

**NCERA-3 (Formerly NCR-3) Annual Meeting
Soil Survey
Madison, WI
June 20-21, 2005**

Administrative Advisor:

Gerald Miller
Iowa State University
132 Curtiss Hall
Ames, IA 50011-1050

Chair:

Cynthia Stiles
University of Wisconsin
1525 Observatory Drive
Madison, WI 53706-1299

Chair-Elect:

Terry Cooper
University of Minnesota
439 Borlaug Hall
St. Paul, MN 55108

Secretary:

Mickey Ransom
Kansas State University
1022 Throckmorton
Manhattan, KS 66506-5501

Members in attendance:

Terry Cooper – Minnesota, Dave Hopkins – North Dakota State, Russ Kelsea – NRCS Lincoln, Randy Miles – Missouri, Del Mokma – Michigan State, Ken Olson – Illinois, Phillip Owens – Purdue, Mickey Ransom – Kansas, Neil Smeck – Ohio State, Gary Steinhardt – Purdue, Cynthia Stiles – Wisconsin, Bill Zanner – Nebraska. Guest: Carl Wacker – NRCS, Wisconsin.

Members absent:

Doug Malo – South Dakota State, Andrew Manu – Iowa State, Tassos Karathanasis – Kentucky, and Jay Noller – Oregon State.

Administrative Advisor: Gerald Miller – Iowa State, present

Minutes:

Meeting called to order Monday June 20 at 1:00 pm at Friederick Center on the campus of UW Madison by Chair Cynthia Stiles.

Approval of Minutes: Clarification made on previous New Business item: Chair, chair-elect and secretary governance will replace previous two-year chair and secretary terms. Motion to approve minutes made by Ken Olson, seconded by Bill Zanner, was carried by voice vote.

Gerald Miller – Introductory Remarks

1. NCR-3 was renewed for 5 yr in Oct 2004 - new five-year plan with five objectives is posted on the web (see below in old business for details), an appendix E was filed.

2. NCR-3 will need to be renamed to abide by a plan outlined by Daryl Lund (NCRA Executive Director, letter dated August 2004). Action on this will be taken during business meeting.
3. The Federal OMB requires accountability for funded grants, thus requiring NCR-3 to generate a midterm impact statement of 1.5-2 pages to be submitted during the 3rd year of the project. This describes important impacts this committee has made based on objectives outlined in the work plan of the NCR-3 proposal.
4. Update on federal budget: Re-appropriations of Federal funds for agricultural research have been made by the present administration. Essentially, state appropriations (Hatch) will be eliminated (by 2007) and funds re-directed to the national competitive level (NRI), which will be increased from \$180M to \$214M in the next two years. Note: Discussion took place on the topic of the increasing influence of college and university administrators over grantsmanship. A few deans and directors would like to see all funds obtained through grants rather than through formula funds. The formula funding plays a vital role for states with small total population and in maintaining many “low visibility” programs. Regional committees may play a more important role in the future as we will no doubt see more multi-state efforts and activities rewarded in the future.

Russ Kelsea (NRCS National Office, Lincoln) – NRCS Agency Report

1. The agency has been reviewed through the government performance and results act – PART (Performance and Analysis and Ratings Tool). These evaluations were made with the most complete and articulate congressional objective listings (clearly defined in 1966, PL 89560 – title 42 – public welfare) as benchmark. According to this act, four main sections are defined for Soil Survey activities:
 - a. Make inventory of soil resources of U.S.
 - b. Keep inventory current to meet needs
 - c. Interpret information and make reports in useful form (farm, industrial, urban)
 - d. Promote use of soil survey information and provide technical assistance in its use
2. The purpose is crystal clear for soil survey and all aspects of the soil survey program now are presently in the strategic planning process. This will help define the inputs/outputs, outcomes and eventual/predicted impacts of those outcomes.
3. The strategic plan for soil survey has been focused on mapping last few decades, leading to an outcome of completed map for the whole country (presently 95-98% complete). Now it is seen that a “more balanced” Soil Survey program should be developing in the future to keep the inventory current. The need to incorporate current technologies to assist in this effort creates a need for research to help with update and maintenance.
4. Paper copies of county soil surveys are no longer being produced, replaced by electronic publication. Reactions expressed amongst committee members to this change are presently mixed.
5. Interpretations: Public interest and pressures for better land use decision-making tool requires that soil interpretations incorporate important environmental interactions (e.g., basements and water table, slope relationships with drainage)

