

# Problematic Landscapes and Parent Materials

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# Problem Soils

- Soils that meet the hydric soil definition but do not exhibit soil morphologies we use as field indicators.

# Problematic Soil Situations- environmental conditions

- Soils with low organic-carbon content
- Soils with low weatherable-iron content
- Soils with high pH
- Recently developed soils
- Seasonally ponded soils
- Disturbed or tilled soils
- Cold temperatures
- Soils with high iron-oxide inputs

# Problem Hydric Soils – parent material

- Red Parent Material
- Black Parent Material
- Glaucconitic Soils
- Coral Rubble and Cobble Soils
- Soils With parent Material High in Gypsum
- Volcanic Ash Soils
- Sandy Parent Materials with Low Iron
- Diatomaceous Earth

# Approaches for Delineating Problem Hydric Soils

- Field Indicators of Hydric Soil in the United States' regionally specific indicators for problem soils.
- Methods listed in chapter 5 of the Corps of Engineers' Regional Supplement.
- Research and local soil scientist's knowledge of problem soils.
- Hydric soils lists.
- Hydric Soils Technical Standard

# Problem Soil Situations with Field Indicators

- Floodplains
- Soils in Depressions Subject to Ponding
- Marl
- Red Parent Material
- Anomalous Bright Loamy Soils
- Vertisols
- Interdunal Swales
- Shallow Soils

# Tools for Hydric Soil Identification in Problem Soils

- Each Regional Supplement lists test indicators for problematic situations at the end of chapter 3. These may be actual test indicators or indicators that are approved for other regions.



# Observations Made Along Hydrologic Gradient



- Soils occur as a continuum on the landscape
- Describe a known “wet” soil
- Describe a known “upland” soil
- Use judgment to discern the boundary



# Observations Along Gradient

- Identify and document landscape position
- Identify areas that have indicators of wetland hydrology and a hydrophytic plant community
  - herbaceous layer is often more diagnostic than trees
- Identify reason soil may be problematic

# Tools for Hydric Soil Identification in Problem Soils

- Observation of a reduced matrix.



# Tools for Hydric Soil Identification in Problem Soils

- Use of Alpha-alpha Dipyridyl Die



# Tools for Hydric Soil Identification in Problem Soils

- Direct observation of hydrology either through repeated visits or well and/or piezometer data



# Tools for Hydric Soil Identification in Problem Soils

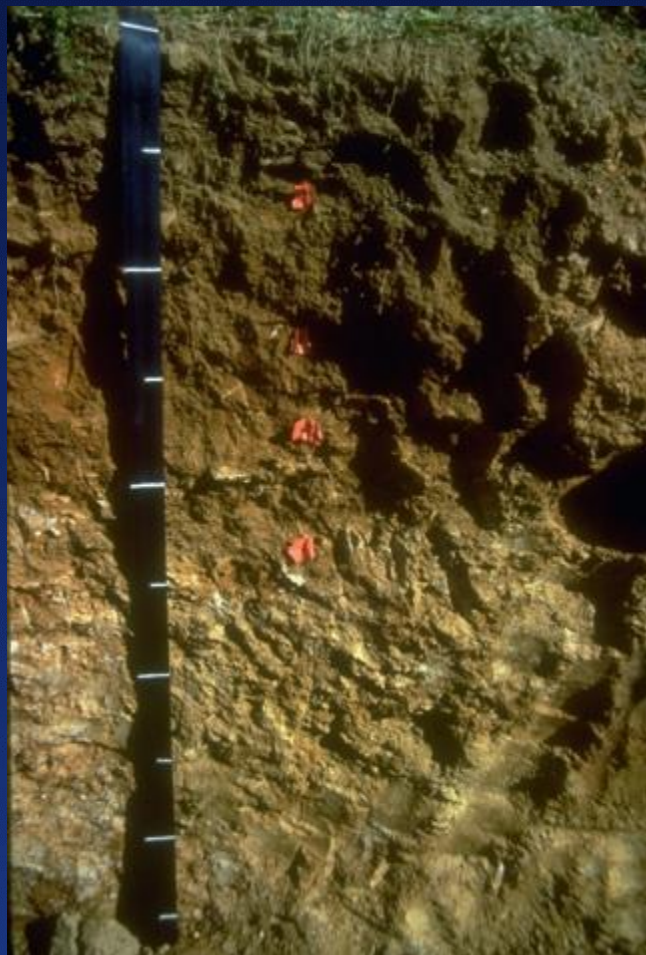
- Use of the Hydric Soil Technical Standard



# Other Tools for Hydric Soil Identification in Problem Soils

- Soil Survey Data
  - Hydric soils report in We Soil Survey
  - Hydric Soils List
- Local expertise

# Beware of lithochromic mottles



# Be cautious of reduce matrices

- If a soil is saturated at the time of excavation, make sure you do soil colors as you dig the soil. Reduced matrices will change color upon exposure to air. Therefore, if you wait to do soil colors, you may not get the colors you expect.



