

**Office of the Chief
Weekly Report**

**Soil Science and Resource Assessment
Soil Science Division**

July 30, 2013

Deadline Reminders

None

Upcoming Meetings/Conferences

None

Soil Science Division Update

Soil Health for Climate Change Mitigation and Adaptation

Resilient Landscapes was this year's theme at the Soil and Water Conservation Society's Annual Conference in Reno, NV, August, 21-24. Much of the conference focused on the interaction of climate change and the use of soil health practices. Dr. Susan Andrews represented the National Soil Survey Center by giving an invited talk on using soil health practices to mitigate expected increases in soil erosion and runoff, drought and flooding, insect herbivory and weed invasions, and pest and disease outbreaks, all due to climate change effects. The talk was part of a joint symposium between SWCS and the Soil Science Society of America, with a special issue in the Journal of Soil and Water Conservation to follow. The take home message from the many talks was that the challenges will be great but soil-building practices can help. Farmers must be engaged in selecting practices that work in their systems to foster resilience for successful mitigation and adaptation efforts.

Soil Geomorphology Institute Field Sites and Training Framework Developed

Drs. Doug Wysocki, Phil Schoeneberger, Zamir Libohova, (NSSC), Jimmie Richardson (NRCS-retired), and Curtis Talbot (NSSC) conducted the Soil Geomorphology Institute (SGI). July 08-26, 2013. The SGI is an intensive 3-week training that presents soil landscape concepts and develops field skills essential for Soil Survey by MLRA and digital soil modeling. The SGI training blends scientific principles with field observations in a variety of geomorphic settings. SGI participants examined 20 major soilscapes from the Loess Hill in western IA to the Vasquez range in CO. Skills gained during the SGI improve and facilitate Soil Survey and Ecological Site Descriptions via science-based digital models and emphasis on soil landscape hydrology. The SGI integrates geomorphology, stratigraphy, hydrology, and pedology to understand and explain soil patterns and water flow in a soil landscape. Participants apply SGI concepts in their respective Soil Survey area as a post-training project.



SGI participants Scottsbluff, NE (back row l-r) Doug Wysocki (NSSC), Rachel Stout-Evans (MS), Curtis Talbot (NSSC), Manuel Matos (PR), Nick Butler (ME), Tim White (NE), Jo Parsley (NE), Jon Gustafson (CA), Chris Hatcher (MS), Jim Curtis (MS), Stuart Veith (MT), Brent Clabaugh (NE), Randy Riddle (CA), Bob Mitchell (MT), (front) Scott Woodall (NM), Tom Burke (CO), Zamir Libahova (NSSC), Janella Cruz (AZ), Shanna Bernal-Fields (OR), Jim Richardson (ID), Christine Ryan (IL), Philip Schoeneberger (NSSC), Angie Elg (NE), and Dave Vyvain (NE).



SGI participants examine a soil catena in the Sandhills near Whitman, NE.

EMI and Ground Penetrating Radar surveys to assist corral relocation project in Montana

A planned NRCS project in south-central Montana will move corrals further away from a tributary of the Stillwater River and provide a vegetated buffer strip, which will prevent the runoff of nutrients and organic matter from entering the stream. The area included in this project is located within the boundaries of a *National Register Site*: the Crow Agency II. While the full extent of this archaeological site is unknown, due diligence is required by NRCS to identify archaeological features located within the area that will be impacted by the corral relocation project.

NRCS is committed to the protection and enhancement of our nation's cultural resources and historic properties. As part of NRCS's reasonable and good faith efforts to determine whether archaeological features are located within the proposed relocation area, Dori Passmann, the NRCS State Archaeologist, requested geophysical assistance from the National Soil Survey Center's Soil Survey Research and Laboratory Staff. With the assistance of the Montana State Office, the Columbus NRCS Field Office, and the Montana Resource Planning and Implementation Team, electromagnetic induction and ground penetrating radar surveys were completed across the area that will be impacted by the proposed corral relocation project. These surveys, which were completed over a two-day period, provided a more comprehensive coverage of the subsurface than possible with traditional archaeological field methods, detected subsurface features related to past operations and land use management by the landowner's family, and identified "areas of interest" if future archaeological excavations are required.



Detailed ground-penetrating radar surveys were conducted across the area impacted by a proposed corral relocation project in Stillwater County, Montana.



