

When you don't have rocks: Mapping vegetation to determine soils and using SoilWeb to “ground truth”

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College policy: Travel time must fall within the time that class is scheduled to meet.

- Nearest outcrop is 50 minutes away if traffic is good.
- Small outcrop of limestone at mouth of spring.



Ocala Limestone
Rock Springs, Kelly Park, FL



St. Augustine Coquina
Washington Oak Gardens State Park, FL

Much of central Florida and Valencia College is situated on relict dunes of quartz sand.

Larger areas of sand are exposed in:

- Sand quarries (60 minutes away if traffic is good)
- Areas of slope erosion (dependent on new sink hole occurrence or erosion of existing ones)
- Construction sites (dependent on campus expansion)



One way to introduce students to geologic mapping is to have them map vegetation as a proxy for the soils that form in the quartz sands.

Tibet-Butler Nature Preserve

- in western Orlando (30 minutes from campus)
- natural area, little to no human alteration or development
- variety of distinct ecosystems – distinctive vegetation and soils



Natural communities including scrub, pine flatwoods, bay and cypress swamps, a cypress dome, and freshwater marshes.



scrub



pine flatwoods



bay swamp



freshwater marsh

- Students work in teams of 2 or 3
- Use data-logging app with I pads and GPS sensors to record locations of changes in vegetation



- Changes are notated with a waypoint



- Different species are photo documented



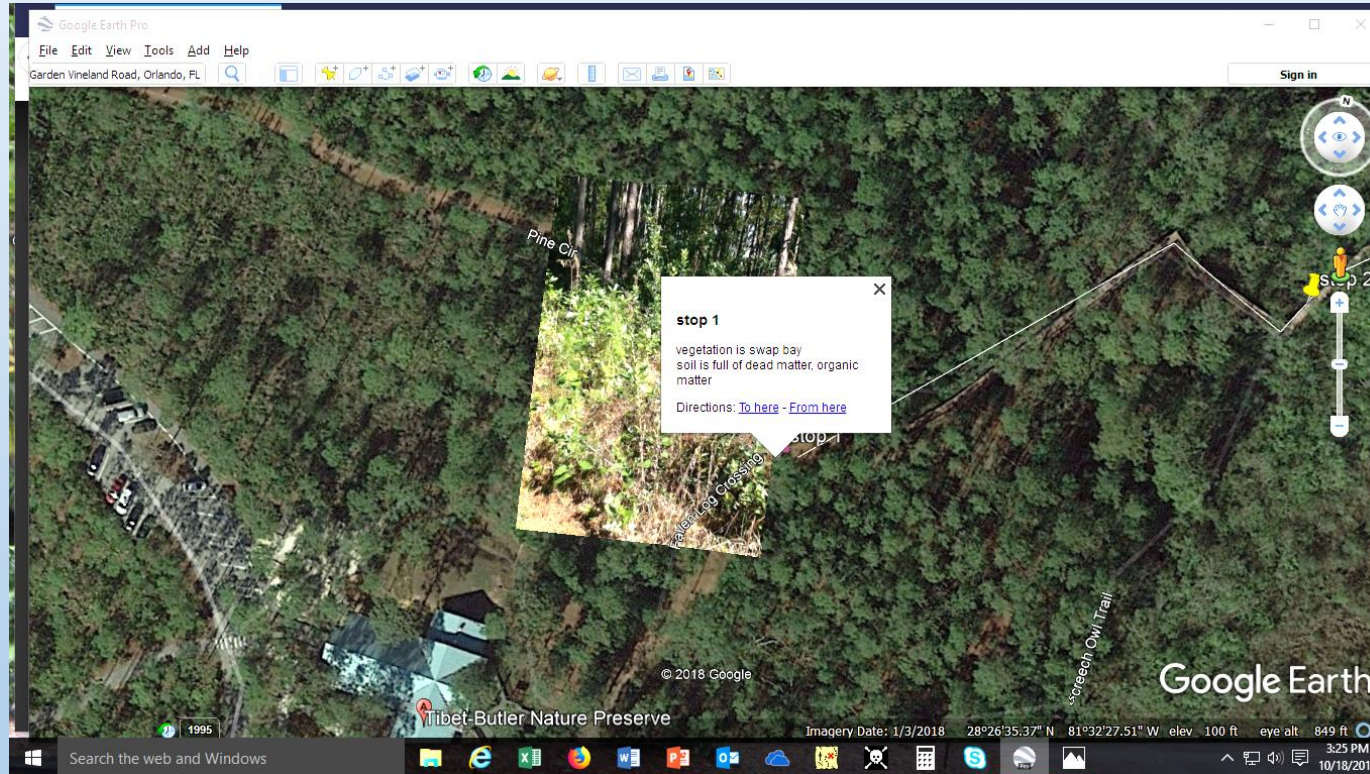
Dahoon holly

- Soil sampled, noting color and composition (percent quartz and percent organic material).



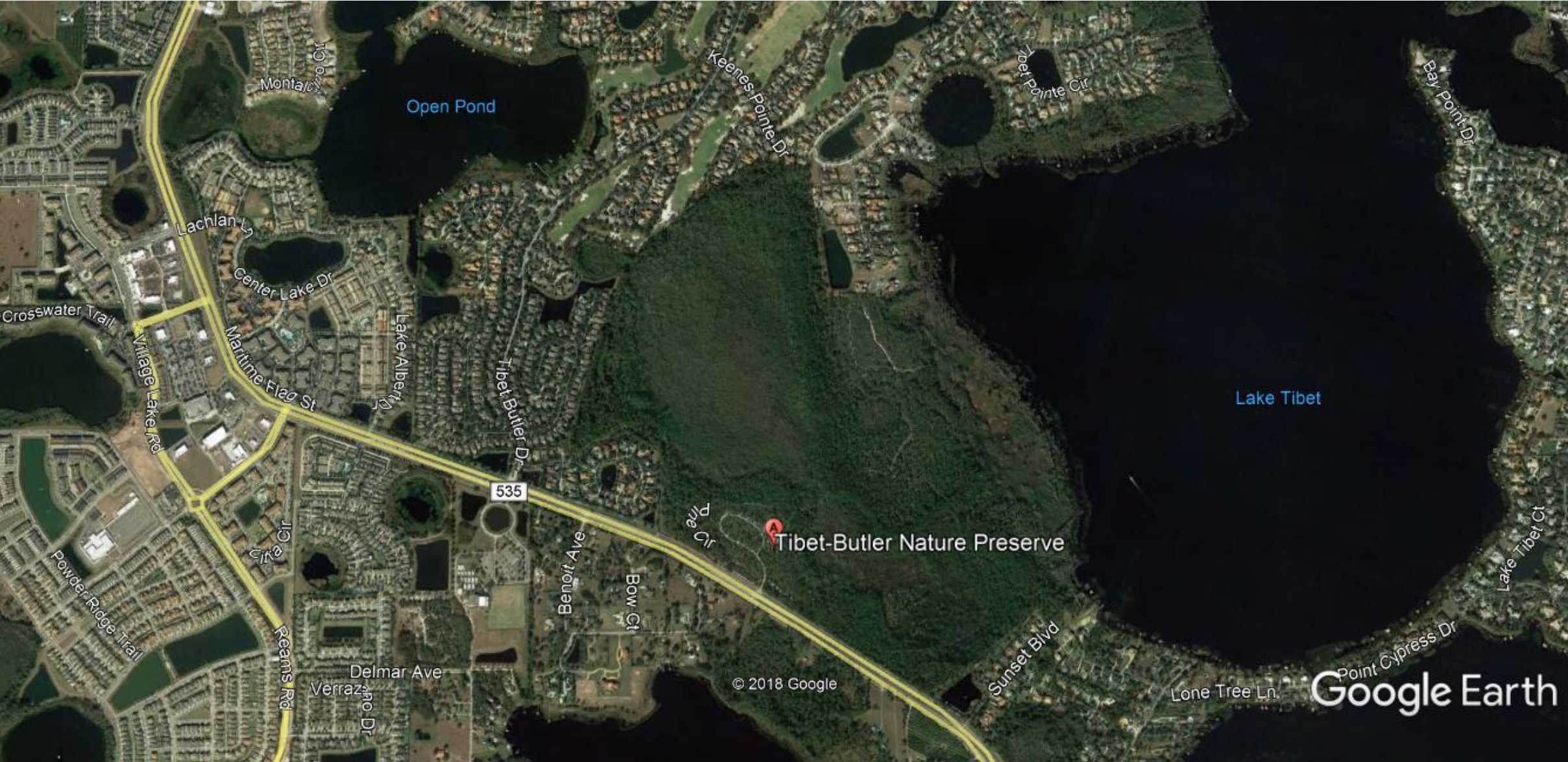
(But sampling is not always possible)

- Results of GPS data saved as KML files (Google Earth)
- Used to produce annotated maps of changes in natural communities and soils along the trails.

