Glacial Gazette

Glaciated Soil Survey Region 12 Newsletter

Spring 2014

In this Issue

Soil Scientist from SSR 12 is the Recipient of the NCSS Soil Scientist Achievement Award

Richard Shaw, State Soil Scientist, Somerset, N.J., is the 2014 recipient of the National Cooperative Soil Survey (NCSS) Soil Scientist Achievement Award. The Soil Science Division made the announcement on April 9, 2014.

In 1999, the centennial year of the NCSS, the Soil Science Division initiated two awards for scientists involved in the production phase of the soil survey program. These two awards are NCSS Soil Scientist of the Year and NCSS Soil Scientist Achievement. A third award, initiated in 2005, is given for NCSS cooperator achievement.

The SSD also announced Kevin Godsey, MLRA Soil Scientist, Marble Hill, Mo., is the 2014 recipient of the NCSS Soil Scientist of the Year Award and Dr. John M. Galbraith, Associate Professor, Department of Crop and Soil Environmental Sciences, College of Agriculture and Life Sciences, Virginia Tech, Blacksburg, Va., is the recipient of the 2014 NCSS Cooperator Achievement Award.

The NCSS soil scientist and cooperator awards will be presented at the 2014 NCSS regional conferences and 2014 Soil Science Society of America Annual Conference.

The North Central regional conference will be held in Ames, Iowa, June 2-5, 2014, and the Northeast regional conference will be held in Plymouth, N.H., June 23-26, 2014.

Luis A. Hernandez
Regional Director

Glacial Gazette is published by USDA-NRCS, Glaciated Soil Survey Region 12 (SSR 12) in Amherst, Massachusetts. SSR 12 provides technical leadership and support in the production, quality assurance, and delivery of scientifically based soil survey and ecological site inventory information throughout the northeastern United States.

Your suggestions, comments, and articles are welcome! Articles may be sent via email as either an MS Word attachment saved as text only, or pasted directly into your email message. Photographs should be emailed as a separate jpg attachment. Please include a caption for each photo submitted.

Send items to SSR 12 editor, **kristina.wiley@ma.usda.gov**.

Greetings!

We are pleased to present this edition of the Glacial Gazette, the official newsletter of Glaciated Soil Survey Region 12 (SSR 12)! The Glacial Gazette provides a forum to share news about SSR 12 and our partners. American author Louis L'Amour once said, "Knowledge is like money: to be of value it must circulate, and in circulating it can increase in quantity and, hopefully, in value." This quote clearly defines the objectives of the Glacial Gazette. I encourage each of you to use this forum to share knowledge and information. Special thanks to those who contributed an article for this edition of the newsletter.

Let me take a few lines to highlight a couple of partnerships. SSR 12 established a new memorandum of understanding (MOU) with U.S. Fish and Wildlife Service for the acceleration and development of ecological site descriptions in selected areas of the northeast. This cooperative effort has opened new opportunities for engaging Nature Conservancy and U.S. Forest Service. Special thanks to Thomas LaPointe, Forest Ecologist, U.S. Fish and Wildlife Service, Northern Forest Land Management Research and Demonstration program, and Dr. David Clausnitzer (retired), SSR 12 Ecological Site Specialist, for their vision and efforts in making this partnership a reality.

Early in fiscal 2014, SSR 12 and Northeastern University in Boston, Mass., established a new MOU to continue studying sequestered organic carbon in soils in the region. This study will supplement the NRCS Rapid Carbon Assessment initiative with additional soil organic carbon information. I would like to thank Dr. Elham A. Ghabbour and Dr. Geoffrey Davies, Directors, Department of Chemistry and Chemical Biology, for their efforts and contributions to the National Cooperative Soil Survey (NCSS) program.

Recently, the Soil Science Division announced the recipients of the 2014 NCSS Achievement Awards. Our region captured one of the awards. Dr. Richard Shaw, New Jersey State Soil Scientist, is the recipient of the NCSS Soil Scientist Achievement Award. Dr. John Galbraith, Associate Professor, Department of Crop and Soil Environmental Sciences, College of Agriculture and Life Sciences, Virginia Tech, Blacksburg, Va., is the recipient of the NCSS Cooperator Achievement Award. As many of you know, Dr. Galbraith mapped soils in this part of the country for many years and completed his doctoral degree at Cornell University. Congratulations to Dr. Shaw and Dr. Galbraith!

Let me close this message by inviting NCSS cooperators to the Northeast and North Central Regional Cooperative Soil Survey conferences. Information about these conferences is available at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/partnership.

