Minutes of the 2007 NCERA-3 "Soil Survey" Annual Meeting
Madison, WI
June 3 and 6, 2007

Administrative Advisor:
Gerald Miller
Iowa State University
132 Curtis Hall
Ames, IA 50011-1050

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

Chair-Elect:
Del Mokma
Department of Crop and Soil Sciences
Michigan State University
East Lansing, MI 48824-1325

Secretary
Kenneth Olson
University of Illinois
S-224 Turner Hall, 1102 S. Goodwin
Urbana, IL 61801

Members in attendance:
Ken Olson, IL -Secretary
Phil Owens, IN
Mickey Ransom, KS –Chair
Del Mokma, MI –Chair–Elect
Terry Cooper, MN – Past Chair
Mark Kuzila, NE
Dave Hopkins, ND - Secretary-elect
Neil Smeck, OH
Cynthia Styles, WI
Bob Ahrens, USDA-NRCS
Maxine Levin, USDA-NRCS
Gerald Miller, IA – Administrative Advisor

Guests
Michael Konen, IL
Lee Burras, IA
Randy Miles, MO

Member states with no representative attending:
SD, KY and OR

Introductions and Agency Reports

Meeting was called to order by Mickey Ransom at 1:05P.M. on June 3, 2007.

Location: Lowell Hall Lower Lounge, 610 Langdon Street, Madison, WI

Minutes from 2006 meeting were approved as distributed.

Administrative Advisor's Report (Gerald Miller)

Jerry circulated a membership list and requested members to update email addresses and telephone numbers if needed.

He discussed budget proposals. Create-21 would include Extension, Teaching and Research. CSREES and ARS program may be combined. NIMSS official committee list is missing a few names. Need to have possible committee members not listed file an appendix E (MO and IA). Mid-term review was approved by NCA-1 and NCRA MRC. Federal budget update was given including changes in Hatch funding level. FY07 continuing resolution eliminated earmarks but gave them back in Hatch. Total $322 million for Hatch. National Institute of Food and Agriculture – modeled after NSF and NIH. Mandatory Farm Bill funding. Concern about how Extension fits in.

NCERA-3 is authorized from 10/01/2004 until 9/30/2009. Will need to assign a writing committee at the next committee meeting in 2008 to prepare a project renewal proposal that is due by December 15, 2008.

USDA – NRCS NSSC Report (Bob Ahrens)

Discussed implementation of MLRA Project Office organization: Not much money for moves. Varies from state to state. New version of Web Soil Survey is available (Version 2.0). Shopping cart feature for doing a custom soil survey report. PLS data layer – can get section. Can get Federal Land boundaries. Corrected the shift on area of interest. Will have a demo this week.

Personnel changes: Chris Smith – new National Leader for Technical Soil Services. Position moved from Lincoln to Washington, DC. Jon Gerken – soil scientist position in Washington, DC. David Hammer – National Soil Survey Leader for Soil Survey Investigations is moving to EPA effective 7/22/07. Looking to fill a research soil scientist position in National Soil Survey Laboratory. 15 people at National Soil Survey Center are eligible for retirement. Characterization data output time has improved
No set aside money for earmarks this year. Asked for proposals in case money is allocated at the end. Big challenge in losing experience and knowledge with retirements.

USDA – NRCS NCSS National Headquarters – Maxine Levin

Jon Gerken will be working with day to day management of soil survey. Will work with the MLRA restructuring plan. Chris Smith will be looking at new applications for soil survey. 5-year investment plan – decision support for the soil survey program. 155 people registered for this conference – more than 50% from outside of NRCS. Federal Land Mapping GS-13 position as National Park Service data manager with Cooperative Soil Survey – two year term that could be renewed for up to 4 years. Forest Service and BLM may develop similar positions.

Old Business

Standing committees:

Effects of Management of Soils Committee –Ken Olson

The committee has been very active. Neil Smeck presented a proposal for classification of soils modified by human activities at the NC Soil Survey Conference in Medora, ND and at the WCSS. Neil Smeck presented his proposal to differentiate steady state and dynamic soil properties in Soil Taxonomy at the 18th World Congress Soil Science Symposium in Philadelphia, PA. (Abstracts, p.137). The proposal was well received but not fully understood. Craig Ditzler sent out a copy of Neil's proposal to all of the MO Leaders in NRCS. Neil has been given a 1 hour session at 1 p.m. on Wednesday at the NCSSC to discuss the proposal. NRCS has indicated that they will not accept the term anthropogenic deviant." Will probably use "anthropogenic variant."

