

# Mineral Hydric Soil Morphology

## Part 1 of 2

### Ch. 7 – Richardson & Vepraskas

Outline:  
Principal Types of Morphological  
Features in Mineral Hydric Soils



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## 2. Principal Types of Morphological Features in Mineral Hydric Soils

A. Accumulation/depletion of OM (see Ch. 6 lectures) can occur in either organic or mineral hydric soils

B. Redoximorphic Features

1. Depletions of C, Mn, Fe, clay in linings, coatings, or zones
2. Concentrations of Mn and Fe in soft masses, linings, coatings, or cemented forms

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## 2.A. Accumulation/depletion of OM (Ch. 6)

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- In addition to the morphology of accumulated organic matter and carbon compounds already discussed in Ch. 6, sandy hydric soils may also accumulate organic compounds in zones where they are translocated by a fluctuating water table and then re-oxidized or where they synthesized as new insoluble compounds such as *spodic materials* or *orstein*.
- Organic compound depletion is observed as the removal of disintegrated coatings of organic compounds on sand grains, leaving very light-colored zones in the soil.

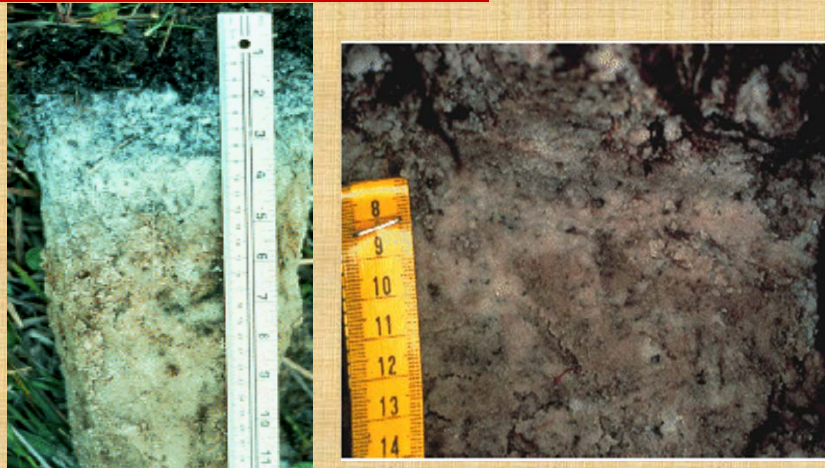
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## Mineral Sandy Soils with Irregular Subsoil Patterns of Organic Carbon Compound Accumulations and Depletions

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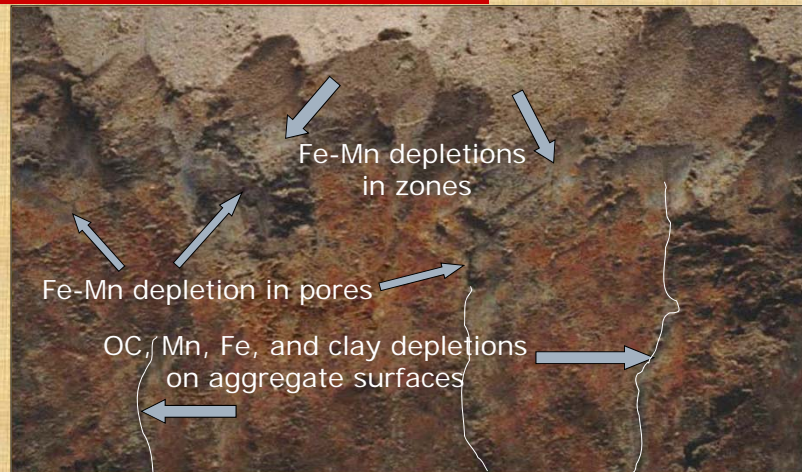


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## 2.B.1. Redox Depletion Types



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## 2.B.1. Redox Depletions (closeup)

- In this example, a depletion is lining an earthworm burrow. The slime from the earthworm was an easily digestible form of OC for microbes, and the burrow may have filled with water. Several depleted zones occur around aggregate surfaces and in the soil mass.



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## 2.B.1. Clay Depletions (closeup)

Also called "albans" (alba means white)

Following removal of the readily-available O, N, Mn, Fe, S, and C, the O, Mn and Fe inside of silicate clays are reduced and removed from the clay minerals, resulting in destruction and dissolution of the mineral structure, and then removal of the soluble weathering by-products



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## 2.B.2. Redox Concentration Types (Uncemented and Cemented)

### Uncemented Forms

- ❑ Soft Masses well inside soil aggregates, but not next to pores or ped surfaces
- ❑ Soft Masses in soil adjacent to pores and root channels
- ❑ Linings inside pores or root channels
- ❑ Soft Mass Coatings on aggregate surfaces but not inside aggregates

### Cemented Forms

- ❑ Nodules (next slide)
- ❑ Concretions (next slide)



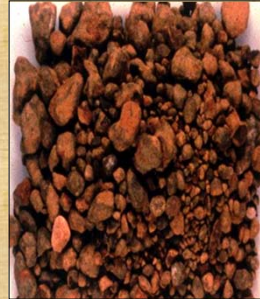
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## 2.B.2. Nodules and Concretions (closeup)

- Nodules and concretions are cemented by high concentrations of Mn/Fe oxides.
- Nodules do not have concentric rings inside, but concretions do.



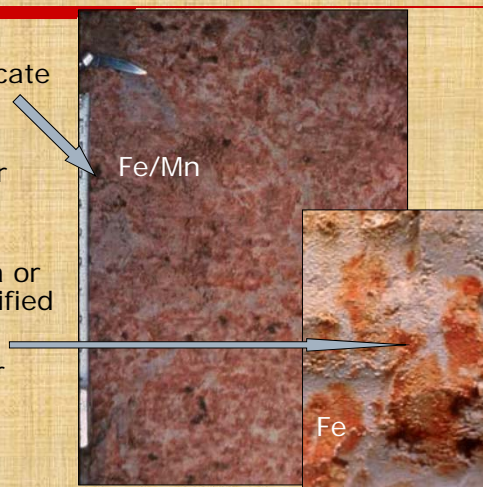
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## 2.B.2. Soft Masses (closeup)

- Variable in shape and color. Dark colors indicate increased Mn concentration.
- Adjacent to and higher chroma than the depletions.
- Often a higher chroma or value than the unmodified soil matrix.
- May surround pores or root channels or aggregate surfaces.



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## 2.B.2. Pore or Root Channel Linings (closeup)

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- Precipitated Fe/Mn-oxides line the pore surface or the root channel but do not extend into the soil matrix.
- Note that this soil has reduced coatings on ped surfaces.

