Soils and Wetlands

What's About to Hit the Pit

ERDC/EL TR-02-20

Environmental Laboratory

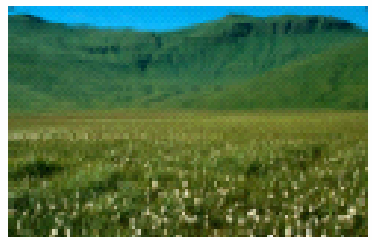
US Army Corps of Engineers®
Engineer Research and Development Center

Developing a "Regionalized" Version of the Corps of Engineers Wetlands Delineation Manual: Issues and Recommendations

James S. Wakeley

August 2002



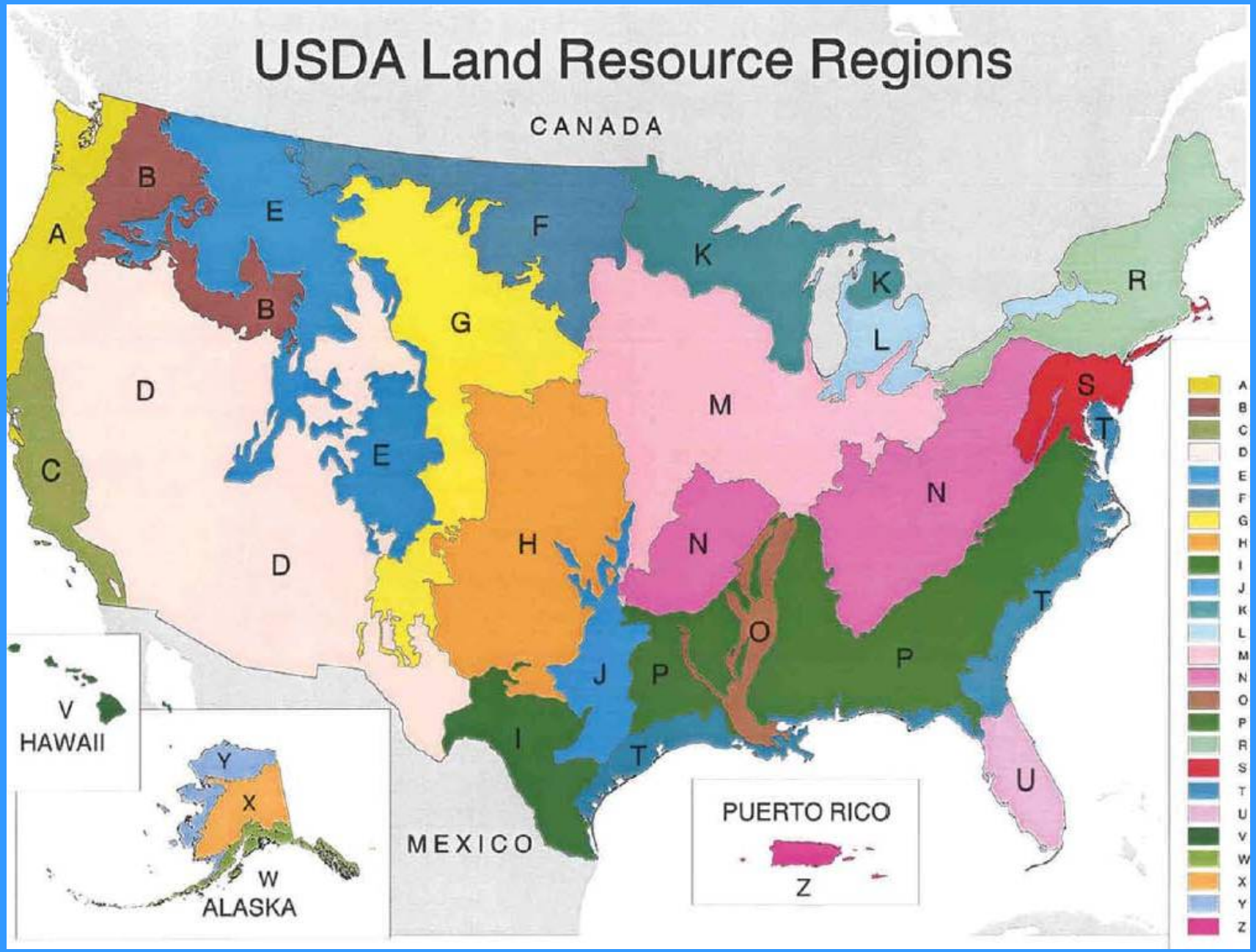
http://www.usace.army.mil/cw/cecwo/reg/reg_supp.htm

Why Regionalize?

Recommendations

- *A new and consistent system of wetland delineation regions is needed, one based on natural boundaries such as ecoregions or land resource regions, rather than political boundaries.*
- *For consistency, wetland plant lists and lists of hydric soil indicators should be revised as needed to conform to the selected system of regions.*
- *… the Corps should support the development of regional lists of "facultative" hydric soil indicators that can be used, with additional information, to identify some wetlands in the absence of a "test positive" hydric soil indicator.*

LAND RESOURCE REGIONS AND MAJOR LAND RESOURCE AREAS FOR THE CONTERMINOUS U.S. - SIDE A


USDA Land Resource Regions
CANADA
MEXICO
HAWAII
ALASKA
PUERTO RICO
A
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United States Department of Agriculture

