Society of Soil Scientists of Southern New England
PO Box 258

Spade and Auger

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Message from the President

Mark Stolt, President.

This May marks the 31st anniversary of our society. Thirty-one years of serving the southern New England community and our fellow soil scientists. I would like to take this opportunity to thank all those who have put in many long hours of service for our soil science society. I would like to especially thank Margie Faber who served as our president for the last 4 years. Thanks for all of your hard work, Margie!!

I would also like to thank the SSSSNE board of directors for all of their efforts this past year and many years prior. Joyce Raabe is our secretary and has served in that position for as long as I can remember. She does the everyday things that need to be done so that the society runs very smoothly day to day and year to year. Donald Parizek serves as vice president and is essentially the arms and hands behind the spades and augers of our field workshops and tours. Donald has located field sites, instrumented and monitored the sites, and dug the pits that we jump into during our field tours. Art Allen is our treasurer. I am amazed at the many financial responsibilities an organization like ours requires. Art sees to it that each one of these is taken care of in a timely manner. Margaret Washburn coordinates all of the society functions. If you attended the annual dinner meetings or participated in one of the workshops or field tours, Margaret saw to it that you knew how to get there, there was good food and drink, it didn't cost you much, and that everything ran smoothly and on time.

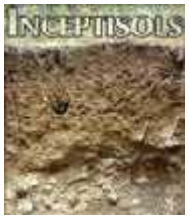
The 31st year of our society also marks the point where we move into the digital age. Our technological advance is led by Jim Turenne. Jim serves as a webmaster; maintaining our web site and the best soil science web page around. If you need soils information you can find it here. Jim also turns out the SSSSNE newsletter; the *Spade and Auger*. Many thanks to Jim Turenne for serving as webmaster and editor-in-chief of the *Spade and Auger*.

The next *Spade and Auger* that you receive will be the last one that will be mailed to each and every one of our more than 200 members. After this mailing you will be notified by email when a new *Spade and Auger* is available on-line (If you request by mail, we will mail you a paper copy of the Spade and Auger). An on-line Spade and Auger allows for longer articles, color photographs, and easy delivery to our membership.

The board of directors has a great program planned for the Society's 31st year. Our programs have been planned based on the survey of our membership and their needs, and we hope you will benefit from them. To start the year off, we are sponsoring and organizing a technical session highlighting recent advances in soil science in southern New England (see accompanying summary of the program). Later in the year we are planning a workshop focused on identifying hydric soils in problem areas in southern New England. If you would like to assist the board of directors in any of our efforts please let us know. We would love to hear from you.

New NRCS Soil Publications Now Available

Several new publications are now available on the USDA-NRCS soil web site: http://soils.usda.gov/. The documents are available for download and printing copies are also provided on the SSSSNE Soil Documentation and Training CD (http://nesoil.com/ssssne/soilCD.htm). The following publications are now online:



Understanding Soil Hazards and Risks: This publication introduces several soil related risks and hazards that are important to city and county planners, developers, construction contractors, and others who use or build facilities on or in soils. This publication features information on 26 different soil concerns such as erosion, liquifraction, landslides, subsidence, and contamination.

Urban Soil Primer: An introduction to urban soils for homeowners and renters, local planning boards, property managers, students, and educators. Features basic soil properties, soil management for recreational, planting, and structural support.

The Twelve Orders of Soil Taxonomy: clickable images of each soil order also allows users to download a high-resolution PDF poster for printing.

Soil Quality sheets: visit http://soils.usda.gov/sqi/ for some new soil quality information including Sod-Based Rotations, Protecting Urban Soil Quality, and Soil Biology and Land Management.

Soil Survey Centennial: several Power-Point presentations and PDF documents celebration 100 years of the National Cooperative Soil Survey. http://soils.usda.gov/partnerships/ncss/history.html

Version 4.0 of the Soil Survey Laboratory Methods Manual is now available on the web.

Northeastern Forest Soil Conference

The Northeastern Forest Soils Conference will meet in West Virginia from July 18 to 21, 2005. The Northeastern Forest Soils Conference is an annual conference for scientists and practitioners to meet, present and discuss forest soils research and application in various locations around the northeastern United States and Canada. Participants include federal and state government, university, and the private sector. The very first conference in 1939 took place at Harvard Forest in Petersham, Massachusetts.

The West Virginia Association of Professional Soil Scientists has invited NEFSC to join them at their Annual Meeting in 2005 during July. The conference will focus on the role of soils in mine land reclamation and about soil development and important processes as affected by mountaintop removal and reforestation. In addition, we'll be looking at the effects of repeated fires on forest soils and the relationship of soils to productivity and various forest management uses. Anyone interested in attending can find more information at: http://www.ma.nrcs.usda.gov/neasoils.