- into survey information. Recent NRCS publications are emphasizing this new, necessary change, i.e., “Soils and Environmental Hazards” and “The Urban Soil Primer”. This also heightens the role played by resource soil scientists in interpretation and delivery.
6. Dave Hammer now heads Investigations and National Soil Survey Laboratory at NRCS. He is encouraging cooperative investigation projects that will provide predictive information for land use planning and resource issues.
 7. Review of significant personnel and responsibilities for NRCS: William Puckett – Deputy Chief, Soil Survey and Resource Assessment; Michael Golden – Director, Soil Survey, Division, NHQ; Ken Lubick – Program Manager, Soil Survey Division, NHQ; Bob Ahrens – Director, National Soil Survey Center, Lincoln; Craig Ditzler – National Leader, Soil Survey Classification and Standards (includes training), Lincoln; Karl Hipple – National Leader, Soil Survey Interpretations, Lincoln; David Hammer – National Leader, Soil Survey Investigations (includes Soil Survey Lab), Lincoln; Russ Kelsea – National Leader, Soil Survey Technical Services (marketing, technical assistance, information systems), Lincoln

Old Business –

1. Sub-committee on eroded Mollisols
 - a. The following history of the eroded Mollisols issue was discussed:
 1. Two white papers have been published in *Soil Survey Horizons* on eroded Mollisol classification criteria by this working group, which also included two NRCS personnel from the most affected states (Bob McLeese, IL, and Mike Sucik IA). Presently, the most important criteria – the definition of mollic epipedon – often excludes eroded soils that obviously were Mollisols, causing difficulty with interpretations. Reclassification to Alfisols confuses land use interpretations and emphasizes a basic flaw in Soil Taxonomy – the soils can be reclassified after a human disturbance.

Olson, K.R., T.E. Fenton, N.E. Smeck, R.D. Hammer, M.D. Ransom, C.W. Zanner, R. McLeese, and Sucik, M.T. 2005. Identification, Mapping, Classification, and Interpretation of Eroded Mollisols in the U.S. Midwest. *Soil Survey Horizons* 46:23-35.

Olson, K.R., T.E. Fenton, N.E. Smeck, R.D. Hammer, M.D. Ransom, C.W. Zanner, R. McLeese, and Sucik, M.T. 2005. Proposed Modifications of Mollic Epipedon Thickness Criteria for Eroded Conditions and Potential Impacts on Existing Soil Classifications. *Soil Survey Horizons* 46:39-47.

2. A proposal was put forth by this sub-committee to the 2004 North Central Regional Soil Survey Conference for the classification of eroded Mollisols. This proposal included criteria for recognizing “eroded conditions” as a diagnostic characteristic in Soil Taxonomy. This conference approved the proposal and submitted it to the 2005 National Cooperative Soil Survey Conference where it was assigned to the NCSS Standards Committee. After the proposal was circulated to all state offices in NRCS, a consensus was not reached by the NCSS Standard Committee to adopt, or to even test, the proposed changes. The proposal was then rejected at the 2005 National Cooperative Soil Survey Conference in Corpus Christi, TX.
 - b. Extensive discussion then followed about the following points
 1. Although a problem exists, no clear solutions are evident
 2. The proposal needs additional testing
 3. The present way of dealing with eroded Mollisols tends to ignore genesis and a genetic thread is not maintained in the classification of these soils
 4. Eroded soils are recognized in older soil surveys
 5. A solution to the problem needs to be found
 6. Could refer the problem to an international committee that is currently studying disturbed soils, although this might kill the proposal
 7. The classification of soils disturbed by humans is a problem that will continue in the future and the amount of human degradation on these soils will continue to be an issue in future decisions on soil classification.
 - c. At this point a consensus was reached to continue discussion on this issue at another time.