NRCS
Natural Resources Conservation Service

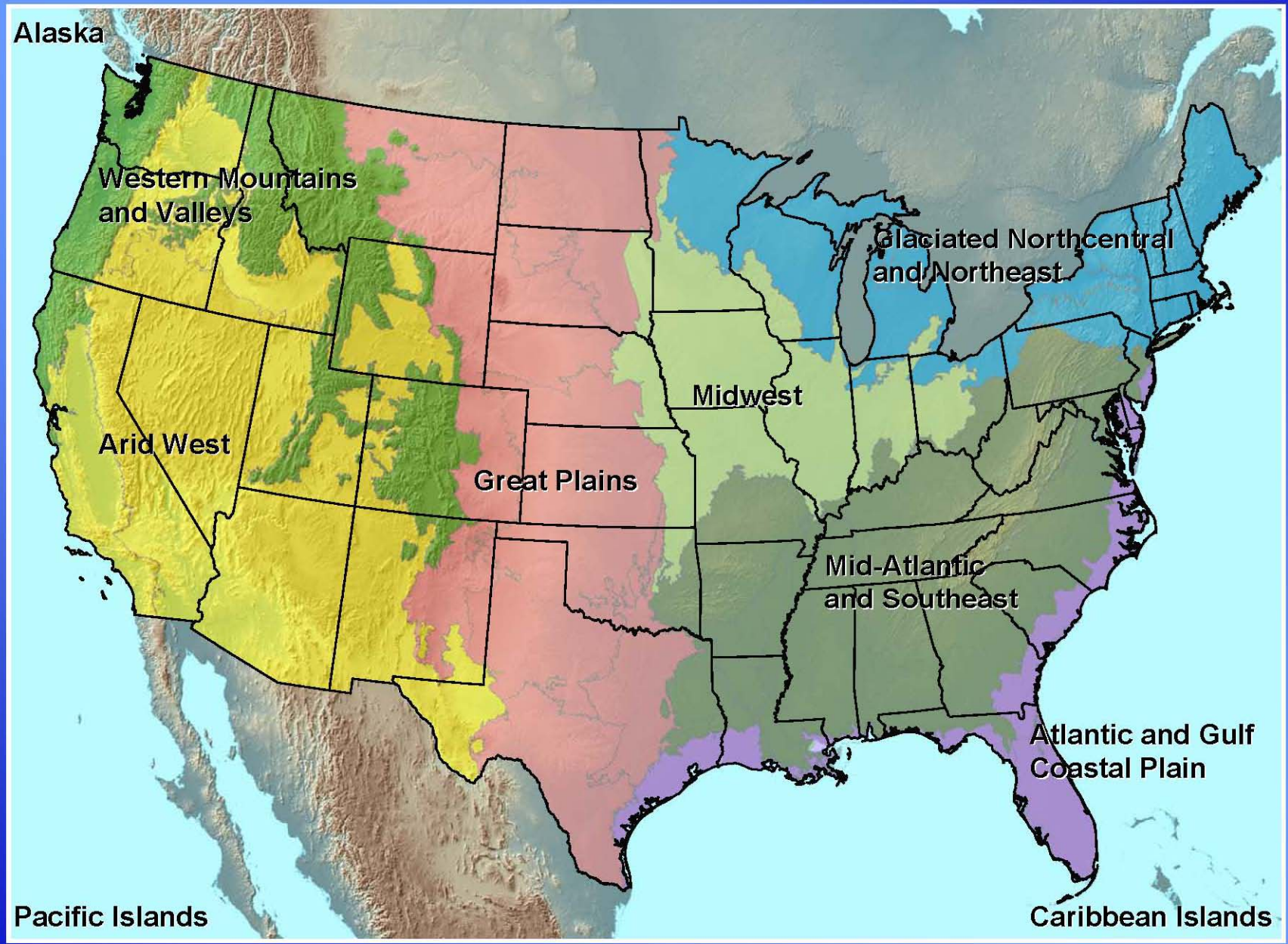
In cooperation with the National Technical Committee for Hydric Soils

