Introduction to County Soil Surveys

**Created by:**

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**Purpose:**

The purpose of this laboratory exercise is for you to gain familiarity with the Natural Resource Conservation Service county-level soil surveys.

**Essential Learning Outcomes:**

Navigate a county soil survey

Determine properties of soils

Link soil properties to geomorphic processes

Understand how soil properties are related to land use suitability

**Instructor’s Notes:**

This laboratory exercise was developed using the Winnebago County soil survey for the state of Wisconsin. Information needed to answer some of the questions included in this exercise may not be included in the soil survey for your particular county. PDF versions of all county-level soil surveys are available at: http://www.nrcs.usda.gov/wps/portal/nrcs/soilsurvey/soils/survey/state/

However, PDF versions typically do not include the maps section. Also available is a complementary lab using the Web Soil Survey.

**Background:**

A soil survey is a detailed report on the soils of an area. The soil survey has maps with soil boundaries and photos, descriptions, and tables of soil properties and features. Soil surveys are used by farmers, real estate agents, land use planners, engineers and others who desire information about the soils of a particular location.

The major parts of a soil survey publication include:

* Table of Contents
* Detailed soil map units
* Use and management and interpretive tables
* Classification of soils
* References
* Glossary
* Index to map sheets
* Soil maps

Using the soil survey - Maps

* Open the soil survey to Index To Map Sheets
* Locate your area of interest or property on the Index.
* The numbers in rectangles correspond to the map sheet number located in the second half of the publication.
* Look at the aerial map closely and locate landmarks such as roads or streams to find your area of interest.
* The lines on the image separate different soil types. Your area of interest may include one or more types.
* The small letters or numbers that are within the same polygon as your area of interest, such as ScC, or KnC, or LaC designate a map unit. Note this map unit symbol. It is the key to finding information.
* Turn to the Index to Map Units which shows the page where these map units are described. Also go to the various tables or reports which are organized by map unit symbol.
* If you find a term or soil description in the detailed information sheet on your soil and you would like to learn what that term means, go the Glossary section of the report. The Glossary is located in the center of the publication.

Using the soil survey - Tables

* The Tables section of the soil survey report provides detailed information on soil properties and their suitability and limitations as well as management and production potential of the various soils.
* The Tables section has detailed information on engineering index properties, physical and chemical properties, and soil and water features.
* The Tables section also has detailed information on soil use, such as crops and pasture, recreation, and engineering.
* To use the tables, simply remember your map unit symbol and find it in the appropriate table.

The soil survey report may have other useful information such as the general soils map, prime farmland, use and management of soils, processes and factors of soil formation, and landforms and surface geology.

**Equipment required:**

County Soil Survey

**Exercises:**

**Part 1. County Soil Surveys**

Use the County Soil Survey provided by your instructor to answer the following:

1. Read the preface on page ii. When was the fieldwork for this survey performed?

Read the introduction beginning on page 1 to answer the following:

1. What is the total area of the county in acres?
2. What percentage of the area was forested prior to settlement?
3. What percentage of the area was forested when the soil survey was published?
4. What type of climate does the county have?
5. What are the average winter and summer temperatures?
6. What types of rocks form the bedrock throughout the county?
7. What is the approximate range in elevation (referred to as altitude in the survey) for the county?
8. What percentage of the county is water?
9. What percent of the county was farmed when the soil survey was published?
10. Utilizing the maps in the back of the survey, what two soil series are most of the campus buildings located on?

Now scroll to the tables near the back of the survey to answer the following:

1. What is the average annual precipitation amount in inches and centimeters?

*(Tip: 1 inch = 2.54 cm)*

1. List the three soils that occupy the greatest land area in the county in order from greatest to third greatest. Also include the acres and percentage of the county they occupy. You do not need to include the slope information.
2. If every acre of your answer to 13A were planted to corn, how many bushels (Bu) could that soil produce in a year?
3. Based on the engineering properties and classifications, what is the USDA texture of the surface horizon and the subsurface horizons of 13A?
4. What is the shrink-swell potential for 13A? Why would shrink-swell potential be important?
5. What parent material did 13A weather from?

1. What Family taxonomic class does 13A belong to?

Now turn to the soil series and morphology description for 13A in the text.

1. Complete the following table for 13A:

|  |  |  |  |
| --- | --- | --- | --- |
| **Horizon** | **Depth (Inches)** | **Munsell color** | **Structure** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. Given what you know about soils in general and the soil in 13A in particular, is this a good soil to build on? What are some positive and negative aspects of this soil?