NRC-3 Service and Action Committees: There are presently three national committees associated with the National Cooperative Soil Survey Conference - Research Agenda; Technology; and NCSS Standards. It was also noted that Dave Hopkins will be on the steering committee for the next NCSS meeting. A motion was made by Randy Miles and seconded by Neil Smeck to structure the NCR-3 action committees to follow the organization of the committees of the National Cooperative Soil Survey Conference. The motion was approved. The NCR-3 Action committees will then be organized as follows:

- a. Effects of Management on Soils (name changed from Soil Organic/Inorganic Carbon and Eroded Mollisols by motion)
 - b. Education and Training
 - c. High Intensity Survey
 - d. Soil Research and Interpretations (name changed from Interpretations by motion).
2. National Cooperative Soil Survey Conference – (Texas 2005) six were present from this committee - Gary Steinhardt was on the planning conference. The

- general discussion in the steering committee was about having more people from Universities present. This was desirable and they want to keep this going in the future – be more aggressive in working with regional committees; vote on bylaws failed – (Next Meeting is in Minnesota in 2007) -- The work brought to the committee determined that all the bylaws need work –they did not have enough people present who were voting members – Good to have linkage from regional committees to National Committees – Web soil survey was previewed and is scheduled to go on line for the public in August. -
3. Restatement of NCR-3 Objectives to help define future activities and impacts:
 - a. Create the critical mass necessary for scientists at the various AES to have an impact of quality control and formulation of policy and direction for the NCSS program on both regional and national basis.
 - b. Identify specific soil and land-use research needs that will benefit from a regional or sub-regional approach that can either build upon existing initiatives in individual states or address a timely emerging need.
 - c. Coordinate official NCR representation on national NCSS and Soil Taxonomy committees and relay/evaluate national recommendations and initiatives to pertinent groups throughout the region.
 - d. Developing and coordinating extension and educational activities related to NCSS.
 - e. Bringing soil science generally and SSI specifically to the same level of recognition as other important sciences and developing alliances with scientists in ancillary disciplines.
 4. Other old business:
 - a. Selection of Secretary for 2006 – Del Mokma was nominated and elected. The Secretary becomes Chair-Elect and then Chair in the three-year rotation system
 - b. Dave Hopkins will serve on the Soil Taxonomy National Committee.

(Committee meeting activity was suspended at 4:30 PM Monday and resumed activity at 8:00 AM, Tuesday)

New Business –

1. Re-evaluation of NCR-3 objectives and ways to address them to show recorded outcomes for the funding agency
 - a. Create the critical mass necessary for scientists at the various AES to have an impact of quality control and formulation of policy and direction for the NCSS program on both regional and national basis.
 - i. It is important to coordinate activities and to hold planning conferences. Several states (Ohio, Minnesota, Illinois) have had meetings with interested parties to discuss and plan activities
 - ii. Work with both MOs (Major Offices) and MLRAs (Major Land Resource Areas), since most states have complicated allocations. Every one should know what is going on to avoid overlap and repetition. A good example is Missouri, where a one day workshop is held each year for MO and MLRA personnel in the

- state to discuss general topics in the morning and work planning for soil survey in the afternoon.
 - iii. Create a category in the yearly NCR-3 state report that indicates facilitation efforts between NRCS soil survey and AES scientists.
 - iv. Work with soil testing labs to maintain unbiased estimates and evaluations of soil testing standards.
 - b. Identify specific soil and land-use research needs that will benefit from a regional or sub-regional approach that can either build upon existing initiatives in individual states or address a timely emerging need. Dave Hammer plans to develop collaborative networks to facilitate interpretations on landscape scales and is considering the judicious use of soil survey staff and the Lincoln laboratory for specific investigations. Two projects are already being developed in the NCR:
 - i. UW-Madison and Platteville are working on landscape investigations in MLRA 105 to assist survey updates.
 - ii. NDSU working on the classification discrepancies between pedon and landscape
 - c. Personnel retirements in the next few years will create openings for Soil Scientists in NRCS. Graduates with MS degrees – and experience – will be preferred.
 - d. Specific research needs for NRCS:
 - i. Eroded soil data evaluation to determine estimated erosion and effects on land use interpretations
 - ii. Collection, presentation, and evaluation of point and landscape water table data. Presently NRCS has instruments for collecting water table data but needs to coordinate data collection and evaluation with AES to obtain valid information, as well as coming up with a useful scheme for incorporating the data into NASIS (National Soil Information System).
- 2. Coordinate official NCR representation on national NCSS and Soil Taxonomy committees and relay/evaluate national recommendations and initiatives to pertinent groups throughout the region. Comment: This is being done with regional members serving on national committees – national structure picks from each region.
- 3. Committee Reports
 - a. National Service Committees
 - i. Soil Taxonomy Committee membership from NCR-3: Cynthia Stiles 2003-05; Gary Steinhardt 2004-07; Dave Hopkins 2005-08.
 - ii. National Conference on Soil Survey membership: Cynthia Stiles + Gary Steinhardt (2003); Gary Steinhardt + Dave Hopkins (2005); Dave Hopkins + Mickey Ransom (2007); Mickey Ransom + Neil Smeck (2009).
 - iii. National Soil Survey Database: Mickey Ransom reported no activity. The National Geospatial Development Center in Morgantown will be taking on the coordination and development of future databases.

