National Cooperative Soil Survey Newsletter

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Issue 1

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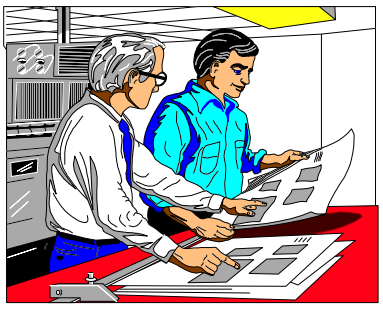
Editor's Note

You are invited to submit stories for future issues of this newsletter to Stanley Anderson, National Soil Survey Center, Lincoln, Nebraska. Phone—402-437-5357; FAX—402-437-5336; email—sanderson@nssc.nrcs.usda.gov.



A Message from the Director

By Horace Smith, Director, Soil Survey Division, NRCS, Washington, DC.

I was promoted to the position of Director of the Soil Survey Division on February 2, 1997. I bring to this position more than 30 years of experience with NRCS in production soil survey, including positions of project member, project leader, resource soil scientist, assistant state soil scientist, assistant principal soil correlator, state soil scientist, state technology manager, assistant state conservationist, and regional soil scientist. I have completed short-term foreign assignments in West Africa, Mexico, Taiwan, and Brazil. I am a product of the NCSS, and as the new director of the Soil Survey Division, I pledge my total support and the resources of the division to the NCSS' continued success and rich tradition as we look towards the 21st century.

During the past 10 months, I have had the opportunity to visit with several cooperators and partners that make up the NCSS. One topic of discussion and a recurring theme that I keep hearing is that there is a lack of communication within NCSS. This topic is not new, as it has been discussed many times before at Regional and National Soil Survey Conferences. Regional and national committees and task forces of these conferences have been formed in the past to discuss ways to improve communication within NCSS. With the recent internal changes, reorganizations, and reinventions,

"I pledge my total support and the resources of the division to the NCSS' continued success and rich tradition as we look towards the 21st century."—Horace Smith

involving several cooperators within NCSS, it is very important that a means of good communication be established.

Improving communication within the NCSS is an issue that I consider a high priority within the Soil Survey Division. Establishment of the "NCSS Newsletter" hopefully is a step in that direction. The purpose of this newsletter is to provide a forum for NCSS cooperators and others interested in the soil survey and related activities to express their views. Cooperators, partners, and others with an interest are encouraged to contribute on a regular basis to this publication. It will be published quarterly.

In addition to placing special emphasis on improving communication, here are a few other issues that I consider high priority and that we in the Soil Survey Division will be concentrating on during my tenure as Division Director:

• Ensure that all activities within the division are science-based. The division's reputation and credibility stand on the quality of the products and services that it produces. Therefore, it is imperative that all activities within the division be defensible and have a sound science-based foundation.

• Ensure that all activities within the

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division are compatible with and in support of NRCS' strategic plan. Staffing plans and budgets at all levels within the agency are tied to the strategic plan.

• Encourage an interdisciplinary approach to activities within the division. We will invite and welcome the input of individuals from other disciplines in our activities at National Headquarters (NHQ) in Washington, DC, and at the National Soil Survey Center (NSSC) in Lincoln, Nebraska. We will also encourage other disciplines within the agency to incorporate the expertise of soil scientists into their activities.

• Support sabbatical assignments of prominent scientists to work within the division at NHQ and at the NSSC on special topics and projects. We will also encourage sabbaticals for select scientists within the division when a sabbatical is mutually beneficial to the employee and the agency.

• Renew and strengthen relations with NCSS cooperators. I will be personally visiting and meeting with cooperators over the coming months to discuss areas of mutual concern and ways we can strengthen our partnerships and leverage our resources.

• Establish a Cooperators Advisory Group to work with the Soil Survey Division. This group will serve as a sounding board for the division and provide advice on strategic issues and emerging topics.

• Establish a Field Soil Survey Advisory Group. This group will consist of field-based individuals, representing a cross-section of disciplines. The group will provide valuable feedback to the division relative to the usefulness and impacts of various soil survey products and policies at the field level.