Education and Training Committee – Terry Cooper

A one-page report was distributed of a survey that we conducted. Lots of programs are training students in soils that have environmental science or conservation in the title. Very few have soil science as the name. Numbers are all over the place as to whether programs are going up or down. Numbers of actual soil science graduates are 3, 5, 10, and 12. No new surprises in the survey results. It is still not too late to turn in the surveys to Terry. Much discussion about declining enrollments despite increases in the enrollment in general interest low-level soil science courses. North Dakota State Soil Science Department will be renamed the School of Natural Resources Science. Received responses from Illinois, Nebraska, Minnesota, and Wisconsin. Survey was conducted of the North Central universities who train soils students. Many universities are combining soils training under a broader program area with subsections related to soils courses.

High Intensity Soil survey Committee – Phillip Owens

Sponsored a symposium at SSSA meetings in 2006 in Indianapolis in cooperation with the National Consulting Soil Scientists. Symposium included 15 posters and 10 presentations and a 15 minute panel discussion. Consultants presented papers. Will try to develop some sort of publication dealing with high intensity soil surveys.

Soil Research and Interpretations committee –Cindy Stiles

Will focus on what soil survey research activities are occurring in the various Departments. She served on an NCSS Committee on research priorities. Discussion included questions about what direction we should go. Soil survey program often comes up with questions that need immediate answers. As researchers we often can not come up with the answers without doing extensive research. Will try to do the survey at the national level and will attempt to determine research problems that need to be worked on. Need to identify areas earlier so that problems can be the focus of graduate research efforts and need to state problems.

Regional soil Map

Cindy Stiles and Lee Burras will attempt to obtain the information from Tom Fenton and put it into a database which is accessible by others. More work needs to be done.

National Advisory Board/committees –

National Soil Survey Database:
Ken Olson is serving as committee member and has been interacting with the National Soil Survey Laboratory to resolve how to identify methods used by each state for each laboratory analyses over time. Attempt will be made by NSSL to acquired state laboratory data and field soil descriptions and identify the methods used to analyze the soil samples. Funds for this project have been awarded to Idaho State University, to hold the funds, while contracts for service or agreements are made with 9 other university laboratories to upload the soil characterization data and soil descriptions into NASIS. The soil descriptions will be entered into pedon_pc v.3.0 which uses MS Access database. NRCS is attempting to select and transfer start up money to initiate the project which is currently being supervised by Dr. David Hammer.

National Soil Taxonomy committee-

Ken Olson (IL) will serve for one more year (2007), Lee Burras (IA) will serve a 2 year term (2007, 2008) and Mark Kuzila (NE) will serve a 3 year term (2007, 2008, and 2009). Ken Olson (IL) should be replaced in 2008 by a member from current east region (MI, OH, or IN).

National Soil Survey Conference Subcommittee:

NCSS National Conference Steering Committee members (2007) are David Hopkins and Mickey Ransom. NCSS National Conference Steering Committee (2009) –Mickey Ransom and Brian Slater. Scheduled to be in the west region in 2009.

National Cooperative Soil Survey Group to Director of Soil Survey Operations – Mickey Ransom and Cindy Stiles.

New Business

Update of Impact Statement at NIMSS website. A subcommittee of Mickey Ransom, Del Mokma, Ken Olson and Dave Hopkins developed and edited a Soil Survey (NCERA-3) Impact nugget. This document was reviewed by the entire NCERA-3 committee and will be discussed again by the full committee at our next session on (6/6/2007) with plans to have it posted to web by September 2007. Mickey Ransom was assigned and accepted that task.

Discussion of midterm review from NCRA Multistate Research Committee

The following statement by the MRC that the NCERA-3 “committee should begin to consider a future where it more fully integrates its activities with emerging technologies and applications” was discussed. The committee initially thought that is what it was doing but perhaps it needs to be more clearly documented. A committee name change

and shift in activity might be appropriate in the next revised proposal to more fully describe its use of emerging technologies and applications.

