Hydric Soil Documentation

Development of Hydric Soils

Inundation or soil saturation

↓

Anaerobic conditions

↓

Chemical reduction (Fe, Mn, etc.)

↓

Distinctive soil characteristics

Typical Colors of Mineral Hydric Soils

- Matrix chroma of 2 or less in mottled soils.
- Matrix chroma of 1 or less in unmottled soils.
- Value $\geq$ 4
- Measured immediately below the A-horizon or at 10 inches, whichever is shallower.

Using Color for Sandy Soils

- High-value, low-chroma colors in sands are often due to parent material and do not indicate wetness.
- However, redox features in sands may indicate hydric soils (see NTCHS Field Indicators).

SOIL Sampling Point: Field 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					SIL	
8-16	2.5Y 5/2	85	7.5YR 5/8	15	C	M	SICL	C2P redox
16-24	5Y 5/2	70	7.5YR 5/8	30	C	PL & M	CL	M3P redox features

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Soil map unit is Palms muck. This description is of a Colwood silt loam inclusion

Describing Redoximorphic Features

- Concentrations and Depletions
  - Describe type, color, abundance and location (i.e., along macropores or within matrix)
    - contrast can be obtained from color charts
- Reduced Matrix
  - Describe reduced matrix color, oxidized color, and time for color change to occur
- alfa, alfa-Dipyridyl
  - Describe % of soil that reacts and location

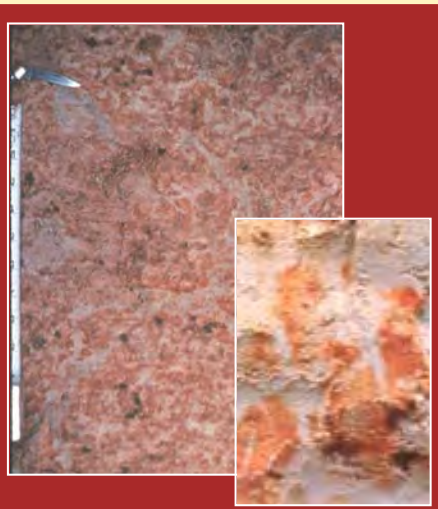
Redox Concentrations

Bodies of apparent accumulation of Fe-Mn oxides

- Masses
- Pore Linings
  - ped faces
  - root channels
- Nodules and Concretions

Masses

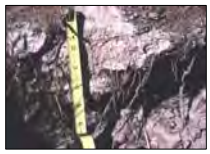
- soft bodies
- frequently in the soil matrix
- variable in shape
- can often be removed from the soil intact



Pore Linings

Coatings on a pore surface

Impregnations of the matrix adjacent to the pore



Pore Linings

Ped Faces

Redox Depletions

Bodies of low chroma where Fe/Mn oxides have been stripped out

- generally value ≥4
- chroma ≤2
- formerly called "gray mottles"

Depleted Matrix

Dominant color of the soil is “gray”

Commonly used to identify hydric soils

Discussed more in hydric indicators section

Depleted Matrix

Value ≥5 chroma 1,

Value ≥6, chroma 2

with or without redox concentrations

4/1, 4/2, 5/2 with ≥2%

redox concentrations

Figure A1. Illustration of values and chromas that require 2 percent or more distinct or prominent redox concentrations and those that do not, for hue 10YR, to meet the definition of a depleted matrix. *Due to inaccurate color reproduction, do not use this page to determine soil colors in the field.* Background image from the Munsell Soil Color Charts reprinted courtesy of Munsell Color Services Lab, a part of X-Rite, Inc.

Gleyed Matrix

Gley Pages

Value 4 or more

Figure A2. For hydric soil determinations, a gleyed matrix has the hues and chroma identified in this illustration with a value of 4 or more. *Due to inaccurate color reproduction, do not use this page to determine soil colors in the field.* Background image from the Munsell Soil Color Charts reprinted courtesy of Munsell Color Services Lab, a part of X-Rite, Inc.

Reduced Matrix

Soils have high value, low chroma in situ but color changes when exposed to air

- reduced Fe is present
- Fe^{+2} (ferrous iron) is oxidized to Fe^{+3} (ferric iron) upon exposure to oxygen

a, a’ - 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

Off-site Wetland Determination Procedures on Agricultural Lands

Agricultural Lands

Lands intensively used and managed for the production of food and fiber. Examples are cropland, hayland and pastures, including native pastures and rangeland, orchards, vineyards, areas that support wetland crops (e.g., cranberries or rice), other lands used to produce or support the production of livestock, and small tree farms.

Off-Site Methods

Available office data can be used:

- To provide background and supporting information to plan and carry out an on-site wetland delineation
- To determine presence of wetlands and draw approximate wetland boundaries when it is not possible to visit the site or when study objectives are limited

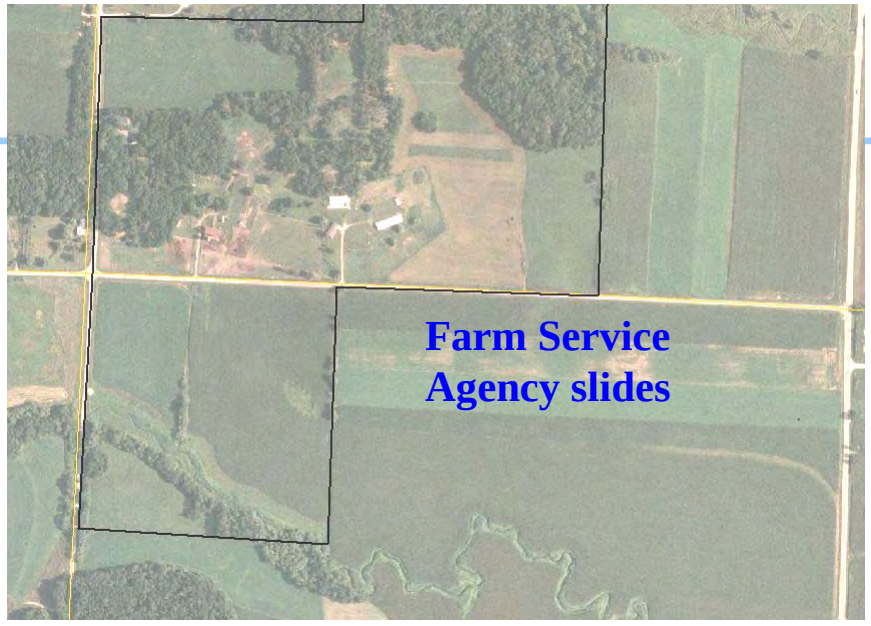
Off-site Mapping Conventions

- Based on field-tested correlations between off-site information and on-site wetland documentation
- Vary by state or region due to regional differences in wetland characteristics and availability of off-site data

