	Shady Grove	50	32
234	-20729002	SRWMD	Water Well	30	17	13.99	83	38	28.00	Shady Grove	75	98
235	-20528002	SRWMD	Water Well	30	17	16.49	83	50	08.56	Lamont SE	40	35
236	-21430015	SRWMD	Water Well	30	17	17.99	83	57	19.00	Wacissa	125	150
237	-20728005	SRWMD	Water Well	30	17	16.99	83	38	04.00	Shady Grove	77	37
238	-20730002	SRWMD	Water Well	30	17	20.99	83	39	34.00	Shady Grove	75	225
239	-20620003	SRWMD	Water Well	30	17	43.99	83	44	35.00	Shady Grove	50	61
240	-20719001	SRWMD	Water Well	30	17	44.99	83	39	44.00	Shady Grove	77	60
241	-20720003	SRWMD	Water Well	30	17	48.49	83	38	53.80	Shady Grove	80	80
242	-20720002	SRWMD	Water Well	30	17	48.99	83	38	25.00	Shady Grove	85	175
243	-20524001	SRWMD	Water Well	30	18	08.99	83	47	13.00	Lamont SE	50	32
244	-20620005	SRWMD	Water Well	30	18	10.95	83	44	46.04	Shady Grove	56	65
245	-20513002	SRWMD	Water Well	30	18	12.99	83	47	02.00	Lamont SE	51	50
246	-20615002	SRWMD	Water Well	30	18	17.99	83	42	35.00	Shady Grove	80	59
247	-20617001	SRWMD	Water Well	30	18	44.99	83	45	18.00	Lamont SE	62	70
248	-20615004	SRWMD	Water Well	30	18	51.99	83	42	39.14	Shady Grove	82	107
249	-20818001	SRWMD	Water Well	30	19	01.99	83	34	07.99	Greenville SE	104	95
250	-20510001	SRWMD	Water Well	30	19	22.99	83	49	10.00	Lamont SE	55	97

Map ID #	*Archived ID #	Data Source	Data Type	Latitude DD	Latitude MM	Latitude SS	Longitude DD	Longitude MM	Longitude SS	1:24,000 Quadrangle	Elev. (Feet)	Total Depth (Feet)
251	-20512002	SRWMD	Water Well	30	19	41.99	83	46	23.00	Lamont SE	60	105
252	-20508003	SRWMD	Water Well	30	19	49.99	83	51	00.00	Lamont SE	50	86
253	-10432002	SRWMD	Water Well	30	20	52.99	83	57	28.00	Wacissa	40	85
254	-10731002	SRWMD	Water Well	30	20	56.99	83	39	50.00	Shady Grove	80	75
255	-10734001	SRWMD	Water Well	30	20	58.99	83	36	31.00	Greenville SE	115	42
256	-10731001	SRWMD	Water Well	30	20	59.99	83	39	38.00	Shady Grove	80	75
257	-10336001	SRWMD	Water Well	30	21	04.99	83	59	25.00	Wacissa	41	32
258	-10833003	SRWMD	Water Well	30	21	02.99	83	31	39.99	Greenville SE	140	130
259	-10732002	SRWMD	Water Well	30	21	14.99	83	39	12.00	Shady Grove	95	95
260	-10736001	SRWMD	Water Well	30	21	14.99	83	35	02.00	Greenville SE	145	115
261	-10735001	SRWMD	Water Well	30	21	19.99	83	35	41.00	Greenville SE	107	110
262	-10534001	SRWMD	Water Well	30	21	31.99	83	49	07.00	Lamont SE	67	81
263	-10336014	SRWMD	Water Well	30	21	32.99	83	58	42.00	Wacissa	40	100
264	-10336013	SRWMD	Water Well	30	21	33.99	83	59	15.00	Wacissa	45	120
265	-10336006	SRWMD	Water Well	30	21	38.99	83	59	29.00	Wacissa	48	72
266	-10831001	SRWMD	Water Well	30	21	37.99	83	33	34.99	Greenville SE	140	120
267	-10728002	SRWMD	Water Well	30	21	50.99	83	37	36.00	Shady Grove	115	260
268	-10325002	SRWMD	Water Well	30	22	02.99	83	59	01.00	Wacissa	168	250
