

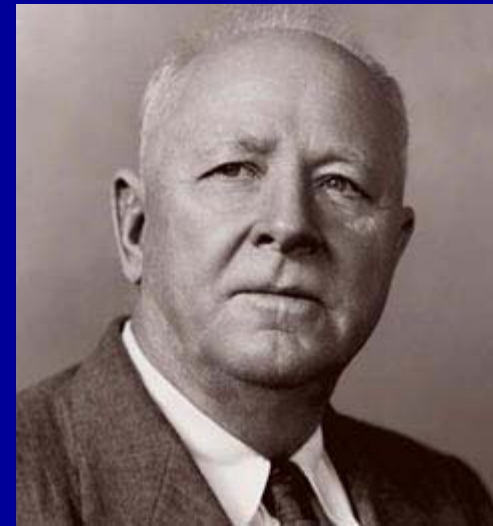


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- U.S. Department of Agriculture
- 1935: Soil Conservation Service (SCS)
- Natural Resources Conservation Service



Hugh Hammond
Bennett

“The father of soil
conservation”

The Dust Bowl



1930's: Dust Bowl





“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

Soil Science (Pedology)

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

- Many different areas
 - Soil chemistry
 - Physics
 - Genesis
 - Classification
 - Morphology
 - Biology



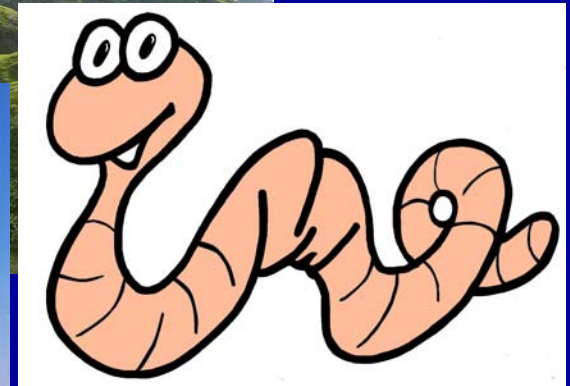
Narragansett Silt Loam – The (Unofficial) State Soil of RI

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

Five factors of soil formation

- Topography
- Organisms
- Climate
- Parent Material
- Time



Parent Materials

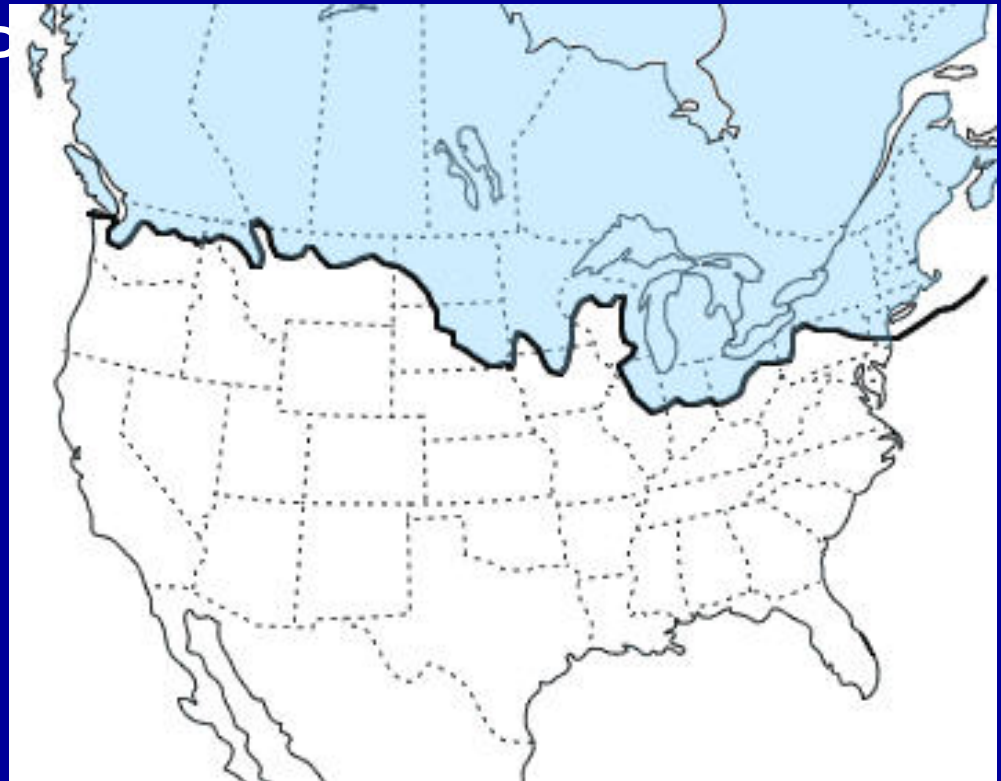
Geologic Material the Soil Formed From (or in).

- 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.