- b. Effect of Management on Soils (Eroded Mollisols)
 - i. Members: Ken Olson (chair), Mickey Ransom, Doug Malo, Neil Smeck, and Randy Miles and Bill Zanner (adjunct)
 - ii. Information presented in old business.
- c. Education and Training
 - i. Members: Mickey Ransom (chair), Terry Cooper, Dave Hopkins, Doug Malo, Del Mokma, and Gary Steinhardt (adjunct)
 - ii. Committee will develop a survey on teaching efforts to determine core courses available at each institution to successfully qualify graduates as soil scientists (minimum of 15 semester credits are required for certification).
 - iii. Evaluate internet and short courses as a way to provide continuing education for practitioners who need additional qualifying courses to work in the natural resource field.
 - iv. Determine if regional expertise may become more valuable as land grant universities may lose their AES pedologists.
 - v. Initiate effort to bring soil science and soil survey to a level of recognition similar to ancillary disciplines and develop cooperative efforts with scientists in other fields who use soil information for their work. These efforts include support for the Smithsonian exhibit, providing information for earth science teachers, and continued support for FFA teams.
 - vi. Each representative should show educational efforts in their annual state report, beyond recording traditional classes.
- d. High Intensity Soil Survey
 - i. Members: Gary Steinhardt (chair), Phillip Owens (chair pro-temp), Russ Kelsea, David Hopkins, and Cynthia Stiles
 - ii. Most work presently being done at Purdue University, where order one surveys have been done over a large area using electronic format map. Deemed to be very time-intensive but use of remote sensing data shortens production time. Travis Neely and NRCS staff (Indiana) spent one day with junior soil scientists on this project to familiarize them with the process.
- e. Soil Research & Interpretations
 - i. Members: Cynthia Stiles (chair), Randy Miles, Neil Smeck, and Mickey Ransom
 - ii. Committee will generate a survey of soils-related programs at all universities (land grant and other) to determine what directions research is taking. This survey will hopefully canvass programs outside of soil science (i.e., Geosciences, Ecology, Geography) to determine to what extent soils work is being done by non-traditional programs.
- f. Notes on committee assignments and duties for NCR-3
 - i. All NCR-3 members must serve on the action committees. Secretary will circulate the list of these committees to absent members to determine their assignments.

- ii. To be a member of NCR-3, participants may file the paper work (Appendix E) through their CRIS administrator. We assume that all active members of committees have current status under CRIS.
- 4. Future critical activities will be evaluated annually by the reports generated by each of the action and service committees. Work on this should continue through the year and provide outcomes for OMB.
- 5. Other New Business
 - a. Motion made and approved that for those participant states not submitting a state report or attending in three consecutive years, the chair will contact the faculty member to file an Appendix E to withdraw from the NCR-3 committee. If this action is not made in a reasonable time period, the Administrative Advisor will contact the appropriate LGU director requesting the host LGU take further action.
 - b. Nomenclature of the committee: Motion made and approved to change the name of the NCR-3 Committee to NCERA-3.
 - c. A request will be sent via e-mail by the Secretary to representatives not in attendance (from Iowa, Kentucky, Oregon and South Dakota) to specify Service/Action committee preferences.
 - d. New officers take office on October 1, 2005: 2006 officers: Terry Cooper-Chair, Mickey Ransom-Chair Elect, and Del Mokma - Secretary.