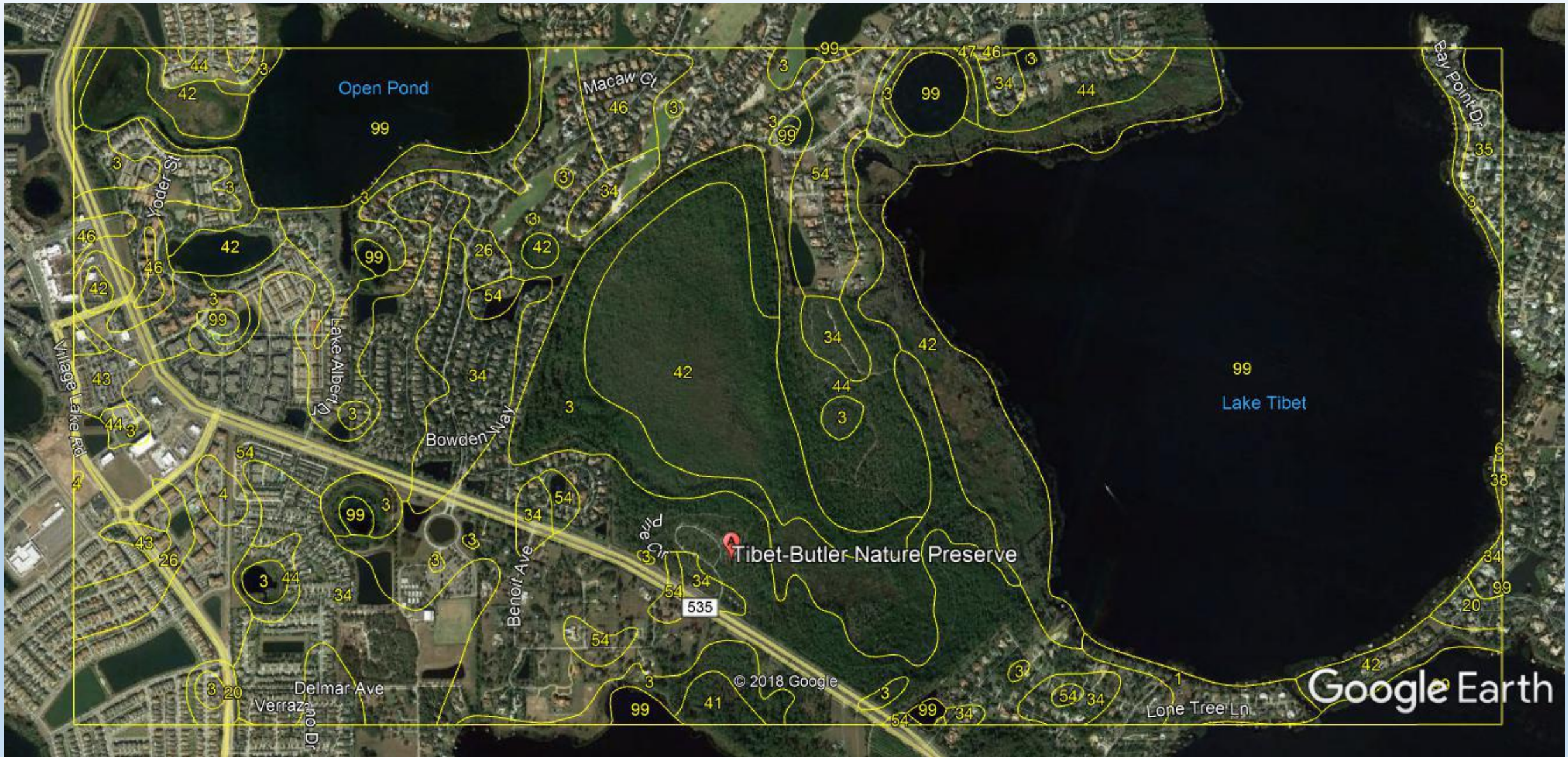


- Finally, students compare their results (KML data) with USDA SoilWeb (Google Earth) maps.

Google Earth Map of Tibet-Butler Nature Preserve



Google Earth Map of Tibet-Butler Nature Preserve with SoilWeb Overlay



Soil profile for Sanibel Muck

Google Earth Pro

en Vineland Road, Orlando, FL

SSURGO | f1095, f1607 | 0.37 seconds | 0.16 cache ratio | BBOX:(-81.5625, 28.4406) (-81.5201, 28.4581) | 1997 acres

Sanibel muck (SSURGO Export: 2018-09-13)

Components within map unit 323157

Soil Type	Percentage	Horizon	Depth (cm)
Sanibel (65%) Histic Humaquepts		Oa1	0 - 18
		Oa2	18 - 23
		C1	23 - 48
		C2	48 - 175
Sanibel (25%) Histic Humaquepts		Oa1	0 - 18
		Oa2	18 - 23
		C2	48 - 175
Hontoon (5%) Typic Medisaprists		Oe	0 - 13
		Oa1	13 - 36
		Oa2	36 - 152
		Oa3	152 - 165
Samsula (5%) Teric Medisaprists		Oa1	0 - 23
		Oa2	23 - 91
		Cg1	91 - 117
		Cg2	117 - 140

depressions
marine terraces

Block Diagrams: [c/o NCSS Job Aids](#)
note that these diagrams may be from multiple survey areas

- [FL-2012-04-25-30](#)

Imagery Date: 1/3/2018 28°26'58.25" N 81°31'22.47" W elev 99 ft eye alt 10280 ft

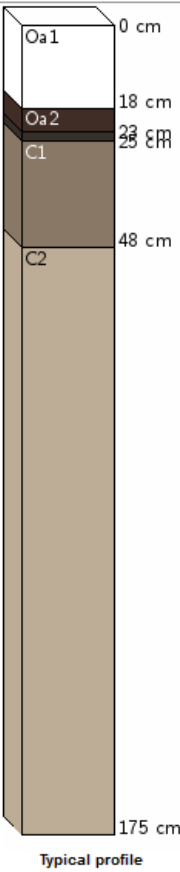
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Soil Characteristics and Related Physiography for Sanibel Muck

Google Earth Pro

File Edit View Tools Add Help

Back to Google Earth https://casoilresource.lawr.ucdavis.edu/soil_web/ssurgo.php - SoilWeb Open in Firefox



Soil profile diagram showing horizons Oa1, Oa2, C1, and C2 with depths from 0 to 175 cm. Typical profile.

Soil Taxonomy

Order:	Inceptisols
Suborder:	Aquepts [Map of Suborders]
Greatgroup:	Humaquepts
Subgroup:	Histic Humaquepts
Family:	Sandy, siliceous, hyperthermic Histic Humaquepts
Soil Series:	Sanibel (Link to OSD) (Soil Series Explorer)
Data:	[Lab Data]
Raw Data	Component All Horizons

Land Classification

Storie Index	NOT RATED
Land Capability Class [non-irrigated]	7-w
Land Capability Class [irrigated]	-
Ecological Site Description	n/a
Forage Suitability Group	n/a

Soil Suitability Ratings

Waste Related	Engineering
Urban/Recreational	Irrigation
Wildlife	Runoff

Hydraulic and Erosion Ratings

Wind Erodibility Group	8
Wind Erodibility Index	0
T Erosion Factor	1
Runoff	Negligible
Drainage	Very poorly drained
Hydric Rating / Hydrologic Group	Yes () [Group A/D]
Parent Material:	thin organic material over sandy marine deposits
Total Plant Available Water (cm):	22.65

Geomorphology

Landform	marshes
Landform	marine terraces
Landscape	coastal plains

Windows Search the web and Windows

2:28 PM 10/18/2018

SoilWeb uses (and links to) soil orders information from University of Idaho website

The screenshot shows a web browser window with the URL <https://www.uidaho.edu/cals/soil-orders>. The page is titled "The Twelve Soil Orders" and features the University of Idaho logo and navigation menus. A sidebar on the left lists the twelve soil orders: Alfisols, Andisols, Aridisols, Entisols, Gelisols, Histosols, Inceptisols, Mollisols, Oxisols, Spodosols, Ultisols, and Vertisols. The main content area displays a large image of soil with the text "Alfisols" and a "LEARN MORE" button. A yellow button labeled "I WANT TO" is also visible. The page footer includes a breadcrumb trail: "COLLEGE OF AGRICULTURAL AND LIFE SCIENCES > TWELVE SOIL ORDERS". The Windows taskbar at the bottom shows the time as 2:29 PM on 10/18/2018.

Ecosystems Information for Sanibel Muck

SoilWeb

https://casoilresource.lawr.ucdavis.edu/soil_web/ssurgo.php?action=explain_com

Plants

Symbol	Scientific Name	Common Name	Range Prod.
AMMU2	<i>Amphicarpum muehlenbergianum</i>	blue maidencane	
SPBA	<i>Spartina bakeri</i>	sand cordgrass	
PAHE2	<i>Panicum hemitomon</i>	maidencane	
ANVIG2	<i>Andropogon virginicus</i> var. <i>glaucus</i>	chalky bluestem	
PATE3	<i>Panicum tenerum</i>	bluejoint panicum	

Forest Productivity

Symbol	Common Name	Site Index	Site Index Curve Number	Productivity (cu.ft. / ac. / yr.)
ACRU	red maple			
LIST2	sweetgum			
NYSY	blackgum			
TADIN	poncycypress	75		43

Soil profile charts showing properties at depths: 0cm, 10cm, 51cm, 102cm, 152cm, 203cm.