• Continue to actively participate in international activities that help to refine and strengthen soil taxonomy and that give support to programs that lead to sustainability of agriculture and protection of the environment around the globe.

• Reorganize the Soil Survey Division management team, establishing function areas and clear lines of responsibility.

• Strengthen and elevate soil survey technical services. On the cover of the Soil Survey Division Program Plan, the mission statement reads: " Helping People Understand Soils." This is really what technical soil services is all about. We will elevate this activity at the field level and put it on a par with production soil survey, soil classification, etc.

• Bring the 1890 Universities and Tuskegee University in as partners of the NCSS. A great number of the employees who make up the NCSS are products of the 1890 Universities. These universities can add a unique dimension to the NCSS.

• Involve the Hispanic Associated Colleges and Universities (HACU) and Tribal Colleges in the NCSS. A major objective during the coming year is to get these colleges and universities involved in the division's digitizing initiative.

• Ensure that a diversified cadre of soil scientists is hired regularly. Due to tight budgets and other priorities, the NRCS and other Federal partners in the NCSS have not hired many entry-level soil scientists during the past years. This is

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PINE TREE STATE

Forest Soils in Maine

High Demand for Forest Soils Information in Maine

The increased demand for wood products and a greater environmental awareness have created an unprecedented high demand for forest soils information in the State of Maine.

Four large woodland-owning or woodland-managing companies entered into reimbursable agreements with the Natural Resources Conservation Service (NRCS) to map the soils on nearly 0.3 million acres of forest land in northern and eastern Maine in FY 1997.

Some of these contracts are renewable over several years until the entire owned or managed acreage is mapped. Mapping the forest land has proven to be a full-time job for Maine's entire staff.

The soils information is being used by the companies for tree growth production management and resource protection planning for lakes, streams, wetlands, and deer yards. The reimbursement has strengthened the relationship between the NRCS and the forest service industry.

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becoming a serious problem as we do not have a large reservoir of talent to fill behind experienced personnel when they move on to greater responsibility or retire.

• Refine the MLRA concept for production soil survey. The MLRA concept for developing legends and producing correlations along major physiographic boundaries was initiated by the NCSS in the mid 1980's. A management structure was established as a means of realizing this concept in 1995, during the NRCS reorganization. This concept is still evolving and will continue to be refined.

• Digitize all ongoing and backlogged soil surveys. Since 1995, NRCS has been earmarking a specified amount of money to accelerate this process.

• Publish a revised hard copy version of *Soil Taxonomy*. A hard copy version of *Soil Taxonomy* has not been published since the initial version was issued December 1975. This revision will be released in the summer of 1998.

• Establish a Soil Survey Division Technical Monograph Committee, which would be responsible for preparing a scholarly paper on each of the emphasis areas the division is responsible for, such as interpretations, classification, technical soil services, soil survey laboratory, world soil resources, investigations, and operations. These papers would be similar to and patterned after those produced by Dr. Charles Kellogg and others during the 1950's and 1960's and would coincide with the Soil Survey Centennial.

• Establish a "Soil Scientist of the Year Award" for field soil scientists involved in production soil survey and technical soil services. This would be an annual award and would recognize an NCSS soil scientist below the state office level who has made substantial contributions to production soil survey activities or technical soil services.

• Establish a "Soil Scientist Hall of Fame Award" for NCSS soil scientists involved in production soil survey. This award would be presented yearly to a uniquely qualified individual at an appropriate forum and would be equivalent to the Soil Science Society of America (SSSA) Fellow Award.

• Encourage professionalism among soil scientists at the field level. Field soil scientists are encouraged to become active members of their State Soil Science Societies and Soil Classifiers Groups, and professional organizations, such as SSSA and the Soil and Water Conservation Society. I will also encourage field managers and supervisors, through the proper channels, to provide the time and resources, where appropriate, for field soil scientists to participate in nontechnical activities that would make them more well-rounded employees and enhance their professionalism.