Preliminary Data Gathering

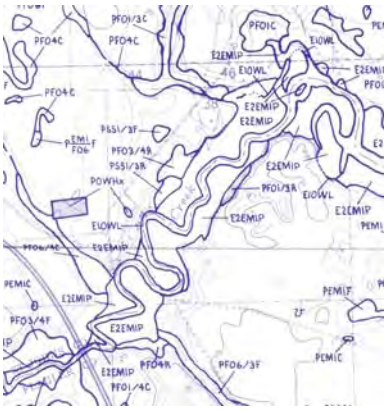
Off-site sources of information are used to plan and carry out an on-site investigation.

Infrared Aerial Photography



Preliminary Data Gathering

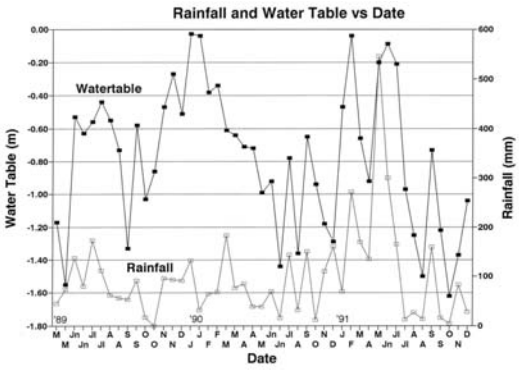
USGS topographic maps



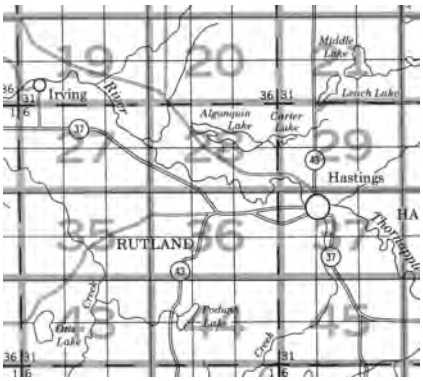
NWI & WDNR WWI maps

Preliminary Data Gathering

Hydrologic data (ground water well, stream gauge, rainfall, etc.)

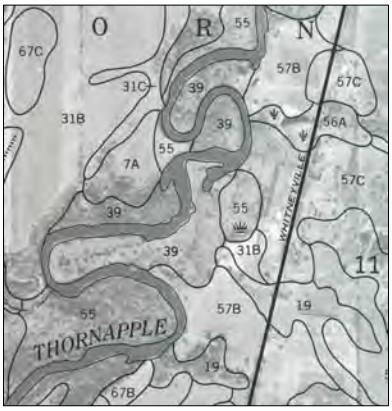


Use County Soil Surveys to Locate Hydric Soils



Index to map sheets

Soil map sheet



WEB SOIL SURVEY

Go to www.wi.nrcs.usda.gov

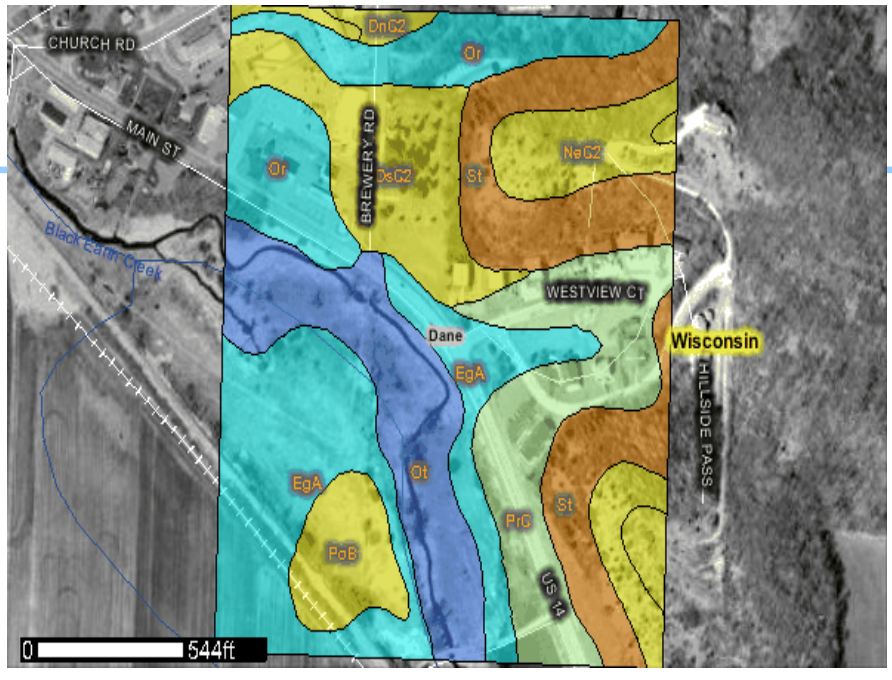
Click: Soils

- Web Soil Survey
- Start WSS
- PLSS (Township and Range)
  enter information (state, twp, range)
- View
- AOI (outline area - fill in “Name”)

WEB SOIL SURVEY

Click: Soil Map

- Soil Data Explorer
  - Soil Properties and Qualities
  - Soil Qualities and Features
  - Drainage Class
  - View Ratings



