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Jim Turenne

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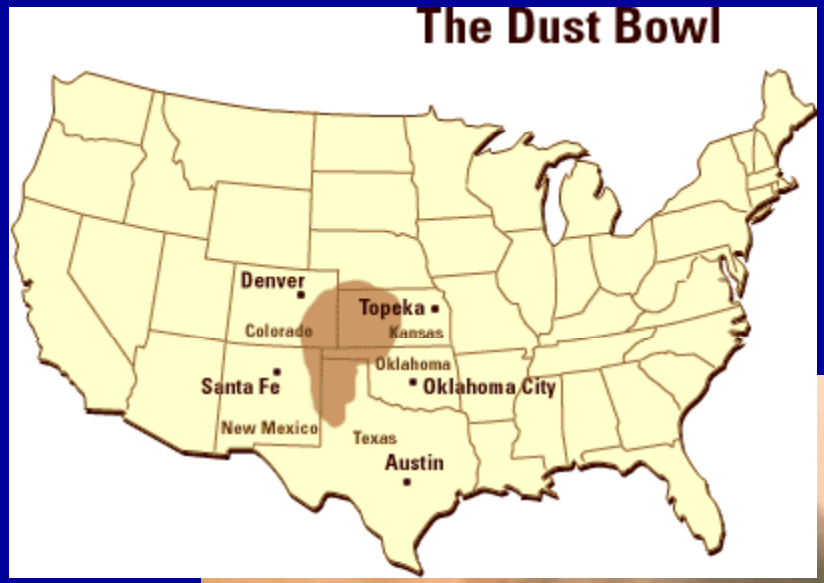
NRCS

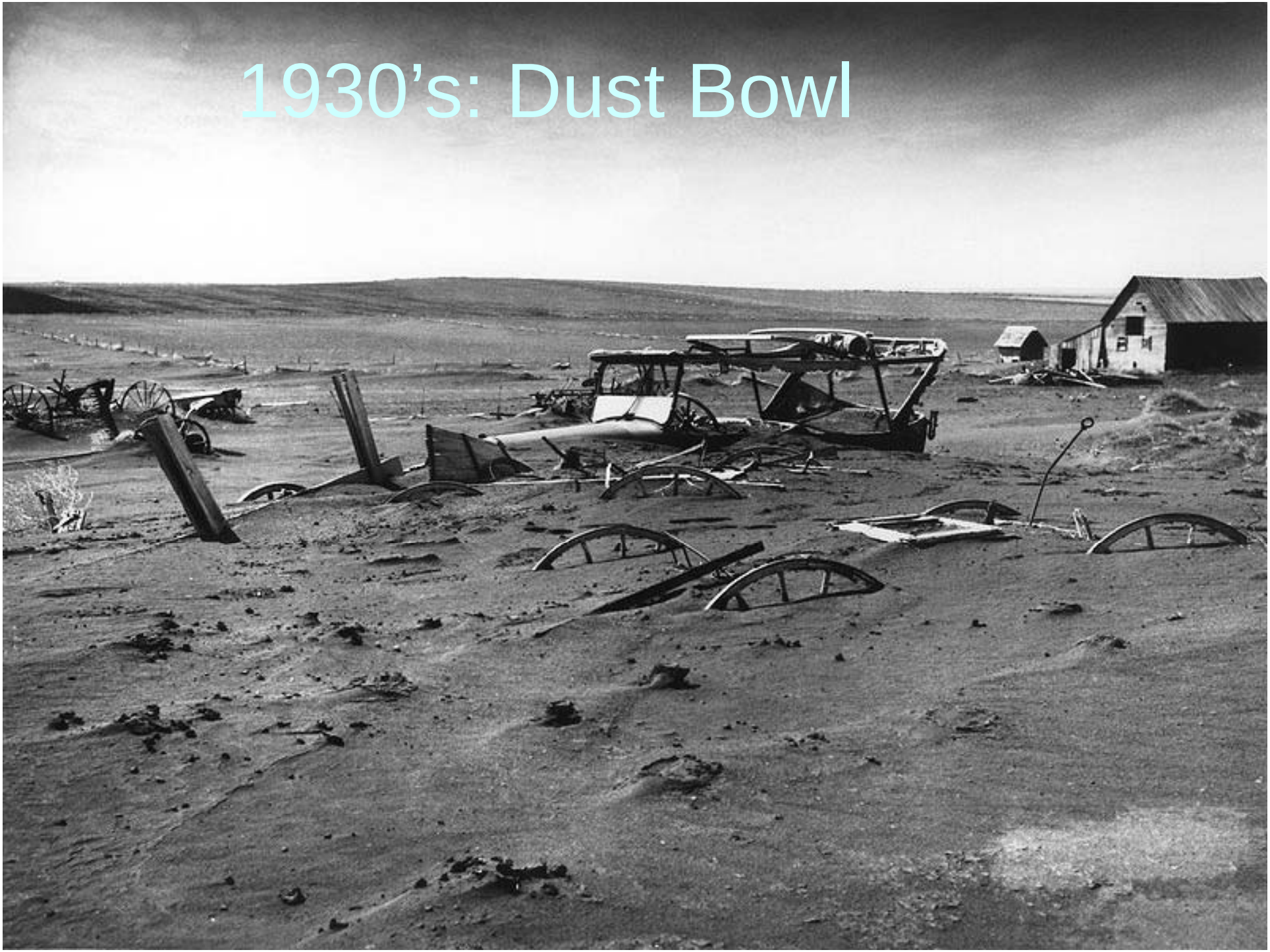
- U.S. Department of Agriculture
- 1935: Soil Conservation Service (SCS)
- Natural Resources Conservation Service

Hugh Hammond Bennett

"The father of soil conservation"


The Dust Bowl
Denver
Topeka
Colorado
Kansas
Oklahoma
Santa Fe
Oklahoma City
New Mexico
Texas
Austin

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

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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 limitatioins (e.g. mottling and permeability) by observing a soil pit or a soil profile
- Recognize the characterisitics 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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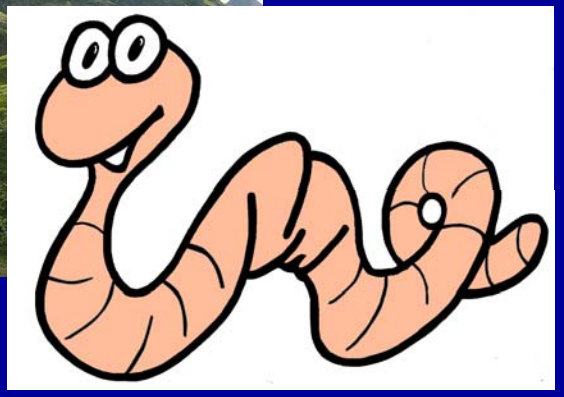
Five factors of soil formation

- 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.

