HYDRIC SOILS

- Background
  - Soils consist of natural bodies that occur on a landform within a landscape and have properties that result from the integrated effects of climate and living organisms, acting on parent material, as conditioned by relief, over a period of time.
  - Soil physical characteristics are specifically tied to the location where they form and conditions that they form under.
  - Concept of “Hydric Soils” new to Soil Science – 1970’s

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Hydric Soil

Definition

" a soil that formed under conditions of saturation, flooding, or ponding, long enough during the growing season to develop anaerobic conditions in the upper part".

Chapter 62.340.550, F.A.C. (20 Days of Saturation/ 7 days of inundation - cumulative)

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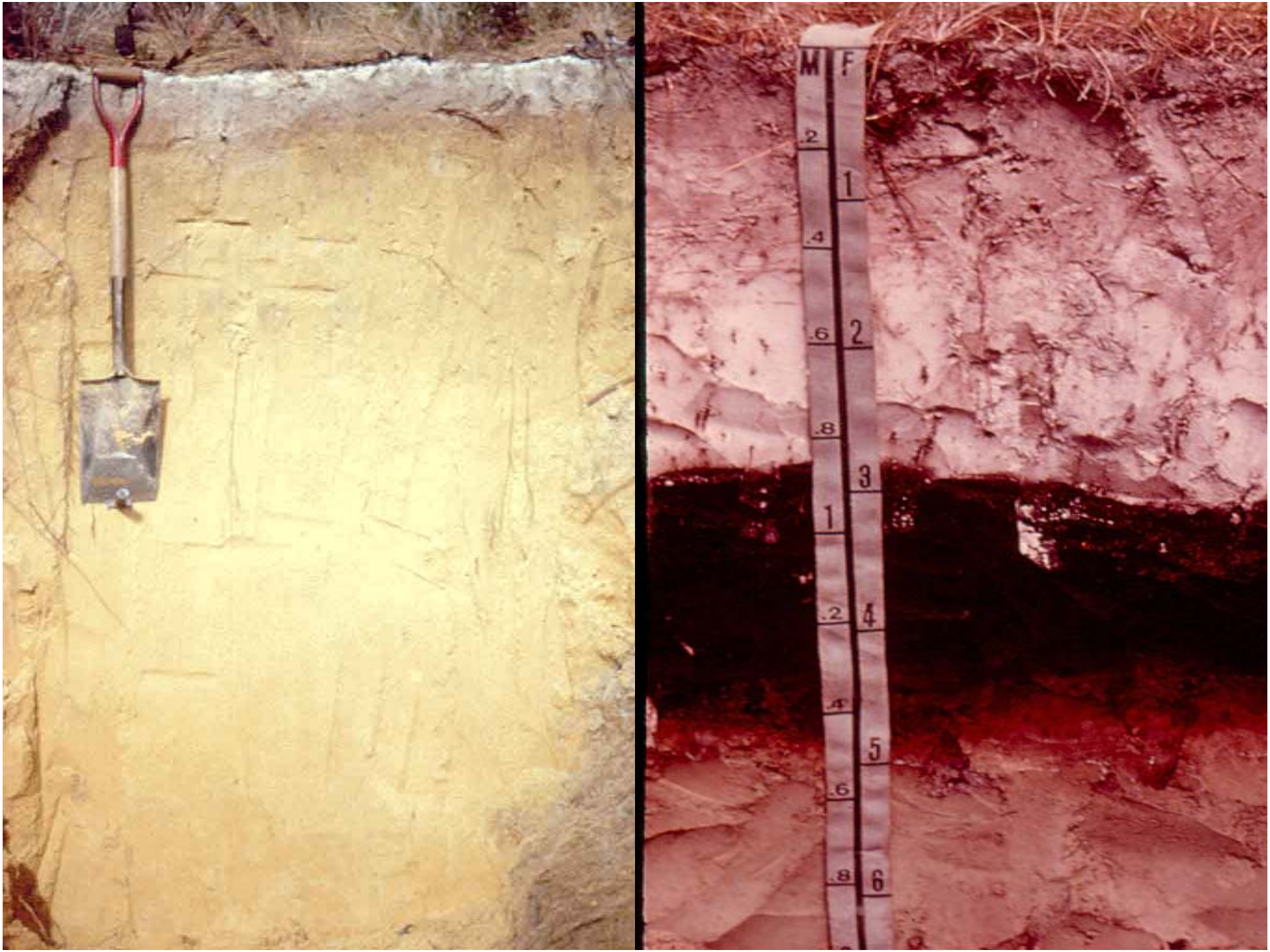
Soil-forming Factors

- There are five factors that affect soil formation
  - CLIMATE
  - LIVING ORGANISMS
  - RELIEF
  - PARENT MATERIAL
  - TIME ….. ***clorpt***


M
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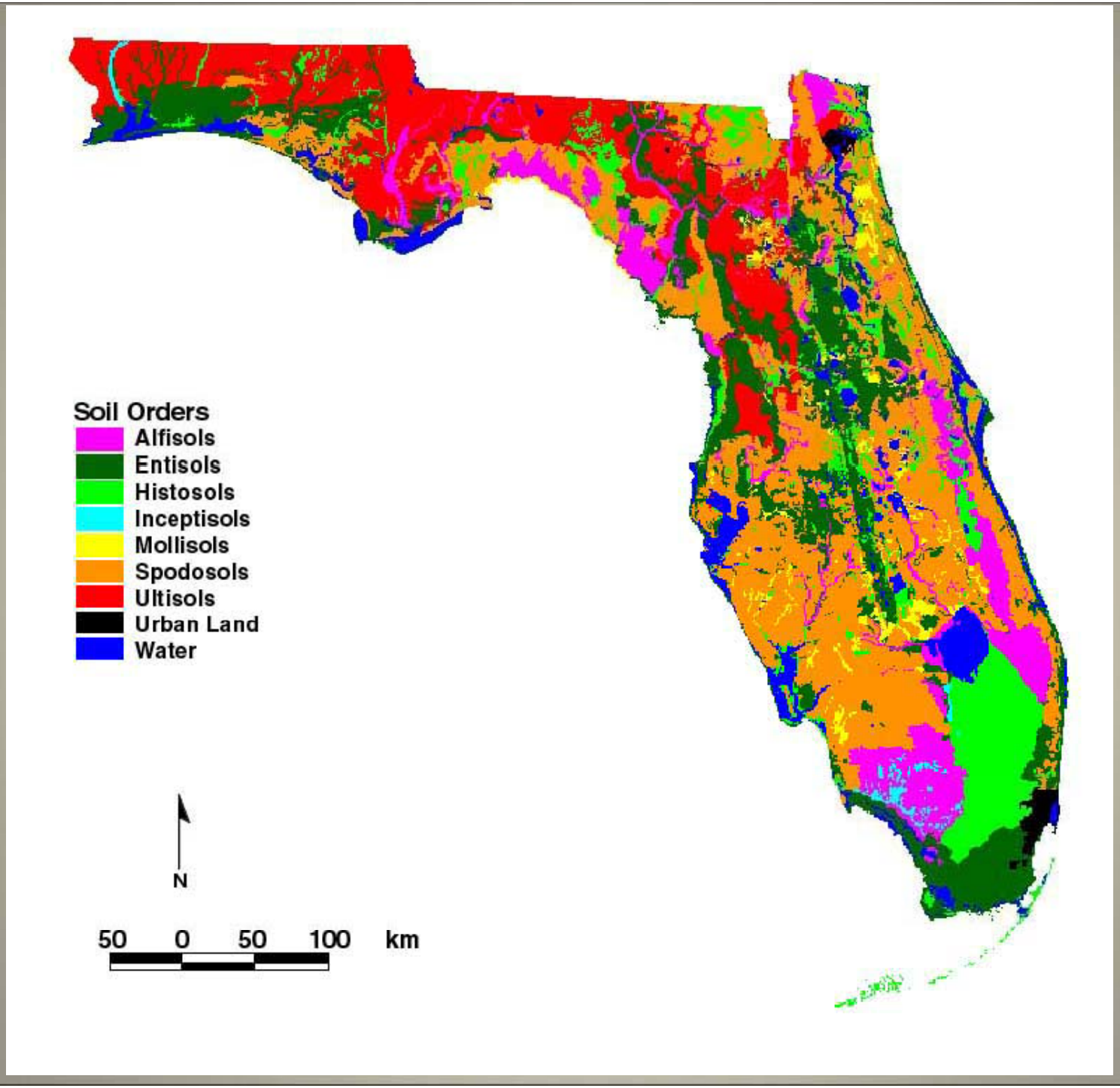
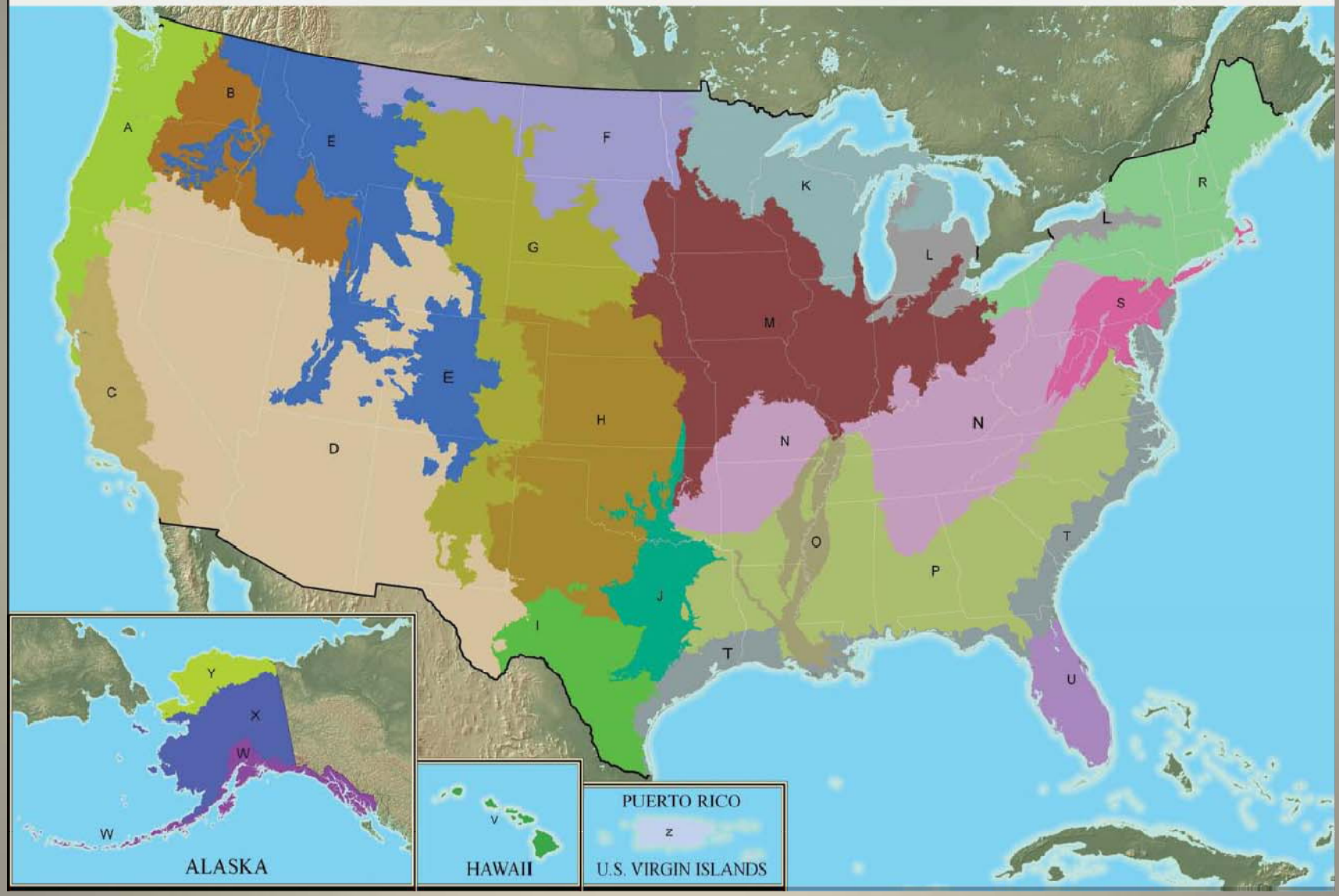
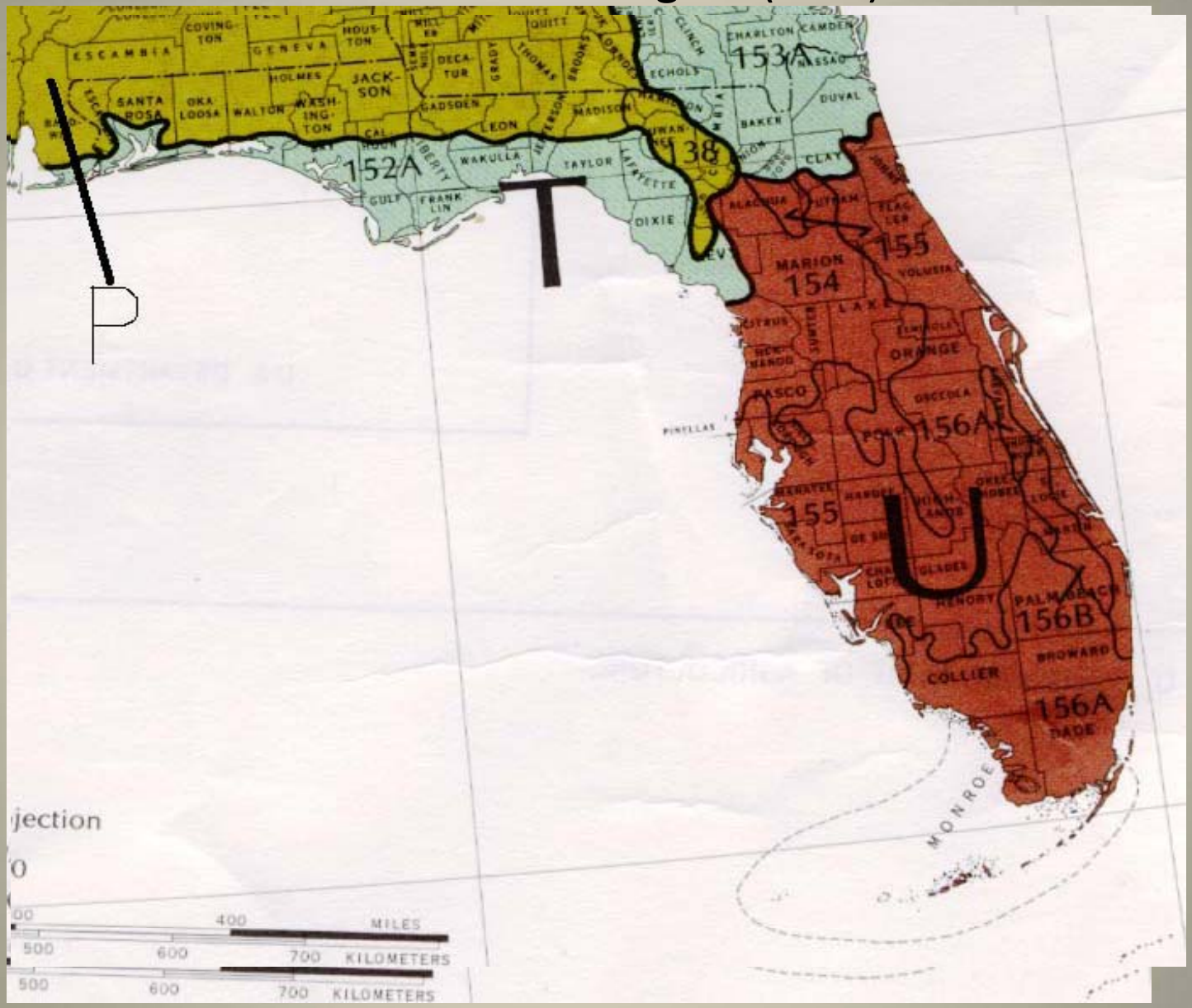