US Army Corps of Engineers

Field Indicators of Hydric Soils in the United States

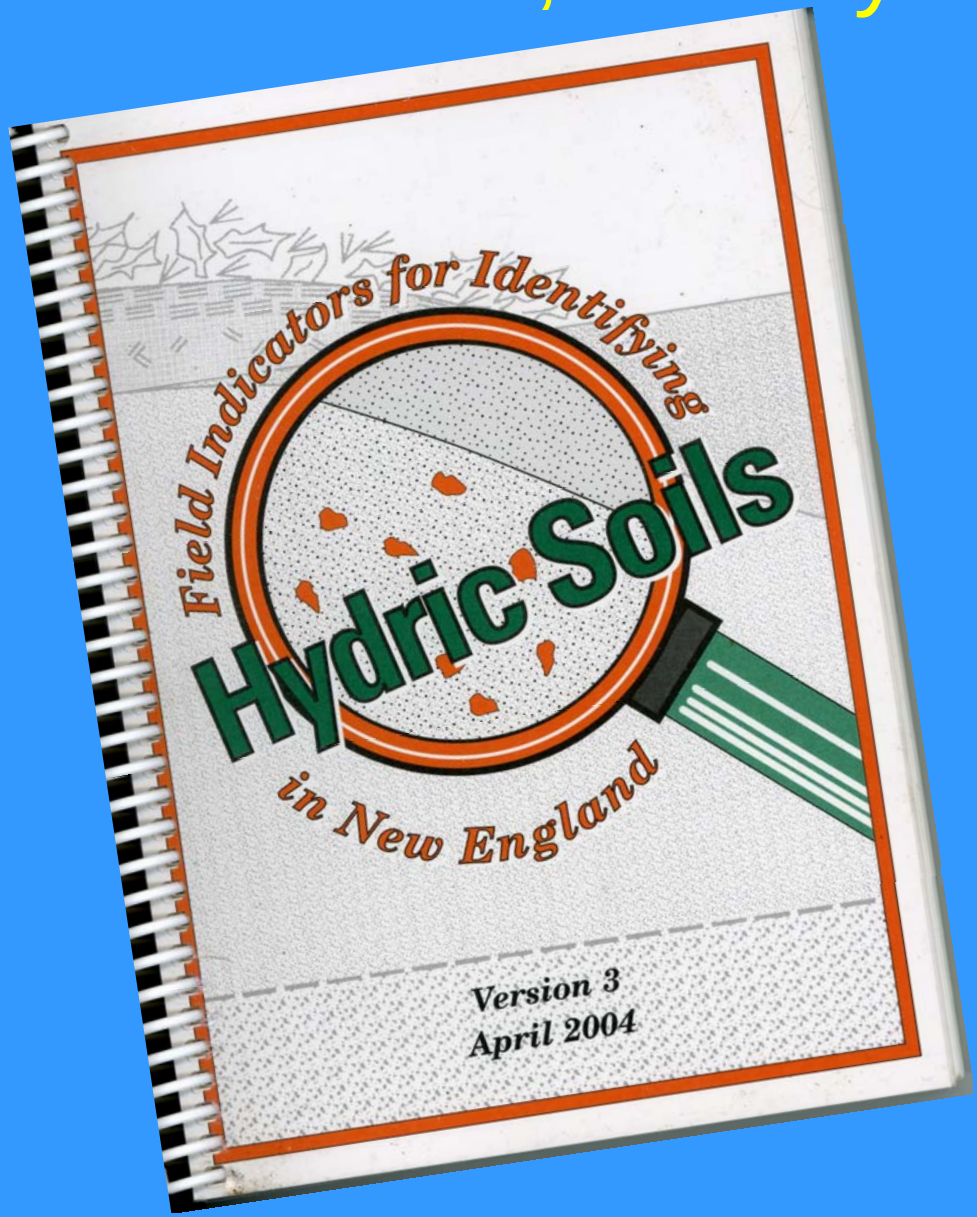
A Guide for Identifying and Delineating Hydric Soils, Version 6.0 (2006)

Wetland Delineation Regions

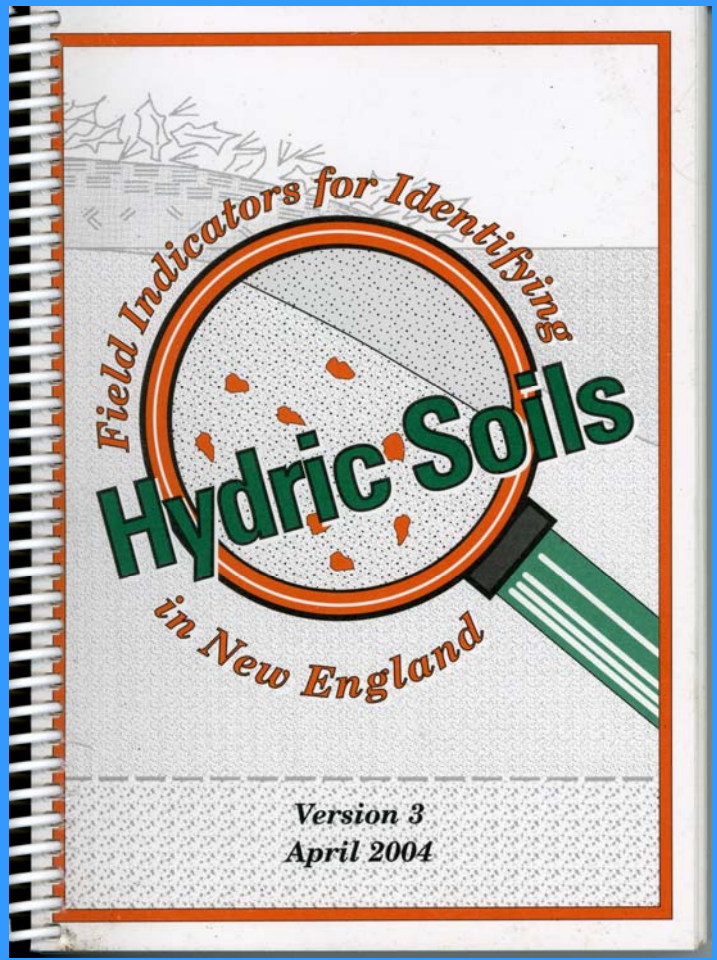


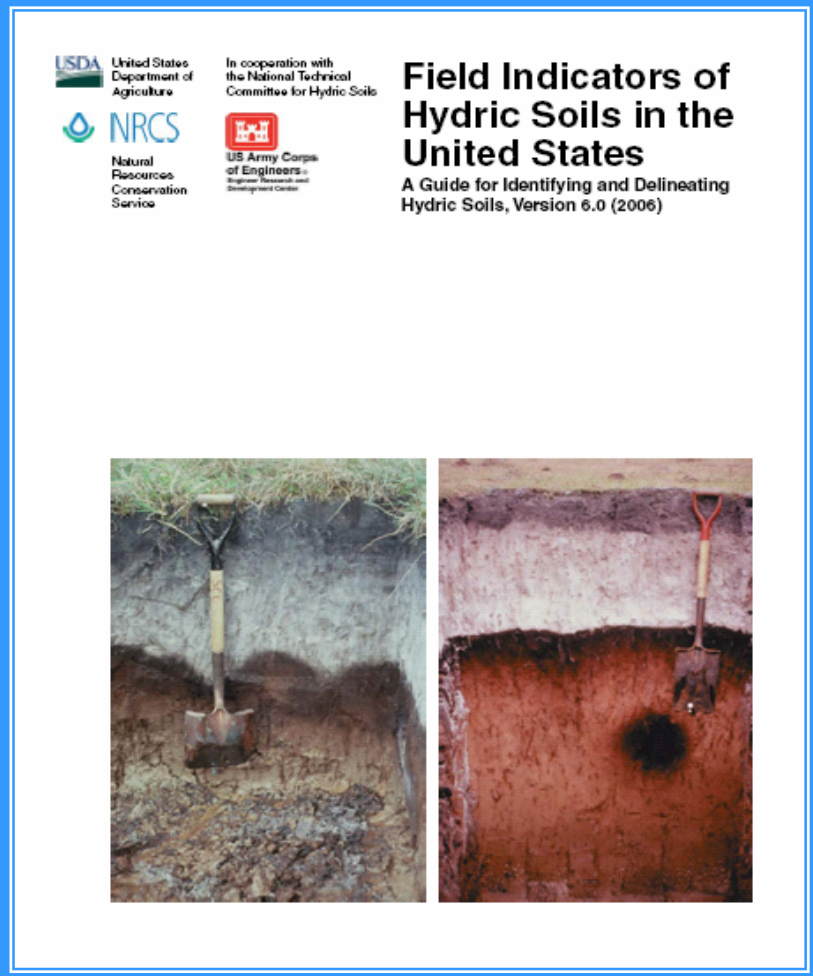
Old to some, new to you?