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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.

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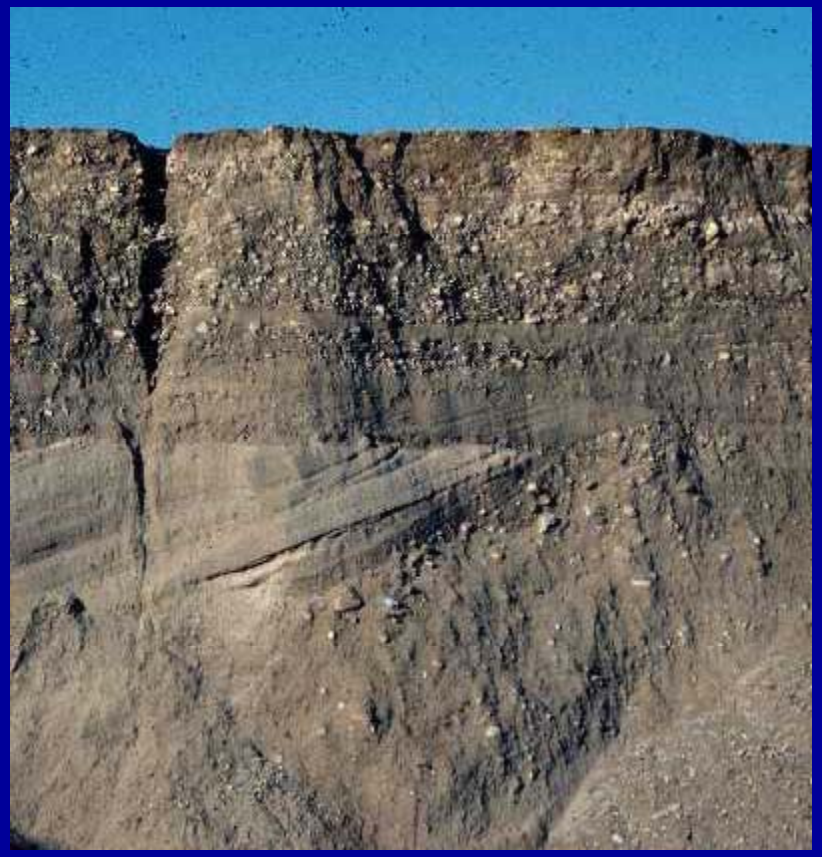
Outwash Properties

