

Evaluating TA-6 Mesic Spodic Indicator.

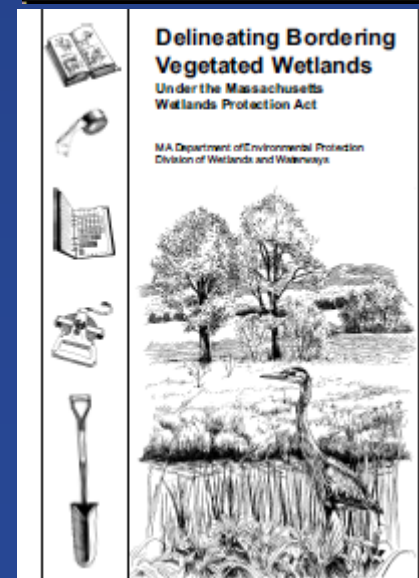
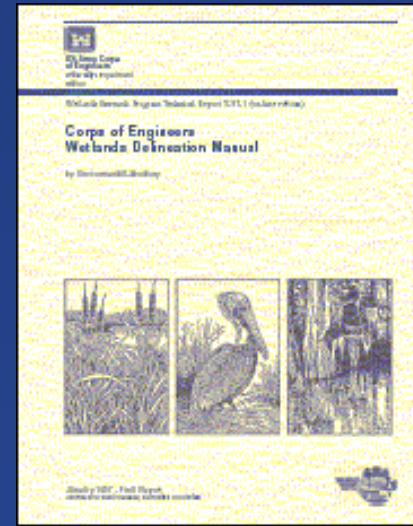


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Background Information

- 87 COE manual – “Wet Spodosols (and other soils with E horizons)” listed in Problem Soil section.
- MA – Delineating Bordering Vegetated Wetlands – Difficult to Analyze “Evergreen forest soils”.
- NEHSTC “Field Indicators” – most of the spodic indicators developed for frigid soils – redox in E, etc.
- Spodosols not mapped in mesic area (even though they exist)



Hydric Soil Tour 2004: RI Vernal Pools

- NEHSTC hosted the 2004 tour in RI looking at Frank Golet's vernal pool study.
- Most of the sites consisted of spodosols.
- Version 3 was not meeting indicators despite obvious wetland hydro/veg.
- Subcommittee formed to develop indicator (Stolt, Fletcher, Tunstead, Turenne)



Mesic Spodic Developed

- Reviewed over 30 pedon descriptions, OSED's, soil survey, etc.
- Data entered to spread sheet with colors, depths, horizons, redox.
- Tested in subsequent tours (Plymouth).
- Converted NE wording to National, submitted to as TA-6.

Pedon	Series (hydric)	Data	National	Proposed	Notes	O thickness	A thickness	All Depth cm	A ₁ color	E ₁ color	Spodic ₁ depth	Spodic ₂ depth	Link to Pedon and/or Data
S93-MA-023-001	Mattapoisett (Y)	Lab, water table data, A ₁ , S ₁ , S ₂ , S ₃ , S ₃	None as described but meets zone with lab data	TS	Moist A10 but this is a hot indicator for S, moist S1 with the lab data (A has 6% carbon so moist mucky) does not meet and without lab data (lower texture described)	18	6-200	12	4Y	18	3/2 with redox		http://soil.com/meds/lab-data/5
Squamicott_L (Deep), 2302104		Pedon, photo	None	S ₁ or T ₁	Has a SL AE, so S cannot be used.								http://soil.com/meds/lab-data/5
S91-MA-023-005	Deerfield (H)	Lab, pedon, water table	None	None	MVD soil non-hydric		16	8-211	36	4Y	44	2.5/2 splotchy	http://soil.com/meds/lab-data/5
S91-MA-023-003	Mattapoisett (Y)			T ₁	Bk under E described need to be a Bk ₁ for proposed		18	6-200	12	4Y	18	3/2, splotchy	http://soil.com/meds/lab-data/5
E2306305	Mattapoisett (Y)	Pedon		S ₁ , T ₁	Bk needs to be changed to Bk ₁		9	6-211	17	6/2	5/3	3/3, splotchy	http://soil.com/meds/lab-data/5
Mushpee OSED	Mushpee (Y)	Pedon		S ₁ , 6.b., 7.b., 5.c., 6.c., or T ₁	Bk needs to be changed or added.		13	6-211	3	7Y	15	3/2	http://ortho.fv.nrcs.usda.gov/5
Massasoit OSED	Massasoit (Y)	Pedon	None		S ₁ , 6.a., 7.a., 5.b., 6.b., 7.b., 5.c., 6.c., or T ₁ combines thickness of E, or you count organic particles as redox features or a stripped matrix.		8	5-251	15	4Y	20	2.5/2, duplications	http://www2.fv.nrcs.usda.gov/5
MA023-2001-01107	Berryland (Y)	Pedon, Lab	None	T ₁	Need to combine Bk ₁ horizons to make thickness		13	14-211	6	5/2	22	2.5/2	http://soil.com/meds/lab-data/5
MA023-2001-03708	Mushpee (Y)	Pedon, water, RIR		T ₁			2	4-211	11	6Y	15	3/3	
MA023-2001-03709													
S07MA022004	Mushpee (Y)	Lab, ped, hydro	none	6a	E is too shallow, if stripped matrix it would make 6a, AE is 50/50 color		12	5-211 and 5	6	6Y	11	2.5/2, splotchy	http://soil.com/meds/lab-data/5
MA023-2001-03704	Massasoit	Pedon, photo, well		S ₁ , T ₁ , S ₁ , T ₁ , 5.c., T ₁ , S ₁ , T ₁ , T ₁	Monitoring site.								http://soil.com/labswell/5/5/5