269	-10729001	SRWMD	Water Well	30	22	10.54	83	38	02.74	Shady Grove	123	103
270	-10325001	SRWMD	Water Well	30	22	13.99	83	59	22.00	Wacissa	132	210
271	-10730001	SRWMD	Water Well	30	22	34.99	83	39	28.00	Greenville	100	91
272	-10522007	SRWMD	Water Well	30	22	38.99	83	48	53.00	Lamont	70	140
273	-10521006	SRWMD	Water Well	30	23	05.99	83	49	59.00	Lamont	140	269
274	-10519001	SRWMD	Water Well	30	23	11.99	83	52	11.00	Lamont	80	99
275	-10719001	SRWMD	Water Well	30	23	21.99	83	39	56.00	Greenville	85	180
276	-10821002	SRWMD	Water Well	30	23	29.99	83	32	03.99	Greenville NE	120	180
277	-10816004	SRWMD	Water Well	30	23	46.99	83	31	50.99	Greenville NE	130	120
278	-10816002	SRWMD	Water Well	30	23	50.99	83	31	29.99	Greenville NE	140	150
279	-10517002	SRWMD	Water Well	30	23	56.99	83	51	04.00	Lamont	75	160
280	-10717002	SRWMD	Water Well	30	23	59.99	83	38	32.00	Greenville	100	111
281	-10717001	SRWMD	Water Well	30	24	06.99	83	38	39.00	Greenville	100	100
282	-10715001	SRWMD	Water Well	30	24	08.99	83	36	31.00	Greenville NE	110	147
283	-10717003	SRWMD	Water Well	30	24	09.99	83	38	55.00	Greenville	100	95
284	-10418001	SRWMD	Water Well	30	24	12.99	83	58	03.00	Waukeenah	190	260
285	-10411001	SRWMD	Water Well	30	24	12.99	83	54	22.00	Waukeenah	180	250
286	-10312003	SRWMD	Water Well	30	24	37.99	83	59	03.00	Waukeenah	170	430
287	-10409001	SRWMD	Water Well	30	24	44.99	83	56	21.00	Waukeenah	200	340
288	-10407001	SRWMD	Water Well	30	24	45.99	83	57	44.00	Waukeenah	200	395
289	-10808001	SRWMD	Water Well	30	24	51.99	83	32	44.00	Greenville NE	100	245
290	-10301001	SRWMD	Water Well	30	25	11.99	83	58	52.00	Waukeenah	210	280
291	-10704004	SRWMD	Water Well	30	25	20.74	83	38	02.14	Greenville	95	80
292	-10704002	SRWMD	Water Well	30	25	30.99	83	37	24.00	Greenville NE	119	109
293	-10806001	SRWMD	Water Well	30	25	33.76	83	33	54.52	Greenville NE	102	90
294	-10601001	SRWMD	Water Well	30	25	45.99	83	40	43.00	Greenville	110	117
295	-10804001	SRWMD	Water Well	30	25	51.58	83	32	06.45	Greenville NE	151	195
296	-10604003	SRWMD	Water Well	30	26	02.76	83	43	45.08	Greenville	75	210
297	10733005	SRWMD	Water Well	30	26	50.99	83	37	50.00	Greenville	149	95
298	10727005	SRWMD	Water Well	30	27	04.09	83	36	55.50	Greenville NE	120	189
299	10428001	SRWMD	Water Well	30	27	07.99	83	56	16.00	Waukeenah	170	190
300	10727001	SRWMD	Water Well	30	27	06.99	83	37	11.00	Greenville NE	121	90
301	10727002	SRWMD	Water Well	30	27	22.99	83	36	49.00	Greenville NE	95	90
302	10730001	SRWMD	Water Well	30	27	29.99	83	39	15.00	Greenville	110	180
303	10630001	SRWMD	Water Well	30	27	37.99	83	45	47.00	Lamont	80	170
304	10727006	SRWMD	Water Well	30	27	48.99	83	36	24.00	Greenville NE	110	205
305	10424001	SRWMD	Water Well	30	28	02.99	83	53	12.00	Waukeenah	192	222