Meeting of NCERA-3 adjourned: 11:30 am on June 21, 2005

Approved:

Signed: Michel Ransom 8/12/2004
Michel Ransom Date
NCR-3 Secretary 2005

Signed: Gerald Miller 8/12/2004
Gerald Miller Date
NCR-3 Administrative Advisor 2005

NCERA-3 State Reports 2005

Illinois

Academic Unit: University of Illinois

Name: Kenneth R. Olson

Summary of Report:

Illinois has published the soil survey reports for all 102 counties. Thirty counties have a digital soil survey in progress. A proposal to modify the mollic epipedon thickness criteria for eroded conditions has been forwarded to the appropriate regional and national Soil Taxonomic Committees.

Research Activities:

- Classification of eroded Mollisols
- Soil productivity-erosion relationships
- Effect of soil tillage on SOC sequestration
- Quantification of erosion and sedimentation
- Crop yields by soil series
- Evaluation of conservation tillage systems for restoration of productivity of previously eroded soils
-

Publications:

- 1 book chapter
- 2 peer-reviewed journal articles
- 2 Soil Survey Horizons articles

Courses taught:

Soil and Water Conservation

Indiana

Academic Unit: Purdue University

Names: Phillip Owens, Gary Steinhardt and Brad Lee

Summary of Report:

All 92 Indiana counties have been initially surveyed and have published survey reports. Thirteen counties have been updated at a scale of 1:12,000 and five additional county updates are in progress. Four of the update surveys have been published with hard copies and soil survey CD's. Publication on the remainder of the update surveys is pending and all of these surveys have been digitized. 58 counties now have been digitized, including the update surveys with 25 more counties in progress. All surveys with digitizing completed have been released on CD as Soil Survey Interim Reports. The 58 counties

that are digitized have spatial and tabular data available online at the Soil Data Mart and the remainder of the 92 counties all have tabular data available online. 22 surveys have Soil Survey publications online at the NRCS Indiana State Web Site.

Research Activities:

- Determining the relationship of seasonal water tables and water movement in soils within benchmark catenas to soil hydrology, pedological features and hydric soils indicators.
- Quantification of the spatial variability of soil properties and trace elements within benchmark catenas using maps created by soil evaluations, digital elevation models, remote sensing and geostatistics.
- Characterization and classification of reclaimed mine-soils and the relationship to soil survey interpretations for cropland yield estimations.
- Relationship of order 1 and order 2 soil surveys to measured georeferenced yield monitors to compare with the predicted soil survey yield interpretations.
- Characterization of the hydraulic conductivity variations between the concentric series of recessional moraines formed from the Erie-Ontario glacial lobe in northeastern Indiana.
- Identification of the clay mineral properties of the illitic soils of MLRA 111.
- Explore the effect of hillslope position on the in situ saturated hydraulic conductivity patterns on a northeastern Indiana moraine.
- Characterization of the spatial distribution of water limiting horizons across a watershed with geophysical methods.
- Evaluation of the utility of geophysical methods to determine the location of septic systems.

Publications: Research - 4, Abstracts - 4, Extension publications - 15

Classes:

Introduction to Soil Morphology, Soil Morphology Geography, Soil Conservation & Management, Remote Sensing of Land Resources, Soil Classification & Survey, Forest Soils, Soils and Land Use, Soils Genesis and Classification, Soils and Septic Systems.

Iowa- No Report

Kansas

Academic Unit: Kansas State University

Name: Michel D. Ransom

Summary of Report:

Updates of soil surveys will be done on a multi-county (MLRA) basis. Updates are in progress in MLRA 72, 73, 74, 77, 79, and 106. All updates will be on a 1:12,000 ortho-quad base. Most surveys in Kansas have been published at a scale of 1:20,000 and are not geo-referenced. The soil surveys for all counties in Kansas are digitized up to NRCS

standards for SSURGO certification. This work was completed by the Agronomy Department, the Geography Department, and NRCS as part of an effort to develop a statewide GIS. The work was completed in the Geographic Information Systems/Spatial Analysis Laboratory of the Geography Department. A Soil Characterization Laboratory analyzed about 500 grab samples in FY05 for the soil survey program.

