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Soils on Social Media
www.twitter.com/SoilSNE
www.fb.com/SoilSNE
www.nesoil.com

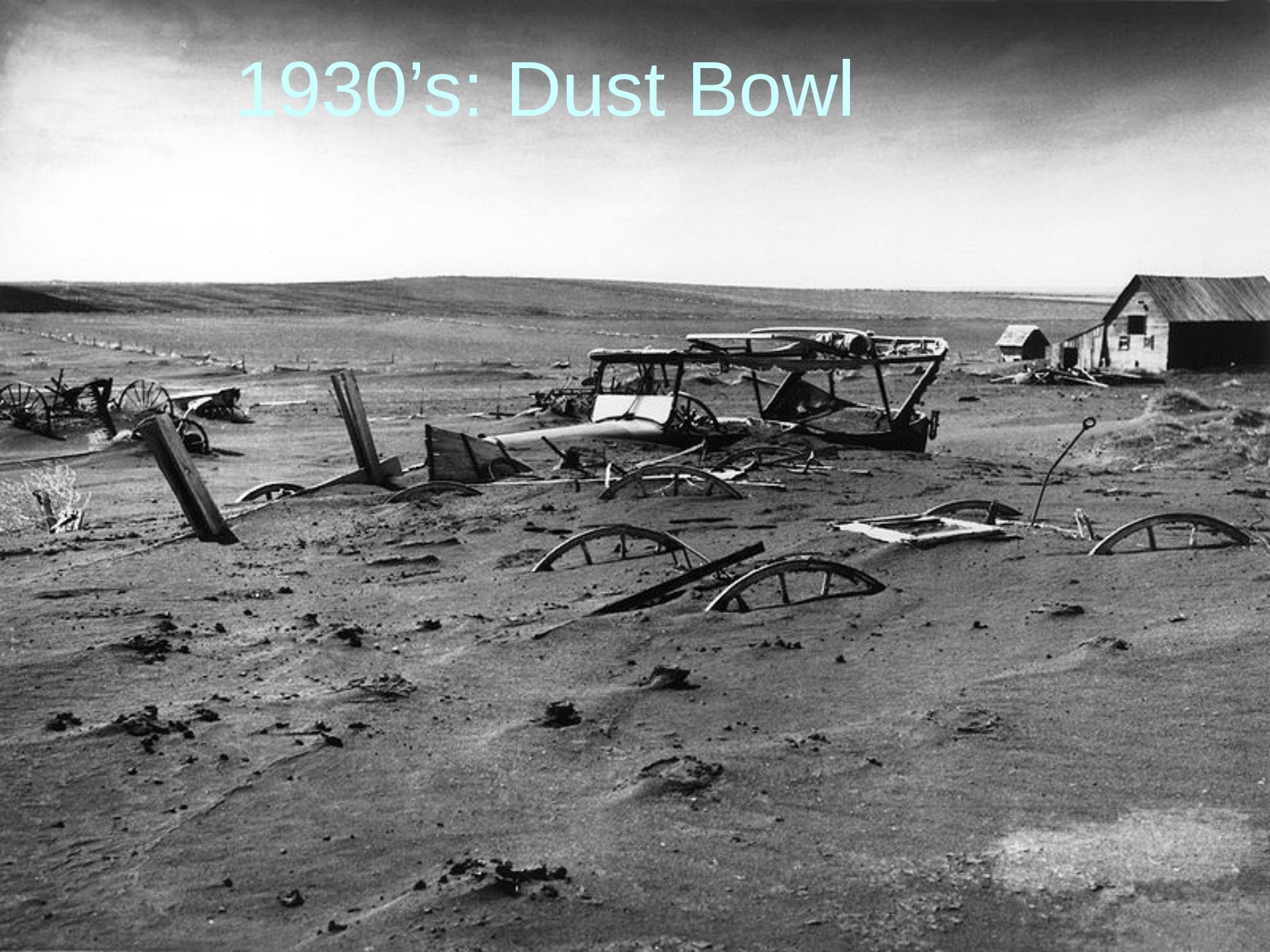
NRCS

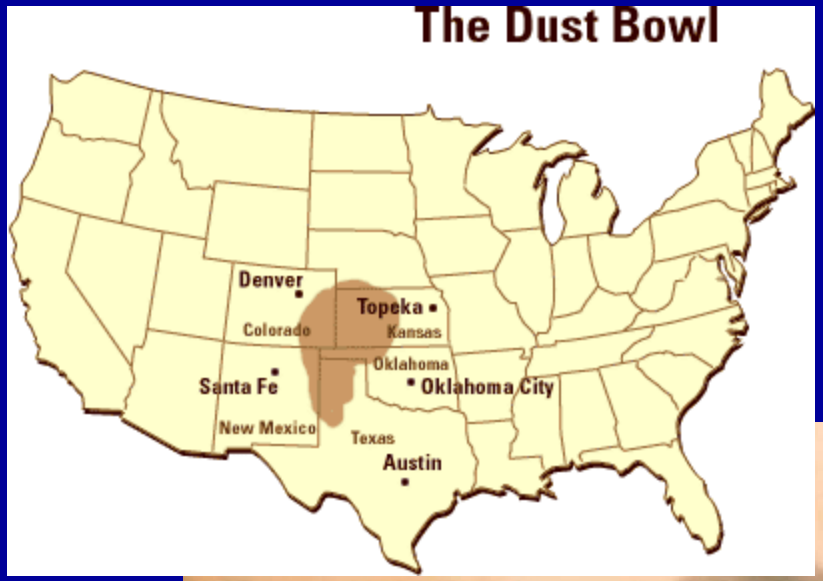
- U.S. Department of Agriculture
- 1935: Soil Conservation Service (SCS)
- Natural Resources Conservation Service