Mapping Conventions

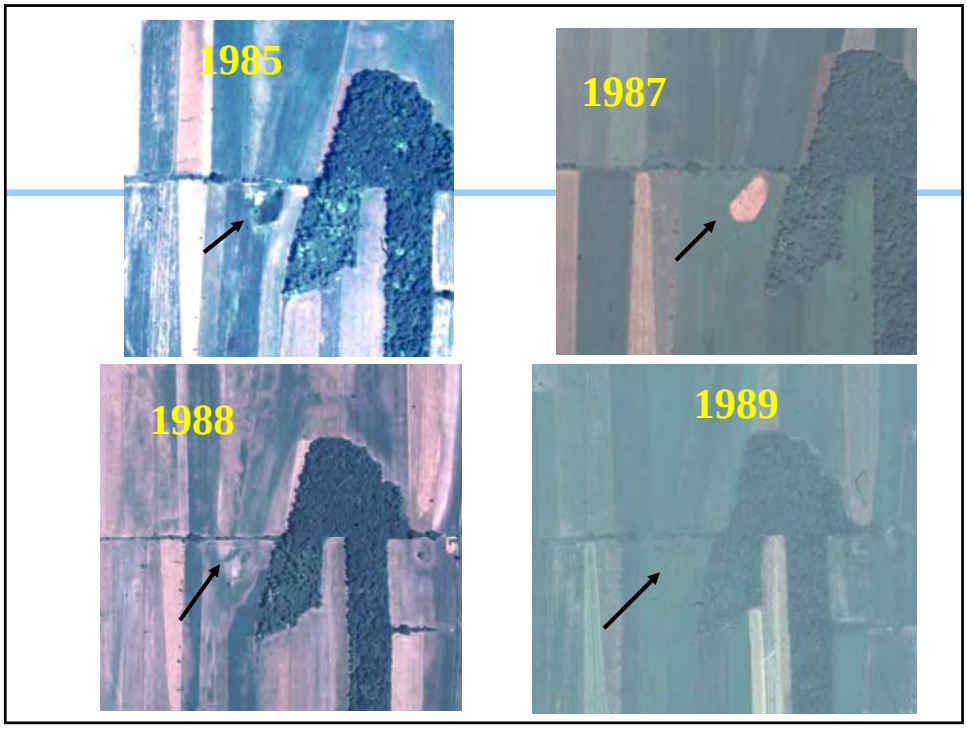
In general, mapping conventions require:

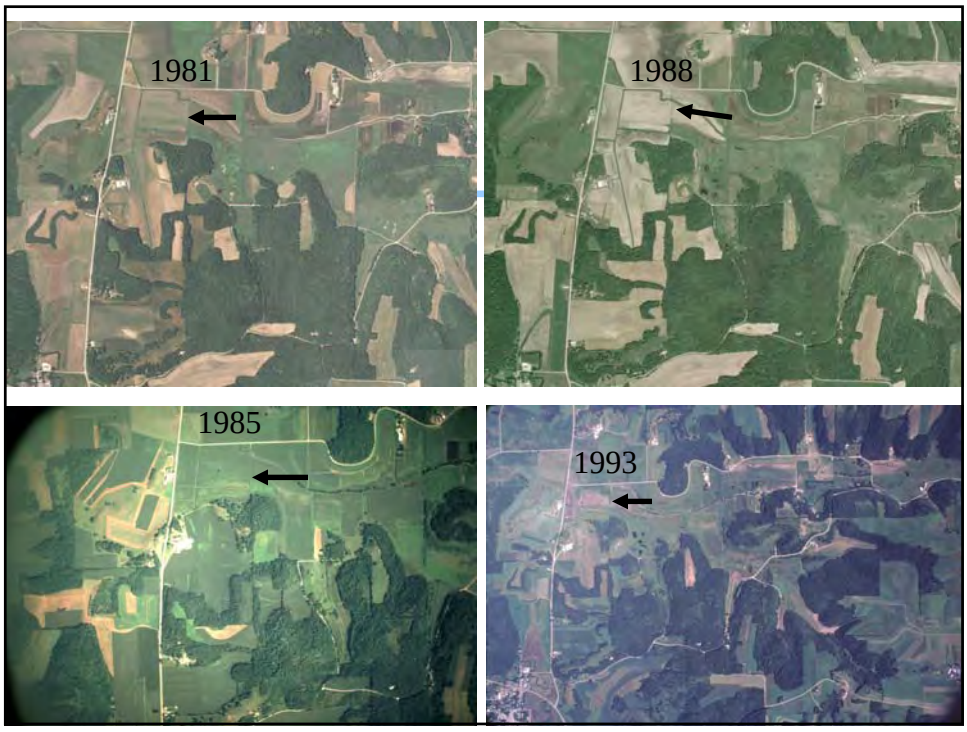
- ≥5 years of FSA slides, if available
- Years of normal precipitation, or equal numbers of wet and dry years
- Consideration of any unusual precipitation events preceding the dates of photography
- Evaluation of signatures that reflect long-term hydrologic conditions

Mapping Conventions

Wetness signatures include:

- Hydrophytic vegetation
- Surface water
- Saturated soils
- Flooded or drowned-out crops
- Stressed crops due to wetness


1985
1987
1988
1989


1981
1988
1985
1993

NRCS-CPA-32W
(6-9-06)

WETLAND DOCUMENTATION RECORD
Remotely Sensed Data Summary

Owner/Operator: _____ County: _____ State_____

Slide Reviewer: _____ Date: _____

Site Identification No. _____ - _____ (Tract No. + Site No.)

Farm Service Agency (or Other) Aerial Slide Data

Date (Mo./Yr)	Rainfall (in) +D/N/W (Apr-June ave. = _____)	Interpretation- (codes listed in box below)
Air Photo		

Y = Yes, signal indicates wetness (+ = strong, - = weak)
CR = cropped (row crop or tilled)
N = No wetness signature
NC = not cropped (hay, pasture, idle, etc.)