Research Activities:

- Clay translocation and carbonate accumulation in central and western Kansas using soil micromorphology
- Distribution and properties of clay minerals in Kansas soils with emphasis on fertility
- Soil genesis and parent material stratigraphy in the Bluestem Hills
- Development of the Kansas Irrigated Productivity Index for Kansas soils
- Carbon sequestration using benchmark sites to estimate soil organic C stocks
- Cooperative work with NC-1018, Impact of Climate and Soils on Crop Selection and Management

Publications: 2 peer-reviewed journal articles; 1 symposium

Courses taught:

Soil Judging, Soil Problems, Soil Genesis and Classification, Advanced Soil Genesis and Classification

Kentucky- No Report

Michigan

Academic Unit: Michigan State University

Name: Delbert L. Mokma

Summary of Report:

Michigan is expected to complete the “once over” soil survey in 2005. Soil surveys of 45 of the 83 Michigan counties have been digitized and SURRGO certified. This work is being done by NRCS. Four MLRA Project offices have been set up with Project Leaders assigned to each MLRA. Some additional staffing has begun. As order 2 soil survey activities are completed, soil scientists will be added to the MLRA staffs.

Research Activities

- No on going research related to the Michigan soil survey program

Publications: 3 peer-reviewed journal articles

Courses taught: Soil Resources

Extension: Soils training for onsite wastewater treatment

Minnesota

Academic Unit: University of Minnesota

Name: Terence H. Cooper

Summary of Report:

Minnesota Soil Survey Program: 64 published surveys of 87 counties. Update mapping = 16, 2 completed. Initial mapping = 6, 3 completed and non-project 2. 49 counties have SSURGO standards. NRCS has five MLRA coordinators and 12 state staff in support of 24 field soil scientists. MAES has 12 different projects in place to aid various segments of the soil survey program. Many of the projects deal with wet soils or spatial variability. Continued use of soil morphology information by wetland delineators and ISTS personnel has required new workshops. A new forest soil scientist will be starting in September (Dr. Bill Zanner).

Research Activities:

- Anoka Sand Plain Practitioner Training
- EAW web page development for EQB
- GIS/RS Innovative Soil Mapping Update Project
- Historical analysis of soils
- Hydrology of Seasonal Ponds
- Minnesota Wetlands Web Page
- Minnesota EQB Environmental Review Web Page
- Redoximorphic Features Conference
- Seasonal Saturation in Minnesota Landscapes
- Soil Survey Orthorectification and Digitization in Minnesota
- Spatial variability of pesticide degradation
- Wetland Delineation Training Workshops
- Wet Soil Monitoring Project

Publications: 4 peer-reviewed; 1 symposium; 1 report

Courses taught:

Basic Soil Science, The Soil Resource, Field Study of Soils, Soil Judging, Soil Geography: Soil Variability on Planet Earth, Jr./Sr. Seminar, Environmental Impact Statements, Wetland soils, Soil Genesis and Landscape Relations, Colloquium in Soil Science- Field Tour of Minn.

Missouri

Academic Unit: University of Missouri

Name: Randall J. Miles

Summary of Report: **All** counties are digitized with nearly all counties available online at the Center for Agriculture, Resources, and Environmental Sciences (CARES) website (<http://soils.missouri.edu/>). The first phase of the “update” is nearly complete. Some of the major activities involved with Phase 1 and II are as follows:

- Pilot project of SoLIM has had a very positive result
- Development of a statewide legend and map unit numbering system.
- Statewide legend is providing a great mechanism to update attribute data in NASIS.
- Phase II is providing the mechanism for prioritization of needs by benchmark series
- Phase II has provided a RFT process for NRCS and MDNR soil scientists.

Research Activities:

- Use of soil morphological properties and geomorphology to assess planar barrowing at the Double Ditch Mandan Site in North Dakota.
- Use of soil morphological properties to develop loading rates and design criteria for conventional and alternative onsite wastewater systems.
- Development of a Soil Potential Index for conventional and alternative onsite wastewater systems.
- The role of Al activity and mineralogy on liming acid soils in southwest Missouri.