• Continue the Request for Proposal (RFP) to support critical NCSS research issues that was initiated in 1997, but limit the RFPs to no more than $25,000.

• Support an interdisciplinary and interagency approach to research and field studies that would help the NCSS to better—

1. Refine the hydric soil status of clayey soils;

2. Understand soil-landscape functions and lateral flow of water within landscapes;

3. Understand site-specific management (precision farming) and the role soil survey can play;

4. Understand the soil and regolith at depths greater than 2 meters for purposes of waste management, water quality, modeling, etc.;

5. Define soil moisture-temperature relationships as they relate to soil behavior and soil quality;

6. Understand the role soils play in global climate change and carbon sequestration and the influences of NRCS programs, such as the Conservation Reserve Program, on the capacity of soils to perform this role; and

7. Understand the properties and characteristics of anthropogenic soils and quantify background levels of heavy metals and trace elements in urban and related soils.

• Make soil survey information more readily available to customers by putting it in digital format and on the Internet. We have a Homepage Team at the NSSC and are well under way with this activity.

• Develop an aggressive marketing campaign for the soil survey and solicit input and support from the private sector.

• Highlight the rich history and unique cooperation within the NCSS during the Soil Survey Centennial in 1999. This is a very important initiative, and all States and entities of the NCSS are encouraged to participate.

These are just a few priority issues that the Soil Survey Division will be concentrating on during the next few years.

Soil Scientist in the Army

Several years ago a Soil Scientist Liaison position was established in the U.S. Environmental Center. The main functions of this position have been to provide the Army with information about soils and to bridge the working relationship with Army personnel and the soils staff of the Narural Resources Conservation Service.

The Army has over 200 installations, 80 to 90 of which cover more than 6 million acres. At present, soil survey activities are being performed in Fort Wainwright, Alaska; Fort Bliss, Texas and New Mexico; and Fort Hood, Texas. The U.S. Army National Guard has approximately 1 million acres in 37 states. We are currently working on approximately 60 installations to provide soil resource information.

The Natural Resources Conservation Service in conjunction with the Forest Service is providing soil scientists to carry out these activities. We are working not only within the continental U.S. but also currently have soil scientists on special detail assignments in South Korea. Soil survey interpretive information is being provided to U.S. Army specialists in Hungary. The liaison is developing a tracking system for pesticides and pesticide management.

Northern Finland Soil Benchmark Study Team

From the April 1997 issue of the Tennessee newsletter "Current Developments," USDA, Natural Resources Conservation Service.

Tennessee State Soil Scientist Darwin Newton served as a member of the Northern Finland Soil Benchmark Study team. The American team, which also included Henry Mount, NRCS Soil Scientist, Lincoln, Nebraska, and Lisa Krall, NRCS Agronomist, Orono, Maine, worked with four geologists from Finland and two soil scientists from France from June 30 to July 12, 1996.

The starting point for the trip was Rovaniemi, the county capital of Lapland (northern Finland). The group spent two days examining and sampling soils in the Pello, Finland, area; three days in the Pallas Camp area; three days in the Enontekio, Finland, area; and finally two days back in Rovaniemi preparing notes and samples for shipment back to the United States. All areas studied were north of the Arctic Circle.

Detailed notes and descriptions were taken at five sites in northern Finland, and soil profile descriptions were taken at three additional sites to assist the Finns in the ecogeochemistry studies. Data at all sites were georeferenced by a GPS device provided by the Finns.

Some of the technology transfer accomplished during this trip:

• A macro datalogger was installed at one site to monitor daily soil temperature and mirtemperature for one year. These data will help to resolve the mean annual soil temperature in this part of northern Finland.

• Soil humus studies were conducted by both the Americans and the Finns at five sites.

Darwin Newton, Tennessee State Soil Scientist, and Henry Mount, Soil Scientist, National Soil Survey Center, Lincoln, Nebraska, in Finland.

• The soil profile descriptions at the five sites sampled by the American team were distributed to team members prior to leaving Finland. After further peer review, final drafts will be mailed to all participants.

• Results from the 1994 study were distributed to the French and Finns. The study contained summarized data for 10 soil pedons in central Finland.

