SOIL SCIENCE AND RESOURCE ASSESSMENT

Weekly Report
March 4 – March 8, 2013

Deadline Reminders: Mid-year performance appraisals due on April 30, 2013

Upcoming Meetings/Conferences: None

Soil Science Division

Ecological State Mapping Training

On March 5 and 6, the Jornada Experimental Range (JER) provided a training course for 25 Las Cruces District BLM staff on Ecological State mapping. This is the first course of its kind and is the result of NRCS NSSC/JER collaborations. Over the past several years, JER/NRCS staff have worked out the protocols and published preliminary papers describing the techniques. This local course is the first effort to see how best to deliver this new technology and to provide a basis for refining and improving delivery of the information. Dr. Brandon Bestelmeyer and Laura Burkett have organized the course based on several field projects across multiple locations. The objective of Ecological State mapping is to guide field staff in constructing maps of unique ecological site/state combinations at a spatial scale relevant to management decisions. Ecological state maps can be used to create an inventory of current conditions as a first step in the conservation planning process and serve as a valuable communication tool for stakeholders to help identify and prioritize conservation practice application. In addition to the Ecological State mapping training, JER scientists and NRCS collaborators have also developed and delivered Ecological Site courses in: ESD Training for Line Officers, ESD Implementation for field staff, ESD data collection and analysis, and Pedoderm and pattern class.


Las Cruces BLM District Staff listen as Dr. Bandon Bestlmeyer presents protocols for an Ecological Site-State Mapping training session. NRCS and BLM staff confirm Ecological Site/Soil characteristics in a field exercise.

Leadership for a Democratic Society

Soil Science Division Director Dave Smith returned to national headquarters this week following a four-week long residential learning program at the Federal Executive Institute (FEI) in Charlottesville, Virginia. FEI's Leadership for a Democratic Society program is designed to help Federal executives improve the performance of their agencies. It requires participants to focus on their values, their organizations, the Constitutional system in which they operate, and global factors affecting their work.

Dave attended along with 58 individuals from various other domestic and defense agencies. They formed into Leadership Development sub-Teams of 7 or 8 individuals and a faculty facilitator to create relationships and work across organizational boundaries – both during and after the program. During the first week, they studied leadership theories, history, and current policies, and used data from personal assessments and team exercises to assess personal leadership strengths and identify areas for development. Participants then attended plenaries and chose different custom courses each week during their last three weeks based on the program themes. Each individual departed FEI with a personal development plan to apply the education and to continue her or his leadership learning back home within their organization.

Ecological Site Assistance in Wisconsin

On February 26-28, in Rhinelander, Wisconsin, Stacey Clark, Regional Ecological Site Specialist, St. Paul Minnesota, and Mike Kucera, Agronomist, Soil Quality and Ecosystems Branch, NSSC, provided hands-on training and technical assistance to NRCS and US Forest Service staff from Wisconsin for ecological site (ES) concept and State and Transition Model (STM) development within MLRA 94D. Local staff presented information on their needs and uses for ESDs, previous work completed and facts about MLRA 94D. Clark and Kucera provided an overview of how ESDs contribute to conservation planning, farm bill programs and other uses, and discussed project management. The group developed draft ecological site concepts for MLRA94D utilizing landform position, texture/geology, slope/drainage class and other abiotic factors common to the proposed reference plant communities and their response to

disturbance. Major soil map unit components were tentatively assigned to the draft ecological sites (ES). Draft STMs for an upland and wetland sites were developed. Draft ecological site concepts and STMs will be reviewed and refined, as part of the ESD acceleration effort in the area.

International Visit from CONIFOR

Ms. Flor Alejandra Rodriguez; Chief, Improvement of Soils and Technical Assistance Department, National Forestry Commission, Mexico; visited NRCS NHQ in Washington DC on March 5, 2013. She is participating in the US Department of State, International Visitor Leadership Program. She met with David W. Smith, Jon Hempel, and Thomas Reinsch of the SSD to discuss soil survey operations, standards, and techniques. She shared that their agency is in the process of developing rapid soil inventory methodology to implement in 15 Mexican states this year. Ms. Rodriguez invited us to exchange soil survey technology with her and her colleagues to assist in achieving this goal. Norm Widman, National Agronomist, led a discussion on water and wind erosion, Dana Larsen, Acting, National Grazing lands Specialist, led a discussion on rangeland management and ecological site descriptions. Herby Bloodworth attended from the International Program Division.