Hugh Hammond Bennett

"The father of soil conservation"

1930's: Dust Bowl





http://youtu.be/x2CiDaUYr90?list=UUkYTImzhK7f-UHBdYXJX5HQ

"Helping People Help the Land"

- NRCS Goals:
  - high quality, productive soils
  - clean and abundant water
  - healthy plant and animal communities
  - clean air
  - an adequate energy supply
  - working farms and ranchlands
- Provide technical and financial assistance to private landowners to achieve these goals

Envirothon Competition

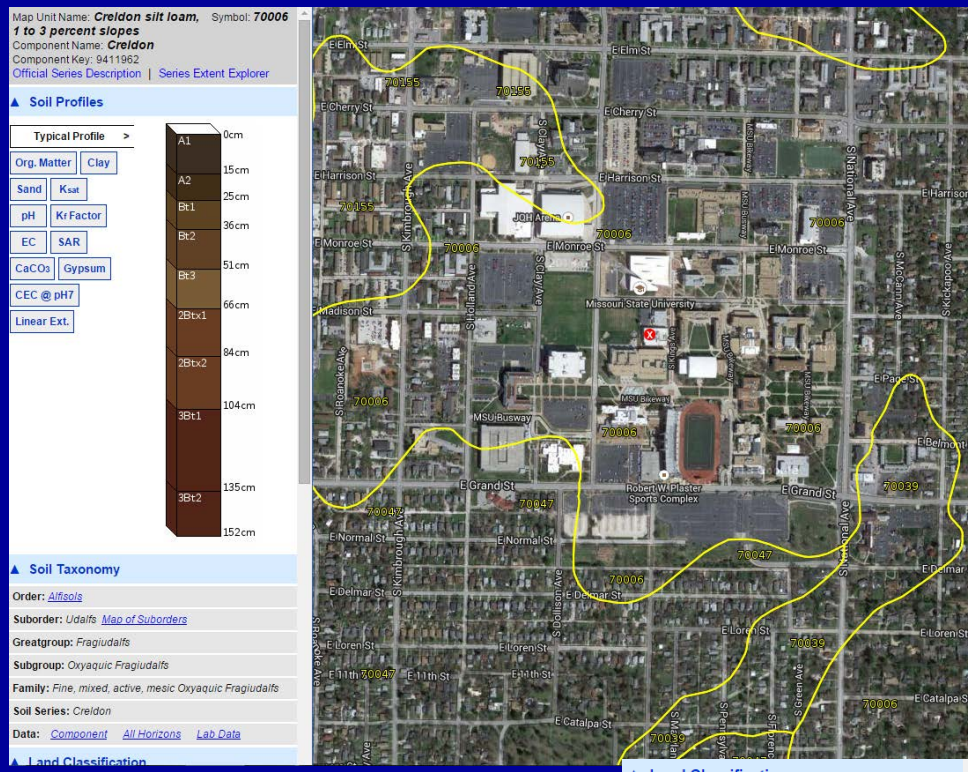
- Multiple choice/ fill in questions about soils
  - Review all online material
- Soil pit or soil profile
  - Describe soil horizons, color, texture, parent material
- Use Printed RI Soil Survey or Web Soil Survey.
- Study EVERYTHING on RI Envirothon site (http://www.rienvirothon.org/soils-resources.htm)

Special Topic

Urban/Community Forestry

http://urbanforestry.frec.vt.edu/stormwater/Resources/PresentationTreesAndStructuralSoils.ppsx

Need on-site investigation to confirm soil type in urban areas.



- Support the weight of pavement, cars and other structures
- Provide space for tree roots to flourish under paved sites
- Porosity of 30-35%, and infiltration rates (514 cm/hour!)

Soil Science (Pedology)

The scientific study of soils, including their origins, characteristics, and uses.

- Why Soils?
  - Interpretations – how to best use the land based on the soil resources

Narragansett Silt Loam – The (Unofficial) State Soil of RI

Learning Objectives for Envirothon

- Recognize soil as an important and dynamic resource.
- Recognize and understand the features of a soil profile
- Describe basic soil properties and soil formation factors
- Understand the origin of soil parent materials
- Identify soil constituents (e.g. clay, organic matter, sand and silt)
- Identify and list soil characteristics (e.g. texture, structure, etc.) and their relation to soil properties.
- Determine basic soil properties and limitations (e.g. mottling and permeability) by observing a soil pit or a soil profile
- Recognize the characteristics of wetland (hydric) soils
- Understand soil drainage classes and know how wetlands are defined
- Understand soil water, its movement, storage, and uptake by plants
- Understand the effects of land use on soils
- Identify types of soil erosion and discuss methods for reducing erosion
- Utilize soil information, including a soil survey