Soil Orders
Alfisols
Entisols
Histosols
Inceptisols
Mollisols
Spodosols
Ultisols
Urban Land
Water
N
50 0 50 100 km

USDA LAND RESOURCE REGIONS



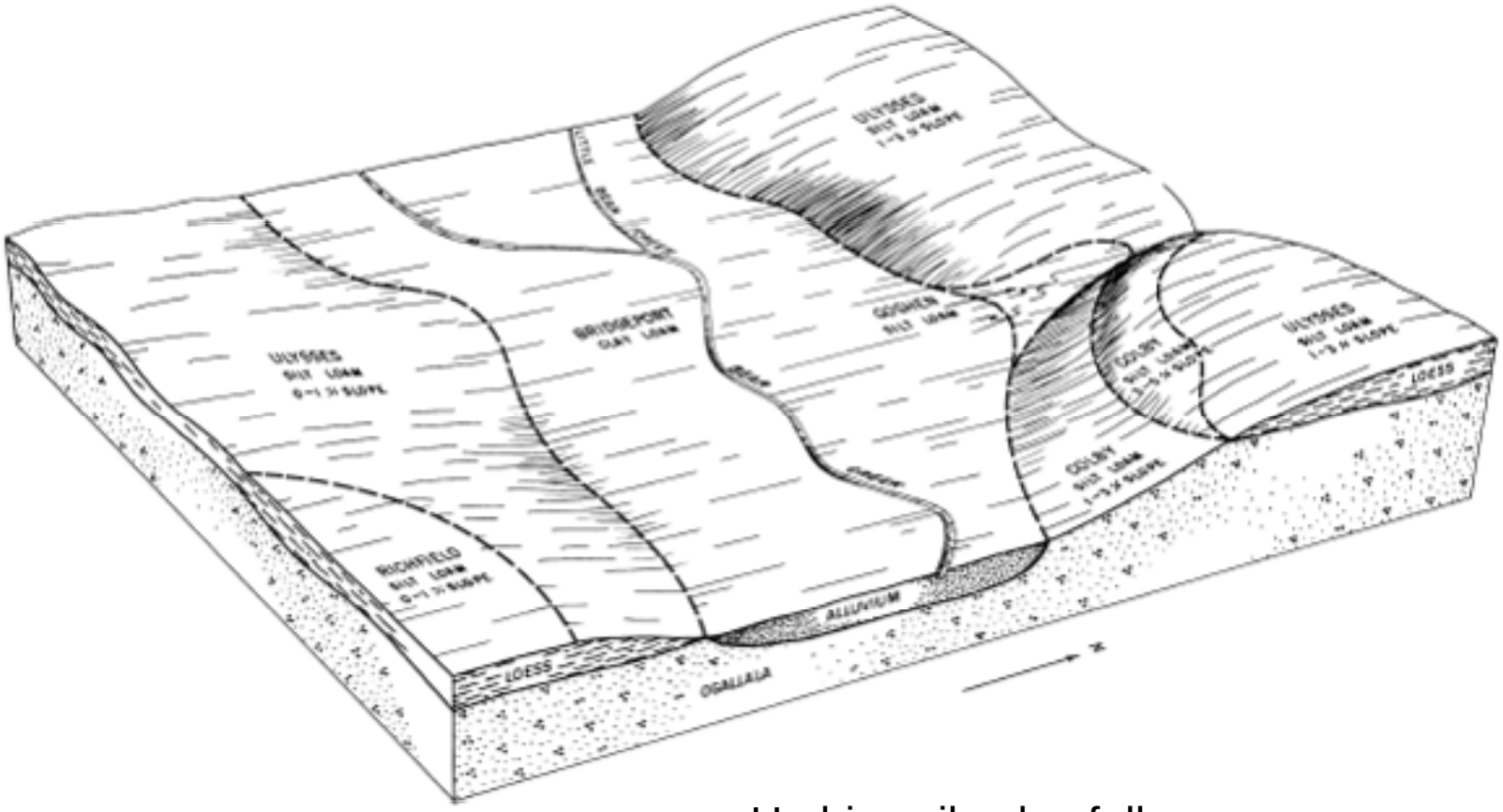
Land Resource Region (LRR)



http://www.doh.state.fl.us/environment/ostds/pdfiles/forms/soils_manual.pdf

SOIL CATENA

sequence of different soil
profiles that occur down a slope



Hydric soils also follow a pattern

Methods to Determine Hydric Soil Indicators

Identification of Soil Properties:

- Color
- Texture
- Depth

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Soil Color

Munsell Color Chart

Hue , Refers to spectral colors Red, Yellow, Green

Value, Relative lightness and darkness of color

Chroma, Degree of vividness in contrast to grayness
< 2 chroma color important hydric soil factor

