MAINE ASSOCIATION OF PROFESSIONAL SOIL SCIENTISTS

The Lay of the Land

The Newsletter of the Maine Association of Professional Soil Scientists

Volume 16, Issue #2 Summer 2012 Edition

The Long Days Of Summer

By Johanna Szillery, CSS; MAPSS President; S. W. Cole Engineering, Inc.

Summer is an interesting mix of contrasts. On one hand, we notice life getting a little slower. Kids aren't in school. Towns and neighborhoods slow down, as people are upta camp for the summer. The weather even hints at it: the heat and humidity lend themselves to a slower pace of work and play. In contrast, for many of us, this is the busy season. Construction season is in full swing. Architects, towns, developers are busy planning and we are, in turn, flagging wetlands, digging soils pits, and designing septic systems. We're busy making a living during the long daylight hours of summer.

The latter has been true of the MAPSS Executive Committee. This past March, the EC put together a great Annual Meeting at a new venue - the Abromson Center at USM. Attendees thought about and discussed some of the issues facing soil scientists. We were fortunate to have Dr. Dawn Ferris, of the Soil Science Society of America, present trends within the profession across the nation, and efforts underway at SSSA to market and diversify the practice of soil science. We were also fortunate to have a panel of our peers - Dave Rocque, Tony Jenkins, Steve Howell, Ivan Fernandez, Andrew Carpenter, Darryl Brown, and Dawn Ferris - share their perspectives on the future of our profession.

In the spirit of freshening up our image, Rod Kelshaw volunteered, then began, updating MAPSS' "Soils of Maine" brochure. This brochure was originally designed and written by Dave Turcotte 7 years ago. Members agreed that an update to the design and the content was due, and Rod has taken on this initiative. The intent of the new design is to engage people who have a limited knowledge of soils and to give them a brief introduction. The brochure should explain what soil "is" and how it was formed, why it is important for everyone, from growing a garden to designing a road or building. It also has a few pages that are designed to be a shameless plug for MAPSS so maybe we get more business. Please go to our website, www.mapss.org , review the brochure, and provide Rod with comments by October 15.

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Note: Opinions expressed by the authors of submitted articles are not necessarily endorsed by MAPSS

The Maine Association of Professional Soil Scientists (MAPSS) was formed in 1978. The Mission of MAPSS is to promote soil science through the exchange of technical, political, and regulatory information that influence and guide the profession of soil science. MAPSS members have interdisciplinary professional backgrounds in both the private and public sector, including soil consultants, wetland scientists, site evaluators, state and federal government scientists and regulators, students, and others with an interest in the natural sciences. The organization's goal is to ensure the success and promote the advancement of the soil science profession. MAPSS strives to provide guidance, education, and training to its members and the public on soil science issues of interest and concern.

The Long Days Of Summer, from page 1

Please note this will be a tri-fold brochure, and will flow differently than appears on the web page (e.g. the front of the brochure is the last section on the second page and the next section is the first section on the first page … got it?). It folds in the same order as the current brochure. A big thank you to Rod for taking this on!

June brought the Northeast Cooperative Soil Survey Conference to the University of Maine. MAPSS member and NRCS State Soil Scientist Tony Jenkins assembled a conference program and technical tour that drew accolades from many participants! The three and a half day meeting featured talks that addressed the future of NRCS, advances in soils mapping and technology, and shared research from academic cooperators. MAPSS member Chris Dorion shared his knowledge of Maine geomorphology and natural resources as the leader of the Conference's Technical Field Tour. Chris was also the keynote speaker for the Conference Banquet. His talk, "The Glacial Geology and Soils of Baxter Park" was a virtual tour that even included a stop in Antarctica!

And, coming on September 6, we'll have a second workshop, thanks to Dave Rocque's efforts, and the collaboration of MAPSS, MAWS, and MASE. Dave Rocque has found a great spot for this workshop: an old borrow pit that has a mix of wetlands and uplands. Most of us regularly come across altered, disturbed, filled or graded sites, and this should be a great opportunity to discuss soils classifications and wetlands determinations in these areas. The agencies will be there to give their opinions on permitting. We will have soil scientists and botanists on-site to assist with test pits and wetland determinations. We hope to see you all there!

Even with the hectic pace of work and life, I hope that you are able to slow down a bit this summer. As I drive to work each day, one of the businesses I pass has this quote posted on their sign: "Deep summer is where laziness finds respectability". I hope you are able to slow down and remember what you enjoy about your profession: whether it's the detail of the technical criteria of a Bhs horizon, or the length of a spikelet; unwrapping the puzzle of a glacially-derived landscape; or just working though the process of an alternatives analysis. Take time to enjoy it!