Welcome New Society Members

Please welcome our two newest members— Associate member Abigail Cadman and Basic member Spencer Myles.

Soil Data Mart — one stop shopping for digital soil data!

Official USDA-NRCS spatial and tabular soil data is now available for viewing or download from the soil data mart at http://soildatamart.nrcs.usda.gov. The site replaces the old SSURGO FTP download site which was quite complex to use. This new site is a one-stop shopping for soils data throughout the U.S. Soil survey users interested in updated information such as hydric soil lists, prime farmlands, and other new interpretations should use the data mart for official soil data. Interpretations contained in older published surveys may be out of date and no longer reflect current soil information. Tabular soil data can be viewed online or downloaded as a Microsoft Access Database file. Spatial data (digitized soil polygons, lines, and points) can be download for viewing on a GIS system in a variety of formats and datums. Eventually the spatial soil maps will be viewable online through an internet mapping system. Users who also want to download base map imagery such as orthophotography, topographic maps, and other types of maps or who wish to order the data on CD need to do so through the geospatial data gateway at: http://datagateway.nrcs.usda.gov. A demo of the soil data mart will be provided at the spring workshop (see below).

Spring Soil Workshop

SSSSNE will be hosting our spring soil workshop titled "Recent Advances is Soil Science in Southern New England" on Friday, May 20th 2005 at the Whispering Pines Conference Center in West Greenwich, RI. The workshop will focus on the latest soil research being conducted at the Southern New England universities and other work from the National Cooperative Soil Survey. Topics of interest will include alternative wastewater systems, computer modeling of water tables using archived climate data, carbon distribution in riparian wetlands, salt marsh restoration, organic amendments for pollution control and denitrification in riparian soils. Other topics may also be added once the workshop is finalized. CEU's will be made available for people attending the workshop. Check the SSSSNE website for registration and directions to Whispering Pines..

Soil Genesis and Classification Course

Modified from the "Field Notes" SSSNNE Newsletter

The UNH Department of Natural Resources is offering a 4-credit graduate level course (NR704/804) this summer. The course is held every Monday from 5:30 to 7:30 PM with two Saturday (or Sunday) sessions. It will be a 10 week course starting Monday May 23, 2005 and ending July 25, 2005.

The course will focus on the soil genesis, morphology, and taxonomy of the New England region along with practical application of interpretive behavior based on the diagnostic features of the taxonomic classes.

The course will be taught by Steven Hundley, Adjunct Professor and State Soil Scientist for NH. If you are interested in the course contact Steve at shundley@cisunix.unh.edu or 603-868-7581.

Update your registry

If you have not already done so please take a few minutes and update your 2005 registry listing online, follow the directions at: http://nesoil.com/ssssne/update.htm

Updating your registry electronically will save time and reduce the chance of errors. Try to keep your listing as brief as possible, the board reserves the right to edit long listings as they see fit. Registry updates must be submitted by June 1, 2005 to be included in the published 2005 registry of soil scientists.

Remember to Pay Your Dues!

Members who have not paid your membership dues for 2005: Please renew by June or you will be dropped as a member.

Recommended Guidelines For Conducting Third Party Reviews Of Wetland Boundary Line Delineations in CT.

Proper identification of wetland resources is important to municipal agencies, private landowners and land development teams. It is common practice in Connecticut to have wetlands identified by qualified soil scientists who delineate the wetland boundaries with consecutively numbered, survey tapes. Most often the locations of these survey tapes will be surveyed and plotted by licensed land surveyors onto maps. Often wetland commissions, applicants, and others wish to have a wetland boundary delineation checked for accuracy by another qualified soil scientist. This report presents a list of information and guidelines that will be helpful to third party reviewers in their process of wetland boundary reviews.

The primary purpose of the third party reviewer is to determine if all wetlands have been identified and whether the wetland boundary delineations are substantially correct. If the reviewer is instructed to only inspect a portion or portions of the property, then it should be specified in their report as to the location(s) of the area inspected. A substantially correct wetland boundary delineation will not exclude obvious wetlands, nor should it include large areas of non-wetland. It is not uncommon to encounter areas where there is a transition zone (often between 5 and 20 feet) where there is a gradual change from obvious wetland to obvious non-wetland. It is up to the third party reviewer to determine whether the delineated wetland boundary appears to be substantially correct in those transitional areas.

I. Pre-Inspection Information : The third party reviewer should be presented with the wetland delineation report along with the delineator's field sketch map (if available). If the wetland boundary survey tapes were surveyed and plotted, then the third party reviewer should also be given the survey map.

