

Updating the Soils Section of the
Corps of Engineers Wetlands
Delineation Manual
January 1987

A Comparison

Steven Carlisle
Soil Scientist
U.S. Department of Agriculture
Natural Resources Conservation Service



In cooperation with the National Technical Committee for Hydric Soils



Natural Resources Conservation Service



US Army Corps of Engineers
Engineer Research and Development Center

Field Indicators of Hydric Soils in the United States

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



US Army Corps of Engineers
Waterways Experiment Station

Wetlands Research Program Technical Report Y-87-1 (on-line edition)

Corps of Engineers Wetlands Delineation Manual

by Environmental Laboratory



January 1987 - Final Report

Approved For Public Release: Distribution is Unlimited



The Hydric Soil Indicators are organized by Region



USDA Land Resource Regions

- The Hydric Soil Indicators are further organized into categories that apply to “all soils”, “sandy soils” and “fine soils”.
- The Hydric Soil Indicators are **dynamic**, proposed indicators with suitable documentation are accepted for testing.

The Following USACE Indicators for non-sandy soils are not in the Field Indicators

- 44 d. Aquic or paraquic moisture regime
- 44 e. Reducing soil conditions
- 44 g. Soil appearing on hydric soils list
- 44 h. Iron and manganese concretions

The Following USACE Indicators for sandy soils are not in the Field Indicators

- 45 a. High Organic Matter Content in the Surface Horizon
- 45 b. Streaking of Subsurface Horizons by Organic Matter
- 45c Organic Pans

No Change-The Following USACE Indicators are in the “All Soils” Section of the Field Indicators

- 44 a. Organic soils (Histosols)
- 44 b. Histic Epipedon
- 44 c. Sulfidic Materials

USACE Indicator -44 d. Soil Colors Similar to Field Indicator F3

For use in all LRR's except W,X and Y. A layer that has a depleted matrix with 60 percent or more of chroma of 2 or less and that has a minimum thickness of either:

- a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15 cm(6 inches) of the soil or
- b. 15 cm (6 inches) starting within 25 cm (10 inches) of the soil surface.

Depleted matrix:

Matrix value 5 or more, chroma 1 or less, w/wo redox concent.

Matrix value 6 or more, chroma 2 or less, w/wo redox concent.

Matrix value 4 or 5, chroma 2 and 2 % or more dist or prom redox con.

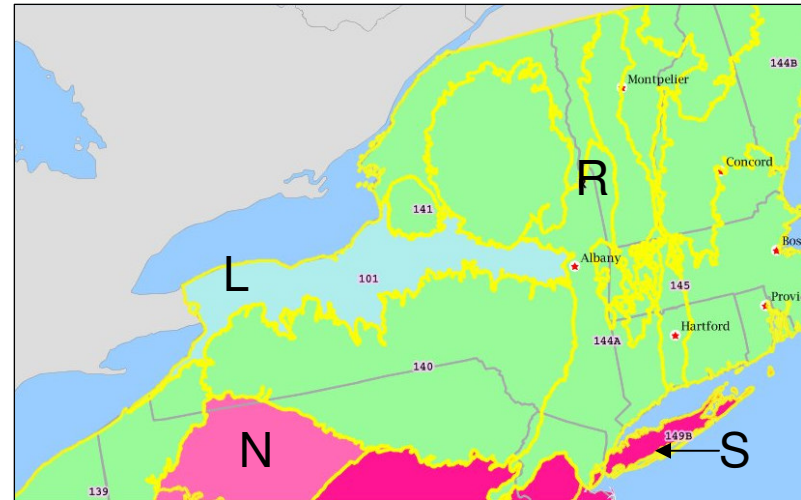
Matrix value of 4 and chroma of 1 and 2% or more dist or prom redox con.

Points of Emphases

- Dig a proper hole (20 inches is prescribed)
- In LRR Region R, except for A1, A2, and A3 the control section begins at the mineral surface.
- In LRR Region L, except for A1, A2 and A3 the control section begins beneath any fibric or hemic material at the muck or mineral surface.