Glacial Fluvial (outwash)

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



Outwash Properties

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

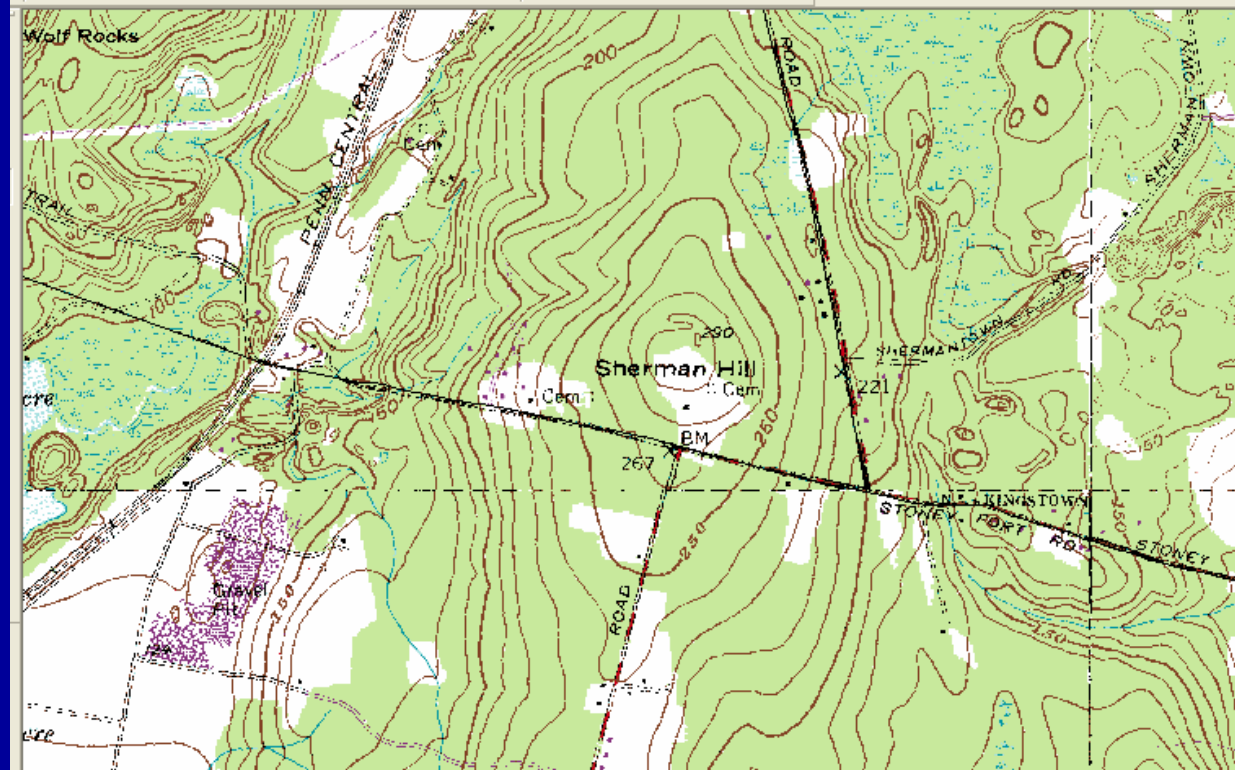


Other parent material

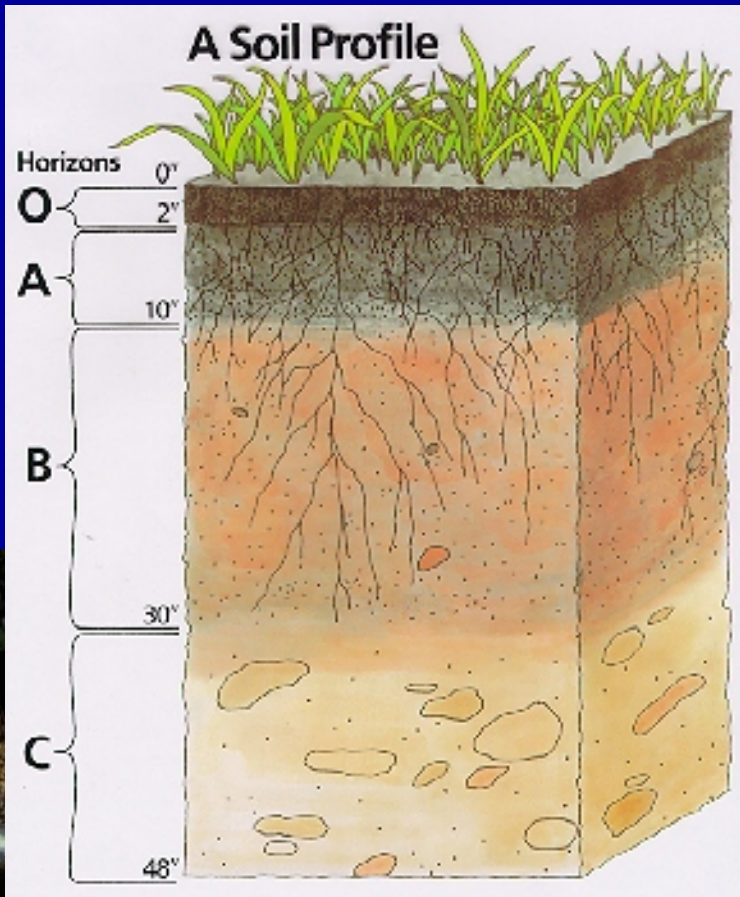
- Laucustrine - Lake
- Volcanic
- Organic
- Loess/Eolian – Moved by the wind
- Colluvium
- Alluvium – Deposited by flowing streams
- Residuim – Weathered bedrock

