2017 RIGIS Soil Survey Attribute Information

http://www.nrcs.usda.gov/wps/portal/nrcs/main/ri/soils/
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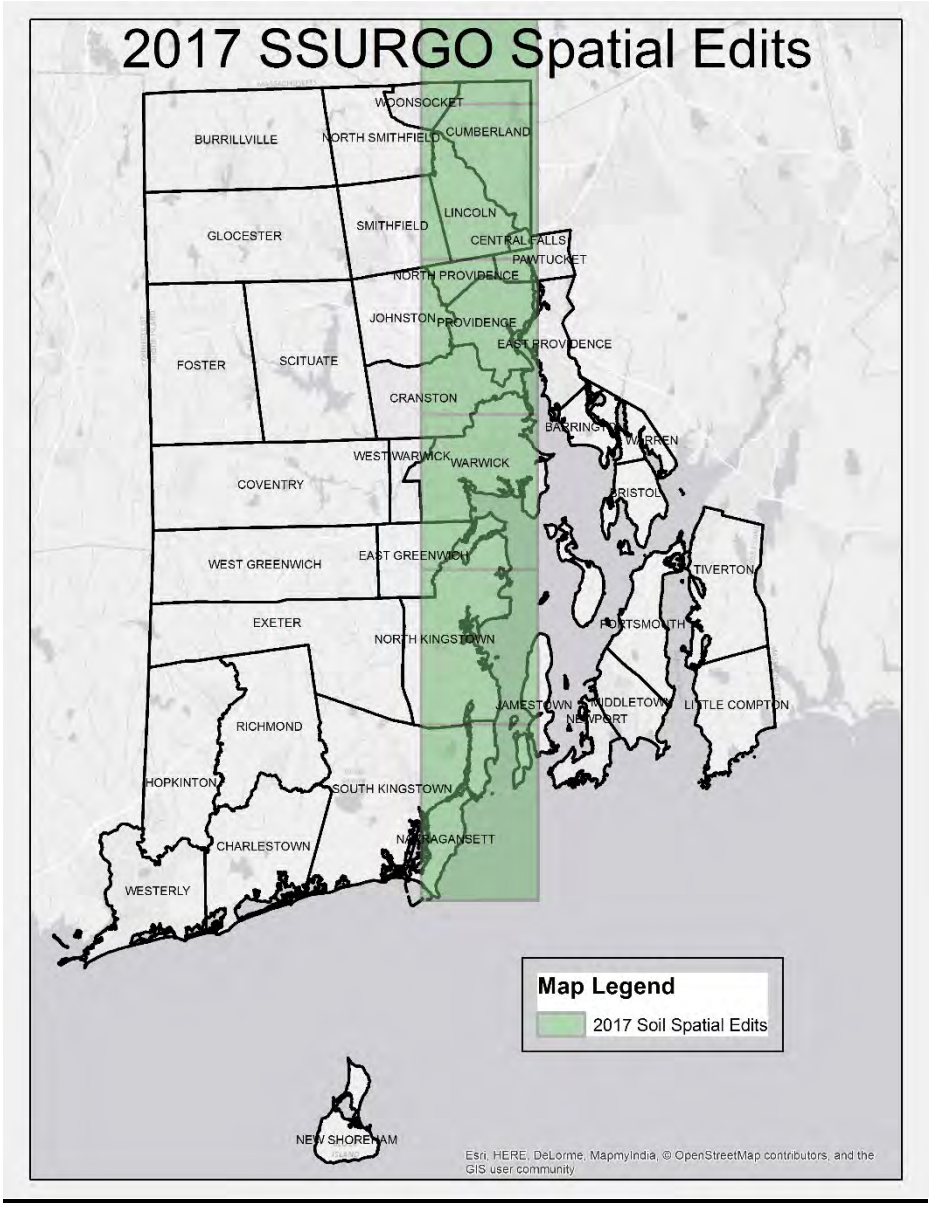

The 2017 RIGIS Soils data (survey area version 16, spatial version 11 Sept. 14, 2017) now includes spatial edits to the following USGS Topo Quads: Narragansett, Wickford, East Greenwich, Providence, Pawtucket, and Franklin.

These edits to the spatial and tabular (attributes and soil interpretations) will be an on-going annual work plan so please assure you download the latest version of the RIGIS soils layer.

2017 RIGIS Soil Attribute Table

(November, 2017)

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http://www.nrcs.usda.gov/wps/portal/nrcs/main/ri/soils/

The following Shape Files are included with the RIGIS Soils data:

Soils17.shp – Soil map unit polygons – described below.
SoilsPoints17.shp – Special point features such as wet spots, bedrock outcrops, etc.
SoilsLines17.shp – Special line features such as short steep slopes and escarpments.
soilattr2017_master.xlsx – an Excel spreadsheet containing the RIGIS attribute table for points, lines, and polygons. Includes all of the old RIGIS fields from 1996 to present.

Changes in the 2017 (Soil Survey Area Version 16, Tabular Version 15, Spatial Version 11 released September 14, 2017) include the following:

- Spatial edits to the following USGS Topo Quads Narragansett Pier, Wickford, East Greenwich, Providence, Pawtucket, and Franklin.

- Use of Lidar derived products (contours, wetness index, slope, etc.) to adjust the hydric soils so they are more accurately delineated – connect riparian areas.

- Changes to the tabular data (attribute table) so it syncs with the Web Soil Survey – changes to Hydrology Soil Groups and Estimated Seasonal High Water Tables are an example of changed data. Some of the old RIGIS fields have been re-added and a new field called "imerv_pct (Percent Impervious) provides how much of he soil polygon for that map unit has impervious ground.