Feature	Color	Manipulation (year of installation)	Other
1 = water	6a = dark green	7a = ditched	write explanation
2 = mud flat	6b = light green	7b = tiled	
3 = bare spot	6c = yellow	7c = filled	
4 = drowned crop	6d = brown	7d = tree/brush removal	
5 = planted late	6e = black	8 = plowed/tilled	

Does slide/air photo data indicate the site is a wetland? ☐Yes ☐No

#_____ years out of #_____ years observed have wet (Y) signatures.

Site, Photo, Rainfall, & Signature Info

NRCS-CPA-32W
(6-9-06)

WETLAND DOCUMENTATION RECORD
Remotely Sensed Data Summary

Owner/Operator: _____ County: _____ State_____

Slide Reviewer: _____ Date: _____

Site Identification No. _____ - _____ (Tract No. + Site No.)

Farm Service Agency (or Other) Aerial Slide Data

Date (Mo./Yr)	Rainfall (in) +D/N/W (Apr-June ave. = _____)	Interpretation- (codes listed in box below)

“Y or N” and “CR or NC” required

Air Photo		

Y = Yes, signal indicates wetness (+ = strong, - = weak) **N** = No wetness signature
CR = cropped (row crop or tilled) **NC** = not cropped (hay, pasture, idle, etc.)

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Does slide/air photo data indicate the site is a wetland? ☐Yes ☐No

#_____ years out of #_____ years observed have wet (Y) signatures.

NRCS-CPA-32W
(6-9-06)

WETLAND DOCUMENTATION RECORD
Remotely Sensed Data Summary

Owner/Operator: _____ County: _____ State_____

Slide Reviewer: _____ Date: _____

Site Identification No. _____ - _____ (Tract No. + Site No.)

Farm Service Agency (or Other) Aerial Slide Data

Date (Mo./Yr)	Rainfall (in) +D/N/W (Apr-June ave. = 10.90)	Interpretation- (codes listed in box below)
8-81		N, CR
7-82		N, CR
7-83	N	N, CR
7-84	W	Y, CR, 2, 6d
7-85	N	N, CR, 6b, v. weak signature
86	N	Y-, CR, 6a
87	D	N, CR
88	D	N, CR
6-89	N	Y-, CR, 6d
7-90	W	Y-, CR, 6d → 6c
91	N	N, CR
7-92	D	N, CR
93	W	Y, CR, 2, 6d
7-95	N	N, CR
7-96	N	N, CR
Air Photo		

Do Signatures Indicate Crop Stress?

Air Photo		

Y = Yes, signal indicates wetness (+ = strong, - = weak) **N** = No wetness signature
CR = cropped (row crop or tilled) **NC** = not cropped (hay, pasture, idle, etc.)

Feature	Color	Manipulation (year of installation)	Other
1 = water	6a = dark green	7a = ditched	write explanation
2 = mud flat	6b = light green	7b = tiled	
3 = bare spot	6c = yellow	7c = filled	
4 = drowned crop	6d = brown	7d = tree/brush removal	
5 = planted late	6e = black	8 = plowed/tilled	

Does slide/air photo data indicate the site is a wetland? ☐Yes ☒No

#5/2 years out of #15/7 years observed have wet (Y) signatures. All years Normal Rainfall

FSA Photo Imagery

2003 FSA switched from 35 mm slides to digital imagery

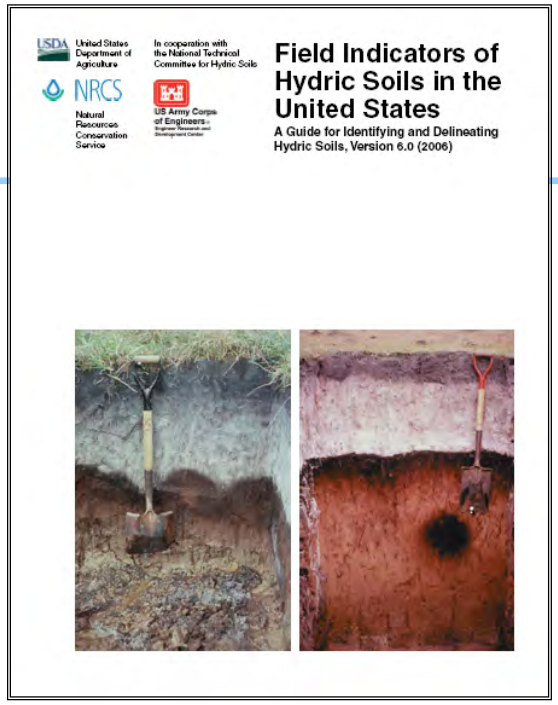
2003 & 2004 available at FSA State Office for $30 a CD

32 counties in 2004 and all counties in 2005 available for free download at www.wisconsinview.org

To acquire 2003-2005 imagery for GIS see http://www.fsa.usda.gov/wi/programs/programs.asp

2005 & 2008 imagery is the highest quality

To scan 35 mm slides from past years please call the FSA State Office first at 608-662-4422 ext. 139



Supplements adopt NTCHS Indicators.

'87 Manual soil indicators are no longer 'valid'

Introduction

- Field indicators are soil morphological features used to identify hydric soils
- The features result from soil genesis in the presence of "anaerobic conditions"
- They are used for on-site verification of hydric soils and are "test positive"
- The list of indicators is dynamic and are subject to revision with new research and field testing

Development of the Indicators

- Continuous process
  - ongoing since the mid-1980's
- Interagency
  - including universities, private sector, federal, state, and local agencies
- Multi-disciplinary
  - soil scientists, hydrologists, botanists
- Recent development
  - COE implementation

US Army Corps of Engineers
Engineer Research and Development Center

Field Indicators originated as

- Refinements of 1987 Indicators
  - Low Chroma Colors, Mottles
  - Gleyed Colors
  - "High" Organic Matter Content
  - Organic Streaking
  - Histosol, Histic epipedon
  - Sulfidic Material
- Address problem soils

Field Indicators only

- Corps 1987 Manual list of Indicators for hydric soil are no longer valid. They are addressed in specific Field Indicators
  - Low Chroma Colors, Redox (F3, F6, F7, A11)
  - Gleyed Colors (A11, A12, F2)
  - "High" Organic Matter Content (A10, F1, S1)
  - Organic Streaking (A5, S6)
  - Histosol, Histic epipedon (A1, A2,)
  - Sulfidic Material (A4)

Field Indicators of Hydric Soils in the U. S.