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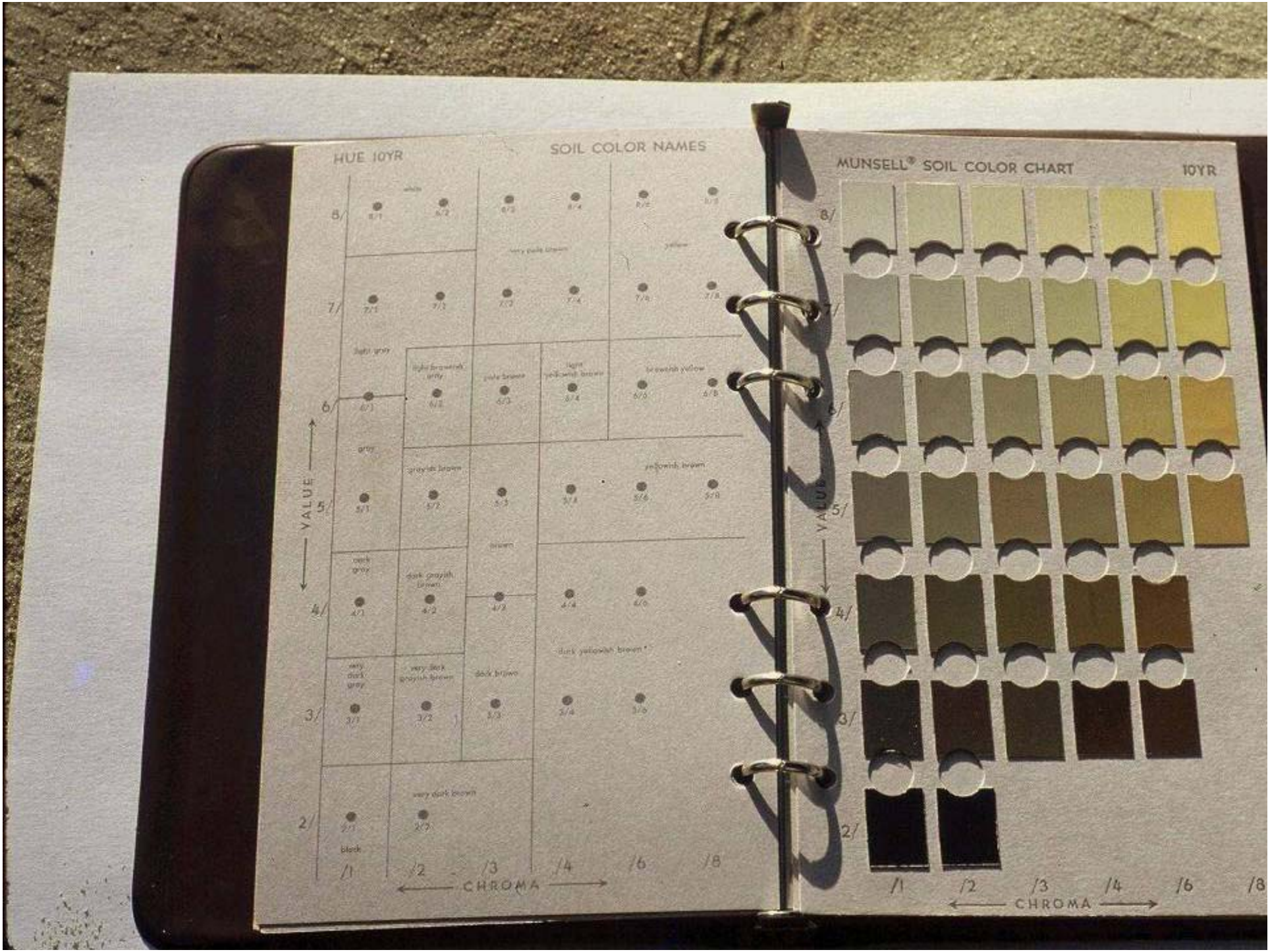
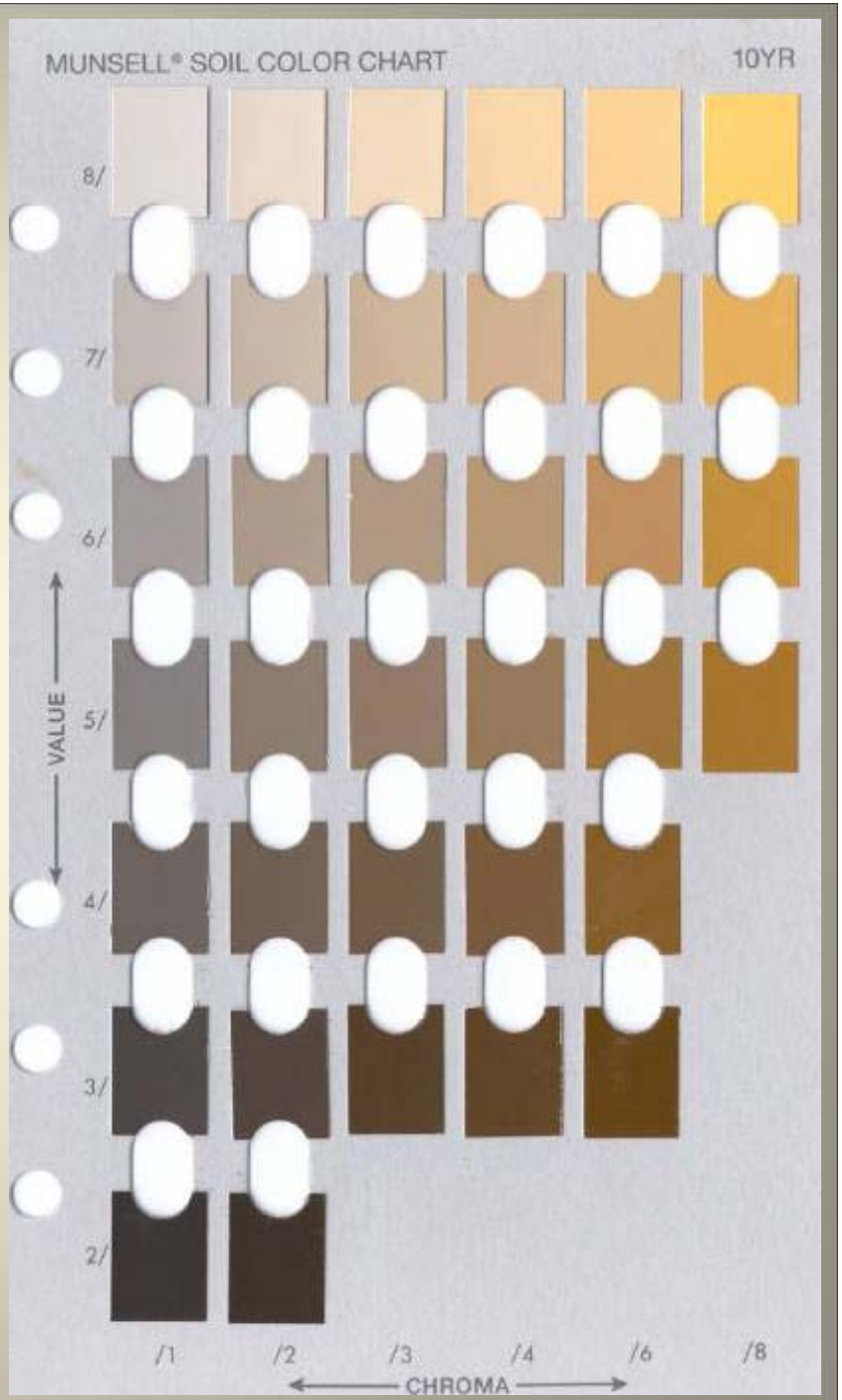

HUE 10YR
SOIL COLOR NAMES
white
very pale brown
yellow
light gray
light brownish gray
pale brown
light yellowish brown
brownish yellow
gray
grayish brown
yellowish brown
brown
dark gray
dark grayish brown
very dark gray
very dark grayish brown
dark brown
dark yellowish brown*
very dark brown
black
VALUE
CHROMA
/1
/2
/3
/4
/6
/8
MUNSELL® SOIL COLOR CHART
10YR

OM and Color

Higher Value (less OM)

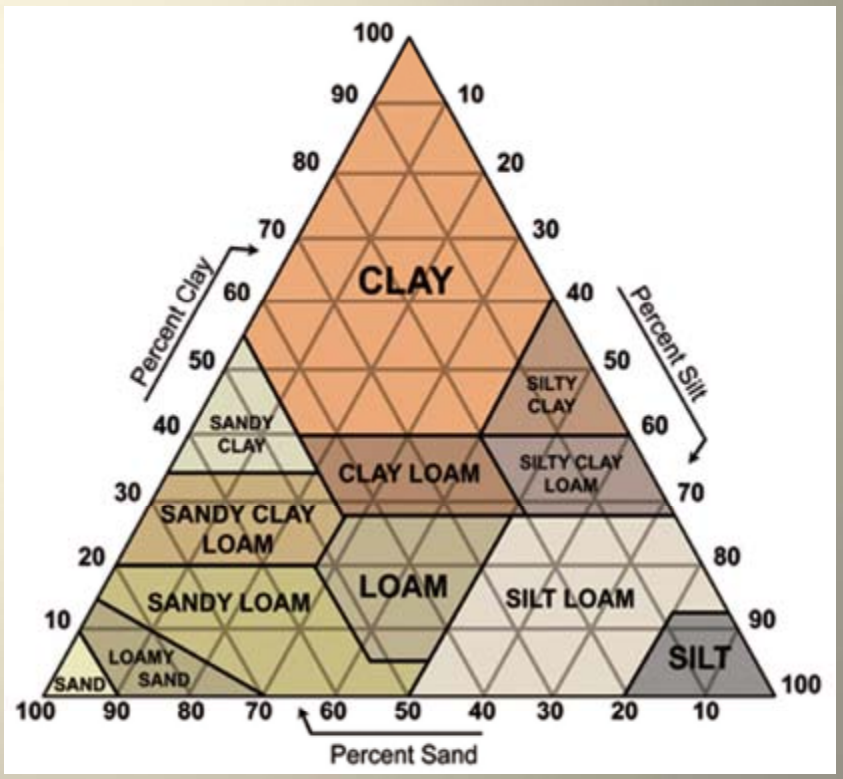
Lower Value (more OM)



TEXTURE

- Refers only to the Mineral particles in the soil
- Does not include Organic Matter
- Grouping of the particle size distribution

12 Major Textural Classes



22 SUB-CLASSES ***Particle Size***

Sands (5) Size (mm)

Very Coarse Sand (VCOS) .....2.0 to 1.0
Coarse Sand (COS) .....1.0 to 0.5
Sand (S) .....0.5 to 0.25
Fine Sand (FS) .....0.25 to 0.10
Very Fine Sand (VFS) Loamy.....0.10 to 0.05

