



A Comprehensive Teacher's Guide to Web Soil Survey

INTRODUCTION

Web Soil Survey (WSS), operated by the USDA Natural Resources Conservation Service (NRCS), is an invaluable resource offering comprehensive, up-to-date, and official soil data collected from the soil survey. The application was created so everyone, including landowners and policymakers, could have access to the most up to date soil data without needing specialized software. WSS covers a diverse array of topics, including:

- ◆ building site development,
- ◆ construction materials,
- ◆ cropland,
- ◆ disaster recovery planning,
- ◆ ecological sites,
- ◆ engineering,
- ◆ farmland preservation,
- ◆ forest and other lands,
- ◆ highly erodible land,
- ◆ wetland conservation,
- ◆ military operations,
- ◆ rangeland and pasture,
- ◆ recreation,
- ◆ sanitary facilities and waste management,
- ◆ soil map units,
- ◆ soil health,
- ◆ soil properties,
- ◆ subaqueous soils, and
- ◆ water features and management.

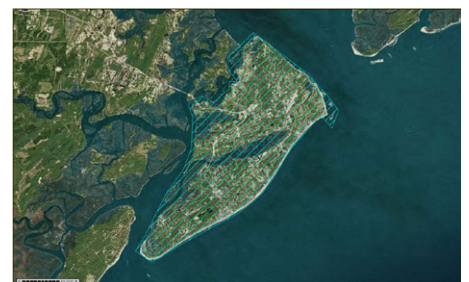
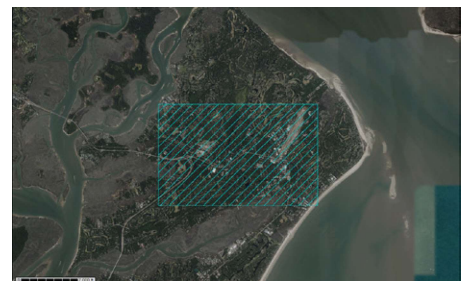
Despite its initial focus on those closely engaged with soil-related matters, WSS proves to be an indispensable tool for educators, as soil science plays a pivotal role in understanding the environment, land use, and sustainability in general. This guide aims to equip teachers with the knowledge and skills to unlock the full potential of WSS in the classroom. Whether you are introducing students to the fundamentals of soil science, examining the impacts of climate change, or investigating natural hazards, this guide will navigate you through WSS's features and functionalities, illustrating ways to seamlessly integrate it into your teaching practices to help students learn soil-related concepts with a real-world context. The result will be a heightened understanding of the pivotal role soils play in shaping our world for both you and your students.

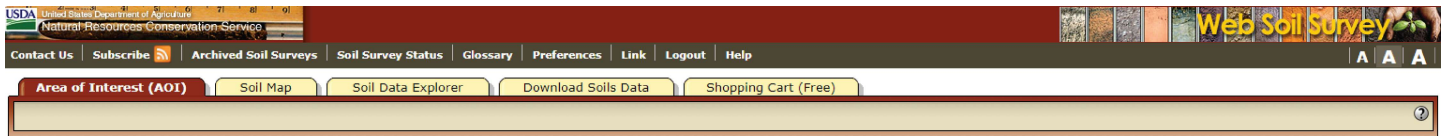
U.S. Department of Agriculture's Natural Resources Conservation Service (USDA NRCS) • www.soils.usda.gov

The USDA NRCS delivers science-based soil information to help farmers, ranchers, foresters, and other land managers effectively manage, conserve, and appraise their most valuable investment — the soil.

