



# Connecticut Envirothon

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## SOILS OBJECTIVES

### ENVIROTHON STUDENTS WILL BE ABLE TO:

- Recognize soil as an important and dynamic resource
- Describe the role of soil in the ecosystem, including the hydrologic and nutrient cycles
- Recognize and understand the features of a soil profile
- Describe basic soil properties and soil formation factors
- Understand the landscapes, geologic history, and the origins of the parent materials of Connecticut soils
- Identify soil constituents (e.g. organic matter, sand, silt and clay)
- Determine basic soil characteristics (texture, structure, etc.) and their relation to soil properties
- Differentiate between soil horizons in a soil profile based upon the physical characteristics (color, texture, structure, redoximorphic features, etc.)
- Describe the influence of particle size upon soil chemical activity
- Recognize the characteristics of prime farmland and wetland soils
- Understand soil drainage classes and know how wetlands are defined in the state of Connecticut
- Differentiate between native forest soils, agricultural soils, wetland soils, and disturbed soils by observing a soil profile
- Understand soil water, its movement, storage, and uptake by plants
- Understand the effects of various land uses on soils
- Identify types of soil erosion and identify methods for reducing erosion
- Be able to use a USGS topographic map
- Identify basic features (roads, woods, fields, buildings, etc.) on an aerial photograph
- Utilize soil information from the official USDA soil survey (*Soil Survey of the State of Connecticut, 2005*)

## **PRACTICE EXERCISES:**

- **Dig a hole about 2 feet deep in the soil at various locations (school, backyard, swamp, etc.). What differences do you notice as you dig deeper into the soil? Compare and contrast the soil from the different layers and locations. Describe your location on the landscape.**
- **Pour at least a gallon of water (preferably more, enough to fill the hole up to the surface) in the hole. How fast does it disappear? Where does the water go? Does the water move out a hole at different rates in different locations? When was the last time it rained and what difference does this make? Major question: why is the soil water relationship so important? Make sure to fill the hole in with soil after you are done.**
- **Using “soil texture by feel”, identify the texture of your soil samples. Practice this on many soil samples so you calibrate your texture fingers!**
- **Locate your house, school, etc. on a topographic map. Compare the map to what you actually see at and near your sites.**
- **Choose a site. Locate your site using the USDA Web Soil Survey. Examine the aerial photograph of the site and compare to what you actually see at your sites. Using the WSS, make soil maps, interpretive maps, and interpretive reports for your sites. Discuss the soil uses and limitations for your sites.**

**SAMPLE TEST QUESTIONS:**

1. What is the landscape position of the soil pit?
  - a. Upland
  - b. Upland depression or drainageway
  - c. Terrace
  - d. Floodplain
  
2. Name two soil or site features that are important in identifying the drainage class of the soil in the tray.
  
3. The maps in the CT soil survey were made originally at a scale of 1:12,000. If an area on one of the soil maps was displayed at a scale of 1:6,000:
  - a. The new map would show twice as many soil map units as the original
  - b. The new map would show half as many soil map units as the original
  - c. The new map would show the same number of soil map units as the original
  - d. None of the above
  
4. What plant cover is most effective in controlling sheet erosion?
  - a. Lawn
  - b. Native forest
  - c. Wildflower field
  - d. Orchard with no ground cover
  
5. How thick is the topsoil layer in the soil pit?
  - a. 0 inches
  - b. 1 to 5 inches
  - c. 5 to 10 inches
  - d. Thicker than 10 inches
  
6. Which of the following describes the wettest soil?
  - a. Clayey texture in the B horizon
  - b. Gray soil color in the B horizon with orange streaks
  - c. Brown soil color in the B horizon with orange streaks
  - d. Soil formed in glacial till parent material
  
7. Soils with dense substrata are common in Connecticut. How does a dense substratum affect the amount of available water in the soil? How does it affect the movement of water in the soil?