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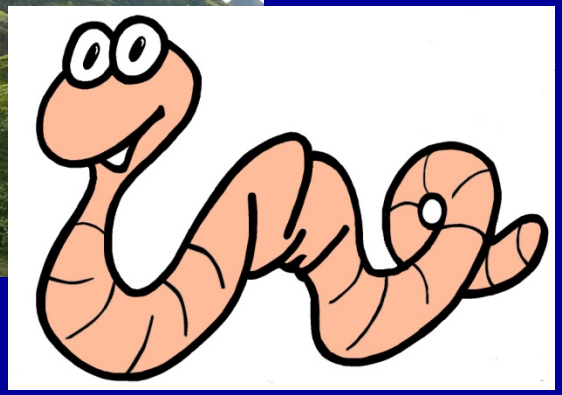
Five factors of soil formation

- Topography
- Organisms
- Climate
- Parent Material
- Time



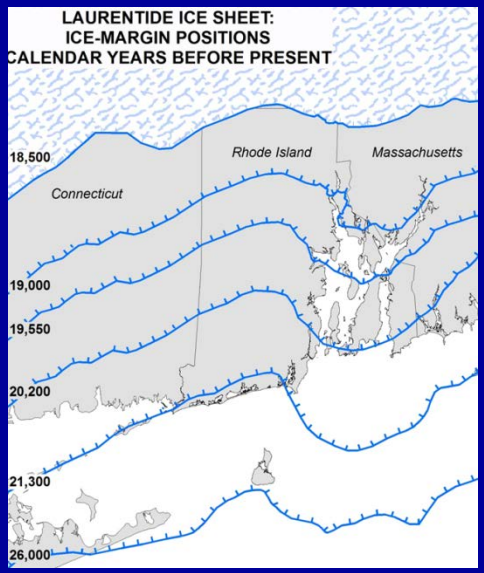
Parent Materials

Geologic Material the Soil Formed From (or in).

- Types of minerals.
- Reaction of soil.
- Soil Color.
- Chemical/physical properties

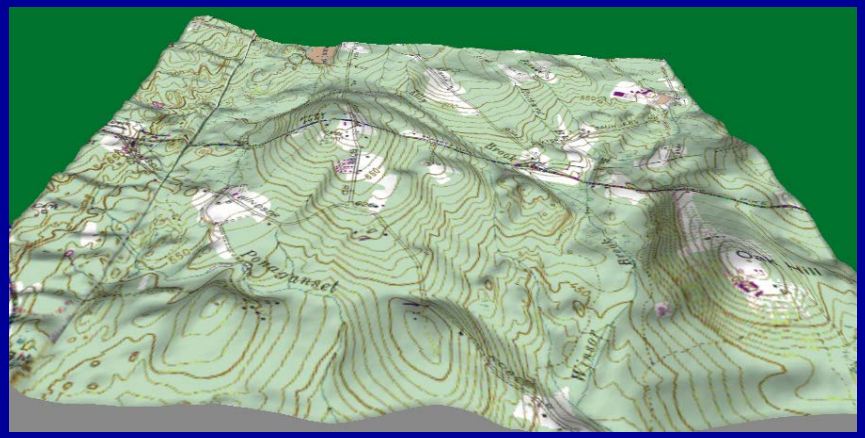
New England Glacial Parent Materials

- Pleistocene Epoch (Ice Age) – 1.8 MYBP to 8 KYBP.
- 4 Major advances.
- Last– Wisconsinan advance covered all of New England to Long Island
- Soil parent materials – glacial & post glacial



Glacial Till

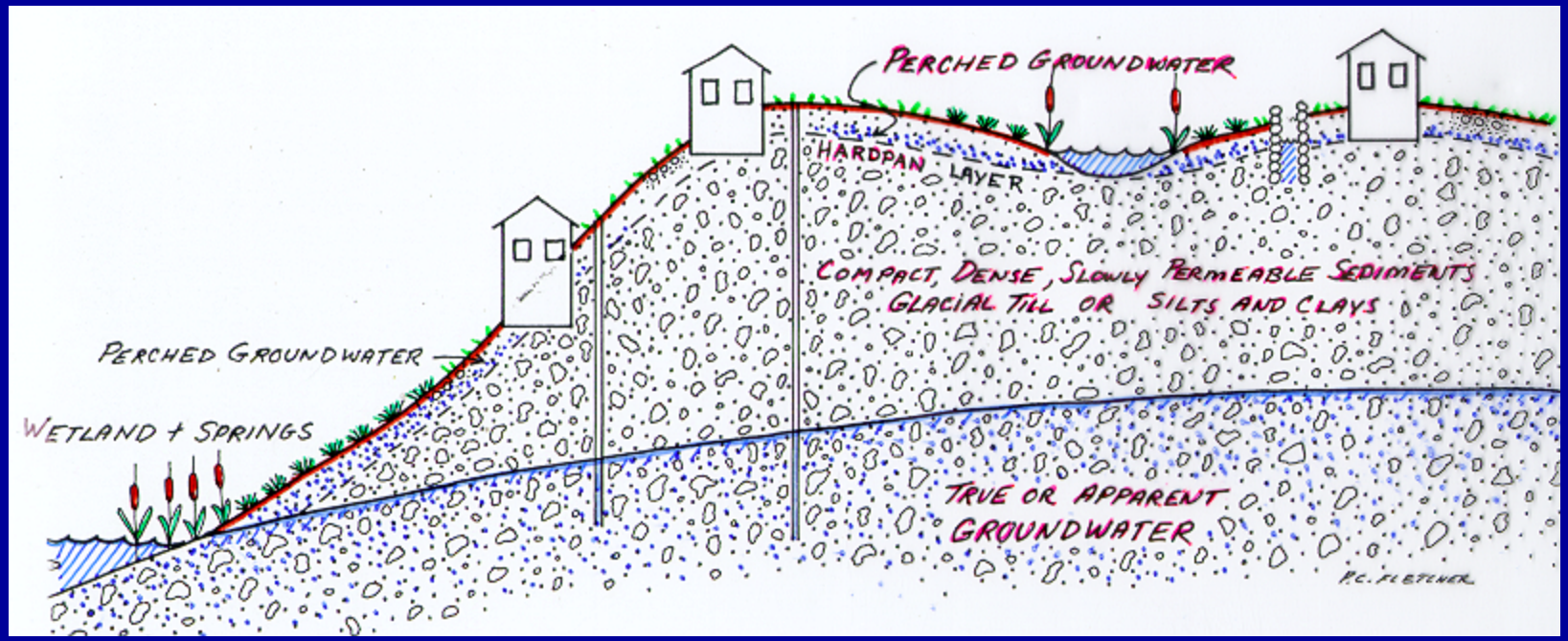
- Unsorted/stratified material deposited beneath and within glacial ice.
- Heterogeneous mixture of all particle sizes (boulder to clay).
- Oldest surficial deposit overlying most bedrock areas.