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

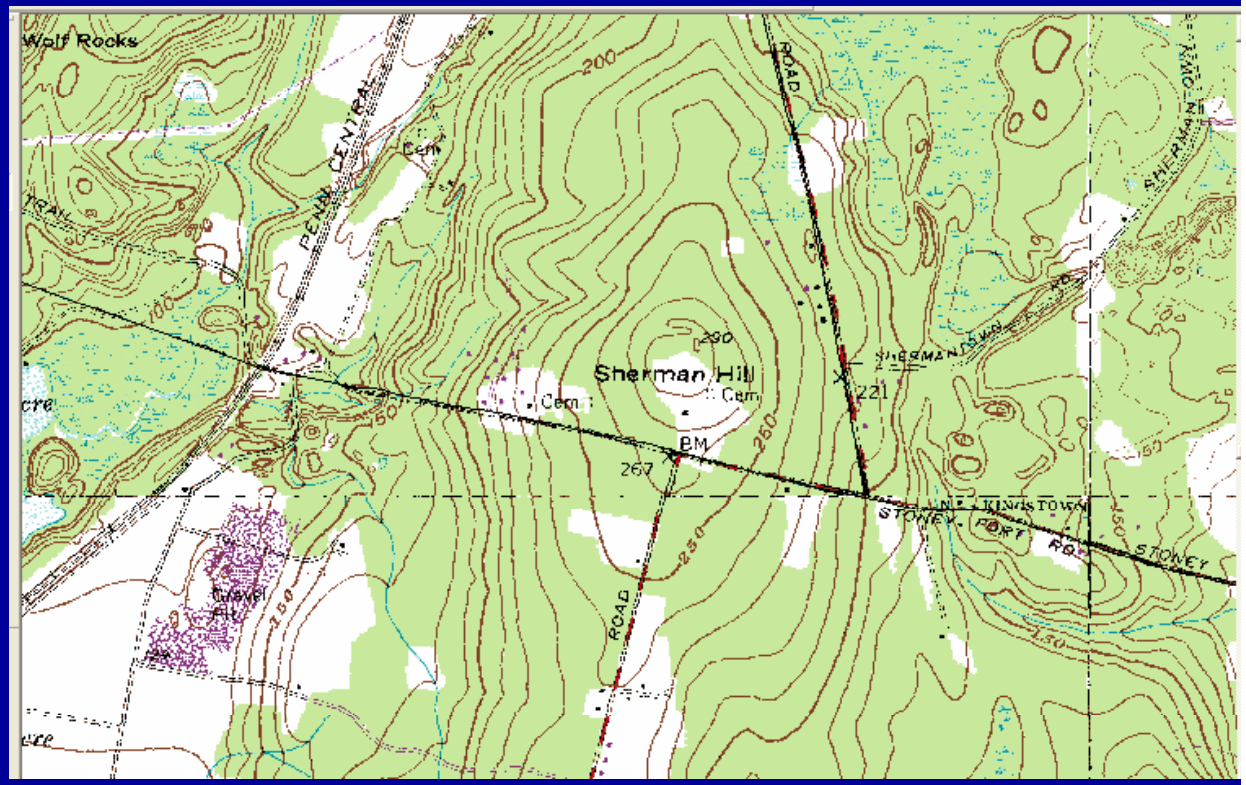


Other parent material

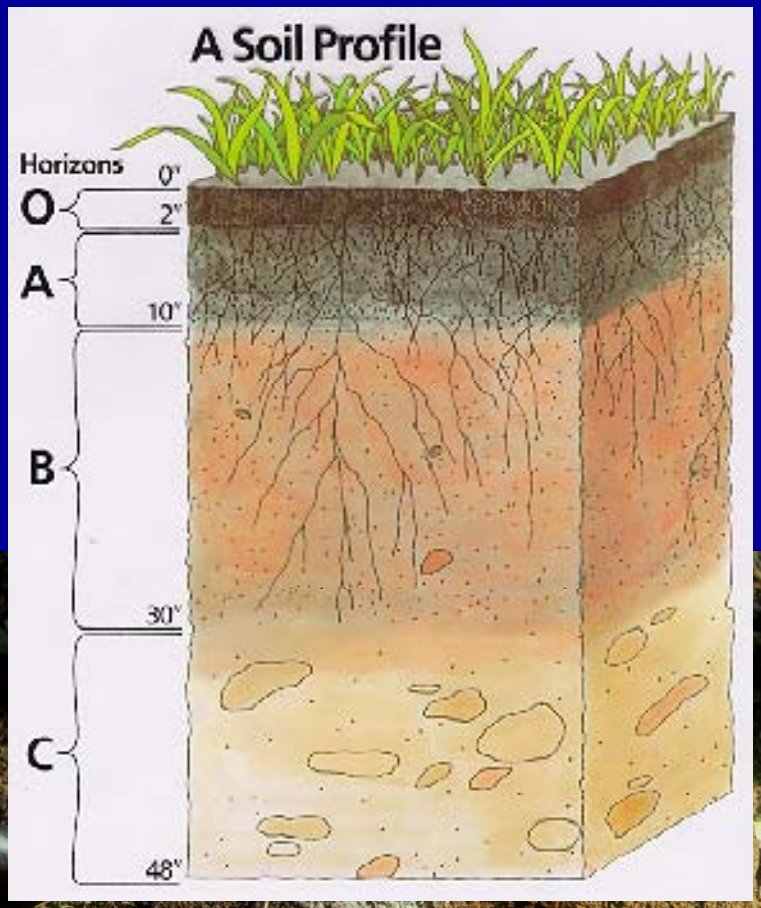
- Laucustrine - Lake
- Volcanic
- Organic
- Loess/Eolian – Moved by the wind
- Colluvium
- Alluvium – Deposited by flowing streams
- Residuim – Weathered bedrock

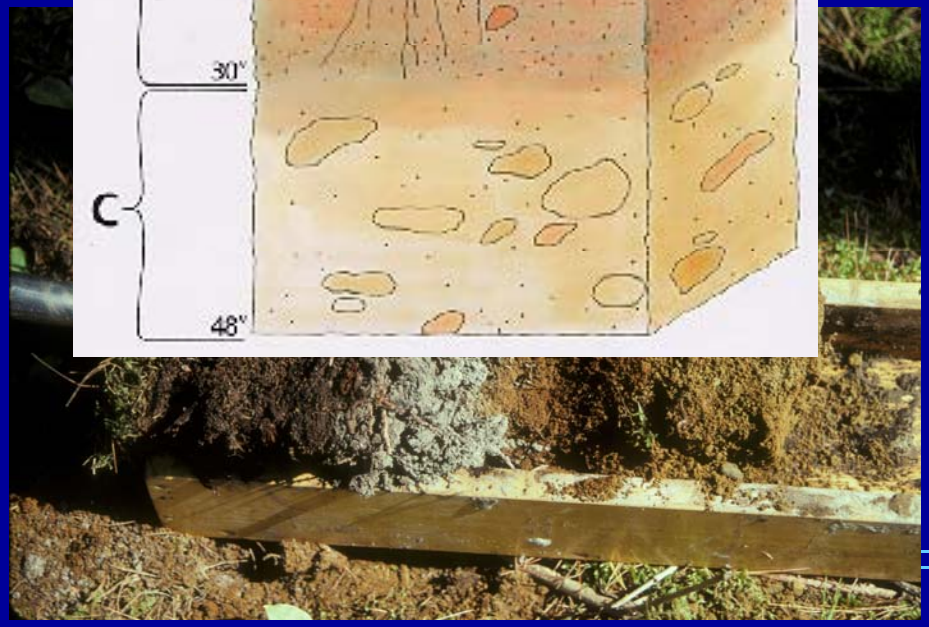
Landforms

- 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**
    - 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

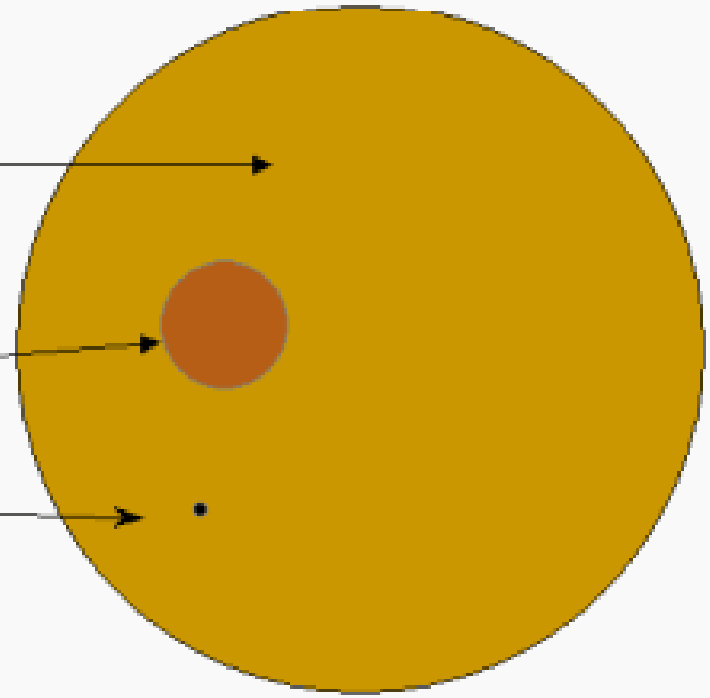
Soil Texture: The relative proportions of sand, silt, and clay particles in a mass of soil (material less than 2mm in size).

