



GLOBE

Soil Characterization

Data Sheets

Print the Soil Characterization Data Sheet:

- [Soil Characterization Data Sheet](#)
 - Page 2 has space to record observations for one soil horizon. Print enough copies of this page for each soil horizon you will measure. You only need to print one copy of page 1.
 - Note: Enter data for soil characterization in site setup. From the data entry homepage, click "Create/Edit My Sites" and enter data under Pedosphere → Soil Characterization Site Setup.

Or print the data sheet with the field guide incorporated:

- [Soil Characterization with field guide](#) (2 pages)
 - The field guide has space to record observations for one horizon. Print enough copies of the field guide plus data sheet, or data sheet linked above for each horizon you will measure.

GLOBE Soil Characterization Data Sheet (page 1)

Name: _____ Site Name: _____

Date: _____ Time (local): _____

Latitude: _____ Longitude: _____

Elevation: _____ m Slope Angle: _____ °

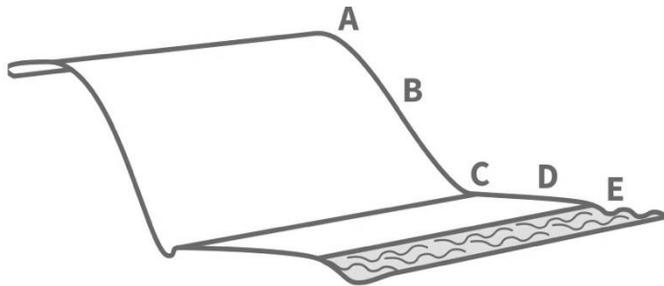
Slope Direction: N NE E SE S SW W NW

Method: Soil Pit Auger Hole Near Surface Excavation Road Cut Erosion Cut

Land Use: Urban Agricultural Recreation Wilderness Other: _____

Landscape Position: Summit (A) Slope (B) Depression (C)

Large Flat Area (D) Stream Bank (E)



Parent Material:

Bedrock Organic Material Construction Material Marine Deposits

Lake Deposits Stream Deposits (Alluvium) Wind Deposits (Loess)

Glacial Deposits (Glacial Till) Loose Materials on Slope (Colluvium)

Volcanic Deposits Don't know Other

Cover Type:

Bare Soil Rocks Grass Shrubs Trees Other: _____

Distance from Major Features: _____ m

GLOBE Soil Characterization Data Sheet (page 2)

Horizon #: _____

Name: _____

Date of collection: _____

The top horizon depth must be the same or lower than the bottom depth of the horizon above it.

Top depth: _____ cm Bottom depth: _____ cm

Moisture Estimate: Unknown Dry Moist Wet

Main color code: _____ Secondary Color Code: _____

Texture Field Estimate:

Unknown Sandy Clay Sandy Clay Loam Sandy Loam Silty Clay
 Silty Clay Loam Silt Loam Loamy Sand Sand
 Silt Clay Clay Loam Loam Organic

Structure Estimate:

Unknown Granular Single Grained Platy Prismatic
 Columnar Blocky Massive

Consistence Estimate:

Unknown Extremely Firm Firm Friable Loose

Carbonates:

Unknown None Slight Strong

Root Quantity Estimate:

Unknown None Few Many

Rock Quantity Estimate:

Unknown None Few Many

Comments:

GLOBE Soil Characterization Data Sheet and Field Guide (page 1)

Name: _____ Site Name: _____

Date: _____ Time (local): _____

Soil Characterization: Identifying and Measuring Horizons

1. Make sure the sun shines on the profile if possible.
2. Use a trowel to scrape a few centimeters of soil off the profile to expose a fresh soil face.
3. Is the soil profile: Dry Moist Wet
 ➤ If the soil profile is dry, moisten it with the spray mist bottle.
4. Start at the top of the profile and observe the characteristics of the soil moving towards the bottom of the profile.
5. Look carefully at the soil profile for distinguishing characteristics such as color, texture, shapes, roots, rocks, small dark nodules (called concretions), worms, small animals, insects, and worm channels. These observations will help to define the horizons.
6. Working in a straight vertical line, place a marker (such as a golf tee or nail) at the top and bottom of each horizon to clearly identify it.
7. Measure the top and bottom depth of each horizon beginning at the top (surface) of the profile. Start with the meter stick or tape measure at 0 cm at the top of the profile. Note the depths at which each horizon starts and ends.
8. Record the top and bottom depth of the first horizon you are measuring.

Horizon # _____. Top depth: _____ cm Bottom depth: _____ cm

9. Record the top and bottom depths of the other horizons on the printed data sheets. For each horizon, the top depth must be the same or lower than the bottom depth of the horizon above it.

Soil Characterization: Measuring Structure

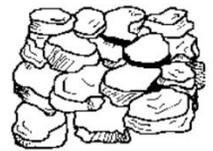
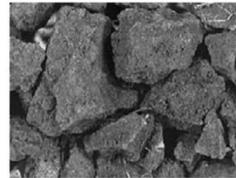
Horizon #: _____

1. Use a trowel or other digging device to remove a sample of soil from the horizon being studied.
2. Hold the sample gently in your hand and look closely at the soil to examine its structure. Choose the soil structure:

Granular: Resembles cookie crumbs and is usually less than 0.5 cm in diameter. Commonly found in surface horizons where roots have been growing.



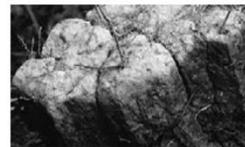
Blocky: Irregular blocks that are usually 1.5–5.0 cm in diameter.