Cindy Stiles made a motion that we adjourn for the day. Phillip Owens 2nd it and motion passed. Meeting adjourned at 4:45P.M. on Sunday, June 3, 2007

Meeting Reconvened at Pyle Center Room 111 at 3:30 P.M. on Wednesday, June 6, 2007. Mike Konen joined the meeting.

Discussion continued related to the NCRA MRC review and the future of NCERA-3. Dave Hopkins made a motion that we send in any revisions to the impact state prior to posting on web. These changes should be submitted by August 15, 2007.

The committee name change will be addressed in the next proposal committee renewal.

A writing committee to prepare a draft project renewal proposal was formed. The committee is composed of Del Mokma, Ken Olson, Dave Hopkins and Phillip Owens. The committee was charged to prepare a draft proposal by the 2008 NCERA-3 meeting. The proposal is due December 15, 2008.

Committee accomplishments:

High Intensity soils symposium at SSSA in 2006
Human impact on soil proposal (Smeck proposal)
Participation on standing committees at the National Soil Survey Conference, Madison, WI
Paper presented on Human impact on soil at 18th World Congress of Soil Science
Conducted educational survey of NC university related to training of soil scientist.
Helped revise the Sharkey report
Published a paper in Soil Survey Horizons 47:61-64, titled "Contributions of North Central Regional Committee 3 to Regional and National Cooperative Soil Survey Programs"

Committee impacts

Invited presentation on classification of human impacted soils

Other items

Cindy Stiles reported on the Research committee work and asked that existing state soil characterization laboratory directors form a committee to work on soil sample exchange and testing. Committee will be chaired by Cindy Stiles with Mickey Ransom and Randy Miles as committee members. There is a chance Ohio State University laboratory might

participate. Other states will be asked to nominate soils and collect soil samples for testing.

Cindy also indicate the need to collect more soil carbon related information and perhaps use newer methods such as liter bags, micro plates and other procedures. It was not clear how much of the research could be related to NCERA-3. Might overlap with other regional committees working on soil carbon sequestration or soil organic matter. Characterizing the soil carbon content clearly fits with NCERA-3 objectives.

Cindy also discussed water table studies both past and present and an upcoming Water table workshop related to monitoring climate change.

Cindy Stiles and Lee Burras will work to get regional soil map on an interactive format so that an urban expansion map and a productive farmlands map can be overlain and distributed.

Phillip Owen will work with SSSA and serve as a liaison with Congressional staff to help bring attention to soil survey and soil laboratory issues and needs.

State reports: Electronic copies should be sent to Ken Olson by June 30, 2007.

David Hopkins will be secretary for the 2008 NCERA-3 meeting. That meeting will be a joint meeting with the North Central Soil Survey conference which will start at 1:00P.M. on the day before the conference which is scheduled for June 24, 2008 and ending on June 26, 2009 in Manhattan, KS. At this time it is not clear whether the Conference field trip will be during the conference or on the Monday before (June 23rd). If it is then the NCERA-3 meeting would be on Sunday June 22, 2008 with a follow-up meeting on Wednesday June 25, 2008. Phillip Owens was elected as secretary-elect for the 2009 NCERA-3 meeting. If invited we might meet with the NCSSC in 2009 which is scheduled to be in the west region.

The incoming FY08 Executive Committee members are:

Mickey Ransom – Past Chair
Del Mokma – Chair
Ken Olson – Chair-elect
David Hopkins -- Secretary

The individual state reports are attached.

Submitted by K.R. Olson, 2007 NCERA-3 Secretary

Approved:

Mickey Ransom, Chair
July 31, 2007

Approved:

Gerald A. Miller, Administrative Advisor
July 31, 2007

2007 NCERA-3 State Reports:

Illinois Report Form
2007

Academic Unit: NRES, ACES, UIUC, Illinois

Name: Kenneth R. Olson

Summary of: Continue to represent the UIUC at county soil survey field reviews and participate in Soil Survey conferences at the state, regional, and national levels. My research activity related to NCERA-3 includes: soil productivity-erosion relationships, evaluation of conservation tillage systems for restoration of productivity, crop yield prediction by soil type, and quantification of erosion rates. The effects of tillage on soil carbon sequestration is also being studied on sloping and eroding, low productivity soils in southern Illinois and on highly productive soils in west-central IL. Crop yields trends over time are also being monitored at these sites. An ongoing research project related to land degradation links teams of soil scientists from UIUC with Moscow State University (Russia) geographers. Co-authored a summarized the contributions of North Central Regional Committee 3 to Regional and National Cooperative Soil Survey Programs.