New to some, not to you?



The Opportunity





Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region

U.S. Army Corps of Engineers

U.S. Army Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

DRAFT Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region

U.S. Army Corps of Engineers

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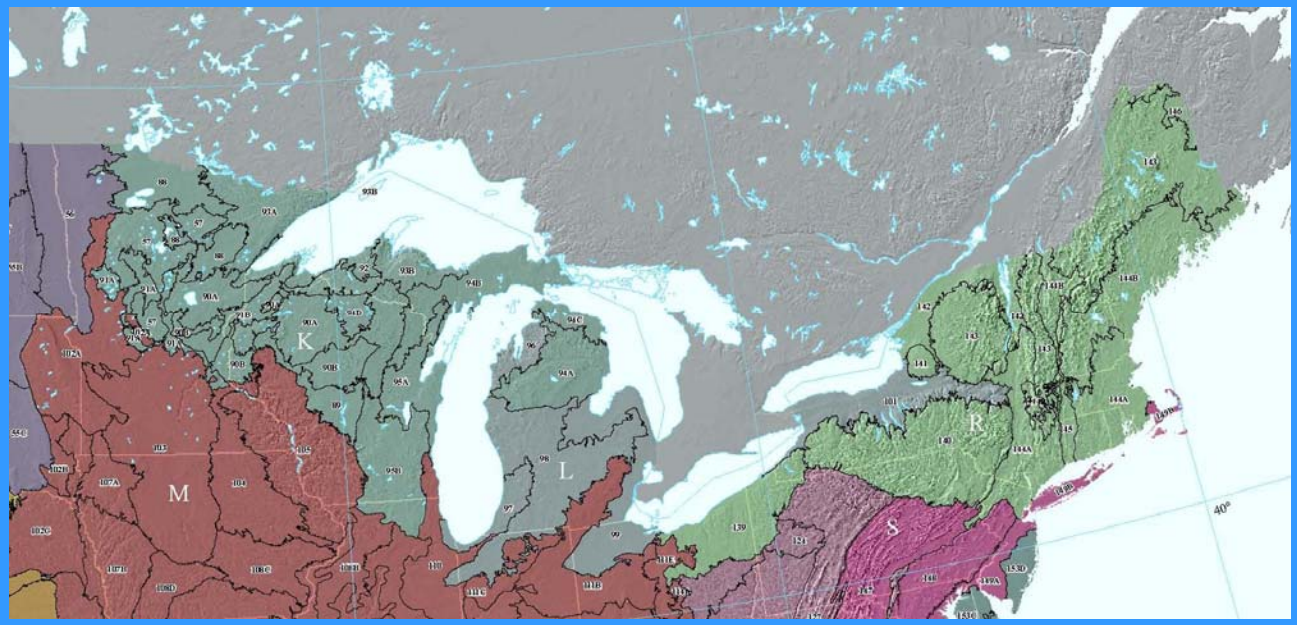
Regional Supplement



- Commonalities:
  - ‘Short’ Growing Season
    - Seasonal wetlands
  - Glaciated and Bedrock
    - Complexity of parent materials on surface and underground
    - Seepage areas, wet but….?
  - Spodosols
    - Sandy soils
  - Forested
    - Organic materials on uplands and wetlands
    - Acidic bogs, evergreen trees and shrubs

Contents

Table 4-1. List of wetland hydrology indicators for the Great Plains		
Indicator	Category	
	Primary	Secondary
Group A – Observation of Surface Water or Saturated Soils		
A1 – Surface water	X	
A2 – High water table	X	
A3 – Saturation	X	
Group B – Evidence of Recent Inundation		
B1 – Water marks	X	
B2 – Sediment deposits	X	
B3 – Drift deposits	X	
B4 – Algal mat or crust	X	
B5 – Iron deposits	X	
B7 – Inundation visible on aerial imagery	X	
B9 – Water-stained leaves	X	
B11 – Salt crust	X	
B13 – Aquatic invertebrates	X	
B6 – Surface soil cracks		X
B8 – Sparsely vegetated concave surface		X
B10 – Drainage patterns		X
Group C – Evidence of Recent Soil Saturation		
C1 – Hydrogen sulfide odor	X	
C2 – Dry-season water table	X	
C4 – Presence of reduced iron	X	
C7 – Thin muck surface	X	
C3 – Oxidized rhizospheres along living roots		X
C8 – Crayfish burrows		X
C9 – Saturation visible on aerial imagery		X
C11 – Frost-heave hummocks		LRR F
Group D – Evidence from Other Site Conditions or Data		
D2 – Geomorphic position		X
D5 – FAC-neutral test		X
D8 – Local soil survey data		X

