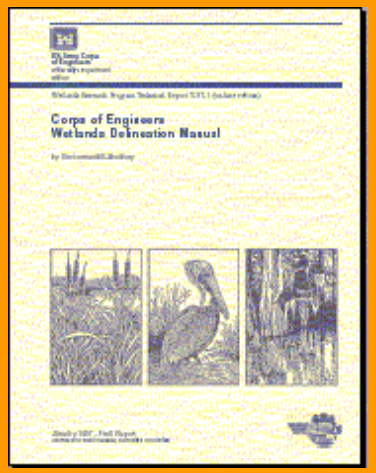
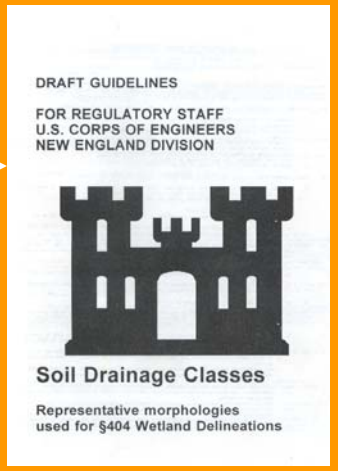
The New England Hydric Soils Technical Committee – 16 years in 10 minutes!

NEW ENGLAND INDICATORS

- 87 Manual used soil drainage classes in the criteria for a hydric soil.
- Drainage classes were mainly an agricultural term without soil morphology associated.
- In the 1980's the NE office of the ACOE with assistance of the NRCS (Pete Fletcher) established drainage class criteria for all of NE - document available at: http://nesoil.com/properties/drainageclasses.htm.





NEW ENGLAND INDICATORS

- Team of COE, EPA, NRCS, F&WS, University, Private Sector - traveled throughout NE to examine soils and data.
- Although some success was reached, this methodology proved complex and highly technical.
- In 1992, Soil Taxonomy and drainage class were melded to form the “Field Indicators for Identifying Hydric Soils in New England – the NEHSTC was formed.
- 1991-93 UMASS Adopt-a-Well study.

New England Hydric Soil Technical Committee

- Federal Agencies (NRCS, ACOE, EPA, USFWS)
- State Agencies (NH DES, CTDEP, Maine Dept of Ag)
- University Personnel (UCONN, URI, UMASS, UNH)
- Private Sector (Consultants)
- 15 member steering team, 4 person chair – meet 2-4 times/year in NH.

Peter Fletcher (Chair), Retired from USDA - Natural Resources Conservation Service
Stephen Gourley, USDA - Natural Resources Conservation Service - Vermont
James Gove, Gove Environmental Services
Peter Hammen, New Hampshire Dept. of Environmental Services
Wayne Hoar, USDA - Natural Resources Conservation Service - Maine
Joseph Homer, USDA - Natural Resources Conservation Service – New Hampshire
Steven Hundley, USDA - Natural Resources Conservation Service – New Hampshire
Kenneth Kettenring, New Hampshire Dept. of Environmental Services
George Loomis, University of Rhode Island
Rebekah Lacey, New England Interstate Water Pollution Control Commission
Ruth Ladd, US Army Corps of Engineers
Raymond Lobdell, Lobdell and Associates
Dr. Harvey Luce, University of Connecticut
Scott Lussier, New England Interstate Water Pollution control Commission
Wende Mahaney, US Fish and Wildlife Service
David Marceau, Maine Association of Professional Soil Scientists
Joseph Noel, Maine Association of Professional Soil Scientists
Thomas Peragallo, Peragallo Associates
Jeff Peterson, Vanesse Hangen Brustlin
Sidney Pilgrim, University of New Hampshire
David Rocque, Maine Dept. of Agriculture, Food and Rural Resources
Matthew Schweisberg, US Environmental Protection Agency
Michael Sheehan, US Army Corps of Engineers
Frank Smigelski, Federal aviation Administration
Lori Sommer, New Hampshire Dept. of Environmental Services
Dr. Mark Stolt, University of Rhode Island
Steven Tessitore, Connecticut Dept. of Environmental Protection
Robert Tunstead, USDA – Natural Resources Conservation Service – Massachusetts
James Turenne, USDA – Natural Resources Conservation Service – Rhode Island
Dr. Peter Veneman, University of Massachusetts, Amherst
Thomas Villars, USDA – Natural Resources Conservation Service - Vermont
David Wilkinson, USDA – Natural Resources Conservation Service - Maine
Dr. William Wright, University of Rhode Island
Michael Whited, USDA – Natural Resources Conservation Service

Field Indicators for Identifying Hydric Soils in New England

- Only region-wide publication not based on National indicators.
- Recognized by the ACOE to conform to results obtained using the 1987 Manual.
- ACOE encourages its usage throughout New England (conforms to the 87 manual).
- All 6 NE states recognize the NE Indicators in their State wetland regulations as a technical guide for wetland delineation.
- Published through the New England Interstate Water Pollution Control Commission. More than 3,000 copies distributed.