Land Resource Region (LRR) R

All soils: A1, A2, A3, A4, A5,
A10(testing), A11, A12

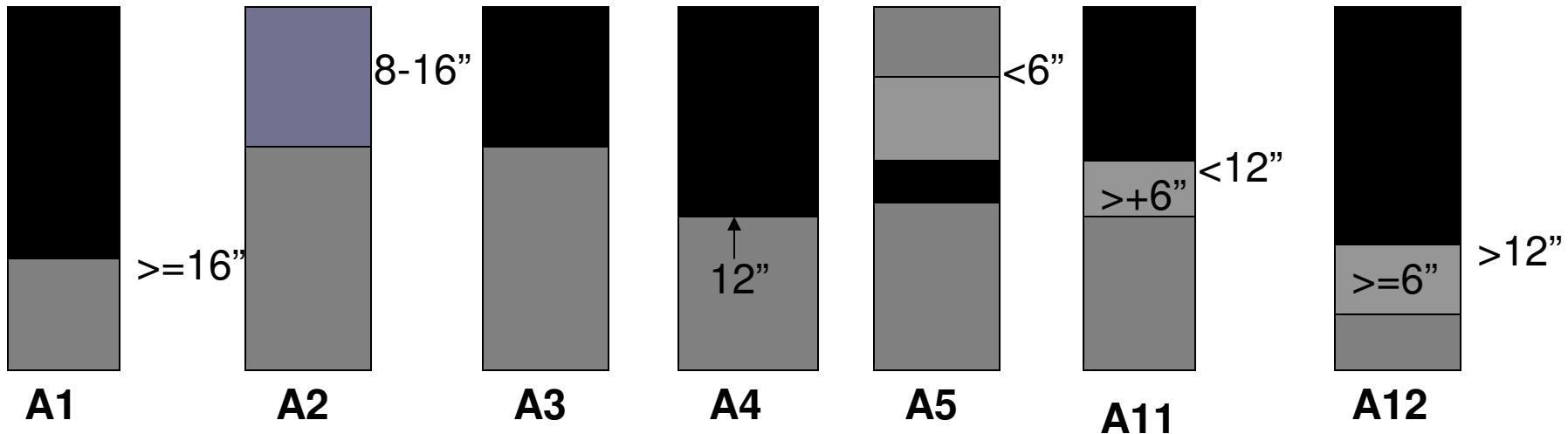


Land Resource Region (LRR) L

All soils: A1, A2, A3, A4, A5, A11,
A12

All Soils

H₂S



A1, Histosol, ≥ 16 inches of OM

A2, Histic, 8-16 inches of OM, artificial drainage or aquic conditions required

A3, Black Histic, 8-16 inches of $\leq 3/1$ OM

A4, Hydrogen sulfide smell in upper 12 inches.

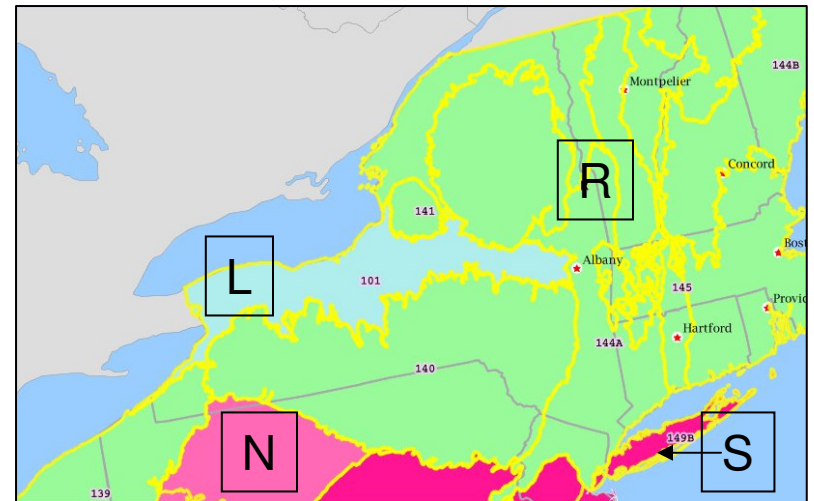
A5, Stratified layers, Several stratified layers starting w/in 6", one or more having color $\leq 3/1$ and is OM or MMM, other layers have chroma ≤ 2 .

A11, Depleted Below Dark Surface. Depleted or gleyed matrix layer, ≥ 6 " thick starting w/in 12" of surface (≥ 2 " if fragmental). Layer above must be $\leq 3/2$ if loamy, or $\leq 3/1$ if sandy.

A12, Thick Dark Surface. ≥ 6 " depleted/gleyed layer starting below 12", the layer above must be $\leq 2.5/1$ to 12" and $\leq 3/1$ for remainder.

