

Environmental Pedology (SOS 4715C)

Gain hands-on, practical knowledge about soils on the landscape:

- Relating soil - landscape - vegetation - parent material.
- Describing and classifying soils.
- Determining seasonal high water tables.
- Estimating erosion, infiltration, permeability, etc.
- Interpreting suitability for waste disposal, etc.

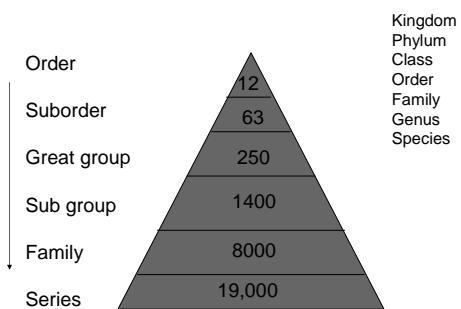


Spring Semester, M & W, period 4
W, periods 6-9 (field lab)

Questions? Contact Willie Harris
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Email: apatite@ufl.edu

Classification of Soils

Soil Taxonomy Hierarchy



Diagnostic Horizons

Surface

Subsurface

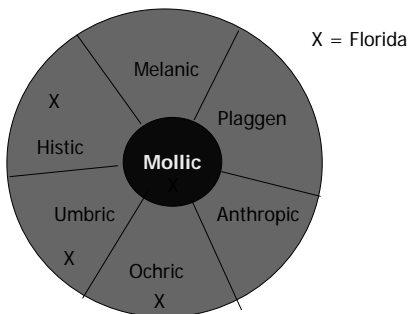


Diagnostic Surface Horizons

Epipedons

Mollic
Umbric
Ochric
Histic
Melanic
Plaggen
Anthropic

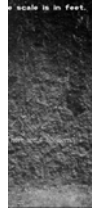
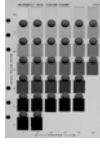
Diagnostic Surface Horizons



Mollic Epipedon

Thickness > 18-25 cm
Color value < 3.5 moist
chroma < 3.5 moist
Organic Carbon > 0.6 %
Base Saturation > 50 %
Structure strongly developed

Organic carbon = organic matter x 0.58



Grassland Soils



Umbric Epipedon

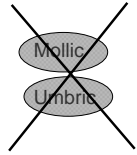


Meets all criteria of the Mollic epipedon,
except base saturation < 50%

Chemically different than Mollic

Ochric Epipedon

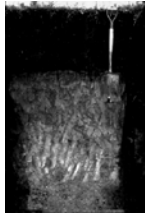
Too: thin
light
low in O.M



Ochric = pale

Extremely common

Histic Epipedon



Organic horizon
Formed in wet areas
Black to dark brown
Low bulk density
20-30 cm thick

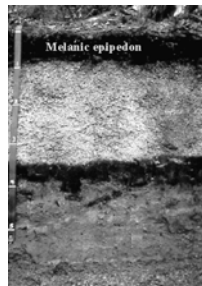


Anaerobic

Organic = > 20% - 35% O.M.
(water saturation, clay content)

Melanic Epipedon

Similar in properties to Mollic
Formed in volcanic ash
Lightweight, Fluffy



Anthropic Epipedon

- Resembles mollic (color, o.m.)
- Use by humans
- Shells and bones
- Water from humans



Plaggen Epipedon

Produced by long-term (100s yrs.) manuring

Old, human-made surface horizon

Absent in U.S.