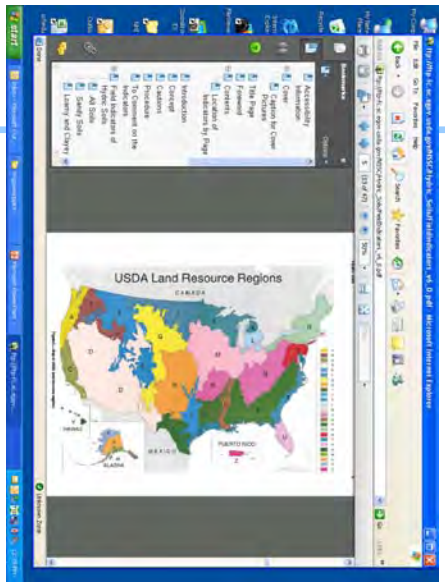
- Available on-line at www.nrcs.usda.gov

Click on Soils (left column, bottom)

Click on Hydric Soils (left column, top)

Click on Field Indicators of Hydric Soils v 6.0

Also check "Errata" for changes & updates



Control Sections or Zones

1) Layers with:
   - -high value, low chroma or;
   - -redoximorphic features or;
   - -organic matter accumulations
2) at a depth
3) of certain thickness

Redox Morphology

Depleted Matrix

-Value 4, Chroma 1 or 2 with redox “mottles”

-Value 5, Chroma 2 with redox “mottles”

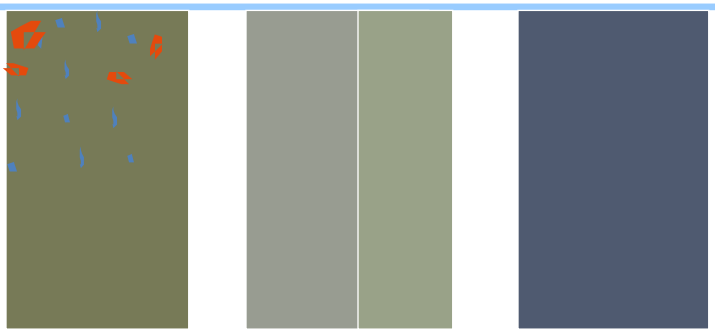
-Value 5 or more, Chroma ≤1 w/ or w/o redox

-Value 6 or more, Chroma ≤2 w/ or w/o redox

Gleyed Matrix

-All Gleyed Pages Value 4 or more

Depleted / Gleyed Matrix



4/1, 4/2, 5/2, with 2% redox concentrations

5/1 or 6/2 with or without redox features

Value >=4 Gley pages

Depleted Matrix

Value ≥5 chroma 1,

Value ≥6, chroma 2

with or without redox concentrations

4/1, 4/2, 5/2 with ≥2%

redox concentrations

Figure A1. Illustration of values and chromas that require 2 percent or more distinct or prominent redox concentrations and those that do not, for hue 10YR, to meet the definition of a depleted matrix. *Due to inaccurate color reproduction, do not use this page to determine soil colors in the field.* Background image from the Munsell Soil Color Charts reprinted courtesy of Munsell Color Services Lab, a part of X-Rite, Inc.

Gleyed Matrix

Gley Pages

Value 4 or more

Figure A2. For hydric soil determinations, a gleyed matrix has the hues and chroma identified in this illustration with a value of 4 or more. *Due to inaccurate color reproduction, do not use this page to determine soil colors in the field.* Background image from the Munsell Soil Color Charts reprinted courtesy of Munsell Color Services Lab, a part of X-Rite, Inc.

Gleyed Matrix

Three Major Divisions

All Soils

- Use regardless of soil texture
- Mostly surface layers of organic material

Sandy Soils

Loamy Soils

- Use sandy indicators in sandy layers, loamy indicators in loamy layers

Indicator Format

1) Alpha-Numeric Designation
2) Short Name
3) Applicable Land Resource Regions (LRR)
4) Description of the Indicator
5) User Notes

Example Indicator Format

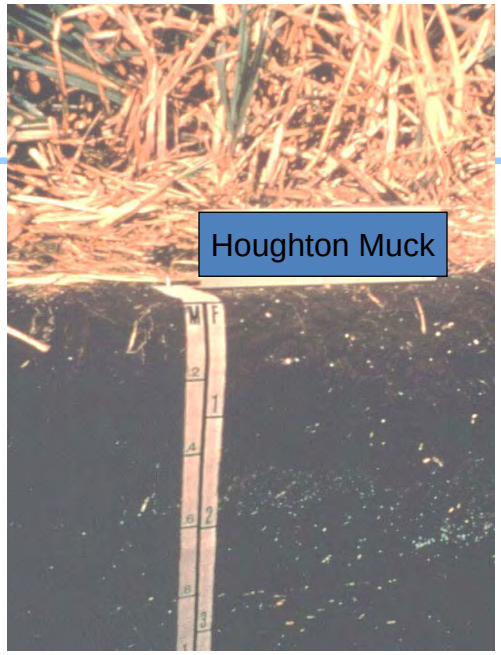
A1 – first indicator for All Soils

Histosol – short name

For use in all LRRs – applicable regions

Classifies as a Histosol, except Folists – indicator description

"A Histosol has 16 inches …" – user notes



“All Soils”

A2, Histic Epipedon

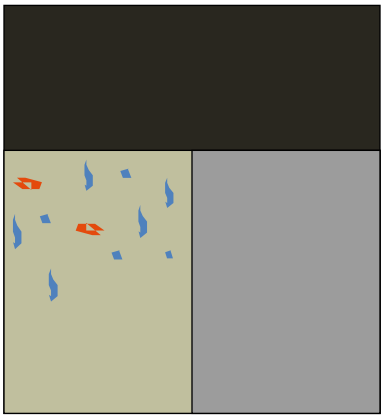
A layer of organic material 8 – 16 inches thick over mineral soil with a chroma of 2 or less. Saturation or artificial drain is requried.