Landforms

- Topographic Maps
 - Drumlins
 - Outwash Plains
 - Eskers
 - Rivers
 - Wetlands



Soil 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**
 - Eluvial
 - **R**
 - Rock

Soil Properties

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



Soil Properties: Texture

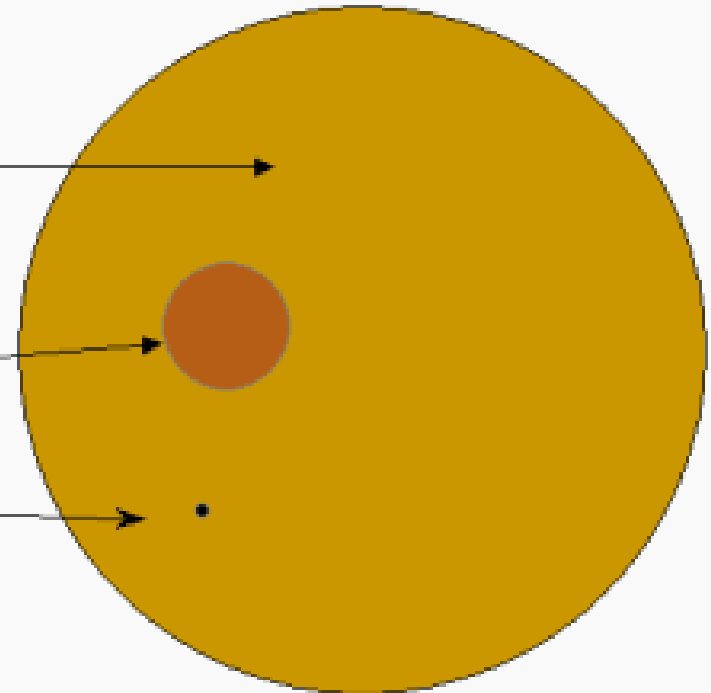
Soil Texture: The relative proportions of sand, silt, and clay particles in a mass of soil (material less than 2mm in size).

Very Coarse Sand = 2 to 1 mm

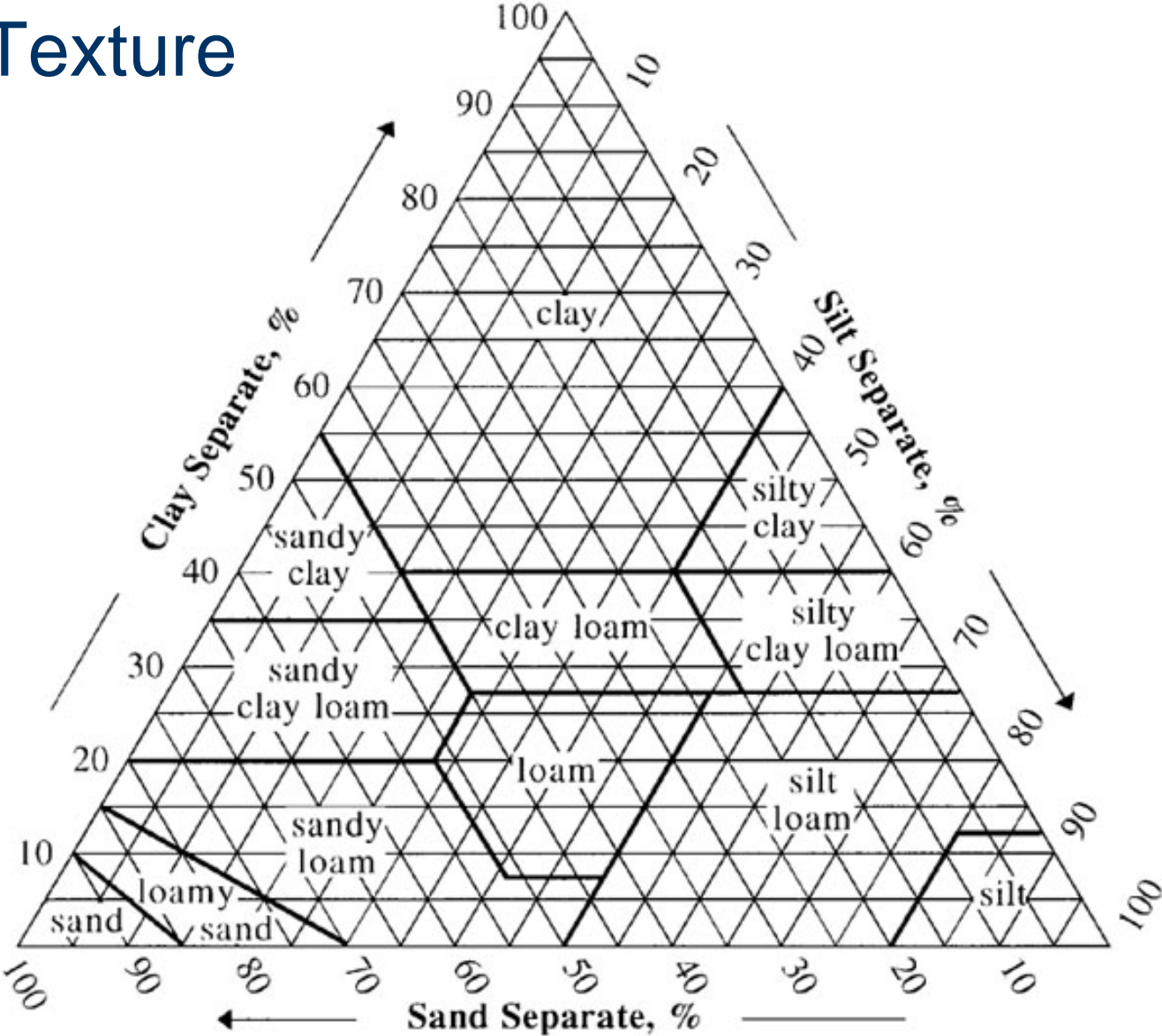
Very Fine Sand = 0.1 to 0.5 mm

Silt = 0.05 to 0.002 mm

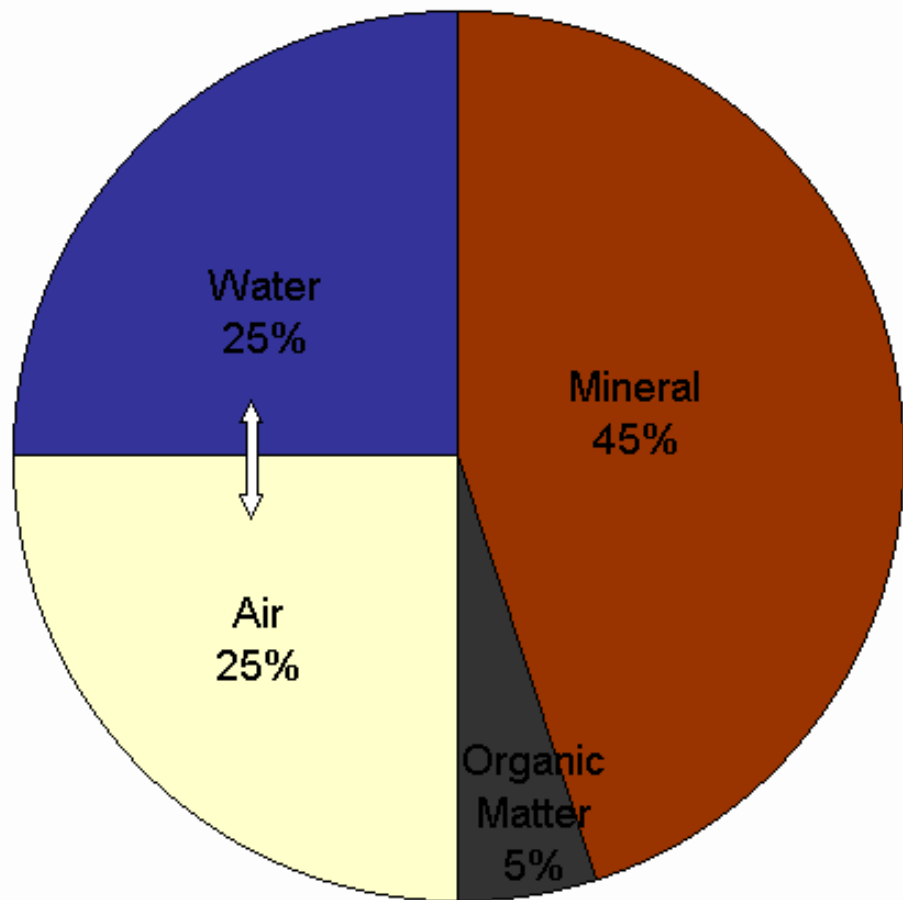
Clay = < 0.002 mm



Soil Texture

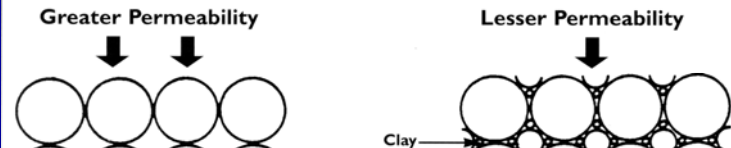


Soil Composition