GETTING STARTED WITH WEB SOIL SURVEY

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. Become acquainted with the toolbar by hovering over each icon. (Click [here](#) to skip to a section with a more detailed description of the toolbar icons.)
4. You will first need to select an Area of Interest (AOI) that is less than 100,000 acres. Use the Quick Navigation toolbar on the left to move the map to your desired location. Select an option suitable to your use, the most likely of which are:
 - a. Address. Type in a complete address, a city and state, or a zip code then click "View."
 - b. State and County. Make selections, then click "View."
 - c. Latitude and Longitude or Current Location. Make appropriate entries, then click "View." (In order to view current location, you may need to adjust settings on your computer.)
 - d. To select an area larger than 100,000 acres, click on the "Soil Survey Area," select a State, select a county, and click "Set AOI". An AOI will appear over the entire county and will not be limited to 100,000 acres.
5. Use the Zoom In and Zoom Out icons until the entire AOI is visible on your screen.
6. Use the AOI rectangle or AOI polygon icons on the toolbar to create an AOI that is less than 100,000 acres. An error message will pop up if the AOI is too large, at which point you can select again.
7. The selected AOI will fill with blue diagonal lines upon a successful selection. Also, information will populate on the left toolbar including the acreage for each county and the total acreage within the AOI.





8. Click on the "Soil Map" or "Soil Data Explorer" tab along the top to view soil data options. Within the Soil Data Explorer tab, there are additional tabs which contain interpretations related to "Suitabilities and Limitations for Use," "Soil Properties and Qualities," and "Ecological Sites."

9. View a soil data or interpretation map by making a selection and clicking "View Rating"

For example, to see the organic matter within an AOI, select

- a. "Soil Data Explorer" tab at the top.
- b. "Soil Properties and Qualities" tab towards the top.
- c. "Soil Health Properties" on the left toolbar.
- d. "Soil Health – Organic Matter" on the left toolbar.
- e. "View Rating" button. The default setting is for the "Surface Layer" rating to be displayed. If you are instead interested in a different depth range, or a weighted average of all layers, make the appropriate selection under "Advanced Options" in the left toolbar.

10. To view the map legend, click on the "Legend" button on the left side of the Map Toolbar. To learn what the soil rating polygon numbers stand for and more about the map, scroll down below the map to see the summary table and Description.

11. To learn more about a specific location within the AOI, select the blue "Identify" icon in the top Map Toolbar then click on the location of interest. A panel will appear below the map with information available related to your selected data or interpretation.

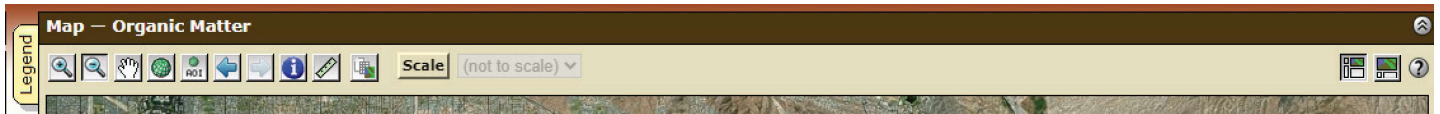
12. To print the map, select the "Printable Version" button in the top right corner. You can add a subtitle and make other printing selections. Select "View" to generate a PDF of the map, legend, and description that will open in a new tab.

Alternatively, you can select "Add to Shopping Cart" to create a single document for free with all of the maps you are interested in making. It is recommended to limit the shopping cart to 10 or fewer items. Usually, viewing and printing maps individually using the "Printable Version" is faster.

More Getting Started Resources

- ◆ [Getting Started With Web Soil Survey](#) from USDA Natural Resources Conservation Service
- ◆ [How to Use WSS ppt](#) from USDA Natural Resources Conservation Service
- ◆ [Web Soil Survey Tutorial \(youtube.com\)](#) from Cornell SIPS

Map Toolbar



Legend: Select this icon to view a floating panel which shows the map symbols and colors displayed on the map.

Magnifying glass with plus sign: Select this icon, and then click on the map to zoom in.

Magnifying glass with minus sign: Select this icon, and then click on the map to zoom out.

Hand tool: Select this icon, then click, hold, and drag the map to view different areas on the map.

World icon: Zoom out to full extent, which is the contiguous U.S. by default.

World AOI icon: Zoom in to the geographic extent of the AOI.

Zoom history Back: Return to a previously viewed map view in the current session.

Zoom history Forward: Select this tool to move forward through the list of map areas previously viewed in your current session.

Identify icon: Click on the map to identify latitude and longitude, and features in visible map layers. Information will appear in the panel below the map.