All Soils

- **A10 - 2 cm Muck**
  - **A layer of muck 2 cm or more thick with value 3 or less and chroma 1 or less starting within 6” of the soil surface.**

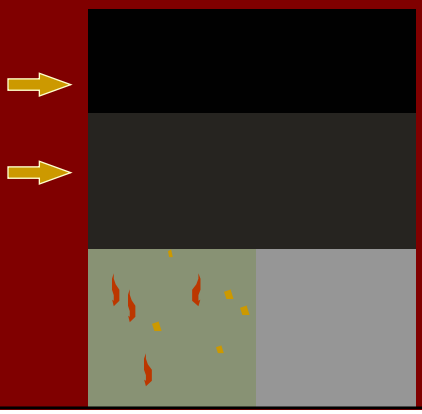
All - Depleted below Dark Surface

- A layer at least 6” thick with a depleted matrix <u>starting within 12”</u> of the surface. The layer(s) above the depleted matrix have value 3 or less and chroma 2 or less.
- Occurs in Mollisols



A12, Thick Dark Surface

A layer at least 6” thick with a depleted or gleyed matrix starting below 12” of the surface. The layer(s) above have value ≤3 and chroma ≤1 in upper 12” and value ≤3 and chroma ≤1 in the remainder of the epipedon (think Mollisols!)



A16 Coast Prairie Redox
For Testing in LRR K & M

A layer starting within 6” of the soil surface at least 4” thick with a matrix chroma ≤3 with 2% or more distinct or prominent redox concentrations as soft masses and/or pore linings.

Sandy Soils

Have a USDA texture of loamy fine sand or coarser

"Control Section" <6 inches in depth

Indicators include:

- organic surface layers
- differential translocation
  - streaking of OM
  - Fe stripped matrix

Sandy Soils

with High OM surface layers

S1, Sandy Mucky Mineral

Lab testing or professional soil scientist recommended

Sandy Soils
with Redox Colors

- S5, Sandy Redox

A 4” layer starting w/in 6” of the surface, matrix >60% chroma ≤2 and ≥2% “distinct or prominent” redox concentrations.

Key for determining Contrast

Tabular key for contrast determination using Munsell® notation

Note: If both colors have values of ≤ 3 and chromas of ≤ 2, the color contrast is *Faint* (regardless of difference in hue).

Hues are the same (Δ h = 0)

Δ Value	Δ Chroma	Contrast
0	≤ 1	Faint
0	2	Distinct
0	3	Distinct
0	≥ 4	Prominent
1	≤ 1	Faint
1	2	Distinct
1	3	Distinct
1	≥ 4	Prominent
≤ 2	≤ 1	Faint
≤ 2	2	Distinct
≤ 2	3	Distinct
≤ 2	≥ 4	Prominent
3	≤ 1	Distinct
3	2	Distinct
3	3	Distinct
3	≥ 4	Prominent
≥ 4	---	Prominent

Hues differ by 1 (Δ h = 1)

Δ Value	Δ Chroma	Contrast
0	≤ 1	Faint
0	2	Distinct
0	≥ 3	Prominent
1	≤ 1	Faint
1	2	Distinct
1	≥ 3	Prominent
≤ 2	≤ 1	Distinct
≤ 2	2	Distinct
≤ 2	≥ 3	Prominent
≥ 3	---	Prominent

Hues differ by 2 (Δ h = 2)

Δ Value	Δ Chroma	Contrast
0	0	Faint
0	1	Distinct
0	≥ 2	Prominent
1	≤ 1	Distinct
1	≥ 2	Prominent
≥ 2	---	Prominent

Hues differ by 3 or more (Δ h ≥ 3)

Δ Value	Δ Chroma	Contrast
Color contrast is prominent, except for low chroma and value.		Prominent

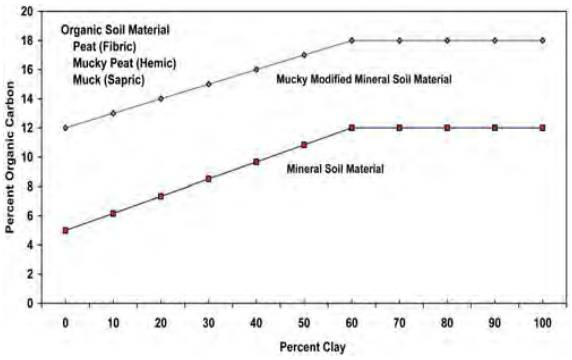
Loamy and Clayey Soils

- Texture is loamy very fine sand and finer
- Control section usually starts within 10-12 inches
- Most indicators are based upon the reduction/oxidation of Fe

Loamy Soils

F1, Loamy Mucky mineral

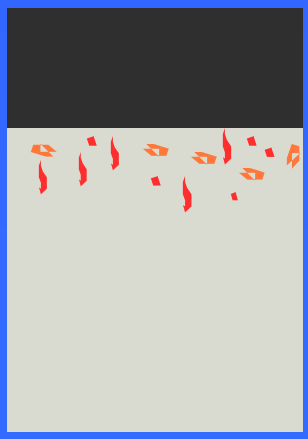
•A layer of mucky modified loamy or clayey soil material 4” or more thick starting within 6” of the surface.



Even expert soil scientists can not consistently apply this indicator without lab data

F3, Depleted Matrix

A layer at least 6” thick with a depleted matrix that has 60% or more chroma 2 or less starting within 10” of the surface.



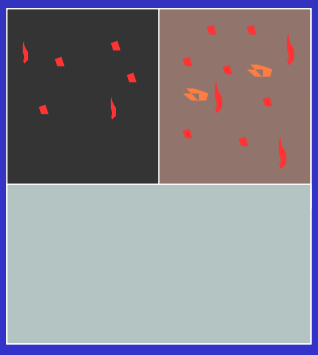
Loamy Soils

F6, Redox Dark Surface

- A layer at least 4” thick entirely within the upper 12” that has:

  a. matrix value ≤3 and chroma 1 or less and ≥2% redox concentrations, or

  b. matrix value ≤3 and chroma ≤2 and ≥5% redox concentrations.