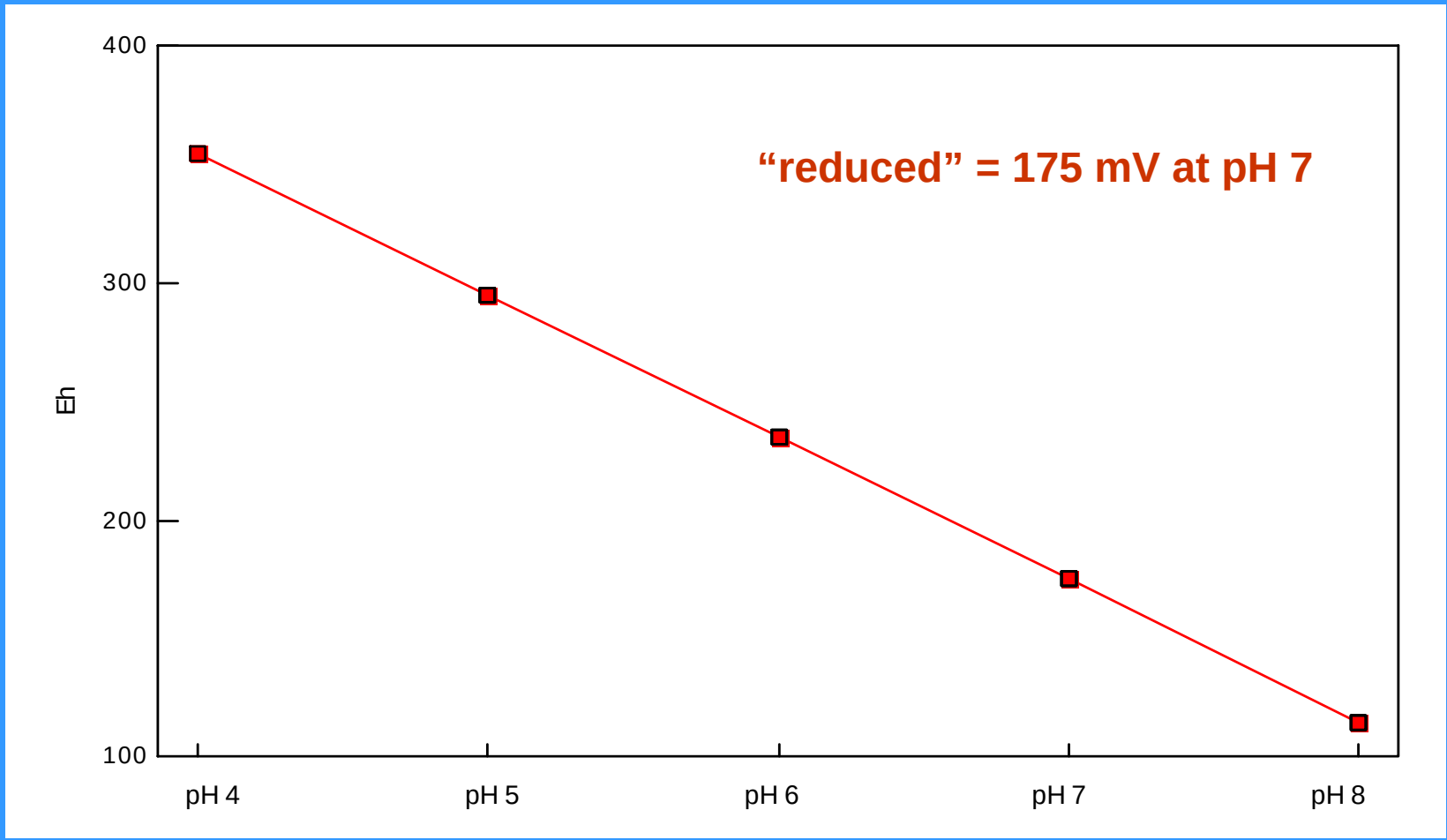
Definition of a Hydric Soil

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

Hydric Soil Identification

- Field Indicators
  - the preferred method based on observable soil morphology (soil color, organic layers, etc.)
- Hydric Soil Criteria
  - database search of estimated soil properties
    - designed to generate a list of soils that are likely to be hydric
- Monitoring Data
  - used with technical standard for sites with no observable hydric morphology