Spodic Indicators for the Mesic Temperature Regime

(this proposed indicator is developed for use in MLRA 144A, 149B, and 145 ONLY - it is generally agreed upon by the NETCHS that soils with strong spodic development in this region is typically limited to the fringe area of wetlands and rarely found in uplands)

(P. C. Fletcher)

A soil (any texture) with evidence of spodic development that has any one or more of the following combinations of listed soil features: starting within 12 inches of the mineral soil surface:

- An **Qa** or **Qc** horizon that is greater than 3 inches thick, and/or
- a mucky **A** or **Ap** horizon that is greater than 3 inches thick, and/or
- a very dark **A** or **Ap** horizon (includes transitional and combination horizons like **AE** and **A/E**), and/or
- an **A** or **Ap** horizon that has redoximorphic features within 6 inches of the mineral soil surface, and/or
- an **E** or **Eg** horizon with redoximorphic features, and/or
- an **E** or **Eg** horizon with a stripped matrix, and/or
- a very thick (>3 inches) **E** or **Eg** horizon

that is directly underlain by either:

- a very dark* **Bh**_s horizon that is 3 inches or greater in thickness, or
- a **Bh**_s horizon that is directly underlain by a horizon with 2% or more redoximorphic features,
- a **Bh**_s horizon with 2% or more redoximorphic features**,
- a partially cemented horizon (**Bh**_s and/or **Bh**_c horizon) with 2% or more nodules and/or concretions; or a more completely cemented horizon (**Bm** and/or **Bhm** horizon),
- a **Bh**_s horizon that has a splotchy pattern of two or more colors (indicative of translocated iron, and/or manganese, and/or aluminum, and/or organic matter) at least one of the colors must have a distinct or prominent contrast (appendix 4) from the matrix directly underlain by a horizon with a depleted matrix or 2% or more redoximorphic features.

Comment [107]: Suggest adding to definition of NE indicators and change to spodic materials and delete the examples Bk₁, etc. as Bk₁ pointed out.

Comment [12]: Will this catch a situation where the combined thickness of an O, A, and/or E horizon is greater than 12 inches?

Comment [15]: Does Qc/a/c₁ can have 11 P of A₁ and then this morphology and will be listed? I believe this morphology does not start on the surface, unless it is E under O, then maybe within 2 of the organic surface, but certainly not 12"

Comment [14]: Stripped matrix will need to be better defined, needs thickness and landscape requirements.

Comment [13]: A₁ is colorless

Comment [16]: If the soil - what matrix is the referring to? Above or below this line or the horizon? If so, needs to be revised differently, if that can't mean, then it will need to be reworded.

Comment [107]: S₁ to S₃ to S₃ comment typically these soil profiles have 3-4 colors, one is the matrix. 50% the other two are matrix colors so one of the matrix colors has to be distinct or prominent contrast from matrix - this indicator needed to separate the matrix from non matrix. Good

Comment [18]: If you require the spodic Bk₁ to be directly underlain by a horizon that has a depleted matrix or 2% or more redox features aren't you caught by the second bullet above?