Luis Hernandez

Ecological Site Descriptions

by David Clausnitzer, Ph.D. (retired NRCS) and Thomas LaPointe, U.S. Fish and Wildlife Service

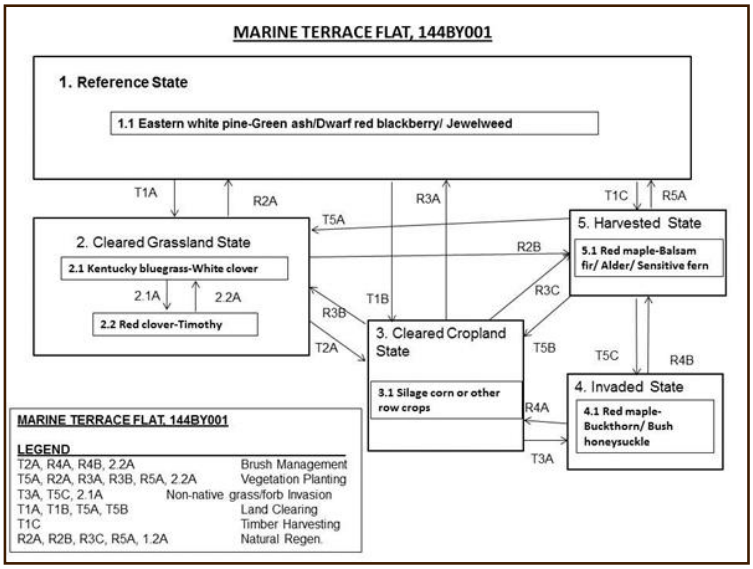
Natural Resources Conservation Service (NRCS) has been developing Ecological Site Descriptions (ESDs) for a number of years now. Western states have developed many ESDs, mostly on rangelands. NRCS has accelerated completion of ESDs nationally. New personnel have been hired, and recently, you may have been hearing more about ESDs.

What are ESDs?

ESDs are descriptive reports developed through activities collectively termed Ecological Site Inventory (ESI). They are a part of the hierarchical NRCS land classification system that includes land resource regions (LRRs), major land resource areas (MLRAs), and soil surveys. ESDs are developed on the same scale as soil surveys, making them suitable for their intended purpose as land management and planning tools. ESDs are not maps of existing vegetation. They are classifications containing information about the multiple types of natural and disturbed vegetation that typically occur within a specific environment in response to management activities and disturbances. An environment that produces a distinct ecological site is defined primarily by a soil component (phase of a soil series), or more typically, a group of similar components, in conjunction with additional climate and landscape factors. Because ESDs are correlated with soil map unit components, ESD maps can be produced from soil maps.

ESDs contain information on physiography, climate, water features, soils, plant communities, vegetation dynamics, and management. Supporting information includes associated and similar ecological sites, type locations, relationships to other vegetation classifications, and references.

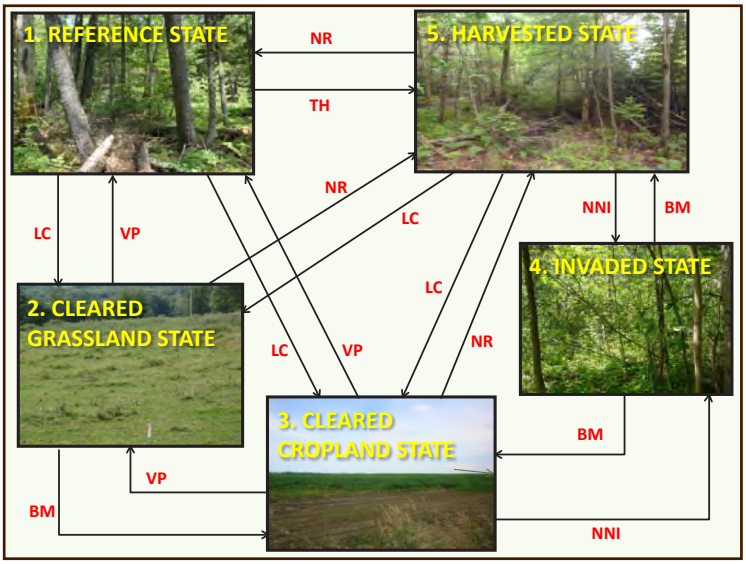
The heart of an ESD is a state-and-transition diagram consisting of boxes representing the different states, plant community phases, and transitions between them, which typically occur within an ecological



State-and-Transition Diagram

Factors Driving Transitions Between States

BRUSH MANAGEMENT	BM
VEGETATION PLANTING	VP
NON-NATIVE PLANT INVASION	NNI
LAND CLEARING	LC
TIMBER HARVESTING	TH
NATURAL REGENERATION	NR



Ecological Site Descriptions continued...

site. A state is a plant community or suite of related plant communities and associated dynamic soil properties that is relatively persistent and resilient. A community phase is a distinctive plant community and associated dynamic soil properties that can occur over time within a state. Transitions between community phases occur as natural succession or in response to relatively minor disturbances and are easily reversible. Transitions between states occur in response to major disturbances and are reversible only with considerable management inputs.

