

The Newsletter of the Maine Association of Professional Soil Scientists

Volume 24, Issue #1

www.mapss.org

Summer 2021 Edition

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PRESIDENT'S MESSAGE

Christopher C. Dorion, Maine LSS #454

We are in our second year of the Covid pandemic, but with rapidly diminishing effects here in the U.S. and especially in the New England States. While we could not hold an in-person annual meeting last March, we did hold a successful and well attended Zoom annual meeting on March 25, 2021. The meeting minutes are found in this newsletter.

Below are bulleted items of interest that have transpired, or will be taking place this year, or will stretch into 2022.

September 8th Wolfe Neck Center / Farm / State Park soils workshop.

Please see the MAPSS website for details and updates, and especially in the next 2 weeks as the workshop schedule is refined. The Agenda and Registration forms will be posted to the website in the next 2 to 3 weeks. This annual MAPSS soil workshop is scheduled for Wednesday, September 8th this year. The location is Wolfe Neck Center / Farm / State Park in Freeport. There are a variety of parent materials present, from marine sediments, glacial till, to filled soils.

The focus of this year's field workshop is on soil test pit descriptions for determining Hydrologic Soil Group (HSG), Human Altered - Human Transported soils (filled, regraded, or eroded situations), and challenging hydric soils using the New England Field Indicators Version 4.0. We have not had a workshop with large, excavator dug soil pits for several years, and this is an opportunity for not just soil scientists, but Site Evaluators, Wetland Scientists, and other professionals to review their soil knowledge, and likely learn new skills.

A major emphasis is on how soil surveys are incorporated into the Storm Water Law provisions (Chapter 500), and also on planning for soil surveys using Lidar imagery.

Technical Committee Chair Tony Jenkins, NRCS, along with Rod Kelshaw and myself, will be coordinating the excavator dug soil test pits later in August.

The Maine Association of Professional Soil Scientists (MAPSS) was formed in 1975. 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.



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As in past MAPSS workshops, we have asked regulatory staff to be present to offer opinions, guidance, and other suggestions that will improve the work we do as soil scientists.

If you are interested in volunteering at one of the soil pit locations, please contact myself, Rod Kelshaw, and Tony Jenkins:

Dorionchristopher61@gmail.com; rodney@flycatcherllc.com; tony.jenkins@usda.gov

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<u>Updating 2009 MAPSS</u> <u>Guidelines:</u>

There have been several important updates, additions, and deletions over the last 11 years. We need to incorporate these changes and move to an all digital document. There are currently scanned portions of the Guidelines which are large files and cumbersome to download. Please step forward if you have an interest in working on the committee to update the Guidelines.

2022 Annual Meeting:

Our 2020 deposit at USM is still valid, so we could hold the March, 2022 annual meeting in Portland at the USM campus. However, please read the next paragraph on some type of joint MAPSS – MAWS annual meeting format.

MAPSS - MAWS Joint Annual Meeting

There has been some discussion relating to combining our annual meetings. We share commonalities, especially in regard to regulatory guidance and law. The MAPSS and MAWS executive committees plan to meet this fall to potentially organize a single, 1 day conference. The format could be one large conference hall where regulatory talks would take place in the morning, after which MAPSS and MAWS members would divide, with each association holding their own business meetings, with one business meeting in the large hall, and the other in a second room. Similarly, afternoon presentations would be run concurrently in the two rooms, with attendees having the choice of which talks to attend. This is a similar format to large regional or national conferences, with multiple, concurrent talks throughout the day. This allows attendees to choose the talks of interest to them.



In summary, this is not a proposal to combine associations into a larger, umbrella association.