Background:
The attribute data contained in the RIGIS soils data Shape file has been revised from the 2016 RIGIS soils coverage. **This 2017 dataset contains changes to the spatial data (points, lines, polygons) for numerous areas throughout RI.** This data is **NOT** the official USDA-NRCS SSURGO Soils Data for Rhode Island (although the spatial data contained is identical). The attribute information on the RIGIS soil data is **NOT** the same as the "official" soils data; if you need official soils data please use the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/).

Methodology:
The methodology for creating and updating the RIGIS Soils17 shape file is as follows:

The spatial data (points, lines, and polygons) was downloaded from the USDA-NRCS Web Soil Survey on November, 21, 2017 (GCS-WGS-84 Geographic Coordinate System). The spatial data was re-projected to RI State Plain, NAD-83 feet projection using the ArcToolbox projection utility. An attribute spread sheet with the RIGIS attribute fields (described below) was then joined to the SSURGO data to provide additional soil attributes (a copy of the master spread sheet is included in the zip download file).

The following are explanations of each of the attribute fields contained in the RIGIS soils data shape. For more information contact the RI Soil Survey Program at 401-828-1300 or jim.turenne@ri.usda.gov.

2017 RIGIS Soil polygon Attribute Fields (NOTE: Aliases are in parenthesis)

~~**Field:** ***A_tex (REMOVED)***~~
~~**Source:** 1996 RIGIS – minor formatting changes made.~~
~~**Description:** USDA Texture of the A horizon surface layer (topsoil), usually the most common texture from an allowed range. See next table below for descriptions of the feature ID.~~
~~**2014 changes**: Texture is only provided for the major component (first name soil series).~~
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

~~**Field:** ***B_tex (REMOVED)***~~
~~**Source:** 1996 RIGIS – minor formatting changes made.~~
~~**Description:** USDA Texture of the subsoil layer at 20 - 24" depth, usually in the B horizon. Only One texture is listed. See table below for descriptions of the feature ID.~~
~~**2014 changes**: Texture is only provided for the major component (first name soil series).~~
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_054242

Feature ID	USDA Texture Name
FSL	Fine sandy loam
GR-S	Gravelly sand
GR-SL	Gravelly sandy loam
GR-SL/SIL	Gravelly sandy loam/Silt loam
LFS	Loamy fine sand
LS	Loamy sand
S	Sand
S+GR	Sand and gravel
SIL	Silt loam
SL	Sandy Loam
UWB	Unweathered Bedrock
CN-SIL	Channery silt loam
FS	Fine sand
VGR-SL	Very gravelly sandy loam
CBL-COS	Cobbly Coarse Sand
BLD-COS	Bouldery Coarse Sand

FLUID SILT	Silt Loam with high fluidity (subaqueous soils).
LOAM	Loam texture
MUCK	Sapric Material
MUCKY PEAT	Hemic Material
MUCKY SAND	Sand with 5-12% organic carbon
PEAT	Fibric Material

Representative soil textures have been added to the RIGIS data set for the A (surface or topsoil) and B (subsoil) horizons. The textures entered are representative for the soil and were taken from the latest official soil series descriptions and from the soil series descriptions included in the Soil Survey of Rhode Island. A series of decisions and assumptions were made in entering this data:

- The textures listed are to be used as a general guide and are not intended to eliminate the need to check the more detailed source materials.
- The A horizon was assumed to be the upper 8-10 inches of the soil.
- The B horizon texture represents the texture at a depth of 20-24 inches. Some soils, such as the very poorly drained series, do not have a B horizon. They are A/C soils. In these instances, the texture entered under B is actually the C horizon texture at the 20-24 in. depth.
- Only one texture is listed per horizon for each soil series in a mapping unit, even though there usually is a range of textures for each horizon. It is very important to remember that the single texture listed is almost always part of an acceptable range of textures for that soil. The textures listed are the more commonly found in Rhode Island. As an example, in most cases a soil listed as having a sandy loam (sl) texture in the B horizon could alternatively have a fine sandy loam, gravelly sandy loam, or gravelly fine sandy loam texture. The full range of permitted textures for each soil was not entered because it would result in a very large and unwieldy data set.
- ~~The multi-taxa map units, such as the Hinckley-Enfield complex, which consist of two soil series with widely differing textures, have a texture listed for each series. The Hinckley-Enfield A horizon texture is listed as "gr-sl/sil", which means the probable texture is either gravelly sandy loam or silt loam at any given spot on the landscape. Most soil map units, however, have only one texture listed for each horizon~~.
- Gravelly textures are listed only when it is the dominant condition. Many soils have rock fragment contents ranging from non-gravelly to gravelly. It is important to remember that a soil listed as having fine sandy loam (fsl) texture may have a gravelly analogue.

Stony and very stony surface textures are not listed. Many soils have stony phases. If information on surface stoniness is needed, sort data by the stoniness attribute.

~~**Field:** ***Bedrock (REMOVED)*** - Soils mapped in bedrock-controlled uplands, percent bedrock outcrop, and shallow soils~~
~~**Source:** 1996 RIGIS~~
~~**Description:** Bedrock group - indicates percent of surface area covered by bedrock and/or shallow to bedrock soil. The table below describes the feature ID.~~
2017 Update: This field is omitted (dropped) from the attribute table but is still available in the spread sheet if needed.