Till Properties

- Major Types: Basal and Ablation.
- Landforms: Drumlins, moraines, Ice contact.
- Basal till has a dense restrictive layer which impedes downward water movement.
- Large angular stones and boulders.

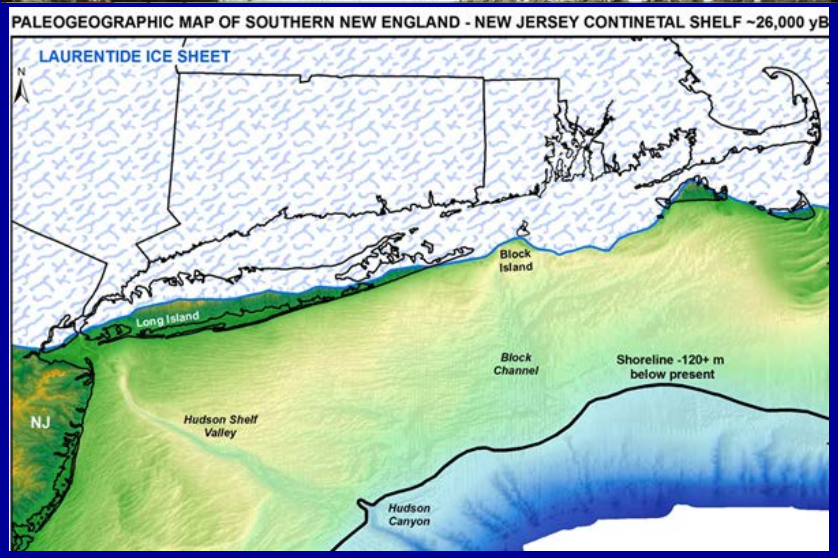
Hydrology in Tills



Hardpan (dense till) perches water causing wet basements, wetlands on hill tops and slopes – drainage driven by landscape position.

Glacial Fluvial (outwash)

- Sediments deposited by glacial meltwater.
- Stratified layers of sand, gravel
- Types: Proglacial and Proximal (ice contact).
- Landforms: Plains, eskers, kames, deltas.



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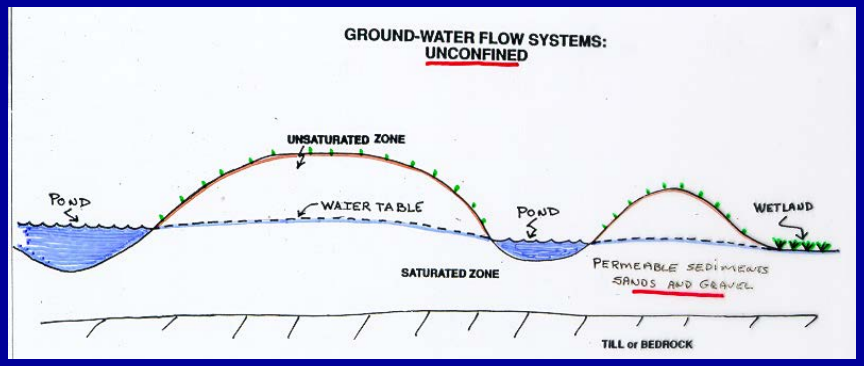
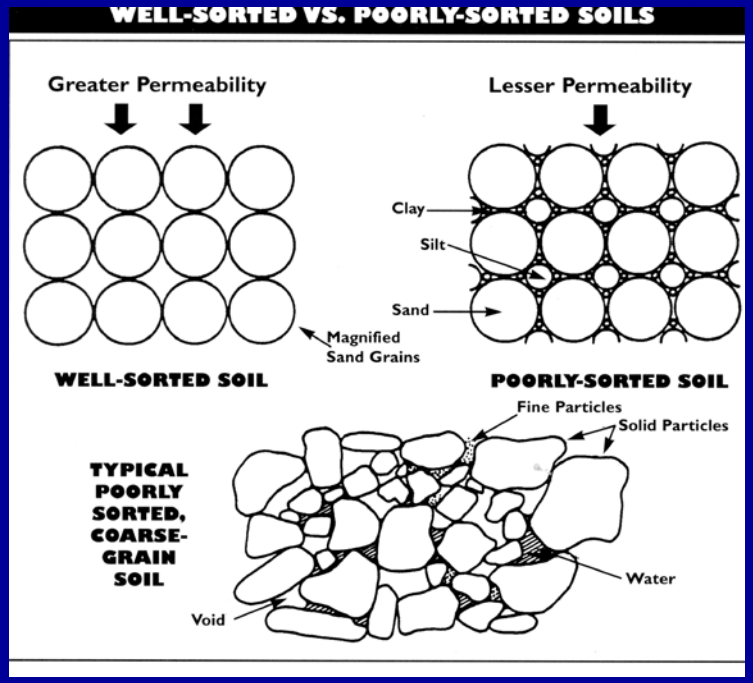
Outwash Properties