MEMO TO MAPSS MEMBERS

A notice (shown on the next page) was passed on to us by NRCS State Soil Scientist, Tony Jenkins. As MAPSS is a Cooperative Soil Survey cooperator, we have an opportunity to comment on these proposed changes pertaining to new horizon designations. Take this opportunity to learn about and maybe comment on some proposed changes to Soil Taxonomy! – JS

From Joseph V. Chiaretti, Soil Scientist/Acting National Leader, NRCS National Soil Survey Center:

[There are] two proposals to amend National Cooperative Soil Survey (NCSS) descriptive standards for soil horizons. In NCSS standards documents, these proposals pertain to chapter 3 of the Soil Survey Manual and chapter 18 of the Keys to Soil Taxonomy under the subject matter "Designations for Horizons and Layers." These proposals are posted online at: http://soils.usda.gov/technical/manual/proposedchanges.html .

The two proposals present different ways of designating vesicular porosity in surface and near-surface horizons of soils. Surficial horizons with vesicular pores are common in soils of arid and semiarid areas and have traditionally been designated as either master A or E horizons. The first proposal would create a new master horizon and require updating the master horizon designations for surface horizons of many soils. The second proposal would validate the current designations of many master A and E horizons containing vesicular pores, but also require adding a new suffix symbol ("vv") to soil pedon descriptions.

The first proposal is entitled "A proposed master V horizon for the designation of near-surface horizons with vesicular porosity" (V_horizon_proposal_31811.pdf). It proposes adding a new master horizon to replace the use of A or E horizons in horizons with vesicular pores.

The second proposal is entitled "An expanded definition of A horizons and a new suffix symbol for use in soil horizons with vesicular porosity" (Proposal_for_A_MasterHorizon_vvSuffix.doc). It proposes 3 separate actions to:

1) Revise the characteristics of the master A horizon to both validate current usage of A horizon designations in soils of arid climates and to make NCSS descriptive standards identical to IUSS-FAO standards for master A horizons;
2) Add a new suffix symbol ("vv") to designate vesicular porosity; and
3) Add a historical technical reference to chapter 18 of the Keys to Soil Taxonomy.

Please review these proposals and comment on the option you support. You may indicate complete support, support with your suggested changes, or complete rejection of either or both of these proposals. Please share this information widely with your soil survey cooperators and ask them to comment if they have interest in descriptive standards.

Comments should be returned to the national leader for Soil Survey Standards, Mr. Cameron Loerch, at Cameron.Loerch@lin.usda.gov, by October 15, 2012.

Thanks for your attention to this request.

Joseph V. ChiarettiSoil Scientist/Acting National Leader
USDA-NRCS National Soil Survey Center Soil Survey Standards Branch

REMINDER

Send Articles to the MAPSS Newsletter Editor (Don Phillips, CSS) at info@phillipsecoservices.com . *Call him* ***first*** *(phone number is in the MAPSS Directory) if you want to send him material via regular mail.*

AFTER THE SOIL PITS ARE BACKFILLED: 6 MONTHS LATER

By Chris Dorion, ME CSS & CG; NH CWS & CG; CC Dorion Geological Services, LLC

We've all experienced this crisis: we are compiling the high intensity soil map and accompanying report for a client's permit application and we find some of our field notes and pedon descriptions wanting in detail and description. The excavator has long since departed the site and it is impracticable to return, due to winter conditions or time constraints. Several pedon descriptions do not match our memory of the soil pits; perhaps our numbering scheme is not matching our field notes; the soil morphology doesn't match our recorded depth to water table or saturation; the hydric soil map units are not aligned with our wetland delineation; was that really bedrock? Or, the opponents at the public hearing refuse to believe the seasonal high water table is at the level you noted. Or, your client can't believe that the hydric soils are where you have them located. Or any of a host of potentially litigious issues. These issues can be resolved, to a large extent, by the liberal use of digital photos.

Photo taken in mid-November. Tile spade for scale in pit. Cat 335 excavator. The high intensity soil map and report were compiled in January. Field notes and the pedon description form for this test pit were stratigraphically unusual; in addition, the lower end of the soil pit reached the wetland boundary. Marine sediments overlay red till derived from the Perry Formation (typically Creasey soils). Soft, rippable sedimentary bedrock was encountered 8 to 9 feet below surface. Several questions arose: Hydrologic group? Named series variant? Cr-horizon or bedrock? Poorly drained or Somewhat Poorly Drained? Recommendations for use and management of this site?

During the January report writing, it was invaluable to have the accompanying photo documentation. Digital photos are essentially free, even if one spends $150 for a rugged, 12 megapixel "point and shoot" camera. I grew up on film cameras, and made the transition in 2002. "Hard copies" can be made of needed photos by using a high quality photo lab. Ink jet prints are fine for a few months, but the colors fade quickly, the prints are water-soluble, and they are expensive per unit cost.