How are ESDs developed?

A draft list of ecological sites is made using existing vegetation classifications, soil maps, GIS analyses, historical accounts, advice from colleagues and partners, and field reconnaissance. The draft list will include brief descriptions of plant species, abundance, and stature along with environmental factors that help define each ecological site, such as soil characteristics, aspect, and climate factors.

From the draft ESD list, projects are developed to plan field data collection on site attributes. Using standard protocols and data sheets, information is collected on soil surface characteristics and plant species, amounts, and production at sites representing all the typical plant communities occurring within the ecological site. Soils are described or verified and GPS points and photographs are taken. Additional information is obtained from colleagues, reports, and other sources. Management interpretations for land uses of the ecological site are developed, often with the help of technical specialists or soil conservationists. The assembled information is entered in the Ecological Site Inventory System (ESIS) website, where it can be used to develop reports, and some information is entered in NASIS.

A state-and-transition diagram is developed by asking the question, what are current and historic land uses and disturbances on the landscape that cause changes in the vegetation? Fire, cropping and abandonment, logging, pests, and grazing are typical factors that cause transitions among states and plant community phases.

The final step before completing the ESD is to correlate the ecological site with the soils upon which it occurs. ESDs are correlated to soil components, typically at the soil series phase level. An ecological site may be correlated with multiple map unit components, but a single component may not be correlated with more than one ecological site.

Who develops ESDs?

Although the Soil Science Division has primary responsibility for developing ESDs, it is a cooperative effort with the Ecological Sciences Division. Collaborative ESD projects are being done with other agencies and organizations as well. ESDs are developed by teams of soil scientists, vegetation ecologists, wildlife biologists, and grazing and forestry specialists.

How is Soil Survey involved?

Soil Survey personnel have information and skills essential to developing ESDs. They can assist ESI specialists with drafting ecological sites, selecting sampling locations, and correlating ecological sites with soils. Examples of ESDs can be found at http://esis.sc.egov.usda.gov/Welcome/pgReportLocation.aspx?type=ESD. For more information, contact Luis Hernandez at 413-253-4370, or luis.hernandez@ma.usda.gov.

Connecticut's 12-TOL Volunteer Pedon Team—Nationally Recognized and a Proven Success

by Marissa Theve, Soil Scientist, MLRA Soil Survey Office 12-TOL, Tolland, Connecticut

To prepare for Soil Survey Data Join Recorrelation (SDJR), soil scientists must update and enter all available soil data so the resulting new map units reflect the most representative soil properties across each major land resource area (MLRA). This process includes updating existing pedons to reflect laboratory results as well as entering typical pedons described in manuscripts, but not yet entered into the database. Here is where 12-TOL's Pedon Team comes in. Last spring, members of the 12-TOL soil survey office put out a flyer to local colleges and universities with soils, geology, and environmental science/natural resource departments inviting students to join the Earth Team Volunteer program. By the end of the spring semester, soil survey office 12-TOL had eight volunteers entering the pedon data. Most students gain course credit for their work through their respective universities, but some are simply using the experience to learn about soils, boost their resumes, and help out.

To facilitate the data entry, students download the PedonPC program, are trained individually in the Tolland state office on their personal laptops, and are given a reference guide to help populate the fields. From there, the students take prepared pedons and work from home or school. The students return to the office once a week, sometimes less, in order to share the completed data and pick up new pedons to enter.

As of January 2014, the pedon team has entered over 250 pedons. Pedons come from surveys as far back as 1973 (Strafford Co., N.H.) to as recent as 2013 (Fulton Co., N.Y.).

The 12-TOL Earth Team Volunteer program proves a victory as the 12-TOL Pedon Team was one of four national award winners in the group category. Current pedon team volunteers include Michelle DuCharme, a recent graduate of Central Connecticut State University; Daniel Grondin and Analia Bertucci, Eastern Connecticut State University; and Aaron Parsons and Danny Beutler, University of Connecticut.

Pedon team volunteers Michelle DuCharme and Devin Spector assist NRCS soil scientists Marissa Theve and Donald Parizek in the field.