II. Site Inspection: 1) The third party reviewer may conduct the site inspection either on their own or together with the wetland delineator. 2) During the site inspection the locations of all wetland flags should be field verified. If the flags have been plotted and surveyed, then the accuracy of the survey map should be evaluated in the field as well. 3) When wetland boundary lines are determined to be inaccurate, then the reviewer should record the inaccurate flag numbers and their location. It is often also helpful if the reviewer sketches onto a map where it is believed that the correct wetland boundary line occurs.

If the wetland delineator is present during the field inspection, then it would be appropriate for the third party reviewer and wetland delineator to agree on the location of the revised wetland boundary and to flag it. If the third party reviewer has questions about the delineated wetlands boundary and the wetland delineator is not present during the site inspection, then the third party reviewer should request that the wetland delineator re-visit the site to look at the problem areas. The third party reviewer may wish to be present during the re-inspection.

III. Report Of Findings: The report should include all or most of the following: 1) Name of the third party reviewer(s) who conducted the field inspection along with the date of inspection. 2) Provide names of all others present during the field inspection. 3) State whether site conditions may have impaired the inspection, such as recent excessive rainfall, snow cover or frost. 4) Provide a list of the information provided to the third party reviewer, including the title of the site plan, the name of the surveyor and/or engineer, the name of the wetland delineator, the number of pages in the plan, and the date of preparation, including revisions. 5) Note whether the wetland boundary survey tapes were found during the site inspection, and if so how many (i.e. all, most or some). 6) Describe which methodology was employed to determine the accuracy of the wetlands boundary delineation (i.e. Test holes were dug with a spade and auger. Soils were examined and identified as to whether they qualify as wetland). 7) State whether the third party reviewer finds the wetlands boundary delineation to be accurate both in field flagging and on the survey map. If the wetland boundary delineation is found to be inaccurate, then specifically state which areas (flag numbers) were determined to be inaccurate. 8) If wetland boundary lines are revised either during or after the site inspection, then state which wetland boundary flags were moved and if the third party reviewer finds the revised locations to be accurate. 9) Identify any other relevant observations regarding field conditions or jurisdictional issues, including the presence of disturbed soils, past history, ditching, drainage, fill or excavation or the presence of other regulated areas, such as watercourses.

IV. Professional Conduct: The third party reviewer and wetland delineator should attempt to resolve any conflicts regarding the location of wetlands prior to preparation of the 3rd party reviewer's report. If conflicts can not be resolved, the 3rd party reviewer shall describe the location of the problem area and submit available field documentation with the final report. Conflicts will then be addressed as part of the municipal review process. Ultimately, the wetland delineator is responsible for the delineation as it is submitted to the municipality. At all times, 3rd party reviewers and wetland delineator's should comply with the SSSNE Code of Ethics.

Submitted by: Thomas W. Pietras, RPSS Soil Science And Environmental Services, Inc. and David Askew Soil Scientist North Central Conservation District

URI Soil Judging Team makes it to the Final

This April the University of Rhode Island soil judging team represented southern New England at the 45th Annual National Soil Judging Contest. The contest was held in Auburn, Alabama and was hosted by Auburn University. Auburn is about 100 miles southwest of Atlanta at the boundary between the coastal plain and piedmont physiographic provinces ("Fall Line"). Agriculture, American beer, and college football are likely the most important things to do or partake in that part of the world. We concentrated on the Piedmont and Coastal Plain soils.

During the practice sessions and the two half day competitions, our students were able to get a first hand look at soils formed in residuum, colluvium, coastal plain deposits, and recent and late Pleistocene aged alluvial deposits. We saw Grossarenic, Arenic, and Lammelic Paleudults; Typic and Plinthic Kanhapludults and Kandiudults; and just plain old Typic Hapludults. Sandy clay was a typical Bt horizon textural class. This was a great educational experience for the students and myself.

Twenty-two schools from around the country participated in the contest. Virginia Tech was the winning team at the competition. The University of Rhode Island took the bronze medal only 50 points out of first place. Three of the top 20 students in the contest were on the URI Soil Judging Team. On behalf of the participating students and the Department of Natural Resources Science, I would like to thank the society for their support toward the training of our future soil-environmental scientists.

The URI Soil Judging Team 2005

Pictured are: Mark Stolt (coach), Matt Richardson (grad assistant), Kaytee Manchester (12th place finish), Sean Donohue (grad assistant), Trish Brennan (SSSSSNE undergraduate scholarship winner), Peter Keller (10th place individual), Nate Socha, and Maggie Kidd Payne (grad assistant).