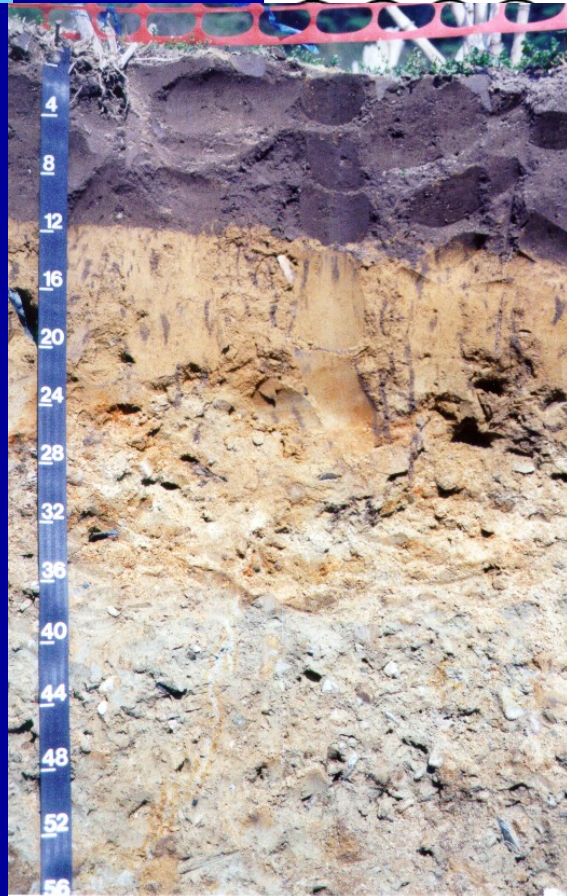


Water in Soils

WELL-SORTED VS. POORLY-SORTED SOILS

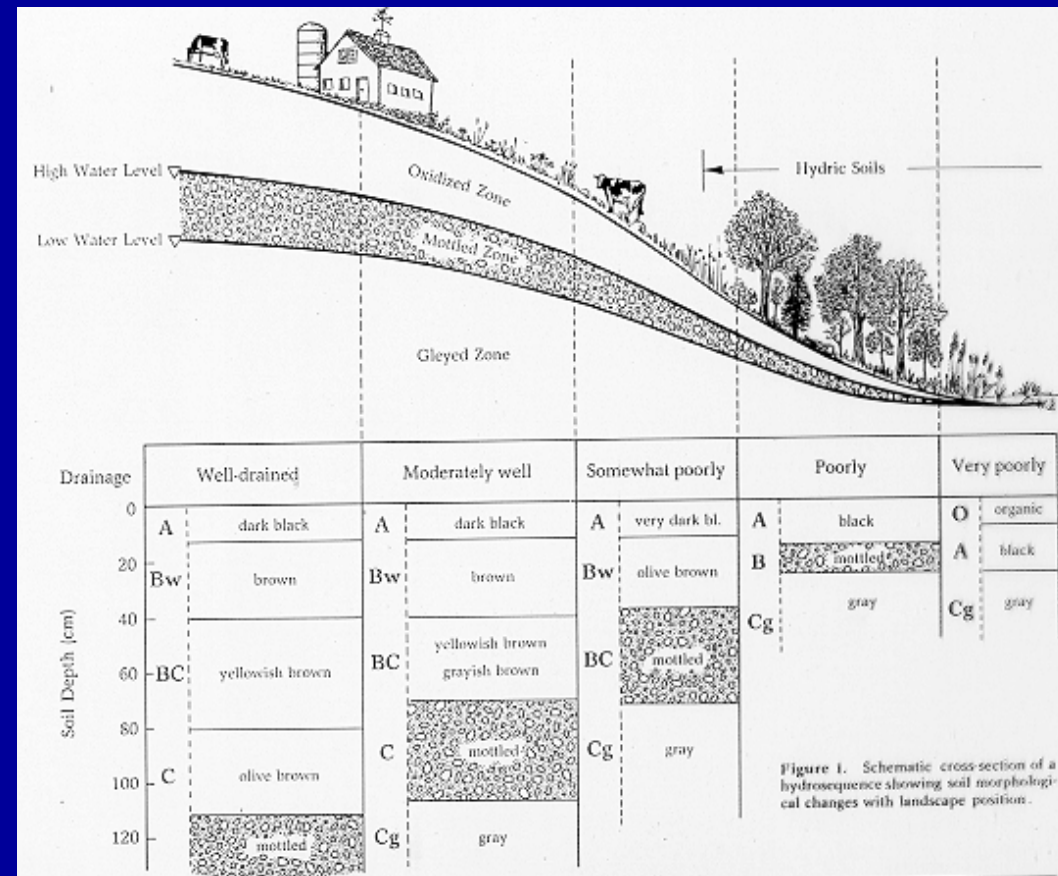


- Water movement
 - Influenced by texture and structure
- Wetland hydrology
 - Hydric Soils
 - Indicators in soil
 - Other wetland indicators