Eh/pH Line (-60) for Determining Aerobic or Anaerobic Conditions

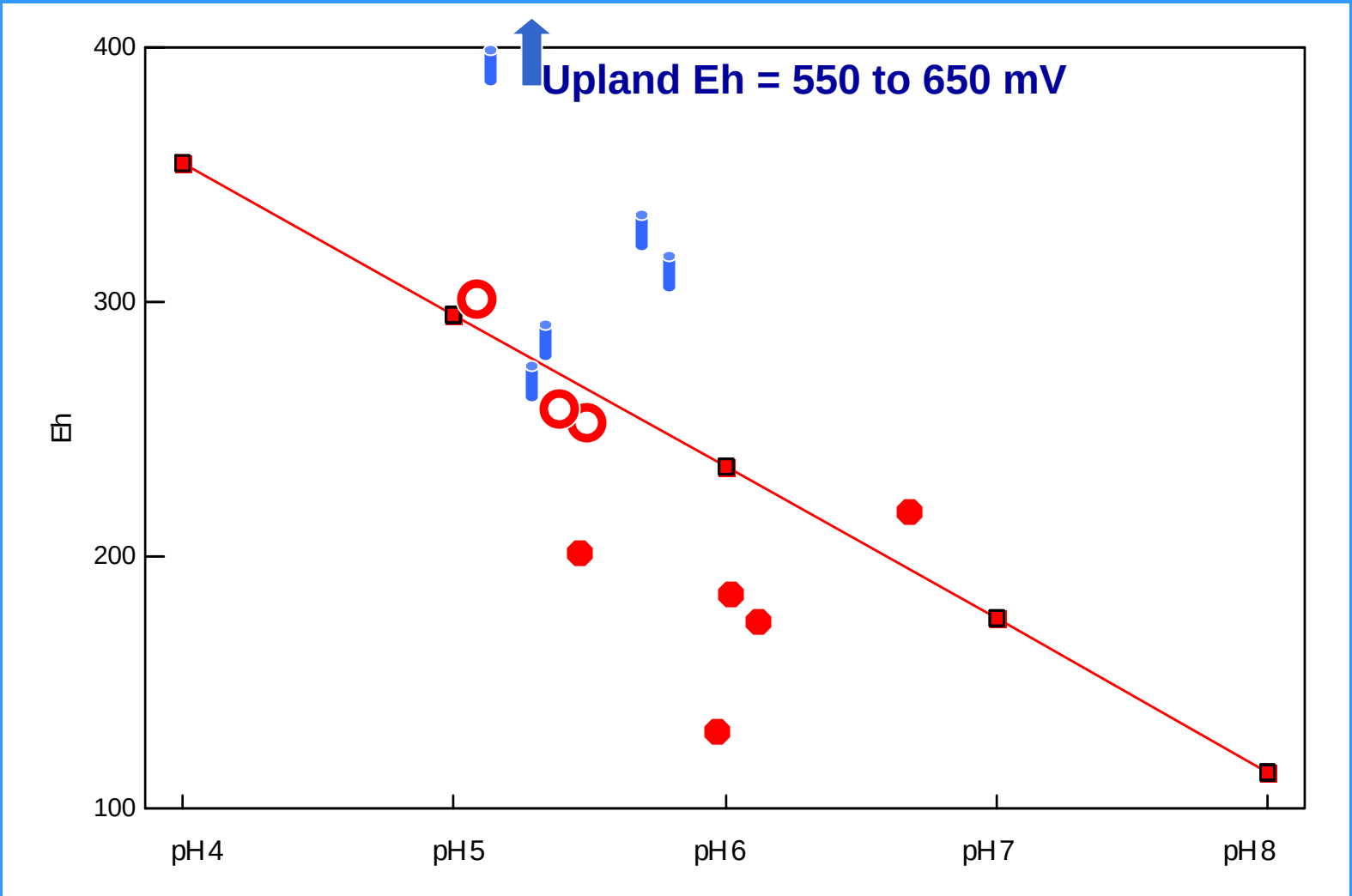


Source: NTCHS Technical Standard for Hydric Soils

α, α -Dipyridyl

- A dye used to test for the presence of reduced Fe
  - pink reaction to Fe^{+2}
  - dye sensitive to light and heat
  - apply to freshly broken open soil ped

α, α -Dipyridyl Data



New Technique - IRIS Tubes

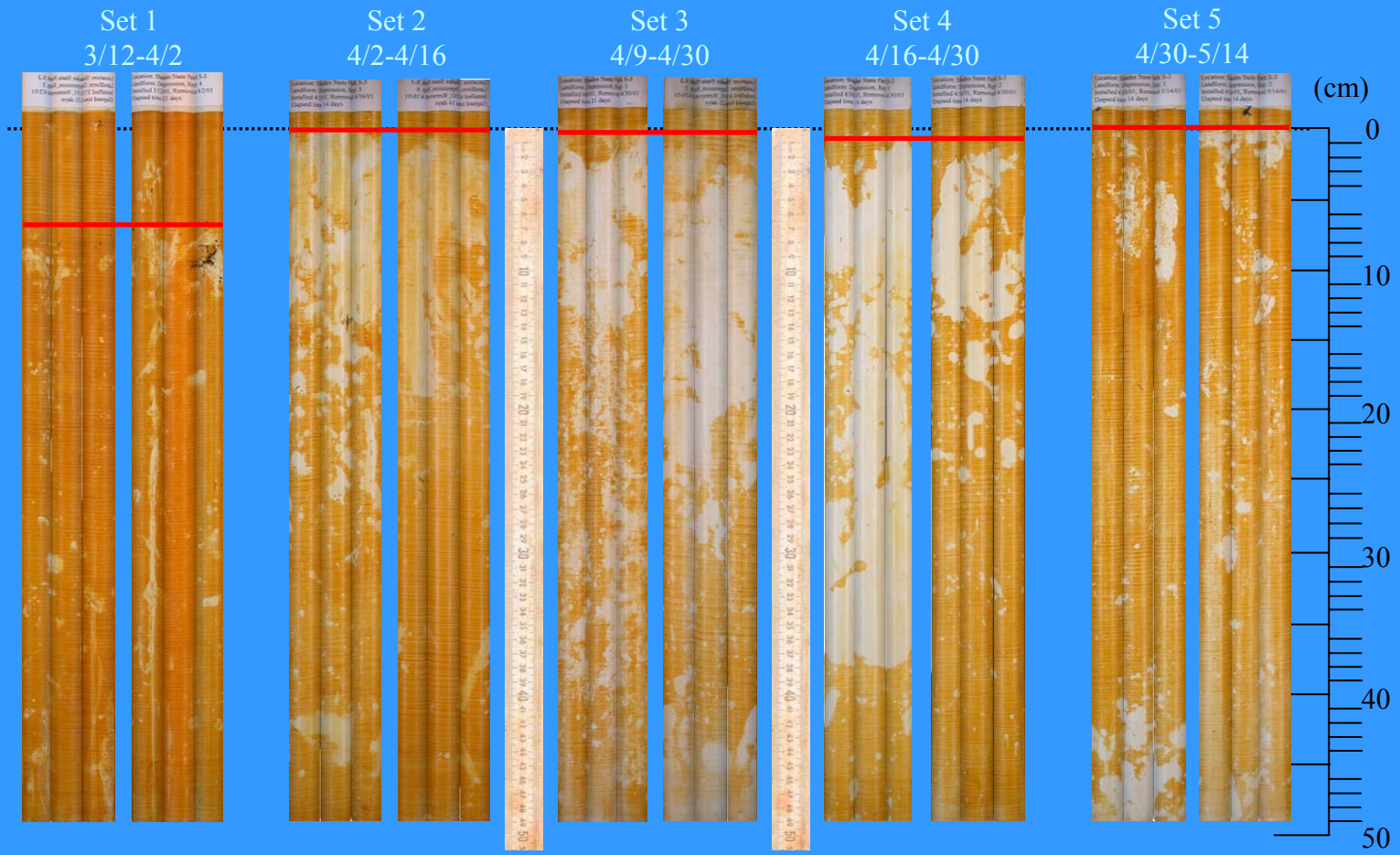
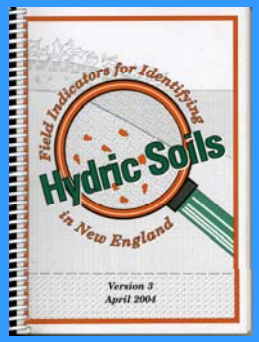