Very Coarse Sand = 2 to 1 mm

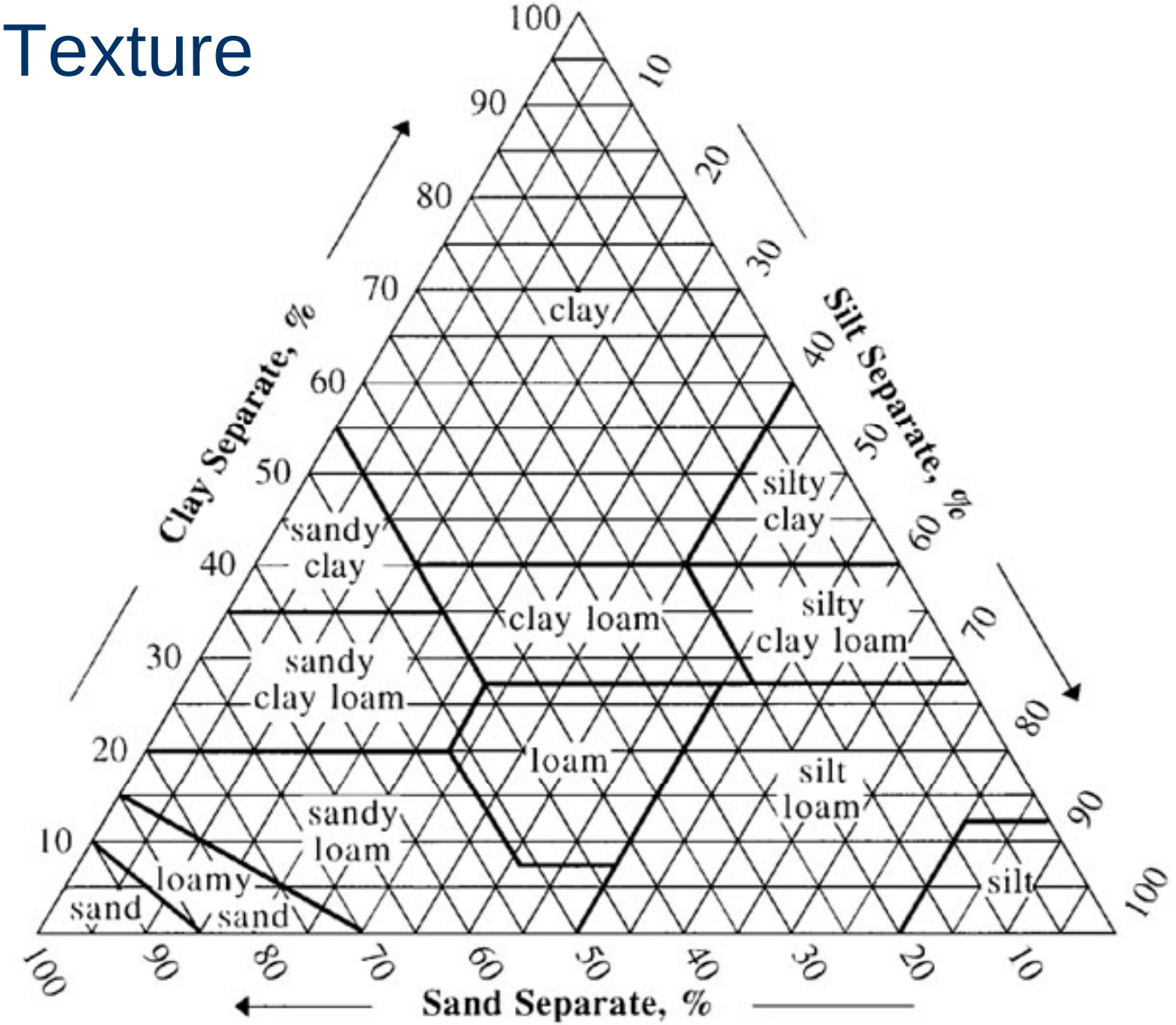
Very Fine Sand = 0.1 to 0.5 mm

Silt = 0.05 to 0.002 mm

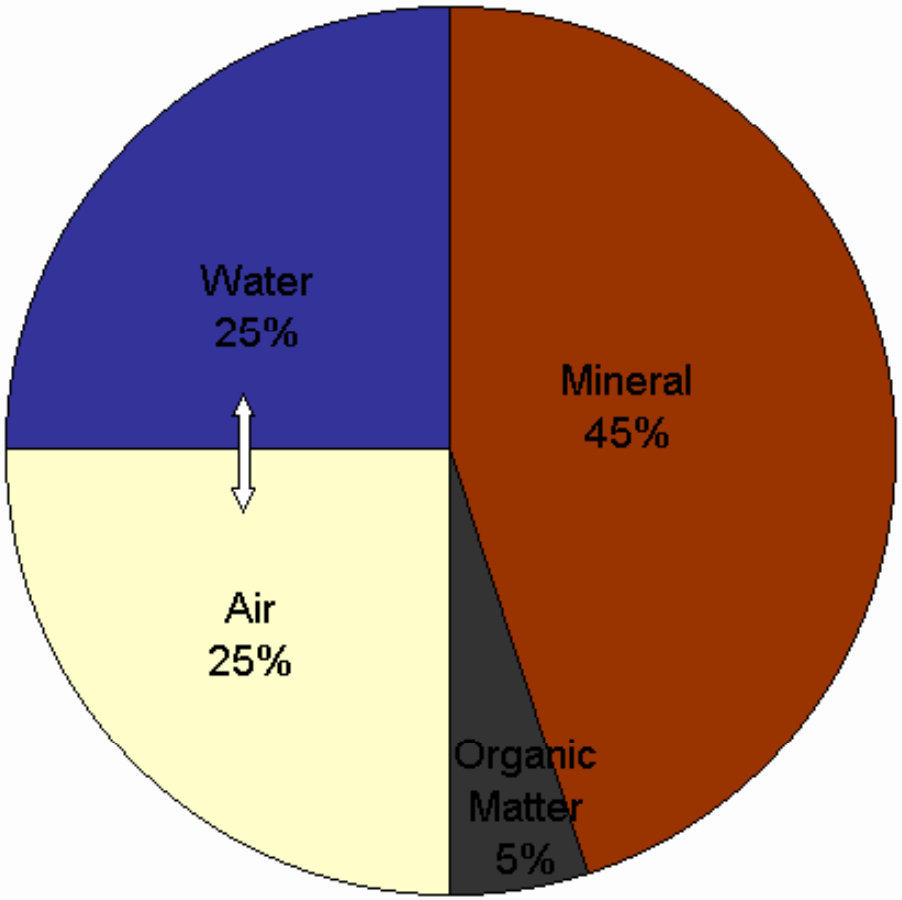
Clay = < 0.002 mm



Soil Texture



Soil Composition



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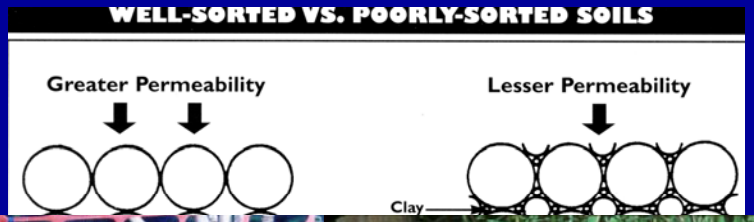
Water in Soils

- 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, poorly, very poorly drained