Volunteer Dan Grondin explains, "With relatively little exposure to pedology, I was able to get a head start in understanding how to classify soils taxonomically. This helped me later in the semester as I was introduced to more in-depth studies of soil sciences during a geomorphology class—everything from mapping and understanding how soils formed, along with the practical application in agricultural, engineering, geological, and soil scientist's perspective. I plan on staying with NRCS to help when I can and further my understanding of the topic."

This overwhelming success shows that with a simple flyer and a little training time, NRCS staff is able to attract exceptional volunteers and accomplish a lot of work. The 12-TOL staff looks forward to sustaining new and continued university relationships, and hopes to attract more students in need of college credit and experience throughout the SDJR process.

NRCS and USFWS Partner to Expand Ecological Site Inventory in Northeastern United States

by Thomas LaPointe, Forest Ecologist, U.S. Fish and Wildlife Service, Northern Forest Land Management Research and Demonstration Program

NRCS Soil Survey Region 12 is pleased to announce a new partnership with the U.S. Fish and Wildlife Service (USFWS) National Wildlife Refuge System (Refuge System) that will allow ecological site descriptions (ESDs) to be developed for ecological sites within the Northern Forest Ecoregion of the northeastern United States.

The pilot study area includes four National Wildlife Refuges (refuges) and will initiate development of ESDs for ecological sites in northeastern Vermont, northern New Hampshire, and western Maine. By working together, NRCS and USFWS are able to share resources to develop ESDs for lands managed by the Refuge System, but also for lands beyond the refuges.

This information is being used by the refuges to inform biological planning and implementation of management strategies designed to provide habitat for wildlife, a diversity of plant communities, and resilience to environmental stress brought on by a changing climate.

A team of experts has been assembled to implement the process used elsewhere by NRCS to develop ESDs. The team includes a national ecologist from NatureServe, forest ecologists from the USFWS, soil scientists from the NRCS St. Johnsbury (Vermont) field office, an NRCS ecological site specialist (Maine), a plant ecologist and botanist from the state of Maine (Maine Natural Areas Program), and other plant ecologist experts from New Hampshire and Vermont

Nulhegan River in Brunswick, Vermont
Photo courtesy of Thomas LaPointe, USFWS

Through this partnership, the team of experts is pooling resources, specialized knowledge, experience within the project area, and existing data to identify ecological sites than can be characterized quickly and accurately using the NRCS National Ecological Site Handbook to expand developing ESD within the northeastern U.S. The project area includes land recently assessed by NRCS soil scientists using LiDAR to map soils for areas not previously mapped, and includes an extensive amount of data available for refuges such as natural community mapping for over 48,000 acres of land, recent aerial photo vegetation mapping, and habitat inventory data for more than 26,000 acres of land. Additional landscape data is being compiled to inform the Ecological Site Inventory (ESI) process and later assist with correlating ESDs to the broader landscape.

ESI data collection will begin during the summer of 2014. The resulting ESDs will meet the criteria for inclusion in the National Soil Information System (NASIS) and the Ecological Site Inventory System (ESIS) databases and will be made available for use by the public through the Web Soil Survey and other avenues for distribution.

The Northeast Cooperative Soil Survey Conference

by Al Averill, State Soil Scientist, Massachusetts and Vermont

The northeast regional conference will be held Monday, June 23 to June 26, 2014. NRCS New Hampshire and Vermont are working together with Plymouth State University, the Society of Soil Scientists of Northern New England, and the U.S. Forest Service (USFS) to host what promises to be a memorable event.

The conference theme is "Forest, Soils and Ecosystems" and New Hampshire's White Mountains is a setting most fitting. The location offers opportunities to provide feedback to, and learn from, long-term forest ecosystem research for which the detailed study of soils and water movement is integral. The ongoing soil survey of the White Mountain National Forest affords the observation and discussion of the application of state of the art mapping and inventory tools and project integration of land typing and ecological site descriptions.

To maximize benefit from these resources, two field days are planned. June 24, the first field day, will take participants to the Hubbard Brook Ecosystem Study where long-term ecological research is conducted within the USFS's 3,160 hectare Hubbard Brook Experimental Forest. The on-site research has resulted in some of the most extensive and longest continuous data bases on the hydrology, biology, geology, and chemistry of a forest and its associated aquatic ecosystems.

Featured will be current research–"*Landform controls on hydrologic flowpaths and pedogenesis explain solute retention and export from pedon to catchment scales*." The research explores relationships between hydrology and soil development that can provide valuable information for managing forests and stream water quality. Five soil functional units have been mapped and characterized with unique morphology, groundwater regimes and chemistry based on over 175 soil pits, an extensive groundwater monitoring network of recording wells, and detailed terrain analysis from LiDAR. The day will begin with presentations on the project, followed by landscape and soil pit observations.

