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.
• Students work in teams of 2 or 3
• Use data-logging app with Ipads 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.
Soil profile for Sanibel Muck
Soil Characteristics and Related Physiography for Sanibel Muck
SoilWeb uses (and links to) soil orders information from University of Idaho website
Ecosystems Information for Sanibel Muck

This page includes the names of vegetation associated with this soil type.
Additional pages provide land use-relevant information.
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
Resource Guide Including Relevant Information for Tibet-Butler Nature Preserve
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.
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