

### Using Soil Survey Information for Geomorphic Analysis

In this activity you will be using Soil Surveys to learn more about soil formation and landscape developments. Soil Surveys are published by the Natural Resources Conservation Service on a county-level basis for much of the United States. Although there are slight differences between each survey book, they all contain information on the soil types (horizons, textures, color, etc.), suitability of the soil for various land uses, classification of the soil, and maps (generally at the 1:20,000 scale). In this activity, you will learn how to use a soil survey and how to interpret soils-related information.

#### Part I: Oneida County Wisconsin

1. Where is Oneida County located? \_\_\_\_\_  
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2. Read about the physiography of the county on Page 3. What physiographic region is Oneida County located in? Briefly describe the geology of the region.  
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3. Soils are mapped based on “map units”. What is a map unit? Are map units pure? Why or why not?  
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\_\_\_\_\_  
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4. Map units assigned a “soil series”. Read the section “Classification of the Soils” starting on page 87. Soil classification is a bit complex (similar to Linnaean classification system in biology). Skip to the paragraph discussing “Series”. What is a soil series? Usually soil series are named for the town near where the soil was first described.  
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5. Earlier you learned that soil mapping primarily involved interpretation of the landforms and geologic processes. Part of understanding geologic processes is identification of the parent material (residuum, till, outwash, alluvium, loess, colluviums, etc.). The soil develops from the parent material, which determines many of the soil’s properties. What soil (master) horizon would provide you the best description of the parent material?

O    A    E    B    C    R    (*circle one*)

6. Complete the following table integrating soil properties, parent material color and texture, landform, etc using the information from the soil survey. Think about your response to the previous question before you complete this table. You might want to verify with me as you are working on this.

Soil Series	Slope Range (%)	Common Landforms	Parent Material Identification	Parent Material Munsell Color <small>(name and notation)</small>	Parent Material Textural Class
Au Gres					
Emmert					
Goodman					
Magnor					

In the next component, you will be constructing a geomorphic map from soils information. Before we do this, let's start practicing some of what you have learned.

7. Take a closer look at the Emmert soil series. It states that the "Emmert series consists of...soils on eskers and eskerlike ridges". The parent material is identified as outwash. Based on our discussion of glacial deposits what would be a more accurate term?

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8. Turn to Mapsheet #2. Find Clear Lake in the upper right of the map. Just south of clear lake are mapunits PeB, PeC, and PeD. Look at the legend. What does the last capital letter indicate?

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9. What glacial landform is represented by these mapunits (along with VsC). Hint: you might also want to look at what the symbols represent. \_\_\_\_\_

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10. The soil maps are a very important aspect of the soil survey. Prior to the beginning of the individual map sheets is a page with a soil legend and description of culture features and symbology used. You will need to refer back to this page often. Turn to mapsheet number 64. There is a nice glacial story that the soils can tell you here.

A topographic map has been provided as your base map. This is the map that you will use for your "mapping" exercise and will record all of your information on. Start by establishing a legend that includes the major glacial landforms that are found in the county: kame, ice-walled lake plain, outwash plain, pitted outwash plain, ground moraine, drumlin, and esker. Each landform should be assigned its own color.

Use the soil survey to determine basic properties of the map units (especially texture and sorting). In addition to this information, use the topographic map to determine the glacial landform represented on your base map. When you are finished your entire base map should be colored. If necessary, you may add "unknown/unclear" on your legend; however, you should be able to interpret nearly all areas on your map based on either the soils information and/or topography.

### Follow-up Questions

11. All of these soils are associated with the most recent Wisconsinan glacial advance. What ice source region are the glacial deposits associated with? Explain your answer.

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12. Did this area have one or more than one ice advance? How can you tell?

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13. What was the direction of ice advance in the region? How can you tell?

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