My chief complaint regarding digital photos is the mediocre quality of the projectors on the market today. They have not decreased in price and they are limited in color depth by their lamp colors. They are still a poor substitute for the old Kodachrome slides and halogen lamp projectors. But for the intended purpose of a soil survey, digital camera documentation is now the accepted standard of practice.

For those who may engage in expert witness cases, a digital record is absolutely essential to further one's argument or to rebut the opposing side's assertions.

Most clients now request a soil report in PDF format, which lends itself to copious digital photos of each test pit, or at least representative test pits. Even at 3 MEGs of memory each, 20 or 30 digital photos can easily be incorporated into a report and burned to CD.

Many of us work as contractors on large, linear projects that produce a GIS database. Our digital photos are linked to the database and form a part of the permanent record of our work.

Unusual landscape features, plants, fauna, geology, or soil morphology can be photographed and emailed to a colleague for advice or recommendations. Or can be compared to on-line photos using various search engines.

Periodically, I am asked to give a presentation or general soil / geology talk to a group. I now have 10 years of digital photos to draw from, and putting the slide show together is fast and fun (although the projectors are weak in color and quirky in terms of compatibility with laptops). Text and arrows can be easily added to photos to emphasize specific characteristics.

Lastly, archiving of digital records should occur in at least 2 locations, and preferably at 3 separate sites. I use an on-line backup service, an external hard drive that is not plugged in except for weekly backups, and my office computer. Photos are placed into titled albums to match the job number and name for easy retrieval.

As licensed professionals, it is incumbent upon us to provide our services at a reasonably high level of performance, as our clients expect.

THE MARCEAU BEDROCK PROBE

By David Marceau, CSS, LSE: Gartley & Dorsky Engineering and Surveying, Inc.

As a soil scientist with nearly 30 years of experience I estimate that I have soil mapped over 20,000 acres at a high intensity level of mapping. Early on in my career I was living in New Hampshire where there was an enormous amount of soil mapping going on due to the raging economy and the fact that I had a lot of work for a company that was spreading biosolids on agricultural land. A lot of this soil mapping was utilized for towns in NH that had lot size by soil type regulations with minimum size map units of 1/10 acre. NH also had line placement standards requiring map unit boundaries to be within +/- 20 feet and land values in NH were much higher then they were in Maine. Needless to say, land was being examined very carefully for development purposes.

At the time there were considerably less soils scientists performing soil mapping in the private sector and most of the techniques for mapping were developed from the NRCS (Soil Conservation Service) at the Order 2 level with two to four acre map unit inclusions. Thus, private sector consultants were forced to develop techniques to identify soil conditions at **a tenth acre minimum size map unit level** that were accurate and cost effective. One technique I developed was the use of a homemade bedrock probe. Initially, it consisted of two pieces of steel welded together to form a "T". The top of the "T" was hollow steel to make it as light as possible and the bottom probe was ¼ inch solid steel. I found out quickly that this didn't work well because it was too flimsy and would break or bend easily when a lot of pressure was applied. After about a year or so of experimenting I settled on the probe I have used for the past 27 years. The top handle is one-and-a-quarter inch solid steel 12 inches long with a ½ inch hole drilled six inches from one end about half an inch into the middle of the handle. The ½ inch rod attached to the bottom is placed up into the ½ inch hole drilled in the handle and welded to the handle.

Drilling of the hole into the handle, then welding it, is very important because of the strength that is added by the drilled hole. I have a five pound sledge hammer and I use that to pound on the top of the probe when probing deep depths (30 to 48 inches). So, having a very solid probe is imperative. I found that if the two pieces of steel were simply welded together and the hole was not drilled the weld would not stand the pounding.

After a while I noticed that companies developed bedrock probes made of fiberglass that had larger points then the shaft above it. On a few occasions (when another site evaluator or soils scientist has allowed) I have used these probes. I can see how they would be useful for locating septic tanks and leach fields (which are relatively shallow). However, for depths in excess of 24 inches, particularly in hardpan or marine sediments, in my opinion those probes don't work. To me they seem very flimsy especially in comparison to my homemade probe. One thing is for certain they will not take the pounding that my probe will.

Any soil scientist knows we are limited to the amount of area we can explore in the landscape with a backhoe. Also, there are many cases where aesthetics is very important to a client or access with a backhoe is extremely difficult. So, I find my probe to be invaluable. I estimate that I have gone through about a dozen of these probes in my career. I have had batches of five of these tools made up four different times. Three Soil Scientists I have spent time training and others who have performed jobs with me know how passionate I am about this tool.

