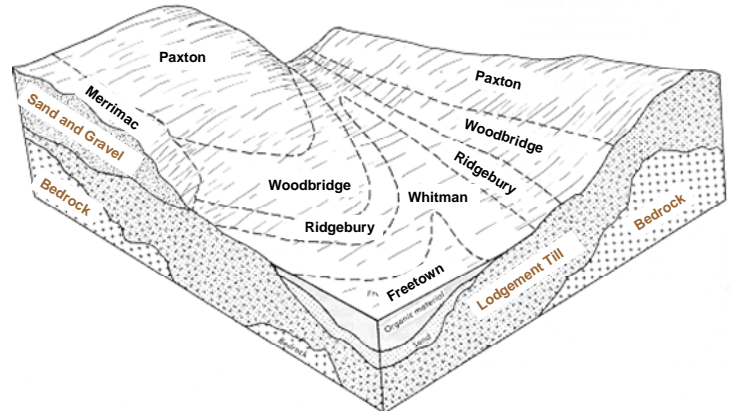


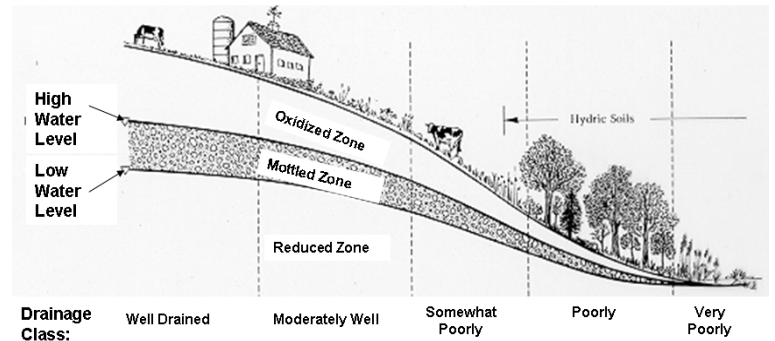
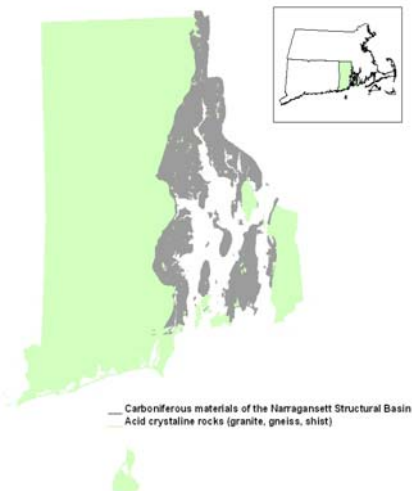
SOIL DRAINAGE CATENAS OF RHODE ISLAND

The soil catena concept is a useful guide to understand the complex nature of soils that cover the landscape. A soil catena is a sequence of soil types, or series, that are developed from similar parent material and extend across landscape positions. Related soils of about the same age, derived from similar parent material, and occurring under similar climatic conditions, can be arranged into a sequence of increasing wetness. The diagram to the right shows a block diagram of a drainage catena on lodgement till parent materials on drumlins. The diagram below shows such a sequence in which wetness increases at lower elevations.



GEOLOGY

Drainage catenas in Rhode Island are formed in soils with similar geology and similar parent materials. Two major geologic formations dominate the bedrock geology of Rhode Island; the Narragansett Structural Basin, and the granitic upland of the north and western part of the state. The Narragansett Basin consists mainly of carboniferous materials such as dark colored metasandstone, phyllite, and shale. The granitic upland of Rhode Island consists of acidic crystalline rocks including granite, gneiss, granodiorite, and schist. The map below shows the general area covered by these two formations.



PARENT MATERIALS

Glacial tills and glaciofluvial deposits are the two most common parent material types in Rhode Island. Till can be either subglacial lodgement till or supraglacial melt-out till. Lodgement till is very dense and often impedes water movement through the soil. Melt-out, flow, or ablation till is generally more friable and allows water to move through the soil. Glaciofluvial deposits consist of stratified sands and gravels and allow for rapid water movement through the soil. Many soils in Rhode Island have a loess or eolian mantle that consists of 6 inches to over 4 feet of silty material that overlies both glacial till and glaciofluvial deposits. This loess mantle was formed shortly after the glaciers retreated as wind picked up and redeposited the fine sands and silts over the landscape. Other soil parent materials in RI consist of alluvium, organic material, overwash and beach deposits, and human transported material.