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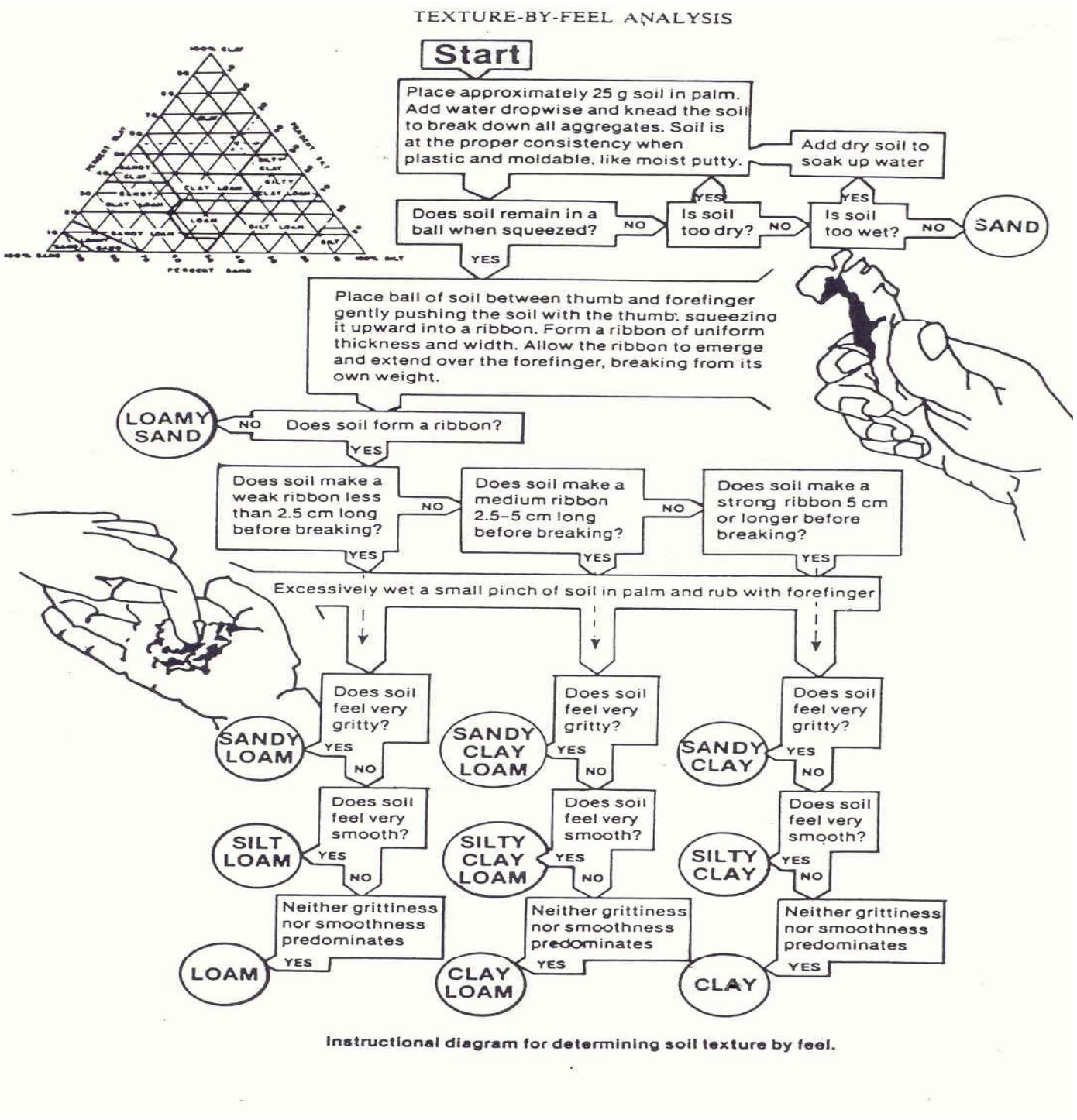
Examine samples that are “Moist”



Instructional diagram for determining soil texture by feel.

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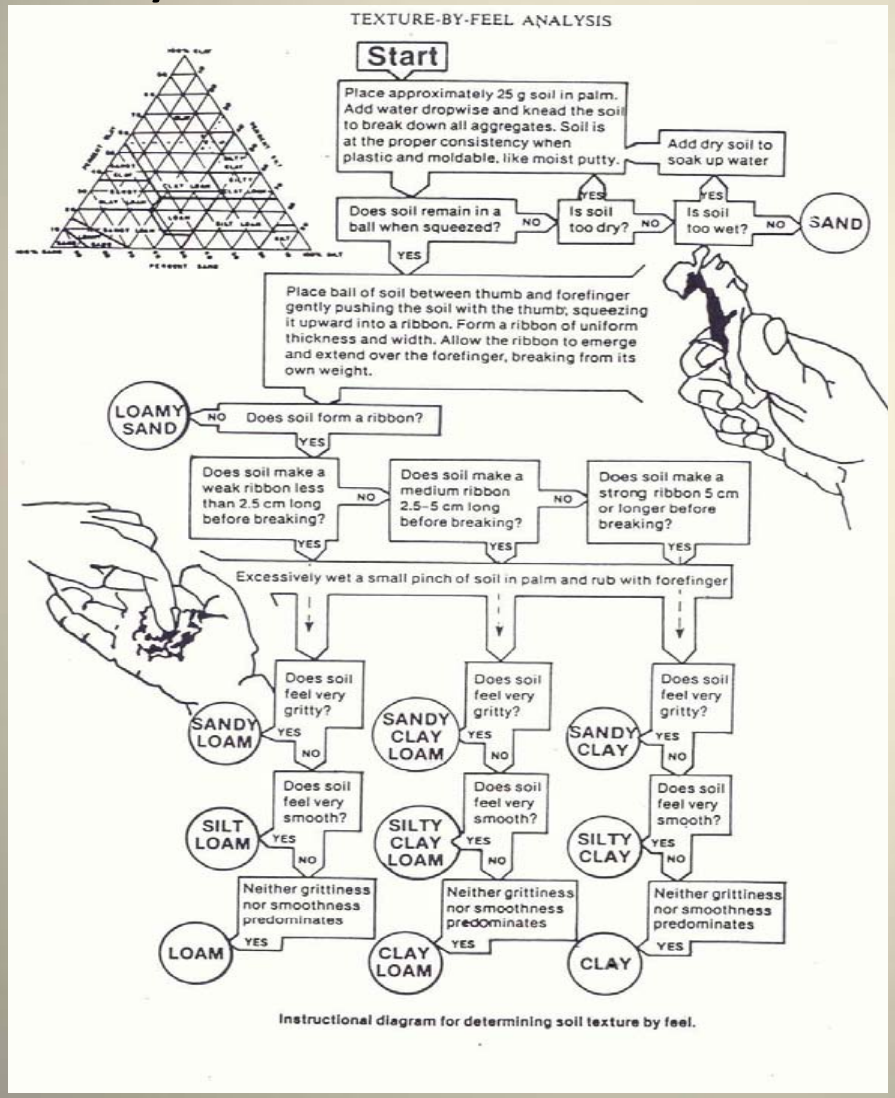
Soil Texture

- Ability of the Soil to be molded and shaped



Instructional diagram for determining soil texture by feel.

Does the soil form a ball?

Does the soil form a ribbon?

How long is the ribbon?

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Sand does not form a ball – it breaks up

Loamy Sand forms a ball

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Yes, your hands will get dirty!

Clay forms a 5 cm or greater ribbon!

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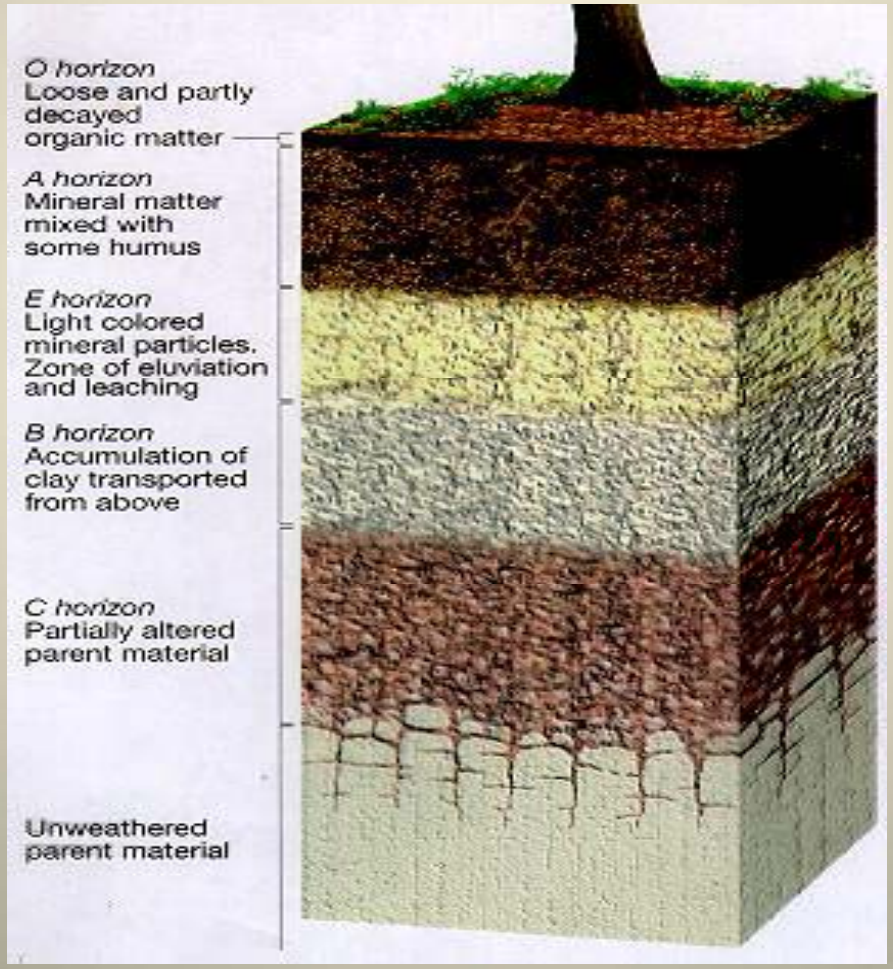
Typical Soil Profile & Soil Horizons



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ENTISOLS - recent

-formed in inert parent material such as quartz

-insufficient time for diagnostic horizon development

-3.3 million acres in FL

DEPTH

Recommended Excavation Depth 20”