Publications: 1 Peer-reviewed; 5 Published Abstracts; 2 Popular Articles; 14 Power Point Education/ Training Modules (Soils and Onsite Wastewater Systems); 1 Training Module (for 7 different courses).

Courses Taught:

Introduction to Soil Science, Introduction to Soil Science Laboratory, Soils and Geomorphology, Soil Judging, Special Problems

Nebraska

Academic Unit: University of Nebraska-Lincoln

Name: Dr. C. William Zanner

Summary of Report:

Cameron Loerch is the new State Soil Scientist. Soil Survey update activities are under way in Sarpy, Douglas, McPherson, Scotts Bluff, and Nance Counties as part of updates to MLRAs 65, 67, 71, and 106. The Saunders, Dundy, and Hall county soil surveys are published, with the Washington County Soil Survey available on CD. The Kimball County Soil Survey is awaiting SSURGO certification. The following county surveys are now available on line: Boone, Cherry, Deuel, Sheridan, Gage County, Dodge, Lancaster, Nuckolls, Pierce, Richardson, Scottsbluff, Seward, Stanton, and Wayne. Nebraska has SSURGO certified digital soils data for all lands within the State. UNL has recently supplied NRCS with four new employees and an intern.

Research Activities:

- Soil properties and the climate gradient across the Great Plains.
- Sand Hills Biocomplexity project: sandy soils and landscape stability
- A Phenological Network for Ecological Viticulture: soils and viticulture in Nebraska.
- Beaver in Agricultural Watersheds: Potential for Mitigating Degraded Midwestern streams.
- Investigation of soil properties and possible relationships to the stability of well grouts.
- Unique occurrence of vaterite in an upland Nebraska sandhills landscape

Publications: 2 Peer-reviewed; 3 Abstracts.

Courses taught:

Great Plains Field Pedology, Wetlands, Land Evaluation (Soil Judging), Forestry Short course, Range Short Course.

North Dakota

Academic Unit: North Dakota State University

Name: David Hopkins

Summary of Report:

North Dakota has increased the number of field soil scientists to 11, which is a significant increase from a few years ago. The State NRCS staff is actively promoting use of GIS and digital databases to facilitate soil survey update procedures and tasks. An NRCS funded project involving application of terrain analysis to update procedures is currently ongoing that involves Dr. David Franzen (NDSU) and Dr. Janis Boettinger (Utah State University). Several graduate students in the department are using GIS based approaches in their research, which is having a beneficial effect on our productivity. Several research projects are ongoing that will benefit our understanding of the spatial distribution of soil properties at the landscape scale.

Research Activities:

- Influence of geologic materials and pedogenic processes on trace elements and salinity in soil landscapes
- Soil organic matter survey of the Glacial Ridge Project Area, northwestern MN
- Characterization of the “alkali problem” and identification of tolerant corn in salt-affected soils of the Red River Valley
- Devils Lake Basin Water Utilization Test Project
- Effects of grazing on compaction of soils in the Little Missouri National Grasslands
- Application of Terrain Analysis to Soil Survey

Publications: 1 peer-reviewed

Courses taught:

Introduction to Soil Science, Advanced soil genesis, morphology, and classification

Ohio

Academic Unit: Ohio State University and Ohio Agricultural Research and Development Center

Name: Neil E. Smeck

Summary of Report:

Four MLRA Project Offices have been established to maintain soil survey data in Ohio. Two of those project offices are completing county subset modernization projects whereas the other two are conducting MLRA-scale updating projects. A statewide digital soil information project with a goal of providing digital soils information for the entire state by 2006 is progressing on schedule. In support of this project, a computer lab utilizing electronic image rectification to compile maps onto ortho-photo bases has been established on campus using student employees in an attempt to generate more student interest in soil science. During the past year, the Ohio Soil Characterization Laboratory analyzed 27 pedons and 264 grab samples in support of the Ohio Soil Survey.