Properties shown in charts:

- Organic Matter (%)
- Percent Clay
- Percent Sand
- K_{sat} (mm/hr)
- pH (1:1 H₂O)
- K_r Factor
- EC (dS/m)
- SAR
- CaCO₃ (%)
- Gypsum (%)
- CEC at pH7 (cmol+ / kg soil)
- Linear Extensibility (%)

Windows taskbar: Search the web and Windows, 2:30 PM 10/18/2018

This page includes the names of vegetation associated with this soil type.

Additional pages provide land use-relevant information.

Agriculture		
AGR - Pesticide Loss Potential-Leaching	Very limited	[1 - 1]
AGR - Pesticide Loss Potential-Soil Surface Runoff	Not limited	[0 - 0]
Irrigation		
WMS - Excavated Ponds (Aquifer-fed)	Very limited	[1 - 1]
WMS - Embankments, Dikes, and Levees	Very limited	[1 - 1]
WMS - Irrigation, Surface (level)	Very limited	[1 - 1]
WMS - Irrigation, Surface (graded)	Very limited	[1 - 1]
WMS - Irrigation, Micro (above ground)	Very limited	[1 - 1]
WMS - Irrigation, Sprinkler (close spaced outlet drops)	Very limited	[1 - 1]
WMS - Irrigation, Sprinkler (general)	Very limited	[1 - 1]
WMS - Irrigation, General	Very limited	[1 - 1]
WMS - Subsurface Water Management, System Performance	Very limited	[1 - 1]
WMS - Subsurface Water Management, System Installation	Somewhat limited	[0.01 - 0.01]
WMS - Subsurface Water Management, Outflow Quality	Very limited	[1 - 1]
WMS - Surface Water Management, System	Somewhat limited	[0.5 - 0.5]
WMS - Irrigation, Micro (subsurface drip)	Very limited	[1 - 1]
WMS - Pond Reservoir Area	Very limited	[1 - 1]
Forest		
FOR - Potential Fire Damage Hazard	High	[0 - 1]
FOR - Potential Seedling Mortality	High	[1 - 1]
FOR - Potential Seedling Mortality (FL)	High	[1 - 1]
FOR - Potential Erosion Hazard (Off-Road/Off-Trail)	Slight	[0 - 0]
FOR - Soil Rutting Hazard	Severe	[1 - 1]
FOR - Road Suitability (Natural Surface)	Poorly suited	[1 - 1]
FOR - Potential Erosion Hazard (Road/Trail)	Slight	[0 - 0]
FOR - Log Landing Suitability	Poorly suited	[1 - 1]
FOR - Construction Limitations for Haul Roads/Log Landings	Severe	[1 - 1]
FOR - Harvest Equipment Operability	Poorly suited	[1 - 1]
FOR - Mechanical Site Preparation (Surface)	Poorly suited	[0.5 - 0.5]
FOR (USFS) - Road Construction/Maintenance (Natural Surface)	Poorly suited	[0 - 0]
FOR - Mechanical Site Preparation (Deep)	Unsuited	[1 - 1]

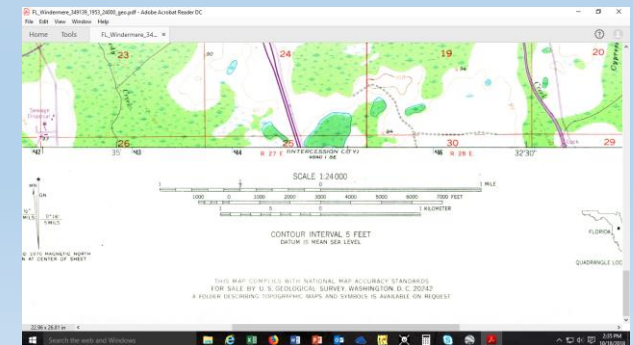
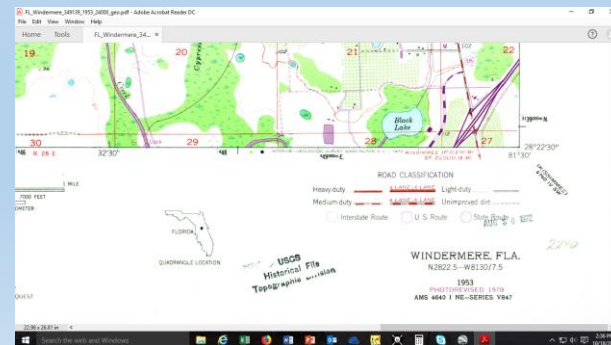
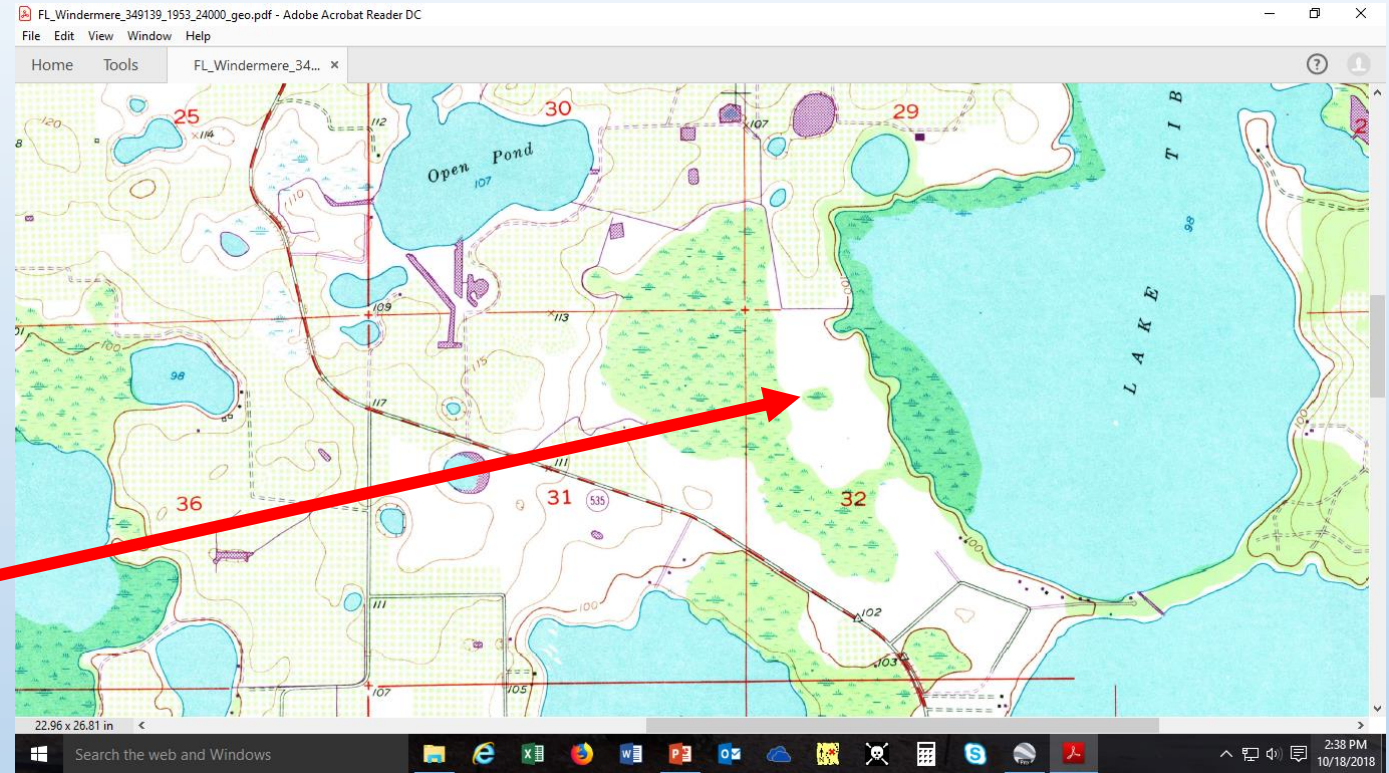
Waste Related		
AWM - Manure and Food Processing Waste	Very limited	[1 - 1]
AWM - Land Application of Municipal Sewage Sludge	Very limited	[1 - 1]
AWM - Rapid Infiltration Disposal of Wastewater	Very limited	[1 - 1]
AWM - Irrigation Disposal of Wastewater	Very limited	[1 - 1]
AWM - Slow Rate Process Treatment of Wastewater	Very limited	[1 - 1]
AWM - Overland Flow Process Treatment of Wastewater	Very limited	[1 - 1]
Engineering		
ENG - Construction Materials; Roadfill	Poor	[0 - 0]
ENG - Construction Materials; Gravel Source	Poor	[0 - 0]
ENG - Construction Materials; Sand Source	Fair	[0.25 - 0.25]
ENG - Construction Materials; Topsoil	Poor	[0 - 0]
ENG - Construction Materials; Reclamation	Fair	[0 - 0.5]
ENG - Septic Tank Absorption Fields (FL)	Severely limited	[1 - 1]
ENG - Septic Tank Absorption Fields	Very limited	[1 - 1]
ENG - Unpaved Local Roads and Streets	Very limited	[1 - 1]
ENG - Shallow Excavations	Very limited	[1 - 1]
ENG - Dwellings W/O Basements	Very limited	[1 - 1]
ENG - Dwellings With Basements	Very limited	[1 - 1]
ENG - Small Commercial Buildings	Very limited	[1 - 1]
ENG - Local Roads and Streets	Very limited	[1 - 1]
ENG - Lawn, Landscape, Golf Fairway	Very limited	[1 - 1]
ENG - Sanitary Landfill (Trench)	Very limited	[1 - 1]
ENG - Sewage Lagoons	Very limited	[1 - 1]
ENG - Sanitary Landfill (Area)	Very limited	[1 - 1]
ENG - Daily Cover for Landfill	Very limited	[1 - 1]
Urban / Recreational		
URBREC - Off-Road Motorcycle Trails	Very limited	[1 - 1]
URBREC - Camp Areas	Very limited	[1 - 1]
URBREC - Picnic Areas	Very limited	[1 - 1]
URBREC - Paths and Trails	Very limited	[1 - 1]
URBREC - Playgrounds	Very limited	[1 - 1]