Research Activities:

- Productivity Index Ratings for New Illinois soils and Crop Yield Updates for Established Soils
- NC-1017 Carbon Sequestration in Eroded Illinois Soils.
- Described and sampled the Muscatune soils which have the highest soil productivity rating in Illinois.

Outreach and Extension:

- North Central soil Survey Conference Soil Taxonomy and Standards Committee
- Illinois Farmland Assessment Technical Advisory Committee

Publications (*number of peer-reviewed (3), symposia (2), reports (1), and abstracts (2)*

Olson, K.R. R.L. Jones, A.N. Gennadiyev, S. Chernyanskii, W.I. Woods, and J.M. Lang. 2006. Fly ash distribution to assess erosion and deposition in an Illinois landscape. Soil and Tillage 89:155-166.

Gennadiyev, A.N., S.S. Chernyanskii, K.R. Olson, and R.G. Kovach. 2006 Use of magnetic spherules as indicators of mass-transfer process in soils. Herald Journal of Moscow State University, Geography. No. 3. 29-35.

Olson, K.R. and T. E. Fenton. 2006. Contributions of North Central Regional Committee 3 to Regional and National Soil Survey Program. Soil Science Society of America. Soil Survey Horizons 47:61-64.

Olson, K.R. 2007. Soil organic carbon storage in southern Illinois woodland and cropland. Soil Science 172:(In press).

Courses taught (*titles*):

Soil and Water Conservation and Management (NRES 474)

Indiana Report - 2007

Academic Unit: Purdue University
Names: Phillip Owens, Brad Lee, Darrell Schulze and Gary Steinhardt

Summary of Report:
All 92 Indiana counties have been initially surveyed since 1986 and have corresponding published soil survey reports. All 92 counties now have been digitized and have spatial and tabular data available online at the Soil Data Mart and Web Soil Survey. 82 counties have also been released on ArcView interactive CDs as Soil Survey SSURGO Interim Reports and the other ten counties have update Soil Survey CDs. Nineteen counties also have Historical Replica Soil Survey CDs and these publications are available online at the NRCS Indiana State Web Site. Fourteen counties have been updated at a scale of 1:12,000 and updates are in progress in the field on nine additional counties. Updates to soil surveys in Indiana is now being done on a MLRA and landform basis. Nine of the update surveys have been published with hard copy manuscripts, maps and Soil Survey CD's. Ten of the update surveys have manuscripts available online at the Web Soil Survey. The tabular data for all 92 counties is being updated on an ongoing basis and being refreshed every six months online at the Soil Data Mart. NRCS currently has 22 soil scientists working in Indiana as follows: 4 Resource Soil Scientists; 1 Student Trainee, 1 soil scientist working part time and attending graduate school; 1 Soil Scientist on the Planning & Technology Staff at the Indiana State Office, 9 Soil Scientists working on project Soil Surveys in two MLRA project offices and 2 subset soil survey offices; and 6 Soil Scientists in the MLRA Soil Survey Region 11 Office.

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.
- Characterize the hydraulic conductivity variations between the concentric series of recessional moraines formed from the Erie-Ontario glacial lobe in northeastern Indiana.
- Identify 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.
- Characterize the spatial distribution of water limiting horizons across a watershed with geophysical methods.

- Evaluate the utility of geophysical methods to determine the location of septic systems.

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.

Publications: Research: 5, Abstracts: 7, Non-peer reviewed publications: 4

Peer Reviewed Publications:

1. Adeli, A. Bala, F.M. Rowe, D.E. Owens, P.R. 2006. Effects of drying intervals and repeated rain events on runoff nutrient dynamics from soil treated with broiler litter. Journal of Sustainable Agriculture. 28:67-83.

2. Iqbal, J., P.R. Owens and I. Ali. 2006. Application of remote sensing data to assess weed infestation in cotton. Agriculture Journal 1:186-191.

3. Smith, D.R., P.R. Owens, A.B. Leytem and E.A. Warnemuende. 2007. Nutrient losses from manure and fertilizer applications as impacted by time to first runoff event. Environmental Pollution.147:131-137.