Genesis of an Indicator

- **Soils formed in dark (lithochromic) mineralogy.**
- **Recognized as "Problem soils" In 87 manual.**
- **Dark soil subcommittee formed.**
- **Hydric Tour: RI 2000 – thesis study, VT/NH 2003 Cabot site with data.**
- **Meetings and let the Emails fly!**

September 17, 2003
CABOT SOIL (31C) – Rochester, VT (Windsor County); approx. 10% slope

Vegetation (using mid-points) close to wells

Shrubs (15' radius):		
Spiraea tomentosa (steeplebush)	FACW	38%/38 = 100%
Herbs (5' radius):		
Aster nova-belgii (New York aster)	FACW+	3/76 = 4%
Aster vimineus (?) (small white aster)	FAC	10.5/76 = 14%
Carex lurida (lurid sedge)	OBL	10.5/6 = 14%
Euthamia graminifolia (narrowleaved goldenrod)	FAC	3/76 = 4%
Geranium pratense (?)	not listed	10.5/76 = 14%
Juncus effusus (soft rush)	FACW+	3/76 = 4%
Onoclea sensibilis (sensitive fern)	FACW	10.5/76 = 14%
Phleum pratense (Timothy)	FACU	trace

End Result

- Dark Mineral indicator developed based on data.
- VIII Approved for version 3.
- Tested in field.
- Re-write for National

VIII. **DARK MINERAL SOILS.** Soils with a matrix chroma of 2 or less that extends to a depth of 20 inches below the *top of the mineral soil material*, and that have a *dark A* or *Ap horizon* (with or without an *O horizon*) that is directly underlain by a horizon with a matrix value of less than 4, and within 12 inches of the *top of the mineral soil material* or directly underlying an *A or Ap horizon*, whichever is shallower, 2 percent or more *redoximorphic features* that extend to:

A. a depth of 20 inches below the *top of the mineral soil material*; or

B. a *depleted* or *gleyed matrix*, whichever is shallower; or

1) A__. Dark Mineral Soils. A mineral surface layer with value 3 or less that is directly underlain by a layer with a matrix value less than 4. Within 30 cm (12 inches) of the top of the mineral soil material or directly underlying the mineral surface layer, whichever is shallower, there are 2 percent or more redoximorphic features that extend to either a depth of 50 cm (20 inches) below the top of the mineral soil material or to a depleted or gleyed matrix. The matrix chroma is 2 or less to a depth of 50 cm (20 inches) below the top of the mineral soil material.

Field Indicators Features

- Dynamic document –changes made as a result of new data, agreed to by the NEHSTC.
- Hierarchal key – starts with wettest soils (few morphologies) to the dry-end of hydric soils.
- Looks for a combination of soil morphologies at certain depths to determine if the soil meets the definition of a hydric soil.
- If a soil meets an indicator it can be considered a hydric soil. If no indicators are met it does NOT mean the soil is non-hydric (professional judgment).

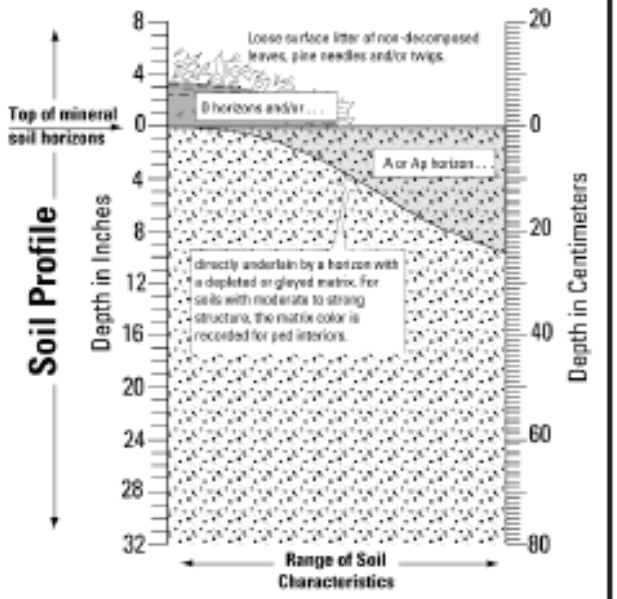
Field Indicators Features

VI. DEPLETED OR GLEYED MATRIX. Within 10 inches of the *top of the mineral soil material* and directly underlying an *A* or *Ap horizon* (or, if they are not present, an *O horizon*), is a horizon with a *depleted* or *gleyed matrix* (for soils with *moderate* to *strong structure*, the *matrix color* is recorded for *ped interiors*); or

USER NOTE: An *E horizon* usually has low chroma colors as a result of an eluvial process and only qualifies as a *depleted* or *gleyed matrix* if it has 2 percent or more *redoximorphic concentrations*. For soils with *E horizons*, refer to Indicators IX.A, IX.B, and IX.C.

