

2010 soils planner - development of the US soil survey

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Abstract

The Soils Planner is a calendar with a soil science theme that USDA-Natural Resources Conservation Service has published yearly since 1999. The 2010 Soil Planner focuses on the history of the US Soil Survey and its important contributions to the cooperative land conservation. Historic highlights of the US Soil Survey and Soil Conservation Movement are portrayed in the calendar, which combines important scientific aspects with strong visual images to encourage the public, as well as SSSA scientists, to contemplate soils and land conservation throughout the year. Communicating scientific ideas with images and clear concise language encourages everyone to appreciate the subject and give it some thought with each month. It forms a succinct monthly reminder of the importance of soils and conservation to human existence. From the beginning, SSSA has partnered with NRCS to produce the Soils Planner.

Key Words

Soil survey, history, public awareness.

Introduction

The Soils Planner is a calendar with a soil science theme that USDA-Natural Resources Conservation Service has published yearly since 1999. The 2010 Soil Planner focuses on the history of the US Soil Survey and its important contributions to the cooperative land conservation. In the context of historical development, we emphasize the interdisciplinary aspects of the Soil Survey and Conservation Movement. Both these endeavors integrate landscape ecology, agriculture, chemistry, physics and other earth sciences. Soil survey in the United States developed only a little more than a century ago, starting in the late 1890's with several state and regional projects focused on agricultural soils. It is important to point out that development of the soil survey program parallels the developments in the related sciences. The US Soil Survey used existing and developing techniques in its operations and staff training, and provided equipment and facilities to ensure that observations and measurements were correct and reproducible. By tying history, conservation and soil science together the Planner educates and engages many different audiences. Not just soil scientists!

Soil survey is a multi-disciplinary science that requires an appreciation and understanding of related sciences such as ecology, geology, climatology, botany and zoology. To understand the complexity of soil, soil science brought together the tools of chemistry, physics, biology, climatology, geography and other sciences. As the scientific field of soil survey was developing, the Soil Conservation Movement began to gain momentum in the late 1920's. With a surge in interest in healing and protecting the land for Agriculture, the US government moved closer to the establishment of an agency that would deal head-on with the issues of soil erosion and land degradation in the US. The purpose of the Soil Survey from its beginning was for the wise use and management of soils. Soil Survey process and products are focused towards that end.

Soil conservation work nationwide was hastened with the passage of the Soil Conservation Act in April of 1935. Recognition of the first conservation district, bounded by the Brown Creek watershed in North Carolina, on August 4, 1937, established a method for the Service to assist farmers in the conservation districts. Locally elected citizens established priorities and plans for the district's work. The Department of Agriculture merged most of its soil survey functions with the Soil Conservation Service in 1952. Here are a few highlights of historical significance that are portrayed in months of the 2010 Soils Planner of the US:

Origins of the national cooperative soil survey

In 1893, President Grover Cleveland asked Charles W. Dabney to be Assistant Secretary of Agriculture and charged him with creating a nonpartisan, professional scientific corps in the USDA. Dabney, who had a doctorate in agricultural chemistry from the University of Göttingen, created the Division of Agricultural

Soils and chose Milton Whitney to be its director. Five years later, the Division of Soils initiated the US Soil Survey, and USDA soil scientists began to systematically investigate the origins and properties of the nation's diverse soils. These events marked the beginning of a federal commitment to Soil Science and Soil Survey activities as part of USDA's scientific work that persists to the present

Soil conservation crusade

No other person did more to alert the country to the problem of soil erosion than Hugh Hammond Bennett. Bennett joined the USDA Bureau of Soils as a soil surveyor in 1903. Through his work, Bennett became deeply aware of the problem of soil erosion and its deleterious effects. In 1928, he co-authored "Soil Erosion, A National Menace," which attracted widespread attention and confirmed Bennett as the nation's foremost crusader for soil conservation. His efforts resulted in the creation of the Soil Erosion Service in 1933 and its subsequent transformation into the Soil Conservation Service in 1935 with Bennett as Chief.

Land capability classification

When the Soil Erosion Service started operations on September 19, 1933, Director Hugh Hammond Bennett needed soils information to recommend soil conserving methods to farmers. County soil surveys published by the Bureau of Soils covered only a selected portion of the country. To meet their needs, SCS staff developed groupings of soils under the "use-capability" concept. Each class related soil to the combination of practices required for sustained production. The land capability classification accommodated the rapid growth of the soil conservation program on a sound basis. After merger of the Soil Survey Division into the Soil Conservation Service, Charles Kellogg directed that the Soil Surveys include the land capability for each soil type.