Haitian Soil Survey Project

Thomas Reinsch and Charles Kome from the Soil Science Division and LeRoy Duval from the International Programs Division held a meeting/teleconference with the FAS Cochran Fellowship program on Monday, March 4th, 2013. This meeting outlined the Cochran Program's role in the Haitian Soil Survey Pilot Project and initiated the inclusion of the Cochran Program in the overall budget.

Ground Penetrating Radar Investigations in Vermont

On February 26, Jim Doolittle, NSSC research soil scientist, the Vermont Soil Staff, and staff with the U.S. Fish and Wildlife Service's Missisquoi National Wildlife Refuge used a mobile ground-penetrating radar (GPR) platform to complete bathymetric and radar facies surveys across Lake Champlain's St. Albans Bay in northwestern Vermont. In a one-day period, more than 39 kilometers of continuous, geo-referenced bathymetric measurements were collected with GPR across ice-covered St. Albans Bay. The GPR data will be used to identify differences in substrates and subaqueous landscape units based on bathymetry, slope, landscape shape, sediment type, and geographical location. Knowledge of the near-shore, submersed soil-landscapes of Lake Champlain and its bays is vital to deal with resource concerns that include water quality, sedimentation, eutrophication, and toxic algae blooms in Lake Champlain. A goal of this investigation is to developed alternative field methods and procedures for the rapid identification, classification, and delineation of subaqueous soils and landscapes. Also participating in this project are the University of Vermont, Vermont Geological Survey, and Vermont Department of Environmental Conservation.

Working with the staff of the U.S. Fish and Wildlife Service's Missisquoi National Wildlife Refuge, Jim Doolittle (Research Soil Scientist, USDA-NRCS-NSSC – second from left) points out some subsurface "anomalies" on a radar file that may well represent buried Native American cultural features along the banks of the Missisquoi River.

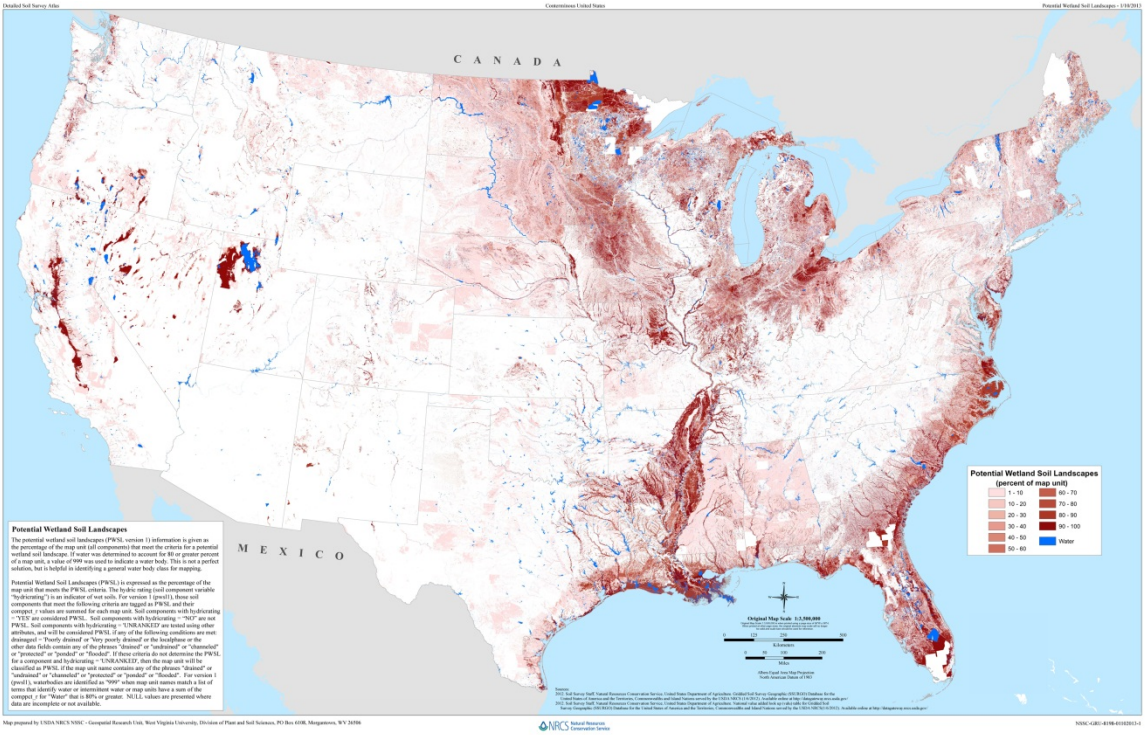
GPR was also used to locate buried Native American cultural features in an area that will be impacted by a streambank stabilization project near the confluence of two streams in the Missisquoi National Wildlife Refuge. In recent years, seasonal flooding has acutely eroded large sections of the stream banks, and an erosion control project is planned that will replace soil materials from a 12 x 80-foot area with rip rap stone. Buried Native American cultural features have been observed along the eroding banks of the two streams. While these proposed erosion control measures will help to ensure the preservation of this important Native American cultural site, it is vital to know in advance the presence of any buried cultural features that will be impacted by soil removal and to take measures to protect them. The information derived from the GPR surveys will be used by the archaeological team monitoring the excavation work in the construction phase of the stabilization project.

