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Editor's Note

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Dr. Kellogg's Reading List and C.P. Snow's "The Two Cultures"

By Stanley P. Anderson, Editor, National Soil Survey Center, NRCS, Lincoln, Nebraska.

Charles E. Kellogg, Soil Conservation Service, United States Department of Agriculture, describes the history of his reading list in the Foreword to the 1971 version of a work entitled "Reading for Soil Scientists, Together With a Library (Revised)":

> This essay and book list for students of general soil science developed gradually between 1930 and 1940, when it was first published in permanent form in the *Journal of the American Society of Agronomy* (32:867-876), November 1940. Since the list appeared to be useful, I was persuaded to revise it in 1956 and in 1964. This issue is a further revision.

Near the beginning of the essay that accompanies the reading list, Kellogg describes the value of general reading:

> Reading is the only practical way open to most of us to enlarge our experience about the things, the people, and the ideas of the world we live in—and especially, perhaps, to learn about ourselves in relation to this world. But one may ask: Why do we need to know? Why not simply take life as it comes and enjoy it? Reading current stock prices or ballgame scores, and how to do a job, may be fine—but why go beyond that? Our kind of open society gives each of us, at least each adult, both freedom and responsibility to answer for himself. Perhaps some do have little concern about other people, either past or present, or for their ideas. Some depend on others for guidance on issues both small and great. Yet those who did care and who tried to learn built the open society we now enjoy together.

The general reader is interested in a broad range of subjects:

> For convenience of organization of libraries and instruction, knowledge is classified quite arbitrarily into "fields." We distinguish the humanities from the sciences and the social sciences from the natural sciences. We split the natural sciences into the physical, earth, and biological sciences. Each of these is subdivided again and again. Yet the boundaries are broad. All the classes overlap. Really, we cannot separate chemistry from literature, or history from art.

Reading is a search for knowledge and truth:

> Truth is a great jewel with many facets. Even if one begins with a narrow objective, continuing inquiry leads to other fields. Some people find it

> helpful to begin with the "great books" because the scholars and artists of each age build partly with older ideas. Yet the general reader can start with either today's authors or the early ones. If he continues his inquiry, he will get to both anyway.

Reading also is a source of pleasure:

> We read for pleasure and beauty as well as for knowledge. Often beauty and knowledge join together. To me a poem or novel appeals if I reflect at the end: "Yes, this is right—this is the way the world is." Then too, most of us like to read partly just for fun, to relax, or to escape from the world around us for a little while. For such reading many enjoy the simple intricacies of a detective story. Yet others who detest detective fiction enjoy books like Spengler's *Decline of the West*, are scarcely able to lay them down. Some of my friends relax before the fire with Horace or Pliny in the original. Most of us don't.

In terms that strike the 2006 reader as chauvinistic, Kellogg applies his general comments to soil scientists:

> Now to get down more specifically to a soil scientist. What should he read? Let us assume that he wants to know more about soil science—about the relationships among soils, water, plants, farming, ranching, forestry, resource conservation, and economic development throughout the world—and how he, as a soil scientist, can contribute to human welfare. In the critical need for more food and for rural improvement in the newly developing countries he sees the great direct challenge to soil science and, perhaps, to himself.
>
> He can start there. But as he progresses he senses three great classes of relationships that he needs to understand: (1) The relationship of facts to facts, the field of science; (2) the relationship of man to the facts, the field of art; and (3) the relationship of man to man, the field of justice and morals. He strives to make his knowledge symmetrical as a citizen of the world as well as a soil scientist per se. He finally sees knowledge as a whole, not really split into departments. He finds that truth is what we said it was earlier—one gorgeous jewel with many facets.
>
> He becomes conscious of barriers to communication between scientists and poets, between people of different ages and backgrounds, and between people of different cultural systems. He tries to overcome them. He learns that appreciation is a far greater virtue than simple tolerance.
>
> Such a soil scientist must of course inform himself in his own field and keep abreast of current research and development. This immediately leads him into the other natural and social sciences. He doubtless reads regularly the publications of the Soil Science Society of America and of the International Society of Soil Science, including its congresses and commissions. He goes through the periodicals and bulletins of the outstanding soil research institutes, both here and abroad. He reads both the new and the old books and monographs by the outstanding masters in his field.
>
> He looks also at the most important books and monographs in closely related fields—chemistry, biology, geology, economics, and the like. He keeps abreast of the principal publications of the American Association for the Advancement of Science. He keeps aware of what is going on in the practical world of farming, forestry, engineering, and land-use planning, both here and overseas. His general reading includes a good newspaper and some of the current magazines.
>
> From these points of departure, he goes where he must to accomplish his purpose. Again and again he discovers the need for more background from current books on science and from the classics. He may use the following reading list or a better one as a general guide.
>
> Thus our soil scientist becomes a general reader!