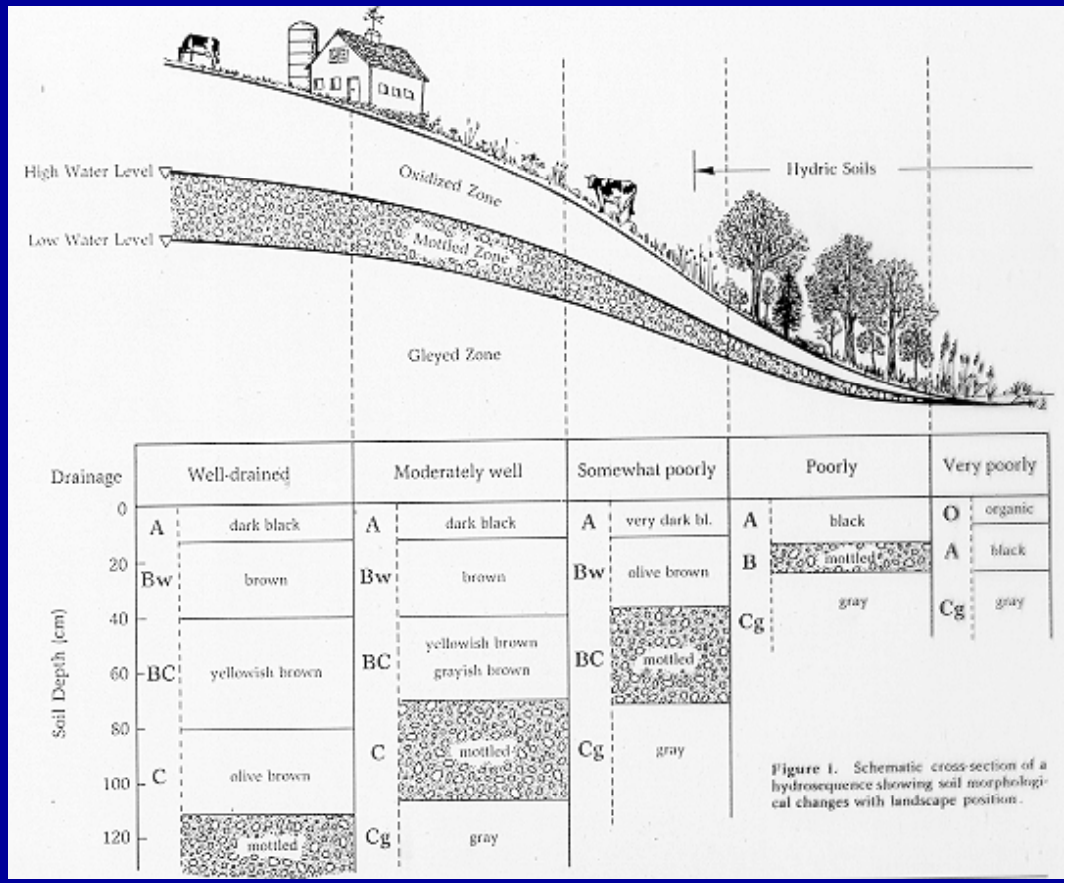
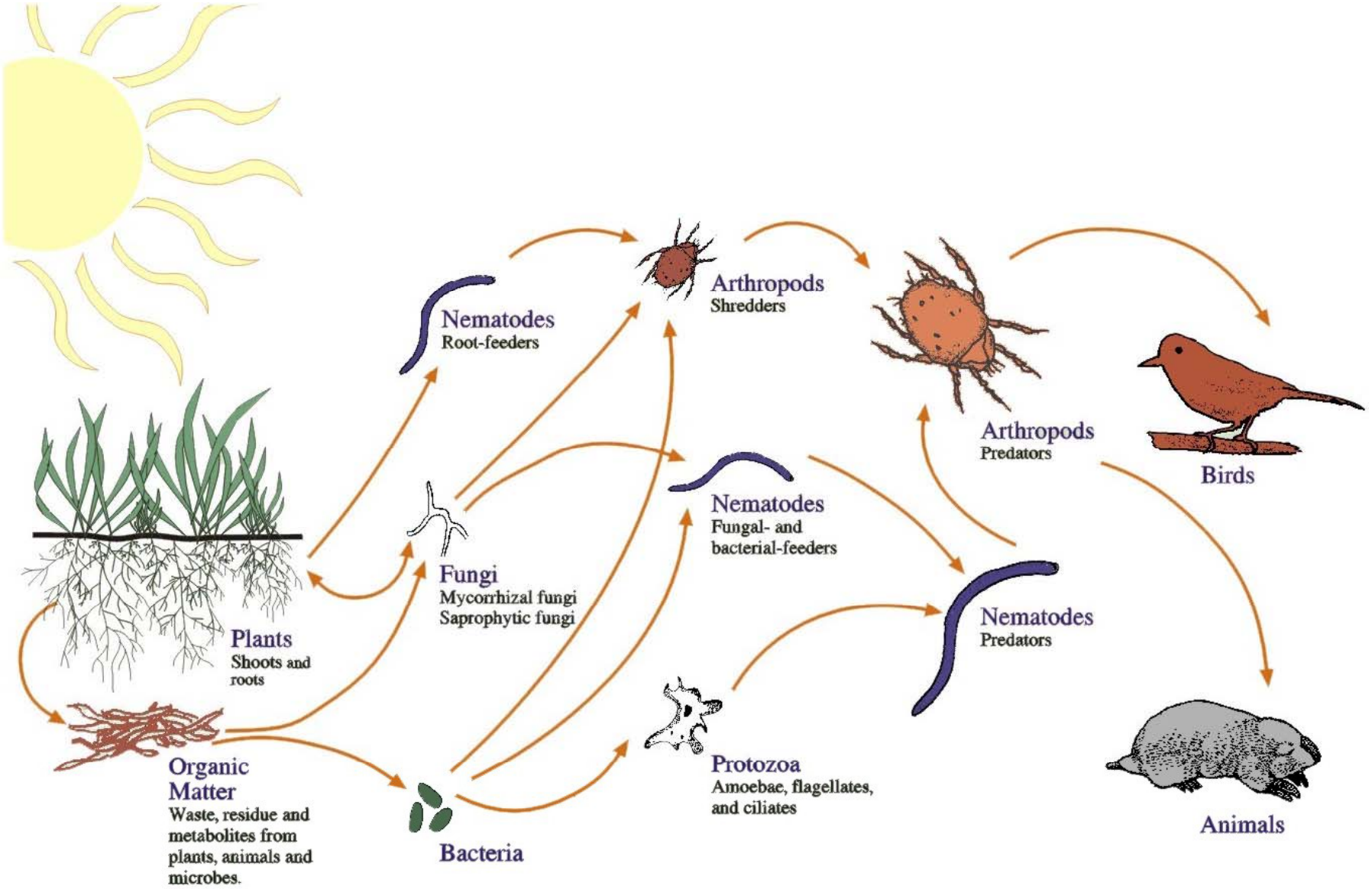


Figure 1. Schematic cross-section of a hydrosequence showing soil morphological changes with landscape position.