Gridded Soil Survey Geographic (gSSURGO) Database

The popular Soil Survey Geographic (SSURGO) Database is available in the Web Soil Survey, but not easily used in national, regional and statewide resource planning and analysis of soils data. USDA-NRCS has added a new product designed to provide more ready access to soils information for large land areas by the simulation modeling community. The new product, called gSSURGO (g for gridded), provides detailed soil survey mapping in raster format including all traditional attributes plus "ready to map" attributes organized in statewide tiles for desktop GIS. In addition, the raster format allows GIS visualization of highly detailed soils themes for an entire state in a matter of seconds.

The gSSURGO Database is derived from the official Soil Survey Geographic Database for fiscal year 2013 and was prepared by merging the traditional vector-based SSURGO digital map data and tabular data into statewide extents, adding a statewide gridded map layer derived from the vector layer, and adding a new value-added look up (valu) table database. The gSSURGO database is provided in an Environmental Systems Research Institute, Inc. (ESRI®) file geodatabase format that relates all attribute tables together to make local soil queries of prime farmland, land capability class, surface pH, or depth to root restriction, etc. more direct and straight forward for the user.

The new "Ready to Map" Themes in the valu1 table contain data such as (but not limited to) soil organic carbon; available water storage; National Commodity Crop Productivity Index; root-zone depth of commodity crops; available water storage within the root-zone depth; drought-vulnerable soil landscapes; and potential wetland soil landscapes just to name a few. Figure 1 illustrates the Potential wetland soil landscapes of the conterminous United States (based on gSSURGO prototype from 1/6/2012 Soil Data Mart database snapshot).
For details on description and how to obtain datasets, go to the gSSURGO website at: http://soils.usda.gov/survey/geography/ssurgo/description_gssurgo.html. The Gridded Soil Survey Geographic Database (gSSURGO) is available on the Geospatial Data Gateway for download or order placement at: http://datagateway.nrcs.usda.gov/.



National Guard Visit to Kellogg Soil Survey Laboratory

On February 26, Captain Sean Thurmer, Science Officer of the 72nd Civil Support Team of the Nebraska Army National Guard, visited the Kellogg Soil Survey Laboratory and National Soil Survey Center. Both the National Guard and KSSL have recently purchased portable x-ray fluorescence units for elemental analysis. The common interest is to cooperate in developing similar analytical protocols for analysis of soils with the instrument and to develop quality control standards. Captain Thurmer is in charge of a portable laboratory that investigates and provides support for any chemical spills or possible agro-terrorism threats that might occur in Nebraska. Mike Wilson, Zamir Libohova, and Steve Peaslee met with Captain Thurmer for discussions of a variety of topics including capturing PXRF data on a portable GIS units, methods of soil analysis, available soils data on the web, and providing geospatial coverage to the National Guard unit. Captain Thurmer also was given a tour of the KSSL. This cooperation will prove beneficial to both groups and will expand the use of soils information in environmental assessment and protection.