Kellogg's reading list is divided into nine parts with the following headings:

1. Soil science
2. Related sciences
3. Early soil science and agriculture
4. General agriculture and planning
5. Science: history, meaning, method, and philosophy
6. Philosophy, conduct of life, history, etc.
7. Novels and stories
8. Biography
9. Poetry and drama

The list includes C.P. Snow's "The Two Cultures" under heading 6. Kellogg's work helps to bridge the cultural divide that Snow describes in "The Two Cultures," a divide between literary intellectuals who know nothing about the Second Law of Thermodynamics and natural scientists who have never read Shakespeare. Snow was a scientist turned novelist and lecturer.

Snow noted that this divide is characterized by mutual incomprehension and hostility. His own lecture inspired animosity, mainly because he characterized the literary intellectuals as Luddites (early 19th century workers who protested against the machine age by destroying labor-saving machinery).

In an introduction to a 1993 printing of "The Two Cultures" (Cambridge University Press), Stefan Collini, describes the historical background of Snow's lecture. Two important works covered in this discussion are T.H. Huxley's "Science and Culture" (1880) and Matthew Arnold's "Literature and Science" (1882). Huxley is a proponent of science. Note that "Science" precedes "Culture" in his title. Arnold is a proponent of literature. Note that "Literature" precedes "Science" in his title. Were I to revise Kellogg's list, I would add both of these essays.

The 1971 version of Kellogg's essay and list can be obtained from the National Agricultural Library (http://www.nal.usda.gov). Click on "Search the NAL Catalog (AGRICOLA)," and follow the directions for obtaining a patron ID and for ordering a specific item from the library.

Berman Hudson used to talk about updating the reading list. This is work that still needs to be done. ■

Regional Conferences of the National Cooperative Soil Survey (NCSS)

Following are notes about the four regional NCSS conferences to be held in 2006.

Southern Regional Conference

The 2006 Southern Regional National Cooperative Soil Survey Conference will be held in Oklahoma City, Oklahoma, June 12-15, 2006. The conference will be held at the Clarion Meridian Hotel and Convention Center in Oklahoma City. The registration cost is $125.00 per person. For information about registration, call (405) 744-6489 or contact Jimmy G. Ford, State Soil Scientist, Stillwater, Oklahoma (jimmy.ford@ok.usda.gov).

The theme of the conference is "Reconnection and Enhancing the National Cooperative Soil Survey Partnership." The Keynote Speaker for the luncheon planned for Wednesday, June 14, is Billy Wilson, President of the National Association of Conservation Districts. Mr. Wilson's topic will be "History and Future of Conservation."

In supporting the theme of the conference, the Tuesday morning session will highlight presentations on research pertaining to interpretations, taxonomy, new technology, etc. from the Southern Exchange Group (SEG) representing the universities.

The Standing Committees, the Chairs, and some of the discussion issues are as follows:

Soil Survey Standards, Bill Craddock
- Umbric criteria
- Micaceous/plinthite study

Research Priorities, Dr. Wayne Hudnall
- Gypsiferous issues (taxonomy, interpretations)

Applied Technology, Duane Daniels
- Exhibit and demonstrations of new technologies/tools for field soil scientists

Interpretation Criteria, Jerry Walker
- Wildlife Interpretations
- Irrigation interpretations—infiltration rates

The conference field tour will be on Thursday, June 15. The tour will concentrate on looking at soils and grazing lands and on how to capture site information in order to adequately describe ecological site components in an Ecological Site Description (ESD). Some interesting archeological sites will also be observed and discussed.

For more information about the conference, contact:

Jimmy G. Ford, State Soil Scientist, NRCS, Stillwater, OK
Karl Hipple, National Leader, Soil Survey Interpretations, NSSC, NRCS, Lincoln, NE
Edward Griffin, Regional Technical Specialists, CNTSC, NRCS, Fort Worth, TX

North Central Regional Conference

The 2006 North Central Regional National Cooperative Soil Survey Conference will be held in Medora, North Dakota, June 25-30, 2006. The conference will be held at the Medora Community Center. The agenda and registration form are being finalized.