Chroma 1 with 2%

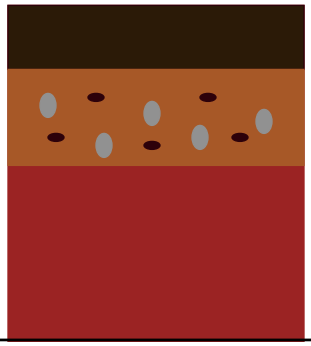
Chroma 2 with 5%

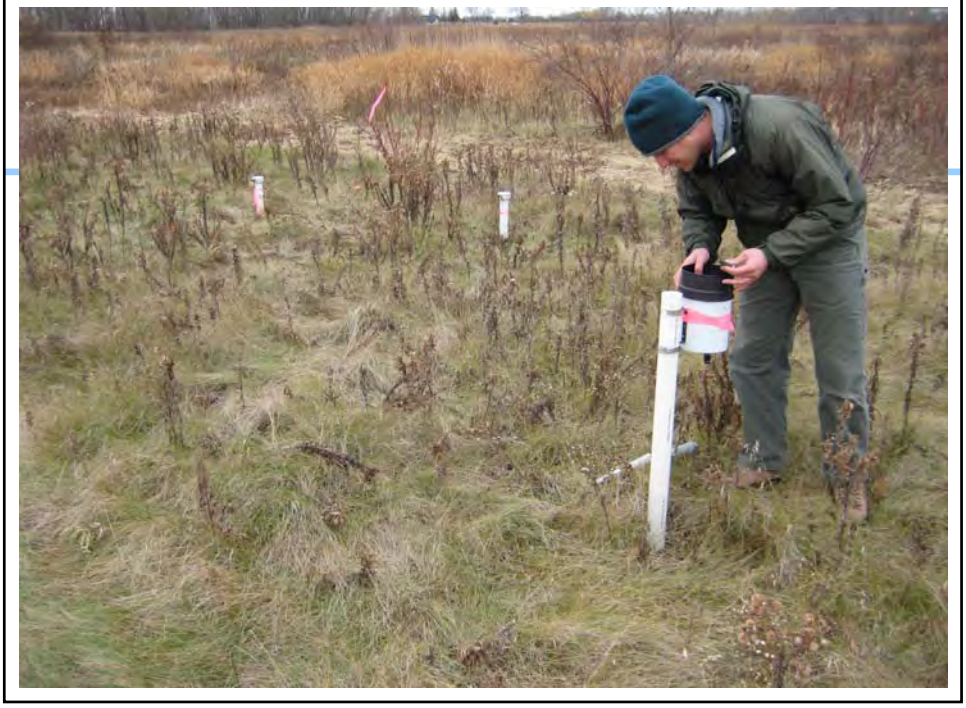
"Test" Indicators

- Indicators needing further study
- Designated for use for problematic hydric soils and require additional documentation
- A16, F12 and TF2 can be used with "Problem Soils"

TF2, Red Parent Material

In parent material with a hue of 7.5YR or redder, a layer at least 4" thick with a matrix chroma of ≤4 and ≥2% redox depletions and/or concentrations. The layer is entirely within 12" of the soil surface.





Hydric Soil Indicators for LRR K & M

- Histosol A1
- Histic Epipedon A2
- Black Histic A3
- Hydrogen Sulfide A4
- Stratified Layers A5
- 2 cm Muck A10
- **Depleted Below Dark Surface A11**
- **Thick Dark Surface A12**
- Sandy Mucky Mineral S1
- 5cm Mucky Peat or Peat S3
- Sandy Gleyed Matrix S4

Hydric Soil Indicators for LRR K & M

- **Sandy Redox S5**
- Stripped Matrix S6
- Loamy Mucky Mineral F1
- Loamy Gleyed Matrix F2
- **Depleted Matrix F3**
- **Redox Dark Surface F6**
- Depleted Dark Surface F7
- Redox Depressions F8
- Coast Prairie Redox A16
- Red Parent Material TF2
- Iron-Mn Masses F12

Universal WI Indicators

- A11 Depleted Below Dark Surface
- A12 Thick Dark Surface
- S5 Sandy Redox
- F3 Depleted Matrix
- F6 Redox Dark Surface
- TF2 Red Parent Material

GET TO KNOW THESE!

Hydric Soils Tech Note 4

NC Supplement permits combining Indicators if all requirements are met except thickness.

- S5 – Sandy Redox & S7 – Dark Surface
- F1 – Loamy Mucky Mineral
- F3 - Depleted Matrix
- F6 – Redox Dark Surface
- F7 – Depleted Dark Surface

Hydric Soils Tech Note 4

0-3, 10YR 2/1, Loam
3-6, 10YR 3/1, cmp 7.5YR redox, Loam
6-10, 10YR 5/2, cmp 7.5YR redox, Loam
10-20, 2.5Y 4/2, Loam

- F6 needs 4 inches w/in upper 12 inches
- F3 needs 6 inches starting w/in 10 inches

- Combine layer 2 & 3 to meet the more restrictive 6 inch requirement of F3

Problem Hydric Soils

- Dark A horizons > 12" thick
  - Mostly Mollisols (Mollic epipedons)
  - Dark colors from high OM mask redox features
- Thick, sandy E horizons
  - Most often Spodosols
  - Lack of Fe in E horizon
- Soils with little development
  - Usually Entisols
    - Sandy soils, low OM, recent deposits on floodplains

Problem Hydric Soils

- Parent materials
  - Reddish colored
    - e.g., materials derived from glacial till deposits
  - -Gray colored
    - e.g. shale and limestone parent materials

Soils with thick Dark Surfaces

- Most are Mollisols
- Dark-colored mineral soils with accumulation of OM in the upper part
- Generally prairie soils, but are extensive soils occurring in herbaceous wetlands throughout the U.S.

