

SOIL SCIENCE AND RESOURCE ASSESSMENT

Weekly Report

February 25 – March 1, 2013

Deadline Reminders

None

Upcoming Meetings/Conferences

David Smith, Director, and Thomas Reinsch, Leader, World Soil Resources, both with the Soil Science Division, and Norm Widman, National Agronomist, and Dana Larsen, Acting Grassland Specialist, both with the Ecological Sciences Division, Washington, D.C., will meet with a visitor from Mexico on March 5. The group will discuss land conservation practices at the federal, state, and local levels, rangeland management and restoration, and carbon capture technological developments in soils and vegetative lands. Michael Robotham, Acting Director, National Soil Survey Center, Lincoln, Nebraska, will also host the visitor on March 11.

Soil Science Division

Useful to Usable: Transforming climate variability and climate change information for cereal crop producers - Mike Kucera (Soil Quality and Ecosystems Branch) and Deb Harms (Soil Survey Standards Branch) participated in a focus group with the Useful to Usable (U2U) team. Agricultural crops contribute about \$150 billion annually to the U.S. economy, most of which comes from the intensely cultivated Midwest (USDA-ERA, 2010). The viability of this industry is affected by increasingly variable climate patterns. The U2U project seeks to improve the resilience and profitability of farms amid variable climate changes by providing stakeholders with better decision support tools (DSTs), such as predictive climate models, delivered more effectively. They will produce research on the biophysical and economic impacts of different climate scenarios on corn and soybean yields in the North Central Region and conduct complementary research to understand how producers and advisors are likely to use climate information. The project surveyed farmers and advisors about their use of weather/climate information in 2012. And recently, this project completed three focus groups in Nebraska with certified crop advisors, conservation advisors, and corn farmers, to get feedback on potentially useful decision tools for agriculture. Based on the findings, the U2U group will develop DSTs and training materials to deliver climate information to our customers. More information about U2U is available at <http://www.AgClimate4U.org>.

Development of Methods for Evaluating Soil Change and its Effect on Erosion Prediction and Soil Condition - In response to erosion and soil condition observations in the field, erosion specialists/ agronomists Joel Poore, CNTSC and Linda Scheffe, NSSC, met at the NSSC during the week of Feb. 25th. One goal was to discuss and evaluate the effects of long term erosion and management practices on soil characteristics that affect predicted erosion and soil quality. A meeting was held with Skye Wills, Soil Ecology Division, Cathy

Seybold, Soil Interpretations Division, and Ken Scheffe, Soil Standards Division to review status of addressing these issues and discuss future direction.

A review was made of historical research and assessment of dynamic soil properties by the NSSC and ARS. A presentation was provided on theoretical approaches for NRCS to document Ecological Site Descriptions for Cropland and the role of dynamic soil properties. The group reviewed potential uses of process-based, time-step models, such as WEPS, to predict long term effects of management on changes in erodibility and soil condition.

In follow-up to the meeting, the erosion specialists agreed to continue using NRCS existing models to develop relationship trends for erosion predictability and soil condition as a result of land use management systems. NSSC specialists and erosion specialists will continue to work together to identify management systems, site conditions, and crop system variables in order to build a predicted database and protocol for soil change. It is hoped that these efforts will begin to address field needs for an integrated approach dealing with long term management effects on erosion prediction and soil condition using the soil survey data.

NSSC Geophysical Assistance on Maryland Serpentine Barrens - During the week of February 18th, Jim Doolittle of the NSSC Soil Survey Research and Laboratory Staff and the Frederick MLRA-148 (Northern Piedmont) Soil Survey Office completed geophysical surveys at the Soldiers Delight Natural Environmental Area (SDNEA), which is located near Baltimore, Maryland. The SDNEA, which is part of the Maryland Wildlands Preservation System, includes about 1900 acres of protected serpentine barrens. Soldiers Delight is the largest protected serpentine barren in eastern United States. The site is protected because of the presence of serpentine soils and over 39 rare, threatened, or endangered plant species. Serpentine soils form in regolith weathered from serpentinite, a green-colored, ultramafic rock, which is low in silicon and high in magnesium and iron. Soils formed over serpentinite have low Ca/Mg ratios, are low in essential nutrients, and have high concentrations of heavy metals (nickel and chromium) all which limit plant growth of many plant species.