Land Resource Region (LR) R

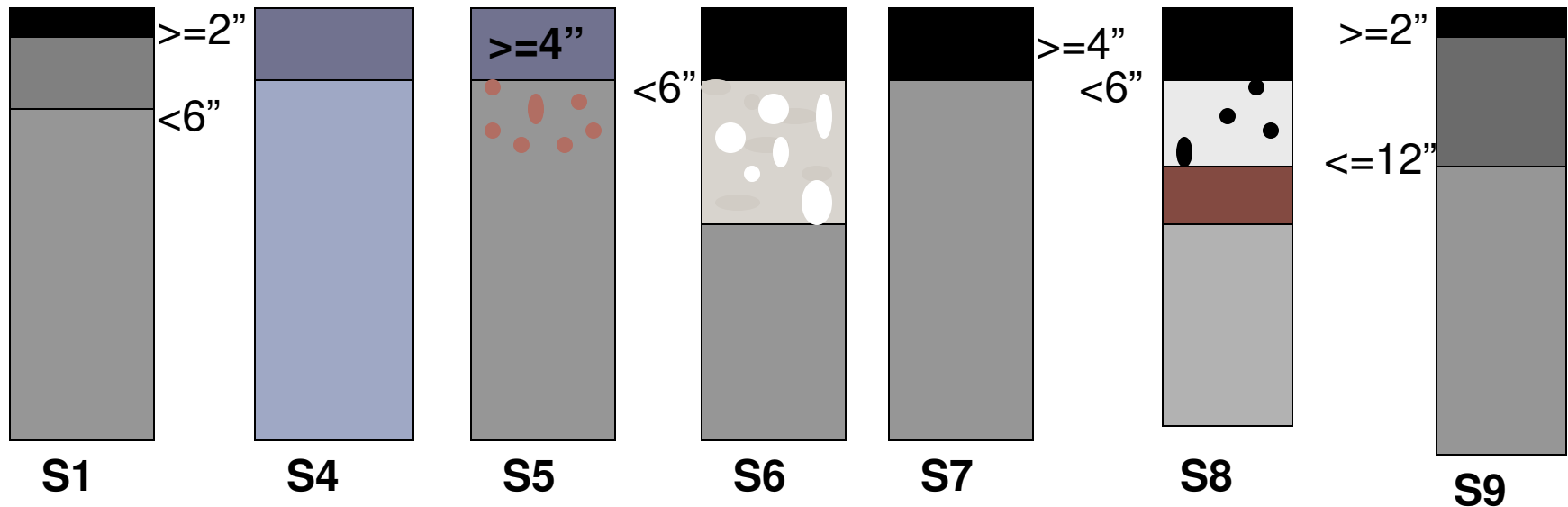
Sandy Soils S1, S3(testing), S4, S5, S6, S7, S8, S9



Land Resource Region (LRR) L

Sandy Soils S1, S4, S5, S6, S8 (testing), S9 (testing)

Sandy Soils



S1, Sandy Mucky Mineral. MMM layer $\geq 2''$ thick, starting within 6''

S4, Sandy Gleyed Matrix. Gleyed matrix within 6''

S5, Sandy Redox. $\geq 4''$ layer starting within 6'' with $\geq 60\%$ \leq chroma 2 and $\geq 2\%$ redox conc.

S6, Stripped Matrix, stripped layer starting within 6'' with faint splotches of fe/om removal and deposition. Stripped areas $\geq 10\%$ of matrix.

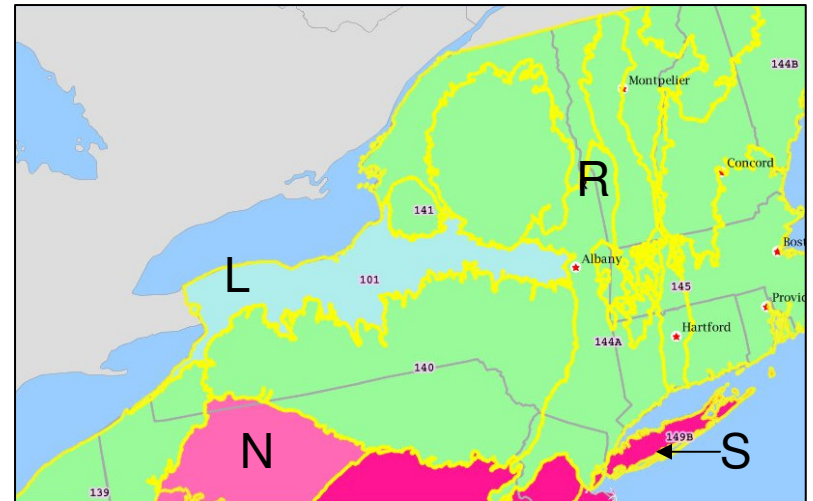
S7, Dark Surface, $\geq 4''$ $\leq 3/1$ layer starting within 6'', over chroma ≤ 2 layer.