Comment [19]: Exclude each of these soil series, I think, since the color criteria to change # 2

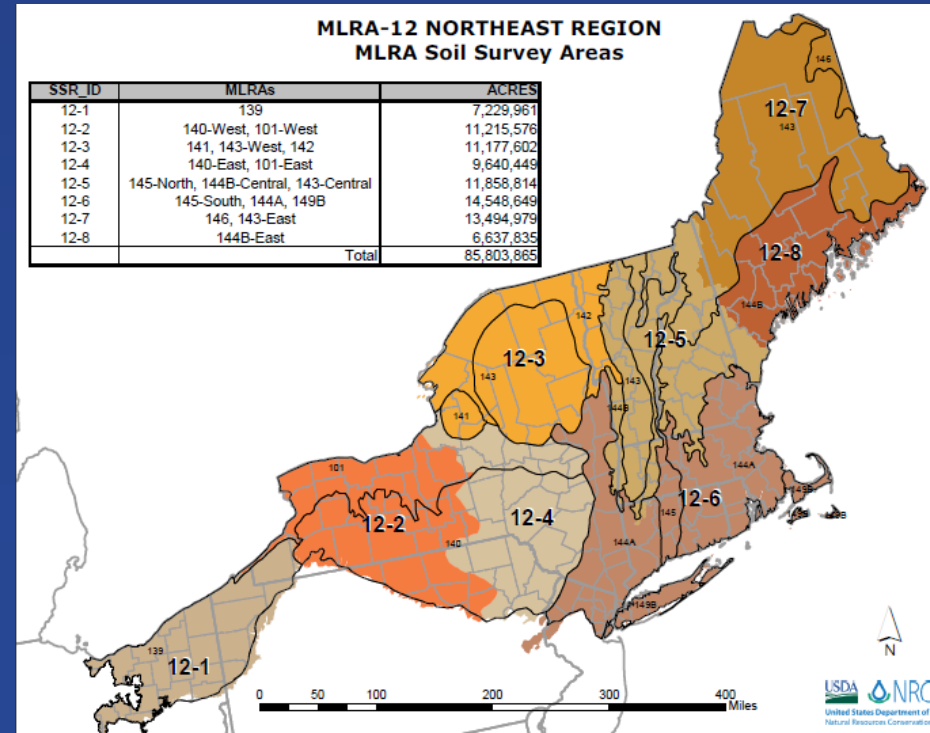
TA-6 – Mesic Spodic

- Currently in version 7 as a test indicator.
- Allowed for use in NE Regional Supplement.
- Only used in 144A, 145, and 146B of Region R – caution along northern boundaries.
- Working to move to an indicator.



MLRA-12 NORTHEAST REGION
MLRA Soil Survey Areas

SSR_ID	MLRAs	ACRES
12-1	139	7,229,961
12-2	140-West, 101-West	11,215,576
12-3	141, 143-West, 142	11,177,602
12-4	140-East, 101-East	9,640,449
12-5	145-North, 144B-Central, 143-Central	11,858,814
12-6	145-South, 144A, 149B	14,548,649
12-7	146, 143-East	13,494,979
12-8	144B-East	6,637,835
	Total	85,803,865



- Used for All textures (not just sandy).
- With or W/O E horizons.
- Spodic horizons typically have several color patterns or cementation (ortstien) – no mention if redox.
- E also has several colors.
- Careful descriptions!

Dark A, underlain by a dark spodic (Bhs, etc.)

Dark A underlain by Eg – underlain by dark spodic.

User Notes provide more info.

TA6. Mesic Spodic. For testing in MLRAs 144A and 145 of LRR R and MLRA 149B of LRR S. A layer 5 cm (2 inches) or more thick, starting within 15 cm (6 inches) of the mineral soil surface, that has value of 3 or less and chroma of 2 or less and is underlain by either:

- a. A layer(s) 8 cm (3 inches) or more thick occurring within 30 cm (12 inches) of the mineral soil surface, having value and chroma of 3 or less, and showing evidence of spodic development; or
- b. A layer(s) 5 cm (2 inches) or more thick occurring within 30 cm (12 inches) of the mineral soil surface, having value of 4 or more and chroma of 2 or less, and directly underlain by a layer(s) 8 cm (3 inches) or more thick having value and chroma of 3 or less and showing evidence of spodic development.