4. Hart, K.S., B. D. Lee, P. S. Schoeneberger, D. P. Franzmeier, P. R. Owens and D.R. Smith. 2007. Comparison of field saturated hydraulic conductivity measurements to estimated morphological loading rates in Northeastern Indiana. Journal of Hydrologic Engineering. *Accepted*

5. Owens, P.R., L.P. Wilding, W.M. Miller and R.W. Griffin. 2007. Inferring oxygen status in soils using iron rods. Catena. Accepted.

Iowa Report Form
2007

No state report. Lee Burras has agreed to serve as ISU member and his Appendix E is being processed.

Kansas Report
2007

Academic Unit: Kansas State University

Name: Michel D. Ransom; other collaborators at Kansas State University include DeAnn Presley, Gerard Kluitenberg, and Charles Rice.

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 FY07 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
- Carbon sequestration using benchmark sites to estimate soil organic C stocks
- Development of a Laser Induced Breakdown Spectroscopy (LIBS) procedure to determine the organic carbon content of soils in the field
- Development of improved procedures for determining soil physical properties, such as saturated hydraulic conductivity, for application to the soil survey program
- Cooperative work with NC-1018, Impact of Climate and Soils on Crop Selection and Management

Outreach and Extension Development:

- USDA-NRCS Advisory Panel to the Director of Soil Survey
- Kansas Soil Survey Technology and Work Planning Conference
- North Central Soil Survey Conference Steering Committee
- North Central Soil Survey Conference Soil Taxonomy and Standards Committee
- Board Representative for Division S-5, Pedology, of the Soil Science Society of America

Publications (2006-07): Peer-reviewed journal articles: 4; Abstracts: 4

Gehl, R.J. and C.W. Rice. 2007. Emerging technologies for in situ measurement of soil carbon. Climatic Change (In Press).

Gunal, H., and M.D. Ransom. 2006. Genesis and micromorphology of loess-derived soils from central Kansas. Catena 65:222-236.

Gunal, H., and M.D. Ransom. 2006. Clay illuviation and calcium carbonate accumulation along a precipitation gradient in Kansas. Catena 68:59-69.

Izaurralde, R.C. and C.W. Rice, 2006: Methods and tools for designing pilot soil carbon sequestration projects. pp. 457-476. In R. Lal, C.C. Cerri, M. Bernoux, J. Etchvers, and E. Cerri. (eds.) Carbon Sequestration in Soils of Latin America. Food Products Press: The Haworth Press, Inc., Binghampton, NY.

Courses taught: Soil Judging, Soil Genesis and Classification, Advanced Soil Genesis and Classification

Kentucky Report Form
2007

No report. Kentucky did request membership in NCERA-3 committee during our last project renewal in 2004. However, during the past 3 years University of Kentucky has not sent a representative to annual meetings, never participated in committee work or submitted an annual report.

Michigan Report
2007

Academic Unit: Michigan State University

Name: Delbert L. Mokma

Summary of Report: Field work for the soil surveys in Michigan was completed in 2005. The final counties have not been published. The soil surveys are being digitized. Updates of soil surveys are being done on a Major Land Resource Area basis.

Research Activities:

- Soil assimilation of food processing wastewater at different temperatures
- Biomat presence in existing onsite wastewater systems

Outreach and Extension Development:

- Michigan Soil Survey Cooperators Meeting
- Michigan Phosphorous Index
- Two-day training courses for onsite wastewater treatment

Publications (2006):

Yli-Halla, M., D.L. Mokma, L.P. Wilding and L.R. Drees. 2006. Formation of a cultivated Spodosol in east-central Finland. Agricultural and Food Science in Finland 15:12-22.

Courses taught: Soil Resources

Minnesota Report
2007

Academic Unit: University of Minnesota, Soil, Water & Climate, 1991 Upper Buford Circle, St. Paul, MN 55117
Name: Terence H. Cooper, Professor, tcooper@umn.edu

Summary of Report

Minnesota Soil Survey Program: 87 counties - 91 soil survey areas (St. Louis County is divided into 5 sub-sets - of these 5, 1 is SSURGO; 2 are in digital review) 76 soil survey areas are SSURGO (75 complete counties) All soil survey areas that are SSURGO are available via web soil survey- Minnesota no longer publishes books or CDs - the "official copy" is web based. This ensures that the user has access to the most up to date soil survey.