306	10721010	SRWMD	Water Well	30	28	04.99	83	38	04.00	Greenville	110	180
307	10722008	SRWMD	Water Well	30	28	13.59	83	37	11.90	Greenville NE	128	105
308	10620004	SRWMD	Water Well	30	28	20.99	83	44	23.00	Greenville	85	175
309	10720004	SRWMD	Water Well	30	28	21.99	83	38	40.00	Greenville	85	265
310	10722007	SRWMD	Water Well	30	28	21.99	83	36	13.50	Greenville NE	100	97
311	10723002	SRWMD	Water Well	30	28	21.89	83	35	13.00	Greenville NE	100	123
312	10719006	SRWMD	Water Well	30	28	22.99	83	39	56.50	Greenville	95	72
313	10720005	SRWMD	Water Well	30	28	28.59	83	39	03.90	Greenville	97	105

Map ID #	*Archived ID #	Data Source	Data Type	Latitude			Longitude			1:24,000 Quadrangle	Elev. (Feet)	Total Depth (Feet)
				DD	MM	SS	DD	MM	SS			
314	10623001	SRWMD	Water Well	30	28	28.99	83	41	27.00	Greenville	100	120
315	10721015	SRWMD	Water Well	30	28	34.69	83	38	01.20	Greenville	102	150
316	10721012	SRWMD	Water Well	30	28	36.89	83	37	19.60	Greenville NE	100	120
317	10622002	SRWMD	Water Well	30	28	37.99	83	42	49.00	Greenville	95	161
318	10722005	SRWMD	Water Well	30	28	39.79	83	36	21.40	Greenville NE	102	108
319	10517001	SRWMD	Water Well	30	28	56.99	83	51	03.00	Lamont	98	110
320	10718001	SRWMD	Water Well	30	29	00.99	83	49	13.00	Lamont	103	87
321	10718002	SRWMD	Water Well	30	29	01.99	83	40	09.90	Greenville	100	240
322	10618002	SRWMD	Water Well	30	29	04.99	83	45	27.00	Lamont	80	180
323	10716011	SRWMD	Water Well	30	29	04.59	83	37	57.20	Greenville	115	82
324	10313001	SRWMD	Water Well	30	29	14.99	83	58	47.00	Waukeenah	177	200
325	10814001	SRWMD	Water Well	30	29	13.99	83	30	08.99	Greenville NE	117	118
326	10717001	SRWMD	Water Well	30	29	18.89	83	38	29.00	Greenville	91	175
327	10513001	SRWMD	Water Well	30	29	27.99	83	47	02.00	Lamont	85	170
328	10415001	SRWMD	Water Well	30	29	28.99	83	55	01.00	Waukeenah	190	203
329	10512001	SRWMD	Water Well	30	29	31.69	83	46	50.47	Lamont	80	155
330	10507001	SRWMD	Water Well	30	29	37.99	83	52	06.00	Lamont	125	280
331	10711004	SRWMD	Water Well	30	29	49.99	83	35	59.00	Greenville NE	120	135

*NOTE: Suwannee River Water Management District (SRWMD) **Archived ID #** is the well's township, range, and section location. The format is as follows: + or – indicates township north (+) versus south (-); there is no need to include an east / west indicator for the range, as the entire SRWMD is east of the Prime Meridian. Following the +/- are 6 digits representing the township, range, and section (TTRRSS), and finally a 3 digit unique identifier assigned consecutively to each well within a given section to differentiate wells with the same +/- and 6 digit number.

For example: **-031224004** means Township 03 South, Range 12 East, Section 24, unique well 004.