NRCS and USFS staff will facilitate the field session on June 25. The two agencies have entered a partnership to develop a coordinated approach to NRCS and USFS natural resource inventories on the White Mountain National Forest by integrating initial soil survey, land type phase mapping, and ecological site inventory. Participants will receive an overview of the 20,000 acre project area, review the methods used for soils and vegetation data collection, and discuss challenges and achievements in under taking a project of this nature.

Calendar of Events

June 2-5, 2014
North Central Cooperative Soil Survey Conference
Ames, Iowa

June 2-6, 2014
Advanced Hydric Soils for Soil Scientists
Albuquerque, N.M.

June 3-13, 2014
Basic Soil Survey – Field and Laboratory
Lincoln, Neb.

June 9-12, 2014
World Soil Congress
Jeju Island, Korea

June 23-26, 2014
Northeast Cooperative Soil Survey Conference
Plymouth, N.H.

NECSSC continued...

This project will result in improved cooperation and technology transfer between NRCS and USFS on the national forest. An important outcome will be the building of USFS Terrestrial Ecological Units (specifically land type phases) along with NRCS soil survey map units and ecological sites. Gains in overall efficiency will be achieved as staff members from each agency work together to collect site and soil data, develop mapping protocols, and share expertise.

With the results of committee meetings, Hubbard Brook research, and USFS and NRCS projects, the conference will provide direction, knowledge of hydropedological systems, and resource inventory methodologies applicable to current and future National Cooperative Soil Survey products.

For more information about the Northeast regional conference, visit the conference website at:

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/partnership/ncss.

Ongoing soil survey and resource inventory projects and ecosystem research in New Hampshire's White Moutains, as well as scenic beauty, provide great opportunity for a dynamic conference.

Soil Survey Office 12-GRR Develops Two New Ecological Site Descriptions

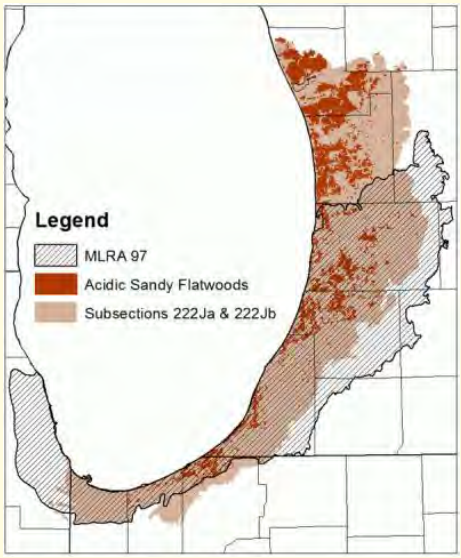
by Greg Schmidt, Ecological Site Inventory Specialist, Grand Rapids, Michigan

Large beak-sedge is a rare coastal plain disjunct.

The major land resource area (MLRA) soil survey office in Grand Rapids, Michigan is completing two ecological site descriptions (ESDs)—the first ESDs in the nation to include portions of the states of Michigan and Indiana. The ESD names are Acidic Sandy Flatwoods (Site ID: F097XA006MI) and Wet Acidic Sandy Flatwoods (Site ID: F097XA007MI).

An ESD describes the climate, soil, natural processes, and plant and animal communities of a site. Characteristics of both ecological sites include deep sand, low soil nutrients, and a seasonal high water table. The degree of wetness is what distinguishes the two. Wet Acidic Sandy Flatwoods is considered a wetland, while Acidic Sandy Flatwoods is not. Characteristic species include red maple, red oak, American beech, black gum, and pin oak in forested sites, with cinnamon ferns, greenbrier, and blueberry in the understory. The wettest community phases are unique habitats for several state-listed plant species, which are otherwise found only in similar environments on the coastal plain of the southeastern United States.

Soil Survey Office 12-GRR Develops Two New Ecological Site Descriptions continued...



From these ESDs, a landowner can find out site-specific management information. They will also know which past land management actions they'll need to reverse in order to restore habitat for species such as marbled salamander, Massasauga rattlesnake, or Prothonotary warbler.

Pin Oak Ponded Phase

After reading these ESDs, a visitor will know to bring rubber boots in the spring, and mosquito repellent in the summer!

New Spatial Soils Data for Rhode Island

by Jim Turenne, Assistant State Soil Scientist, Rhode Island

A new version of the Rhode Island Soil Survey SSURGO maps was released in January 2014. This new soils version contains numerous improvements—update soil mapping for the entire Rhode Island coastal zone (dunes, marshes, and beaches), error fixes, and adjustments to the hydrology along major rivers and streams. Aiding in the update mapping is the use of recently released state-wide LiDAR (light detection and ranging) elevation data and derived products such as 2-foot elevation contours, wetness index, and slope maps. The LiDAR products were created and provided to Rhode Island by the 12-TOL soil survey office. Rhode Island soils data is currently being improved by yearly updates to the spatial data. The following provides additional information about the changes found in the 2014 version.