Website:

The website is updated periodically. It is also a comprehensive source for soil, wetland, and related links. For example, the following links are available (if any dead links, please contact Chris Dorion or Matt Dorman):

Soil and Wetland Science Links

- Maine State Soil Website the CHESUNCOOK series
- Official Soil Series Descriptions (OSDs)
- Field Book for Describing and Sampling Soils, version 3.0
- Field Indicators for Identifying Hydric Soils in New England, 2018
- National soil survey data including Online Web Soil Survey, Historical soil survey publications, Status and schedule, Laboratory and research data, and National Soil Characterization Data - National Soil Laboratory site specific data with search routines.
- Field Indicators of Hydric Soils in the United States -A Guide for Identifying and Delineating Hydric Soils, Version 8.2, 2018
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, 2012
- Testing Wetland Delineation Indicators in New England Boulder Fields, June 2012, by Robert
 W. Lichvar, Katherine E. Curtis, Jennifer J. Gillrich, and Lindsey E. Dixon
- The 2013 National Wetland Plant List. This interactive web site is described by Paul Minkin, U.S. A.C.O.E.: "By using the NWPL website, users can sort and download customized plant lists – e.g., just for the Northcentral/Northeast region, just Maine, or even just a county in Maine. This site will contain any changes that are made to plant names, indicators, etc. (we are already working on the 2014 update). There are also assorted other tools – photos to help with identification, county-level occurrence data, etc. – that are available on the site."
- Ksat Values For New Hampshire Soils, 2010
- Site-Specific Soil Mapping Standards For New Hampshire And Vermont, 2011
- Standards For A High Intensity Soil Map New Hampshire, 2008
- · Web Soil Survey for the U.S. Follow these instructions.
- · Soil Science Society of Northern New England
- MDEP Bureau of Land & Water Quality
- · School of Food and Agriculture at the University of Maine at Orono
- · Maine Geological Survey with numerous mapping products of interest.
- · The Home Page of the Maine Association of Wetland Scientists (MAWS)
- · Visit or volunteer with the University of Maine Herbarium



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Faster HSG Lookup Method

http://www.mapss.org/pdf/HSG_fast_data_lookup.pdf

Please familiarize yourself with the above link, also found on the MAPSS web page. From past experience, using the older HSG Ksat lookup method involved drawing your Area of Interest (AOI) around your soil survey project area. Often times the soil that you mapped was not listed in the AOI you drew.

This improved method allows you to select the entire county at once, so it is highly likely that the soil you mapped during your high intensity soil survey will be found.

This updated method diverges from the older one in that after selecting the county, then the Soil Reports tab, you will select "Water Features" which opens a sub-menu of all HSGs in the county and the horizons of typical soil series with depths and Ksat Low-RV-High values.

LUPC Soil Suitability Evaluation for Re-Zoning Applications

MAPSS members worked with LUPC over the last year to update the soil scientist's evaluation of whether soils at a proposed re-zoning area would be suitable for the proposed use(s). Below, in *italics*, is the LUPC background information.

LUPC zones all areas within their jurisdiction based on a number of factors. When an application is submitted to them to have a property rezoned for another use, they are required to review those applications and render a decision on the basis of how suitable the use is for the area. One of the factors they take into consideration is soil suitability for the intended use. Obviously, the best way to make that determination would be to require a high intensity soil survey. LUPC is aware that the NRCS published soil surveys are not generally detailed enough to provide that information. LUPC is also aware that the cost of a high intensity soil survey is a burden to applicants when there is no guarantee that the area will be rezoned.

Working with the Maine Association of Professional Soil Scientists and the State Soil Scientist, LUPC developed the language at the end of this explanation. It will provide LUPC with a general soil suitability evaluation without the expense of a full-blown soil survey. The soil suitability assessment should be based on the intended use and standard soil limitations such as slope, depth to bedrock, drainage class and surface stoniness. In general, observations do not need to be made below a depth of 24". Depth to hardpan is less of an issue for most development activities but should be noted if encountered within the depth observed. Parent material should also be noted as well as soil texture.

The NRCS's Soil Potential Ratings for Low Density Development in The Unorganized Territories is a good guide for making suitability determinations for most development activities. You can find a copy at <u>https://efotg.sc.egov.usda.gov/references/public/ME/SoilsPotentials.pdf</u>. Slopes over 15% are not generally suitable nor are soils that are in the lower part of somewhat poorly drained or wetter. Soils that are shallow to bedrock are not suitable for buildings with basements but are fine for road construction provided that deep cuts are not needed. Surface stoniness is less of a concern for development activities unless the stones are boulders



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and will be difficult to remove or may require blasting. If in doubt about what soil characteristics are important for a proposed rezoning use, contact your nearest LUPC office. Current telephone numbers are below and up-to-date contact information, including email addresses, is available at www.maine.gov/dacf/lupc/about/staff/index.shtml.

Contacting the Maine Land Use Planning Commission

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AUGUSTA OFFICE		NORTHERN REGION	
		Serving most of Aroostook County and northern Penobscot County	
18 Elkins Lane - Harlow Bldg.	Tel. (207) 287-2631	45 Radar Road	Tel. (207) 435-7970
22 State House Station	TTY (888) 577-6690	Ashland, ME 04732-3600	Tel. (207) 435-7969
Augusta, ME 04333-0022	FAX (207) 287-7439		FAX (207) 435-7184
DOWNEAST REGION		EASTERN REGION	
Serving Hancock, Knox, Lincoln, and Sagadahoc Counties, and		Serving southern Penobscot County, southern Aroostook County,	
portions of Washington, Kennebec, Penobscot and Piscataquis		and portions of Piscataquis County	
counties; and the coastal islands in the LUPC service area			
106 Hogan Rd, Suite 8	Tel. (207) 215-4685	191 Main Street	Tel. (207) 485-8354
Bangor, ME 04401	Tel. (207) 592-4448	East Millinocket, ME 04430	Tel. (207) 399-2176
	FAX (207) 941-4222		FAX (207) 746-2243
MOOSEHEAD REGION		WESTERN REGION	
Serving Somerset County and most of Piscataquis County		Serving Franklin County and Oxford County	
43 Lakeview Street	Tel. (207) 695-2466	932 US Route 2 East	Tel. (207) 670-7492 FR
P.O. Box 1107	Tel. (207) 731-4398	Wilton, ME 04294	Tel. (207) 670-7493 OX
Greenville, ME 04441	. /		. /

Land Use Planning Commission Application for Zone Change

Soil Suitability Exhibit

Soil Suitability

Applicability: Required for rezoning to Development Subdistricts

Rev: 12/14/2020

Rule Sections: 10.08,A & 10.25,G

Submit a report from a Maine Licensed Soil Scientist or NRCS Soil Scientist containing sufficient detail to demonstrate that soils and site conditions in the area proposed for rezoning are generally suitable for the proposed uses. The report should include information on the depth to groundwater, the depth to bedrock, and the slopes in the project area. The field investigation used in preparing the soil suitability report may be based on excavator, hand shovel, and/or auger borings, provided the method used is specifically documented in the report.

If the soil suitability is limited for the proposed uses, describe how the limitations could be overcome using standard construction practices.



e If the area to be rezoned is less than 1 acre, the Commission may accept the following as evidence of soil suitability in place of a report completed by a Maine Licensed Soil Scientist: a) the preliminary site evaluation report submitted for the Wastewater Disposal exhibit provided it is based on at least two test pits or two soil auger borings, or b) a complete HHE-200 form for the site signed by a Maine Licensed Site Evaluator and including a statement that the soils data on the form is generally representative of the site.

Maine Association of Professional Soil Scientists March 25, 2021 Annual Business Meeting Summary 3:00 pm to 4:30 pm Via Zoom

The meeting was called to order at 3:00 pm by Maine Association of Professional Soil Scientists (MAPSS) President Chris Dorion.