Spade and Auger goes digital!

This edition of the *Spade and Auger* will be the last one you will receive in the mail. The SSSSNE Board of Directors has decided to publish the *Spade and Auger* newsletter in Adobe Acrobat (PDF) format and post it on the SSSSNE website —http://nesoil.com/ssssne/newsletter.htm. Mailing the newsletter has become too labor and cost extensive to send to our 200 plus members. Printing and mailing fees of a typical edition costs over $300 and requires about 8 hours of volunteer labor which has become something hard to find. Digital versions of the newsletter have been made available on the SSSSNE web site since 2004. An email notice to members with an email address (the updated registry emails will be used) will be sent when a new edition is published, members who do not have email should check the SSSSNE website each month. Members who wish to keep receiving the Spade and Auger in the mail must send a letter to the Board each year requesting it (send the letter to the SSSSNE PO box address). Anyone wishing to submit an article for the *Spade and Auger* can sent it to soils@cox.net or the SSSSNE PO Box.

Riparian-Wetland Soils

Free Publication Now Available (see bottom)

Riparian-wetland soils constitute one of the largest freshwater reservoirs on Earth. They are an important component of both standing water (lentic) systems, such as swamps, marshes, bogs, and running water (lotic) systems such as rivers, streams, and springs. Riparian-wetland areas are the "green zones" or links, between aquatic environments and upland, terrestrial ecosystems. Healthy riparian-wetland areas provide several important ecological functions. These functions include water storage and aquifer recharge, filtering of chemical and organic wastes, sediment trapping, streambank building and maintenance, flow energy dissipation, and primary biotic (vegetation and animal) production.

Riparian – wetland areas are intimately related to their adjacent waterways since the presence of water for all or part of the growing season is their distinguishing characteristic. In fact, the nature and condition of a riparian-wetland area fundamentally affects the aquatic ecosystem. In addition to water, there are three other essential components of the riparian-wetland areas: soil, vegetation, and landform. In a healthy riparian-wetland ecosystem, the four are in balance and mutually supporting one another.

Because of the presence of water, riparian-wetlands have soil properties that differ from upland areas. For example, most upland areas are derived from in-place weathering processes and relatively little soil material is derived from offsite sources. In contrast, riparian–wetland soils are constantly changing because of the influx of new material being deposited by different storm events and by overland flow. As a result, great variability in soil types can occur in short distances.

This great variation in soils has an affect on hydrology and vegetation, as well as on erosion and deposition. The soil in streambanks and floodplains and the substrate under the channel act as a sponge to retain water. This stored water is released as subsurface water or ground water over time, extending the availability of water in the watershed for a longer period in the summer or recharging the underground aquifer. Water restricting soil types such as clay or hardpans often have impermeable layers that support the water table of standing water riparian-ecosystems. Water movement over, into, and through the soil is what drives hydrology.

Vegetative composition of riparian-wetland areas is also strongly influenced by the amount of moisture and oxygen levels in the soil. For example, the type of riparian-wetland soil, the amount of soil organic matter, the depth to which the water table will rise, the climate, and the season and duration of high water will determine the kinds of plants that will grow in riparian-wetland areas.

Sediment, though necessary in some amounts, must be in balance with the amount of water and vegetation to prevent excessive erosion or deposition. Soils, interacting with geology, water, and vegetation, play a critical role in determining the health and, thus, the rate of erosion and deposition in riparian-wetland areas.

The purpose of this publication is to further the understanding and appreciation of riparian-wetland soils. Specifically, it explores the relationship of these soils to hydrology, vegetation, and erosion or deposition, which is important information for assessing the condition of both lotic and lentic riparian-wetland areas. The information presented was developed cooperatively by the Bureau of Land Management and the Forest Service working with the Natural Resources Conservation Service.

The first section of the publication examines basic soil concepts and landforming processes. While these concepts and processes may be commonly understood by those who have studied soils, they may be helpful to others who are less familiar with this subject and fundamental for understanding the riparian-wetland soil chapters. The last section presents examples of how soil information can be interpreted and applied in understanding, managing, and protecting riparian wetland soils.

Download this document at the URL below, this document is also on the SSSSNE Soil CD:

http://www.or.blm.gov/nrst/Tech_References/tech_references.htm

TR 1737-19 Riparian - Wetland Soils (2003)

Red Soils All Over—by Arthur Allen III, CPSS

As south-central New England becomes a focus of land development activities, undeveloped land has become more scarce and prices continue to climb. As a result, in the last decade development of marginal areas that are steeper, rockier, and wetter has increased. Of particular concern to me are areas with Brimfield Schist-influenced soils. The Brimfield Schist is a rock type that has a high iron oxide content. Iron oxide imparts a red color to the rock. As this rock weathers, it forms red soil. Because of the natural red color of soils formed in these parent materials, it is difficult to recognize the redoximorphic features that are typically seen in soils with seasonal high water tables. As development pressure continues to increase, it becomes imperative to recognize and understand the influence of red soil colors in identifying high water tables and delineating wetlands.