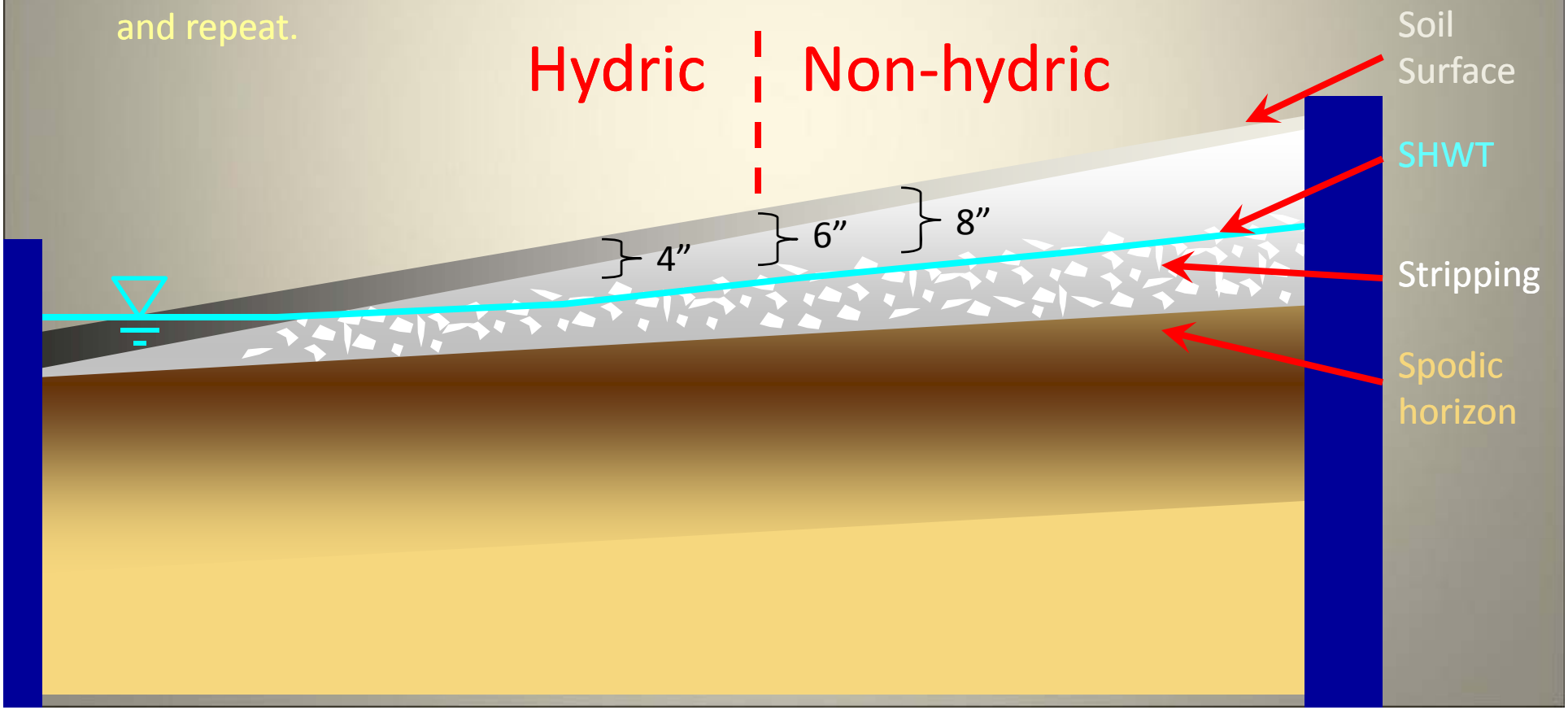
Indicator Depths by Soil Type:

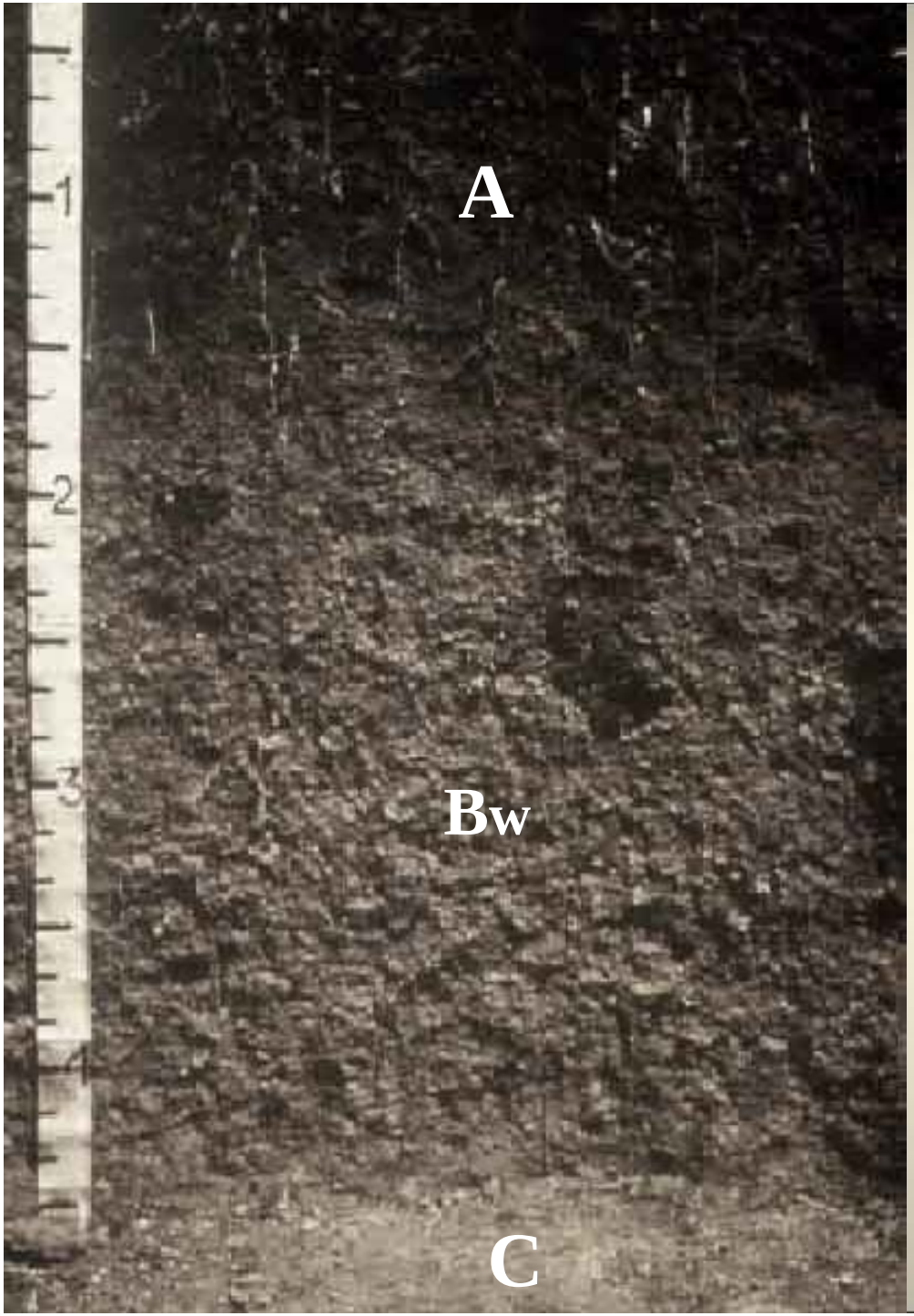
Sandy Soils - Start within 6” of the Surface

Loamy Soils - Start within 10” of the Surface

How to Delineate

- Identify a suspected landform break near wetland edge.
- Observe soil on the downhill side of the break.
- If no indicator is observed, proceed downhill toward next landform break and observe soil.
- If indicator is observed, observe soil on other side of landform break to verify no indicator is present. If no indicator, this is the hydric/non-hydric line. If indicator is observed, the line is too wet so proceed up the hill and identify the next landform break and repeat.





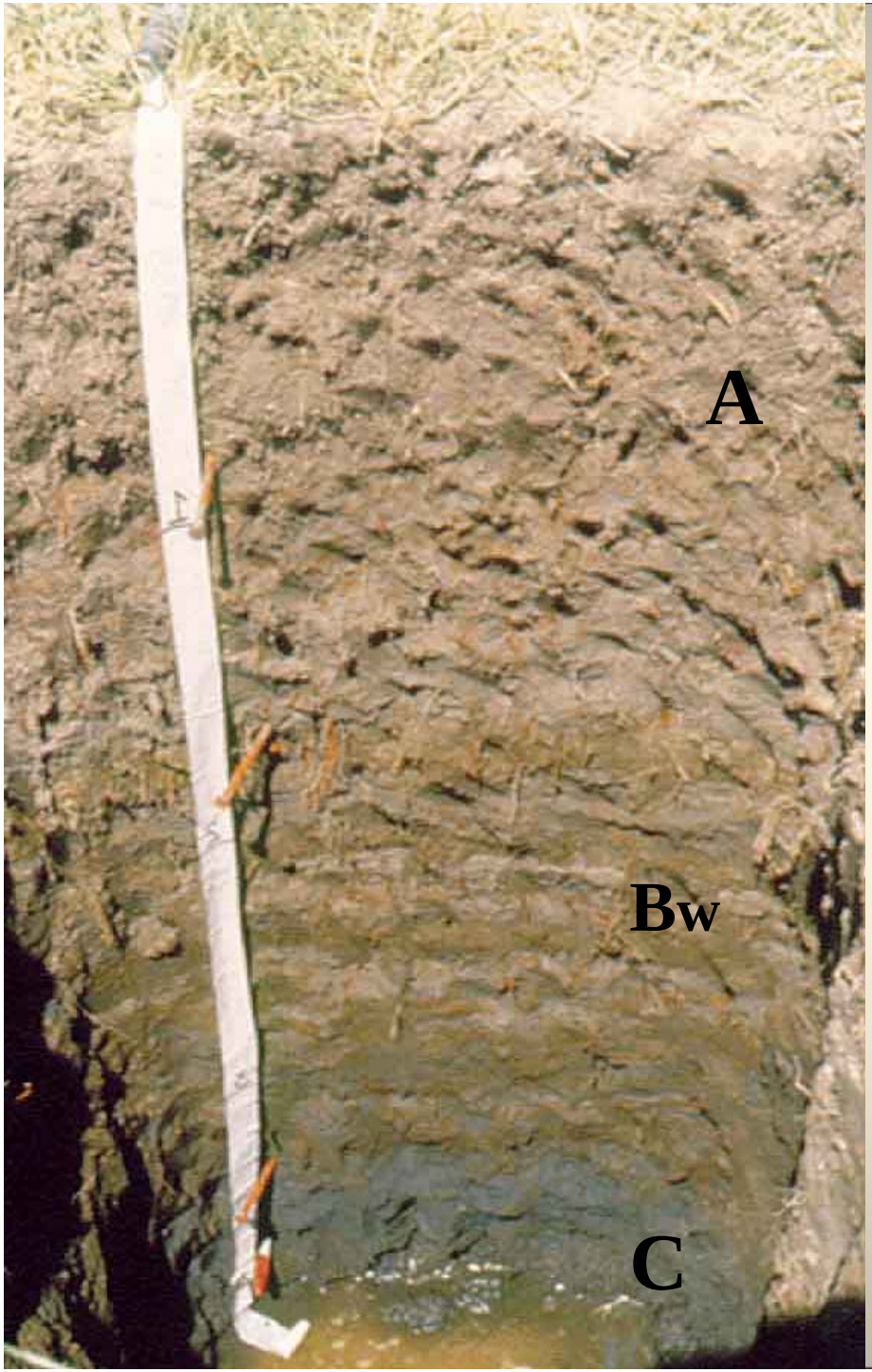
MOLLISOLS - dark

-thick dark colored surface

-good structure & permeability

-base rich (Ca, Mg, N)