Figure 27. Images of IRIS tubes from Washtenaw soil, Shades State Park. Depth to anaerobic microbial reduction of Fe is indicated by horizontal red line on each tube. Dotted line represents the soil surface.

The ‘Professional Judgment’ Clause

- The indicators are used to help identify the hydric soil component of wetlands; however, some hydric soils do not have any of the currently listed indicators. The absence of any listed indicator does not preclude the soil from being hydric. Guidance for identifying hydric soils that lack indicators can be found in chapter 3 (see the sections on documenting the site and its soils) and in Chapter 5 (Difficult Wetland Situations in the Region).



What's the Diff.?

- NE – A key, wet to dry
- Grassroots NE development
- Uses multiple morphologies
- Includes what some might refer to as 'faculatative' indicators
  - Chroma 3 the sticky point
- NTCHS – A key, hydric or ?
- National in scope
- Most based on single morphology
- Uses tried and true 2 chroma or less

Ch. 5 Difficult Wetland Situations

- This chapter provides guidance for making wetland determinations in difficult-to-identify wetland situations.
- **Problem Area wetlands** are defined as naturally occurring wetland types that periodically lack indicators of hydrophytic vegetation, hydric soil, or wetland hydrology due to normal seasonal or annual variability.
- In addition, some Problem Area wetlands may permanently lack certain indicators due to the nature of the soils or plant species on the site.
- **Atypical Situations** are defined as wetlands in which vegetation, soil, or hydrology indicators are absent due to recent human activities or natural events.
- In addition, this chapter addresses certain procedural problems (e.g., wetland/non-wetland mosaics) that can make wetland determinations difficult or confusing. The chapter is organized into the following sections:
- 1. Problematic Hydrophytic Vegetation
- 2. Problematic Hydric Soils
- 3. Wetlands that Periodically Lack Indicators of Wetland Hydrology
- 4. Wetland/Non-Wetland Mosaics

Problematic Hydric Soils

- **Soils with Faint or No Indicators**
  - **Fluvial Sediments within Floodplains.**
  - **Recently Developed Wetlands.**
  - **Seasonally Ponded Soils.**
    - Vernal pools
    - Seasonally saturated slopes
  - **Red Parent Material.**
    - Mesozoic sediments in CT Valley
    - Brimfield / Brookfield Schist?
  - **Black Parent Material.**
    - Carboniferous till
  - **The Big Question in the Region**
    - What the heck can we use to separate hydric from upland Spodosols????
    - What works in the SSSSNE area does not work in the MAPSS area and vice versa