# Which soil is the hydric soil?



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# Which soil is the hydric soils?



# Which soil is the hydric soils?

Sandy upland soil with a thick E horizon.



Sandy hydric soil with thick dark surface and yellow sands underneath.



# Which soil is the hydric soil?



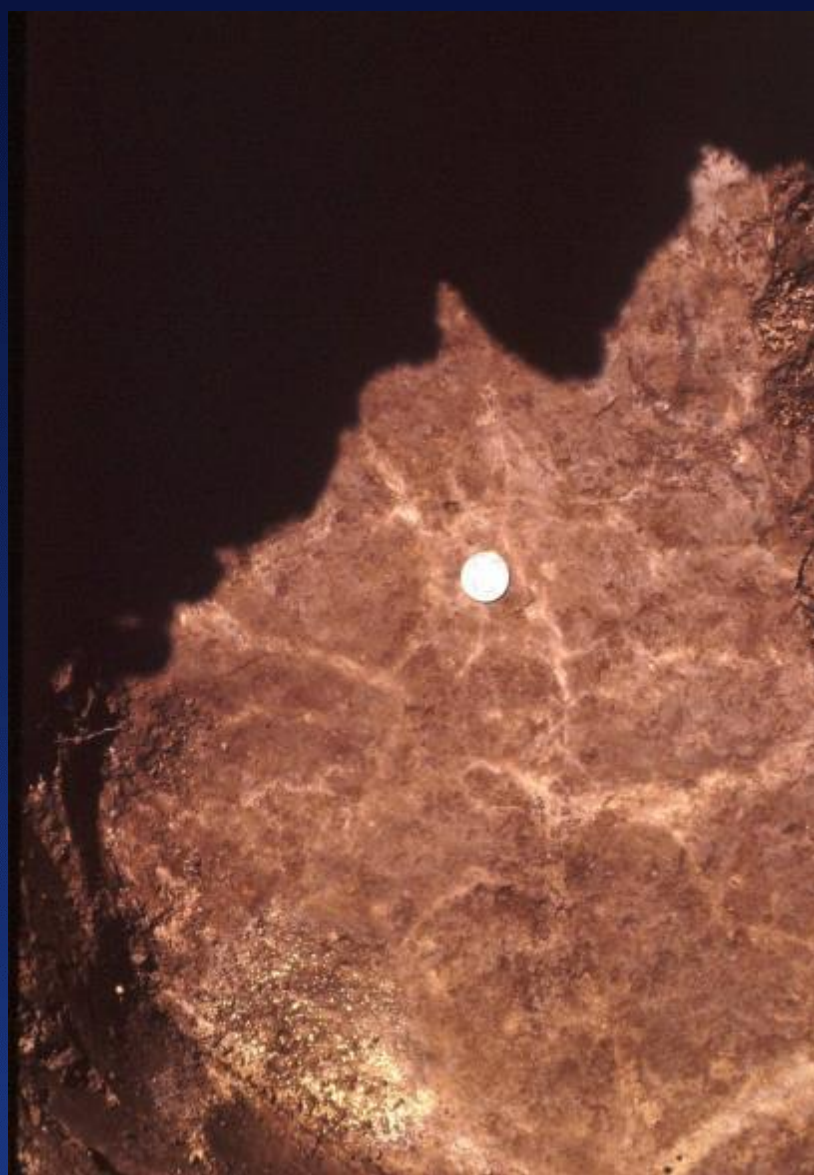
# Which soil is the hydric soil?



# Red Parent Material



# Redox depletions along ped faces





# F3 in Red Parent Material



Glaucconitic upland  
soil that appears  
to meet F6



# Wet soil containing glaucanite





Gray bedrock-  
burnt shales

# Latort profile







Diatamaceous  
earth

“ABLS” soil found  
in freshwater  
wetlands adjacent  
to tidal areas



Photo by M.C. Rabenhorst



# “ABSS”



# Piedmont floodplains



Photo by M.C. Rabenhorst



Buried hydric soil on  
Piedmont floodplains

# High pH/High Salt/High Gypsum



# ... MONITOR !!



# Conclusions

- A problem soil is a soil that meets the definition of a hydric soil but lacks characteristic morphologies associated with hydric soils.
- Problem soils are saturated, ponded or flooded long enough during the growing season to develop anaerobic conditions in the upper part.
- To identify a problem soil
  - Use Field Indicators developed for problematic soil situations
  - With identification of indicators of hydrophytic vegetation and wetland hydrology follow methods in chapter 5 of the Corps of Engineers' Regional Supplements.
  - Collect data to prove the soil meets the Hydric Soil Technical Standard.