Prismatic: Vertical columns of soil that might be several cm long. Usually found in lower horizons.



Columnar: Vertical columns of soil that have a white, rounded salt “cap” at the top. Found in soils of arid climates.



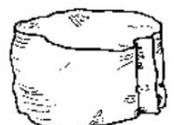
Platy: Thin, flat plates of soil that lie horizontally. Usually found in compacted soil.



Single Grained (no structure): Soil is broken into individual particles that do not stick together. Always accompanies a loose consistence. Commonly found in sandy soils.



Massive (no structure): Soil has no visible structure, is hard to break apart and appears in very large clods.



Soil Characterization: Measuring Color

Horizon #: _____

1. Take a ped from the horizon being studied and note whether it is moist, dry, or wet. If it is dry, moisten it slightly with water from your water bottle.
2. Break the ped and hold it next to the color chart.
3. Stand with the sun over your shoulder so that sunlight shines on the color chart and the soil sample you are examining.
4. Find the color on the color chart that most closely matches the color that covers the largest area of inside surface of the ped.

Main color code: _____

5. If necessary, determine the secondary color.

Secondary color code: _____

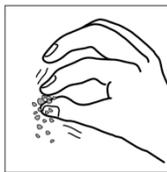
Soil Characterization: Measuring Soil Consistence

1. Take a ped from the soil horizon being studied. If the soil is very dry, moisten the face of the profile by squirting water on it, and then remove a ped for determining consistence.
2. Holding the ped between your thumb and forefinger, gently squeeze it until it pops or falls apart.
3. Record one of the following categories of soil ped consistence:



Loose: You have trouble picking out a single ped and the structure falls apart before you handle it.

Note: Soils with single grained structure always have loose consistence.



Firm: The ped breaks when you apply a larger amount of pressure and the ped dents your fingers before it breaks.



Friable: The ped breaks with a small amount of pressure.



Extremely Firm: The ped can't be crushed with your fingers (you need a hammer!)

GLOBE Soil Characterization Data Sheet and Field Guide (page 4)

Soil Characterization: Measuring Soil Texture

Horizon #: _____

1. Place some soil from a horizon (about the size of a small egg) in your hand and use the spray mist bottle to moisten the soil. Let the water soak into the soil and then work it between your fingers until it is thoroughly moist. Once the soil is moist, try to form a ball.
 - If it forms a ball, go to **Step 2**. If it does not, it is **sand**.
2. Place the ball of soil between your thumb and index finger and gently push and squeeze it into a ribbon.
 - If you can make a ribbon that is longer than 2.5 cm, go to **Step 3**. If the ribbon breaks apart before it reaches 2.5 cm, it is **loamy sand**.

3. If the soil:

- Is very sticky
- Hard to squeeze
- Stains your hands
- Has a shine when rubbed
- Forms a long (5+ cm) ribbon without breaking

It is **clay** and go to **Step 4**.

- Is somewhat sticky
- Is somewhat hard to squeeze
- Forms a medium (2–5 cm) ribbon

It is **clay loam** and go to **Step 4**.

- Is smooth
- Easy to squeeze
- At most slightly sticky
- Forms a short (<2 cm) ribbon

It is **loam** and go to **Step 4**.

4. Wet a small pinch of the soil in your palm and rub it with a forefinger. If the soil:

Feels very gritty every time you squeeze the soil, add the word **sandy** to the initial classification.

Feels very smooth, with no gritty feeling, add the word **silt** or **silty** to the initial classification.

Feels only a little gritty, leave the original classification.

5. Check the box next to this horizon's soil texture:

- | | | | | |
|--|-------------------------------------|--|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> Unknown | <input type="checkbox"/> Sandy Clay | <input type="checkbox"/> Sandy Clay Loam | <input type="checkbox"/> Sandy Loam | <input type="checkbox"/> Silty Clay |
| <input type="checkbox"/> Silty Clay Loam | <input type="checkbox"/> Silt Loam | <input type="checkbox"/> Loamy Sand | <input type="checkbox"/> Sand | |
| <input type="checkbox"/> Silt | <input type="checkbox"/> Clay | <input type="checkbox"/> Clay Loam | <input type="checkbox"/> Loam | <input type="checkbox"/> Organic |

Horizon #: _____

Soil Characterization: Measuring Roots

1. In this horizon, how many roots are there? None Few Many

Soil Characterization: Measuring Rocks

1. In this horizon, how many rocks or rock fragments are there? A rock or rock fragment is larger than 2 mm in size.
- None Few Many

Soil Characterization: Measuring Free Carbonates

1. Set aside a portion of the exposed soil to use for the free carbonates test. Make sure not to touch it with your bare hands.
2. Open the acid bottle and squirt vinegar on the soil particles, starting from the bottom of the profile and moving up. Be sure to use caution and point the bottle directly at the soil, not toward others. If vinegar gets into your eyes, rinse with water for 15 minutes.
3. Look carefully for the presence of effervescence (bubbles). The more carbonates that are present, the more effervescence you will observe.
4. For this horizon, record if you observe:
 - None:** If you observe no reaction, the soil has no free carbonates present.
 - Slight:** If you observe a very slight bubbling action, this indicates the presence of some carbonates.
 - Strong:** If there is a strong reaction (many and/or large bubbles), this indicates that many carbonates are present.

Soil Characterization: Photographing the site

1. Place a tape measure or meter stick starting from the top of the soil profile next to where the horizons have been marked.
2. With the sun at your back, photograph the soil profile so that the horizons and depths can be seen clearly.
3. Take photographs in each cardinal direction of the landscape around the soil profile.

Comments: