

The Newsletter of the Maine Association of Professional Soil Scientists

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www.mapss.org

Winter 2024 Edition

2023-2024 Executive Committee

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PRESIDENT'S MESSAGE

Rodney Kelshaw, Maine LSS #522

A MESSAGE FROM THE PRESIDENT: RODNEY KELSHAW

Hello MAPSS Membership. I want to start by saying thank you once again for the opportunity to be a contributing member to our association and continuing in the role of President. 2023 was an interesting year. From what I gather, based on conversations with many of you, it sounds like soil scientists in Maine were busy over the last year. Soil surveys and stormwater test pits were in hot demand, along with other soil related work that many of you perform, including wetland delineation and site evaluation. Based on new legislation in recent years and potential development, this trend could continue. Here are a few examples:

• In October 2023 the State of Maine Housing Production Needs Study was

released. It is the result of a joint effort between MaineHousing, the Governor's Office of Policy Innovation & Future (GOPIF), the Maine Department of Economic and

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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Community Development (DECD), and a broad group of stakeholders. The takeaway message was that "Maine needs nearly 38,500 more homes today, and an additional 37,900-to-45,800 new homes by the end of the decade to expected demands. The study, released Wednesday, was commissioned by MaineHousing, the Governor's Office of Policy Innovation and the Future and the Maine Department of Economic and Community Development.". That's over 84,000 homes in seven years.

- The Maine Department of Environmental Protection (MDEP) began the Rulemaking process for the Chapter 500 Stormwater Management Law Update. This Chapter describes stormwater standards for activities licensed under the State's Stormwater Management Law and Site Location of Development Law. This stakeholder process will tentatively run through June 2024, with formal rulemaking to follow in the fall of 2024. The Department's goal is to propose rulemaking to the Board of Environmental Protection in time for provisional adoption by the end of 2024, allowing for the rules to be considered by the Legislature in 2025.
- LD 2003 was passed by the State Legislature and signed by the Governor in April, 2022, and went into effect July 27, 2022. The goal of the new law is to alleviate the housing affordability issues in Maine by increase housing opportunities. What is LD2003? It requires towns and cities to increase housing density allowed in their zoning ordinances in several different ways.
- LD 1881 was passed by the State Legislature and signed by the Governor in July 2023. This is "An Act Regarding Compensation Fees and Related Conservation Efforts to Protect Soils and Wildlife and Fisheries Habitat from Solar and Wind Energy Development and High-impact Electric Transmission Lines Under the Site Location of Development Laws". A person engaging in solar energy development that is required to obtain a permit under Title 38, chapter 3, subchapter 1, article 6 shall pay a compensation fee for any portion of the development, including associated facilities, that is located on "Prime agricultural soils" or "Soils of statewide importance" under subsection 2. The department, in consultation with the Governor's Energy Office, shall establish the definitions of and process for identifying, verifying, and assessing adverse impacts upon prime agricultural soils and soils of statewide or local importance, or unique farmland by the United States Department of Agriculture, Natural Resources Conservation Service. A permit applicant under subsection 1 shall submit with the permit application a compensation fee payment plan based upon the compensation fee calculated by the department using the square footage of the developed area located on prime agricultural soils or soils of statewide importance under subsection 2, and applying a per square foot compensation fee set by the department.

The accurate description of soil properties and boundary mapping will continue, and these opportunities could increase in the future. The MAPSS mission 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 are participating in the rulemaking process to help provide technical assistance in these processes. Some members are also volunteering to be guest lecturers at the University of Maine at Orono for the Spring 2024 session in EES 140 Introduction to Soil Science. This could help spur some younger blood that is interested in soil science to backfill the workforce in the coming years.

Stay interested and engaged, and through MAPSS we will continue to further soil knowledge outside of our organization.



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RECAP OF THE 2023 MAPSS/MAWS NATURAL RESOURCES WORKSHOP

The 2023 MAPSS/MAWS Natural Resources Workshop was held at Pineland Farms in New Gloucester, Maine, on Wednesday, September 13, 2023.

About Pineland Farms: Pineland Farms is a 5,000-acre working farm, diverse business campus and educational and recreational venue that welcomes visitors to enjoy its beautiful rural landscape. There is a Market and Welcome Center for more information about activities and events, the farm provides self-guided tour and educational programs. There's always something fun happening at Pineland Farm including farm visits, disc golf tournaments, family programs, tastings at the Market, open gym and candlepin bowling, you name it. You can take the family, some friends, or enjoy a personal day on the farm, trails, and gardens. Please Note: to ensure the safety of all our visitors and our farm animals Pineland Farms does not allow dogs on the premises. Workshop: The goal of this workshop was to train environmental scientists, students, and the regulating communities in identification of natural resources and to facilitate a discussion of permitting scenarios based on the resources observed at the site. We covered topics such as wetland boundary delineation, significant vernal pool determination (including is there an "outlet" and is this natural), a stream determination, prime farmland soil identification and boundary determination, discussions around soil/site suitability for stormwater management, hydric soil determination, site evaluation determinations (can you design a septic system here), and so much more.

The post-lunch discussion was at the Outdoor & Fitness Center where we discussed the features viewed at each station, including determinations by State and federal regulators and experts. Highlights of the discussions include:

- "Verification" of the presence or absence of Prime Farmland Soil (PFS) may not be a simple task; furthermore, identification of the PFS boundary might be as intensive as performing a Class A High Intensity Soil Survey. [See soil map on page 5]
- If a wetland is in a forested setting and has a closed forest canopy, despite ALL of the trees being rooted in the upland and are non-hydrophytes, is this a forested wetland, an emergent wetland, or something else? I think there will be more discussion on this question. [editor's note: this discussion will be further explored at the Annual Meeting]
- Landscape formation and historical land use can be helpful in making the determination on a site feature being a Significant vernal pool or "modified".
- How do you document a wetland delineation where the test pit does not classify as a hydric soil?



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From the September Pineland Farms workshop, Site 1, Potential Vernal Pool. Discussion centered around Cowardin et al. (1979) classification of wetland type and degree of historical modification. To be further discussed at the 2024 Annual Meeting.



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Regulatory soil map of Prime Farmland and Farmland of Statewide Importance covering the joint MAPSS – MAWS 2023 field conference at Pineland Farms. Site 1 is located in the upper left of the map (NW) while Site 2 is located to the SE in the lower right of the soil map.





Photo: *T.P.-3*, Site 2. This lodgement till with sand lenses in the Cd-horizon keyed out to the Skerry soil series. Both redoximorphic concentrations and depletions were present beginning at 20 inches below the mineral soil surface. Discussion centered on why this MWD soil would receive HSG D using the National Engineering Handbook Table 7, while the Maine Erosion and Sediment Control BMP gives Skerry soils HSG C/D with a footnote "…most commonly HSG C/D". The landscape position on an elevated convex landform in the field would suggest HSG C.



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9-11-2023 BOR SCENTER NACS + 1.5.5 ECLASS HWD PRAEMT LODGE MENT FIRD CONFERENCE MAGE ROCK Surface FRAGMENTS storinese REDOX DEP'S GEOLOGIC (%. 524) UFSL ø ¢ 6t FR 2.5/2 1000 1.5 YR GR FSL \$ 3/3 3-13 84 2%. F+M GTZ 56K FSL 4/4 12-16 BC 5/4 FSL 5BK 16-2 251 VIII AND Cd Fit SL F 5/3 20 72 4/4 in. t SAND LENSES WITHIN THE Cd HORIZON

Figure: Test pit log for T.P.-3, Site 2. Photo 1 above shows the excavator dug soil test pit.

Updating 2009 MAPSS Guidelines:

There have been several important updates, additions, and deletions over the last 13 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 and edit. Please step forward if you have an interest in working on the committee to update the Guidelines.

Website:

The website link "REGULATORY/SOIL links" in the left navigation pane on the MAPSS website is regularly updated. If anyone finds dead links or similar problems, please contact web master Chris Dorion or Matt Dorman.

The on-line directory of members (<u>http://www.mapss.org/directoryinfo.htm</u>) was updated in early February, 2022. Please review your specific contact information and send any edits to: <u>dorionchristopher61@gmail.com</u>

VERIFY YOUR LICENSE INFORMATION AND STATUS:

Go to:

https://www.maine.gov/pfr/professionallicensing/professions/board-licensure-geologists-soil-scientists



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Link to the menu options in the right navigation pane to maintain the accuracy of your license contact information.

License renewals are due by December 31 each year. Failure to pay the renewal fee may result in the loss of your license and you will be required to reapply and retake all exams.

Iron Concentrations, Concretions, Nodules, and Cementation: Always Evidence of Seasonal High-Water <u>Tables?</u>

Nicholas Butler, Tony Jenkins USDA-NRCS

Many important use and management decisions are made based on identifying the depth to a seasonal highwater table (SHWT) in the soil. Soil scientists make SHWT determinations based on the presence of redoximorphic (redox) features, typically redox depletions – and less often in the form of redox concentrations alone. To be confident in our determinations we need to understand the aquic conditions required to develop the redox features that signify the SHWT. We also need to understand the various kinds of redox features, the significance of cementation, and, if and when they warrant the attribution of a SHWT at a particular depth.

Aquic conditions can be described as the environmental elements required to develop redoximorphic features. Three determinations are needed to establish if/where aquic conditions are present in a soil profile: 1.) Depth of saturation, 2.) Occurrence of reduction, and 3.) Presence of redox features. (Vepraskas, 1994). Saturation is characterized by zero or positive pressure in the soil water and can generally be determined by observing free water in an unlined auger hole. The duration of saturation required for creating aquic conditions varies depending on the soil environment. The degree of reduction in a soil can be characterized by the direct measurement of redox potentials. In soil taxonomy, the duration of saturation required to reduce iron and develop redox features is the baseline for SHWT identification (Soil Survey Staff (SSS), 2022).

Redox features develop when the soil fluctuates between an aerobic and anerobic state. In an anaerobic environment, soil microbes reduce manganese from the manganic (Mn4+) to the manganous (Mn2+) form, and iron from the ferric (Fe3+) to the ferrous (Fe2+) form along an oxygen depletion gradient (respectively). Iron in the ferrous (Fe2+) form is soluble and readily moves in soil water. The areas of the soil that lose iron can become grayish in color and are called depletions. If the soil becomes aerobic, the iron that is in solution oxidizes and typically precipitates as soft masses, often along pores and root channels. These are redox concentrations. (USDA-NRCS, 2018). If soils are observed under a state of saturation, iron may still be in solution and not be visible in the soil profile; however, upon returning to aerobic conditions concentrations will form. These soils are considered to have a reduced matrix. (Vepraskas, 1994).

Most of us are familiar with the soft massed iron concentrations present in off-drained soils described above; however, concretions and nodules are other forms of redox concentrations described in taxonomy that are not as common. Nodules and concretions are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules based on internal organization. A concretion typically has concentric layers that may be visible to the naked eye. Nodules do not have visible organized internal structure. Boundaries commonly are diffuse if formed *in situ* and sharp after pedoturbation. Sharp boundaries may be relict features in



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some soils. (SSS, 2022). In most cases, a soil scientist should not associate a contemporary SHWT solely on the presence of concretions or nodules alone – but rather upon redox depletions, or concentrations in the form of soft masses/linings/coatings. This is exemplified in the Indicators of Hydric Soils manuscript with the phrase: "Nodules and concretions are not considered to be redox concentrations for the application of the indicators".

Occasionally in coarse grained Spodosols (i.e., Kinsman series) we see evidence of cementation, in the form of Ortstein, often below diagnostic redox morphology in the case of Kinsman. Ortstein is defined as a spodic horizon that is at least partially pedogenically cemented (50% or more laterally) in some part. Orstein is formed when iron, manganese, and aluminum weathered from ferromagnesian minerals (such as hornblende, amphiboles, pyroxene, and olivine), along with dissolved organic carbon, are eluviated from the upper part of an acid soil and moved downward into the subsoil, where they accumulate and form a spodic horizon. (Taxonomy, 2022). The presence of cementation (such as Ortstein), or other dense materials (e.g., fragipans and densic materials), when sufficient to impede profile drainage, may cause aquic conditions that should be indicated by redox morphology.

Soft masses of iron concentrations, concretions, and nodules, all indicate evidence, to varying degrees, of aquic conditions in the soil – but they may not be indicative of a contemporary SHWT. Nodules and concretions alone typically should not be used to call a SHWT. That does not mean they are not forms of redox morphology, just that they are not consistently/sufficiently reliable as indicators of contemporary aquic conditions. The best practice and your safest bet are to estimate your SHWT depth as the depth where you identify redox depletions, or in the case of some spodosols - soft masses of oxidized iron within the lower profile, often along pores or root channels.

A note on soil taxonomy: "Aquic Dystrudepts". The criteria for an "Aquic Dystrudepts" reads: "Other Dystrudepts that have, in one or more horizons within 60 cm (24 in.) of the mineral soil surface, redox depletions with chroma of 2 or less and also aquic conditions for some time in normal years (or artificial drainage)" (Taxonomy, 2022, p. 225). Now contrast - "Aquic Haplorthods: "Other Haplorthods that have redox features in one or more horizons within 75 cm (30 in.) of the mineral soil surface and also aquic conditions for some time in normal years (or artificial drainage)" (Taxonomy, 2022, p. 225). Now contrast - "Aquic Haplorthods: "Other Haplorthods that have redox features in one or more horizons within 75 cm (30 in.) of the mineral soil surface and also aquic conditions for some time in normal years (or artificial drainage)" (Taxonomy, 2022). The presence of redox features, of any form, along with aquic conditions, indicate the SHWT in Spodosols. The specific presence of chroma 2 (depletions), which is a requirement in Inceptisols, is not needed. We recommend following that taxonomic guidance specific to redox concentrations to make SHWT determinations.

This article is based on the common and predominant morphological evidence associated with the translocations and transformations indicative of SHWT, exceptional situations will occur ☺.

References

Vepraskas, M.J. 1994. Redoximorphic features for identifying aquic conditions. Technical Bulletin 301. North Carolina Agricultural Research Service, North Carolina State University, Raleigh, NC

United States Department of Agriculture, Natural Resources Conservation Service. 2018. Field indicators of hydric soils in the United States, version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). In cooperation with the National Technical Committee for Hydric Soils

Soil Survey Staff. 2022. Keys to Soil Taxonomy, 13th edition. USDA Natural Resources Conservation Service.



NOTE FROM EDITORInceptisolSoil OrderUdeptSuborderDystrudeptGreat GroupAquic DystrudeptSubgroup

NOTE FROM EDITOR	
Spodosol	Soil Order
Orthod	Suborder
Haplorthod	Great Group
Aquic Haplorthod	Subgroup

REGISTRATION & COST Register Online at: <u>http://mainewetlands.org/store</u>

\$45 for active MAWS/MAPSS members \$55 for non-members

Sorry, No Refunds for Cancellations

Free for Current Students and Municipal, State, or Federal Employees (but you must pre-register on or before March 13, 2023)

If you do not want to pay online, please register online and send a check to: Roger St. Amand, MAWS Treasurer - P.O. Box 76 - Bass Harbor, ME 04653



MAPSS 2023 Treasury Report		
MAPSS Checking Account as of 12/31/22		\$14,683.28
<u>2023 Income:</u>		
2023 Dues (full membership)	\$1,050.00	42 full members at \$25.00 each
2023 Dues (associate membership)	\$165.00	11 associate members at \$15.00 each
2023 Dues (student membership)	\$0.00	0 student members at \$0.00 each
2023 Dues (honorary membership)	\$0.00	0 honorary members at \$0.00 each
2024 Dues (full membership)	\$50.00	
2020-2022 Dues	\$75.00	
	\$1,340.00	
Annual Meeting Registration	\$45.00	1 registrants at \$45.00 each
	\$0.00	0 registrants at \$50.00 each
	\$0.00	0 students at \$15.00 each
-	\$45.00	
2023 Workshop	\$180.00	4 registrants at \$45.00 each
2023 Workshop	\$50.00	1 registrants at \$50.00 each
MAWS (2023 Workshop)	\$908.50	
	\$1,138.50	
	\$1,100.00	
Janet Cormier Scholarship (2023)	\$400.00	
Maine Envirothon (2023)	\$200.00	
TOTAL INCOME	\$2 122 50	
TOTAL INCOME	\$3,123.50	
2023 Expenses:	\$1 000 00	
Envirothon (Maine Association of Conservation Districts)	\$1,000.00	
Janet Cormier Scholarship	\$0.00	
MAPSS/ MAWS workshop insurance (9/13/23)	\$253.00	
Website Host (DiscountASP.net)	\$120.00	
Domain Registration (Speedsoft)	\$18.95	
Chargeback (5/24/23)	\$15.00	
TOTAL EXPENSES	\$1,406.95	
	<i>41,100,00</i>	
MAPSS Checking Account as of 12/31/23		\$16,399.83



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Below is the meeting agenda as of early February, 2024. <u>Always check the MAWS and</u> <u>MAPSS websites for last minute changes.</u>

MAWS-MAPSS Annual Meeting 2024 The Regulatory Story

Thursday, March 21, 2024 University of Maine at Augusta – Auditorium 46 University Drive, Augusta, ME 04330 The meeting will be recorded and posted later, but not streamed live

<u>Time</u>	<u>Topic / Agenda Item</u>
0745 - 0830	Sign In Registration desk, annual dues payment, update contact information
0830 - 0845	MAWS President Welcome
0845 - 0900	MAPSS President Welcome
0900 - 0930	Are iron concentrations indicative of soil saturation? (follow-on discussion from the September MAPSS – MAWS Pineland field conference)
0930 - 1015	Forested vs. Emergent Wetland (follow-on discussion from the September MAPSS – MAWS Pineland field conference)
	MAINE State Regulatory Updates MDEP Land & Water – Dawn Hallowell MDEP Storm Water – Karem Gungor MDEP Enforcement – Cameron Dufour DACF – Matt Boucher, Maine State Soil Scientist
1015 - 1200	MDEP Shoreland Zoning – Colin Clark LUPC – Tim Carr MDIF&W – Phillip deMaynadier or John Perry or Bethany Atkins TNC – MNRCP – Bryan Emerson
1200 - 1330	LUNCH -Fireside Lounge (same location as 2023 meeting)
1230 - 1330	MAPSS BUSINESS MEETING LUNCH (Breakout Room 250 Near Lunch area)
1330 - 1430	<u>Stipend Awards and Winner Presentations</u> Lizbeth Amador Victoria Niedzinski
1430 - 1600	<u>FEDERAL Regulatory Updates</u> USACOE – Taylor Bell and Peter Olmstead



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USFWS – Patrick Dockens USACOE – Paul Minkin

1600 – 1700 MAWS Business Meeting

An informal gathering to follow TBA. Please join your fellow members and colleagues after the meeting for a smart cocktail, light appetizers, and delicious conversation.

Maine Association of Professional Soil Scientist (MAPSS) March 21, 2023 Annual Business Meeting Minutes (<u>to be approved / amended at the March 21,</u> 2024 Annual Business Meeting)

12:30PM to 1:30PM at Randall Student Center, UMaine Augusta Meeting was called to order at 12:20PM by MAPSS President Rodney Kelshaw

Election of Officers

A motion was made and passed for the following slate of officers for 2023: Rodney Kelshaw - President Roger St Amand – Vice President Gary Fullerton - Treasurer Chris Dorion - Past President Natilie Curry - Director Eric Whitney - Secretary

Treasurer's Report

Gary Fullerton reported on MAPSS finances for 2022. MAPSS has 33 full members this year, 18 full members paid dues in 2023, 13 full members paid dues in 2022. MAPSS ended the year with \$14,683.28. A motion was made by Roger St Amand to accept the report and it was passed shortly after.

Envirothon

A motion was made by Dave Marceau to donate \$1,000 to the Envirothon for 2023. Last year, \$1,000 was also donated. The motion was passed.

Cormier Scholarship

Discussion began with addressing the need for a new Education Committee Chair to head the Scholarship. Dave Moyse volunteered as Chair. Rodney Kelshaw shared updates (sent via email) from Ivan Fernandez regarding the future of UMaine Soil Science Curriculum. Fernandez confirmed that an Intro to Soil Science class would be offered in 2024. A motion was made by Dave Marceau to contribute \$1,000 to the committed \$2,500 to the Scholarchip. Marceau than moved to amend the contribution amount to \$1,500, this motion was passed. **Welcoming of State Soil Scientist, Matt Boucher**

Matt Boucher was hired as the State of Maine Soil Scientist. Matt shared his goals for his role, one of those goals is further development of the "Healthy Soils Program" (L.D. 437). The Healthy Soils Program is directed towards agriculture, the program is currently funded at three million. Boucher shared one of the programs



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focuses is work force development. Boucher requested assistance from MAPSS for additional regulatory training.

NRCS Update

Tony Jenkins shared updates with the NRCS. A demand for Comprehensive Nutrient Management Plans is growing and there is currently one active Technical Service Provider (TSP). A financial assistance budget is being pushed to help fund activities such as PFAS testing, soil testing for contamination, soil health testing, carbon sequestration, and testing for nutrient management. Nicholas Butler was announced as the new Assistant State Soil Scientist for the NRCS.

MANRS

The combining of MAPSS and MAWS into a new association, Maine Association of Natural Resource Scientist (MANRS), was discussed. Thoughts and concerns regarding the representation of soil scientist within the new association was considered among the group. A mock vote was held to determine if MAPSS may be in favor of MNARS, the vote resulted in 3 to 5, with most opposing the new association.

Motion to adjourn meeting was made by Kelshaw at 1:33PM, the motion was passed.

The Lay of the Land, the Biannual Newsletter of MAPSS, Seeks an Editor

Currently, Chris Dorion is performing the job of newsletter editor. He would like to pass on the job to an enthusiastic MAPSS member or associate member. The work requires soliciting articles of interest from members and associate members twice per year and formatting them into an existing MS Word template. Photos can be inserted liberally, and Chris can give the simple 2 step method to reduce their size (export a raw image JPEG to a smaller file size). Anyone with MS Word experience can compile the newsletter.