Erosion Prediction Coordination Work Session
Erosion specialists/agronomists Joel Poore, CNTSC and Linda Scheffe, NSSC, met at the NSSC during the week of Feb. 25th to coordinate efforts and databases for erosion prediction models, Wind Erosion Prediction System (WEPS) and Revised Universal Soil Loss Equation version 2 (RUSLE2). Vegetation, operation and management databases were compared, data gaps identified, and further synchronization efforts were planned for use in planning sustainable conservation systems. Redesign and transition of the WEPS and RUSLE2 websites to more user friendly format and database retrieval, including selecting an Area of Interest system, were also included in the discussion. The effect of long term erosion and crop management on soil properties affecting current erosion simulation as well as a strategy for collaboration was discussed with NSSC specialists. Protocols for updating databases based on requests from the field and other NRCS and partner users, addressing training, outreach, and technology needs, and the transition of the stand alone model databases into the joint Land Management Operations Database were drafted. It is hoped that these efforts will help address field needs for an integrated approach so conservation planners and farmers can provide sound land management decision making and implement integrated conservation systems.

Personnel Highlights – David Smith recently completed training at the Federal Executive Institute
None

International Programs Division

Deadline Reminders

None.

Upcoming Meetings/Conferences

None scheduled.

NRCS Staff in Afghanistan:

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

Division Updates

None.

Personnel Highlights
None.

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

2012 NRI imagery processing: 96% complete
2012 Stewardship Lands imagery processing: 28% complete

NRI-CEAP NRCS Data Collection

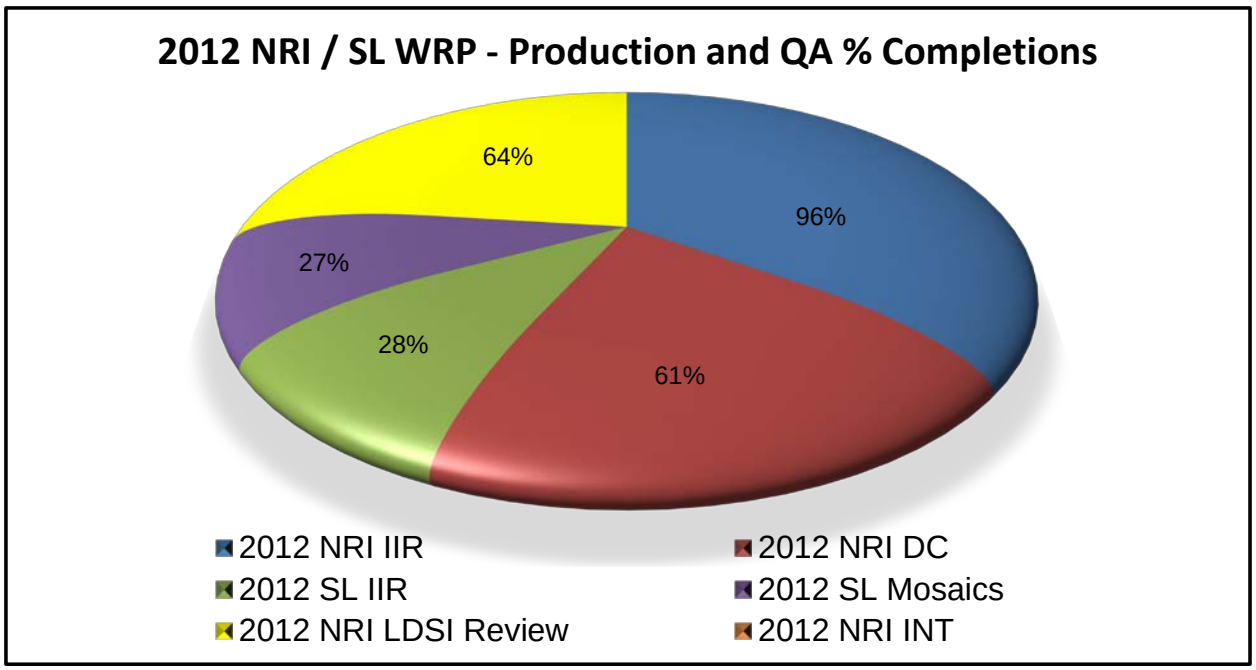
State Resource Inventory Coordinators in 5 states (IA, MN, MI, OH, IN) are wrapping up NRI-CEAP NRCS data collection this week for two watersheds, the Western Lake Erie Basin and the Des Moines River Watershed. A complete NRI-CEAP survey consists of 2 parts; a 'farmer' survey, collected by NASS, and a survey of conservation activities collected by NRCS field