Election of Officers

A motion was made and passed for the following slate of officers for 2021:

- President: Chris Dorion
- Vice President: Roger St. Amand
- Secretary: Sean Donohue
- Treasurer: Gary Fullerton
- Past President: Dave Marceau
- Director: Natalie Marceau
- •

Treasurer's Report

Gary Fullerton reported on MAPSS' finances. \$1,005 in fees collected for the 2020 annual meeting that was cancelled due to the pandemic have been earmarked as a credit for those who paid for the next in-person annual meeting, which is anticipated to be in 2022. MAPSS did provide support for a \$1,000 scholarship in 2020 and made a \$100 donation to Ducks Unlimited. MAPSS did not fund the Envirothon in 2020. A motion was made and passed to approve the Treasurer's report with verbal amendments that would be incorporated into an updated and final written Treasurer's Report and posted to the MAPSS website by Chris Dorion.

Envirothon

Chris Dorion spoke with the Envirothon management, and confirmed the Envirothon is being held virtually this year. Envirothon is still seeking financial support to offset the costs of holding the event virtually. A motion was made and passed to donate \$1,000 to the 2021 Envirothon.

Janet Cormier Scholarship



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Mike Jakubowski reported on the Janet Cormier Scholarship. No complete applications have been accepted as of yet this year. Mike is anticipating that one to two complete applications may be received. The deadline for submitting an application has gone by, but MAPSS will be flexible on the deadline due to the pandemic. Gary Fullerton mentioned that this year the scholarship amount is \$1,080. The membership discussed having a report made to MAPSS by scholarship recipients in future years in the form a verbal update or poster presentation. The membership generally agreed this would be a good idea. A motion was made and passed for a \$1,080 scholarship in 2021 and a \$1,000 scholarship in 2022.

Newsletter Editor

Chris Dorion reported that it has been difficult to find a new newsletter editor since Don Phillips stepped down from the position after many years. After brief discussion on alternatives to a traditional newsletter and the need for a volunteer, no MAPSS members expressed an interest. Chris Dorion ultimately volunteered to put together a spring newsletter and will be asking the membership for articles soon.

Land Use Planning Commission Rezoning and Soil Suitability

Chris Dorion and Dave Rocque discussed the recent Land Use Planning Commission rule change for rezoning applications that requires the applicant to demonstrate that the soils at the site are suitable for the proposed rezoning. The membership briefly discussed that there are no clear standards for how soils would be deemed suitable or not.

Natural Resource Field Workshop

Tony Jenkins reported that September 8 has been selected as the date for a MAPSS sponsored workshop. The location is to be determined, but will probably be located in southern Maine. It is anticipated the workshop will include review and discussion of soil pits dug by an excavator and include hydric soil profiles, moderately well drained soil profiles for discussion of hydrologic soil group classifications, and a discussion of the use of LIDAR to disaggregate USDA Soil Survey map units without completing a full on-site high intensity soil survey.

MAPSS 2009 Guidelines for High Intensity Soil Surveys

Tony Jenkins reported that technical committee members are needed to update the MAPSS 2009 Guidelines. Tony also mentioned that he has made efforts with USDA – NRCS to return certain moderately deep or deeper moderately well drained series to their former hydrologic soil group C classification from group D, but has not made much headway. The possibility of a MAPSS letter of support was discussed to help advance this effort. A motion was made for MAPSS to support returning moderately deep and deeper moderately well drained soils to a hydrologic soil group C designation from group D until the National Engineering Handbook can be updated. After discussion, the motion was not voted on, but Chris Dorion proposed revisiting this at a later time when the development of a formal letter to USDA-NRCS could be discussed in more detail. Tony suggested that if written, the letter be accompanied by a list of applicable series in Maine. The meeting adjourned at 4:30 pm.





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Subject: Soil Logs for Soil Scientists

MAPSS received updated guidance from Bill Noble, MDEP on July 9, 2021. The following guidance is copied in *italics*. A new long form and an updated standard short form soil test pit form have been posted to the MAPSS website:

http://www.mapss.org/pdf/New_FormF_long.pdf http://www.mapss.org/pdf/New_FormF_short.pdf

Attached are log sheets developed specifically for soil scientists. These are a result of some comments that had been received from soil scientists doing work on site location projects, and due to an amendment to the geologists and soil scientists licensing law in 2019.