Measure distance icon: Select this tool, then click on the map to start a segment and click once to end each segment. Double click to finish and to display total distance. Individual segment distances and total distances will be displayed in the panel below the map. Select the tool again to clear the measurement.

Soil data available icon: Select this tool and click on an area on the map to see the specific soil data available for this location.

Area of interest icon: Select either the square AOI or polygon AOI to select the Area of Interest for which you are interested in viewing soil data. To define an area with a polygon, select vertex points with a single click and double click to finish the polygon. Selections are limited to an area under 100,000 acres. An error message will display if you have selected an AOI that is too large.

Scale: Select this icon to recalibrate the map on your screen in case of resolution issues.

Scale drop down menu: Change the scale of the map to one of the predefined scales. These options will change if you have selected an AOI. WSS defaults to exploring the Contiguous U.S.

Layout icon: Select either of the layouts. Normal Layout (left) allows you to view the search options to find areas of interest, while Full Width Map Layout (right) hides the search options.

Question mark / Help icon: Select this icon to view more detailed information about the Map Toolbar and each of these icons.

WSS FEATURES

Search Feature

Use the Search panel, in the upper left corner of each tab to help navigate within WSS. Enter keywords or phrases, and use the Advanced Search options if needed, and click Search. The search results are links that navigate to the places in Web Soil Survey that match your search items.

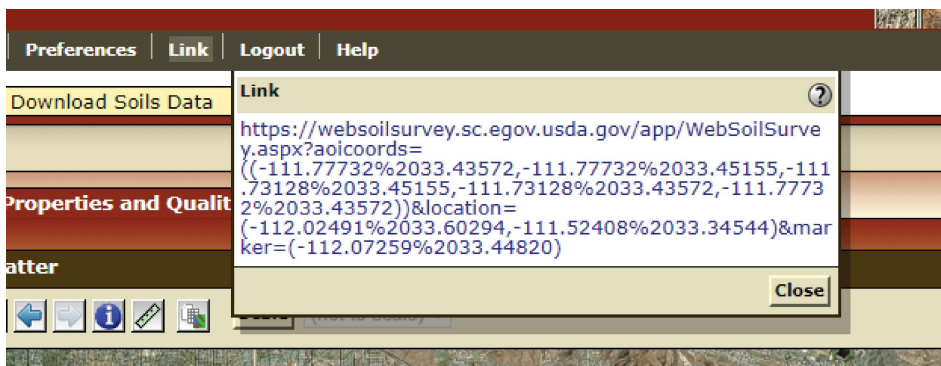
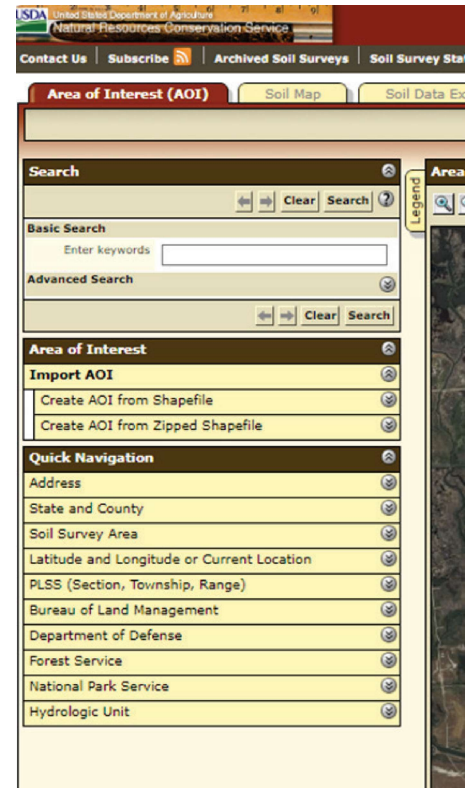
Legend Features

The features represented in the map are arranged in "layers" and grouped in "layer categories." You can turn the display of map layers on and off, individually or by categories. Some map layers have editable properties. To edit layer properties, select the layer, right click the layer, then select "Edit Layer Properties." Some editable properties include showing/removing labels, adjusting label size, and opacity of the layer.