During this study, ground-penetrating radar was used to document the depth to rock within several soil map units. Electromagnetic induction was used to infer the spatial variability of soil magnetic susceptibility which is related to differing concentrations of heavy metals in soils within the area. With the assistance of the New Jersey NRCS soils staff, a portable X-ray fluorescence spectrometer will be used to assess the concentrations of different metals in the soil samples collected from the study areas. These results will be used to correlate XRF concentrations with the response of the electromagnetic induction meter. Information gathered from this study will be used to improve map unit interpretations and to help develop Ecological Site Descriptions for soils formed on serpentinite.

The National Soil Survey Center's Kellogg Lab was spotlighted in the Sunday edition of the Lincoln Journal Star with a picture of Patty Jones, physical science technician. The photo showed Jones working on soil samples and had the caption "Patty Jones is a physical science technician for the NRCS, National Soil Survey Center. The Center's Kellogg Laboratory annually analyses thousands of samples from all parts of the U.S. for organic matter and other properties that are used to define different soil types and guide recommendations for proper management." It ran as part of the "Lincoln at Work" feature section called DIRECTIONS.

International Programs Division

NRCS Staff in Afghanistan:

<u>Name</u>	<u>State</u>	<u>Beginning date</u>	<u>Ending date</u>
Adam, Drew	VT	12/6/2012	12/8/2013

National Geospatial Management Center

SSRA-NGCE Elevation Leaders Attend the International LiDAR Mapping Forum (ILMF) in Denver

NRCS Elevation Leaders, William Marken and Steven Nechero of NGCE, attended the International LiDAR Mapping Forum in Denver, Colorado, February 11-13, 2013. The event attracted over 850 registered attendees from over 30 countries with an exhibition of 70 vendors showcasing new systems and software. The three-day technical conference and exhibition focused on airborne and bathymetric LiDAR, with a particular emphasis on mobile mapping systems. The conference provided an opportunity to learn about the latest advances in technology and hear about industry changes from industry experts.

NRCS will benefit from the new data capture systems, data fusion/classification and processing techniques and the increasing integration of imagery and elevation technologies. William Marken has made some key contacts with technical experts to explore how NRCS can take advantage of the new technology. NGCE presented the NRCS Elevation Program and Applications at the field level in a 40-minute time slot on Wednesday, February 13, 2013. The presentation was well received and SSRA-NGCE was contacted by several partners and vendors that had suggestions on how to enhance the map and data services NGCE is building for NRCS.

Dr. David F. Maune attended the session and complimented NRCS on our successful implementation of our National Elevation Program based on the recommendations from the NRCS Elevation Study he completed in 2010. Two major emerging technologies are Waveform and FLASH LiDAR; there was a significant discussion and presentation by Lewis Graham, President, CEO GeoQue, and LiDAR Division Director ASPRS on the LiDAR validation suite and micro UAVs. NGCE also met with our State GIS Specialist in Colorado, Chris Mueller, and several USGS liaisons to discuss partnerships and LiDAR applications. Carol Griffin, USGS Liaison for Colorado, is organizing a workshop this summer on the applications of LiDAR in the San Luis Valley. This is a highly successful partnership of federal and local agencies to acquire, integrate and deploy LiDAR products and services for conservation and environmental analysis. NRCS was a major contributor to the San Luis Valley LiDAR project along with USGS, NPS, USFWS, BLM and USFS. The ILMF 2013 presentations are now available for download. Visit <http://www.lidarmap.org/downloads/>. The username is: *ilmf13* and the password is: *ilmfdenver2013*.

The major takeaways from the conference are twofold: 1) LiDAR is a mature mapping technology and 2) Airborne LiDAR mapping systems provide 3D information for the surface of the Earth which includes terrain surface models, vegetation characteristics, and man-made

features. The NRCS Elevation Program is on track to provide this key technology to NRCS GIS users at all levels (field, state, regional, and national). For additional information on LiDAR technologies and strategies, please contact: William Marken, Acting National Elevation Leader, or Steven Nechero, NGCE Geospatial Data Management Branch Chief, via email at william.marken@ftw.usda.gov and steven.nechero@ftw.usda.gov.