During the 13 years that I have been mapping, interpreting, delineating, and teaching about soils, I have witnessed the influence of red soil colors in Spodosols and Connecticut River valley soils with Mesozoic geologic parent materials. However, I have heard little discussion about the influence of Brimfield Schist parent materials on the soils of the region. In particular, soils in the central portion of Massachusetts, including the towns of Baldwinville, Barre, Brimfield, the Brookfields, Fiskdale, Holland, New Braintree, Sturbridge, Templeton, Wales, Warren, Williamsville, and Winchendon, are significantly influenced by the Brimfield Schist. The Bedrock Geologic Map of Massachusetts (U.S. Geological Survey, 1983, E-an Zen, editor) designates the Brimfield Schist as part of the Partridge Formation of bedrock, which originated in the Middle Ordovician period of geologic time. The Partridge Formation includes sulfidic mica schist with amphibolites and/or calc-silicates. The symbols indicating these rocks on the geologic map include Ops, Opsa, and Opsc. This rock type also extends into southern New Hampshire and northern Connecticut. Late Pleistocene glacial deposition has distributed fine particles of the Brimfield Schist in till and outwash deposits throughout the area. The Soil Survey of Worcester County, Massachusetts, Southern Part (U.S. Dept. of Agriculture, Natural Resources Conservation Service, 1998, W.H. Taylor) mapped two soil series derived from Brimfield Schist. These are the Brimfield and Brookfield Series. These series are somewhat excessively drained and well drained, respectively. There are no official soil series for wetter (less well drained) soils formed in this parent material.

Late last summer I delineated wetlands on a large tract of land off New Braintree Road in West Brookfield, MA. This site had very red subsoils. I noted the presence of red soils as soon as I started into the woods and came upon the first percolation deep test hole. The hole had been recently backfilled and the soils and rock fragments on the ground surface were stained bright red with occasional dark purple coatings of manganese oxide. This hole had been dug on the shoulder slope and was most likely in a well-drained landscape position. Further down the slope I encountered a slightly concave terrace position that had strong wetland herbaceous vegetation. This area had been, until recently, fully wooded. The site had been logged and the terrace in question had been clear-cut, enabling a healthy stand of sedges and rushes to become established. Noting the wetland vegetation, I sampled the soil and, somewhat to my surprise, the 8-inch deep topsoil (fine sandy loam Ap - Munsell color 7.5YR 3/2) was underlain by a very red subsoil down to 16+ inches that showed no visible redoximorphic features (fine sandy loam Bw - Munsell color 5YR 4/4). This is not a hydric soil according to any of the manuals, and it did not occur in a geographic area that is typically noted for "difficult red soils." There was evidence of water staining in the vicinity of the soil test hole, and rutting from the logging vehicles that had operated in the area when the soils were saturated. The rutting and resultant compaction was limited to about 10% of the area whereas the entire area had dominant, FACW or wetter, wetland vegetation. I delineated this area as part of the wetland on the basis of dominant wetland vegetation and non-soil indicators of hydrology (e.g., staining and rutting). This wetland area, at the time of my delineation, was dry and I am quite sure that it would have passed a percolation test. In addition, the soil profile gave no indication of a seasonal high water table. Obviously a below grade septic system installed in this area would fail as soon as the water tables rebounded. The majority of perimeter wetland soils on this site had similar red parent material influence. In my experience this site is typical of soil landscapes influenced by Brimfield Schist parent material.

The Field Indicators for Identifying Hydric Soils in New England (New England Technical Committee, 2004, 3rd ed., New England Interstate Water Pollution Control Commission, Lowell, MA) identifies "soils formed in red parent materials" as one of the "problem soil areas." This manual only mentions the Connecticut Valley and adjacent areas with Mesozoic geologic materials. The soil described above, developed in Ordovician Brimfield Schist, would not prove hydric according to the test indicator (TF2) suggested in this manual for soils with red parent materials.

It is my hope that this article will contribute to a dialogue among soil scientists, and others, regarding the problems associated with recognizing and interpreting wet soils developed in Brimfield Schist.

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SSS of SNE

Dedicated to advancing the soil science profession and encouraging broad use of soil resource information.

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Jim Turenne, editor.