2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

Field ID	Percent Surface Covered by Outcrops
1	0-1
2	1-10
3	5-10
4	10-30
5	30-80
6	80-100

~~**Field:** ***B_perm (REMOVED)***~~
~~**Source:** 1996 RIGIS~~
~~**Description:** B horizon permeability group. See next table for descriptions.~~
~~**2014 Update:** This field is omitted (dropped) from the attribute table but is still available in the spread sheet if needed.~~
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

~~**Field:** ***C_perm (REMOVED)***~~
~~**Source:** 1996 RIGIS~~
~~**Description:** C horizon permeability group. See table below for descriptions.~~
~~**Online Linkage:** http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_054242~~
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

NOTE: The term "permeability" is an outdated term in soil survey; it has been replaced by saturated hydraulic conductivity (Ksat), visit the Soil Data Mart for Ksat values:

Soil permeability groupings have been prepared for both the B and C horizons:

Field ID	Permeability Range (inches/hour)
1	<0.2
2	0.2-0.6
3	0.6-2.0
4	0.6-6.0
5	0.6-20.0
6	2.0-6.0
7	2.0-20.0
8	>2.0
9	6.0-20.0
9.9	Too variable to rate
10	>6.0
11	>20
12	<0.2 or 0.6-20.0
13	<0.2 or Too variable to rate
14	0.6-2.0 or 0.6-6.0
15	0.6-2.0 or Too variable to rate
16	0.6-6.0 or Too variable to rate
17	0.6-6.0 or 2.0-6.0
18	2.0-6.0 or Too variable to rate

19	0.6-6.0 or >2.0
20	0.6-2.0 or 6.0-20.0
21	0.6-6.0 or 6.0-20.0
22	6.0-20.0 or >6.0
23	6.0-20.0 or >20.0
24	6.0-20.0 or Too variable to rate
25	>6.0 or >20.0

The water table depths used in the grouping system are taken from the current NRCS Soil Interpretation Record (form SOI 5) rather than the Soil Survey of Rhode Island

- Group 1 includes the Stissing series (0.06 - 0.2 inches/hour in the C horizon) and the Pittstown series (0.06 - 0.6 inches/hour in the C horizon). They were included to make the Stissing and Pittstown series consistent with the other hardpan soils in RI.
- Groups 12 through 24 represent multi-taxa mapping units. These map units contain two or more named soils that have different permeability's. Soil map units in Group 12, for example, consist of two soils, one of which has a permeability of <0.2 inches/hour and the other, a permeability of 0.6 - 20 in./hr. Depending on which soil exists on a specific site, the permeability rating is 0.2 or 0.6 - 20.

Field: *Cap_cls* (Capability Subclass)
Source: 2014
Description Capability classes and subclasses - the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive land forming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations-of groups of soils for rangeland, for forest trees, or for engineering purposes. The table below describes each field code.
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2_016628
2017 Update: This field was re-added to the 2017 table as per user request.

Field ID	Description
1	Class I soils have few limitations that restrict their use.
2	Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
3	Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.
4	Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.
5	Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.
6	Class VI soils have severe limitations that make them generally unsuitable for cultivation.
7	Class VII soils have very severe limitations that make them unsuitable for cultivation.
8	Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, IIe. The letter e shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow,

droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations (NOTE: The digital data has subclasses added to class I soils due to database constraints, please ignore the subclass on class I soils). Class V contains only the subclasses indicated by w, s, or c because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Dual Classes: On the digital soil attribute data some Capability classes and subclasses have dual ratings separated by a / for example 7s/8. This is used for soil complex map units where the two soils in the complex have different classes. In map unit complexes where both soils have the same capability class the / is not used.

~~**Field:** ***Corros (REMOVED)***~~
~~**Source:** 1996 RIGIS~~
~~**Description:** Corrosion potential of the soil on buried uncoated steel (L = Low, M = Moderate, H = High, V=Variable).~~
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_054242
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

Field: ***Descrbe (Development Group)***
Source: 1996 RIGIS
Description: A textual description of the soil characteristic(s) as per RIDOA/USDA-SCS definitions for the municipal comprehensive plan map series project of July 1990.
2017 Update: No changes were made to this field, the water tables depths do **NOT** match the ESHWT field which is a new field based on the SSURGO data.

Description
Moderate Constraints to Development
Seasonal high water table (19 to 42 in. Depth)
Bedrock and/or slope constraints (>15 percent slopes)
Hydric Soils – Severe Constraints (0 to 18 in. depth to water table)
All Other Severe Constraints (Rock, Sand, etc.)

~~**Field: Devgroup** ***(REMOVED)***~~
~~**Source:** 1996 RIGIS – Minor changes in the RIGIS attribute: well drained, dense till soils changed to 2 – Paxton for example.~~
~~**Description:** Numeric code from 0 to 5. Restrictions or constraints to residential or commercial development.~~
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

Field: ***Drainage (Drainage Class)***
Source: 1996 RIGIS
Description: Natural soil drainage classes for the soil map unit.
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_054242

Natural drainage class refers to the frequency and duration of wet periods under conditions similar to those under which the soil developed. Alteration of the water regime by humans, either through drainage or irrigation, is not a consideration unless the alterations have significantly changed the morphology of the soil. The classes follow:

Field Code	Description
ED	Excessively Drained
SWED	Somewhat Excessively Drained
WD	Well Drained
MWD	Moderately Well Drained
PD	Poorly Drained (hydric)
VPD	Very Poorly Drained (hydric)
SUBAQUIC	Permanently Submerged Soil (hydric)

Dual classes (ED and WD) are labeled for soil complexes with two different drainage classes. Bridgehampton soils are listed as WD to MWD due to the morphology and hydrology of the soil.

~~**Field: *Erosion (REMOVED)***~~
~~**Source:**1996 RIGIS~~
~~**Description:** Soil erosion potential of the soil. Number listed is the "k" value of the soil at depth of 24 - 30 ". This depth may not be appropriate for some users of the data. These values are NOT the same as the Kw value in the Soil Data Mart reports.~~
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_054242
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All). A Soil Erosion Index raster layer is available from RIGIS: http://www.edc.uri.edu/rigis/data/data.aspx?ISO=geoscientificInformation

Field: ESHWT (Estimated Seasonal High Water Table)
Source: 2014 RIGIS
Description: The estimated seasonal high water table depth in feet below the soil surface, these values may not match the Web Soil Survey data.