- Dominantly sand and gravel sized particles.
- Rapid water movement, associated with aquifers.
- Apparent watertable.
- Few limitations for most uses.

Outwash Hydrology Concerns

- Apparent watertables, generally easy to interpret hydrology.
- Large pore space causes rapid permeability.
- Aquifer recharge areas.
- Poor filtering capacity.





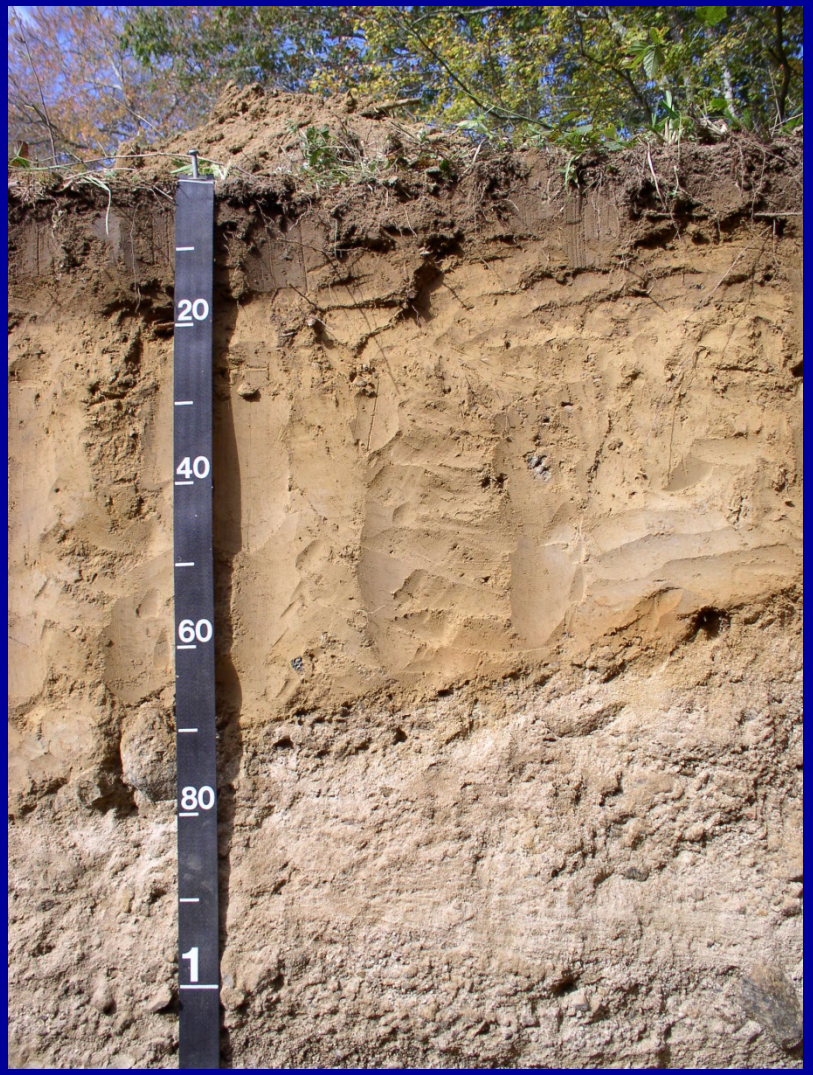
Other parent material

- Laucustrine – glacial lakes now drained.
- Volcanic – ash (Andisols).
- Organic – swamps, marshes, bogs
- Loess/Eolian – Deposited by the wind
- Colluvium – Gravity deposits (slides).
- Alluvium – Deposited by flooded rivers.
- Residuim – Formed in place (weathered bedrock).
- HTM – Human Transported Material.