My bedrock probe is very versatile. It can be used to locate septic tanks, all types of leach fields and assess depths to bedrock up to 48 inches. The land application of biosolids regulations require confirming depths to bedrock within stockpile sites to 48 inches. Because farmers have little money and don't like their fields being dug up it is easy to see how this tool can pay for itself when driven to its total length of 48 inches.

It also is extremely valuable in areas that vary from very shallow to deep to bedrock. In just a few minutes I can assess depths to bedrock with no sign of me even having sampled the area. The relatively heavy nature of my probe assists me in penetrating soils deeper then the lighter probes in which all of the force has to come from the user. Also, unlike other probes if you run into a small rock, hardpan or other restrictive layer you can use the sledgehammer to find out what is truly solid bedrock without having to hire a backhoe, use your screw auger or dig a deep shovel hole.

Since I believe using the bedrock probe is a great way of gathering some good soil related data I figured that I might as well share my technique and maybe help others gather better data as well. If you wish to have one of the bedrock probes I have developed give me a call or send me an e-mail. I'm in the MAPSS directory.

INVASIVE SPECIES: A SOIL SCIENCE PROBLEM?

By Donald Phillips, CSS; Phillips EcoServices

This soil scientist has been on the warpath all summer long fighting back against an onslaught of multiflora roses. I was alone fighting this skirmish but, fortunately, I'm not alone fighting the overall war. I wonder, though: are we all fighting on the same side in this war?

The State of Maine Natural Areas Program has declared multiflora rose and an assortment of other species as our most problematic terrestrial invasive species. It's easy to understand why. Having moved to the mid-coast area of Maine about 25 years ago, I rarely encountered invasive species (other than purple loosestrife) during fieldwork. But that began to change and, when it did, the change seemed rapid and the aftermath – once noted – worrisome. A relevant anecdote: I recall how I felt about a certain site on which I delineated a wetland back in the early 2000's, about how out-of-whack it was compared to other sites I've worked on. It was the ugliest wetland I ever saw up to that time and the upland wasn't that visually appealing either. In the wetland, the scrub-shrub vegetation consisted of *nothing* but a tangled growth of glossy buckthorn (a FAC species); in the upland, *nothing* but a scrubby growth of Morrow's honeysuckle (NI, and a generally accepted non-hydrophytic species). Both are invasive and were separated one from the other by a sharply abrupt boundary. Suspicious, I asked a reputable botanist who worked in the mid-coast area her opinion on the matter, and she told me that it had only "been in recent years" that invasives had taken such a dominant hold of coastal areas.

Like a cancerous growth, invasive species arrive like a punch, and then migrate at an alarmingly out-of-control rate in the environment. Their advancement is formidable and almost unstoppable. One or more species may appear from seemingly nowhere by taking advantage of any soil disturbance that might enable it to gain a quick foothold. Once arrived, the lack of natural environmental checks in its new environment allows for rapid growth and expansion at which time the entire surrounding habitat is susceptible to yet more encroaching growth, whether the soil is disturbed or not. This happens by any one of several sneaky means of spreading, including an ability to: (1) leaf out earlier than native vegetation, or by; (2) smothering nearby shorter native vegetation by denying it sunshine, or by; (3) aggressively spreading via prolific seed production, or by; (4) girdling tree trunks, branches and stems to gain mechanical support, or by; (5) spreading courtesy of wildlife dispersal; and even by (6) metabolically taking better advantage of increasing levels of carbon dioxide in the atmosphere to speed up growth.

The six tactics listed above are those typically documented in the literature as the chief reasons why they thrive so well in the environment. Allow me to add one more reason, even if my justification is based only on empirical experience. Multiflora rose, an insidiously thorny species, has a frighteningly vigorous network of adventurous roots, as I documented for myself one day. Wanting to get root dimensions from a small plant (nearly four feet tall) for this article, I selected then carefully dug around one bush to expose and collect as many intact roots as possible. Digging took awhile, but I finally walked back up the dusty road to my house carrying the thorny thing, at which time I hog-tied it down on my deck for measurements (see photographs at the end of this article). My findings? Earlier, I measured a tap root that went 2-feet straight down into the C horizon (of a SPD Colonel sandy loam, for those who are interested) before it snapped off at the bottom of the hole. I suspect it may have continued down for at least another foot, based on reasonable projections. In addition to the tap root, I observed four stolons (i.e., lateral roots going horizontally under the topsoil), all of which headed off in various directions around the parent shrub. One stolon measured an astonishingly long 4-feet 2-inches -- longer than the plant was tall! Keep in mind that this was just a young plant! Also keep in mind that roots of woody vegetation typically cling tenaciously to life – think of all those sprouts you see that grow from the stumps of downed hardwood trees. Furthermore, it is well known that many seeds in the soil typically have a shelf life that can survive in dormancy for decades before they germinate. No doubt the same holds true for multiflora rose. It's no wonder that woody invasives can be so difficult to eradicate whether we try mechanical and/or chemical methods to do so.

