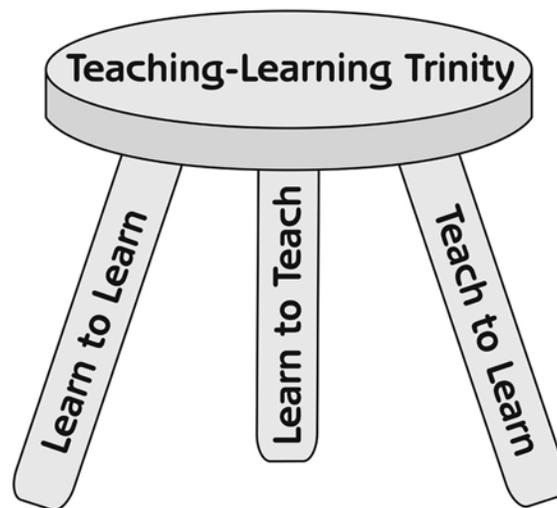


Soil Survey Division Training Strategic Plan

February - 2006



Teaching and learning is a three-legged approach according to Steve J. Thien, Department of Agronomy, Kansas State University. We as instructors must learn how to teach then teach to learn. The student must learn how to learn.

The Mission

These four functions are the core mission areas of the Soil Survey Division:

1. make an inventory of the soil resources of the United States;
2. keep the soil survey relevant to ever-changing needs;
3. interpret the information and make it available in a useful form; and
4. promote the soil survey and provide technical assistance in its use for a wide range of community planning and resource development issues related to non-farm and farm uses.

The soil survey mission is accomplished with two basic functional roles of soil scientists: the soil scientist that is involved in soil survey mapping, database management, correlation, and data quality control and assurance; and the soil scientist involved in technical soil services. With the emergence of geospatial applications and tools it is recognized that a potentially important additional functional role performed by soil scientists is as a GIS specialist focused on soil survey activities.

A soil survey program that is balanced across all mission functions requires soil scientists who are technically competent in new technologies and their discipline, understand how soil science and soil survey are relevant to public policy, and are able to communicate effectively with both urban and rural audiences. To accomplish this, the Soil Survey Division Strategic Plan specifies the following in regards to training and education:

1. Work with NCSS partners to identify knowledge, skills, and abilities necessary for future soil scientists.
2. Enhance course content, develop new courses where necessary, and provide training that includes emphasis on interpretations, new technologies, USDA programs, law and public policy, and other aspects of a well balanced soil survey program.
3. Promote a graduate studies program and establish continuing education credit for the soil science institute curriculum and all other Soil Survey Division courses.

The Methods

The Soil Survey Division's training efforts will utilize a mixture of the following methods to enhance the ability of NCSS participants to carry out the soil survey mission.

Technology transfer is the integrated use of training, education, development, job aids and other activities and techniques to provide our NRCS and partner employees with the most up-to-date knowledge, skills, and abilities necessary to conduct their assigned tasks. These can be defined as follows:

Training is typically short-term learning that is intended to establish or improve a match between present job requirements and individual knowledge, skills and attitudes. Training helps people meet minimally acceptable job requirements or refine, upgrade, and improve what they do. ***When employees complete a training activity, they should be able to apply the new learning immediately to their jobs.***

Education focuses on the broader and more long-term job of increasing the knowledge base of employees. Educational activities include self-directed study and graduate education as examples.

Development is learning that is usually focused on stimulating new ideas or providing awareness for future reference.

A **job aid** is, simply put, something that can be used on the job to improve performance. Examples include modules developed for specific tasks (estimating rock fragments, for example), training plans for new employees, proficiency models, any kind of how-to manual, etc.

In reviewing our training needs in the Soil Survey Division (SSD), we consider all four of the above methods in providing technology transfer in conjunction with professional development workshops and on-the-job training. Training will be the main focus, but we should consider whether an objective we develop is suited to traditional classroom training, distance learning using AgLearn, national, regional, MO, or state developmental workshops, or a job aid. In particular, we want to keep our minds open to the use of any distance learning activities whether web-based training or some type of electronic job aid posted where it can be grabbed and used.

Prerequisites are what a learner has to be able to do to qualify for a course. Other requirements may include access to tools, hardware or software that the student will need to apply the training after the course or an office work setting where a supervisor allows the learner to apply what is learned. It occasionally happens that a learner attends a course too early in their career, without the background necessary to grasp the training that is being provided. We will address the subject of prerequisites for each of our courses.

Blended learning refers to using multiple methods of delivery in conjunction with traditional classroom style teaching. In particular, adding the use of web-based training (***distance learning***) as a supplement to training course attendance. The use of activities or exercises, both in the classroom and in the field, in conjunction with classroom teaching, are examples. Blended learning also includes using pre-course and post-course assignments. Pre-course assignments have already been utilized by the Soil Survey Division. Post-course assignments will play a major role in our training packages. They will be used as a new method of delivery and a measure of learning achieved.