Adjustments to the major rivers and hydrology:

When the original soils data was digitized in the 1990s the only available base map for use was U.S. Geological Survey (USGS) topo quads. As a result, there is a "spatial shift" in the soils data when it is overlaid on modern orthophotography, causing the soil map units to not align with the imagery. The improvements to the new soils version include a re-digitization of all of the major rivers and streams so they now match the orthophotography and the associated riparian areas. The hydric soils (wetlands) along the flood plains were also adjusted to match the hydrography, wetness index, and elevation contours.

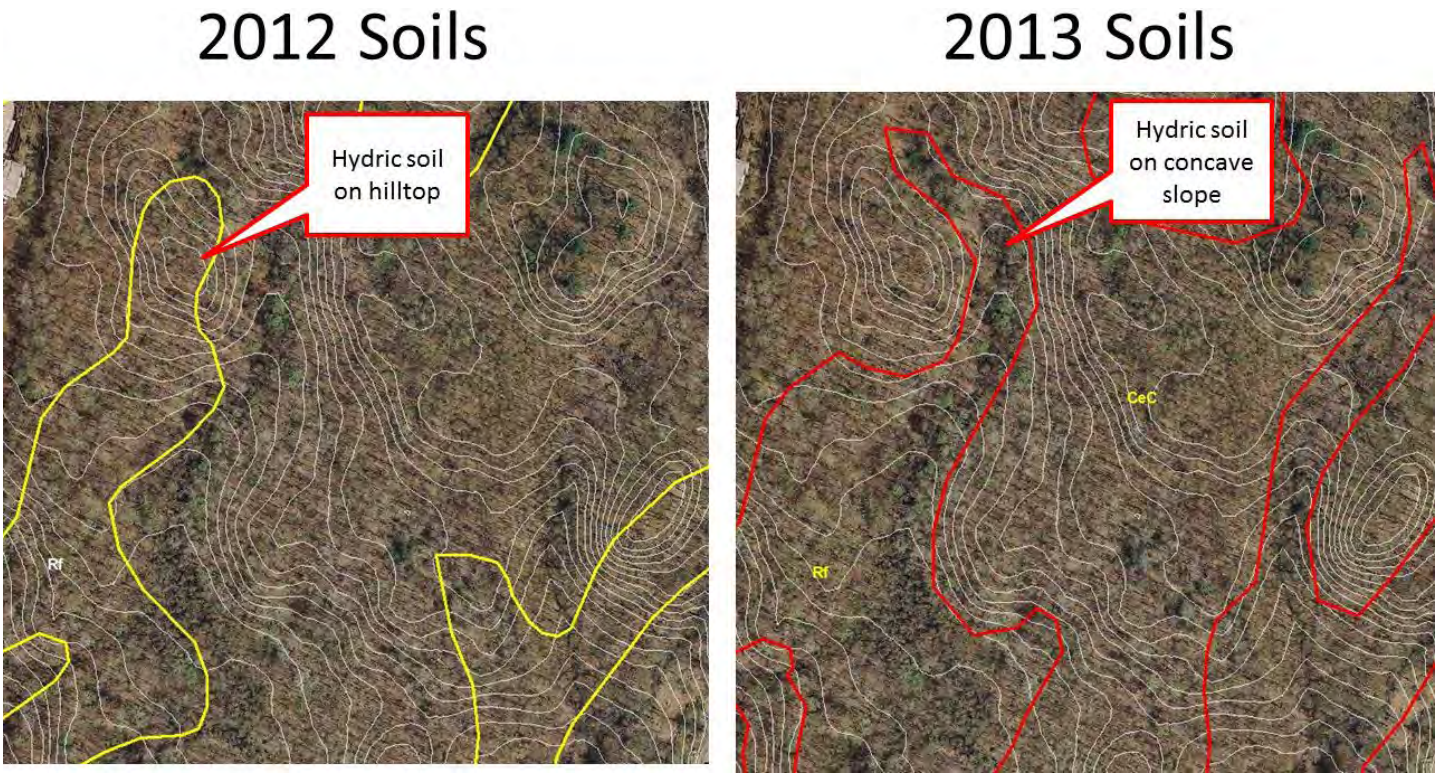
Coastal Zone Soil Survey:

The 2014 soils data contains a complete re-digitization and classification of the soils for the entire Rhode Island shoreline as part of the on-going Coastal Zone Soil Survey of Rhode Island (this fixes the "spatial shift" so beaches are accurately mapped). Beaches are now mapped and classified based on their dominate surface fragment size. Several new coastal ponds and coves in Narragansett Bay are also included, and the dunes and marshes along Narragansett Bay have also been re-digitized and classified to the series level. Rhode Island currently has a Shoreline Special Management Area (SAMP) and this data will be useful for coastal planners.