Discussion starting for soil survey in Lake and Cook counties. Initial mapping continues in Koochiching County, St. Louis County, and Pine County. Update mapping - (8 counties) Lincoln, Wabasha, Fillmore, Benton, Crow Wing, and the Red Lake Indian Reservation in Lake of the Woods, Beltrami, and Clearwater Counties

Minnesota NRCS has 5 MLRA coordinators and 9 state staff in support of 25 field soil scientists. MAES has 15 different projects in place to aid various segments of the soil survey program. Many of the projects deal with wet soils or spatial variability. New workshops for wetland delineators and ISTS personnel have been given during the year.

Research Activities:

- Anoka Sand Plain Practitioner Training
- 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
- 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
- Climosequence effects on loess parent materials across the U.S.Great Plains
- Influence of soils, paleosols, and stratigraphy on well grout performance across Nebraska
- Beaver recolonization of eastern Great Plains agricultural watersheds
- Introduced legumes in grazed wet meadows: soil carbon effects
- Comparing soil quality and nematode communities in a long term (30 year) tillage study
- Controls on Nebraska Sand Hills stability and periodic instability
- Relict Soil Mottling Study

Outreach and Extension :

- Interagency information session on soil survey – hosted by UM and NRCS March. 2007 in St. Paul

Publications

peer-reviewed	9
Book Chapter	1

Courses taught (titles):
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., Forest Soils, Soil Conservation.

List of Publications:
Jeremiason, J.D., D.R. Engstrom, E.B. Swain, **E.A. Nater**, B.M. Johnson, J.E. Almendinger, B.A. Monson, R.K. Kolka. 2006. Sulfate addition increases methylmercury export from an experimental wetland. *Environmental Science & Technology* 40(12):3800-3806.

Kelley, D.W., S.A. Brachfield, **E.A. Nater**, and H.E. Wright, Jr. 2006. Sources of sediment in Lake Pepin on the Upper Mississippi River in response to Holocene climatic changes. *Journal of Paleolimnology* 35: 193-206.

H.A.S. Dolliver and J.C. **Bell**. 2006. Using scientific visualization to represent soil hydrology dynamics. Journal of Natural Resources and Life Sciences Education 35:5-11.

Bell, J. C. and C. W. Zanner. 200_. Chapter 6 – Wetland Soils. *In* J. C. Bell and C. W. Zanner (eds.). Guide to the Wetlands of Minnesota. The University of Minnesota Extension Service Publication. St. Paul, MN. *In Press*

Geiss, C.E. and **C.W. Zanner**, December 2006. How abundant is pedogenic magnetite? Abundance and grain-size estimates for loessic soils based on rock-magnetic analyses. Journal of Geophysical Research. B12S21.

Guyodo, Y., T. M. LaPara, A. J. Anschutz, R.L. Penn, S. K. Banerjee, C. E. Geiss, **C. W. Zanner**, Rock magnetic, chemical and bacterial community analysis of a modern soil from Nebraska. Earth and Planetary Science Letters, 251, p. 168-178, 2006.

Geiss, C. E., and **C. W. Zanner**. 2006. Sediment Magnetic Signature of Modern Climate. Quaternary International

In Press/ Accepted

Mousel, E.M., W.H. Schacht, **C.W. Zanner**, and L.E. Moser. 2006. In press. Comparison of botanical composition effects on soil carbon content and root distribution of subirrigated meadows in the Nebraska Sandhills. .Journal of Great Plains Research.

Machac, T.A., C. E. Geiss, and **C. W. Zanner,** Accepted with minor revisions. Time dependent IRM acquisition as a tool to quantify the abundance of ultra-fine superparamagnetic magnetite in loessic soils. Geophysical Journal International.

Loeding, April M., & **Terence H. Cooper**; 2006. Help Guides Aid Understanding of Minnesota's Environmental Review Process, CURA Reporter, Vol 36, No. 1, Spring, Univ. of Minnesota, Center for Urban and Regional Affairs.

Missouri Report Form
2007

No report. Missouri has not officially re-appointed a member to the NCERA-3 committee. However, Missouri was represented by Randy Miles at the 2007 annual meeting and he has participated in various committee assignments.