The Standing Committees and the Chairs are as follows:

Taxonomy & Standards, Mike Ulmer

Research Needs, Dennis Potter

New Technology, Chad Remle

Interpretations, Mike Sucik and Randy Miles

Constitution & By-Laws, Jon Gerkin

Future Direction of Soil Survey, Phillip Owens

The conference field tour will be on Wednesday, June 28. The tour will concentrate on North Dakota soils, landscapes, and geology.

For more information about the conference, contact:

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Dr. David Hopkins, Professor, NDSU Extension Service, Soil Science Department, Fargo, ND
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Northeast Regional Conference

The 2006 Northeastern Regional National Cooperative Soil Survey Conference will be held in Bordentown, New Jersey, May 21-25, 2006, at Rutgers, The State University of New Jersey, EcoComplex, which is off campus. The registration cost is $150.00 per person. The agenda and committees are being determined by the planning committee and will be available in early February. In addition to the standing national committees, other committees will address selected regional concerns.

As Rutgers University's Environmental Research and Extension Center, the Eco-Complex is a fitting location. It is partnered with the Burlington County Solid Waste Administration, which addresses issues of solid waste and resource recovery.

Participants will lodge at the Ramada Inn just off Exit 6 of the NJTPK and on the outskirts of historic Bordentown. Sunday evening will include registration and a group social at the motel.

On Monday morning, the meeting will convene at the Eco-Complex, a 5-minute drive from the motel.

Tuesday's agenda is an all-day tour featuring the soils and landscapes of both the Inner and Outer Mid-Atlantic Coastal Plain. Stops will include a site where soils formed from greensand, wet soils at the Cranberry and Blueberry Experiment Station, and one of the oldest land surfaces on the coastal plain. The return route includes a stop at Batsto, a historic iron village, where the conference participants will be shown an example of how soils information can be included in the natural history exhibit of a visitor's center. The return trip includes a stop at one of New Jersey's fastest growing agricultural enterprises, small wineries.

Wednesday will be a busy day of general sessions and committee meetings to address the various charges. Late in the afternoon, there will be a tour of the many varied activities occurring at the landfill. The tour will show how resources that are considered to be worthless can be profitably recovered. Following the tour will be an evening BBQ at the Eco-Complex.

Thursday's morning session will include invited speakers. In the afternoon, committee reports will be presented and the business meeting will be conducted before adjournment.

Throughout the week, the Standing Committees (Standards, Soil Taxonomy, and Research Needs) will address ongoing regional concerns. Additional committees will address issues involving hydric soils and subaqueous soils and additional selected issues and interpretation criteria.

One objective of the meeting is to encourage cooperator participation and aggressively explore ways to enhance and strengthen relationships between the cooperators and NRCS.

For more information about the conference, contact:

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Western Regional Conference

The Western Regional Cooperative Soil Survey (WRCSS) Conference will be held jointly with the Western Soil Science Society meeting at the Prospector Lodge and Conference Center, Park City, Utah, from June 19-22, 2006. Jeff Bruggink, Region 4 Soil Scientist with the Forest Service, is the Chairperson for the 2006 conference. Craig Ditzler, NRCS National Leader for Standards, is the NSSC liaison for the conference. Registration is being handled by Utah State University Conference Services and will be online by mid-February.

Members of the Western Soil Science Society will meet jointly with the WRCSS Conference during Tuesday afternoon oral presentations that will be of mutual interest to the attendees. They also will participate in the conference poster session, banquet, and midweek tour.

The conference theme is "Innovative Applications of Soil Survey: Meeting the Changing Needs of Today's Society." Sylvia Gillen, Utah State Conservationist, NRCS, will give a speech welcoming the attendees to the

conference. The agenda will include presentations on "Using soil survey information to develop farm management alternatives based on soil type" by Gale Dunn, ARS; "Benchmark soilscapes to predict effects of climatic change in the western USA" by Anthony O'Geen, UC Davis; "Use of SSURGO data and field assessments for monitoring pipe infrastructure degradation in arid environments: A case study from Las Vegas, NV" by Patrick Drohan and Brenda Buck, UNLV; and "National Park Service Dynamic Soil Properties Project in Utah" by NRCS and NPS staff.