offices. This year, NASS enumerators used an iPad application developed by Iowa State's Center for Survey Statistics and Methodology to screen potential respondents for suitability in the survey and also to trigger the need for the NRCS portion of the survey once the 'farmer' survey was completed.
NRCS field offices used a web based application to input data from field office records. Data inputted included information regarding conservation plans, conservation practices and conservation program participation related to the surveyed farm.
Now that the data collection is complete, data from NASS and from the NRCS surveys will be used by the Temple modeling team to evaluate and assess the impacts of our conservation investments on the landscape.

Screening using iPad 1

Remote Sensing Laboratory Progress Report :
The 2012 NRI and SL WRP Easements survey workloads and current completion status :

RSL 2012 National Resources Inventory (NRI) - Production and Quality Assurance/Review Status			
Process	Segments	Completed	% Completed
NRI Image to Image Registration	73989	70954	96%
NRI Image to Image Registration QA	3699	3318	90%
NRI Data Collection	73279	44462	61%
NRI Data Collection QA	3664	1591	43%
NRI LDSI Review	55532	35307	64%
NRI Integration	55532	732	1%
% Of 2012 NRI Workload Complete		59%	
RSL 2012 WRP Easements (SL) - Production and Quality Assurance/Review Status			
SL WRP Image Registration	21811	6211	28%
SL WRP Image Mosaics	12997	3510	27%
SL WRP Image Mosaics QA	8685	1601	18%
% Of 2012 Easement Workload Complete		26%	



Current estimated 2012 survey completion date is July 2013
NRI = National Resources Inventory
SL = Stewardship Lands

Resource Assessment Division

Headlines

- Norfleet honored as Grassland Soil and Water Research Laboratory Scientist of the Year
- Norfleet to conduct briefings during the week of March 18
- Nature Conservancy briefing on WLEB scheduled for March 15
- SRM journal *Rangelands* published article on CEAP rangeland literature synthesis
- Lab supports CBWI priority areas
- RAD supports SPPD with updated information on Water Pilot Watershed Projects
- Mullarkey briefed RCs on State Resource Allocations
- RCA Process Improvement Session will be held March 20 at the Log Lodge, Beltsville
- RAD assistant Mary Baker passed away March 3

Deadline Reminders

Negative

Upcoming Meetings/Conferences

Negative

Division Updates

Lee Norfleet, Scientist of the Year

Lee Norfleet, Leader of the CEAP Modeling Team, has been named Scientist of the Year at the ARS Grassland Soil and Water Research Laboratory in Temple, TX, during a ceremony on March 6. The purpose of this awards program is to promote job performance excellence and to recognize employees of the lab. Lee was nominated by not only NRCS employees but also ARS and Texas AgriLife employees. A selection committee consisting of previous winners recommends a winner of the award, which is open to all employees of ARS, NRCS, and Texas AgriLife Research who conduct original research or provide professional services. From the citation: "Lee is an accomplished and respected soil scientist, and he keeps our research focused on important USDA conservation policy, giving our research instant impact."

Norfleet Briefings Scheduled for Week of March 18

Lee Norfleet, Leader of the CEAP Modeling Team, Temple, TX, will be in Washington the week of March 18 to conduct a number of briefings:

- March 19, 08:00 AM: HRP group regarding CEAP estimates for Gulf and basic water quality modeling capabilities.
- March 19, 11:00 AM: Chesapeake Bay re-survey status and preliminary findings, for Chief and Deputy Chief.
- March 21, 10:00 AM to noon: CEAP findings for the Subcommittee on Water Availability and Quality (SWAQ). This group advises and assists the National Science and Technology Council (NSTC) and the Committee on Environment, Natural Resources, and Sustainability (CENRS), part of the White House Office of Science and Technology Policy.
- TBD: CEAP-Cropland report on the Arkansas-White-Red Basin, for STCs and RCs.