Aerial photography

The U.S. Soil Survey pioneered the use of aerial photography for making soil maps during the 1920s. The first county Soil Survey based entirely on aerial photographs was made by Thomas W. Bushnell of the Jennings County, Indiana Agricultural Experiment Station in 1929. Bushnell recognized the advantage of aerial photography over the conventional method of soil mapping using a plane table and alidade. Surveyors found that using aerial photographs allowed them to make more accurate maps in nearly half the time. As airplanes and cameras became more reliable, the use of aerial photography for soil mapping became a standard practice for the soil surveyors in the 1930s.

Unification of the soil survey division and scs soil conservation surveys

Secretary of Agriculture Charles Brannan unified the soil survey work in 1952 when he transferred the Soil Survey functions to the USDA Soil Conservation Service (SCS). The merger linked the US Soil Survey with a principal user group, soil conservationists doing conservation planning on farmlands.

Soil taxonomy

Soil Taxonomy and its associated science developed in the 1950s and 1960s after Charles Kellogg asked Dr. Guy Smith to lead an effort to create a new soil classification system to replace the system outlined in the 1938 Yearbook of Agriculture. The 1938 system relied heavily on theories of soil genesis and subjective visual observations. The new system developed by Smith and his colleagues relied on standardized measurements and could be applied consistently across diverse environments by the more than 1400 field soil scientists then working on the nation's Soil Survey. Smith produced an ingenious system for classifying soils using observable, quantitative "*diagnostic horizons and features*" to group genetically similar soils together. The effect was to put all soil scientists from the recently hired to the most senior on an equal basis in their ability to classify soils in the field.

Soil geomorphology

The scientific contributions of USDA soil geomorphology studies are largely the product of two successful research initiatives. The integration of soils and geomorphology research originated in the 1930s when the SCS Office of Research's Climatic and Physiographic Division brought soils and geomorphology researchers together to study soil erosion processes in Arizona, Mississippi, Kentucky, and South Carolina. This effort was continued after World War II by Dr. Robert V. Ruhe, who from 1953 to 1970 led soil geomorphology research in the Soil Survey Investigations Division with projects in Iowa, New Mexico, North Carolina, and Oregon designed to soil processes in different geomorphic, stratigraphic, and geographic settings. This research provided significant breakthroughs in the science of geomorphology and served to facilitate more accurate soil surveys.

International assistance

Throughout its history, the Soil Survey has provided assistance to foreign countries. During the 1910s and 1920s, Hugh Bennett worked in many Central and South American countries. In the 1930s, James Thorp conducted and wrote a soil survey of China. Through the 1940s and 1950s, Charles Kellogg initiated studies of tropical soils and worked to assist developing countries to achieve food self-sufficiency. In the 1970s, the U. S. Agency for International Development (USAID) started the Soil Management Support Services (SMSS), which has organized workshops and training courses around the world. SMSS staff sampled soils in more than 100 countries. These samples were analyzed by the USDA National Soil Survey Lab, and used to develop the Global Soil Regions map, which has been adopted worldwide as a standard reference resource.

Web soil survey

The Web Soil Survey is an easy-access, self service system to retrieve local soil information which allows for consistent updating of data, and substitutes for the familiar printed soil survey books. Whenever soil information is needed for agronomic, forestry, construction or urban development, the Web Soil Survey draws on the most current, up-to-date official USDA soil survey information available. Web Soil Survey can display soil maps and interpretive thematic maps. A customer is able to build a report or data file customized to their individual needs to address questions on potential land use. Web Soil Survey version 1.0 was released for public use in August 2005. Version 2.1 was released in November 2008. To date, about 3.75 million internal USDA and external public customers have used Web Soil Survey, currently averaging over 110,000 per month or about 4,200 per day.

Conclusion

The 2010 Soils Planner presents the historic highlights of US Soil Survey and Conservation Movement in which two disciplines of thought came together to consider landscape ecology, agriculture, chemistry, physics and geosciences, supporting each other to eventually create a body of knowledge that serves the US in all aspects of its development and sustainable environment. The 2010 NRCS Soils Planner provides a sense of the arc of this history through imagery that depicts developments in the history of the U.S. Soil Survey.

Using the communication tool of a calendar targeted to professionals, laymen and students, the USDA-NRCS Soils Planner (with SSSA, and other groups partnering in printing and distribution) has been successfully distributing soils information to a diverse audience over a 10 year period. As the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) approaches its 75th Anniversary, the Agency looks forward and reflects on its accomplishments and discoveries during the initial Conservation Movement in the United States and the people and their ideas that made it happen. The partnerships of the US Soil Survey and the Natural Resources Conservation Service have provided the science and the dialog necessary to transfer technology into action to conserve and sustain our natural resources.

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