The following committees will be meeting:

- The standing Applied Technology Committee, which is chaired by Bill Ypsilantis, BLM, and Dave Hoover, NRCS. The committee's charge is to make recommendations on digital mapping methods and standards for the National Cooperative Soil Survey.
- The standing Research Needs Committee, which is chaired by Anthony O'Geen, UC Davis. The committee's charges are under discussion. The main charge probably will be how to foster a highly visible, regionally comprehensive, and active research program between cooperators in the western region and the NRCS.
- The standing Taxonomy Committee, which is chaired by Tom Hahn, NRCS. The committee's charges are under discussion.
- An ad hoc committee on interpretations, which will be chaired by Susan Southard, NRCS. The committee's charge is to recommend a process that involves state or regional technical review of national interpretation criteria changes made in NASIS by the National Soil Survey Center. A secondary charge is to provide recommendations on edits needed to national interpretations that were changed without regional or state input.
- The standing Standards Committee does not have any issues pending.

The midweek soil tour will highlight the use of soil information to guide land management. The tour will include a stop in Park City, which is experiencing growth pressures; a stop along the middle stretch of the Provo River where riparian work has been done for water-quality improvements; and stops in the national forest land near the Strawberry Reservoir where soil survey has been used for forest land use planning.

The Federal Lands Advisory Group will meet on Friday, after the conference, to discuss proposed strategies for completing soil survey on Federal lands in the United States.

For further information about the conference, contact Jeff Bruggink at jbruggink@fs.fed.us or Mike Domier at mike.domier@ut.usda.gov. ■

Status and Activities of the Gypsiferous Soil Project

By David Hammer, Phil Schoeneberger, and Karl Hipple, National Soil Survey Center, NRCS, Lincoln, Nebraska.

Interest in gypsiferous soil responses to human impacts is making this a topic of high relevance and importance in NRCS. Last summer, Dr. Phil Schoeneberger was asked to chair a gypsiferous soils task force at the National Soil Survey Center to begin gathering information from different states about their needs regarding classification, description, composition, behavior, and interpretations of soil with high concentrations of gypsum and associated chemicals.

Some initial contacts have been made, and we still are in the preliminary stages of gathering information. Our intention is to query all State Soil Scientists and MO leaders who have extensive areas of gypsiferous soils. We will compile a list of needs and concerns, distill them, and then hold a series of teleconferences. Our goal is to identify and prioritize needs in description, classification, sampling, laboratory analyses, and interpretations and to organize a focused, coordinated effort to address these issues. If we have not called you yet, we soon will!

Please feel free to contact any of us if you have questions, concerns, or ideas. ■

Data: Are We Asking the Right Questions?

By David Hammer, National Leader, Soil Survey Investigations, and Karl Hipple, National Leader, Soil Survey Interpretations, National Soil Survey Center, NRCS, Lincoln, Nebraska.

Recent discussions about the future of the National Cooperative Soil Survey (NCSS) have focused on the legislated missions of the NCSS and possible ways to fulfill those missions. Karl Hipple and David Hammer presented some of the challenges in the article "Soil Interpretations for Today and Tomorrow: Rationale for the New Soil Survey" in the last issue of the NCSS Newsletter.

The article stated that meeting future NCSS needs requires "new data" to make interpretations for both traditional and new users of soil survey

information. The leadership staffs of the Natural Resources Conservation Service (NRCS) have discussed this requirement in numerous recent meetings concerned with strategic planning and organizational issues.

A question logically arises from these discussions about new data and the future of the NCSS: What does "data" mean in the context of the changing focus of the NCSS? At first glance, this may appear to be a frivolous question, but important ramifications occur, particularly in the context of allocations of fiscal and human resources. These ramifications become evident when we assess NCSS priorities as the mission emphasis shifts to a balance among all aspects of the NCSS program (e.g., making and maintaining maps, making interpretations, and delivering services) and when we attempt to ensure the utility and reliability of the data to data users. The term "data" is used within NCSS in a variety of contexts. This variety blurs the precision, accuracy, and sources of the numbers that represent the data. By now, you probably have noticed that "data" are plural, not singular.

For the sake of discussion, numbers used to quantify soil attributes and make soil interpretations can be classified broadly into three categories—hard data, soft data, and tacit knowledge. "Hard data" are measured numbers collected with specified methods and procedures. Hard data can produce determinable statistical attributes, such as ranges, means, standard deviations, correlations, and distributional patterns. Particle-size data determined by pipette, precisely following specified analytical procedures and with reference to standard samples as part of the sampled population, are "hard data." Different laboratory technicians analyzing the same soil, following the same procedures, and using identical equipment should be able to produce the same numbers within an acceptable statistical range. The population of collected hard data, regardless of who performed the analyses, could reveal many ancillary statistical data that could be applied in a variety of ways by a spectrum of soil survey users. Most of our university cooperators probably think of data in this context, because they are scientists who gather data through hypothesis-based research with carefully monitored controls. Research data and the inferences drawn from those data are subject to intensive peer review.