Soil Drainage

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

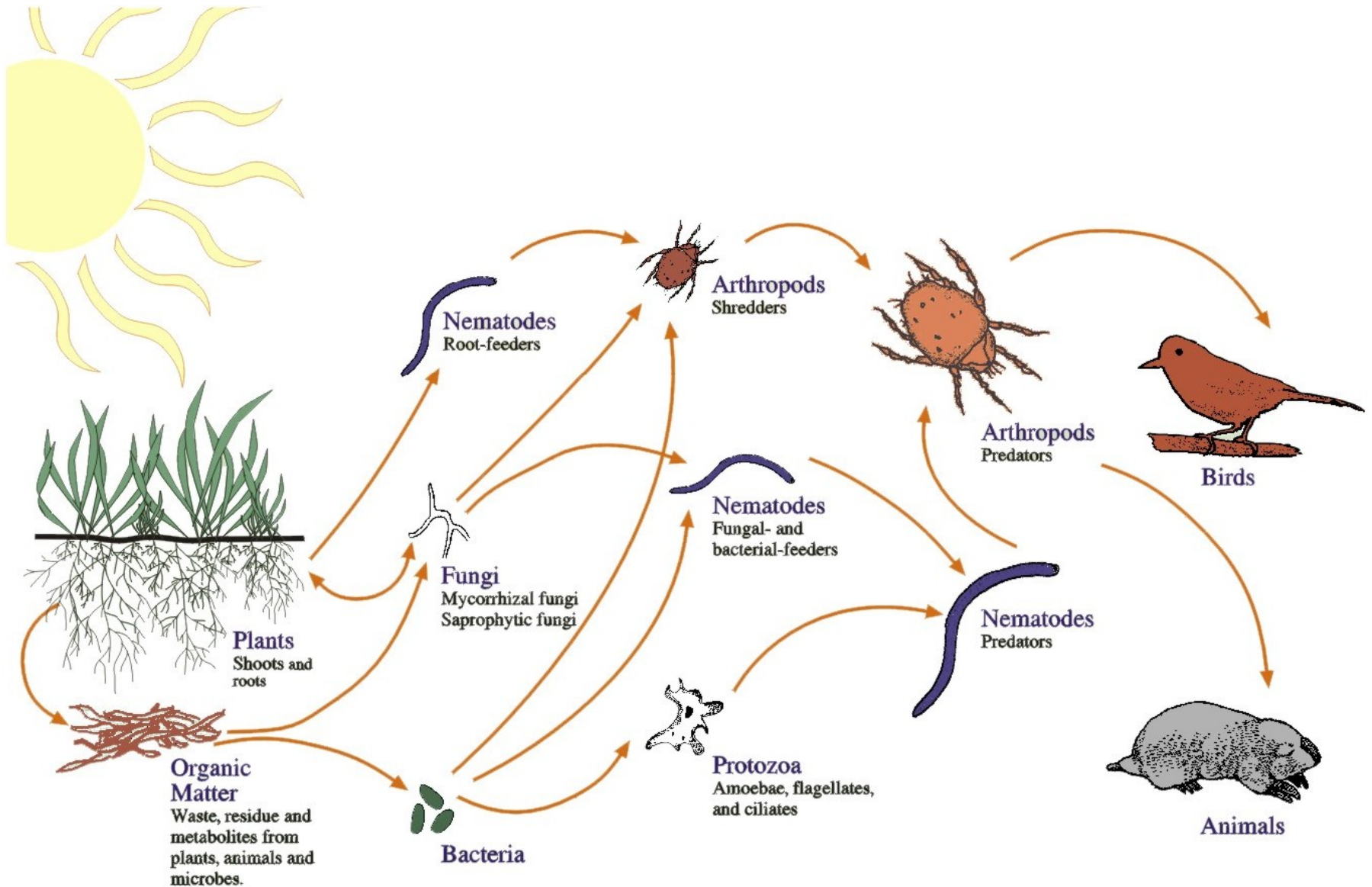


Soil Erosion

- Water
 - Rill
 - Sheet
 - Gully
- Wind
- Highly Erodible Soils:
 - Dependent on texture and slope