Some may say that invasive species are outside the bailiwick of soil science. I disagree. Our work, by its very nature, disturbs the soil (albeit negligibly so). One or two dozen hand-dug holes may be inconsequential on a given property, but a typical multiple-acre soil mapping project may involve up to a hundred or more test holes including a dozen or more excavated test pits. During one's career, a soil scientist is apt to dig, at a minimum, several thousand or more holes.

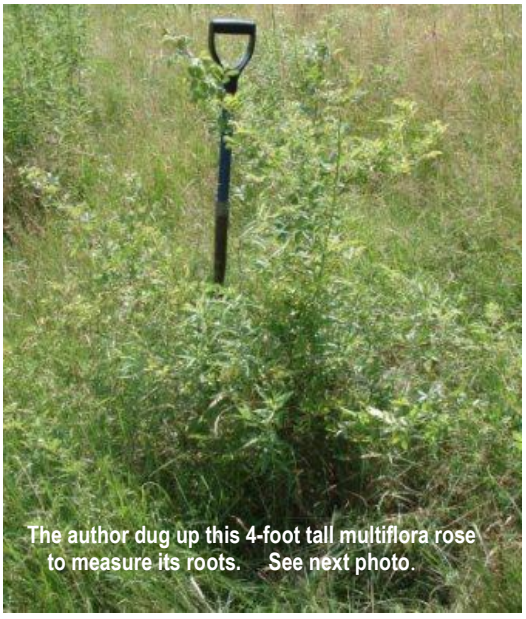
Backfill on some of these holes no doubt presents an opportunity for the subsequent introduction of invasive species. Therefore, it may be timely for our profession to come up with recommendations on ways to help reduce the spread of invasives from a soil scientist's perspective. Recommendations may be as simple as making a better and/or more conscientious effort to: 1) limit soil disturbance as much as possible; 2) replace sod over a test hole after profile measurements are taken; 3) direct an excavator operator to pack backfill down as thoroughly as reasonably possible before leaving a test pit, and/or 4) know what invasive species are present on a site and use that knowledge to guide placement of test holes. Key to these recommendations is awareness that most invasives do not usually spread to a new area if the ground is covered by a thick mat of undisturbed vegetation.

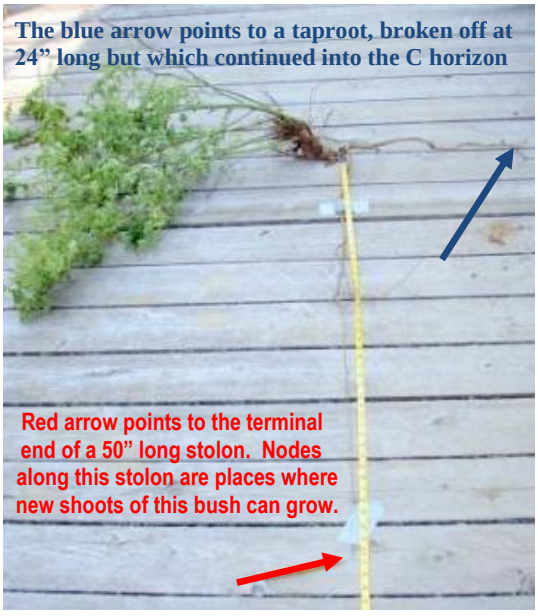
I realize the matter of invasive species and what to do about them is not wholly a soil science problem and soil scientists alone cannot prevent their introduction in society. And besides, a soil scientist contracted to conduct a mapping project cannot go beyond the services he or she was hired to do; that is, map the soils -- not begin an eradication program.

Rather, the matter of what to do about invasive plants would be an issue better addressed by our Association. Why? Consider how unsound soil management policies helped exacerbate the Dust Bowl years. Certainly a number of contributing factors were also involved, but in the end improved soil management including the protection of topsoil from wind was key to make the Midwest's farmland soils become productive again. I believe there is a similarity with invasive plants today. If we accept the argument that not incorporating sound soil management policies flirts with neglecting our soil, it's not a leap to think that a different kind of unsound soil management policies could neglectfully lead to what amounts to an open invitation for the introduction of invasive species. And land which is infested with invasive species, such as multiflora rose growing amuck in a pasture, is unproductive land and of little use to anybody.