Columns have been added for horizons and structure, and the terms consistency and mottling are replaced by consistence and redox, respectively, as they are understood to be preferred terms by the USDA. Also, the title "certified" is replaced by "licensed" because of the law change.

There are two versions: a short form (Form F SS1), and a long form (Form F SS2) (for logging deep excavations such as for documenting soil conditions for stormwater basins).

Note that the regular DEP forms E and F have also been updated, and they can be sent upon request.

Using these forms for DEP projects is suggested, not mandatory. You can use your own forms as long as they include the same information, but I hope you will find these forms useful.

William T. Noble, L.G., L.S.S.

Environmental Geology Unit

Division of Environmental Assessment

DEP Bureau of Water Quality

(207) 215-1792



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Updating and Streamlining the Janet Engle Cormier Scholarship Application Process

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Despite the many challenges brought upon Maine's student body due to the pandemic, the Janet Engle Cormier Soil Science Scholarship saw zero complete applications submitted by the 2021 deadline, which received a month-long extension. Multiple colleges and universities across the state were contacted. This low display of interest is not an isolated incident, as the applicant pool has steadily declined in recent years. In 2020, a single complete application was received. While the 2020 recipient was, in fact, a highly competitive applicant, the lack of competition is duly noted. Does it reflect waning student interest in soils or is it a sign that our scholarship's barrier to entry is simply not worth the trouble? Personally, I'm hoping it's the latter.

Currently, the scholarship requires that application packages include sealed envelopes featuring the reference's signature across the flap. Last year, I accepted emailed letters in response to the pandemic. It made everyone's lives easier and resulted in less physical mail making rounds across the state. I intend to revise the scholarship application to state that emails will suffice. Fraudulent email addresses can be discovered with a little digging (pun intended). I believe that our other barrier to entry is requiring official transcripts. Unofficial transcripts are significantly easier for students to obtain and I have noticed that letters of reference tend to corroborate transcript contents. Official transcripts often have an associated cost and wait time, which further increases our barrier to entry for applicants.

I believe that these two simple changes can reverse the trend our scholarship program is currently taking. Award recipients will also be asked to present their body of work, should they have one, either in person or remotely, or to simply provide a slideshow for presentation at the annual meeting by the Education Committee Chair; an additional duty I would be happy to perform to the best of my abilities. Some of you have heard me mention these proposed changes for a few years now, but I was placated as applicants continued to trickle in. Receiving a single application in 2020 was a bit of a wakeup call, and zero applicants in 2021 was a rude awakening.

Mike Jakubowski, Chair, Scholarship Committee

June 14th, 2021 Treasurer Report Gary Fullerton, MAPSS Treasurer

The following page contains the most up-to-date Treasurer's report from Gary Fullerton. Note that due to the lingering effects of the Covid19 pandemic, we were not able to hold an annual meeting in March this year. However, in reading through the annual meeting (Zoomed) minutes, you will see the membership approved a \$1,000 donation to Envirothon this year, \$1,080 to the Janet Engle Cormier scholarship this year, and \$1,000 to the scholarship for 2022.



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MAPSS 2021 Treasury Report					
MAPSS Checking Account as of 12/31/20		\$13,126.18			
2021 Income					
2021 <u>Income.</u> 2021 Dues (full membershin)	\$675.00	27 full members at \$25.00 each			
2021 Dues (associate membership)	\$120.00	8 associate members at \$15.00 each			
2021 Dues (student membership)	\$0.00	0 student members at \$0.00 each			
2021 Dues (honorary membership)	\$0.00	0 honorary members at \$0.00 each			
	\$795.00				
Annual Meeting Registration	\$0.00	0 registrants at \$45.00 each			
	\$0.00	0 registrants at \$50.00 each			
	\$0.00	0 students at \$15.00 each			
_	\$0.00				
Workshop	\$0.00	0 registrants at \$40.00 each			
	\$0.00	0 registrants at \$50.00 each			
		0 registrants at \$.00 each			
	\$0.00				
JEC Scholarship Donation	\$80.00				
2020 Late Memberships	\$45.00				
TOTAL INCOME	\$875.00				
2021 Expenses: Envirothon (Maine Association of Conservation Districts) Annual Meeting Facility Annual Meeting Expenses (copies) Janet Cormier Scholarship Workshop (MAWS portion) Website Host (DiscountASP.net) Domain Registration (Speedsoft)					
TOTAL EXPENSES	\$0.00				
MAPSS Checking Account as of 6/14/21		\$14,001.18			