Why a Problem?

- Lack redoximorphic features in upper part
  - redox features, where present, are often masked by dark colors due to OM
- Commonly disturbed by tillage

Soils with Dark-Colored Surfaces

"Tricks of the Trade"

- Note Color below Dark Surface
- Edge effect *
- Landscape position *

* Pertinent in all soils

Spodosols

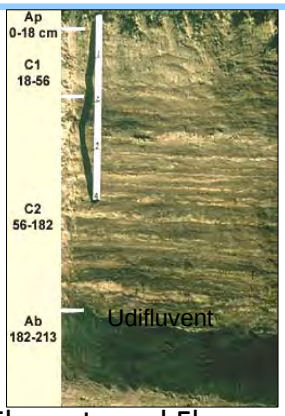
- Mineral soils that have a spodic horizon.
- Amorphous mixtures of OM and Al, with or without Fe, have accumulated.
- Usually have a gray to light gray eluvial (E) horizon overlaying the spodic.

Recently Deposited Soils

Entisols

- mineral soils with little or no horizon development
- young soils on unstable landscapes
  - e.g., floodplains
- sandy soils

Entisols - Two Divisions



Udifluvent

Udipsamment

- Fluvents and Fluvaquents - mostly loamy and clayey
- Psamments and Psammaquents - sandy texture

Problem Soils, Parent Material

- Reddish colored
  - Great Lakes region glacial lacustrine and till deposits

Well drained

Poorly drained

SWP drained

Red soils get “browner” as they get wetter

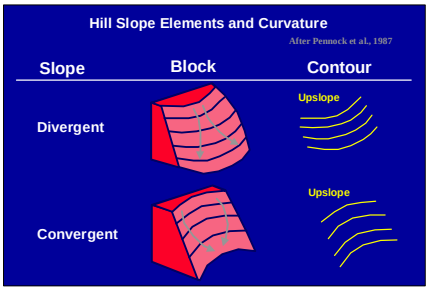
Look for redox depletions and concentrations in a red soil and use TF2 (high chroma subsoils)

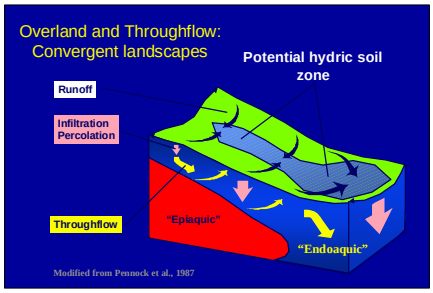
Still not sure?

- Landscape position, landscape position…
  - compare soil profiles from various landscape positions
- Look at the entire soil profile
  - top to bottom, not just 10” or immediately below the A

Landscape Position

- Critically influences water flow and soil formation
- Most wetlands, even groundwater seeps, are on some sort of concave surface





Still not sure?

- Indicators of wetland hydrology and a hydrophytic plant community
  - herbaceous layer is often more diagnostic than trees
- When all else fails....

… MONITOR !!
Apply the technical standard

Problem Hydric Soils

Problem situations in the NC Regional Supplement

1. **Sandy Soils**
2. **Red Parent Material**
3. **Fluvial deposits within Flood Plains**
4. **Recently Developed Soils**
5. **Seasonally Ponded Soils**
6. **Discharge Areas for Iron-Enriched Groundwater**

NC Supplement Procedure

1. Is hydrophytic vegetation present? If Yes, go to 2.
2. Is 1 primary or 2 secondary hydrology indicators present? If Yes, go to 3.
3. Will landscape position collect or concentrate water? If Yes, go to 4.
4. In the Remarks Section, put why no Indicators were met and determine whether the soil is hydric by:

NC Supplement Procedures

4a. meeting Problem Indicators A10, A16, S3, S7, S8, S9, F12, F19 or TF2.

4b. meeting Problematic Soil Situations

- **-Sandy soils**
- **-Red parent material**
- **-Fluvial deposits within floodplains**
- **-Recently developed wetlands**
- **-Seasonally ponded soils**
- **-Discharge areas for iron-enriched groundwater**

NC Supplement Procedures

4c. having a 4" layer starting w/in 12" that oxidizes when exposed to air. (must change color w/in 30 minutes and does NOT dry out)

4d. having a 4" layer w/in 12" that is reduced, indicating ferrous iron is present. (soil must be saturated in order to test a freshly broken ped face with alpha, alpha-dipyridyl dye)

4e. having stream gauge data, water-table monitoring data or repeated observation that show soil is flooded, ponded, or saturated to the surface for ≥14 consecutive days during the growing season.

If Yes to any above, soil is Hydric, put in remarks section.

MW Supplement Problem Soils

- Shallow soils over limestone (high pH inhibits redox features from developing)
- Fluvial Sediments within Floodplains
- Recently Developed Wetlands
- Seasonally Ponded Soils
- Soils with High-Chroma Subsoils

MW Supplement Procedure

1. Is hydrophytic vegetation present? If Yes, go to 2.
2. Is 1 primary or 2 secondary hydrology indicators present? If Yes, go to 3.
3. Will landscape position collect water? If Yes, go to 4.
4. Determine whether the soil is hydric by:

MW Supplement Procedures

a. Is Coastal Prairie Redox (A16) or Fe/Mn Masses (F12) present?

b. Is the site one of the 5 identified Problem Soils?

c. Does a 4" layer starting w/in 12" oxidize when exposed to air? (must change color w/in 30 minutes and does NOT dry out)

d. Is a 4" layer w/in 12" reduced, indicating ferrous iron is present? (soil must be saturated in order to test freshly broken ped face with alpha, alpha-dipyridl dye)

e. Does stream gauge data, water-table monitoring data or repeated observation show soil is flooded, ponded, or saturated to the surface for ≥14 consecutive days during the growing season?

If Yes to any above, soil is Hydric, put in remarks section.

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.
  - Some "wet" sites will not meet an indicator. What do we do if we believe a soil is 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).