Field: EX_PERM (Excessively Permeable Soil)
Source: 2014 RIGIS
Description: This is a yes/no field listing those soils that have excessively permeable substratums (rapid or very rapid permeability classes > 6.0 in/hr^{-1}).

Field: FARM_CLS (Farmland Classification)
Source: 2014 RIGIS
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2_016661
Description: The farmland classification of the soil map unit – prime, state-wide important, not prime farmland.

Field: HSG_SHWT
Source: 2014 RIGIS
Description: This field groups soils by hydrologic soil group (HSG) and seasonal high water table depth (SHWT). It also identifies hydric soils and soils with shallow bedrock. This group was created to identify major constraints to land development, to indicate suitability for onsite wastewater treatment systems, and to support site planning and design of land development projects and storm water management systems.

A number of groupings have been made to simplify mapping where either the HSG or SHWT may be different but land development constraints are similar. The field ID lists the HSG first, followed by the SHWT, then the Hydric or Bedrock severe constraint where applicable. Hydric soils having different HSG are grouped together, with both HSGs listed as C, D. Subaqueous soils, which may have a mapped HSG but are not suitable for development, are categorized as water.

2017 Updates: The Hydrologic Soil Group part was changed to reflect the new calculated values in the HSG field, the SHWT values were also changed to reflect the ESHWT field.

Field ID	Description
A, > 6 ft.	HSG A soils having low runoff potential, with seasonal high water table greater than 6 ft.
B, > 6 ft.	HSG B soils having moderate runoff potential, with SHWT greater than 6 ft.
B, 1.5 ft.	HSG B soils having moderate runoff potential, with SHWT of 1.5 ft (one unit has 2.0 ft water)
B, > 6 ft., Bedrock	Soil complexes with map units consisting of HSG B (Canton and Charlton) and a bedrock component (CeC). This category includes soil units that are moderately and shallow to rock that are not mapped separately, and where field investigation is needed to determine HSG.
C, 1.5 ft.	HSG C soils having high runoff potential, with SHWT of 1.5 ft. Most of these have restrictive layer in subsoil (densic). The SHWT ranges from 1.4 to 1.9 for this class.
D, 0 ft., HYDRIC	Soils that have SHWT at soil surface and are hydric soils.
D, 1.5 ft	Soils that have a SHWT within 1.5 feet and are in HSG D (these are typically moderately well drained soils with a densic contact).
Variable	Variable rating is assigned where the HSG and/or SHWT is listed as variable or not rated.
Water	All subaquic soils and mapped water bodies

~~**Field:** ***Helrate***~~
~~**Source:** New field~~
~~**Description:** This field provides information on the erodibility rating of the soil (used for USDA-NRCS program ratings).~~
~~**Online Linkage:** http://www.ri.nrcs.usda.gov/technical/highlyerodible.html~~

~~**Field ID**~~	~~**Description**~~
~~HEL~~	~~Highly erodible soil map unit~~
~~PHEL~~	~~Potential highly erodible soil map unit~~
~~Not Rated~~	~~Not rated, miscellaneous unit, etc.~~

Field: ***HYDR_RATE (Hydric Rating)***
Source: 2014 RIGIS
Description: The hydric soil rating of the map unit as found on the Web Soil Survey Reports. The following is an explanation of the codes:

Hydric = 100% of the map unit components are hydric soils.
Predominantly Hydric = 66 to 99% of the components are hydric soils.
Partially Hydric = 33 to 65% of the components are hydric soils.
Predominately Nonhydric = 1 to 32% of the components are hydric soils.
Nonhydric = 0% of the soil components are hydric.

This rating indicates the proportion of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is designated as "hydric," "predominantly hydric," "partially hydric," "predominantly nonhydric," or "nonhydric" depending on the rating of its respective components and the percentage of each component within the map unit.

"Hydric" means that all components listed for a given map unit are rated as being hydric. "Predominantly hydric" means components that comprise 66 to 99 percent of the map unit are rated as hydric. "Partially hydric" means components that comprise 33 to 66 percent of the map unit are rated as hydric. "Predominantly nonhydric" means components that comprise up to 33 percent of the map unit are rated as hydric. "Nonhydric" means that none of the components are rated as hydric. The assumption here is that all components of the map unit are rated as hydric or nonhydric in the underlying database. A "Not rated or not available" map unit rating is displayed when none of the components within a map unit have been rated.

Field: ***Hydric (Hydric Soil)***
Source: 1996 RIGIS
Description: Hydric soil field. Y = Yes soil map unit is dominantly hydric soils, N = No soil map unit is dominantly non-hydric soils. User must be cautioned; non hydric soil map units can contain hydric inclusions and vice versa. Users should also use the Ad-hoc point file to look for wet spot, IOW, MAR, W symbols. The definition of a hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/

Field: ***Hydro_GRP (Hydrologic Soil Group)***
Source: 2016 SSURGO Soils
Description: Hydrologic group of the soil map unit.
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_054242
Link to National Engineering Handbook: ftp://ftp.wcc.nrcs.usda.gov/wntsc/H&H/NEHhydrology/ch7.pdf
2014 Update: Dual groups have been dropped and only the dominate component is shown.
2016 Update: The HSG have been copied to match the SSURGO soils tabular data – the HSG have now been changed to a calculated value**.**

Field ID	Description
A	Saturated hydraulic conductivity is *very high* or in the upper half of high and internal free water occurrence is *very deep*
B	Saturated hydraulic conductivity is in the lower half of high or in the upper half of moderately high and free water occurrence is deep or very deep

C	Saturated hydraulic conductivity is in the lower half of moderately high or in the upper half of moderately low and internal free water occurrence is deeper than shallow.
D	Saturated hydraulic conductivity is below the upper half of moderately low, and/or internal free water occurrence is shallow or very shallow and transitory through permanent
Not Rated	The map unit is either a non-soil area (bedrock) or is too variable to rate (anthropogenic soil) and an on-site is needed to determine site conditions.