Web Soil Survey defaults to an aerial image display as the background image. You can instead, or in addition, display a topographic map. In the Legend Properties Menu, scroll down to the bottom where "Background" is located and select "Topographic Map."

Saving an AOI

There are two ways to save a selected AOI so you can come back for further analysis.

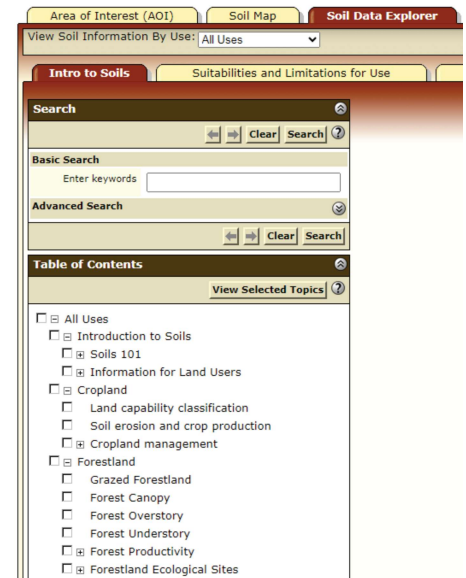
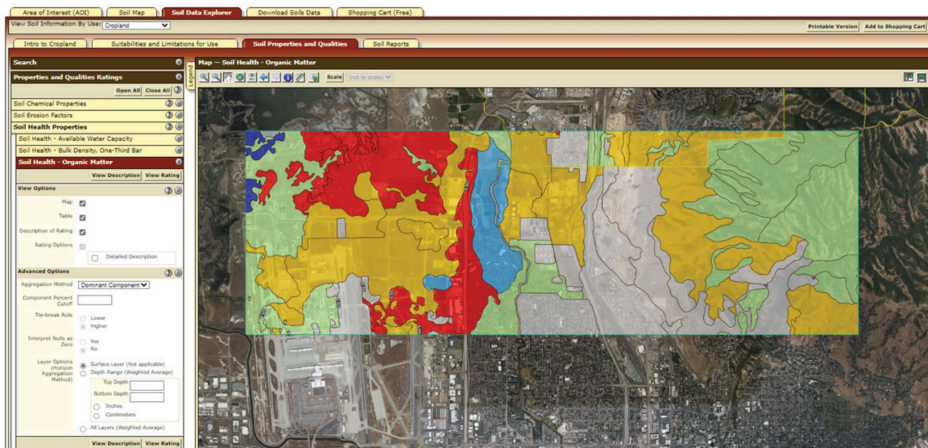


1. On the very top toolbar, select "Link." Save the URL displayed there or bookmark it for later use.
2. On the Area of Interest (AOI) tab, save your AOI using Export AOI and then choose the option Export AOI as Zipped Shapefile. After the zipped shapefile is saved to your computer, go back into Web Soil Survey and choose "Import AOI," and then choose the option "Create AOI from Zipped Shapefile," and select your saved zipped shapefile.

Intro to Soils

Under the Soil Data Explorer Tab, there is an "Intro to Soils" tab where users can learn more about soil. Navigate to different topic areas using the table of contents. Select topics you would like to read about and click the "View Selected Topics" button. Text will appear in the right panel for your selections.

Archived Data



To view a list of archived soil survey versions available for the specified AOI, click "Archived Soil Surveys" from the very top toolbar. You will be directed to historical documents of soil surveys prior to 2006.

USING WSS IN INSTRUCTION

Web Soil Survey can be a powerful instructional tool for educators who become familiar with the platform and discern relevant soil interpretations aligning with their curriculum. Tailored guides for thematic topics like climate change, natural hazards, and water processes offer educators a wealth of resources. These guides not only streamline the exploration of specific maps but also provide information and interactive learning activities aligned with the subjects. By leveraging WSS and the guides, educators can incorporate local soil data into their teaching, providing students with hands-on experiences and practical insights that are relevant to their community.

Find the full set of WSS Guides and other lessons from NRCS and AGI at www.americangeosciences.org/NRCS