Post Glacial Deposits

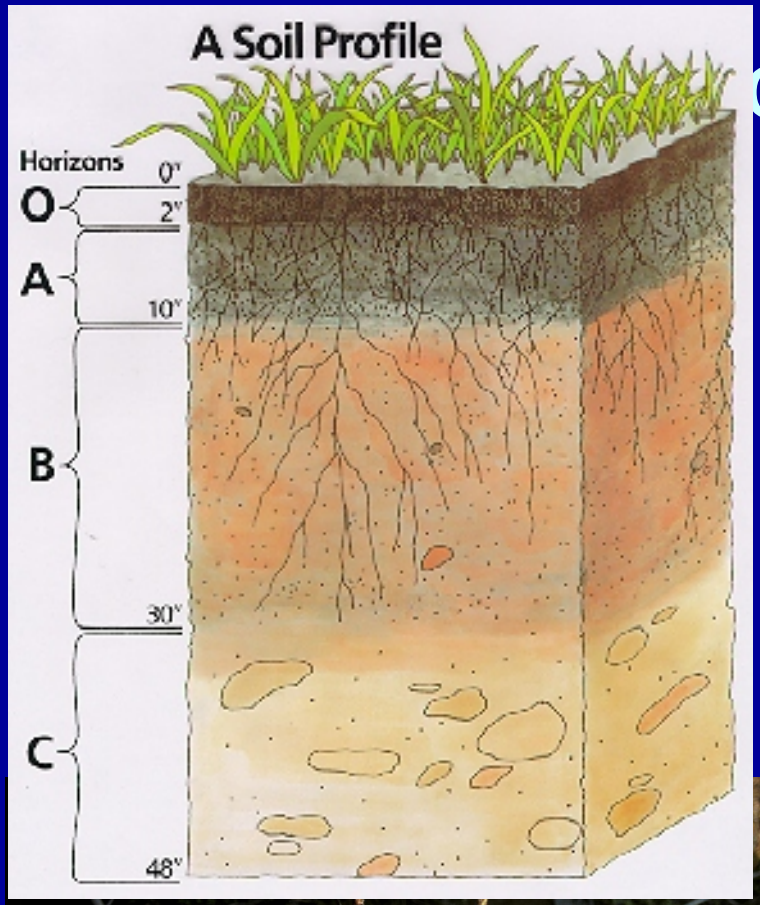
- Material deposited after glacier left (Holocene–10K BP).
- Eolian – wind deposited sand to silt sized particles.

Most upland soils in NE have a thin 18–36 inch eolian cap. Deposited rapidly after ice left.



Landforms

oil Profile



- Master Horizon Designations:
  - A
    - Mineral horizon colored by organic matter
  - B
    - Mineral horizon that shows evidence of soil formation (color, structure)
  - C
    - Parent material
  - O
    - Organic
  - E
    - Elluvial
  - R
    - Rock

Soil Poperties

- Texture
- Color
  - Organic Matter and Iron
- Structure
  - Granular, subangular blocky
- Redox Features
  - Reduction / Oxidation of Iron
  - Evidence of wetness
- Permeability

Soil Properties: Texture

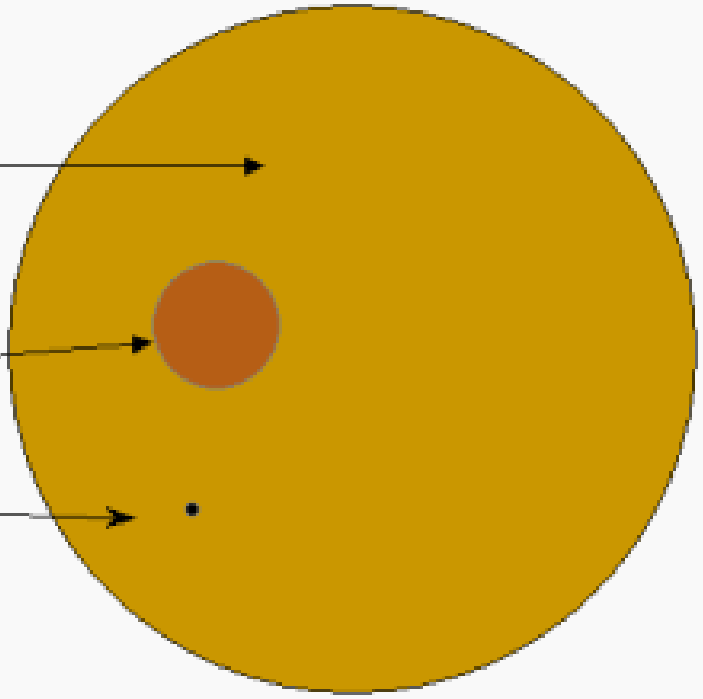
Soil Texture: The relative proportions of sand, silt, and clay particles in a mass of soil (material less than 2mm in size).