Follow up to Training One of the measures of a course is whether the learner applies the learning after the training. Is it being applied? If not, for what reason? Are there performance barriers, was there a problem in the instruction, or was the learner just not ready yet for that level of activity? Capturing this information is not an easy task. The SSD will strive to utilize methods that are efficient and do the job.

Future Challenges and Opportunities

The Soil Survey Program has achieved success for over 100 years by adopting new technologies and adapting to society's changing needs. For continued success we must anticipate future changes and begin now to provide the necessary skills for our employees to meet these challenges and take advantage of new opportunities in meeting the Soil Survey Division's mission. Some anticipated challenges and opportunities are:

- We will see greater balance between our four mission areas.
- There will be less emphasis on initial mapping, more on updating existing surveys on MLRA basis.
- More activity on interpreting, marketing, and providing technical support.
- Greater reliance on GIS and remote sensing tools.
- Skills in data evaluation, summary and interpretation will be needed to build on and improve existing data.
- Increased use of electronic forms of data delivery.
- Greater accessibility of soil surveys will result in exposure of omissions, errors and conflicts in our database.
- We expect to need more kinds of interpretations with more local tailoring.
- Single-soil interpretations will be increasingly inadequate. We will see demand for interpretations over landforms and even landscapes (linking pedons and other data sets).
- Increased emphasis on soil functions. We'll need to show links between human impacts and soil performance.
- We will have more Resource Soil Scientists who are increasingly well trained.
- We will have greater need for interdisciplinary approaches to interpretations.
- There will be a growing niche for the private sector to take our data and repackage it for their clients because we can not meet all demands for formatting and presentation of the data. This will be an important client base.
- We need to be better attuned to public policy and legal processes to be effective in demonstrating the relevancy of soil survey to society.
- We will need to be able to provide a quick response in adapting soil survey information to crisis situations.

Matrix of Knowledge, Skills, and Abilities for Soil Scientists.

A matrix of knowledge, skills, and abilities (KSAs) has been developed. This matrix is dynamic but captures the main needs of our soil scientists to be functional in all aspects of the job to be done. The KSA levels were evaluated in the context of the mission areas and basic functional roles, as well as at what point, early or later, in their career the KSA needs to be obtained. Existing training courses have been evaluated to see that they met the KSA level needs as well as identified those courses that needed updating to achieve the desired training and use of new technologies. The matrix also identified several new training needs to meet soil scientist training objectives.

Goals and Objectives

Strategic objectives define the desired state, desired condition, or direction to take for each of three goals that address the four mission areas of the Soil Survey Division. Strategic initiatives are broadly defined emphasis areas that are necessary to accomplish the objectives. Each objective has a baseline, or current condition, from which performance can be measured. The strategic initiatives serve as guides to annual plans for soil survey operations.

Goal 1; Enhance course content, develop new courses where necessary, and provide training that includes emphasis on interpretations, new technologies, USDA programs, law and public policy, and other aspects of a well balanced soil survey program.

Objective 1: Incorporate blended learning into training including increased use of web-based learning

Baseline

Blended learning means using a combination of delivery methods such as classroom and web-based training. The Harvard Business School has reported that students learn more and show increased student interaction and satisfaction with the use of blended learning. It provides for more classroom time for exercises and activities by placing pre-work and post-work online. Currently, our cooperators do not have access to AgLearn where the bulk of our web-based learning will reside. This issue needs to be addressed.

Initiatives

1. Increase use of and repetition of hands-on exercises and activities in training to increase retention of learning in all courses.
2. Incorporate flexible precourse and post course assignments in training courses where appropriate to enhance the learning experience and help in retention of learning in all courses.
3. Work with NEDC to insure that Co-operators who need access to our distance learning have that access.
4. Develop refresher materials, when appropriate, to capture updates to past training in technology that is changing rapidly, develop a mechanism to notify people of the updates, and post for access.

Objective 2: Do required maintenance on the existing NEDC courses in order to address the skills required by soil scientists to accomplish the SSD Mission into the foreseeable future

Baseline

Policy, procedures, and especially technology change over time. Training must remain relevant to current standards and utilize the most current technology adopted by the SSD. Because of the investment of time, effort, and budget to training, learners should be accountable for successful completion of training and measured through test scores that should be made available to State Soil Scientists and supervisors.