The key that follows uses the catena concept by matching geology, parent material, and drainage for each series mapped in Rhode Island. This is helpful in identifying the relationship of one series to others. It is intended to be used only as a guide; the Official Series Description should be used to identify a soil being evaluated.

Visit: <http://www.ri.nrcs.usda.gov/technical/soils.html> for more information.
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PARENT MATERIAL	SOIL DRAINAGE CLASS				
Of the soils catena & selected characteristics of the deepest, best drained member	Somewhat Excessively Drained	Well Drained	Moderately Well Drained	Poorly Drained	Very Poorly Drained
A. Soils Formed in Lodgement Till (firm, compact, basal, dense): Unsorted/unstratified heterogeneous mixture of sand, silt, clay & clasts deposited directly by a glacier.					
1. Tills derived from carboniferous materials of the Narragansett Structural Basin (dark colored metasandstone, phyllite, and shale)					
a. coarse-loamy soils		Newport	Pittstown	Stissing	Mansfield
b. sandy mantled (eolian) over loamy till soils		Poquonock	Birchwood		
2. Tills derived from acidic crystalline rocks (granite, gneiss and shist)					
a. coarse-loamy soils		Paxton	Woodbridge	Ridgebury	Whitman
b. coarse-loamy soils with < 40" of loess overlying till		Broadbrook	Rainbow		
c. coarse-silty soils with > 40" of loess overlying till			Scio		
B. Soils Formed in Supraglacial Melt-Out/Flow Till (ablation, friable, loose): Dominantly unstratified heterogeneous mixture of clasts, sand, and minor percentages of silt and clay.					
1. Tills Derived from acidic crystalline rocks (granite, gneiss, granodiorite, and shist)					
a. coarse-loamy soils		Charlton	Sutton	Leicester	
b. sandy and gravelly to bouldery soils	Gloucester				
c. sandy and gravelly, moderately deep to weathered bedrock	Lippett				
d. coarse-loamy over sandy to sandy skeletal soils		Canton			
e. coarse-loamy over sandy and gravelly soils with loess mantle overlying till		Narragansett	Wapping		
C. Soils Formed in Glaciofluvial Deposits: Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice.					
1. Glaciofluvial materials derived from carboniferous materials of the Narragansett Structural Basin (dark metasandstone, shist, and shale)					
a. sandy and gravelly soils with high percentage of dark channers	Quonsett				
2. Glaciofluvial materials derived from acidic crystalline rocks (granite, gneiss, and granodiorite)					
a. sandy and gravelly soils	Hinkley	Merrimac	Sudbury	Walpole	Scarboro
b. sandy soils	Windsor		Deerfield		Scarboro
c. loamy over sandy and gravelly soils		Agawam	Ninigret		
d. coarse silty over sandy and gravelly soils with <40" loess mantle overlying outwash		Enfield	Tisbury	Raypol	
e. coarse silty soils with > 40" loess mantle overlying outwash		Bridgehampton			
D. Soils Formed in Alluvial Deposits: Material deposited in modern-day flood plains, mixture of stratified sand & fines.					
a. coarse-loamy soils			Podunk	Rumney	
E. Organic and Coastal Soils					
1. Freshwater organic materials					
a. soils with 16-50" of organic material					Adrian
b. soils with >50" of organic material					Carlisle
2. Tidal organic materials (salt and brackish waters)					
a. soils with 16-50" of organic material over loamy tills					Westbrook
b. soils with 16-50" of organic material over sandy substrate					Pawcatuck
c. soils with >50" of organic material					Ipswich
d. soils with 8-16" of organic material over sandy substrate; includes intertidal areas					Matunuck
3. Other coastal soils					
a. sandy soils formed in eolian and/or overwash deposits on dunes and back barriers	←			Udipsamments (UAB Map Unit)	
b. mixed clay and till on coastal escarpments along Block Island	←			Udorhents, very steep (UBE Unit)	