New Spatial Soils Data for Rhode Island continued...

Use of LiDAR for adjusting hydric soil map units:

Utilizing LiDAR data along with overlying National Wetlands Inventory, state wetland, and georeferenced quaternary geology maps, adjustments were made to the major sloping wetland unit Rf (Ridgebury-Liecester-Whitman). The LiDAR was also used to adjust the organic soils (swamps and bogs) in many areas of the state. Below is an example of the comparison of the previous (yellow polygons) and the updated 2013 soils (red polygons).



Future Updates:

The Rhode Island soil survey staff, in collaboration with MLRA Soil Survey Office 12-TOL and the regional soil survey office in Amherst, will continue to improve the soils data by continuing yearly updates to improve the location of the soil boundaries. If the soil polygons are not in the right location, the tabular data is useless. Soil scientists need to continue to use their spade and augers as much as their mouse and fingers.

For more information on the Rhode Island Soil Survey Program, contact Jim Turenne at 401-822-8830 or email jim.turenne@ri.usda.gov.

Soil Survey Region 12 Safety

by Shawn Finn, Senior Regional Soil Scientist, Amherst, Mass.

It almost goes without saying that safety should always be an important consideration in any activity, yet accidents can and will happen. All employees should be trained in the recognition and avoidance of hazards so they will not unwittingly expose themselves to unsafe conditions. Safety education and precautions and good decision making can help prevent situations turning from routine to tragic. This column will include articles about safety as part of the Soil Survey Region 12 safety information program.

This periodic series of articles is launched with a short prevention video, ***Excavations in Construction–Soil Classification,*** and Occupational Safety and Health Administration (OSHA) quick card on excavations and site safety, ***Working Safely in Trenches***. Both are available on the World Wide Web courtesy of OSHA. The video is approximately 11 minutes in length and available in English and Spanish. It can be found at:

https://www.osha.gov/dts/vtools/construction/soil_testing_fnl_eng_web.html.

OSHA maintains a library of safety topics at:

https://www.osha.gov/dte/grant_materials/material_listing_topic.html#e.

A trench deeper than five feet requires an adequate protection system. Soil scientists should be capable of identifying existing and predictable hazards in their surroundings or working conditions, and must determine the necessity for a protective system if the trench or pit is less than five feet deep.

A ***Safety*** folder is being developed on the SSR 12 SharePoint in the ***Guidance*** library that will include relevant links, articles, and videos.

Dig safe! Be safe!

Upcoming topics: SDJR safety!

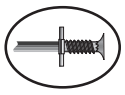
Working Safely in Trenches

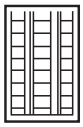
Two workers are killed every month in trench collapses. Each worker in a trench shall be protected from a cave-in by an adequate protective system. Some of the protective systems for trenches are:

- Sloped for stability; or

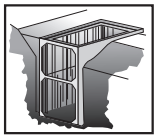
- Cut to create stepped benched grades (Type A or B soil only); or

- Supported by a system made with materials such as posts, beams, shores or planking and hydraulic jacks; or

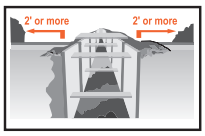




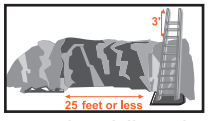
- Shielded by a trench box to protect workers in a trench.



Excavated or other materials and equipment must be at least 2 feet back from the edge of a trench; and



A safe way to exit must be provided within 25 feet of workers in a trench.



A competent person must inspect trenches daily and when conditions change. An unprotected trench is an early grave. Do not enter an unprotected trench.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

TTY (887) 889-5627

OSHA 3243-09R-11

National Soil Project at Northeastern University

by Elham A. Ghabbour and Geoffrey Davies, Directors, Department of Chemistry and Chemical Biology, Northeastern University, Boston, Mass.