-0.4 million acres in FL

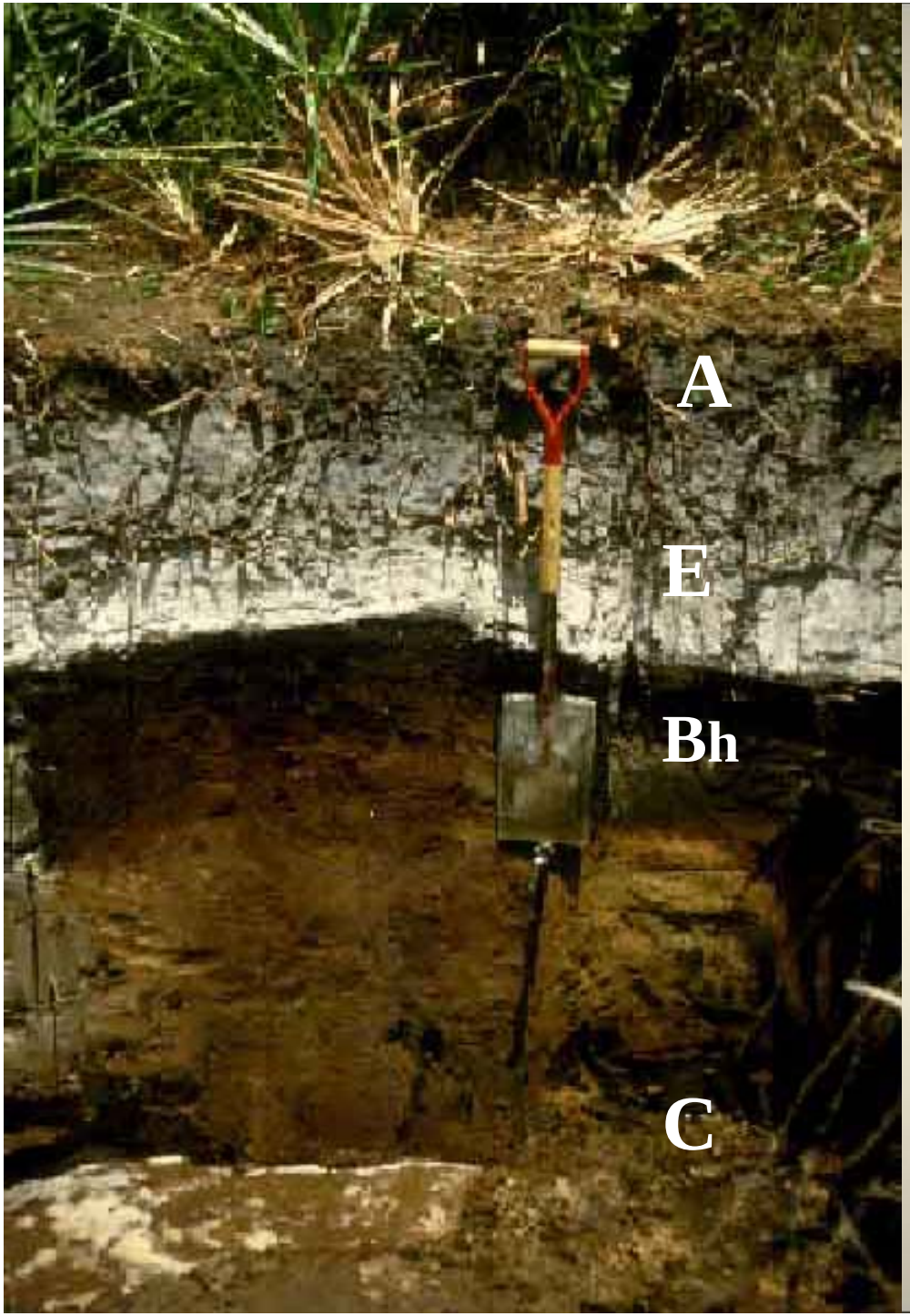


INCEPTISOLS - beginning

-structure

-color

-0.5 million acres in FL



SPODOSOLS - ash

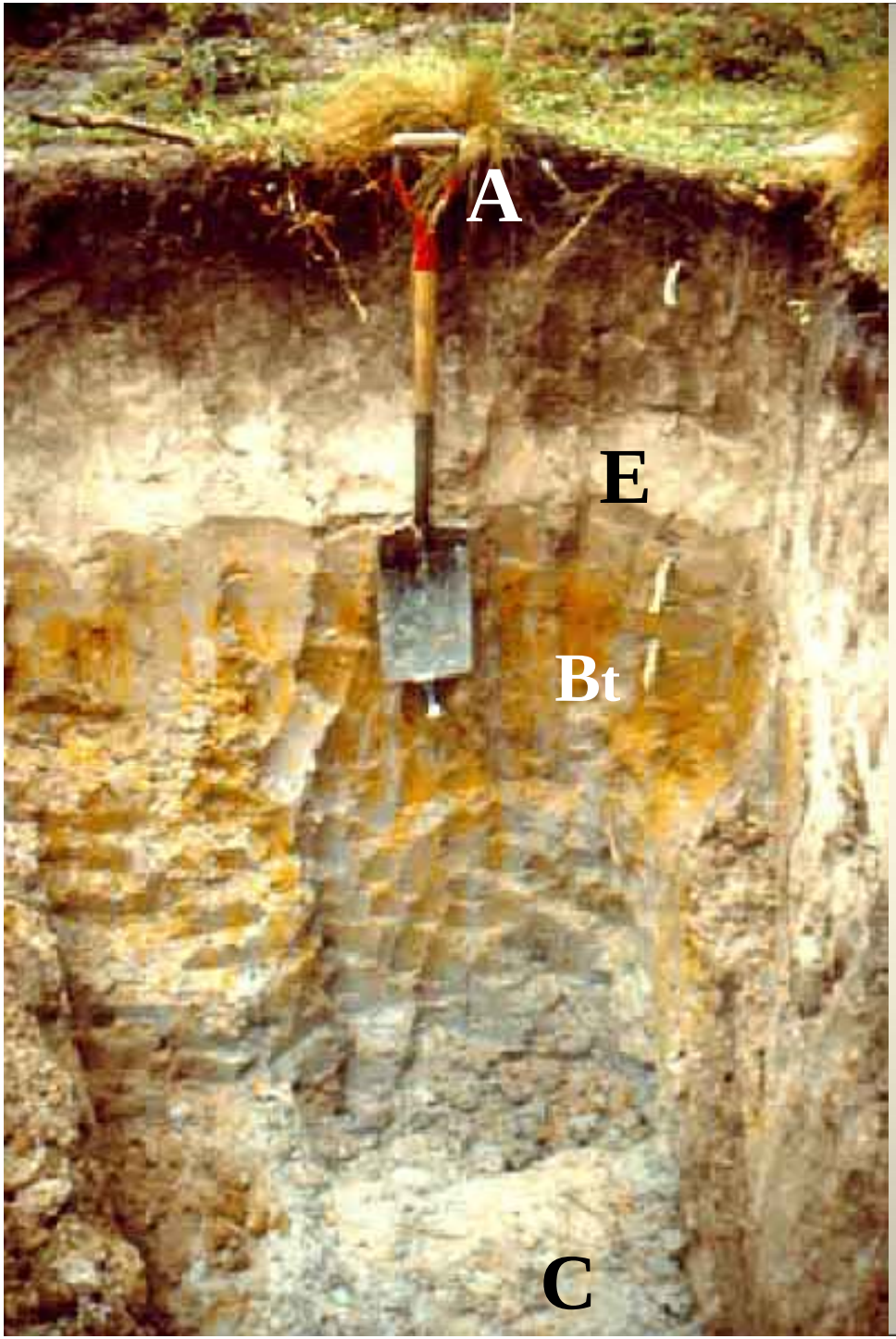
-structure

-color

-translocation

of Fe & Al

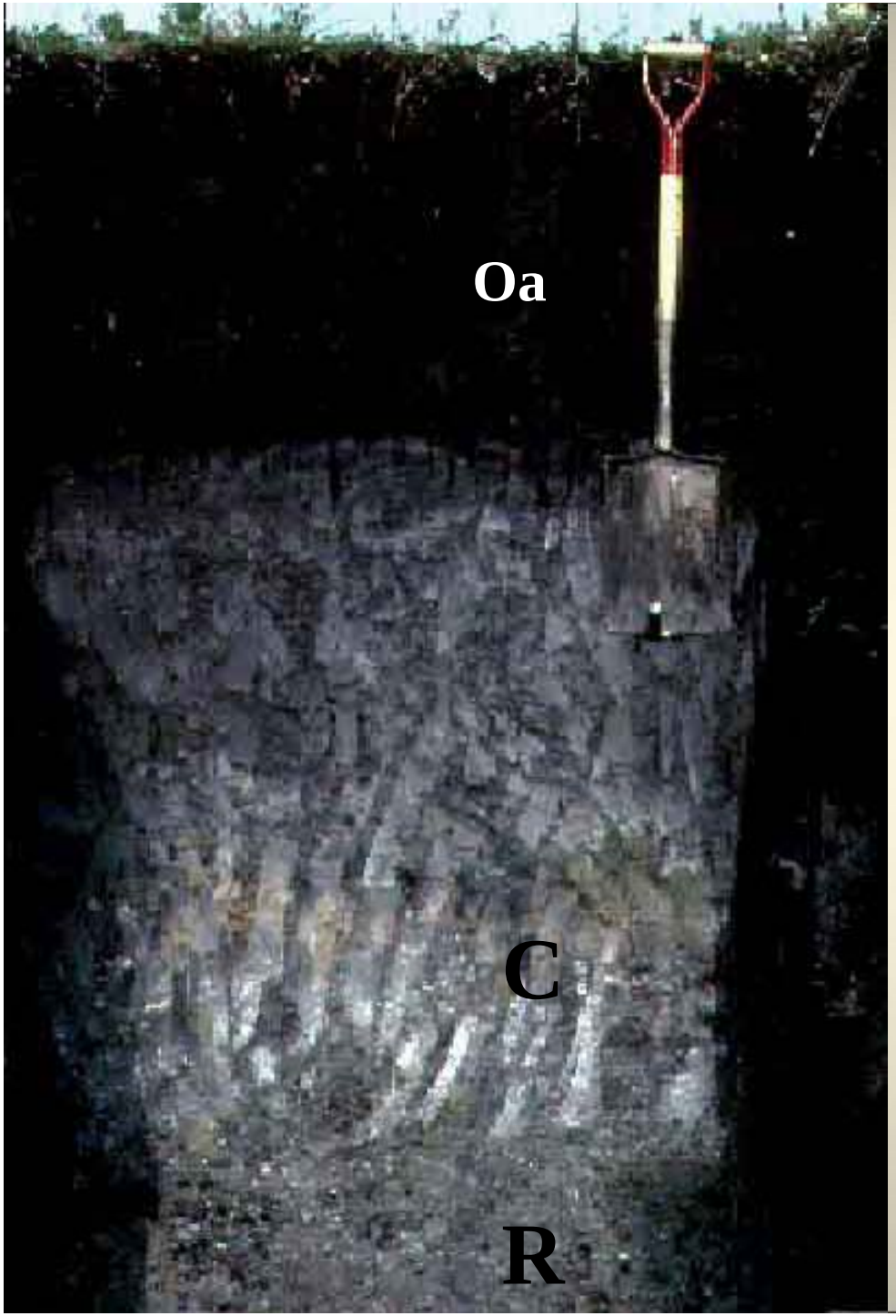
-4.7 million acres in FL



ALFISOLS - clay accumulation

-translocation of silicate clays w/o base depletion

-1.7 million acres in FL



HISTOSOLS - organic carbon

-very high organic content

upper 32” of the soil;
if no lithic or paralithic contact

-1.6 million acres in FL

Hydric Soils Indicators

Freshwater Wetlands
Tampa Bay Region

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INDICATORS FOR ALL SOIL TYPES

	Common Indicators
• A1 –Histosol (1/2 upper 32”)	
• A2 -Histic Epipedon (8-24”)	√
• A3 -Black Histic	
• A4 -Hydrogen Sulfide	√
• A5 -Stratified Layers	√
• A6 -Organic Bodies	√
• A7 -2” Mucky Mineral	√
• A8 -Muck Presence	

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Sandy Soils

Defined as Sandy Loamy Fine Sand and Coarser

- **Common Indicators**

- S4 -Sandy Gleyed Matrix
  - **√**
- S5 -Sandy Redox
  - **√**
- S6 -Stripped Matrix
  - **√**
- S7 -Dark Surface

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Loamy and Clayey Soils

~~Very Fine Sand~~

F3 – Depleted Matrix

F5 – Thick Dark Surface

F6 – Redox Dark Surface

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Hydric Soils

Indicator Types: Group 1a Soils with these indicators have a **SHWT at or above the surface**:

- A1. Histosols
- A2. Histic Epipedon
- A3. Black Histic
- A4. Sulfidic Odor,
- A7. Mucky mineral,
- A8. Muck presence,
- F5 Thick Dark Surface

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A1. Histosol