Research Activities:

- Evaluation of field estimates of accelerated erosion based on field morphological properties by chemical, physical, and micromorphological analyses.
- Concurrence of mineralogical characteristics and family class criteria for soils occurring in the K-rich region of NW Ohio.
- Influence of extractable Ca and Mg, Fe oxides, and amorphous components on *i*) silica sorption in fragipan and non-fragipan horizons and *ii*) soil rupture strengths.
- Changes in replaced soil and coal strip-mine spoil properties during the 25 year period following reclamation.
- Differences in nutrient cycling, processes, and soil properties among native forest ecosystems and long-term no-till and conventionally tilled agroecosystems in well and poorly drained landscapes.

Publications: 3 peer-reviewed journal articles; 1 abstract

Courses taught:

Introductory Soil Science, Introductory Soil Science Laboratory, Soil Management, Pedology

Oregon- No Report

South Dakota

Academic Unit: South Dakota State University (SD Agricultural Experiment Station,
Plant Science Department)

Name: Douglas D. Malo

Summary of Report:

All of SD has been mapped once and all counties have a published soil survey. Updates of soil surveys are being done by the SD Cooperative Soil Survey on a multi-county (MLRA) basis. Updates are in progress in MLRAs 60A, 61, 62, 64, 65, and 102A. All updates will be on an ortho-quad base. The soil survey for Minnehaha County was published. Working on a project to convert hardcopy soil lab and morphology data to digital format. Fact sheets (technical soil property information) for benchmark soils are being prepared. Assisting SD agencies in evaluating the feasibility of using Missouri River reservoir sediments for agricultural and other uses. Soil formation and properties are being evaluated in gold mine reclamation area.

Research Activities:

- Development of hydric soil properties under different temperature, time, and carbon levels
- Assisted with the SD Cooperative Soil Survey in Codington and Lawrence Counties.
- Characterized 350+ soil samples for research and NRCS soil survey use.
- Soil property and carbon sequestration changes due to grazing management practices in rangeland (42 pedons being studied from Pennington County).
- Cooperative soil characterization and genesis study with NRCS in Black Hills area (MLRA 62)
- Changes in surface soil test levels of P and K since 1950 (county and regional changes).
- Developing Web site for soil images and other information.
- Land management impacts on soil properties after 12 years of cultivation (corn and soybeans), cool season grasses, and warm season grasses.

Publications: 8 peer-reviewed journal articles; 5 published abstracts; 1 lab manual; 67 CDs (old deteriorating air photos [1939-1954] of SD)

Courses taught: Soils, Soil Geography and Landuse, Soil Judging, Rural Real Estate Appraisal, Integrated Natural Resource Management, Teaching Experience, Advanced Soil Genesis, Field Studies in Pedology

Wisconsin

Academic Unit: University of Wisconsin - Madison

Name: Cynthia A. Stiles

Summary of Report:

Initial mapping for all counties will be completed in 2005. Update mapping projects are completed in six counties, with one additional county expected completion by the end of 2005. Cooperative efforts are based on physiographic boundaries rather than political ones. Staffing shifts will begin from the northern tier of counties to the south as initial mapping and updates are completed. Work focused on MLRA 90, 92, 93, and 94 will shift to MLRA 105 and eventually to the southern portion of 91 and WI portion of 110 in the southeast. Field scientists utilize iPAQ handheld computers with GPS to create digital maps with ArcPad and 3D Mapper. Ortho Mapper is also used to rectify maps to orthophotos in digitizing efforts. A SoLIM-based update is on going for Dane County and new technology is being utilized in Iowa County to update existing survey. All 62 counties have published reports.

Research Activities:

- Landscape model development for virtual mapping in MLRA 105 (Upper Mississippi Valley Loess Hills)
- Micromorphology and geochemical evaluation of soil genesis/stabilization from loess and carbonate bedrock
- Geological landscape evolution in varying loess-covered bedrocks areas of the Driftless Area
- Phosphorus geochemistry in residually developed Rountree Formation sub-soils
- Evaluating soils model parameters for use in policy development for establishing and maintaining riparian buffers
- Linking soil water and physicochemical properties with watershed modeling to predict erosion in MLRA 105 landscapes
- Using soil spatial data and pre-evaluations for prairie restoration
- Geochemical landscape survey of Wisconsin surface soils

Publications: 2 peer-reviewed journal articles; 1 symposium; 5 abstracts

Courses taught:

Pedology, Advanced Pedology, Permafrost Soils Field Course (with Chien-Lu Ping at UAF)