Special Topic: Biodiversity



Biomass of Soil Organisms in Four Ecosystems

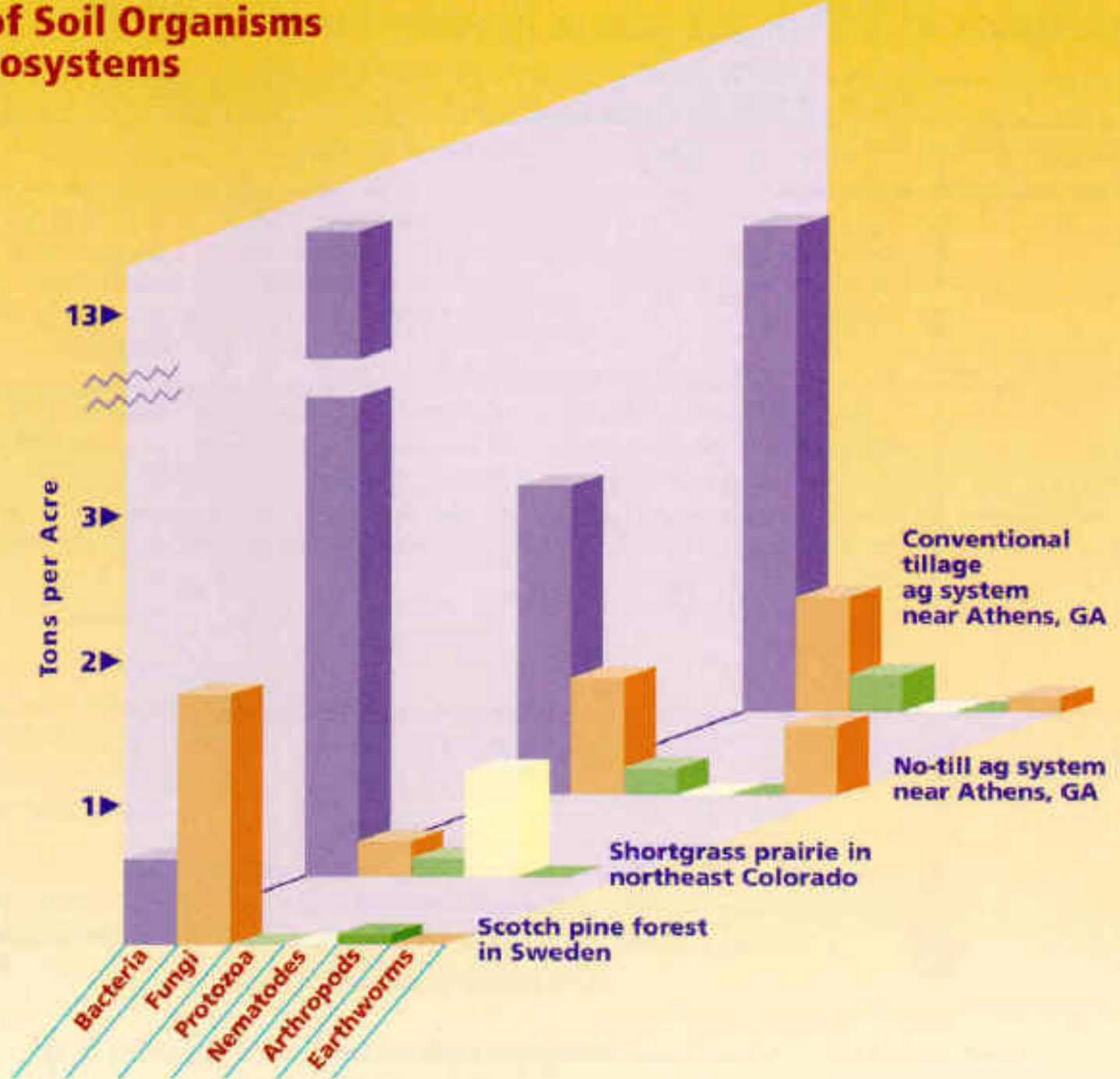


Figure 2

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



You are here: Web Soil Survey Home

Search

- Browse by Subject**
- ▶ [Soils Home](#)
 - ▶ [National Cooperative Soil Survey \(NCSS\)](#)
 - ▶ [Archived Soil Surveys](#)
 - ▶ [Status Maps](#)
 - ▶ [Official Soil Series Descriptions \(OSD\)](#)
 - ▶ [Soil Series Extent Mapping Tool](#)
 - ▶ [Soil Data Mart](#)
 - ▶ [Geospatial Data Gateway](#)

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



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.](#)



Web Soil Survey

Address: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

Go Links McAfee SiteAdvisor Convert Select

Area of Interest Properties

Clear AOI

AOI Information

Name

- Map Unit Symbols
- Use Soil Survey Area Map Unit Symbols
 - Use National Map Unit Symbols

Area (acres) 5,153.9

Soil Data Available from Web Soil Survey

State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties (RI600)

Soil Maps Version 1, Nov 24, 2004

Soil Data Version 4, Mar 17, 2008

Clear AOI

Quick Navigation

Navigate By...

Address

View

Address

Area of Interest Interactive Map

Legend

Scale (not to scale)

View Extent: Contiguous U.S.