Field: *Imperv_pct* (Percent Impervious)
Source: New
Description: This field provides the percent of the soil polygon that has impervious ground which are typically pavement and buildings (Urban land). This percentage was determined from the 2011 RIGIS impervious surface coverage so there may be additional impervious surfaces added. The field is useful for determining how much of the soil map unit includes urban land and for use in run-off calculations.

Field: *Muname (Map Unit Name)*
Source: New
Description: The soil map unit name used in the published Soil Survey of Rhode Island.

Field: *Mukey*
Source: SSURGO
Description: The Map Unit Key field is a unique identifier of the SSURGO soils data that allows the spatial data to be linked with the tabular data when using the Soil Data Viewer program (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_053620) or the access tabular data.

Field: *Ord_symb (Ordination Symbol)* -woodland suitability.
Source: New
Description: This field contains the "Ordination Symbol" for woodland suitability which is provided in Table 17 of the published survey. The first part of the ordination symbol, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major soil limitation. The letter x indicates stoniness or rockiness; w, excessive water in or on the soil; d, restrictive root depth; s, sandy soil textures; and r, steep slopes. The letter o indicates insignificant limitations.

Field: *OWTS_class (Onsite Wastewater Treatment System Class)*
Source: New
Description: This field lists the soil class used in the RI Septic System regulations (http://www.dem.ri.gov/programs/benviron/water/permits/isds/). It provides the soil class outlined in the regulation. NOTE: This field is intended to provide general site information and does NOT take place of an onsite investigation.

Field ID	Description
A	**Class A** -Glacial Lodgement Till: Silt loam to loamy sand texture. Lower profiles tend to have a platy structure and are dense to very dense. Excavation is difficult. High probability of hydraulically restrictive lower layers. Angular rock fragments and occasional cobbles and stones.
B	**Class B** -Glacial Ablation Till: Silt loam to loamy sand throughout the profile. Lower horizons tend to be sandier. These soils tend to be looser than lodgment tills and typically do not have

	hydraulically restrictive layers. Lower horizons may be firm. Angular rock fragments and occasional cobbles and stones.
C	**Class C** -Proglacial Outwash Deposit: Also referred to as stratified drift, soil textures range from silt loam to loamy sand (in the upper horizons) to a sandy/ gravely substratum. Stratified layers of water sorted materials may be present. Entire profile tends to be loose and easy to dig except saturated horizons may be firm or cemented or both. Horizons of rounded rock fragments are common. A silty eolian mantle may also be present.
D	**Class D** -Glacial Ice Contact Deposit: Outwash deposits of well to poorly sorted sands and gravel. Texture can be highly variable over short distances and may include pockets or lenses of silt or silt loam. Stratification may be irregular or absent. Sub-rounded to rounded stones and cobbles are possible.
E	**Class E** -Coastal Dune Deposit: Fine to coarse sands, well sorted, often finely stratified. Little or no silt and clay. Typically no sediment larger than coarse sand. Deposited by wind action or storm over wash.
F	**Class F** -Alluvial Deposits: Material transported and deposited by streams and rivers. Typically well sorted, stratified, fine textured sediment that may have dark layers in the substratum which were at one time surface layers. Subject to seasonal flooding.
G	**Class G** -Eolian Deposits: Windblown silts deposited after the retreat of the Wisconsin glaciation. Typically brown to dark brown silt ranging in thickness of several inches to several feet. Underlain by outwash, ablation till, or lodgment till.
F	**Class H** –(NOT IN ISDS REGS) –Human transported material (fill).
I	**Class I (**NOT IN ISDS REGS) – Organic/Subaqueous Soils.
W	**Water**

Field: ***Parent_m (Parent Material)***
Source: New
Description: This field provides information about the parent material in which the soil formed. The soil parent material is one of the major factors of soil formation used to differentiate many of the soils in the northeast and many interpretations are made based on the type of parent material. The parent material is also used when making soil evaluations for septic systems in RI (see the OWTS_class field). NOTE: most upland soils in RI have a thin, 15 to 35 inch eolian (wind deposited) mantle of loamy sand to silt loam material overlying the glacial material. This eolian material is not included in the field except for soil which formed in thick deposits of silt loam textured material referred to as loess or when the mantle is sandy material underlain by till. The table below describes the field.
Online Poster of the RI Soil Parent Materials:
http://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1237660&ext=pdf

Field ID	Description
Ablation Till	Unsorted, non-stratified material deposited by glacial ice and consisting of a heterogeneous mixture of clay to boulder size particles. Ablation till is very variable but tends to be loose and dominantly sandy, but may have lenses of firm loamy material.