I believe one thing is clear. Combating invasive species is something that *everybody* – soil scientists, wetland scientists, foresters, wildlife biologists, site evaluators, botanists, ecologists, land planners, agronomists, as well as those in other professions as may be represented by other readers of this newsletter – should get involved with. We should all play on the same team to exterminate these unwanted and uninvited invasives, wherever and whenever possible.

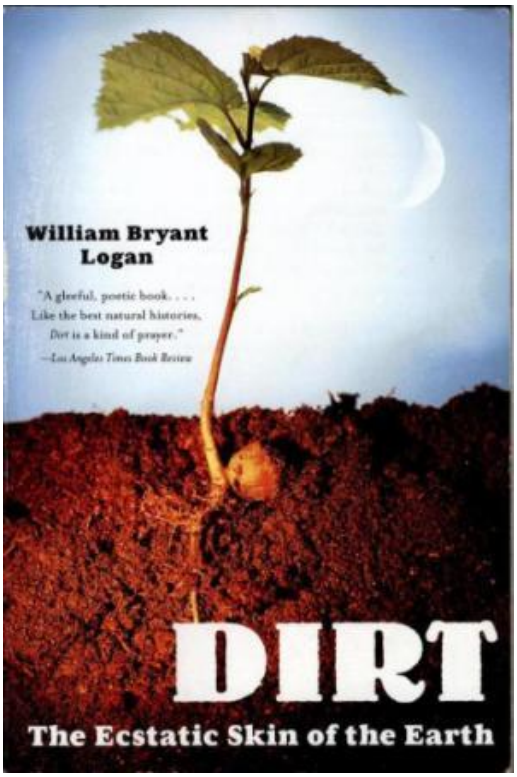
Perhaps a speaker at the forthcoming workshop can address how we can minimize our role in preventing – if not actually controlling – the introduction of invasive species on lands we work on. Obviously, we cannot "save" the environment by ourselves but, as land resource professionals, for us to ignore what ecologists and others consider the second-greatest threat to global biodiversity after loss of habitat would be irresponsible.





BOOK REVIEW: DIRT - THE ECSTATIC SKIN OF THE EARTH

By David Turcotte, CSS; USDA NRCS



As promised in my review of Dirt! The Movie in last winter's edition of "The Lay of the Land", here is my review of William Bryant Logan's acclaimed book, from which spun off the movie with the similar name. As is often the case, the book has much more insight and is much more comprehensive compared to the movie. All-in-all there are some parallels between the movie and the book - the most noteworthy being William Bryant Logan, the author of the book and who is also in the movie, and "Clyde's Pickup". I think the movie is more passionate about saving the soil resource, whereas the book is more informative about the soil resources as a whole, including historical references.

Though the book is not scientifically based, as a pedologist with ample experience, training, involvement and education in the profession, I can tell you that it reveals very useful information about the soil resource, and that the book is quite entertaining (at times eccentric) as well. Logan, the author, is a certified arborist and a Quill & Trowel Award -winning writer (also the author of *Oak*). In several parts of the book he notes his affiliation with, and knowledge attained, from *Hans Jenny*. The book has short chapters within these Parts: THE ECSTATIC SKIN OF THE EARTH; THE MATRIX; ON DIGGING HOLES; EARTH AND STONE; CLAY ALIVE; IN THE DARK; HUMAN SOIL; and VISIONS OF THE SOIL. In the following paragraphs I shall briefly (if ever there was a challenge!) describe what caught me most about each Part.

THE ECSTATIC SKIN OF THE EARTH - Thinking universally, Logan reminds us that soil did not originate on earth ("Stardust"). Nevertheless, life on Earth ("The First Soil") is like a machine for making soil, and atmospheres as well, with volcanoes helping. What you may have seen in Gary Larson's "Far Side" (especially "Great Moments in Evolution"), "Life did not crawl out of the sea onto the land: it oozed from the sea into the land, the organic acids of its excretions joining with the carbonic acid of the rainfall to create the first soft mantle of soil on the earth". This part of the book includes chapters on" Humus" (with all its biological, chemical and physical virtues), "Sweet and Sour Soils" (emphasizing the importance of pH to soil fertility and corrosivity), "Saint Phocas as Fertilizer" (who ultimately gave back to the earth...)," The Sand Drowns the Sea, the Sea Takes the Sand" (what goes around comes around), and "Virgin Soil" (vs. Udorthents.)