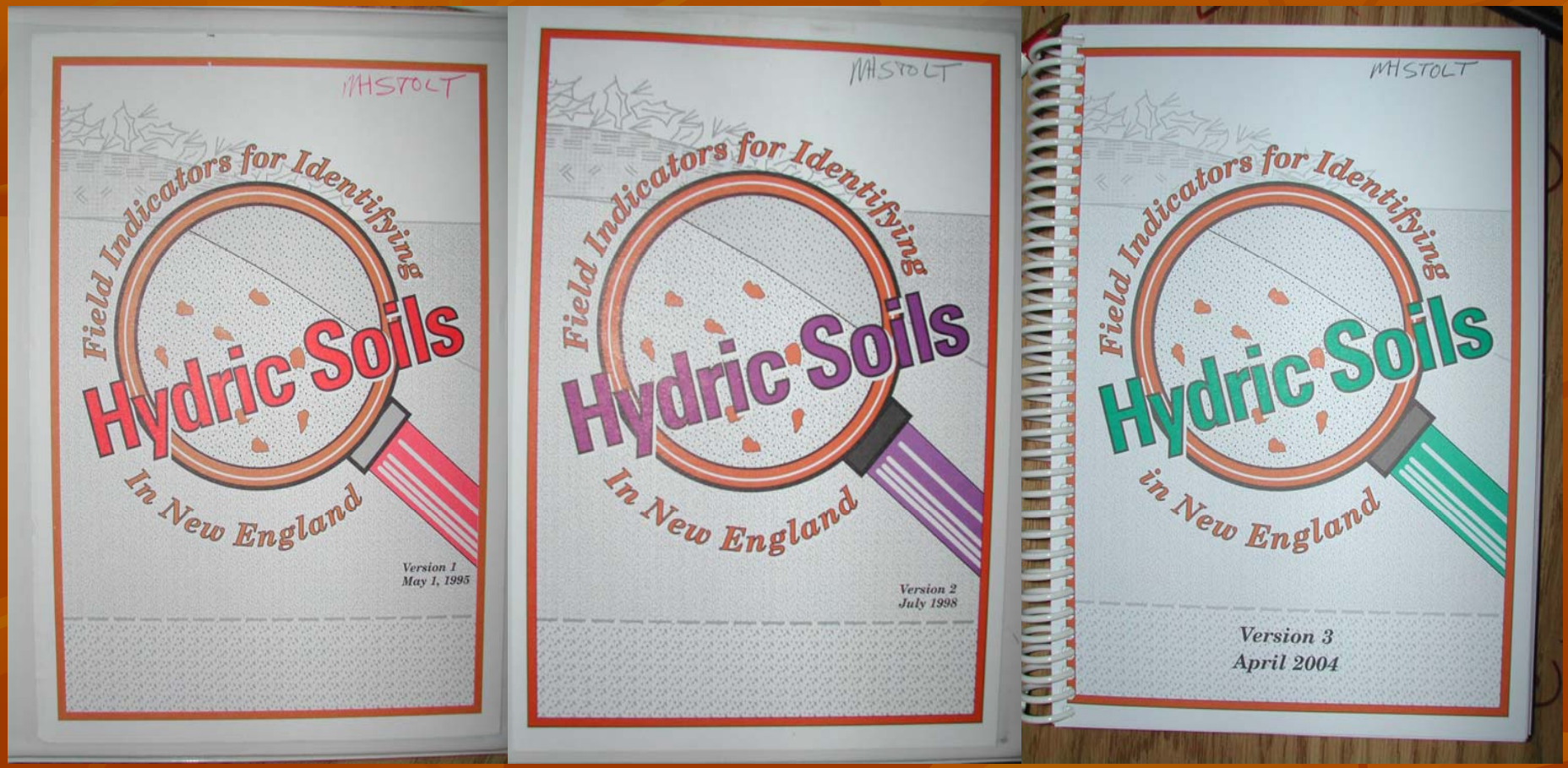
Terms or phrases in ***bold italics*** *are defined in the* ***Glossary of Terms***

VI. Depleted or Gleyed Matrix



Key for Soil Textures

Three Versions 1995, 1998, and 2004



Data and Documentation

- Early tours were conducted throughout region to study the wetlands and soils.
- UMASS well study set up about 15 sites, wells sunk, veg. data recorded, Eh, etc. Sites were toured by committee and NHSTC.
- Each year the NEHSTC hosts a hydric soil tour to address a particular indicator (2002 – disturbed, 2003 – dark pm, 2004 – mesic spodic, 2005 – folists, 2006 spodic, etc.).

