

**Office of the Chief
Weekly Report**

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

February 27, 2013

Deadline Reminders - None

Upcoming Meetings/Conferences - None

Soil Science Division Update –

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.

Personnel Highlights - None