

# 100 Years of the National Cooperative Soil Survey — and Still Learning

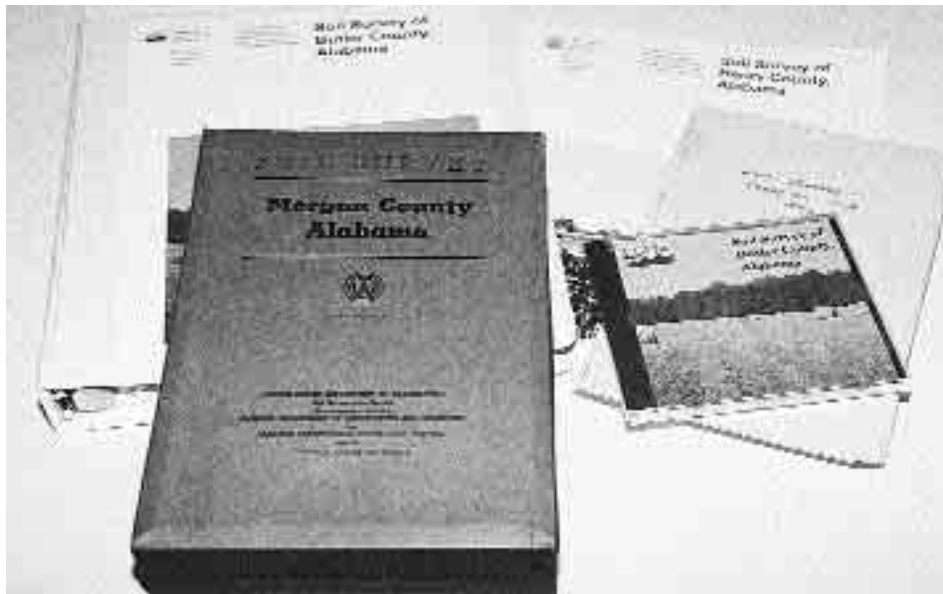
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**T**HINK of the abundance of produce at the supermarket, the interstate highways that network our country, the crystal clear stream that flows through the mountains, and the comfortable dwellings that we call home. What do these things have in common? Soil. Soil is the foundation of it all. It's the carpet of our world, the seedbed for our food and fiber, the support for our buildings and roads, the reservoir of our water sources, and the filter for our waste. The United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) just observed its Centennial year. In cooperation with state and local partners, the USDA-NRCS has been interpreting soil for 100 years now. The data derived from this study is recorded in a document called a soil survey.

The soil survey is perhaps the largest and most valuable natural resource database in the world. It is a scientific inventory of soil resources, including soil maps, data about the physical and chemical properties of soils, and information on the potentials and limitations of each soil. Soils respond differently to various types of management.

The soil survey serves as the basis for applying what we have learned through research and experience to specific tracts of land. Soil data are used for many reasons, primarily to ensure that the intended use of the land fits the soil. Farmers, ranchers, and foresters use the data to predict production capabilities, to develop conservation plans, to serve as tools for wildlife management, and to help identify wetlands. Engineers use the data to analyze the soil's response for construction, for waste disposal, and for pollution control.



*Soil survey data has been presented in various formats through the years. The first surveys were small booklets; modern soil survey data is available on CD-ROM.*

## History

The soil survey program, carried out by the National Cooperative Soil Survey, is a nationwide partnership of federal, regional, state, and local agencies and institutions. USDA-NRCS is the leader of the federal part of the partnership.

The soil survey was largely the brainchild of one man — Milton Whitney. Associated with state agricultural experiment stations in Connecticut, North Carolina, South Carolina, and Maryland, he became the first chief of the Division of Agricultural Soils at the U.S. Department of Agriculture in 1894. He developed the idea of mapping soil characteristics as a means of promoting agricultural development. Hugh Hammond Bennett, the father of soil conservation, made his early discoveries of the effects of sheet erosion in 1905 when he was a

young soil scientist mapping soils in Louis County, Virginia. He began a crusade to explain and reduce soil erosion that resulted in a national program to protect natural resources, first in USDA's Soil Conservation Service, later renamed the Natural Resources Conservation Service.

The first soil surveys were mapped to find areas for the expansion of agriculture. The surveys in the eastern United States were started to see if certain imported varieties of tobacco could be grown. The western surveys were in areas with very dry climates and were mapped to see if the soil was suitable for food production under irrigation. The first soil survey field operations began in the summer of 1899. The soil survey parties worked in four sites: Pecos Valley, New Mexico; Salt Lake Valley, Utah;



*The screw auger was the primary tool used by the soil scientist in the early days. Texturing by hand was one of the first "soil tests" and continues to be a tool for the soil scientist today.*

Cecil County, Maryland; and the Connecticut Valley of Massachusetts and Connecticut.

The first soil survey in Alabama was completed in 1902 for Perry County. Since that time, approximately 93 percent of the private land in Alabama has been mapped.

### **Method**

Fieldwork for soil scientists has changed little through the years. They study the land in a survey area, its vegetation, and its features. They identify the different kinds of soil by examining the soil layers, usually to a depth of 6 feet. The soil scientist determines the slope, possible erosion hazards, the color, the acidity or alkalinity, and the proportions of sand, silt, clay, and organic matter. They classify the soils according to a national system and outline each kind of soil on an aerial photograph before they leave the field.

### **Soil Survey Update**

Nationwide, soil survey mapping is complete on more than 90 percent of the private land, 48 percent of Indian lands, and 47 percent of public lands. Overall,

about 78 percent of the total land area of the United States has some type of completed soil survey. However, only about 59 percent of this mapping adequately supports modern land-use decisions. The other 41 percent is in need of updating.

Work is underway to provide soil surveys in more usable formats. Modern soil surveys are available on CD-ROM and on the Internet. In addition, NRCS and its partners have embarked on an effort to digitize soil surveys. With digitizing, soils information can be used with other geospatial data in overlays to visualize the landscape and natural resources information in relation to each other.

### **A Time to Reflect**

The Centennial of the Soil Survey Program provided an opportunity to remind us of the importance of soil, to reflect on what we have learned about soil, and to look forward to what may be available in the future. Food, fiber, and foundations — the common denominator is soil. USDA-NRCS has been interpreting soil for 100 years, and the soil scientist is still learning. The soil scientist is ever looking for new ways to tell the story. 🏡



*A horse patiently waits while an early soil scientist takes a soil sample.*