



## Earth Science Education Activity

# Understanding the Soil in Your County

## INTRODUCTION

Understanding soil is essential because soil supports nearly every aspect of life on Earth—it anchors plants, filters water, cycles nutrients, stores carbon, and provides habitat for countless organisms. For humans, healthy soil is critical to growing food, managing water resources, and maintaining resilient ecosystems. It also plays a role in climate regulation and helps buffer the effects of extreme weather. Whether in farming, construction, gardening, or conservation, knowing how soils form and function allows people to make informed decisions that sustain both natural and human systems.

To understand how soil develops, scientists use the concept of CLORPT, an acronym for Climate, Organisms, Relief, Parent material, and Time. These five factors determine the physical and chemical properties of the soil that forms.

- ◆ **Climate** influences soil formation through temperature and precipitation, which affect rates of weathering and organic matter decomposition. For example, warm, wet climates tend to form soils more rapidly than cold, dry regions.
- ◆ **Organisms** (plants, animals, fungi, and microorganisms) contribute to soil development by adding organic matter, mixing soil layers, and transforming nutrients.
- ◆ **Relief**, or topography, affects drainage, erosion, and exposure to sun and wind. Soils on steep slopes often erode more quickly, while soils in valleys may accumulate more material and moisture.
- ◆ **Parent material** is the original geologic material (such as bedrock, volcanic ash, or glacial deposits) from which the soil forms, influencing its texture and mineral content.
- ◆ **Time** allows the other factors to interact and shape the soil profile; older soils typically show more developed horizons and more weathering.

You can explore how these factors have shaped the soil in your own community by using the USDA's archived soil surveys and through Web Soil Survey soil maps.

## UTILIZING THE ARCHIVED SOIL SURVEYS

1. Navigate to the WSS website (<https://websoilsurvey.sc.egov.usda.gov/>).
2. After reading the introductory text on the homepage, click on the green "START WSS" button to enter the application.
3. Select "Archived Soil Surveys" button from the top of the toolbar.
4. Select "[Historical soil surveys are being moved to archive.org](#)".

5. Select your state.
6. Enter your county into the search bar.
7. Hover over the results to see more information, including the year it was published.
8. Select one of the results.
9. You are looking for the Soil Formation section. This can be named slightly different and is located in different locations. On the left sidebar search using one or more of these terms: formation, classification, parent material.  
  
*\* For example, if "Formation" is searched in the Soil Survey of Du Page County, Illinois text, there are 20 results. On page n16 is the section, "Formation and Classification of the Soils."*
10. Read through the Soil Formation section, which should have subsections for Climate, Organisms (or living organisms), Relief, Parent Material, and Time.

## UTILIZING WEB SOIL SURVEY SOIL MAPS

1. Navigate to the WSS website (<https://websoilsurvey.sc.egov.usda.gov/>).
2. After reading the introductory text on the homepage, click on the green "START WSS" button to enter the application.
3. Utilize the Getting Started with Web Soil Survey section in the Comprehensive Teacher's Guide to Web Soil Survey to select an Area of Interest.
4. Select the Soil Map tab in the top toolbar.
5. Select a Map Unit Legend you would like to know more about. Read through the Map Unit Description, especially the setting, typical profile, and properties and qualities for CLORPT details of the soil.

## USING WEB SOIL SURVEY IN INSTRUCTION

Find the full set of Web Soil Survey Guides and soil-related lessons from NRCS and AGI at [www.americangeosciences.org/NRCS](http://www.americangeosciences.org/NRCS)