Urban / Recreational		
URBREC - Off-Road Motorcycle Trails	Very limited	[1 - 1]
URBREC - Camp Areas	Very limited	[1 - 1]
URBREC - Picnic Areas	Very limited	[1 - 1]
URBREC - Paths and Trails	Very limited	[1 - 1]
URBREC - Playgrounds	Very limited	[1 - 1]
DHS		
DHS - Rubble and Debris Disposal, Large-Scale Event	Severely limited	[1 - 1]
DHS - Suitability for Clay Liner Material	Poor	[0 - 0]
DHS - Site for Composting Facility - Surface	Very limited	[1 - 1]
DHS - Site for Composting Facility - Subsurface	Very limited	[1 - 1]
DHS - Suitability for Composting Medium and Final Cover	Poor	[0 - 0]
DHS - Potential for Radioactive Sequestration	Very low sequestration potential	[0 - 0]
DHS - Potential for Radioactive Bioaccumulation	High bioaccumulation potential	[1 - 1]
DHS - Catastrophic Mortality, Large Animal Disposal, Pit	Very limited	[1 - 1]
DHS - Catastrophic Mortality, Large Animal Disposal, Trench	Very limited	[1 - 1]
DHS - Catastrophic Event, Large Animal Mortality, Burial	Very severely limited	[1 - 1]
DHS - Catastrophic Event, Large Animal Mortality, Incinerate	Very severely limited	[1 - 1]
Wildlife		
WLF - Gopher Tortoise Burrowing Suitability	Unsuitable	[0 - 0]
Surface Runoff		

Students are provided with several electronic resources that are downloaded to Ipads before leaving for the preserve.



Older topographic map shows pre-development physiographic and topographic information, including location of cypress dome.



Resource available to students but used to create an abbreviated guide



FLORIDA NATURAL AREAS INVENTORY
**GUIDE TO THE
 NATURAL COMMUNITIES OF FLORIDA**
 2010 EDITION



FRESHWATER FORESTED WETLANDS
CYPRESS/TUPELO – DOME SWAMP
 GLOBAL AND STATE RANK G4/S4

DESCRIPTION

Dome swamp is an isolated, forested, depression wetland occurring within a fire-maintained community such as mesic flatwoods. These swamps are generally small, but may also be large and shallow. The characteristic dome shape is created by smaller trees that grow in the shallower waters of the outer edge, while taller trees grow in the deeper water in the interior of the swamp. Pond cypress (*Taxodium ascendens*) often dominates, but swamp tupelo (*Nyssa sylvatica* var. *biflora*), may also form pure stands or occur as a co-dominant. Other canopy or sub-canopy species include red maple (*Acer rubrum*), dahoon (*Ilex cassine*), swamp bay (*Persea palustris*), slash pine (*Pinus elliotii*), sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and, in South Florida, cocoplum (*Chrysobalanus icaco*) and pond apple (*Ardisia glabra*). Shrubs are typically sparse to moderate, but often are absent in dome swamps with a high fire frequency or dense in swamps where fire has long been absent. Shrubs common in dome swamps include Virginia willow (*Ita virginica*), fetterbush (*Lyonia lucida*), common buttonbush

(*Cephalanthus occidentalis*), coastalplain willow (*Salix caroliniana*), wax myrtle (*Myrica cerifera*), uti (*Cyrtia racemiflora*), and St. John's wort (*Hypericum* spp.). Herbaceous species can be dense or absent and include a wide variety of ferns, graminoids, and herbs including Virginia chain fern (*Woodswardia virginica*), royal fern (*Osmunda regalis* var. *spectabilis*), cinnamon fern (*Osmunda cinnamomea*), toothed midsorus fern (*Blechnum serrulatum*), maiden-cane (*Panicum hemitomon*), sawgrass (*Cladium jamaicense*), various species of beaksedge (*Ilypnispongia* spp.), lizard's tail (*Saururus cernuus*), Carolina reedcocks (*Lachnanthes caroliniana*), taperleaf waterhorebound (*Lycopus rubellus*), false nettle (*Boehmeria cylindrica*), and knotweeds (*Polygonum* spp.). Sphagnum moss (*Sphagnum* spp.) often occurs in patches where the soil is saturated but not flooded.²⁰⁰ Vines such as eastern poison ivy (*Toxicodendron radicans*), white twinevine (*Sarcostemma clausum*), laurel greentier (*Smitilax laurifolia*), epiphytes such as Spanish moss (*Tillandsia usneoides*), several species of wild pine (*Tillandsia* spp.), and orchids can be common in dome swamps. The center of the dome swamp contains the largest cypress trees and the understorey can be open with deeper water



Three Lakes Wildlife Management Area (Ocala County) Celia Stein

FRESHWATER FORESTED WETLANDS - CYPRESS/TUPELO - DOME SWAMP

and floating and emergent species such as alligatorflag (*Thalia geniculata*), big floatingheart (*Nymphoides aquatica*), floating water spangles (*Sagittaria nitens*), duckweeds (*Lemna*, *Spirodela*, and/or *Landoltia*), and bulltongue arrowhead (*Sagittaria lancifolia*).

for.^{201,202} The normal hydroperiod for dome swamps is 180 to 270 days per year,²⁰³ with water being deepest, and remaining longest, near the center of the dome creating a larger buildup of peat there. Ewel¹⁹⁸ suggests the most likely reason for the dome profile, where trees grow faster in the center of the dome swamp¹⁹⁸ is due to deeper peat and lower competition from other species.

Dome swamps are most often found on flat terraces, where they develop when the overlying sand has slumped into a depression in the underlying limestone, creating a rounded depression connected to a shallow water table. In uplands with clay subsoils, dome swamps may occupy depressions over a perched water table. Soils in dome swamps are variable²⁰⁴ but are most often composed of a layer of peat, which may be thin or absent at the periphery, becoming thicker toward the center of the dome.²⁰⁵ This peat layer is generally underlain with acidic sands or marl and then limestone or a clay lens. In South Florida, dome swamps also occur on peat directly overlying limestone.²⁰⁶ Common soil types include Bladen, Coxville, and Bayboro.

Dome swamps experience a wide range of water level variation.⁴¹²² Prolonged dry periods as well as prolonged wet periods can have a significant effect on cypress regeneration. Although adult cypress trees are tolerant of extended inundation, their seeds cannot germinate under water and cypress seedlings may not survive if submerged.^{204,42}

CHARACTERISTIC SET OF SPECIES

Pond cypress, swamp tupelo

RARE SPECIES

Dome swamps can host a suite of rare species, including pondspice (*Litsea aestivalis*), panhandle spiderly (*Hymenocallis henryae*), and small-flowered meadowbeauty (*Rhexia parviflora*) in North Florida, and many-flowered catcrops (*Cataprepis floridana*) in South Florida. Dome swamps provide important habitat for many wildlife species,⁵⁰ including several rare animals. They provide critical breeding habitat for flatwoods salamanders (*Ambystoma cingulatum* and *Ambystoma taylori*) and are important roosting sites for wading birds such as white ibis (*Eudicinus albus*) and wood stork (*Mycteria americana*).

Fire is essential for maintaining the structure and the species composition of a dome swamp community.¹⁹⁹ Without periodic fires cypress may become less dominant as hardwood or bay canopy species increase and peat accumulates. Cypress have fairly thick, fire-resistant bark and are tolerant of light surface fires, but catastrophic fires burning into the peat can kill cypress trees, especially when fire has long been absent. The consumption of muck fuels from such a catastrophic wildfire can lower the ground surface and transform a dome swamp into a pond, wet prairie, or shrub bog. Fire frequency is generally greatest at the periphery of the dome and least in the interior, where long hydroperiods and deeper peat, and/or water, maintain high moisture levels.²⁰² The normal fire cycle might be as short as three to five years along the outer edge and as long as 100 to 150 years towards the center.²⁰⁷ The domed profile of these swamps may be partly attributable to this frequent, peripheral fire regime. Fire in a long-unburned dome swamp may result in higher cypress mortality in the center of the dome where fire burns through a deeper layer of accumulated peat and kills the cypress roots.²⁰⁷ Emergent marshes can develop in the center of such dome swamps.

RANGE

Dome swamps are most common in Central Florida but occur throughout the state, except in the Florida Keys. Similar cypress swamps in shallow depressions also occur throughout the southeastern coastal plain.²⁰

Topographic microsites can be important areas for tree, shrub, and herbaceous seedling recruitment in dome swamps.²⁰² Raised mats of root fiber and peat form hummocks at the bases of trees and shrubs, on old tree stumps, or among cypress knees, often creating microsites for more diverse and mesic species to establish above the water surface.²⁰⁰

NATURAL PROCESSES

Dome swamps are often formed when poor surface drainage causes water to move downward and dissolve the limestone bedrock. These depressions then fill in with peat or marl.²⁰⁸ Dome swamps derive much of their water through surficial runoff from surrounding uplands.²⁰⁹ Water levels in dome swamps naturally fluctuate with seasonal rainfall changes.¹⁰⁷ They may also be connected directly to the aquifer, where groundwater influences the hydrological regime, especially during periods of drought.¹⁰⁷ Dome swamps can function as reservoirs that recharge the aquifer

COMMUNITY VARIATIONS

Dome swamps are classically small (relative to other swamp types) and circular or elliptical in shape but can occur in any size or shape on the landscape, especially if the swamp is shallow. Dome swamps can completely surround, or appear as fringes, on the edge of basin or depression marshes. Some dome swamps have marsh vegetation or a small pond in their center, creating a "doughnut" appearance when viewed from above. Although most dome

Resource Guide Including Relevant Information for Tibet-Butler Nature Preserve

Tibet Butler Ecosystem Guide

HARDWOOD FORESTED UPLANDS – mesic or xeric forest dominated mainly by hardwood trees.

Xeric Hammock (G3/S3) – upland with deep sand substrate; xeric; primarily eastern Panhandle to central peninsula; rare or no fire; closed canopy of evergreen hardwoods; sand live oak, saw palmetto.



HIGH PINE AND SCRUB – hills with mesic or xeric woodlands or shrublands; canopy, if present, open and consisting of pine or a mixture of pine and deciduous hardwoods.

Scrub (G2/S2) – upland with deep sand substrate; xeric; statewide except extreme southern peninsula and Keys; occasional or rare fire (usually 5-20 years); open or dense sl canopy; sand pine and/or scrub oaks and/or Florida rosemary.

ROSEMARY SCRUB – on the driest ridge crests, particularly at the southern end of the Lal Panhandle barrier islands; occasional or rare fire (10-40 years); dominated by Florida rose bare sand visible between the shrubs.

SAND PINE SCRUB – on ridges throughout the state; rare fire (20-80 years); canopy of sa of the three shrubby oaks, or less commonly, Florida rosemary.



PINE FLATWOODS AND DRY PRAIRIE – mesic or hydric pine woodland or mesic sh substrates, may have a hard pan that impedes drainage.

Wet Flatwoods (G4/S4) – flatland with sand substrate; seasonally inundated; s peninsula and Keys; frequent fire (2-4 years for grassy wet flatwoods, 5-10 yea closed to open pine canopy with grassy or shrubby understory; slash pine, pon sweetbay, cabbage palm, wiregrass, toothache grass.

CUTTHROAT GRASS FLATWOODS – on and near the Lake Wales Ridge; frequen pines over cutthroat grass and/or other hydrophytic herbs.

CABBAGE PALM FLATWOODS – on shelly sand or where limestone is near the : peninsula; pine canopy over cabbage palm understory.



Mesic Flatwoods (G4/S4) – flatland with sand substrate; mesic; statewide except extreme southern peninsula and Keys; frequent fire (2-4 years); open pine canopy with a layer of low shrubs and herbs; longleaf pine and/or slash pine, saw palmetto, galberry, dwarf live oak, wiregrass.



Scrubby Flatwoods (G2/S2?) – flatland with sand substrate, xeric-mesic; statewide except extreme southern peninsula and Keys; occasional fire (5-15 years); widely scattered pine canopy over saw palmetto and scrub oaks; longleaf pine, sand live oak, myrtle oak, Chapman's oak, saw palmetto, wiregrass.



FRESHWATER NON-FORESTED WETLANDS – herbaceous or shrubby palustrine communities in floodplains or depressions; canopy trees, if present, very sparse and often stunted.

MARSHES – long hydroperiod; dominated by grasses, sedges, broadleaf emergents, floating aquatics, or shrubs.

Basin Marsh (G4/S3) – basin with peat or sand substrate; seasonally inundated; statewic occasional fire; largely herbaceous; maidencane, sawgrass, bulltongue arrowhead, picke cordgrass, white water lily, coastal/pain willow.

LAKE BOTTOM – marshes on former lake bottoms of "disappearing" lakes in northern Flc between lake and marsh when the sinkholes draining them are plugged or re-opened; w Lake Miccosukee and Paynes Prairie.



FRESHWATER FORESTED WETLANDS – floodplains or depressions dominated by hydrophytic tr

CYPRESS/TUPELO – dominated entirely by cypress or tupelo, or these species important in hydroperiod.

Dome Swamp (G4/S4) – small or large and shallow isolated depression in sand/marl/limest peat accumulating toward center; occurring within a fire-maintained community; seasonal statewide excluding Keys; occasional or rare fire, forested, canopy often tallest in center; pc tupelo.



Basin Swamp (G4/S3) – typically large basin wetland with peat substrate; seasonally inundated; still water or with water output; Panhandle to central peninsula; occasional or rare fire; forest of cypress/tupelo/mixed hardwoods; pond cypress, swamp tupelo.



HARDWOOD – dominated by a mix of hydrophytic hardwood trees; cypress or tupelo may be occasional or infrequent in the canopy; short hydroperiod.

Baygall (G4/S4) – slope or depression wetland with peat substrate; usually saturated and occasionally inundated; statewide excluding Keys; rare or no fire; closed canopy of evergreen trees; loblolly bay, sweetbay, swamp bay, tit, fetterbush.

BAY SWAMP – large or small peat filled depression; mainly eastern Panhandle to central peninsula; forested; dominated by bay species.



PONDS and LAKES (LACUSTRINE) – non-flowing wetlands of natural depressions lacking persistent emergent vegetation except around the perimeter.

Flatwoods/Prairie Lake (G4/S3) – generally shallow basin in flatlands with high water table; frequently with a broad littoral zone; still water or flow-through; sand or peat substrate; statewide except extreme southern peninsula and Keys; variable water chemistry, colored to clear, acidic to slightly alkaline, soft to moderately hard water with moderate mineral content (sodium, chloride, sulfate); oligo-mesotrophic to eutrophic.

Tibet-Butler Nature Preserve Field Assignment

Pre-trip materials include links to:

- Tibet-Butler Topographic Map
- Tibet-Butler Google Earth (GE) Maps and Soils
- *Native Plants Guide* with information about plants associated with the major ecosystems in central Florida.
- *Tibet-Butler Ecosystems Guide* with information about the major ecosystems in the preserve
- *Florida Soils* paper
- FNAI Natural Community Classification Guide

Tibet-Butler Nature Preserve Field Assignment

For this assignment, while on the field trip:

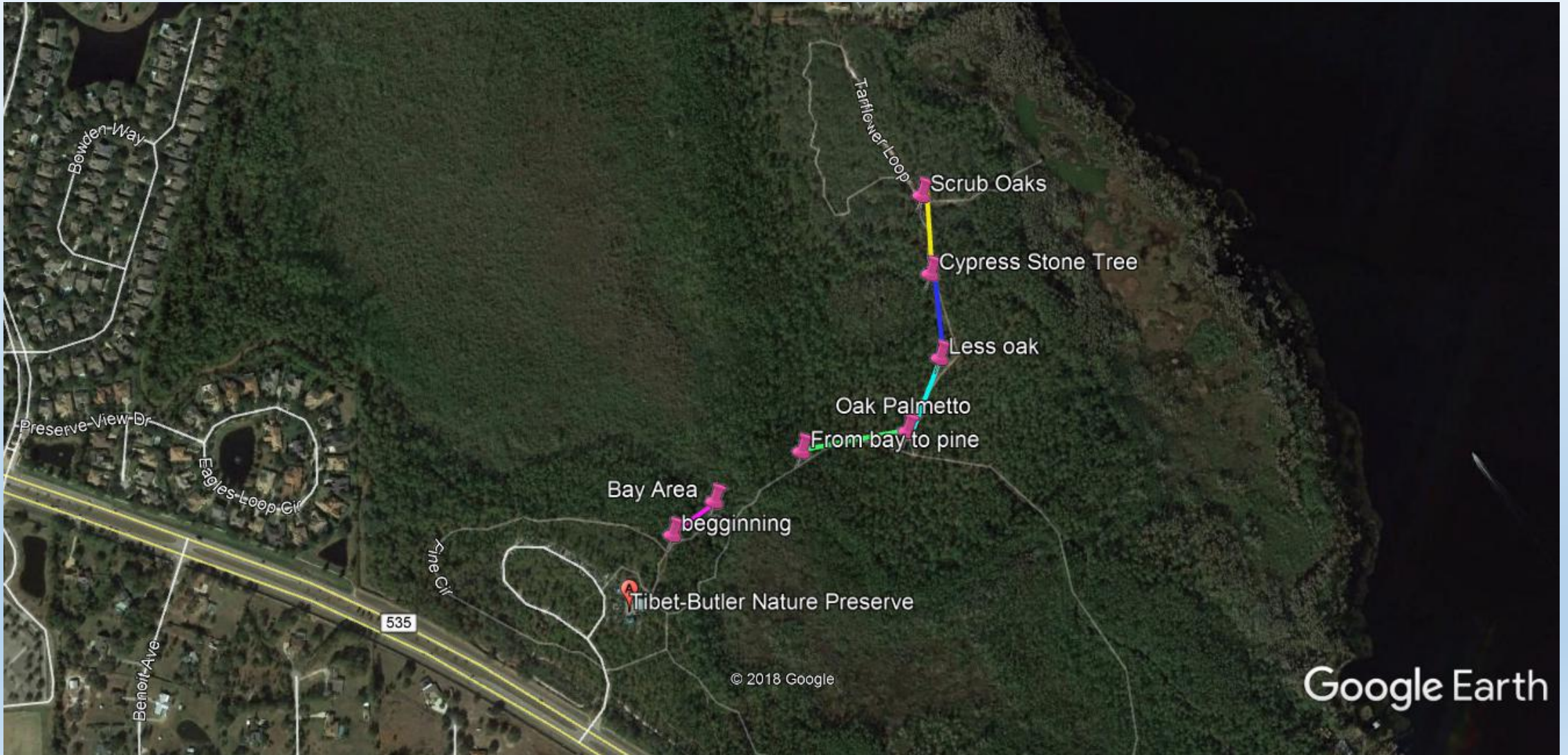
1. You will be taking notes and photos of the different types of vegetation and soils associated with the different ecosystems that we encounter.
2. You will be recording GPS waypoints at locations where you observe changes in vegetation and soil type.

Tibet-Butler Nature Preserve Field Assignment

At the end of the trip, you should:

1. Have images demonstrating your observations.
2. Have annotations of these images that makes clear what is being shown.
3. Be able to use your observations to identify specific ecosystems.
4. Be able to determine where the changes in ecosystems occur.
5. Be able to summarize your evidence that led to your conclusion (in #4).
6. Have an annotated map denoting the different ecosystems.

Placemarks and colored paths used to map the different natural communities based on vegetation types.



Photos of vegetation added as overlays and annotated to placemarks



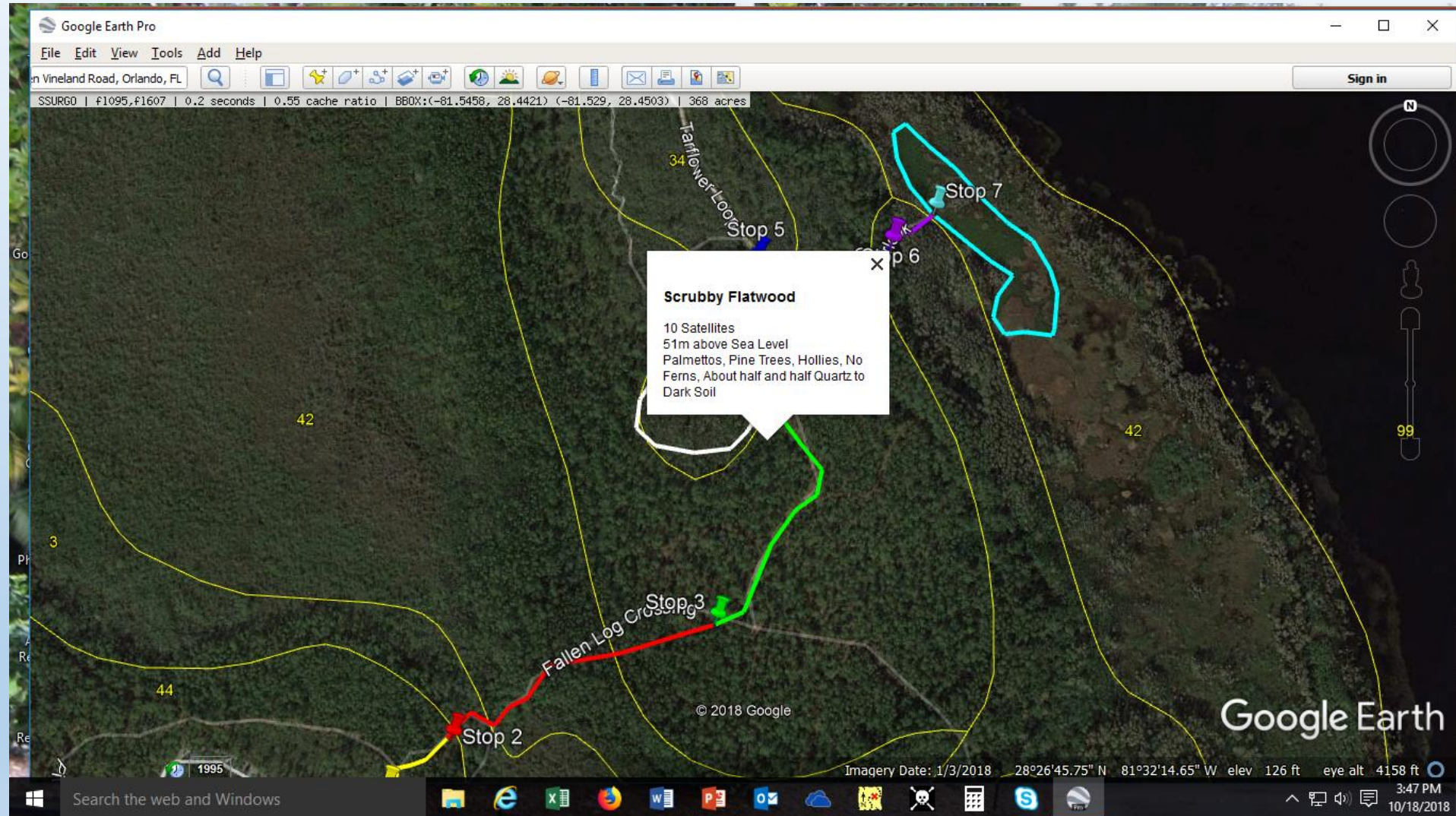
Vegetation photo with annotation.

The image is a screenshot of the Google Earth Pro application. The window title is "Google Earth Pro". The menu bar includes "File", "Edit", "View", "Tools", "Add", and "Help". The search bar contains "Garden Vineland Road, Orlando, FL". The main view is a satellite image of a forested area. A photo of a vegetation patch is overlaid on the map, with a white annotation box. The photo is labeled "Pine Cir" at the top and "Fallen Log Crossing" at the bottom. The annotation box contains the following text:

stop 1
vegetation is swap bay
soil is full of dead matter, organic
matter
Directions: [To here](#) - [From here](#)

The map also shows a path labeled "Creech Owl Trail" and a location marker for "Tibet-Butler Nature Preserve". The bottom status bar displays "© 2018 Google", "Imagery Date: 1/3/2018", "28°26'35.37" N 81°32'27.51" W", "elev 100 ft", "eye alt 849 ft", and the "Google Earth" logo. The Windows taskbar at the bottom shows the search bar and various application icons, with the system clock indicating "3:25 PM 10/18/2018".