> 50 cm thick

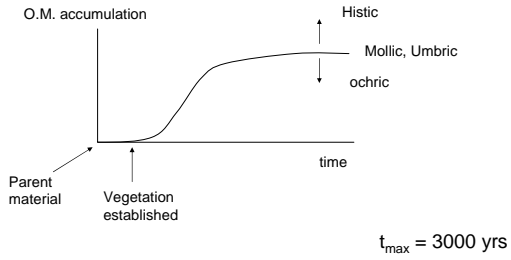


Diagnostic Surface Horizons

Epipedons

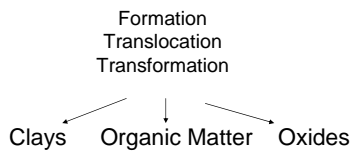
Mollic	
Umbric	Very common
Ochric	
Histic	"specialized"
Melanic	
Plaggen	
Anthropic	Human-derived

Organic Matter Accumulation



Diagnostic Sub-surface Horizons

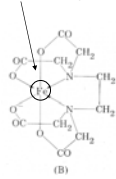
Diagnostic Subsurface Horizons



Subsurface Horizons

Formation
Translocation
Transformation

Organic Matter	Clays	Oxides
Dark colors	smectites	Iron
Metals (Fe, Al)	Kaolinite	Aluminum



Also: salts, carbonates, sulfides

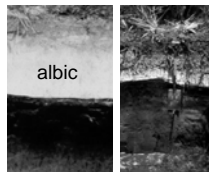
Diagnostic Subsurface Horizons

Albic	Natric	↘	Sub-Horizon Designations
Argillic	Agric		
Spodic	Calcic		
Oxic	Gypsic		
Cambic	Salic		
Kandic	Duripan		
Sombric	Fragipan	↗	
sulfuric	Placic		

Diagnostic Subsurface Horizons

Albic (white) Horizon

Light-colored (Value > 6 moist)
 Eluvial (E master horizon*)
 Low in clay, Fe and Al oxides
 Generally sandy textured
 Low chemical reactivity (low CEC)
 Typically overlies Bh or Bt horizons

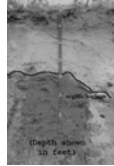
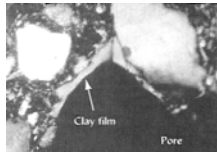


*not all E horizons are albic horizons

Diagnostic Subsurface Horizons

Argillic Horizon

Illuvial accumulation of silicate clays
Illuvial based on overlying horizon
Clay bridges
Clay coatings



Diagnostic Subsurface Horizons

Argillic Horizon

Kandic Horizon

High

Activity of Clays

Low

Necessary

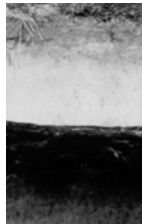
Illuviation of clay

Not Necessary

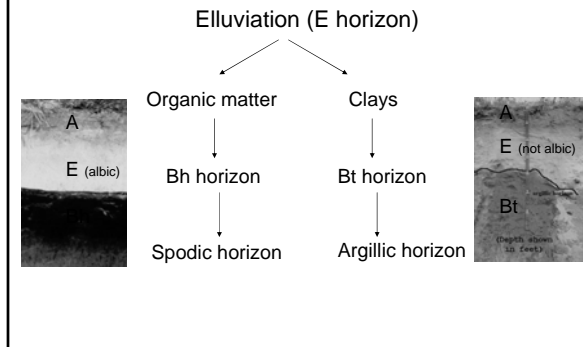
Diagnostic Subsurface Horizons

Spodic Horizon

- Illuvial accumulation of organic matter and aluminum (+/- iron)
- Dark colored (value, chroma < 3)
- Low base saturation (acidic)
- Formed under humid acid conditions



Elluviation and Illuviation



Diagnostic Subsurface Horizons

Oxic horizon

- Highly weathered (high temperatures, high rainfall)
 - High in Fe, Al oxides
 - High in low-activity clays (kaolinite < smectite < vermiculite)
 - activity



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Umbric
Ochric
Histic
Melanic
Plaggen
Anthropic

Subsurface

Albic
Kandic
Argillic
Spodic
Oxic

Soil Taxonomy

Diagnostic Epipedons
Diagnostic Subsurface horizons
Moisture Regimes
Temperature Regimes

Check Your E-mail