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Musing from the Former State Soil Scientist

On January 1, 2021 I woke up to the realization that, for the first time since I was 14, I was not obligated to go to work every week day that was not a holiday (there were no youth work limits way back then). That was a run of 54 years. Then, before that, I was obligated to go to school every week day, except for holidays and summer vacation (when I worked on a farm). The longest consecutive break I had during those work years was one week of vacation and then I was usually doing some work associated activities during those weeks (checking emails, answering phone calls, reviewing applications for LUPC, DEP or Agriculture, planning a workshop, designing septic systems etc.). So, being retired was quite a change of pace and mind set. I also needed to buy and setup a personal computer and cell phone. My wife had a personal computer but I did not. Not being a computer expert, that was a bigger problem than I had anticipated. Thank goodness for family that had much more computer expertise than did I or my wife. Both are finally up and running properly though it took about 6 months. I also needed to get a lot of paperwork completed for my retirement including social security and State Retirement. Thanks to Covid – 19, everything had to be done remotely. I can assure you, from personal experience, trying to successfully complete all of the necessary paperwork remotely is <u>NOT</u> the equivalent to doing it in person with the agency requesting the paperwork. It took me until July to get my full state retirement distribution but I think I am finally there.

Being an active person, I needed something to fill the void so I went ice fishing 29 of the 31 days in January. It was a relatively mild month with little snow so the ice fishing was not too difficult. After a month, folks I had worked with as the State Soil Scientist began reaching out to me so I slowly re-entered the world I had once been quite involved with for 36 years. I signed two contracts with LUPC, to provide soil science expertise. One is for a rezoning application for a major metallic mineral mine in the Patten, Maine area and the other is for general project review. The two contracts are needed because applicants for major projects that require above normal degrees of review are required to pay for that review themselves whereas all other projects have to be paid for by the State agency. I continue to do gravel roads workshops with DEP and usually for Soil and Water Conservation Districts, septic system workshops and forestry workshops. I also do a few other site visits related to septic systems or soil erosion for groups such as Lake Associations. I answer a number of e-mails from Code Enforcement Officers, consultants, Conservation Districts etc. to provide advice. It is a lot like what I used to do when employed as the State Soil Scientist but at a reduced scale. I don't get many inquiries from the general public because they do not know where or how to find me, except when referred by someone who does know how to reach me. And, the best part, is that I no longer have to answer to any supervisor or deal with government mandates.

When I was contemplating retirement, I discovered my biggest barrier was not leaving the work, though I did enjoy much of what I used to do. I am still doing some of that work, in a similar manner to how I was doing it during the pandemic. It was the social aspects. The people. Covid-19 made the break much easier. I was working from home most of the time so I did not have to leave my office environment and there was no social aspect any more. Every thing was zoom or teams meetings which was not very personal. Presentations were speaking to my computer screen, not an engaged audience that I could see and read so my presentations could be adjusted to keep the audience engaged. It is nice to once again do presentations in person and I look forward to meetings in person in the future.

As for my future involvement with the professions I spent a career in, I am not sure. This is still a new venture and I am finding way along the new path. I do know that I still enjoy doing gravel roads workshops, septic



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system workshops, forestry workshops, site visits etc. and answering e-mails or the occasional phone calls. I was very fortunate to have held the position of State Soil Scientist for 33 years during which time I learned a lot, made a lot of important connections and made a lot of friends. It was a very big part of my life and I am reluctant to let it all go in retirement. I believe it is a shame to waste all of the knowledge I accumulated over those years and wish to continue sharing it in retirement, albeit at a more moderate pace. I therefore, encourage you to reach out to me should you have a question or wish to seek advice and maybe a site visit. The advice is free but site visits will require mileage and a small stipend for my time. I am not creating my own consulting business but do intend to be available for some field work or workshops that will not have to be paid for out of my own pocket. If you would like to reach out to me, my e-mail address is <u>drsoilman@outlook.com</u>. My cell phone number is 313-4489.

