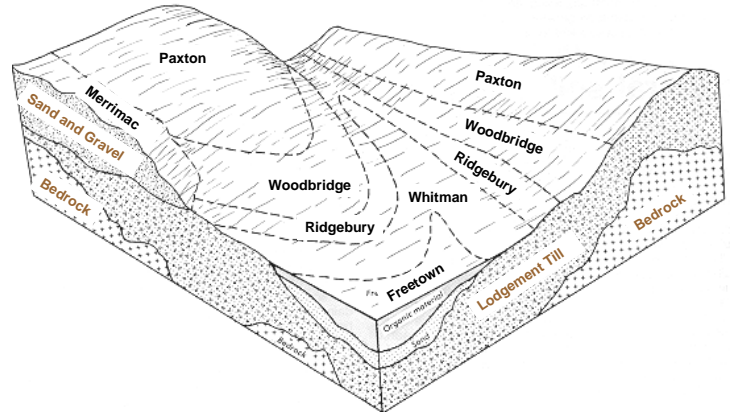


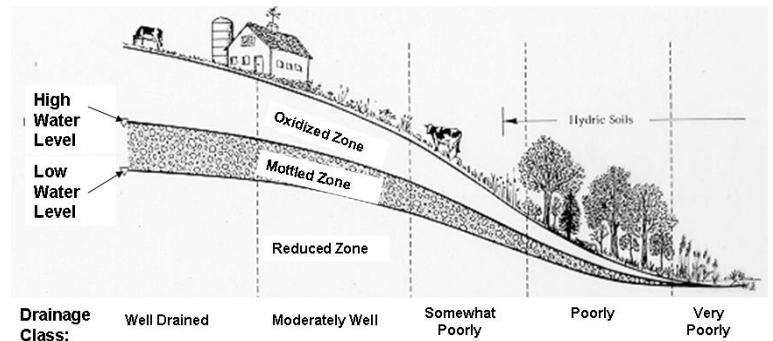
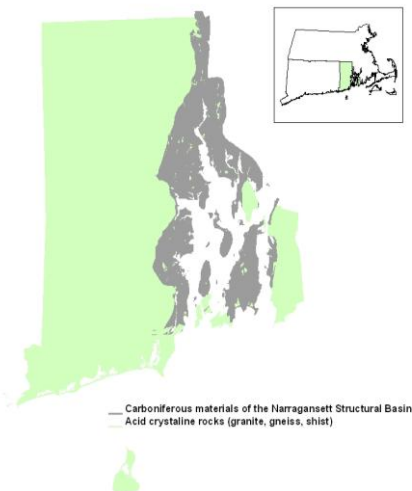
SOIL DRAINAGE CATENAS OF RHODE ISLAND

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 ablation till. Lodgement till is very dense and often impedes water movement through the soil. Ablation, or debris-flow, 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	LITHOLOGY	TEXTURE GROUP	SOIL DRAINAGE CLASS					
			Somewhat Excessively Drained	Well Drained	Moderately Well Drained	Poorly Drained	Very Poorly Drained	Subaqueous
LODGEMENT TILL**	carboniferous#	coarse-loamy		Newport	Pittstown	Stissing	Mansfield	
		sandy mantled (eolian) over loamy till		Poquonock	Birchwood			
	acidic crystalline rocks (granite, gneiss and shist)	coarse-loamy		Paxton	Woodbridge	Ridgebury	Whitman	Burlingame
		< 40" of loess overlying till; coarse-loamy		Broadbrook	Rainbow			
	> 40" of loess overlying till; coarse-silty			Scio				
ABLATION TILL++	acidic crystalline rocks (granite, gneiss and shist)	coarse-loamy		Charlton	Sutton	Leicester		
		sandy and gravelly to bouldery	Gloucester					Napatree*
		sandy and gravelly, moderately deep to bedrock	Lippett					
		coarse-loamy over sandy to sandy skeletal		Canton				
		loess mantled coarse-loamy over sandy and gravelly		Narragansett	Wapping			
GLACIOFLUVIAL‡	carboniferous#	sandy and gravelly with high percentage of dark channers	Quonset					
		sandy and gravelly	Hinckley	Merrimac	Sudbury	Walpole		Anguilla*
	acidic crystalline rocks (granite, gneiss and shist)	sandy	Windsor		Deerfield		Scarboro	Aquapaug
		loamy over sandy and gravelly		Agawam	Ninigret			Shannock
		< 40" loess mantle; coarse silty over sandy and gravelly		Enfield	Tisbury	Raypol		
		> 40" loess mantle coarse silty		Bridgehampton				
ALLUVIAL+	acidic crystalline	coarse-loamy			Podunk	Rumney		
HUMAN ALTERED	dredged sand	sandy	←	Bigapple	Fortress			
COASTAL DEPOSITS	Sand	sandy formed in eolian and/or overwash deposits on dunes and back barriers	←	Hooksan	Succotash		Sandyhook	
			←		Udipsamments (UAB Map Unit)			
	Clay	mixed clay and till on coastal escarpments along Block Island	←		Udorthents, very steep (UBE Unit)			
MARINE/ ESTUARINE DEPOSITS	marine/estuarine sands	sandy	0-10 cm highly fluid surface		sulfidic			Massapog*
			10-50 cm highly fluid surface					Rhodesfolly*
	10-50 cm marine silts					Nagunt*		
	>100 cm marine silts					Marshneck*		
	marine/estuarine silts	silty				Fort Neck*		
							Pishagqua*	
ORGANIC DEPOSITS	freshwater/inland organics	variable	16-50" of organics				Swansea	Wickford
			>50" of organics				Freetown	Tuckertown
	salt and brackish (tidal) organics	loamy	16-50" of organics				Ipswich	
			0-8" of organics				Westbrook	
		sandy	8-16" of organics				Sandyhook	
			16-50" of organics				Matunuck	Billington*
						Pawcatuck		

Derived from carboniferous materials of the Narragansett Structural Basin (dark colored metasandstone, phyllite, and shale)

** Firm, compact, basal, dense till: Unsorted/unstratified mixture of sand, silt, clay, and clasts deposited directly by a glacier

++ Debris-flow, friable, loose till: Dominantly unstratified heterogeneous mixture of clasts, sand, and minor percentages of silt and clay

‡ Glaciofluvial deposits: material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice

+ Alluvial deposits: Material deposited in modern-day flood plains; mixture of stratified sand and fines

* Indicates subaqueous soils submerged under salt/brackish waters