NGCE Geospatial Experts Help in Developing HGM Class Maps in Michigan

NGCE formerly NGMC lent assistance in developing maps for the Southern Lower Peninsula of Michigan in 2012. The purpose was to investigate five MLRA regions and delineate four key hydrogeomorphic wetland classes along with a set of detailed instructions for deriving results for each HGM class. The maps were developed in ArcMap 9.3.1 and utilized NAIP imagery and various layers acquired from the Geospatial Data Gateway and the Soil Data Mart. Landscape position parameters and soil taxonomy were utilized to develop wetland class specific maps. The maps were delivered in December 2012.

Introduced initially in 1993, the HGM wetland classification system provided a new approach to wetland functional assessment by subdividing wetlands into key geomorphic landscape positions; i.e., mineral flat, riverine, depression and slope. By compartmentalizing wetlands into specific types, the NRCS is better equipped to assess wetland conversion, mitigation and restoration issues.

NGCE make available 2013 Version of the Cropland Data Layer from National Agricultural Statistics Service (NASS) at the USDA Data Gateway

The USDA-NASS Cropland Data Layer is a raster, geo-referenced, categorized land cover data layer produced using satellite imagery. The purpose of the Cropland Data Layer Program is to use satellite imagery on an annual basis to (1) provide supplemental acreage estimates for the state's major commodities and (2) produce digital, crop specific, categorized geo-referenced output products. Maps are included for all available years when the product is ordered.

This program represents a cooperative venture between three USDA agencies (headquarters units of NASS, the Foreign Agriculture Service, and the Farm Service Agency) plus in-state agreements among the Agricultural Statistics Service, the Department of Natural Resources and the Department of Agriculture. The product is also available directly from NASS at <http://nassgeodata.gmu.edu/CropScape>.

NGCE receives the data from NASS once a year and prepares and processes the data for delivery, by state, on the Geospatial Data Gateway. This agreement with NASS shows NGCE's continued commitment to providing convenient, easy, one-stop geospatial data availability to our customers. Gateway home page is: <http://datagateway.nrcs.usda.gov/>. If you have questions please, send those to Kenneth Becker, NGCE Authoritative Data Team Leader – kenneth.becker@ftw.usda.gov.

Resource Inventory Division

Remote Sensing Laboratory Progress Report:

2012 APFO NRI-SL Photo Acquisition Status

NRI Image Registration Workload = 73,280

APFO photos accepted to date = 73,280 (100%)

SL Image Registration Workload = 21,811

APFO photos accepted to date = 21,811 (100%)

2012 APFO Photo Acquisition Status - Total Imagery Available in Data Mart (RSL)						
Process	Planned Images to Process	APFO Photos Accepted	Images In RSL Data Mart	%Images Available to Process	Images Processed to Date	Process % Complete
2012 NRI IIR	73280	73280	73280	100%	70026	96%
2012 SL IIR	21811	21811	21811	100%	6056	28%

2012 APFO Photo Acquisition Status - Imagery Available Per Remote Sensing Lab (RSL)						
ERSL	Planned Images to Process	APFO Photos Accepted	Images In RSL Data Mart	%Images Available to Process	Images Processed to Date	Process % Complete
2012 NRI IIR	31127	31127	31127	100%	28422	91%
2012 SL IIR	7068	7068	7068	100%	2650	37%
CRSL	Planned Images to Process	APFO Photos Accepted	Images In RSL Data Mart	%Images Available to Process	Images Processed to Date	Process % Complete
2012 NRI IIR	28138	28138	28138	100%	28138	100%
2012 SL IIR	14630	14630	14630	100%	3293	23%
WRSL	Planned Images to Process	APFO Photos Accepted	Images In RSL Data Mart	%Images Available to Process	Images Processed to Date	Process % Complete
2012 NRI IIR	14724	14724	14724	99%	13466	91%
2012 SL IIR	113	113	113	100%	113	100%

NRI = National Resources Inventory

SL = Stewardship Lands