TNC-CEAP Presentation on Biological Endpoints in the Western Lake Erie Basin

Dr. Scott Sowa, lead PI for The Nature Conservancy (TNC), will give a presentation for interested NRCS NHQ personnel on approaches for integrating biological endpoints (primarily stream fish communities) in CEAP modeling efforts, focusing on the Great Lakes. Presentation will be in the USDA Reference Center, 1052-S, from 2-4 PM, on Friday, March 15.

The CEAP partnership with TNC over the past few years has led to a more intensive, integrated CEAP effort in the Western Lake Erie Basin involving our CEAP modeling partners at ARS and aquatic ecologists at TNC, Ohio State University, and others. Results have great potential to help focus conservation efforts to maximize benefits across resource concerns, including biological endpoints.

New Article on Rangeland CEAP

A newly published article in the Society for Range Management (SRM) journal *Rangelands* summarizes findings of the cutting-edge NRCS publication, *Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps* (Briske, ed. 2011). The article, "Rangeland CEAP: An Assessment of Natural Resources Conservation Service Practices," also offers recommendations for moving forward with CEAP-related activities on rangelands, improving NRCS conservation practice standards, assessing the existing NRCS practice

reporting framework for rangeland practices, and considerations for social and economic strategies to enhance producer investment in conservation practice application to achieve multiple resource benefits. Proper citation:

> Spaeth, K., M. Weltz, D.D. Briske, L.J. Jolley, L.J. Metz, and C. Rossi. 2013. Rangeland CEAP: An assessment of Natural Resources Conservation Service practices. *Rangelands* 35:1, 2-10.

CBW Watershed Initiative Support
The RAD GIS Lab provided an updated account of unique acres treated in the Chesapeake Bay Watershed Initiative priority areas. This request is part of a broader request for the agency to update information contributed last year to the Chesapeake Bay Program Office Executive Order report on activities in the region. NRCS is required under the Executive Order to report annually on Chesapeake Bay restoration activities. Part of the restoration goal is to treat 4 million acres in priority areas for the region. The latest information was provided to Tom Morgart and Rob McAfee, State Conservationist Assistant State Conservation for Maryland, respectively, and their team.

APG Update
RAD staff have been working with SPPD to provide updated information on the status and future plans of the two annual performance goals for Water Pilot Watershed Projects. Lisa Duriancik collaborated with CEAP partners in ARS to get input on progress and summarized progress and next for the APG Quarter 1 Progress Report. The two projects are the St. Joseph River Watershed, Indiana, (a CEAP Watershed Study) and the Cienega Creek Watershed, Arizona (a pilot project for CEAP Grazing Lands).

State Resource Allocation Estimates
RCA Coordinator Dan Mullarkey briefed the RCs on the State Resource Allocation project on Thursday, March 7. The briefing focused on state level estimates of acres in critical need of conservation treatment for each CDSI resource concern, which RAD and RID are helping provide for the SRA process. The RC's expressed confidence in both the process and products, and it is anticipated that the full state-level dataset will be finalized next week.

RCA Process Improvement
A meeting to discuss RCA process improvement has been scheduled for the afternoon of March 20 in the Log Lodge, Beltsville. Members of the original RCA Blue Ribbon Panel who assisted with public participation activities associated with the 2012 USDA National Conservation Program, representatives of the Farm Foundation, and NRCS leadership will attend. Focus of the meeting will be ongoing public participation in the RCA process, as required by law.

Personnel

Mary Baker, Administrative Assistant for RAD, passed away unexpectedly March 3. Funeral services were held Saturday, March 9, in Clinton, MD. Mary leaves her husband, Bob Terry, and two daughters, Jordan and Lauren. Cards may be sent to Bob and the family at 9106 Dangerfield Pl, Clinton, MD 20735. Obituary.

KEVIN INGRAM
Acting Director
Resource Assessment Division