Data and Documentation

- 2007 – ACOE Region 1 purchased 15 soil temp loggers, 10 continuous water loggers, IRIS tubes and wells – deployed on study sites (red soils, dark, spodics, marine sediments, HTM) throughout region.
- Review of OSEDs, thesis studies, Reg IV sites, State regulators data, private sector delineation sites.

The Merger

- With regional supplement coming in to play and general agreement on the need to have one set of indicators, the NEHSTC focused efforts over past two years reviewing both guides, deciding how they differ, which of our indicators fit National, and which of ours needs to be added for our region (New England).

The Merger

- Members met in each region (frigid, mesic, problem indicators, etc.) to review data, descriptions, OSEDs.
- Decided which of our indicators did not fit the National.
- Numerous meetings to re-write our proposal for the National.

Part 2. Matching National Indicators to the NE Indicators

NE Regional Indicator (with the edits noted at beginning of table)	National Indicator that fits or overlaps with all or parts of NE Regional Indicator
I. → PONDED OR FLOODED SOILS. Any soil that is *frequently ponded* or *flooded* for a long or very long duration during the *growing season*;	Not in National Indicators Not really a soil indicator – no morphology specified.
II. → TIDAL SOILS. Soils that are *flooded* daily by tides and/or have *sulfidic materials* within 30 cm (12 inches) of the *soil surface*; or	Sulfidic materials part of this is covered by **A4**. "Flooded daily by tides" is also not really a soil indicator.
III. → HISTOSOLS. Soils having *organic soil materials* at or near the *soil surface* that are greater than 40 cm (16 inches) thick (i.e., classify as *Histosols*); or	**A1** matches this pretty well
IV. → HISTIC EPIPEDONS. Soils having a layer of *organic soil materials* at or near the *soil surface* that is 20 to 40 cm (8 to 16 inches) thick (i.e., *histic epipedon*); and directly underlying the *O horizon* or, if present, the *A horizon*, is a horizon with *redoximorphic features*; or	**A2** requires chroma of 2 or less under histic; could be a dark A, too. NE indicator requires redox, and it can be below A **A3** Black Histic – soils that meet this probably also meet IV.
V. MINERAL HISTIC. Any mineral soil having a layer 10 to 20 cm (4 to 8 inches) thick of *slightly to well decomposed organic soil material* and/or a *mucky mineral surface horizon*, and is *directly underlain* by a horizon with a *depleted* or *gleyed matrix*; or	No match? (but see **A7** – should there be one a little thicker for LRR R, like 10-20cm Muck?)
VI. DEPLETED OR GLEYED MATRIX. Within 25 cm (10 inches) of the top of the *mineral soil material* and directly underlying a *mineral surface horizon* (or, if not present, an *O horizon*), is a horizon with a *depleted* or *gleyed matrix* (for soils with *moderate* to *strong structure*, the *matrix color* is recorded for *ped interiors*); or	**F2** – gleyed matrix w/i 30cm for loamy clayey soils **F3** – depleted matrix – read closely for depth criteria **S4** – sandy gleyed matrix – w/i 6 inches of surface **S5** – sandy redox – matrix chroma 2 or less w/ 2% or more redox conc. starting w/i 6 inches of surface

Series	Soil Subgroup * * *	Typical Pedon OSD N.E. Indicator (Version 9/15/03)	Typical Pedon OSD NTCHS Indicators Version VI
Adrian	Terric Haplosaprists	III, IV, … (RoC may not fit IV)	A1
Adrian, flooded	Terric Haplosaprists	I, III, IV, … (RoC may not fit IV)	A1
Alden	Mollic Endoaquepts	V, VI	F3
Atherton	Aeric Endoaquepts	VI	F3
*Au Gres	Typic Endoaquods	VIII A 1 & VIII A 2	S5
*Aurelie	Aeric Epiaquepts Technical Bulletins 94 and 137, Maine Agricultural Experiment Station.	**None** – "Close" to meeting V & VI Any Water Table Data?	**Almost F3 because in the NTCHS Indicators it says begin measurements underneath the peat, mucky peat or muck**

Questions