Ablation Till (Moraine Deposits)	Areas of Ablation Till mapped on moraines such as the Charlestown End Moraine.
Ablation Till over Bedrock	These map units consist of bedrock-controlled landforms. The soils formed in ablation till (described above) and have ledge or bedrock typically within 6 feet of the surface. These soils are mapped in a complex of shallow, moderately deep, and very deep soils.
Alluvial Deposits	Material deposited in modern-day floodplains.
Coastal Bluff (mixed clay and till)	Used only along the shoreline escarpment of Block Island (map unit UBE). These deposits consist of mixed thrusted coastal plain clays and till material.
Eolian Sand and/or Overwash Deposits	Dune and back barrier Holocene deposits adjacent to beaches along the south shore and shoreline areas.
Fluvial Deposits (glacial outwash)	Stratified deposits of sand and gravel deposited by glacial melt-water streams (also includes fluviodeltaic deposits).
Human Transported Material	Commonly referred to as fill, human - altered/transported material includes a variety of soil and geologic material deposited by human activity.
Human Transported Material over Refuse	Active and inactive refuse (landfills, dumps, etc.) areas.
Lodgement Till Narragansett Basin Lithology (also called basal or dense till)	Unsorted, non-stratified material deposited by glacial ice and consisting of a heterogeneous mixture of clay to boulder size particles. Lodgement till is usually found on drumlins and till uplands. Lodgement till tends to have a higher percentage of silt and clay than ablation till and is usually very dense. This group is for areas of lodgment till derived from dark colored mineralogy associated with the Narragansett Basin Bedrock (Carboniferous in age).
Lodgement Till Narragansett Basin Lithology (sandy mantled)	Same as above but these map units have a sandy to loamy sand mantle (Poquonock and Birchwood Soils). NOTE: This coding does not include those areas where the sandy mantle is very thick and was mapped as glacial fluvial soils (Windsor and Agawam) these areas will show up as fluvial soils even though they are underlain by carboniferous till or bedrock.
Lodgement Till (mixed lithology)	Unsorted, non-stratified material deposited by glacial ice and consisting of a heterogeneous mixture of clay to boulder size particles. Lodgement till is usually found on drumlins and till ridges. Lodgement till tends to have a higher percentage of silt and clay than ablation till and is usually very dense.
Loess over Ablation Till	These soils formed in silt loam textured loess overlying sandy, ablation till.
Loess over Fluvial	These soils formed in silt loam textured loess overlying fluvial deposits.
Loess over Lodgement Till	These soils formed in silt-loam textured loess overlying lodgment (dense) till deposits (mixed lithology).
Organic Deposits	Includes both fresh and tidal organic soils formed in more than 16 inches of organic material. For tidal organic areas, Matunuck soils are included even though the organic thickness is less than 16 inches.
Fluid Silty Marine/Estuarine Deposits	Subaqueous soils in coastal lagoons and bays that consist of thick deposits of silt loam textured (organic silts), highly fluid marine material. Dredged phase is in dredged channels.
Fluid Silty Marine/Estuarine Deposits over Organic Deposits	Subaqueous soils in coastal lagoons and bays that consist of thin (<1m) deposits of silt loam textured (organic silts), highly fluid marine material overlying buried organic deposits of fresh or marine origin.

Fluid Silty Marine/Estuarine Deposits over Sandy Marine Deposits	Subaqueous soils in coastal lagoons and bays that consist of thin (<1m) deposits of silt loam textured (organic silts), highly fluid marine material overlying sandy marine deposits (also includes sandy/gravelly fluvial deposits).
Loamy Marine/Estuarine Deposits	Subaqueous soil in coastal lagoons and bays that consist of loamy textured estuarine deposits (often fluid surface).
Sandy Marine/Estuarine Deposits	Subaqueous soils in coastal lagoons and bays that consist of sandy marine deposited material.
Sandy Marine/Estuarine Deposits over Outwash	Subaqueous soils in coastal lagoons and bays that consist of sandy marine deposited material underlain by sandy and/or gravelly outwash.
Sandy Marine/Estuarine Deposits over Till	Subaqueous soils in coastal lagoons and bays that consist of sandy marine deposited material underlain by till.

~~**Field:** ***Prime***~~
~~**Source:** New~~
~~**Description:** This field provides the farmland rating of the soil. P, indicates the map unit is Prime Farmland; SI, indicates Statewide Important soil map units; N, indicates the soil is not rated for farmland.~~
~~**Online Linkage:** http://www.ri.nrcs.usda.gov/technical/primefarmlands.html~~
See Farm_Cls

Field: ***PRB_SAND (Probable Sand)***
Source: 2014 RIGIS
Description: A yes/no field indicating soils that have sandy and gravelly (coarse textured) substratums and a seasonal high water table within 65 inches of the soil surface which may be problematic for interpreting water table elevations for septic systems.

Problem sands in regards to expression of redoximorphic features. Yes = Yes, soil map unit is predominantly a problem sand. No = No, the map unit is not identified as a problem sand based either on texture and water table depth or lack of data.

This field consists of coarse textured soils with a seasonal high water table of three feet or less. It was created to indicate soils where the abundance of redoximorphic features is particularly unreliable in determining the depth of the seasonal high water table.

Included in this field are sands, loamy sands and beach deposits (Owts Class C –Proglacial outwash, Class E – Coastal dune deposits, and Class F – Alluvial deposits) where the depth to the seasonal high water table is three feet or less (SHWT codes 2, 3 and 4).

Supporting data:
Identification of problem sands is based on research on the relationship between soil redoximorphic features (RMFs) and the depth and duration of the seasonal high water table (SHWT). The field research was conducted in RI and focused on soils with shallow depth to water table. Results show that RMFs are a good indicator of the "average shwt", defined as the average depth of the water table between the low and high points during the spring. However, RMFs do not identify the highest the water table rises, nor how long the water table remains high. This is a concern because OWTS design is based on the depth to the SHWT where common abundance (2-20%) of RMFs is found. If the water table rises above this level, the separation distance between the bottom of the OWTS drainfield and the water table will be compromised, increasing risk that untreated bacteria will enter groundwater.