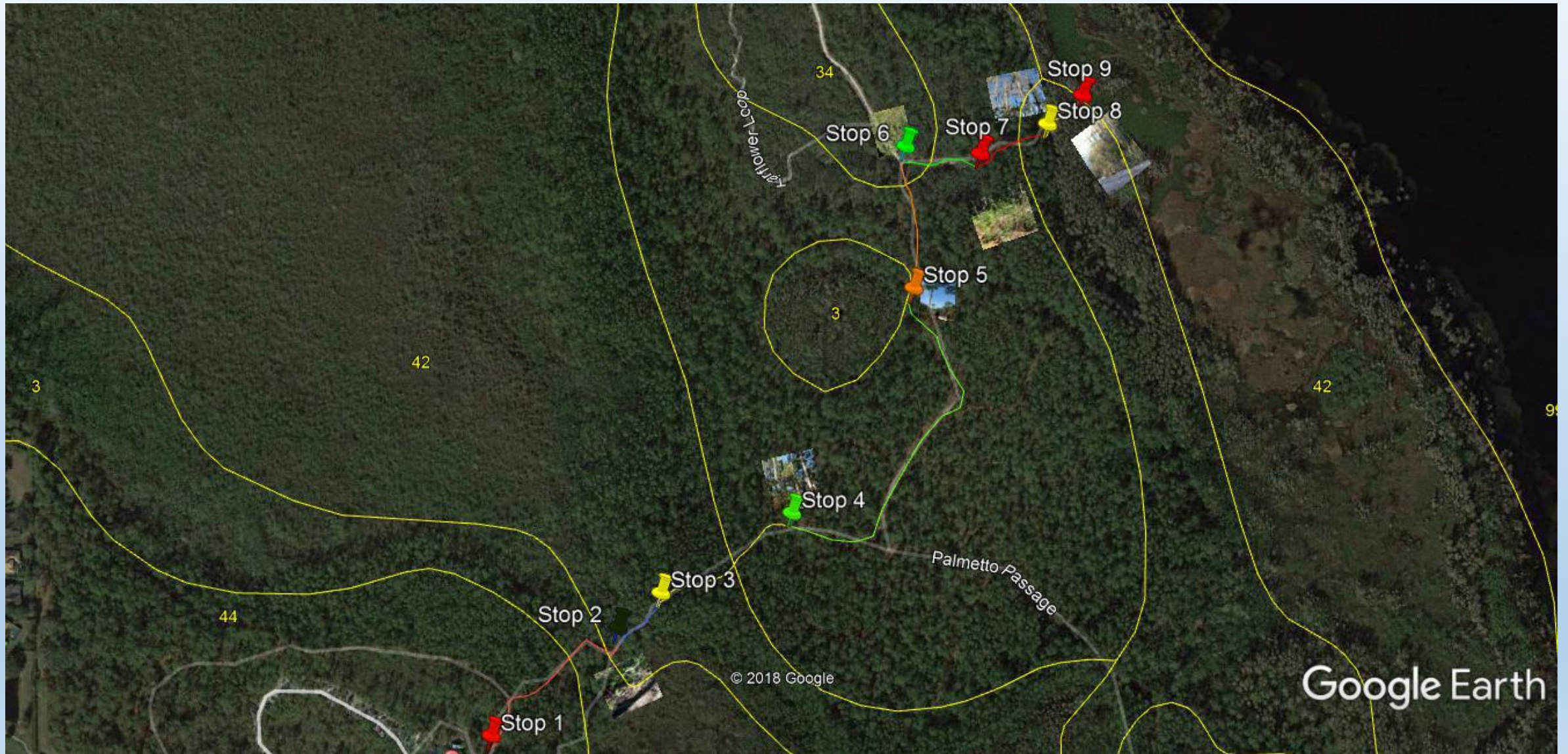
Vegetation, soil, and community information added to description box of placemarks



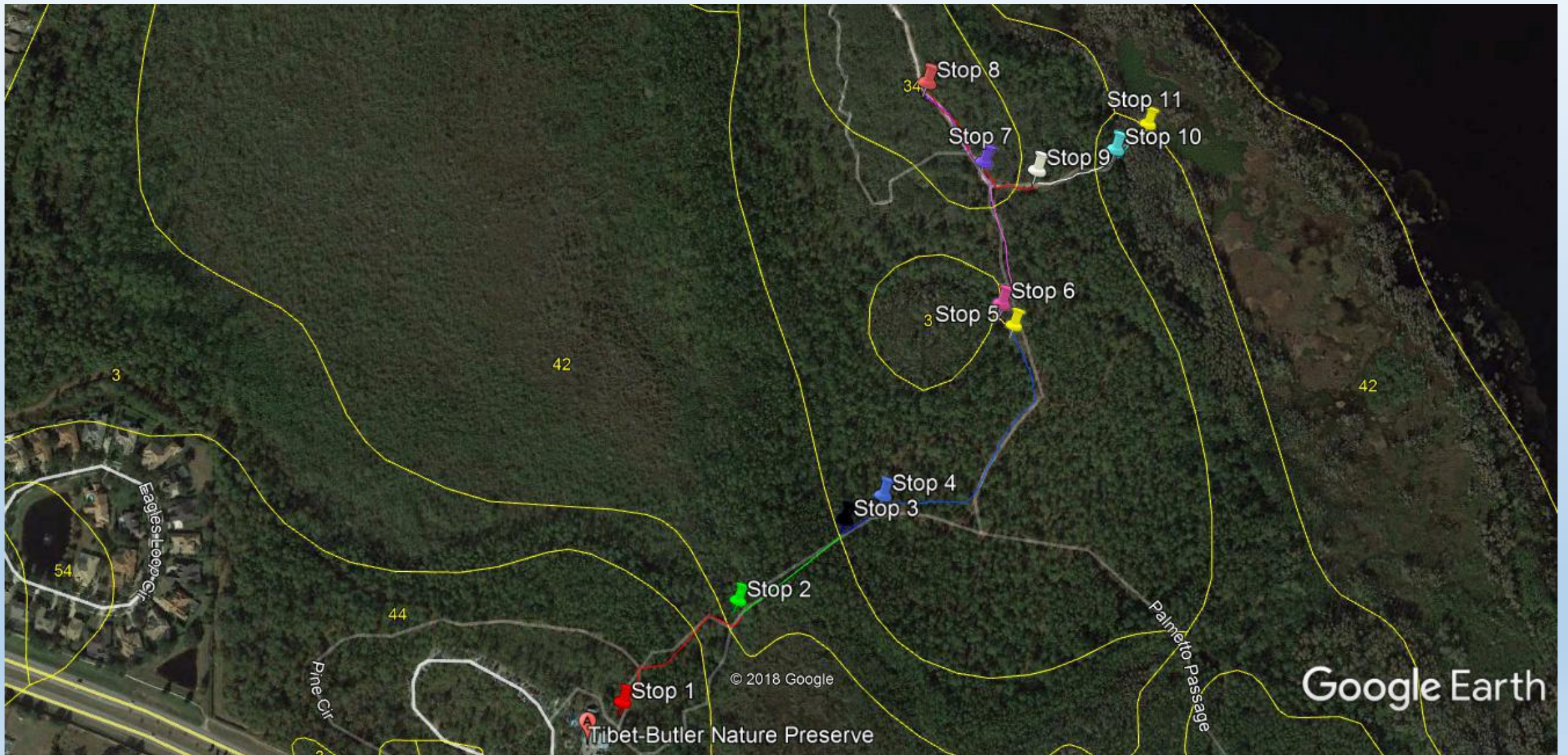
Examples of comparisons:

Students' maps with SoilWeb.

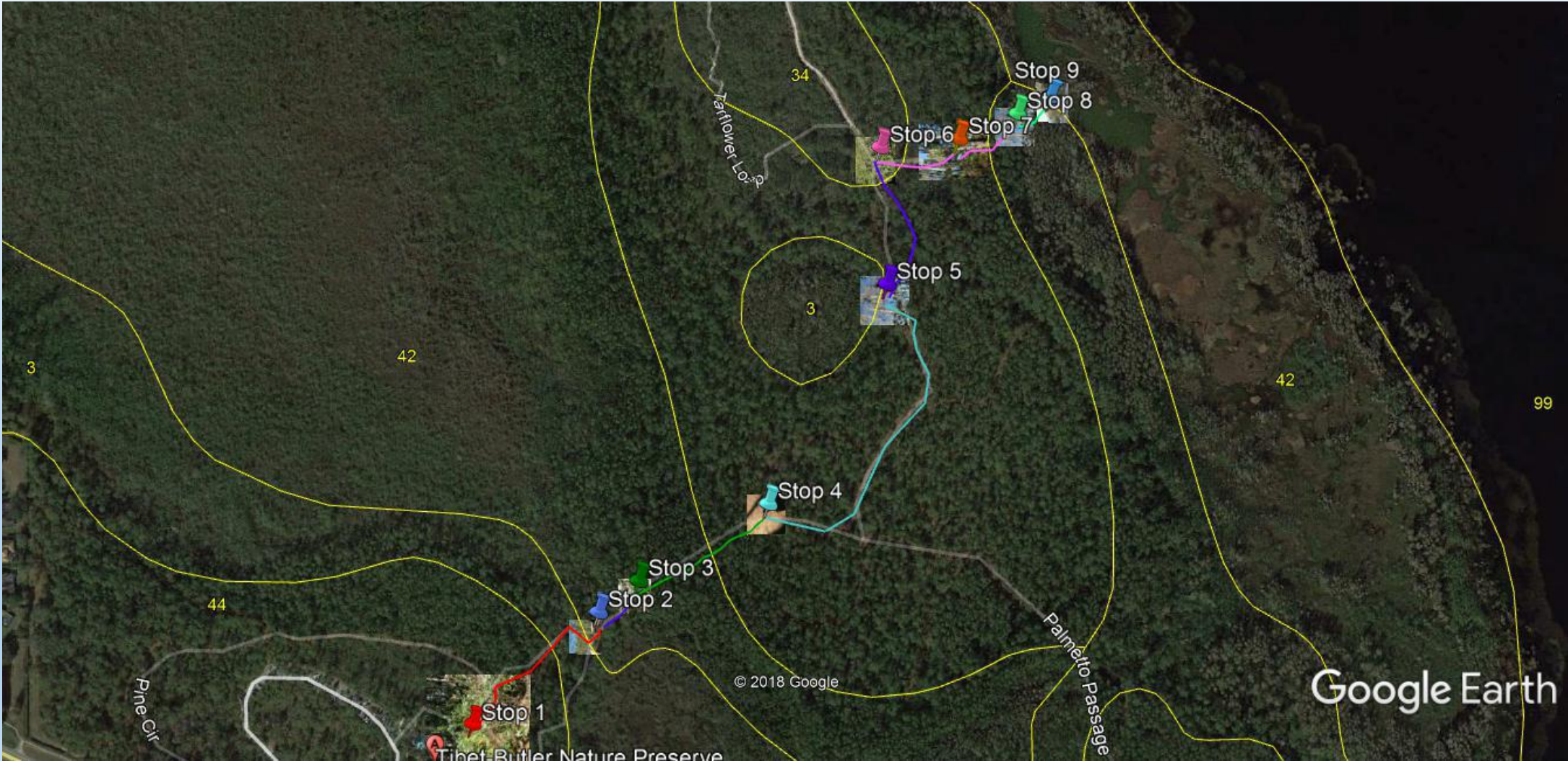
Comparison of student mapping with SoilWeb mapping



