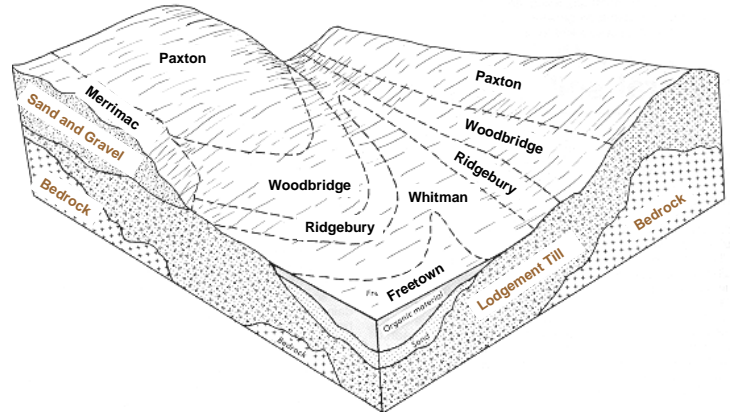


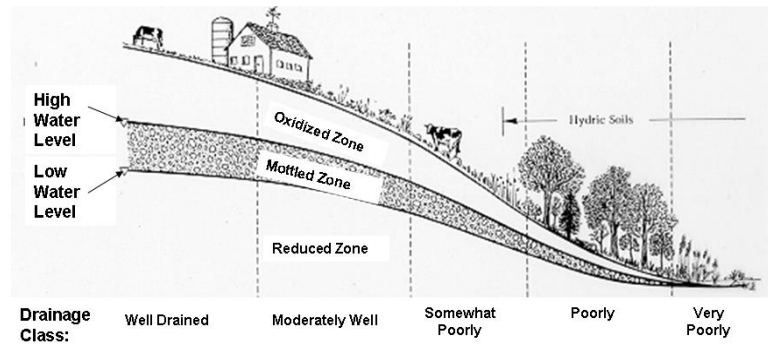
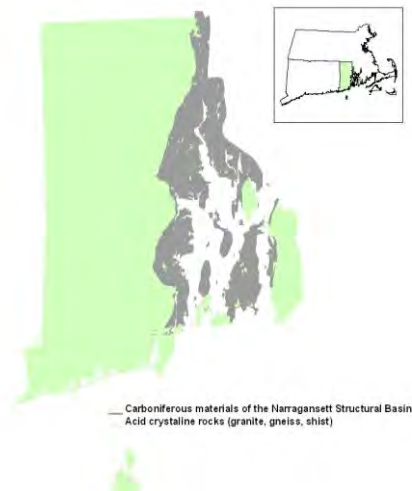
SOIL DRAINAGE CATENAS OF RHODE ISLAND

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 shist. The map below show 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