Initiatives

1. Work with instructor cadres to incorporate new, adopted technology, policy, and procedures in each SSD sponsored NEDC course on an ongoing basis.
2. Work with instructor cadres to incorporate the NCCS soil scientist skills matrix developed for each current course and incorporate these skills into course objectives for all courses.
3. Work with NEDC to assign and credit CEUs to SSD sponsored courses as each course is updated/redesigned/designed.
4. Add the NASIS training courses to NEDC course catalog.
5. Determine “core” courses appropriate for soil scientists and provide to State Soil Scientists.
6. Develop method of delivering test scores to State Soil Scientists, supervisors, and students, distributing more than one level of course certification based on performance versus attendance, and allocating CEUs based on successful completion of training versus attendance only.

Objective 3: Develop new courses and training modules to address unmet needs of the Soil Survey Division’s four mission areas.

Baseline

Again, as policy, procedures, and especially technology change over time, we must address training needs to stay current. This may mean adding additional training modules or courses, especially in the area of GIS.

Initiatives

1. The SSD Leadership should approach the Human Resources Management Division and check on the need for a soil survey training course for NRCS and cooperator non soil scientists to meet undergraduate level course requirements for GS-457 series. If one is needed the SSD Training Coordinator should help locate an existing university online course or develop a suitable course.
2. Complete development of an ArcGIS SDV training course to help in delivery of soil survey products by Technical Soil Services staff and others.
3. Apply the skills matrix to the ArcGIS SDV course and the Soil Technology-Programs and Applications course to decide if there is potential for a new course or a complete redesign of the Programs & Application course relevant to TSS; a basic TSS course, SDV course, marketing, community relationships, etc. to address the mission in regards to TSS.
4. Address list of new GIS related training needs, either as new course, new modules within existing courses, or utilize existing courses outside Soil Survey Division responsibility:. Also consider training needs inclusive of the Soil Resource Inventory Toolbox (SRIT):
 - 3D visual techniques
 - Digital remote sensing
 - ERDAS Imagine
 - Geodatabase management
 - Data analysis, interpretive, and development tools (Spatial Analyst, 3D Analyst, Terrain navigator, Developing block diagrams, etc.)
 - Projections and coordinate systems (existing ESRI training)
 - Mobile computing
5. Address list of new training needs, other than GIS, either as new course, new modules within existing courses, or utilize existing courses outside Soil Survey Division responsibility:
 - Administrative duties for project leaders
 - Ecological Site Descriptions and state transition models
 - Soil Genesis and Morphology
 - Introduction to Conservation Planning (NEDC AgLearn course)
 - Effective interagency cooperation to enhance the NCSS program (NHQ sponsored SSS training)

6. Work with NCSS people throughout each region of the country and on an as need basis develop web-based training modules related to Soil Taxonomy and soil classification that is relevant to each region.
7. Work with NCSS people throughout each region of the country and on an as need basis develop web-based training modules related to Pedology that is relevant to each region.

Objective 4: Enhance use of professional development workshops by MLRA Offices, States, and NTSC's as a method of technology transfer

Baseline

Regional workshops are an excellent method of technology transfer of training and developmental topics, especially for topics that are regionally oriented. Workshops have been held sporadically across the country in recent years, consistently in some parts of the country, not at all in others. The NTSC's are encouraged to utilize workshops for the Technical Soil Services staffs in their regions.

Initiatives

1. Promote workshop concept to all SSS/MOLs and Regional Soil Scientists as means of providing training and developmental material. SSD training coordinator will prepare and provide a template for workshops and assist in developing workshops upon request.
2. Encourage workshop hosts to share agendas and workshop materials with others in the NCSS through the SSD training coordinator. The soils.usda.gov website should be utilized to accomplish this action.

Objective 5: Market this training strategic plan throughout NRCS and the NCSS program

Baseline

Some of the changes proposed for training within the SSD will require a cultural change. To accomplish this change, it is imperative that the SSD work with the Centers, States, and cooperators to insure acceptance. Then, it will be necessary to insure that the plan's implementation is maintained in the following years.

Initiatives

1. SSD Training Coordinator or representative should attend regional SSS meetings and/or regional work planning conferences and provide an overview of the changes coming in SSD technology transfer.

2. SSD Training Coordinator should write an article in an issue of the NCSS newsletter to provide an overview of the changes coming in SSD technology transfer.
3. SSD Training Coordinator is encouraged to establish and maintain relationships with Tech Specialists at each NTSC for cooperative efforts in technology transfer.
4. SSD Training Coordinator should maintain contact with SSS and Center directors to encourage continued support for training activities, on an ongoing basis.
5. SSD should link this training strategic plan to the NRCS Human Capital Strategic Plan and that plan's part that addresses training needs.

Objective 6: Maintain the two Soil Science Institutes

Baseline

The Soil Science Institutes are integral in refreshing or providing the educational aspect of technology transfer for NCSS soil scientists. Funding has become an issue but all efforts should be made to keep them available. In recent years, there has been more interest in the newer Institute for Geomorphology and it may be appropriate to change the rotation of the two institutes accordingly, offering geomorphology more often. It is important that all but in particular our younger soil scientists have a good educational foundation in geomorphology.