In loamy soil, results show that the water table can rise 3 feet higher than the common (2-20%) RMFs, and remain at or above the RMFs 20% of the time. In sand and loamy sands, which are less likely to form redoximorphic features, the water table was at or above the common RMFs 32-45% of the time. The management implications are that using few rather than common RMFs to identify the SHWT would provide a measure of safety to protect drainfield hydraulic and treatment functions. This applies to all soils with water table less than 3 feet, but is especially warranted in problem sands.

References

Morgan, C.P. and M.H. Stolt. 2006. Soil morphology-water table cumulative duration relationships in southern New England. Soil Sci. Soc. Am. J. 70:816-824. http://www.soils.org/publications/sssaj/pdfs/70/3/816

Stolt, M.H. 2013. Relationships between soil morphology and water table levels. Presentation at the Rhode Island Regulatory Setbacks and Buffers workshop. November 21, 2013. URI, Kingston RI. http://www.uri.edu/ce/wq/nemo/Workshops-Support/Previous_Workshops.htm#Buffers2013

Field: *Rav (Relative Agricultural Value)*
Source: New
Description: Relative Agricultural Value. This is a numeric rating from 100 (best) to 0 (worst) of the soil map unit for agricultural production. This number is used for rating the soil for agricultural uses.

Field: *RESTRICT (Restrictions for Septic Systems)*
Source: 1996 RIGIS (minor formatting changes and some units changed to better reflect modern interpretations)
Description: Restrictions of soil to support traditional septic systems.

Field: *RES_TYPE (Restrictive Layer Type)*
Source: 2014 RIGIS
Description: New field that lists the type of soil restrictive layer (defined below). Three types of restrictive layers are identified in RI soils: densic materials (dense till), bedrock, and manufactured layers (human made). Definition of restrictive layer: A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restricts roots or otherwise provides an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

~~**Field: *Septic (REMOVED)***~~
~~**Source:** 1996 RIGIS~~
~~**Description:** Suitability for on-site septic absorption fields (S =Slight, M =Moderate, V=Severe). Multitaxa soil map units (complexes) often have dual ratings such as SV (slight for Canton, severe for bedrock)~~
2017 Changes: Removed from RIGIS Attribute Table – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

~~**Field: *Shwt (REMOVED)***~~
~~**Source:** 1996 RIGIS~~
~~**Description:** Seasonal high water table. Number given is the water table group. Table below provides field descriptions.~~
2017 Changes: Removed from RIGIS Attribute Table (See field ESHWT) – still included in the master sheet (2017RIGIS_Soil_Attribute_All).

The following seasonal high water table depth groupings have been established:

Group Number	Depth (in feet above + or below – soil surface) to Water Table
1	+1.0-0.0

2	+1.0-0.5
3	+1.0-1.0
4	+0.5-1.0
5	0.0-1.0
6	0.0-1.5
7	1.5-3.5†
8	2.0-4.0*
9	>6.0
99**	Too variable to rate

The water table depths used in the grouping system are taken from the published (archived) NRCS Soil Interpretation Record (form SOI 5), with the following exceptions:

- †Group 7 has water table depths of 1.5-2.5 feet on the current NRCS form SOI 5. In the Soil Survey of Rhode Island, however, the Group 7 soils have water table depths ranging from 1.0 or 1.5 feet to 3.0 or 3.5 feet. It has been decided to standardize the water table depths of these moderately well drained soils at 1.5-3.5 feet since this is how they were mapped in the field. Valuable information would be lost if these soils were rated as having water table depths of 1.5-2.5 feet as the current Soil Interpretations Records show. In making this decision it is recognized the rules of soil taxonomy are not being met, specifically the depth criteria for soil mottling in the Aquic subgroups. The tradeoff is whether to strictly use the rules of taxonomy or to use the information as it was gathered in the field. Most users in RI felt the emphasis should be on having the most useful data entered into the RIGIS, hence the decision to use 1.5-3.5 foot depths for the moderately well drained soils. Map unit UAB has also been changed to 7.
- * Group 8 soils were formerly listed in the 1996 RIGIS as > 6.0 feet for most of the year. Group 8 is now listed as having a water table between 2 and 4 feet below the surface, this group is used for soils are considered "well drained" that formed in lodgment till (Paxton, Newport, etc.). These soils typically have perched (oxyaquic) water tables during the winter and spring and following major precipitation events. The water table generally last until late May, early June then drops once plant growth begins. They are not major concerns for septic systems but can cause wet basements and other problems where drainage is a concern.
- ** This group was listed as 9.9 in 1996 RIGIS, now changed to 99. It is used for areas of bedrock, urban land, and human transported material that require onsite investigation to determine the water table depth.

- For “official” or updated data on season high water table depths visit the web soil survey (http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm).

~~**Field:** ***Slope (REMOVED)***~~
~~**Source:** 1996 RIGI~~
~~**Description:** Slope of the land. Number given is the slope group. The table below has the field information.~~

SLOPE GROUP NO.	PERCENT SLOPE RANGE
1	0-1
2	0–2
3	0–3
4	0-8
5	0-15
6	0-25
7	0-35
8	0-50

9	3-8
10	3-15
11	8-15
12	15-25
13	15-35
14	25-65

Slopes for each soil map unit are as listed in the "Soil Survey of Rhode Island", except:

- Those map units which have no slope range listed in the Soil Survey, such as GBC, GBD, UAB, UBE, etc., have been assigned to a slope group based on a review of the National Soils Handbook and/or the appropriate Soil Interpretation Record (NRCS form SOI-5).
- Three map units were assigned to soil slope groups that differ slightly from the slope ranges shown for these soils in the Soil Survey. These changes were made to eliminate the need to set up three more slope groups, each of which would have only one soil map unit in it, and would nearly duplicate another group. The differences in the slope ranges are so small as to be of little significance. These soils are:

Map Symbol	Percent Slope in Soil Survey	Assigned Slope Range
NP	1-15	0-15
Pk	0-4	0-3
Ur	0-10	0-8

Field: ***Soil_name (REMOVED)***
Source: 1996 RIGIS
Description: The soil map unit symbol
Online Linkage: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2_016615

~~**Field:** ***Soil_num***~~
~~**Source:** 1996 RIGIS~~
~~**Description:** Unique numeric value from 1 to 112 for each soil mapping unit. Used to join tables, field can be deleted if not used.~~

~~**Field:** ***Stone (REMOVED)***~~
~~**Source:** 1996 RIGIS~~
~~**Description:** Stoniness group. Indicates the percent of the land surface covered by stones and boulders. Please note the mapping for RI was performed during the 1960-1970s and has not been updated, land use changes have not been updated. See table below for attribute descriptions.~~
2017 Update: This field is omitted (dropped) from the attribute table but is still available in the spread sheet if needed.

Field ID	Percent Surface Covered by Stones/boulders	Descriptive Name
1	0-2	Nonstony, Stony
2	2-10	Very Stony
3	10-35	Extremely Stony

Field: ***URL***
Source: New
Description: This field contains the Uniform Resource Locator (internet URL) which links the soil polygon to map unit description provided in the published soil survey. This field works as a “Hot Link” field for linking the soil polygons to

the map unit. To use this in ArcView use the hot link feature, ArcMap users can click the URL from the identify window to link to the map unit description. If you find a dead link please email jim.turenne@ri.usda.gov

AD-HOC SPOT SYMBOLS (SPECIAL FEATURES, POINTS AND LINES)

Background:
Special Soil Features represent soil, miscellaneous area, or landform features that are too small to be digitized as soil delineations (area features or map unit polygons). Special Soil Features labels represent specific Special Soil Features. These features are identified with a descriptive label. The label is assigned to the point or line assigned to represent the feature on maps.

These AD-HOC spot symbols are used on soil survey maps to locate special areas, features, and soil inclusions which were too small to delineate at the scale of mapping or provide useful information about an area. The RI Soil Survey was mapped at a 1:15,840 scale with minimum polygon size ranging from 3 to 6 acres in size. In certain areas where the soil surveyor identified a special area or inclusion that had major differences in interpretations from the mapped soil in the area, a spot symbol was placed on the map.

Agricultural Handbook 18, Soil Survey Manual, 1993, USDA, SCS; National Soil Survey Handbook, Title 430-VI, part 647 (current issue), USDA, NRCS

Methodology:
NOTE: The special feature point files were downloaded from the Web Soil Survey and re-projected to RI State Plane, NAD 83, feet coordinates using the ArcToolbox Projection Utility. Cultural features such as cemeteries, bunkers, and schools which are delineated in the published Soil Survey of Rhode Island were not digitized and are not provided on this file.

SoilsPoints2017.shp – Special point features such as short steep slopes and escarpments.

featsymb	feat_name	feat_desc
GPI	Gravel Pit	An open excavation from which soil and underlying material has been removed, and used without crushing, as a source of sand and gravel. Typically 1 to 3 acres.
MPI	Quarry pit	An open excavation from which soil and underlying material is removed exposing the bedrock. Also used to denote surface openings to underground mines. Typically 1 to 3 acres.
ROC	Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils in the surrounding map unit are shallow over bedrock. Typically 1 to 3 acres.
STV	Very stony spot	An area with more than 3 percent of the surface covered by rock fragments that are greater than 10 inches in diameter. Typically 1 to 3 acres.
WET	Wet spot	Somewhat poorly drained to very poorly drained area that is at least 2 drainage classes wetter than the named soils in the surrounding map unit. Typically 1 to 3 acres.
BLD	Bouldery Spot	Used to designate individual boulders or groups of boulders, greater than 5 feet in diameter. Boulders may be permanently submerged, intertidal, or permanently exposed. Not mapped in bouldery map units.
DRY	Dry Spot	An area of moderately well drained or excessively drained soils within a poorly or very poorly drained soil map unit or an intertidal or permanently exposed area within a subaqueous soil map unit.
FLU	Fluid Soil Spot	An area of (subaqueous) soils with a moderately to highly fluid surface in a map unit with a non-fluid surface.

IOW	Intermittent Open Water Spot	Small, natural or constructed lakes, ponds, or pits that contain water intermittently either with tidal cycles or during wet periods (Vernal Ponds).
MAR	Marsh Spot	A very poorly drained area of marshes and swamps consisting of organic soils. Not used in map units where the named components are poorly or very poorly drained.
WAT	Water Spot	Small, natural or constructed lake, pond, or pit that contains water most of the year.
SHL	Shelly Spot	A shelly area created by humans either as waste disposal or for aquaculture management/restoration.
GRA	Gravelly Spot	A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly 3 inches in diameter in an area with less than 15 percent fragments.
SAN	Sandy Spot	A spot where the surface layer is a loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

SoilsLines2017.shp – Special line features such as slope, structures, and bedrock escarpments.

Featsym	**Feature Name**	**Description**
ESB	Escarpment, Bedrock	A relatively continuous and steep slope or cliff produced by erosion or faulting breaking the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.
SLP	Short Steep Slope	Narrow soil area that has slopes that are at least 2 slope classes steeper that the slope class of the surrounding named map unit.
SPS	Shoreline Protection Structures	Linear, human-made shoreline protection structures or jetties composed of one or more of the following materials: boulders, concrete, or steel.
BDF	Bedforms	A linear pattern of sand indicating movement of sand due to currents and waves.
SUB	Submerged Object Spot	Used to designate individual submerged human transported or created structures such as sunken ships, building wreckage, or dumped objects.

End