Nebraska State Report
2007

Academic Unit: School of Natural Resources, University of Nebraska

Name: Mark Kuzila

Summary of Report:
Soil Survey Update and Maintenance work is centered out of 4 newly established MLRA Soil Survey Project Offices. The MLRA offices in Nebraska are located in Scottsbluff, North Platte, Lincoln and projected for Stanton. The soil surveys for all counties in Nebraska are digitized to NRCS standards for SSURGO certification and available via the Web soil survey. A priority activity for 2007 includes the implementation of a state-wide legend leading to seamless digital coverage of the state. The state-wide legend will provide to users a digital product that is consistently joined between counties or survey areas. The Nebraska cooperative soil survey partners, including NRCS, UNL Conservation and Survey Division, and Nebraska Department of Natural Resources are working on this effort. As soils information is updated and improved, the data is posted to a soils data mart, and then made available to the public through the Web Soil Survey.

Research Activities:

- Soil characterization analyses of approximately 28 pedons for ongoing soil survey update work
- The effect of bio-fuel production on soil carbon stocks.
- Carbon sequestration under newly established golf fairways at the Arbor Day Farm.
- Loess history of Central Nebraska and restoration strategies for rainwater basins.
- Geomorphology and ages of terrace landscapes along the Platte River in Central NE.

- Geochemical analysis of soils at 130 sites across Nebraska as part of the USGS study.

Courses taught (*titles*): Soil Evaluation and Great Plains Field Pedology

Ohio Report Form
2007

Brian Slater has agreed to serve as OSU member to NCERA-3 and his Appendix E is being processed. No state report. Neil Smeck did represent OSU at the annual meeting.

Oregon Report Form
2007

No report. Oregon did request membership in NCERA-3 committee during our last project renewal in 2004. However, during the past 3 years has not sent a representative to annual meetings, never participated in committee work or submitted an annual report.

South Dakota Report
July 2006- June 2007

Academic Unit: SD State University (SD Agricultural Experiment Station, Plant Science Dept.)

Name: Douglas D. Malo (0.75 FTE Teaching/0.25 FTE Research)
Douglas.Malo@sdstate.edu

Summary of Report:
SD has all been mapped and all counties have a published soil survey. Soil surveys updates (MLRAs 60A, 61, 62, 64, 65, and 102A) are being done by the SD Cooperative Soil Survey on a multi-county (MLRA) basis. The field work for Lawrence County is continuing. 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 developed. Assisting SD agencies and the NRCS in improving the SD Soil Productivity Rating System. Soil formation and properties are being evaluated in gold mine reclamation area near Lead, SD.

Research Activities (bulleted titles of projects, no descriptive text):

- 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 characterized from Pennington County).

- Cooperative soil characterization and plant vegetation study with Department of Horticulture, Forestry, and Parks and SD Dept of Transportation in Black Hills area.
- Changes in surface soil test levels of P and K since 1950 (county and regional changes).
- Revising SD soil productivity index (PI) values (compare NASIS PI with Yield PI).
- Land management impacts on soil properties after 12 years of cultivation (corn and soybeans), cool season grasses, and warm season grasses.
- Hawaii (Maui) wetland soils reclamation project for endangered species (200 soil samples taken)

Outreach and Extension Development

- Work Planning Conference for the SD Cooperative Soil Survey
- Soil PI rating development and use workshop (county assessors and SD Dept of Revenue)

Grants (co-investigator/collaborator on all projects listed) received (7/2006-6/2007)

- Gilt Edge Mine Reclamation – US EPA
- Chloride Injury from De-Icing Salts in Trees and Soils in the Black Hills of SD – SDDOT
- Cropping Systems Evaluation for Enhanced Crop Production – SD Crop Improvement
- Continuous Corn Impacts on Soil Quality – SD Corn Council.