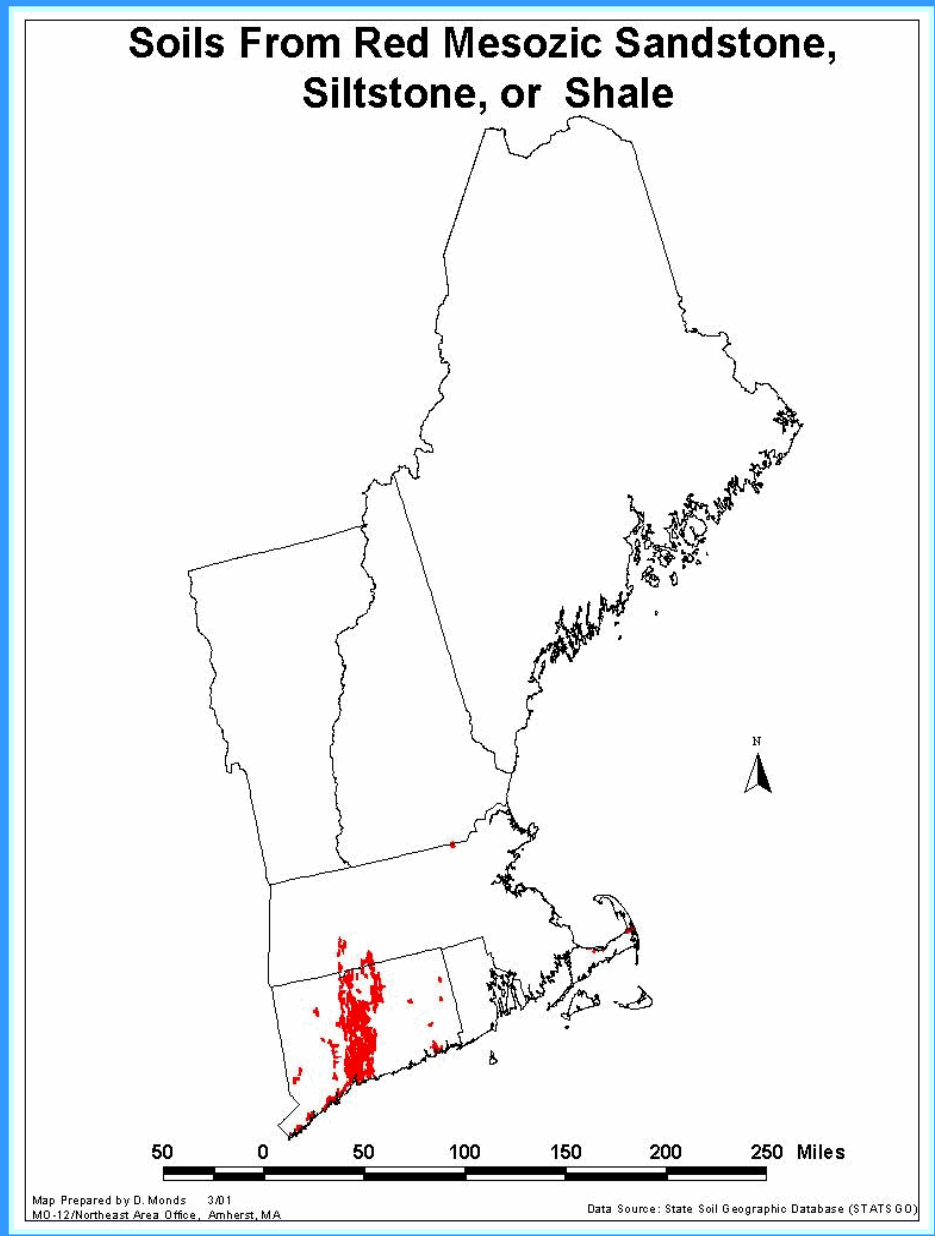
Schedule of Regional Supplements

	Target Date For Publication
Alaska	2006
Arid West	2006
Western Mountains, Valleys & Coast	2007
Great Plains	2007
Midwest	2008
Atlantic and Gulf Coastal Plain	2008
Northcentral and Northeast	2009
Caribbean Islands	2009
Mid-Atlantic and Southeast	2010
Hawaii / Pacific Islands	2010

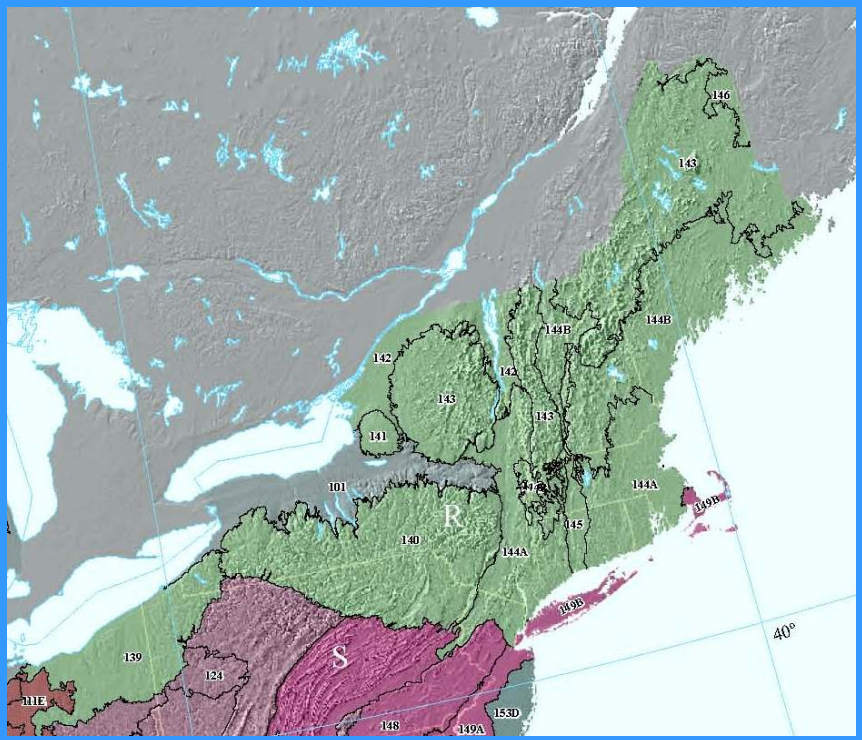
What Are We Doing About It?

Red Parent Material

- STATSGO generated problem soil maps on NEIWPCC web site
  - Shows Indicator Series
    - Cheshire, Wethersfield, Ludlow, Wilbraham, Menlo, Gaylesville
  - Smallest polygon is several hundred acres
  - Test indicator TF2 added to Version III



New England MLRA's



R NORTHEASTERN FORAGE AND FOREST REGION

139	Lake Erie Glaciated Plateau
140	Glaciated Allegheny Plateau and Catskill Mountains
141	Tughill Plateau
142	St. Lawrence-Champlain Plain
143	Northeastern Mountains
144A	New England and Eastern New York Upland, Southern Part
144B	New England and Eastern New York Upland, Northern Part
145	Connecticut Valley
146	Aroostook Area

Hydric or Not?