Very Coarse Sand = 2 to 1 mm

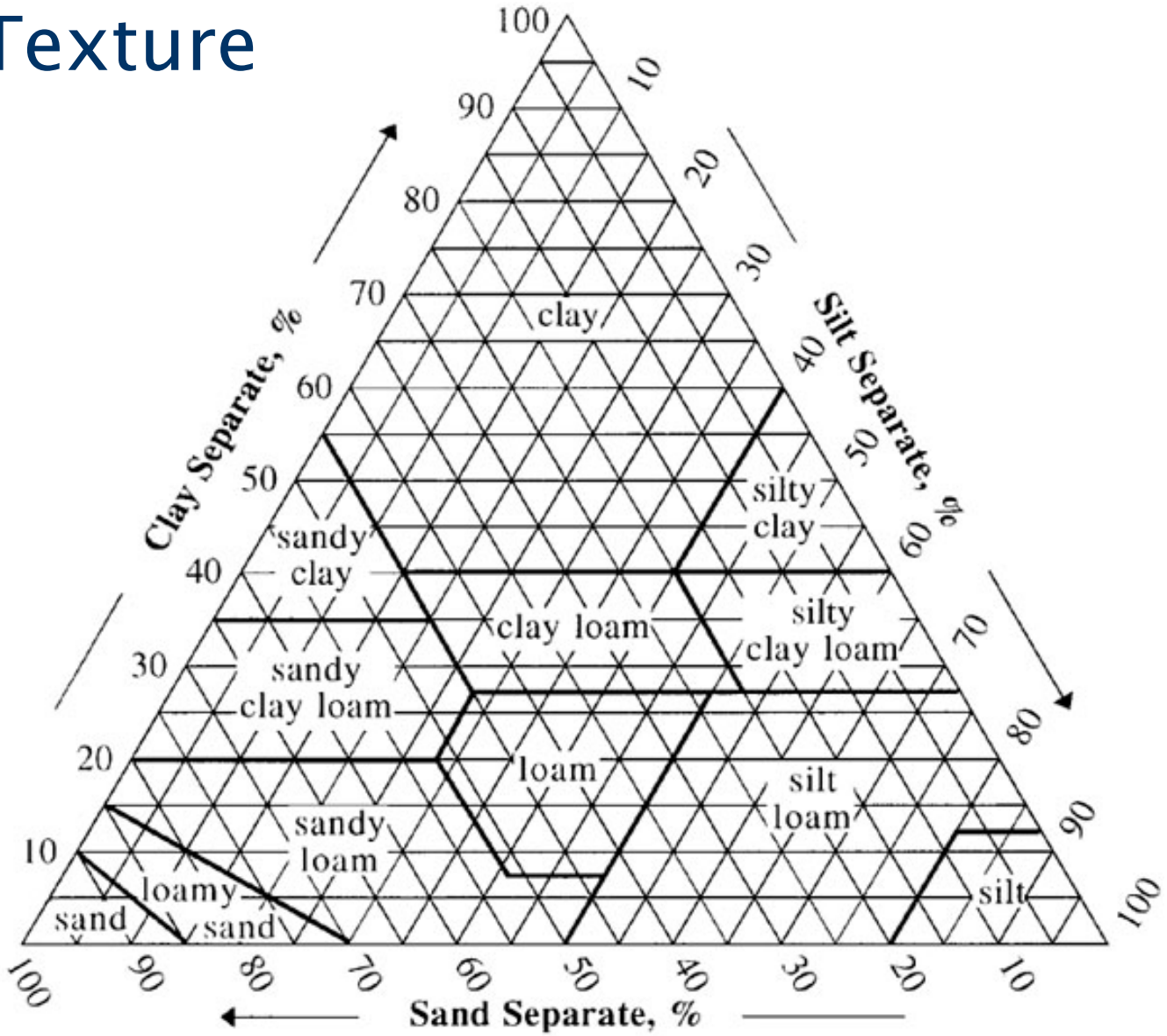
Very Fine Sand = 0.1 to 0.5 mm

Silt = 0.05 to 0.002 mm

Clay = < 0.002 mm

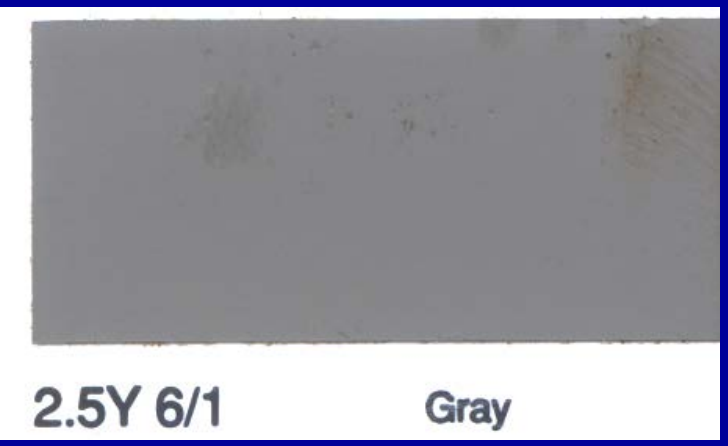


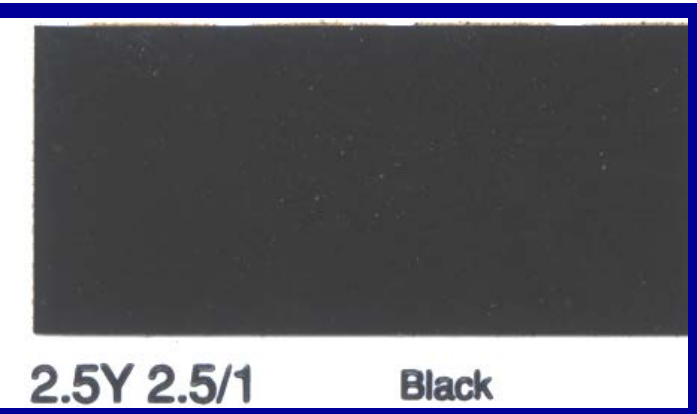
Soil Texture



Soil Color

- Easily identified property.
- Used to relate chemical/physical properties such as watertable depth, drainage, chemical constituents, formation, horizons.