16” or more of upper 32” as organic soil material

Muck, Mucky Peat and Peat

S8. Polyvalue Below Surface

- diffuse
- splotchy pattern of black (value of 3 or less and chroma of
- 1 or less) and gray (value of 4 or more and chroma of 1 or
- less) below a black surface horizon is evidence of organic
- matter that has been mobilized and translocated. This
- soil also meets the requirements of indicator S5 (Sandy
- Redox).

Hydric Soils

-Indicator Types: Group 1b Soils with these indicators have a **SHWT within 6" of the surface.**

- A5 Stratified Layers
- A6. Organic bodies
- S4. Sandy Gleyed Matrix
- S5. Sandy Redox
- S6. Stripped matrix
- S7. Dark surface

S6. Stripped matrix

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Below Stream Terrace . Stratified layer ? YES flooded, not A5;

Soil Workshop Quincy April.2011

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Stripped Matrix - S6 Indicator

"…diffuse splotchy patterns with rounded areas stripped of organic matter or iron…"

No abrupt patterns

Stripped Zones 10% of volume, approx. 1-3 cm diameter

Photo credits: USDA, NRCS Field Indicators of Hydric Soils in the United States A Guide for Identifying and Delineating Hydric Soils, Version 7.0, 2010


4
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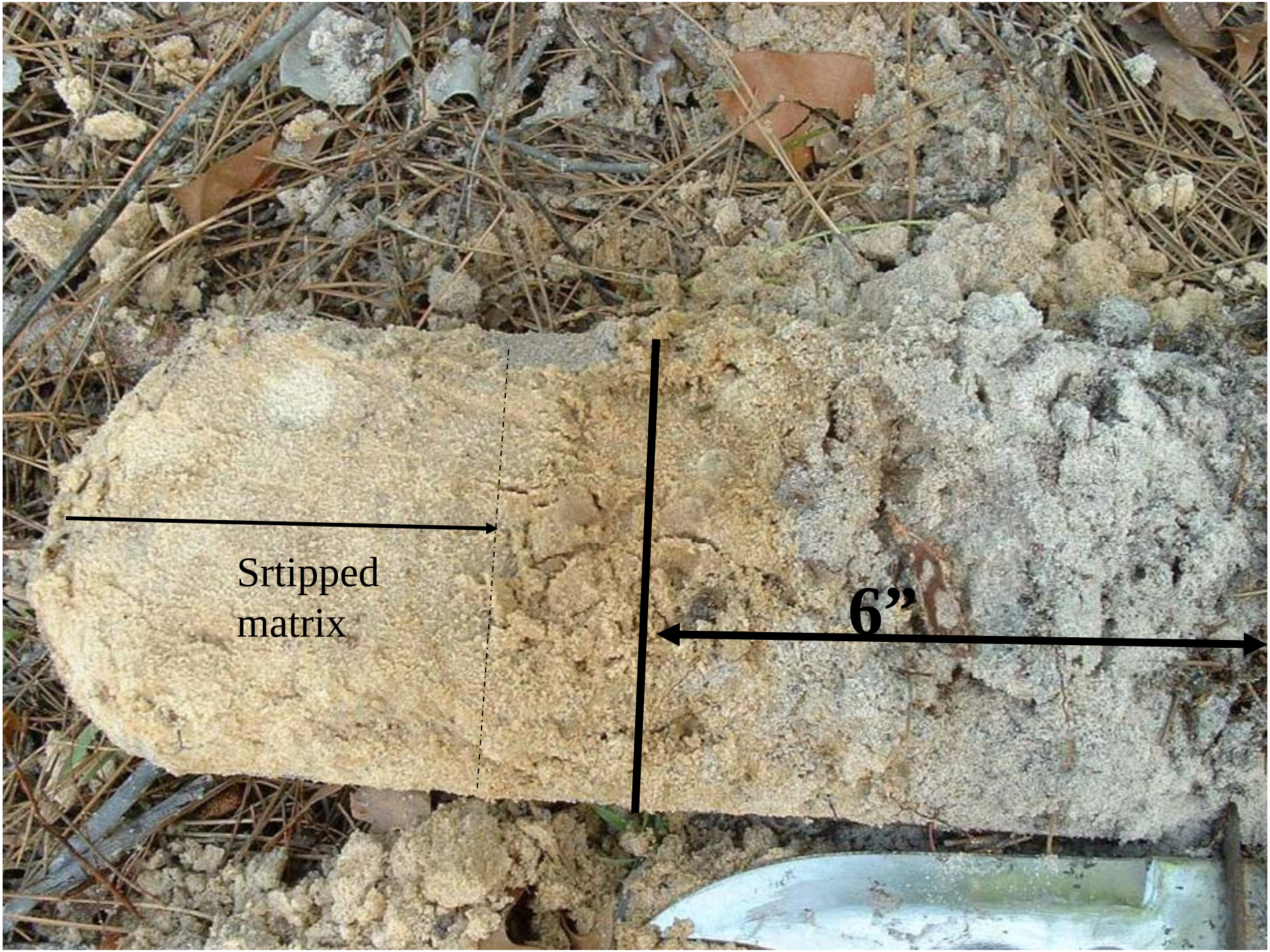
tampa
Non-hydric
soil


Srtipped
matrix
6”

Sandy Redox S5 Indicator

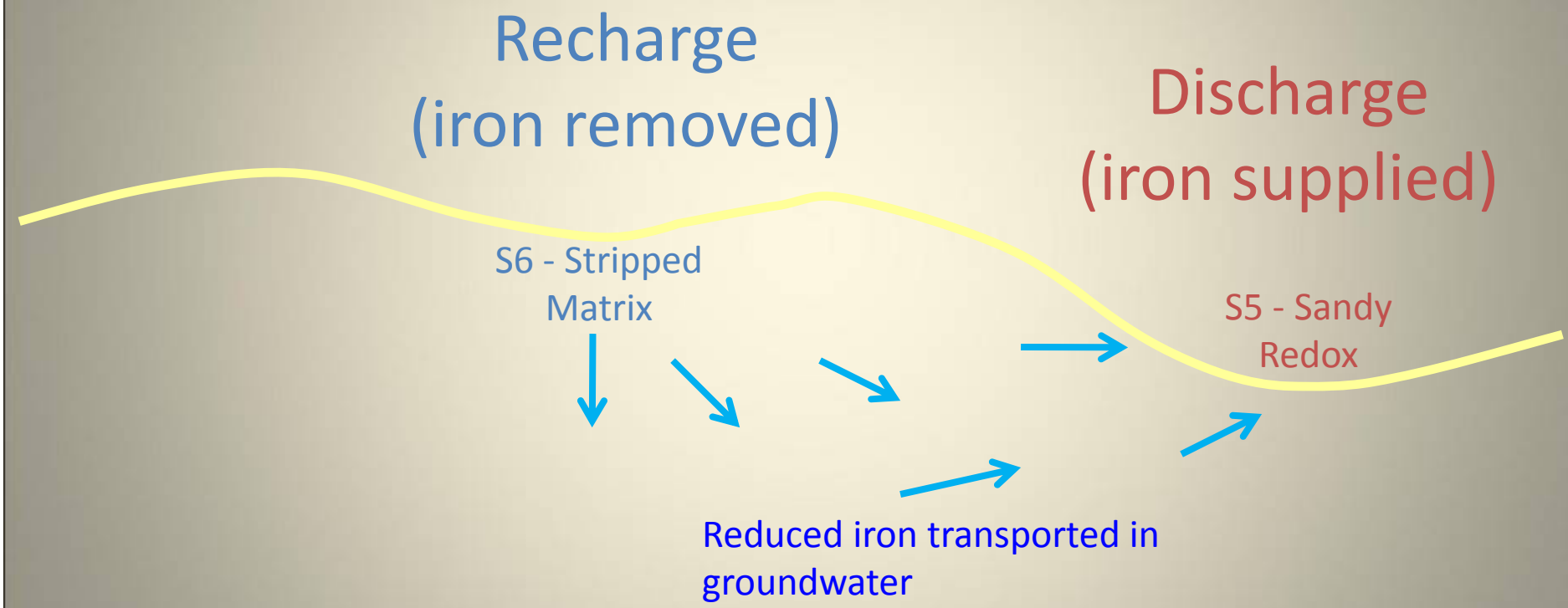
Requires a matrix chroma of 2 or less and at least 2 percent redox concentrations starting at a depth of about 10 cm. (distinct or prominent redox concentrations as soft masses and/or pore linings of iron and manganese masses or mottles)