• Permafrost does not exist in Finland, except for the upper portions of the country above 69 degrees 30 minutes. This is much farther north than in Alaska, Iceland, and Greenland because of the upper level atmosphere airstream flow. As a result, the team has possibly sampled the northernmost podzol in the world.

This study was a cooperative effort by the French, Finns, and Americans and was a follow-up to a similar trip to southeastern Finland in the summer of 1994. Plans are to publish another paper on the soils sampled in northern Finland during 1996.

Soil Survey Tables Join the Electronic Age

By Anne Schlicher, Editor, Phoenix MLRA Office.

In the past, the text and tables of soil survey manuscripts were prepared for publication in two different kinds of software. Camera-ready copies of the text were typeset in PageMaker or Magna software, and camera-ready copies of the tables were prepared in word-processing software, such as XyWrite or MS Word. Now, however, a new process will allow all of the files to be typeset in PageMaker.

Suzie Meierdierks, editor for the Morgantown MLRA Office, has developed a procedure for typesetting the tables in PageMaker. As a result, electronic PageMaker files of both the tables and the text can now be sent to the printer. This procedure eliminates the printing problems that occur when the text is prepared in PageMaker and the tables are prepared in another software. Anne Schlicher, editor at the Phoenix MLRA Office, recently spent three days in training with Suzie in order to learn the new process. The Phoenix MLRA Office will use the new system for all future soil surveys.

The new procedure facilitates publication in electronic formats. The text and tables can be easily prepared for presentation in CD-ROM format (and possibly on the World Wide Web) if (1) the new procedure for tables is used, (2) the Index to Map Units and Summary of Tables are deleted and the information traditionally presented in them is included in the Contents, (3) the Contents is generated automatically by PageMaker, and (4) the files are saved as PDF files. The PageMaker software automatically establishes HTML links as it prepares the Contents.

Comparative Field Study of Wetland Boundary Indicators

Mascoma Headwaters, Dorchester, New Hampshire

By Steven J. Hundley, Project Leader, NRCS, Durham, New Hampshire; Joseph Homer, Project Coordinator, NRCS, Lancaster, New Hampshire; and Karen Dudley, Data Analyst, NRCS, Concord, New Hampshire.

In the fall of 1995, the NRCS Soils Staff in New Hampshire began an intensive field study to compare and evaluate the field indicators used for wetland identification in northern New England. The objective of this study is to increase our understanding of hydric soil properties indicative of wetland conditions and document field indicators that support wetland hydrology and vegetative criteria. This study looks at the concerns and issues that emerge in applying consistent protocols for identifying and mapping spatial variability of wetlands in northern New England.

A portion of this study is funded by the National Wetlands Science Institute. Instrumentation and technical support are being provided by the Global Change Initiative, the National Soil Survey Laboratory, and the National Climate Center. This study is also receiving technical support and assistance from the U.S. Army Corps of Engineers, New England Division, and USEPA, Region 1. The project involves the New Hampshire Wetlands Bureau, the New Hampshire Department of Environmental Services, and the New Hampshire Office of State Planning.

A 40-acre parcel was selected at the headwaters of the Mascoma River in Dorchester, New Hampshire. A point grid, serving as intensive ground control, was installed over the entire 40 acres. A global positioning system was used to georeference each control point, and the parcel boundary itself, for digitization into the New Hampshire NRCS GRASS Geographic Information System. Preliminary piezometers and thermistors were installed to monitor ground water and soil temperature.

In the spring of 1996, teams of scientists from NRCS, USCOE, and USEPA mapped and recorded the boundary of the three criteria used to identify and delineate wetlands. A 1:1,200 base map was used to delineate the boundary of wetland hydrology, hydrophytic plant communities, and the hydric soil boundary. All of these maps were digitized into the GRASS GIS for comparative evaluation.

The initial comparative evaluation

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revealed a need to suggest some revisions in hydric soil indicators and to reevaluate the start and length of the growing season. Initial findings indicate that a soil temperature of 5 degrees C at 50 cm is not a good indicator for the start of the growing season in the frigid temperature regime of northern New England. This conclusion supports the findings of the National Research Council in their 1995 report entitled "Wetlands: Characteristics and Boundaries."