Initiatives

1. Assess demand for each Institute and conduct each according to the demand over the next three to five years. Reassess the need again after that period of time.
2. Check past history of Institutes in regards to CEUs. Work with NEDC to assess and assign Continuing Education Units (CEUs) to each soil science institute's curriculum.
3. Develop method of delivering test scores to State Soil Scientists, supervisors, and students, distributing more than one level of course certification based on performance versus attendance, and allocating CEUs based on successful completion of training versus attendance only.

Objective 7: Encourage soil scientists to utilize other educational opportunities within and outside the agency

Baseline

Education beyond the Soil Science Institutes is available through the USDA Graduate Program on a competitive basis, and through colleges and universities through the personal efforts of the individual. Often, though, soil scientists are not located within commuting range of colleges and universities. Distance learning may be an answer to that.

Initiatives

1. Query for existing on-line courses sponsored at universities across the country and provide list as part of a job aid that helps soil scientists explore educational opportunities that will help them support the 4 mission areas of the SSD, with emphasis on distance learning opportunities available.
- 2.
3. SSD leadership should continue to take the initiative to annually identify appropriate grad program subject(s) areas and submit them to the Agency Leadership.
4. SSD leadership should, as budget allows, look into increasing opportunities for grad program participation, if the demand is there and when it can benefit the needs of the agency. This should be done on an ongoing basis.
5. The SSD should continue to administratively support (admin. leave to attend classes for example) education by the individual, if that education supports the needs of the agency. This should be done on an ongoing basis.

Goal 2; Develop the teaching skills of those providing training

Objective 1: Provide course instructors with the tools and skills they need to be effective instructors

Baseline

Effective instructors are essential to successful learning. Instructors must understand how adults learn, know how to prepare effective training materials, and know how to effectively present those materials. Without effective instructors, learning is

diminished. Recognize that all instructors are taking time out from their assigned duties to develop and present the training material.

Initiatives

1. Provide “Train the Trainer” training to all current and future instructor cadre members through whatever means possible, on an as need basis.
2. Prepare a set of guidelines for instructors to include guidance, tips, and tools relevant to training instruction within the SSD.
3. Work continually with MLRA Office Leaders, State Soil Scientists, center directors, and national leaders to encourage our best potential instructors to become instructor cadre members.
4. The SSD, and States should utilize the current incentive awards program for providing awards or certificates, as appropriate, to instructors to thank them and encourage them to remain with the instructor cadres.
5. States, MO’s, Centers, etc. should be recognized for committing staff resources to training activities.

Objective 2: Provide supervisors and others who provide On the Job Training (OJT) with the guidance and tools they need to effectively do that job

Baseline

On-the-Job-Training (OJT) is often where the most effective training occurs. It can address local conditions versus a national perspective received at nationally led training courses. It can provide the repetition necessary for learning to be retained. It is one-on-one training. Those providing OJT have probably never received guidance in delivery, tools, tips, etc for effective OJT.

Initiatives

1. Develop a training module as a vehicle to provide supervisors with the methods, tools and job aids necessary for effectively providing OJT. The module to be stand alone or part of the Correlation & Management of MLRA Soil Surveys course.
2. Develop guidelines, tools, and job aids to assist project leaders and other supervisors responsible for providing effective OJT. To support the proposed training module in initiative #1 above.

3. Provide a template training plan for a new employee's first year to 18 months of employment.
4. Provide a template Employee Development Plan (EDP) that includes all possible formal training needs for all soil scientists, to be edited by the employee and supervisor to address the specific needs of the employee.
5. Require student and supervisor to have contact with each other prior to training to discuss course content, prerequisites, expectations, and follow up.
6. Encourage the use of rotational training to allow employees to shadow mentors in soil survey or other disciplines.
7. Encourage the use of the Education Grants Program for employees below the GS-11 grade level.

Goal 3; Make job aids available to all within the SSD

Objective 1: Develop a clearinghouse of job aids from around the NCSS where they can be shared with others

Baseline

The effort to develop a job aid where the same or similar already exists somewhere else but unknown to others is wasted effort. Many "job aids" exist within the NCSS. People within the SSD need to be willing and able to share these with others.

Initiatives

1. solicit existing job aids and prepare a system to capture and categorize them and make them accessible to other potential users through a single web based clearinghouse at the NSSC.
2. solicit needs for new job aids, develop them, and add to the clearinghouse.
3. Address the first list of training aids proposed for development
 - Photographing soil profiles
 - Selected Taxonomy topics
 - Selected soil Description topics
 - Soil monolith construction
 - Soil sampling techniques
 - Pedon and PDAs