THE MATRIX - Once again, Logan gives ample credit to volcanoes for providing the matrix needed for creating many a soil, and even goes into differences in the inherent fertility of different types of magmas. This recognition of the connection between soil and volcanoes ("Fire and Ice") must have come to him as a child, when he was infatuated with bubbling/gurgling (viscous) oatmeal that his mother had boiling on the stove. It is here in this portion of the book where Logan explains why he uses Dirt in the title and much of the context of the book - rather than soil (I personally think he must have used this cruder but more familiar term because the book is geared towards the layperson). Other chapters are dedicated to composting and manure, including John Adam's legendary manure piles. Another chapter is kind of creepy: "The Soil of Graves", while another is dedicated to "The (amazing and impressive) Dung Beetle". This second part of the book concludes with "The Almost Perfect Recipe" - what we like to see in terms of a balanced soil that makes plants flourish!

ON DIGGING HOLES - Here is part of the book that is naturally bound to attract a pedologist's fancy. Reading this part brings out the child in the reader, as Logan brings back childhood memories of us trying to dig "That Hole to China". In particular, he relates that in all aspects of digging it is all about the hands, and relates our hands to the shovel or plow.

Here is where (he and I reckon) one knows if they were born to be a pedologist: "To dig a hole is a glorious thing, and once you are in the rhythm of it, it can be hard to stop. Nevertheless, few adults would start to dig one unless they were "told to". Of course it does help if one is digging in an Adams or Nicholville soil - vs. a Hermon or Danforth soil!

EARTH AND STONE - Logan becomes universal again here, bringing earth science back into play. In this way, he looks at the bigger picture again, such as how earthquakes can quite literally displace soil and shift it from one place to another. He tries to bridge this gap between earth and stone, where geologists see soil as "regolith" while pedologists look to the stone as a clue as to what soil to expect. He does well in making the distinction between stone and soil - where soil leaves stone behind by being fruitful and providing life. He also delves into groundwater, and makes the important distinction between total and available water for plants.

CLAY ALIVE - In this part of the book clay and silt are given their just due. Logan shares how an electron microscope is needed to truly understand and appreciate the complexity of aluminosilicate clays, while recognizing the importance of silt to soil fertility and plant available water holding capacity. He lends an appreciation as to the incredible amount of surface area exhibited by clay particles which go way beyond their small size, and distinguishes between 2:1 and 1:1 clays. And of course he explains how clays are negatively charged - thus attracting cations (rather than anions). He also introduces "Crevice Invasion" (aka weathering) that bridges the gap between earth and stone. In this regard he makes the important distinction as to how the chemistry (limestone weathering the fastest) or metamorphic grade (stronger being more resistant) of the stone dictates how fast the stone weathers to soil - all other factors being equal.

IN THE DARK - Here is the part of the book that brings out Krotovinas - or as Dr. Francis Hole once studied - soil animals. He describes the incredible amount of soil that gophers move, perceptions about worms in general, and just how crucial earthworms are to soil fertility, infiltration, permeability and available water holding capacity. "Generally speaking, if you build (soil), worms will come". He also reveals just how many pharmaceuticals have been derived from bacteria and fungi that live in soil - most noteworthy a chemical named *gramicidin* that was isolated from soil bacterium. The first of the antibiotics, it was the basis for the discovery of *penicillin*. Later, another chemical was derived from a common bacteria in soil - *Streptomyces griseus.* That chemical - *Streptomycin* - was the first antibiotic that was able to control tuberculosis.

HUMAN SOIL - As with "The Soil of Graves", the first chapter of this part of the book ("The Soil and the Devil") starts out pretty heavy. A very short chapter cites a quote from George Perkins Marsh, who founded American Ecology with his 1864 *"Man and Nature, a study of the Earth as modified by human action"*. Another chapter is about Virgil (RE: Roman empire), and his long poem about dirt (a.k.a. soil and husbandry (an attitude towards living that entails honesty and economy). The last chapter is about the Iroquois Agricultural Society (and their three-in-one goddess *Dio-H-Ko*, under the guise of corn, beans and squash) that established the foundation of our Thanksgiving Feast, advocated green manure crops / polyculture, and inspired part of the landmark 1938 U.S.D.A *Soils and Men* publication.

VISIONS OF THE SOIL - This last part of the book brings *Hans Jenny* (who died in 1992) back into play one last time, within the context of soil being a "Body in Nature". It reminds us of some powerful lessons, including the American Dust Bowl of the 1930s and other blatant failures (resulting in desertification) to recognize land use capability. It even cites Darwin noting a "snow of white dust" on his *Beagle* in 1846 - the *Sahara* feeding the *Amazon*. Adams' and Jefferson's farming practices are compared, different and yet righteous (considering their ideals, morals and principles). Remarkably, they died within an hour of each other. Finally, I leave with a quote (not for the first time) from the author: "A soil is not a pile of dirt. It is a transformer, a body that organizes raw materials into tissues. These are the tissues that become mother to all organic life".