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

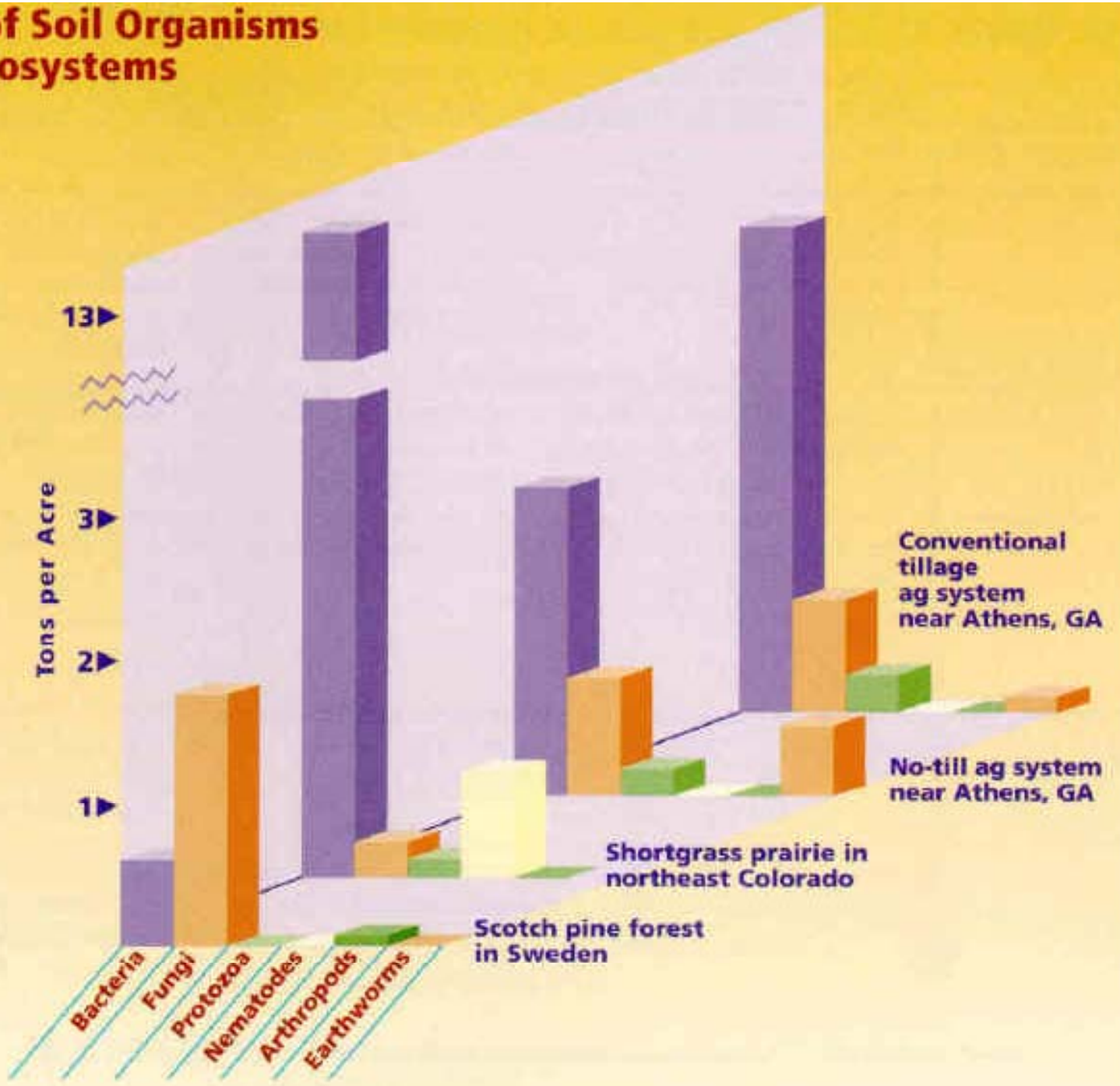


Figure 2

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

s.usda.gov/app/HomePage.htm

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USDA United States Department of Agriculture
Natural Resources Conservation Service

Web Soil Survey

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You are here: Web Soil Survey Home

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All NRCS Sites

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.

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.

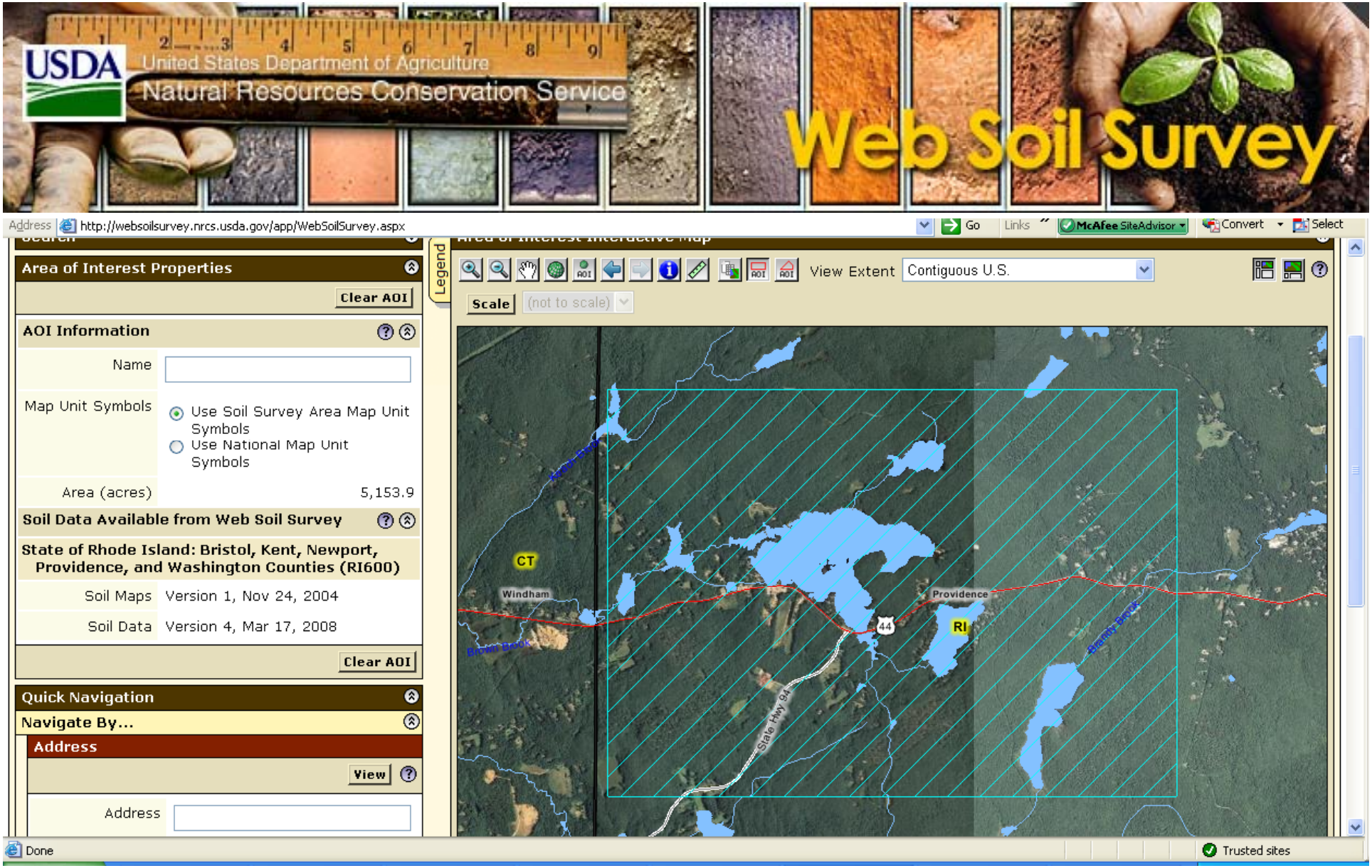
Three Basic Steps

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.