The precision and accuracy of "soft data" cannot be verified or commonly are not verified. Soft data used in the NCSS generally are combinations of observations, measurements, and inferences that produce maps and models (interpretations) at various scales. "Soft data" cannot be reproduced with precision. A person who is determining particle size by hydrometer in a field laboratory and who does not follow a verified set of procedures and has no verification process would be creating "soft data." Infiltration interpretations extrapolated from one soil to another on the basis of surface texture, without measurements and quality assurance, would be "soft data." In the latter situation, some tacit knowledge would be used in the extrapolation. Soft data are important, have many uses in society, and are most successfully applied when one recognizes and understands the limitations of these data.

"Tacit knowledge" is human understanding that results from focused experience within a system. Hudson (1992) illustrated how tacit knowledge of local soil-landform relationships is a necessary component of the soil mapping paradigm. Tacit knowledge also is an important component in many soil survey interpretations. A key question facing the Soil Survey Division is how the next generation of soil scientists will acquire tacit knowledge without the intensive production mapping experience to which the current generation was universally exposed.

The best hard data are both precise and accurate. For example, if a person performs a particle-size analysis on six subsets of the same soil sample and obtains six different values for clay content on the same soil, the analyses were not precisely performed and some or all of the answers are not accurate. If the six answers are identical, the procedure was precisely performed, but its accuracy is unknown unless a certifiable value for the clay content can somehow be obtained. Again, the best data are both precise and accurate and are verified through a systematic quality-assurance program.

The NCSS traditionally uses combinations of hard data, soft data, and tacit knowledge to make soil maps and interpretations about soil responses to human activities. The challenge is to make myriad interpretations for an ever-changing suite of soil survey users. This challenge precludes the ability to acquire verified hard data for all needs. In this context, the key data questions facing the NCSS would seem to be:

1. When should the different kinds of data be used? When are hard data required, and when is a combination of soft data and tacit knowledge acceptable?
2. What restrictions should accompany the applications and publication of the various kinds of data?
3. How much information about the origins of the data should be conveyed to the user, and how should this information be conveyed?

Is it important for a user to know how the interpretation numbers are generated? Do users want to have confidence in the precision and accuracy of the data we give them? Does the NCSS want or need to be able to track the sources and values of the data and interpretations we generate? Do we ultimately want or need to be able to distinguish hard data from soft data in our data archives? The senior author, when employed as a university professor, had many opportunities to consult in legal settings. The well-established quality-assurance procedures and standards used by SCS and NRCS always were accepted in legal proceedings. The Soil Survey Division's standards and quality-assurance procedures are respected and important attributes.

Traditionally, NCSS has presented data in a variety of ways, often without telling users how numbers generated and how decisions were made. For purposes of illustration, two soil surveys will be cited. The first of these is the *Soil Survey of Brookings County, South Dakota*, Series 1955 (Westin et al., 1959), and the second is the *Soil Survey of Randolph County, Missouri* (Potter, 1989).

The survey of Brookings County includes a data table not common to modern soil surveys. Table 5, "Mechanical and chemical analytical data for important soils" begins on page 50. The table includes a soil series name, sample location, sample number, and laboratory number for each soil profile. Horizon names and horizon depths and thicknesses are included. The data included are particle size-distribution, cation-exchange capacity, exchangeable cations, electrical conductivity, pH in saturated paste, and 1:10 ratios of soil to water, organic matter, and nitrogen. Data are footnoted with the statement, "Analysis (sic) by Soil Conservation Laboratory, Mandan, N. Dakota." Inclusion of laboratory-generated data for complete soil profiles in the "soil management" section of the soil survey conveys a sense of assurance to the user. Hard data were available when the survey staff made interpretations. The data are available for anyone and can be applied as necessary by the user.

