Terrace and Soils Lab - River Changes over Time

Description: Today we will again examine the terraces of the Huntington River at the Audubon Center. These terraces record the 14,000 year history of river behavior and incision as base level, climate, and sediment supply changed following glacial retreat. We will work in groups of 3 to dig and describe 6 soil pits. We will use the soils to help us learn about changes that occur over time. We will use the stratigraphy exposed in the pits to tell us more about the environment in which the river deposited the sediment we see.

Specific skills and general knowledge: By the end of the week, you should be able to make a basic description of a soil pit including delineating horizons and describing soil textures and colors. You should be able to understand and describe soil-forming processes as well as understand what a soil chronosequence is and why it is important.

Gear: Shovels, tarps, field books, pencils. Munsell color books, pH meter, yardsticks, nails and flags, tapes, trowels, laminated maps, laminated diagrams. Egg crates, pH meters, DI water, plastic cups, pH kits

Procedure

At each site, three people will dig a soil pit that is at least a meter in all three dimensions. The goal is to dig through the over bank sand deposits and into the gravel below. We will employ low-impact soil pitting techniques which means top-soil and sod should be carefully removed and all the soil should be placed on a tarp.

Once the pit is dug, you want to describe it carefully so that you can make a detailed log of the pit. The log is a graphical representation of what you observed in the field.

At or before 3:30 pm (depending on how hard it is raining and how wet everyone is!), we will meet at the lowermost pit. We'll hear a short (5 minute) presentation from the group that dug the pit and then move up to the next terrace and next pit. As we leave each site, the hole should be filled and the sod replaced. We need to be back at the bus, ready to roll by 4:30 pm at the latest.

THINGS TO KEEP IN MIND WHEN DESCRIBING SOIL PROFILES….

- Delineate and describe the O, A, E, B, and C horizons if they exist in your pit.
- Start with "0" depth at the surface and measure down in cm.
- How thick is each horizon?

- What is the pH of soil in each horizon?
- Describe any evidence of bioturbation in each horizon.
- Describe the color of each horizon using the Munsell system
- Describe the texture of each horizon (sandy, silty, clay or percentage mixture)
- How well sorted is the sediment (parent material) in each horizon?
- Is the horizon graded? (Does the grain size get smaller toward the top of the horizon?)
- Is there visible organic matter in the horizon? How much?
- Are there any rust colored stains present?
- What is the nature of contacts between adjacent horizons (sharp or gradational)?
- What is the elevation of the terrace on which your pit is dug?
- What is the geomorphic setting of the pit you dug (eg, on a flat surface? At the base of a riser?)

WRITE UP

On **Friday**, your group should draft a detailed log of your soil pit to scale. It should include a sketch of the pit with a description of each horizon that includes all the details in the bulleted section above. Your log can be either neatly drawn by hand or computer drafted. You should work together to draft a summary paragraph interpreting what you saw in your pit in terms of soil formation and parent material. We will post these logs on the web and they will be evaluated for your grade on this lab.