Done

Trusted sites



Area of Interest (AOI)

Soil Map

Soil Data Explorer

Shopping Cart (Free)

Printable Version Add to Shopping Cart

Search

Map Unit Legend

State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties (RI600)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Aa	Adrian muck	61.6	1.2%
CaC	Canton-Charlton-Rock outcrop complex, 3 to 15 percent slopes	7.1	0.1%
CaD	Canton-Charlton-Rock outcrop complex, 15 to 35 percent	73.1	1.4%

Soil Map

Legend

Scale (not to scale)



Printable Version

Area of Interest (AOI)

Search

Map Unit Legend

State of Rhode Island: B
Newport, Providence,
Counties (RI600)

Map Unit Symbol	Map Unit Name
Aa	Adrian muck
CaC	Canton-Charlton-Rock outcrop complex, 3 to 15 percent slopes
CaD	Canton-Charlton-Rock outcrop complex, 15 to 35 percent slopes
CdA	Canton and Charlton fine

Report — Map Unit Description

State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties

Aa—Adrian muck

Map Unit Setting

Elevation: 0 to 810 feet
Mean annual precipitation: 44 to 50 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 115 to 200 days

Map Unit Composition

Adrian and similar soils: 90 percent
Minor components: 10 percent

Description of Adrian

Setting

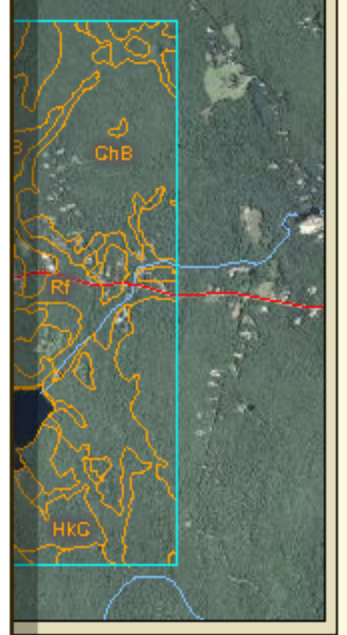
Landform: Swamps
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy and gravelly glaciofluvial deposits derived from granite and gneiss

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained

Add to Shopping Cart

0 scale)



Search

Properties and Qualities Ratings

Open All Close All

Soil Chemical Properties

Soil Erosion Factors

Soil Physical Properties

Soil Qualities and Features

AASHTO Group Classification (Surface)

Depth to a Selected Soil Restrictive Layer

Depth to Any Soil Restrictive Layer

Drainage Class

View Description View Rating

View Options

Map

Table

Description of

Map - Drainage Class

Scale (not to scale)

0 4683ft

NRCS Group Classification (Surface)
 Depth to a Selected Soil Restrictive Layer
 Depth to Any Soil Restrictive Layer

Drainage Class

View Options

Map

Table

Description of Rating

Rating Options

Advanced Options

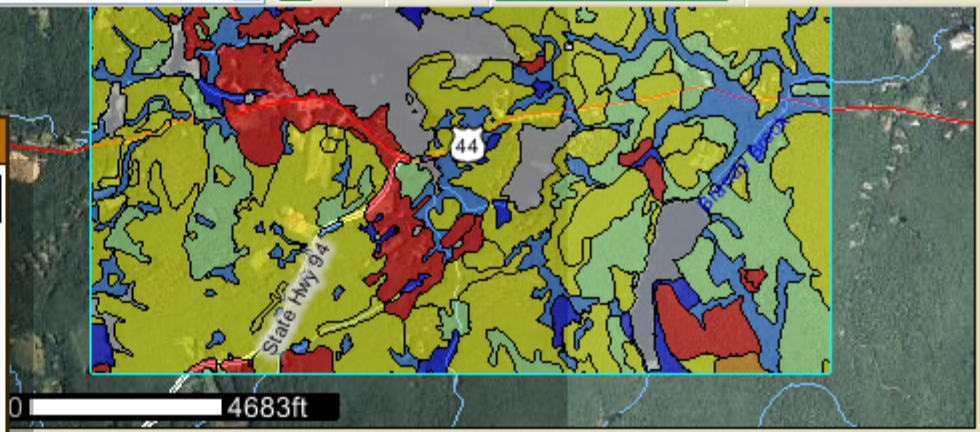
Aggregation Method

Component Percent Cutoff

Tie-break Rule

Map Legend

- Map Legend**
- Soils
 - Soil Survey Areas
 - Soil Map Units
 - Soil Ratings
 - Excessively drained
 - Somewhat excessively drained
 - Well drained
 - Moderately well drained
 - Somewhat poorly drained
 - Poorly drained
 - Very poorly drained
 - Not rated or not available
 - Special Point Features
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression



Drainage Class — Summary By Map Unit

Summary by Map Unit — State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
	Adrian muck	Very poorly drained	61.6	1.2%
	Canton-Charlton-Rock outcrop complex, 3 to 15 percent slopes	Well drained	7.1	0.1%
	Canton-Charlton-Rock outcrop complex, 15 to 35 percent slopes	Well drained	73.1	1.4%
CdA	Canton and Charlton fine	Well drained	37.3	0.7%

Soils