Initiated in 2008, the National Soil Project (NSP) at Northeastern is a unique research program focused on active and sequestered soil and compost carbon. Total soil organic matter (OM) is measured by optimized loss-on-ignition. The humified (long-lived, sequestered) carbon pool consisting of humic acid (HA), fulvic acid (FA) and humin (HU) is separated from a soil sample with simple acid-base chemistry.[1] Figure 1 shows samples near the end of the protocol. HA (the lower layer) is isolated, washed with water, dried and measured gravimetrically, as is HU when observed. FA (the upper layer) is separated and measured from its visible spectrum based on the optical properties of three International Humic Substances Society (IHSS) FA standards.[2] The percent sequestration %H of a sample is given by Eq. (1). Data range from zero to 100%w/w on a dry sample basis.

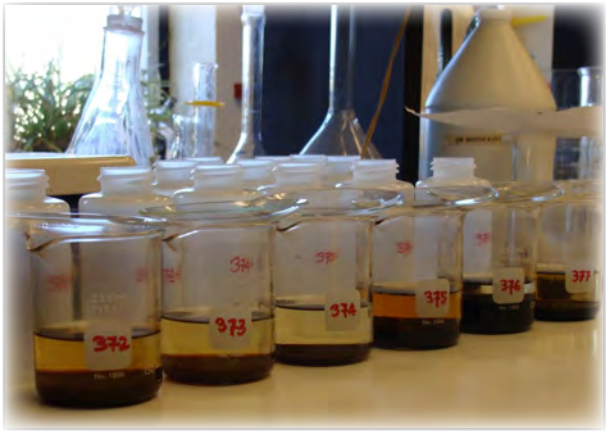


Figure 1.—Fractionated FA (upper phase) and HA hydrogel (lower phase) near the end of the fractionation protocol.

$$\%H = ([\%HA + \%FA + \%HU]/\%OM) \times 100 \qquad (1)$$

Measurement of sequestered dissolved organic carbon (DOC) from the ultra-violet (UV) spectrum of the same FA solution[3] enables the %C in the FA to be calculated from the ratio DOC/FA. These methods have been applied to 1000+ conventional farm top soils from all 50 states and used to investigate hydric, agricultural and woodland soil profiles. For example, FA isolated from Maine soil horizons contains ~54% C.[4]

Current NSP work is focused in five areas:

❶ a study of hydric soil profiles in collaboration with Professors Mark Stolt (University of Rhode Island) and Martin Rabenhorst (University of Maryland);

❷ measurement of sequestered C in widely different soils tested for OM by soil labs in the Agricultural Laboratory Proficiency program led by Dr. Robert Miller (Collaborative Testing Services, Inc.);

❸ measurement of sequestered C in organic farm top soils for comparison with the already measured conventional farm soil data;

❹ determination of sequestered C in urban composts; and direct measurement of OM and sequestered C in SSR 12 samples from the Rapid Carbon Assessment (RaCA) project in collaboration with Luis Hernandez, SSR 12 Director. This hopefully will facilitate interpretation of the samples' vis-NIR reflectance spectra.

❺ Donated samples are requested and appreciated. NSP analyses are made by lab-trained Northeastern undergraduates with QA AT NO CHARGE to sample donors. The Sample Reply Form is at www.neu.edu/hagroup. Results are sent to the donor and entered into an anonymous national database.

Acknowledgement

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National Soil Project at Northeastern University continued...

National Soil Project Directors Dr. Elham Ghabbour and Professor Geoffrey Davies.

References

1. Ghabbour EA, Davies G, Daggett Jr JL, Worgul CA, Wyant GA, Sayedbagheri M-M. Measuring the humic acids content of commercial lignites and agricultural top soils in the National Soil Project. *Annal. Environ. Sci*., 2012, 6: 1-12 (peer-reviewed open access).

2. Ghabbour EA, Davies G. Spectrophotometric analysis of fulvic acid solutions – A second look, *Annal. Environ. Sci*., 2009, 3: 131-138 (peer-reviewed open access).

3. Carter HT, Tipping E, Koprivnjak J-F, Miller MP, Cookson, B, Hamilton-Taylor, J. Freshwater DOM quantity and quality from a two-component model of UV absorbance. *Water Res*. 2012, 46: 4532-4542.

4. Ghabbour EA, Davies G, Sayeed AA, Jenkins T. Measuring the retained water and sequestered organic carbon contents of soil Profiles in Aroostook and Piscataquis Counties, Maine, USA. *Soil Horizons* 13: 1-7 (Nov/Dec, 2013) doi:10.2136/sh13-05-0012.

David Clausnitzer and Bob Evon Retire

Soil Survey Region 12 Director Luis Hernandez presents David Clausnitzer with a retirement plaque. David was instrumental in establishing the partnership with U.S. Fish and Wildlife Service to expand ecological site inventory in the northeast.

Bob Evon, MLRA soil survey office leader in Dover-foxcroft, Maine, retired this past winter.

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