S5 Sandy Redox

- Iron concentrations above the 5” mark appears relict and not indicative of present hydrology
- More contemporary features below 5” w/ sandy redox depicting seasonal saturation

Sandy Redox-12-14” . Soil Workshop Quincy April.2011

Recharge / Discharge



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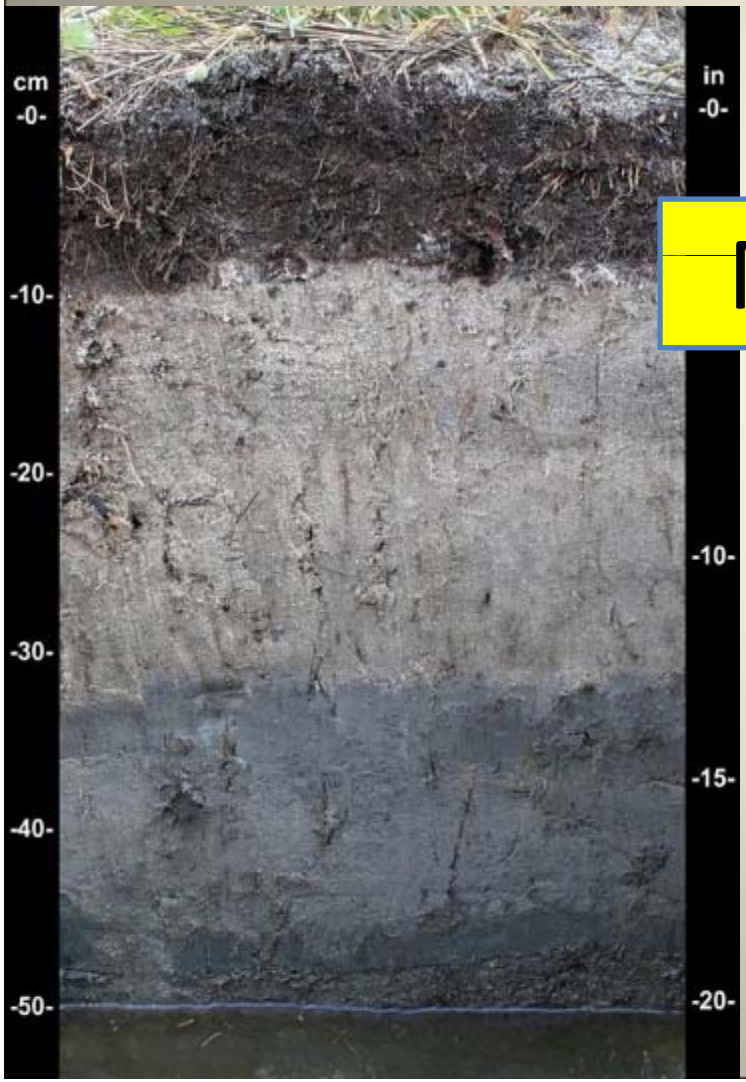
A6. Organic bodies

- 1-3 cm size
- Adhere to roots
- Feel greasy

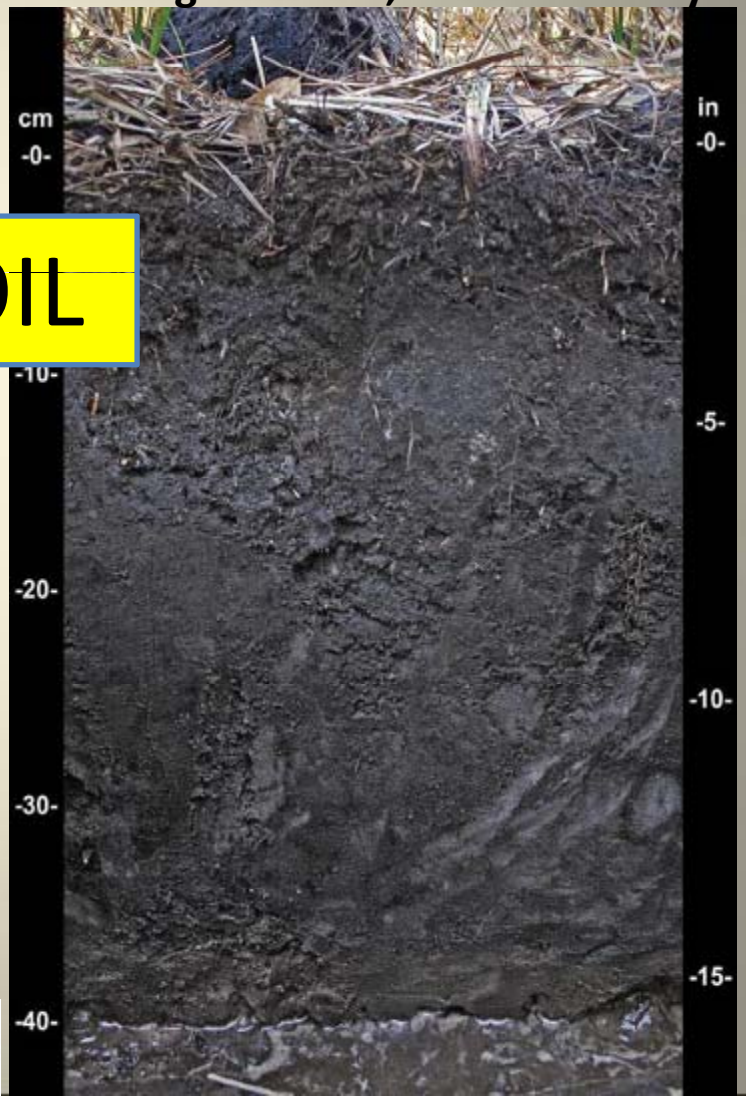

Forest Hills

Indicator A7 (5 cm Mucky Mineral)
More than 5 cm of mucky sand, starting at the surface.

Indicator S7 (Dark Surface)
Requires a value of 3 or less and chroma of 1 or less from the surface to a depth of 10 cm.
Directly below chroma of 2 or less required.
70% particles coated with organic material
Using 10X -15X magnification; 100% naked eye



MOIST SOIL



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Example From a Spodosol

Stripping at 12”

Seasonal high saturation therefore at 12”

This is a non-hydric soil.


10/24/2009

Wetland ID:
Assessor:

SOIL ASSESSMENT FIELD FORM

Instructions: Dig the soil pit at the wetland edge in the most natural area of the wetland away from soil disturbances such as pig rooting, foot traffic and the like.
Determine where, if at all, the Hydric Soil Indicator/s are in your 12" core.
List the Indicator/s type/name and depth and describe the soil characteristics of the core.
For Marsh Wetlands: Dig the soil core 6' from the historic edge (e.g., palmetto).
For Cypress Wetlands: Dig the soil core near the outermost cypress.

Depth (in):		Matrix Color (Moist Soil)	Redoximorphic Features (if present)	Texture: (use texture flowchart)	Indicator	Depth (in.) Found
From	To					

Dig a Soil Core no Probes

Example: If a Stripped Matrix S6, is found at 8" in depth, this should be recorded as such even though it exceeds the "within" 6" criterion for that indicator.

Comments:

Equipment List:

Sharpshooter Shovel
Sharp Knife
Towel
Filled Spray Water Bottle
Munsell Color Chart
Field Determination of Soil Texture diagram
Soil Data sheets
Indicator Listing with Descriptions for LRR U
Loop (magnifier)
Tape Measure
Hydric Soil of Florida Handbook (Optional)

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USDA United States Department of Agriculture

In cooperation with the National Technical Committee for Hydric Soils

NRCS Natural Resources Conservation Service

Fiel
Hyd
Unit
A Guide
Hydric S

HYDRIC SOILS OF FLORI
HANDBOOK

FOURTH EDITION

Florida Association of Environmental Soil Scientists
Founded 1975

FLORIDA ASSOCIATION OF ENVIRONMENTAL SOIL SC
in cooperation with
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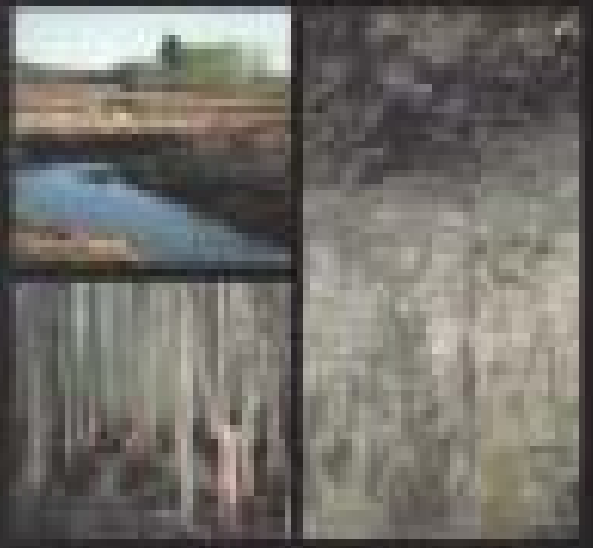
WETLAND SOILS

Genesis, Hydrology, Landscapes, and Classification



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The End


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