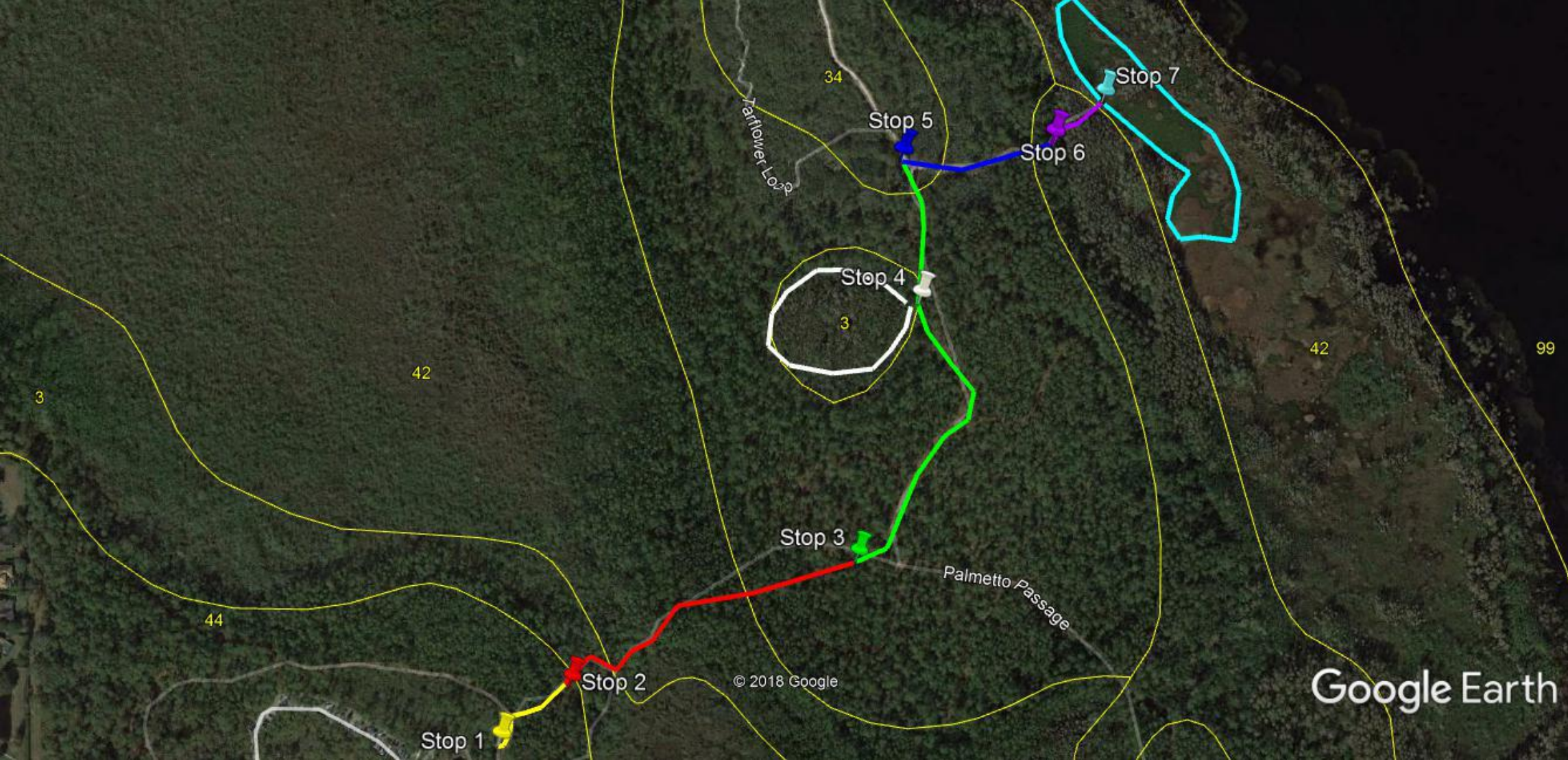
Comparison of student mapping with SoilWeb mapping



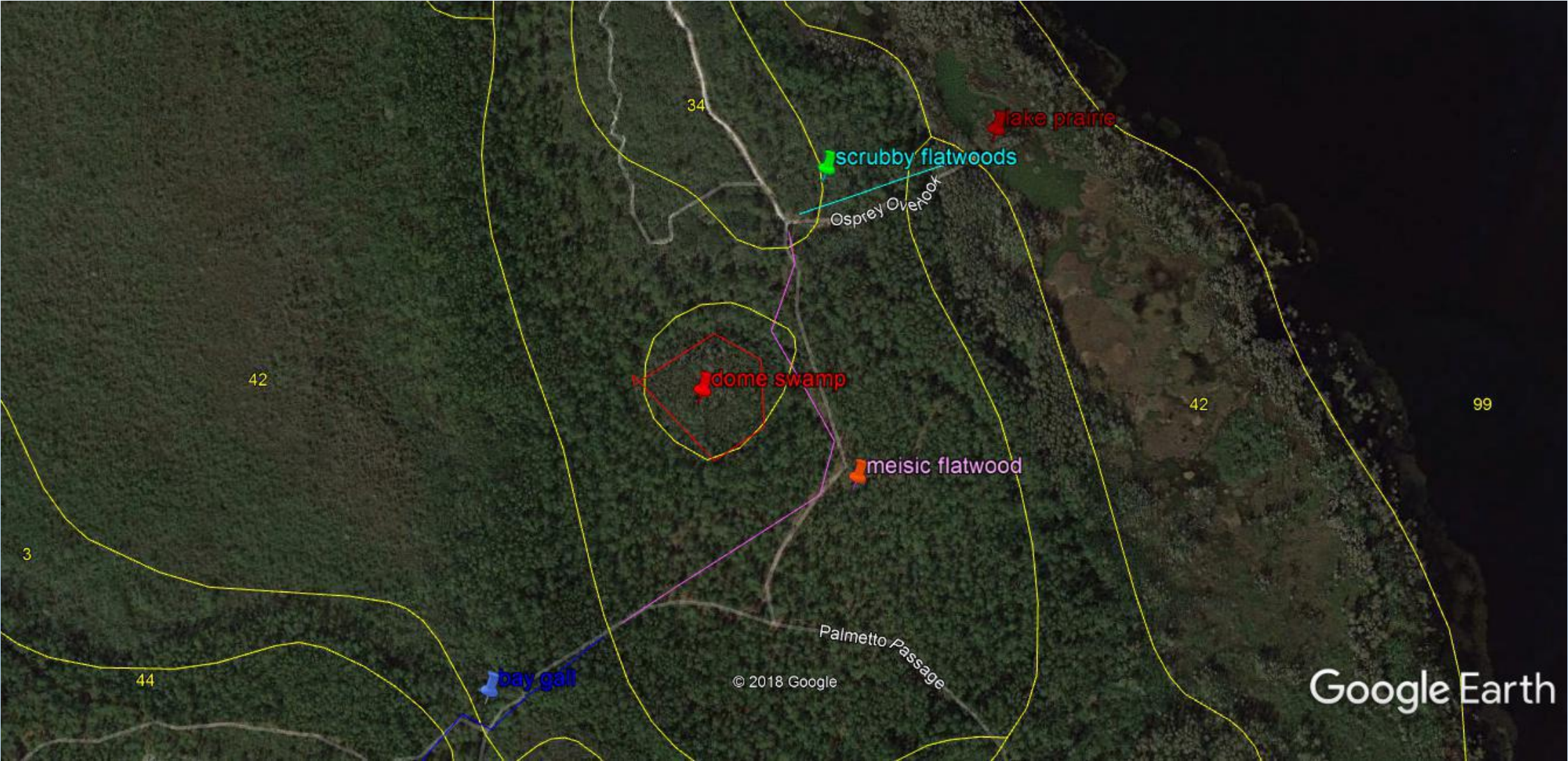
Comparison of student mapping with SoilWeb mapping



Comparison of student mapping with SoilWeb mapping



Comparison of student mapping with SoilWeb mapping



Changes in the trail can provide further lessons in observation



Bay or Cypress Swamp



Mesic Flatwoods



Scrub

Last Thoughts