As a result of the first year's study, several recommendations have been submitted to the National Technical Committee on Hydric Soils. The intensity of the data collection on soil properties and behavior has increased, and an intensive study to determine more suitable indicators for identifying the duration of the growing season has commenced based on recommendations made by the National Research Council.

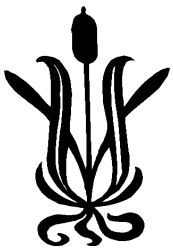
In the fall of 1996, four vegetative plots were established to monitor bud swelling and vegetative emergence and growth in the spring. Soil temperature probes and dataloggers were installed at each vegetative plot. With assistance from the USCOE Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire, thermistors were installed at 10-cm intervals down to 50 cm and connected to dataloggers for continuous readings during late winter and early spring.

During the summer of 1997, NRCS engineers in New Hampshire surveyed the 40-acre parcel to develop a 2-foot contour map. The NRCS soil scientists are in the process of completing a high-intensity soil survey. Both maps will be digitized into the GRASS GIS.

The Global Change Initiative approved funding for instrumentation at three locations within the 40-acre study site to collect continuous readings on soil temperature, soil moisture, ground-water level, redox potential, air temperature, relative humidity, and solar radiation. With assistance from the National Soil Survey Laboratory, representative soils were described and sampled for complete characterization.

Armed with substantially more information on environmental conditions and soil behavior within the 40-acre parcel, the teams of scientists will remap the boundary of wetland indicators in the spring of 1998. A revised start of the growing season will be tested, and the requested revisions of the field indicators of hydric soils will be employed. A result of findings will be submitted to the National Wetlands Science Institute, Global Change Initiative, the National Technical Committee for Hydric Soils, and the other cooperators in this project.

This Comparative Field Study of Wetland Boundary Indicators is the only one of its kind in New England. It is receiving widespread interest because it provides the documentation needed to accurately identify and delineate wetlands and the technical support needed to carry out Federal and State wetland regulations. The study also provides a wealth of information on the



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Minnesota, Virginia, New Hampshire, Maine, and a pending program in Texas. Soil scientists who are currently CPSS or who apply by the end of 1997 will not have to take the exams.

All applicants in 1998 will have to pass both examinations to become certified soil scientists. Applicants can take the Fundamentals exam without experience, and graduating seniors are encouraged to begin the certification process just before or after graduation. To be eligible for the professional exam, applicants must demonstrate that they have 5 years of soil science work experience. Both exams are based on the Soil Science Performance Objectives developed by the SSSA. These performance objectives will be published early in the fall of 1997.

Soil scientists who attain APSS (Associate Professional Soil Scientist) status before 1998 will be able to move up to CPSS without taking the Professional Practice exam. The current method will be used for "grandparented" APSS's—5 years of professional soil scientist experience for those with a B.S. degree and 3 years of professional soil scientist experience for those with an M.S. or Ph.D. The ARCPACS soils board will determine if the APSS's qualify for full certification when they apply for CPSS.

For information about ARCPACS soil science certification, phone Cleo Tindall at (608) 273-8090, ext. 315.

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Items Needed for the Soil Survey Centennial

By Gary Muckel, Soil Scientist, National Soil Survey Center, Lincoln, Nebraska.

The following items are needed:

- Atterberg - device
- Clippers - tree root
- Color charts of 1946 - large size for testing
- Drafting - instruments
- Field description kit
- Forms - full set of 232s (a) to (g)
- Instructions to field parties - about 1903 to 1915 (other than 1904 and 1914)
- Knife - straight
- Maxwell apparatus for color - metal desk mounted to rotate
- Odometer (Bell revolution counter for buggies)
- Photographs - historical of people and equipment
- Sand-size guide
- Scale - weight
- Sieves - large
- Spade - Montana sharpshooter
- Speedometer - 1938 version
- Spotplate
- Spudbar

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