URBAN/ALTERED/DISTURBED SOIL WORKSHOP

Submitted by Dave Rocque, State Soil Scientist; Maine Department of Conservation

In conjunction with the Maine Association of Wetland Scientists and Maine Association of Site Evaluators, we are sponsoring a one day workshop on urban/altered/disturbed sites scheduled for **Thursday, September 6, 2012**. This workshop will focus on making sense of areas that have been disturbed. The Workshop will focus on disturbed soils and how to map and describe them. It'll discuss altered hydrology and the regulatory implications. It'll also consider the flora associated with disturbed areas and how it fits into wetland determinations.

Join us for what should be a fun and informative day! Information regarding where it'll be held and a registration form follows this announcement.

SOILS/ SITE EVAULATION: Workshops held in the past have focused on naturally occurring soils in a host of sites and conditions. In disturbed soils, morphological features observed do not necessarily reflect current soil development conditions. Because of the wide range in variability of altered/disturbed soils, published recommendations do not exist. It is therefore, up to the soil scientist or site evaluator to determine the proper use and management of the soil, based on such factors as texture, consistency, structure and depth to seasonal groundwater table. How do we determine the actual drainage class of the soil or its hydrologic soil group? Which properties are important for use and management? What is the hydrologic class of a soil with varying layers of fill/disturbed soil material? The hydrologic class of a soil is critical for stormwater management. Is the soil suitable for a septic system and if so, what is the limiting factor? Can a layer or layers be removed from the soil to improve its septic system suitability?

BOTANY/ HYDROLOGY: Altered soils can include compacted layers that are anaerobic due to the lack of pore spaces. If the compacted layer is at the soil surface, the result can be that it supports hydrophytic vegetation and develops redoximorphic features. Altered soils can also include layers from the subsoil horizons of a soil that formed in a wet environment and therefore has hydric soil morphologies not indicative of current hydrologic conditions. The question then becomes; is the soil a hydric soil and is the site a wetland? How do you distinguish between currently forming redoximorphic features and relict redoximorphic features? Also of interest is a concentrated flow channel that may or may not be a stream. This channel has long stretches that are culverted. Do regulators require setbacks from stream channels that are culverted?

These are just a few of the questions to be discussed at the workshop. The soil pits will be evaluated and described by a team of soil and wetland scientists as well as site evaluators. Regulators from DEP, LURC and ACOE will also be present to discuss issues and answer questions. We hope to see you there.

MAPSS/MAWS/MASE 2012 FALL WORKSHOP

Submitted by Dave Rocque

This year's Urban/Altered/Disturbed Soils Workshop will be held at the Augusta Bond Brook Trail System Site at the end of the Augusta Airport in Augusta, Maine on September 6, 2012 from 9:00 am until 3:00 pm. Check-in will be at the end of the entrance road through Mt. Hope Cemetery, just before driving down into the gravel pit. Soils and/or vegetation experts will be stationed at soil pits or clusters of soil pits which will be numbered. You will have from 9:00 am to 1:00 pm to visit the pits and sites. **Please bring your own lunch.**

After visiting the pits and sites, gather around the picnic tables in the middle of the pit floor for a discussion beginning at 1:30 pm. The discussion will include interpretations by regulators. Included in this workshop will be deeply cut soils, soils with fill materials that include redoximorphic features, compacted soils, disturbed soils with hydrophytic vegetation, soils with various combinations of fill materials, soils cut so deeply they now might be considered to be wetlands (including deeply cut gravel soils), a concentrated flow channel that may be considered to be a stream which has long sections in culverts. Questions to be discussed include how to make a soil map of disturbed sites, suitability for septic system siting and modifications allowed by DEH, wetland determinations/delineations in disturbed sites, setbacks required from streams with culverted sections and more. See attached workshop description for more details.

Workshop Fee: $35.00 for MAPSS/MAWS/MASE members & associate members; **$40.00 for all others.**

☐ Check here if you would like to become a MAPSS/MAWS/MASE member or associate member. Include $25.00 for membership or $15.00 for associate membership.

Please send your checks, payable to MAPSS, to:
Gary Fullerton
104 Millturn Road
Limington, Maine 04049

For planning purposes, we ask that you register by September 1. Check www.mapss.org for background information and updates. Otherwise, please direct questions to Dave Rocque at **David.rocque@Maine.gov .**

Registration for MAPSS/MAWS/MASE 2012 Urban/Altered/Disturbed Soil Workshop
Reservoir Lane, Augusta, Maine

Name: _____

Address: _____

Phone Number: _____ **Email:** _____

Number Attending Workshop: Members _____ **X** **$35.00** _____

Non-Members _____ **X** **$40.00** _____

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