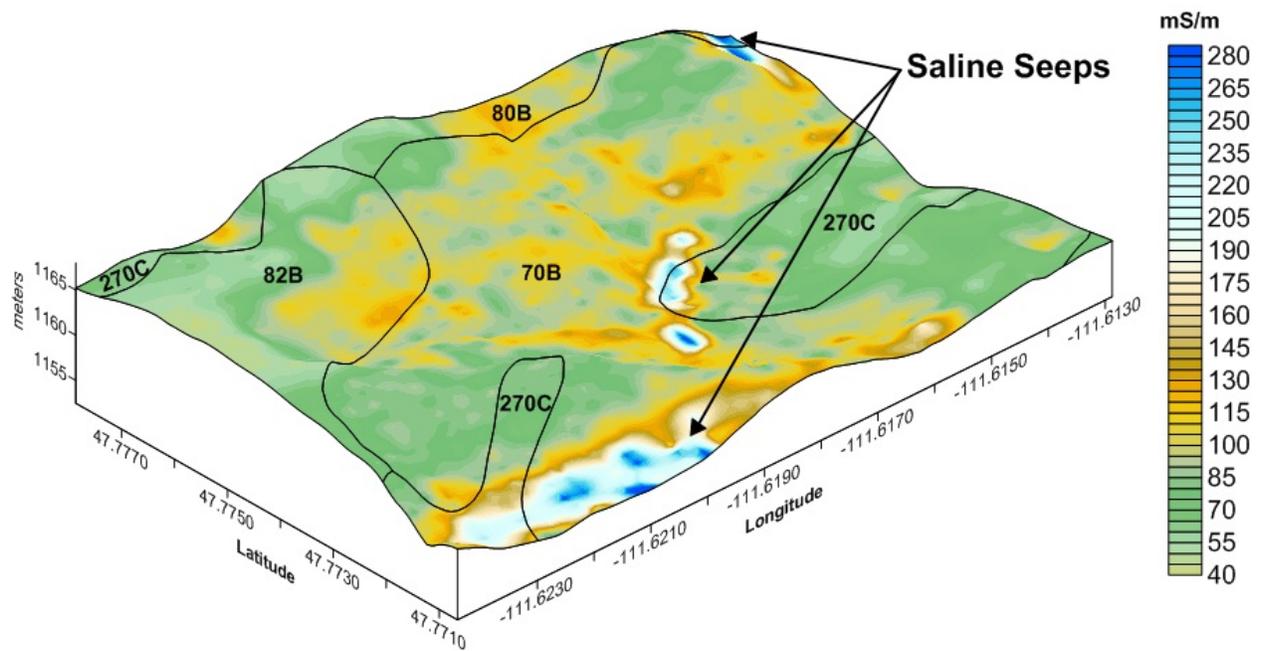
District Conservationist Ted Nelson assists with an electromagnetic induction survey of an impacted area near the Crow Agency II, National Register Site in Stillwater County, Montana.

Use of electromagnetic induction (EMI) to identify saline seeps in Montana

The development, control, and reclamation of saline seeps are major concerns of management in the Northern Great Plains. During the week of 22 July, the National Soil Survey Center's Soil Survey Research and Laboratory Staff assisted with a workshop on the use of electromagnetic induction (EMI) to identify saline seeps and recharge areas in areas of dryland farming. Twenty agronomists, conservationists, soil scientists, and technicians from north-central Montana attended the two-day workshop in the Great Falls, Montana. The use of EMI meters and measured apparent conductivity (ECa) data to identify discharge and recharge areas associated with saline-seeps, and methods for processing, displaying and interpreting ECa data were discussed. Patrick Hensleigh (State Agronomist) and Cari Ostberg (Area Resource Conservationist) lead discussions on methods that can be used to reduce the flow of subsurface water and restrict the development of saline seeps. Field exercises allowed participants to operate EMI meters, and conduct detailed and reconnaissance surveys using both mobile and pedestrian EMI platforms over a 160-acre field in Teton County that contained saline seeps.



Field exercises allowed participants to operate EMI meters and discuss management concerns associated with saline seeps in the Northern Great Plains.



This three-dimensional map shows the spatial distribution of apparent conductivity across a quarter section of land in Teton County, Montana. Spatial patterns provide inferences into the flow of subsurface water and soluble salts across this landscape and the distribution of recharge, discharge and flow-through areas contributing to the development of saline seeps.

NSSC involvement with Climate and Land Use Alliance (CLUA)

Dr. Joel Brown, NSSC staff, has been invited to provide technical advice to the Climate and Land Use Alliance (CLUA), a funding collaborative between the Packard, Moore, Ford, and ClimateWorks foundations focused on reducing GHG emissions from the forestry and agriculture sectors. To date, CLUA's attention has been largely focused on deforestation & land degradation, but now they want to better understand mitigation opportunities in the agricultural sector globally. CLUA is in the process of trying to develop a solid scientific basis for their input to both government policy and private sector markets for the development of incentives to reduce atmospheric greenhouse gas levels.

Personnel Highlights

None