

Analyzing Soils Data for the National Wetland Condition Assessment

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Soils Field Data Collected by Horizon

- Abrupt boundary
- Field texture
- % rock fragments
- Matrix color
- Rodoximorphic features
- % masked sand grains in sandy soils



Other field data collected

- Field Indicators of Hydric Soils in the United States met
- Water table depth



Lab analysis by horizon

- Particle size
- Calcium carbonate equivalent
- Total C, N and S
- pH
- CEC
- Ammonium oxalate extraction (Al, Fe, Mn, P, Si)
- EC
- Dithionite-citrate extraction (Al, Fe, Mn)
- Trace elements
 - Ag, As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, P, Pb, Sb, Se, Sn, Sr, V, W, Zn
- Bulk density

Questions????

- What is the definition of “condition”?
- How do we determine reference?
- How do we group sites so that we are making valid comparisons?
- Do we rate stressors or rate the impacts due to the stressors?
- How do we integrate other data (veg., hydrology, buffer, etc.) with results from soils analysis to come up with comprehensive results?

Examples of Ecosystem Services Directly Impacted by Soil Condition

- Water retention
- Sedimentation
- Biogeochemical cycling of
Nutrients

Soil Stressors to Ecosystem Services

- Permeability
- Drainage class/hydroperiod
- Cation exchange capacity
- Organic carbon content
- Slope
- Microtopography
- Soil ecology (microbial community)

Potential soils based indicators to evaluate stressor

- Permeability
 - Texture
 - Structure
 - Evidence of soil compaction

Potential soil based indicators of drainage class/hydroperiod stressor

- Field Indicator(s) of Hydric Soils
- Surface color
- Presence of organic soil material at the surface
- Subsurface color
- Redox feature characteristics



Potential Soil Based Indicators of Stressors to Soil Ecology

- Surface color
- Organic matter content
- Redox features

Soil Characteristics Used to Evaluate Water Retention

- Long term storage
 - Slope
 - Drainage class/hydroperiod
 - Permeability
- Short term
 - Slope
 - Microtopography
 - Permeability
 - Surface organic carbon content

Soil Characteristics Used to Evaluate Biogeochemical Cycling

- Cycling of Redox Sensitive Compounds
 - Permeability
 - Drainage class/hydroperiod
 - Organic C content
 - Soil ecology (microbial community)
- Sediment retention (phosphorous/heavy metals)
 - Permeability
 - Slope
 - Microtopography
 - Cation exchange capacity

Soil Characteristics Used to Evaluate Biogeochemical Cycling

- Carbon sequestration
 - Organic carbon content
 - Drainage class/hydroperiod
 - Landscape position
 - Microtopography



Summary

- Soils play an integral part in the way wetlands function.
- The condition of hydric soils can impact the condition of the wetland.
- Direct measurements made through the NWCA sampling can be used as indicators or to calibrate indicators or models in the evaluation of wetland condition.



Questions?