S8, Polyvalue Beneath Dark Surface, $\leq 3/1$ layer starting $< 6''$ over $\geq 4/1$ layer with $\geq 5\%$ $\leq 3/1$ translocated om splotches. $\geq 4/1$ layer extends to the first, 12'' or spodic horizon.

S9, Thin Dark Surface, $\geq 2''$ $\leq 3/1$ layer within top 6'' over a $\leq 4/1$ layer to 12'' or spodic horizon.

Land Resource Region (LRR) R

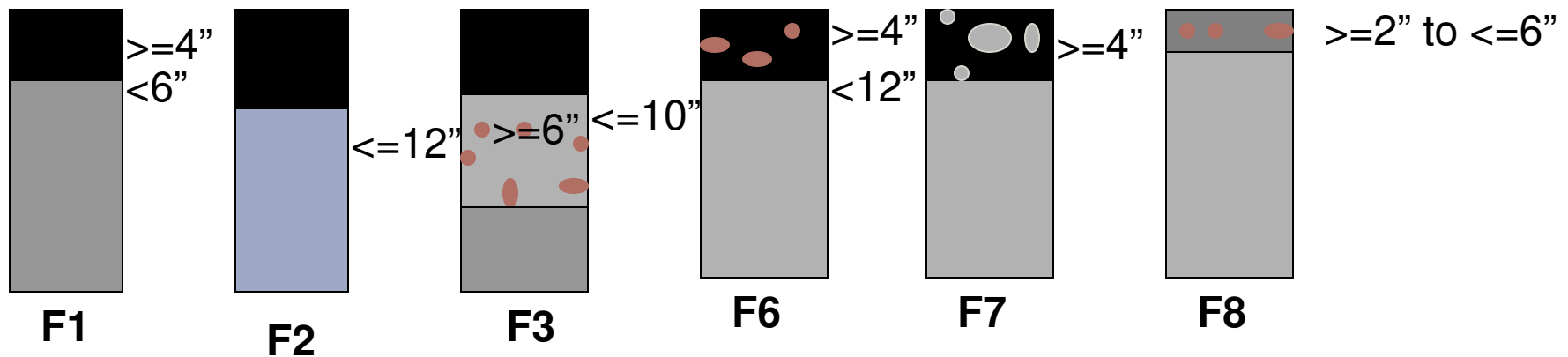
Loamy and Clayey Soils F2, F3, F6, F7, F8



Land Resource Region (LRR) L

Loamy and Clayey Soils F1, F2, F3, F6, F7, F8

Loamy and Clayey Soils



F1, Loamy Mucky Mineral, MMM layer $\geq 4''$, starting within upper $6''$.

F2, Loamy Gleyed Matrix, gleyed matrix starting within 12 inches.

F3, Depleted Matrix, $\geq 2''$ depleted matrix entirely within upper $6''$ or $\geq 6''$ depleted matrix beginning within 10 inches.

F6, Redox Dark Surface, Layer $\geq 4''$ within top $12''$ that is $\leq 3/1$ with $\geq 2\%$ redox concn, or is $\leq 3/2$ with $\geq 5\%$ redox concn.

F7, Depleted Dark Surface, Redox depletions with value of ≥ 5 and chroma of ≤ 2 in a layer entirely within top $12''$ that is ≥ 4 inches. If the layer has matrix of $\leq 3/1$ there must be ≥ 10 depletions, if matrix is $\leq 3/2$ there must be ≥ 20 depletions.

F8, Redox Depressions, closed depressions subject to ponding, ≥ 2 inch layer entirely within top $6''$, that has $\geq 5\%$ redox concn.

Some important web addresses

Field Indicators of Hydric Soils from the web.

<http://www.soils.usda.gov/use/hydric>

Mid-Atlantic Hydric Soils

www.epa.gov/reg3esd1/hydricsoils/index.htm

Web Soil Survey from the Web.

<http://www.soils.usda.gov>

Land Resource Regions and Major Land Resource Areas:

<http://www.cei.psu.edu/mlra>