Table 7, "Woodland Management and Productivity," in the survey of Randolph County (p. 75) gives site index values for the tree species best suited to the soils in the county. White oak (*Quercus alba L.)* is given a site index value of 55 for the Calwoods, Gorin, and Gosport soils. At the time this soil survey was correlated, these soils were, respectively, Aeric Ochraqualfs, Aquic Hapludalfs, and Typic Dystrochrepts. The absolute value of 55 for a relatively dry site species across this range of soils might be questioned by someone with a forestry background. Site index (the height of a healthy, canopy-dominant tree at a reference age—50 years for eastern hardwoods) is highly variable. Trees have different rates of growth with age and with site locations that affect plant-available soil water (aspect, position on the slope, soil profile attributes, etc.). Standard procedures for site index require that five canopy-dominate trees per stand be measured and that several stands be measured to generate sufficient data for the user to have confidence in the values. Older "harmonized" site index curves for oak give different site index values than polymorphic curves based on stem analysis.

So how was the value "55" derived? Was it measured in the field, generated from a model, or inferred from some unknown source? The soil survey reader has no way of knowing. In this particular situation, however, the baseline data are available online at the NRCS Web site "Ecological Site Information System." The soil survey user is not informed of this. Is it important that NCSS do a better job of informing users of the source and location of hard data?

The site index data illustrate several important considerations that apply to how the NCSS might better disseminate data in the future. Site index is a value for which a single number is not a realistic or representative way to display the variance of existing conditions. A more representative display of site index values would be a range about a mean, a clear indication of how the numbers were obtained (measured, modeled from data, or inferred with tacit knowledge), and a brief discussion of the soil and landform conditions that would cause systematic, predictable variation. This approach would educate the lay user and could establish more credibility with the professional user.

If acquiring data to maintain the soil survey and make interpretations is now the focus of the NCSS, discussions about priorities of data acquisition and referencing to data source would appear to be relevant and important. Relevant questions include:

1. What data must be "hard" data to meet user needs?
2. How much and what information should we convey to the user about how the data were obtained?
3. How should we distinguish in our own databases between the "real" values of measured data and data obtained by other means? A time may come when it is important to know the differences. "Institutional memory" must be systematically created if this distinction is to be traced in the future.
4. How responsible are we for the precision and accuracy of our data?
5. What are the best ways to obtain the required data?

6. How do we use existing hard data, soft data, and tacit knowledge to improve our estimated soil property data?

7. What data should be archived, and how should the data be archived?

8. How should we allocate fiscal and personnel resources to ensure that the most important user needs are met?

The likelihood is high that the NCSS will continue to utilize all three kinds of data. Certain kinds of soil information and interpretations require considerable tacit knowledge about patterns of soil distributions and processes of soil behavior that can be acquired only through field experience. An example is the interpretation for disposal of large carcasses recently completed at the NSSC. Is there any other collection of individuals, data, and knowledge that could have produced this kind of interpretation so quickly?

Laboratory data associated with the NCSS traditionally have been generated by laboratories funded and managed by the NRCS (or SCS) or by cooperators in the universities. Generally, university laboratories have used NCSS laboratory methods as the analytical template and have generated precise, accurate "hard" data. The laboratory data in the survey of Brookings County are examples.

The number of field soil scientists is projected to be about 450 as the NCSS shifts emphasis. This is a significant reduction in field personnel from the basic inventory phase, and it means that fewer soil scientists will be asked to meet more, increasingly complex user needs. To be pragmatic about acquiring the necessary "hard" data in the future, the NCSS should discuss and plan the optimum allocation of resources to ensure that targeted soil samples are analyzed precisely and accurately.

The first steps in meeting data needs for the future are being taken. A questionnaire that has been sent to the NSSC cooperators in the academic sector has begun the task of determining the amount, kind, and quality of soils data archived in universities. The ultimate goal will be to verify cooperator data and incorporate the data into the national soil database.

State Soil Scientists and MO leaders have been asked to update existing lists of benchmark soils. These are soils of broad geographic extent in areas where the native vegetation or land use practices are common to a region. The idea is that benchmark soils provide the best template from which to broadly extrapolate soil data and soil interpretations within states and MLRAs. Populating the database for benchmark soils will be a priority in the MLRA update and maintenance phase of soil survey.

It is our hope that this article will answer some questions, prompt others, and inspire focused discussions on how the NCSS can most effectively meet current and future needs of our changing clientele.

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Language Matters

By Stanley P. Anderson, Editor, National Soil Survey Center, NRCS, Lincoln, Nebraska.

I value concise writing. My motto is, "Say it once, just once, only once, and be done with it." The way this motto is expressed shows that you can be brief at the same time that you are redundant. ■