

EPSc 413 Introduction to Soil Science

Soil Characterization Laboratory

Color and texture are two physical properties of soil that are easily diagnosed in the field and relate to other chemical and physical properties. In this laboratory activity you will get to practice using these techniques to characterize soil, hopefully seeing that even similar looking soils can have subtle variations in properties that are easy to diagnose in the field.

Methods:

Soil Texture:

Soil texture (the amount of sand, silt, and clay in a soil) can be determined quantitatively in the laboratory, but there is a two-step hand method for quickly assessing texture in the field. Follow the instructions on the attached flow chart to determine the texture. A few tips:

- If your sample is too dry then it will simply break apart, but if it is too wet then the soil will simply coat your hand and not make a nice ball. Add water to correct dryness. If you soil is too wet, add some dry soil or knead the soil in your hand for a few minutes. The heat of your hand will slowly dry the soil, bringing it to the right consistency.
- When making a ribbon, remember that ribbons are thin. You are not making sausage! If your ribbon is too thick then you will bias your result towards a high clay content.
- When smearing the soil in your palm, you need to assess whether it feels mostly gritty, mostly smooth, or both smooth and gritty. Silt is smooth (like flour) and sand is gritty.

Soil Color:

Use the Munsell soil color books to determine the wet color of the soil. Do this by placing a smooth piece of soil (like your soil ball from texture analysis) behind a sheet in the book, exposing it through the holes to directly compare to color chips. Flip forward and backwards through the book to get the correct hue, and then find the value and chroma.

Laboratory Assignment:

Your instructor will work through the analysis of soil sample A as an example. Around the classroom are locations with 10 other soil samples: Primary samples B through E and bonus samples F through K.

1. Determine the texture and color of the Primary soil samples B through E. For example, "Soil B has a silty clay texture and a wet color of 10YR 3/4".
2. If you have time, determine the texture and color of one or more of the Bonus samples F through K.
3. Make sure to help clean up at the end of class!

After class, please email a summary of your results to your TA. The results will be tabulated and compared to what Prof. Catalano and your TA determine on their own.

Procedure for Analyzing Soil Texture by Feel