USDA
United States Department of Agriculture
Natural Resources Conservation Service
Web Soil Survey
Address http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx
Go
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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
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View
Address
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Providence
RI
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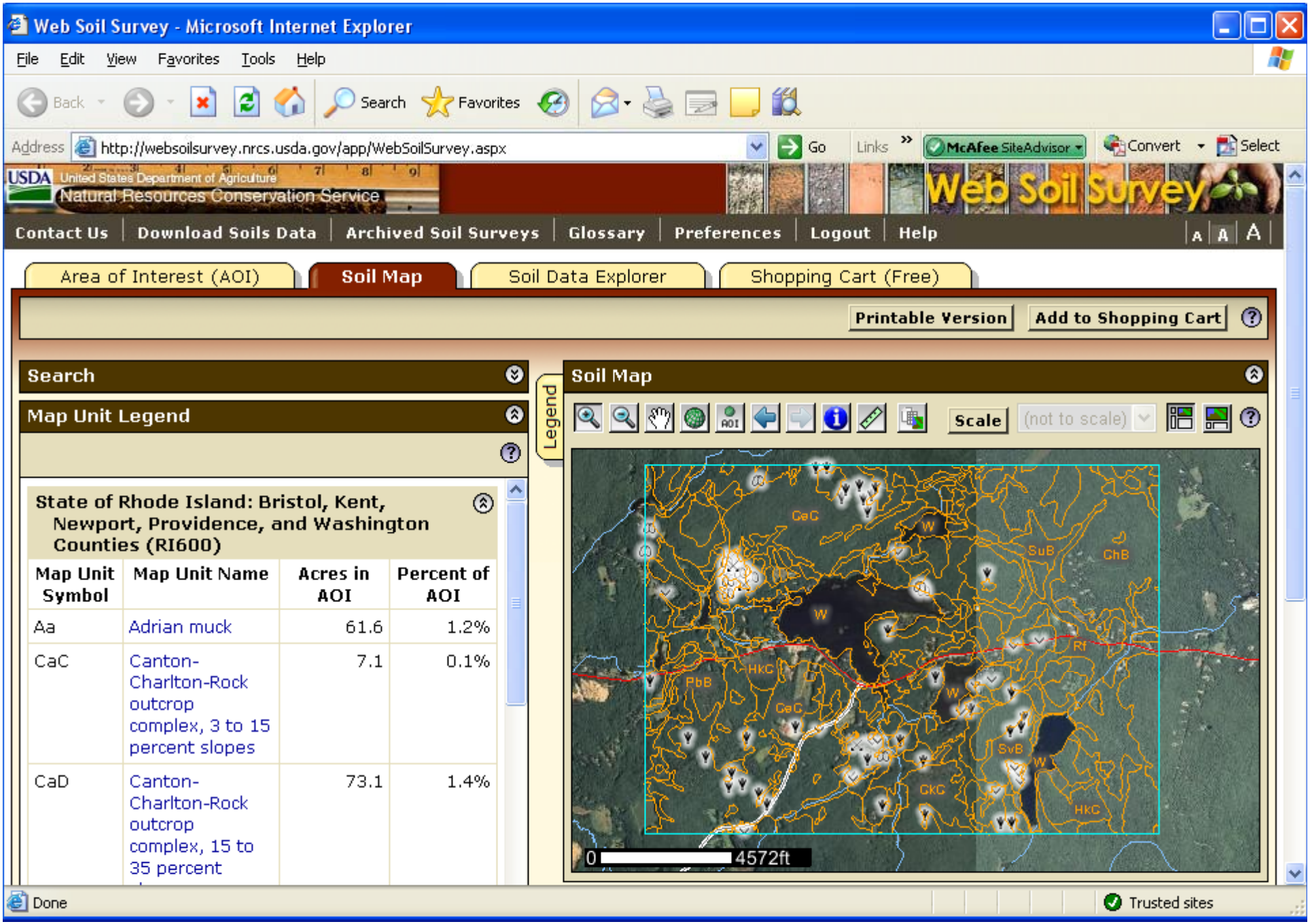
Brown Brook
Branch Brook
State Hwy 64
Done
Trusted sites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Natural Resources Conservation Service
Web Soil Survey
Contact Us | Download Soils Data | Archived Soil Surveys | Glossary | Preferences | Logout | Help
Area of Interest (AOI) | Soil Map | Soil 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)
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Web Soil Survey - Microsoft Internet Explorer

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Address http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx Go Links McAfee SiteAdvisor Convert Select

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

dd to Shopping Cart

o scale)

