American Association of Petroleum Geologists Foundation

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connecting earth, science, and people

Designing Rain Gardens for Stormwater Solutions

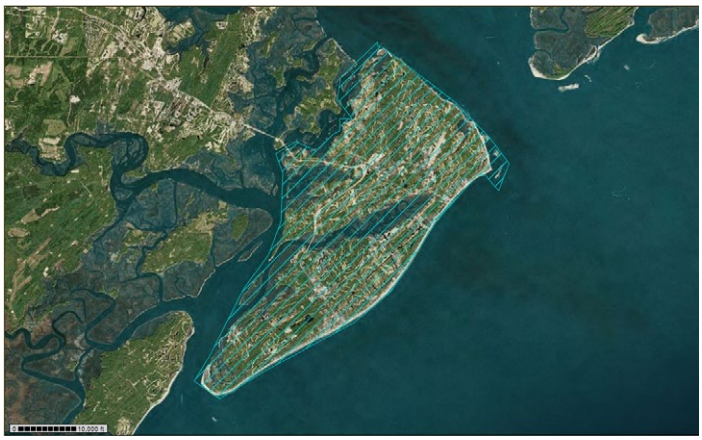
Digital Soil Analysis with Web Soil Survey

Background: Rain gardens capture runoff from impervious surfaces, allowing water to infiltrate rather than overwhelm drainage systems. Proper site selection ensures effective infiltration and prevents pooling. Web Soil Survey (WSS), a free online tool from the USDA Natural Resources Conservation Service, provides detailed soil data, including texture, drainage class, permeability, and infiltration rates. By analyzing these properties, users can assess whether a site can effectively absorb stormwater or if modifications, such as adding organic matter or amending soil structure, are needed.

SELECTING AN AREA OF INTEREST WITHIN WEB SOIL SURVEY

1. Navigate to the WSS website.
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.
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 for 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."
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.
   a. The selected AOI will fill with blue diagonal lines upon a successful selection.
   b. Information will populate on the left toolbar including the acreage for each county and the total acreage within the AOI.



Screenshots of AOI option selections: rectangular (top) and polygon (bottom) in WSS.

7. 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."

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ASSESSING SITE SUITABILITY USING SELECT INTERPRETATIONS

1. For each of the soil interpretations below, navigate to the interpretation on the left panel, read about it using the "View Description" button, and then "View Rating" to learn more about the selected AOI.

   a. Soil Texture
   - *Soil Properties and Qualities* > *Soil Physical Properties* > *Surface Texture*

   b. Hydraulic Conductivity
   - *Soil Properties and Qualities* > *Soil Physical Properties* > *Saturated Hydraulic Conductivity*

   c. Depth to Water Table
   - *Soil Properties and Qualities* > *Water Features* > *Depth to Water Table*

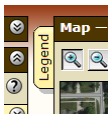
   d. Hydrologic Soil Group
   - *Soil Properties and Qualities* > *Soil Qualities and Features* > *Hydrologic Soil Group*

   e. Drainage Class
   - *Soil Properties and Qualities* > *Soil Qualities and Features* > *Drainage Class*

   f. Flooding Frequency
   - *Soil Properties and Qualities* > *Water Features* > *Flooding Frequency*

   g. Ponding Frequency
   - *Soil Properties and Qualities* > *Water Features* > *Ponding Frequency*

2. To save print maps, select "Printable Version" in the top left, and then "View". A new webpage will open with the map, key, and description. Adjust what is included in the report, including map features, using the legend in WSS.



3. To save a map or an AOI, select "Link" on the very top toolbar. Save the URL or bookmark it for later use.