User Notes: This indicator is used to identify wet soils that have spodic materials or that meet the definition of Spodosols, only in MLRAs 144A and 145 of LRR R and in MLRA 149B of LRR S. The layer

that has value of 4 or more and chroma of 2 or less is typically described as an E or Eg horizon (typically having a color pattern referred to as stripped or partially stripped matrices). The layers with evidence of the accumulation of translocated organic matter typically are described as Bh, Bhs, Bhsm, Bsm, or Bs horizons. These layers typically have several color patterns or cementation indicative of translocated iron, aluminum, and/or organic matter.

Current Status

- According to National need to submit data for 3 additional study sites with support data showing they meet the tech standards.
- NEHST currently has 4 sites, 2 in RI and 2 in MA.
- Monitoring wells, IRIS, Alpha tests, undergrad study being run.
- Sites visited during the 2010 Hydric tour.

2. Adding or deleting a test indicator: Minimally, the following should accompany all requests for adding or deleting a test indicator in *Field Indicators of Hydric Soils in the United States*:

- a) Detailed descriptions of at least three pedons that document the test indicator and detailed descriptions of three neighboring nonhydric pedons.
- b) Detailed vegetative data collected to represent the vegetation of the six pedons.

3. All requests involving 1 and 2 above require a short written plan that: a) identifies the problem, b) explains the rationale for the request, and c) provides the following—person responsible and point of contact (e-mail and postal addresses and phone





Dark surface at least 2" thick and;

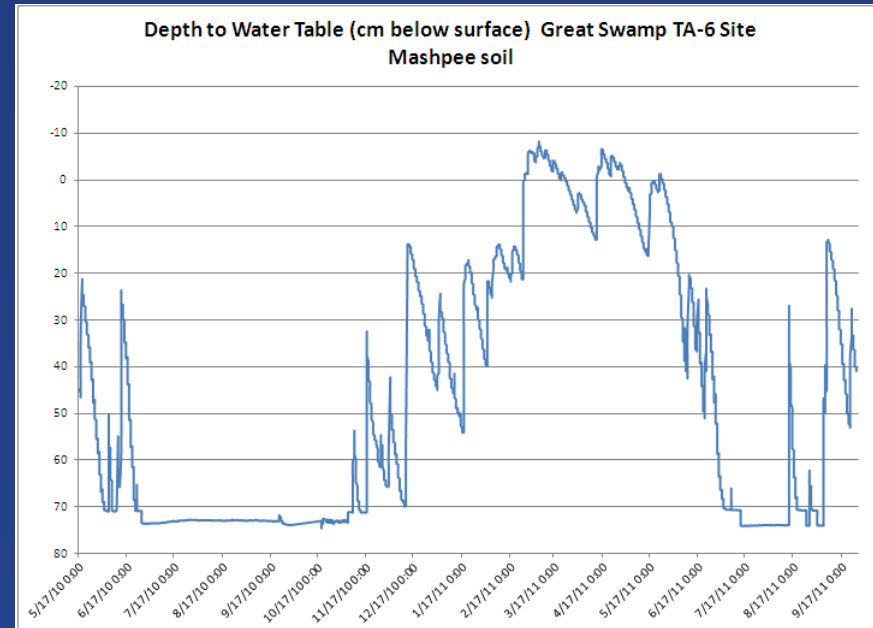
1) Layer at least 3" thick starting within 12" of soil surface that is 3/3 or darker and shows evidence of spodic morphology; or

2) A layer 2" or more thick occurring within 12" of the mineral soil surface, having value of 4 or more and chroma of 2 or less, and

directly underlain by a layer 3" or more thick having value and chroma of 3 or less and showing evidence of spodic development.

Support Data

- Support data (MW, IRIS, etc.) need to show soils meet technical standard for a hydric soil.
- Four study sites being monitored, data is supporting TS.
- Some sites reviewed in 2010 had “upland” pits meeting indicator by some – may need to modify tech notes (require redox at some depth).
- Still need to also meet veg and hydro to be a federal wetland!



Issue: Redox or not?

- Samples of spodic horizons (Bh, Bhs, Bhsm) have been collected and heated to 550C to remove SOM.
- Results show little iron in system and most of color is organic and Al.
- This mottled appearance has been described as redox [], w/o Fe and Mn they are not redox but mottles.
- TA-6 uses term “patterns of translocated iron, al and/or SOM.
- E horizons – same look for two or more colors of light and dark (stripped matrix – S6 confusion).