One project I was involved with before retiring and after, that may be of interest to you all, is the Department of Transportation's connector between I-95 in Brewer and the Airline (Rt.9). The year before retiring, I was asked by the DOT environmental engineer, Kerem Gungor (who was the department of Environmental Protection's lead engineer in the Augusta office, before leaving to take the DOT position) to evaluate areas along the proposed connector path where they wanted to install vegetated buffers to treat stormwater runoff. These areas could not accommodate an under-drained bio-filter so a vegetated buffer was the only reasonable option. I discovered that, for the most part, the soils in the proposed vegetated buffer strips were either poorly drained Monarda or somewhat poorly drained Pushaw soil series. Both of these soil series are HSG D with very little capacity to treat stormwater runoff. That allowed me to suggest using techniques I have been promoting for several years and discussed at presentations some of you may have heard. The DOT engineer proposed using my suggestions and they were accepted by the lead engineer from the DEP field office in Bangor. My suggestions were fine tuned over the winter and are now going out in a package for contractors to bid on with work to start late this year or early next year.

There were a couple of areas where the soils were HSG B or C and did not need modification. Most of the proposed vegetated buffer strip areas though had soils that were HSG D and were not considered to be suitable for a vegetated buffer according to the DEP standards:

- 1. One was on nearly level ground with significant pit and mound topography. The pits were not connected so any runoff water that entered them would collect and be forced to infiltrate into the soil. There was significant water holding capacity in these pits and there was a thick organic duff layer. Though the soils were poorly drained in the pits, the thick organic duff layer made the infiltrative capacity the equivalent of at least a somewhat poorly drained soil. My suggestion was to leave these areas as they are, without any modification. I believe they have enough infiltrative capacity and storage capacity to adequately treat the anticipated stormwater runoff as they are. I recommended that DOT keep all heavy equipment during construction away from these areas as they could be significantly damaged otherwise.
- 2. A second condition was also nearly level or gently sloping at the toe of a slope but had a very bouldery surface. It was a poorly drained glacial till but was boulder covered. The boulders had a thick organic duff over them and in between the boulders. Again, though the soils under the boulders was poorly drained, there was at least 12" of organic duff over and between the boulders available to treat the stormwater runoff before it reached the soil. Then, the runoff would face resistance as it had travel through the boulder field before exiting so it would have additional treatment time.



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3. The third condition was in former agricultural fields where corn had been grown until recently (corn stubble was still present during my evaluation). They were on slopes of 5% or less and there was only about 8" – 10" of friable topsoil over the firm C horizon due to erosion. There were large cracks in these soils when I evaluated them. Not very suitable for vegetated buffers. My suggestions was to remove the top 24" of soil in the proposed vegetated buffer strips, mix in a minimum of 6" of fresh erosion control mulch (not composted material but fresh stump grindings), and then replace the material in the excavation. Compaction would be by a small tracked dozer and no other heavy equipment would be allowed on the area during construction. My thought was to bulk up the upper 24" of native soil, similar to potting soil with vermiculite to provide pore space for infiltration water that would last until soil structure could develop over time when the ECM decomposed. On top of the soil/ECM mix, will be a layer at least 4" thick of ECM, not loam and seed which would likely wash away and have significantly reduced infiltrative capacity. The ECM is to have its own separate specification to limit the amount of soil in it and to require woody material that is not decomposed.

I am looking forward to seeing these buffers installed. If they work as I envision, they should pave the way for more flexibility in designing vegetative buffers on sites with what are now considered to be unsuitable soils. DOT has the funding to monitor how well these sites work so there will be a good source of supporting data. I suspect some modification will be required but the concept may become a reality. Stay tuned.