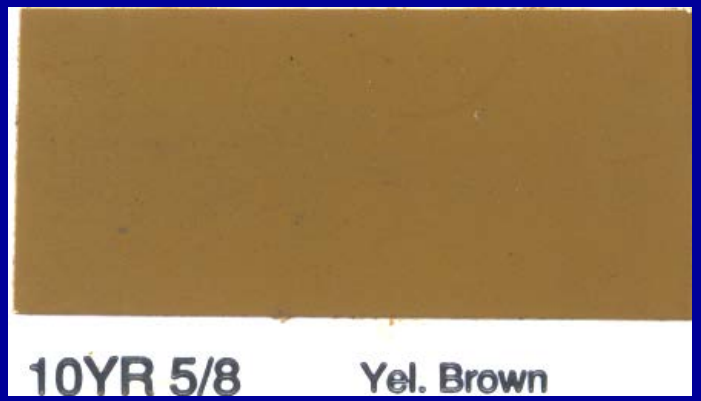


Hue – dominate spectral series 10YR

Value – amt of light reflected white to black

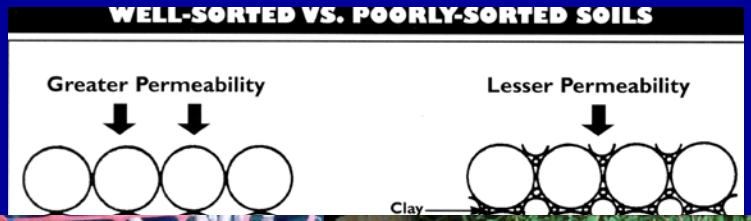
Chroma – strength of the hue

Hue V/C



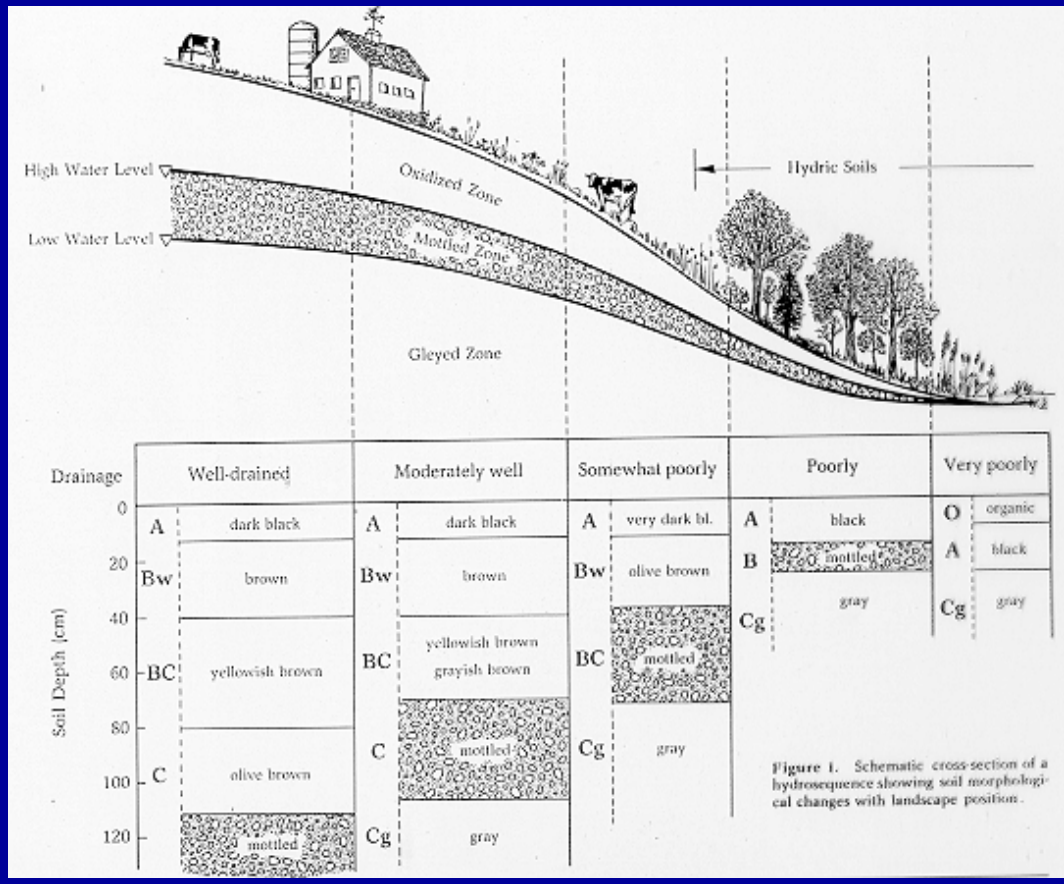
Water in Soils

- Water movement
  - Influenced by texture and structure
- Wetland hydrology
  - Hydric Soils
  - Indicators in so
  - Other wetland indicators



Soil Drainage

- Depth to water or evidence of water
- Classes: Excessively, well, moderately well, poorly, very poorly drained



Using Soil Survey

- Paper soil survey
  - Mapped at 1:15,840 scale
    - 2.5 acre minimum map unit
    - 1 mile = 4 inches
  - Published in 1981
  - Field work done in 1950s and 1960s
- Web Soil Survey
  - Can access all states data in one place
  - For RI: Same base data and scale 1:15,840
  - Attributes updated more recently
  - “Official” Soils Data

NRCS

s.usda.gov/app/HomePage.htm

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- Soil Series Extent Mapping Tool
- Soil Data Mart
- Geospatial Data Gateway

The simple yet powerful way to access and use soil data.

START WSS

Welcome to Web Soil Survey (WSS)

Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Three Basic Steps

I Want To...

- Start Web Soil Survey (WSS)
- Know the requirements for running Web Soil Survey
- Know whether Web Soil Survey works in my web browser
- Know the Web Soil Survey hours of operation
- Find what areas of the U.S. have soil data

Announcements/Events

- Web Soil Survey 2.1 has been released! View description of new features.


Soils