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

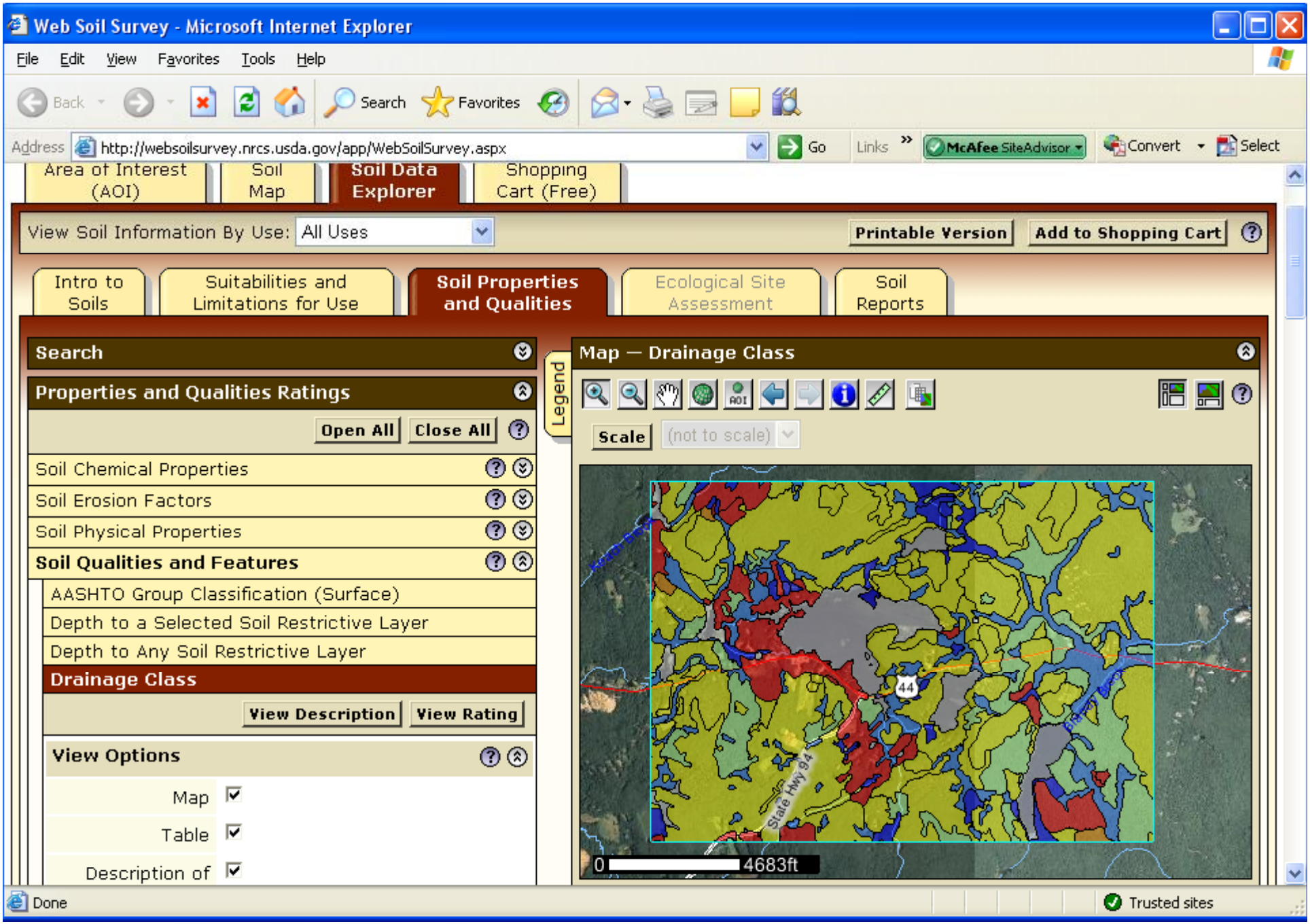
Setting

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

Done Trusted sites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Soil Properties and Qualities
Ecological Site Assessment
Soil Reports
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Close All
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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
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View Rating
View Options
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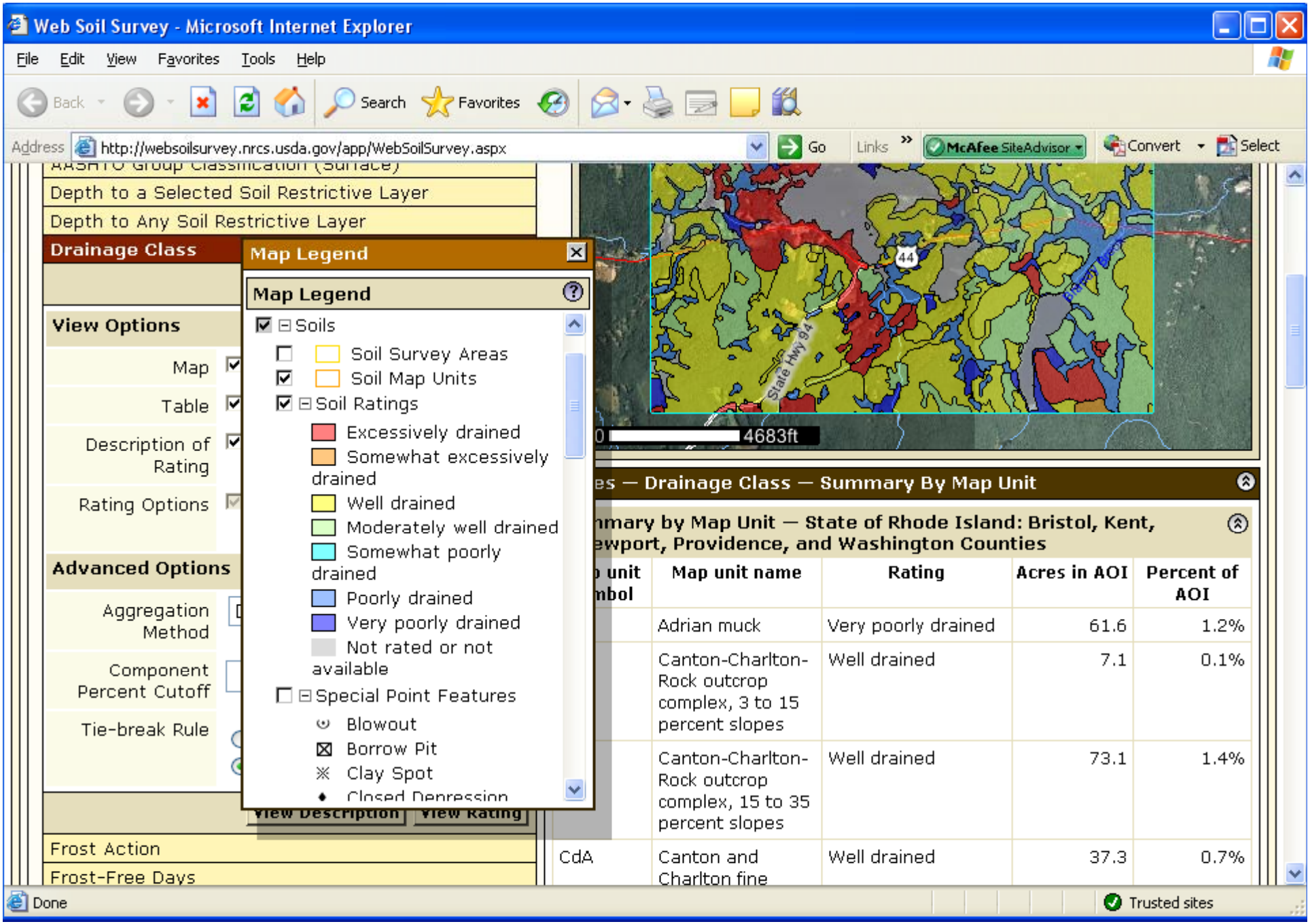
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Depth to a Selected Soil Restrictive Layer
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Description of Rating
Rating Options
Advanced Options
Aggregation Method
Component Percent Cutoff
Tie-break Rule
Map Legend
Map Legend
Soils
Soil Survey 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
View Description
View Rating
Frost Action
Frost-Free Days
4683ft
State Hwy 94
44
— Drainage Class — Summary By Map Unit
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%
Done
Trusted sites


Soils