Courses taught: Soils, Soil Judging, Integrated Natural Resource Management, Teaching Experience, Soil Geography and Land Use Interpretation, Rural Real Estate Appraisal, Advanced Soil Genesis, Field Studies in Pedology, Undergraduate Research/Scholarship, Special Topics – Soils of CA, and Thesis

Publications (7/2006-6/2007): (List of publications available on request)

- 3 peer-reviewed journal articles and 1 teaching pamphlet
- 5 published abstracts, 2 MS theses
- 1 lab manual and 1 text for Introductory Soils
- 10 CDs (old deteriorating air photos [1939-1954] of SD) and 5 CDs (soils teaching)

<u>SD NCERA-3 Publication List (2006-2007) (* = refereed articles)</u>

1. Malo, D.D., Clay, D.E., Doolittle, J.J. and Reese, C.L.. 2006. Soils Laboratory Manual. 35th Edition. Plant Sci. Dept. SDSU. Brookings 57007-2141 (290 p).
2. Malo, D.D. 2007. Introductory Soils. 8th Edition. Plant Science Department. SDSU, Brookings. 57006-2141 (261 p).
3. *Eynard, A., Schumacher, T.E., Lindstrom, M.J., Malo, D.D., and Kohl, R.A. 2006. Effects of aggregate structure and organic C on wettability of Ustolls. Soil Tillage Research 88:205-216.

4. *Papiernik, S.K., M.J. Lindstrom, Schumacher, T.E., Schumacher, J.A., Malo, D.D., and Lobb, D.A. 2006. Characterization of Soil Profiles in a Landscape Affected by Long-Term Tillage. Soil Tillage Research 88: (in press, doi:10.1016/j.still.2006.05.007).
5. *Schumacher, T.E., Eynard, A., Lindstrom, M.J., Schumacher, J.A., Papiernik, S.K., Malo, D.D., Kohl, R.A., and Lobb, D.A. 2006. Aggregate wettability and stability in an eroded landscape. Proceedings of ISTRO 17: Sustainability: Its Impact on Soil Management and Environment. pp. 1474-1479. ISBN 3-9811134-0-3.
6. *C.E. Werkmeister[2], D.D. Malo, T.E. Schumacher[*], J.J. Doolittle, and G.C. Miller. 2007. Testing Durability of Acid Rock Passivation to Root System Activity within Greenhouse Columns. National Meeting of the American Society of Mining and Reclamation, Gillette WY, June 2-7, 2007. R.I. Barnhisel (Ed.) Published by ASMR.

Wisconsin State Report
2007

Academic Unit: University of Wisconsin - Madison

Name: Cynthia A. Stiles

Summary of Report:
2006 was declared the Year of Soil by Governor Jim Doyle in honor of the completion of the initial once-over mapping for all counties by NCSS. Staffing shifts have moved or retired many agency soil mappers and soil scientists and the state is operating on bare-bones level for technical services and resource management evaluations only. University cooperative efforts this past year focused on the SoLIM validation/sampling project with the Geography Department (A-Xing Zhu and Jim Burt), where point data and observations were taken at over 500 georeferenced sites in a third order watershed in western Dane County. Efforts are on-going for tracking relationships of soil properties with spread and persistence of Chronic Wasting Disease in deer focused in Iowa County, tracking non-point contaminant plumes induced through electromagnetic fields in urban wetlands, and evaluation of geochemical degradation of Mollisols in southwestern WI due to farming systems. The Soil Science program at Madison continues to hang on to faculty and appear as a valid scholastic unit within the College of Ag and Life Sciences because we have started to focus on large-enrolment service courses at the lower undergrad level to fulfill science credits for students in other colleges. These courses expose a greater number of people to the nature and problems encountered in soil and water resource management. It will hopefully increase interest and lead to more majors within our program. A new MS degree in Agroecology promises to increase grad student numbers in the future.

Research Activities:
- Soil characteristics related to inference-derived mapping units
- Watershed scale carbon stores evaluations

- Geochemistry of soil genesis/stabilization from loess and carbonate bedrock
- Geological landscape evolution in varying loess-covered bedrocks areas of the Driftless Area
- Phosphorus retention kinetics of Rountree Formation clays
- Geospatial data and soil characteristics as tools to track CWD in south-central Wisconsin
- Identifying geochemically degraded mollic epipedons – effects of farming practices
- Geochemical landscape survey of Wisconsin surface soils

Publications: 2 peer-reviewed journal articles; 2 open-file reports; 10 abstracts

Courses taught:
Undergraduate: Earth's Water (learning activity leader); Forum on the Environment (invited lecture), Pedology; Graduate: Climate Change in the Geologic Record Colloquium, (co-instructed with geology faculty).