Rhode Island Soil Survey Updates

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Outline

• Provide an overview of the National Cooperative Soil Survey.
• Information on the 1981 Soil Survey of Rhode Island (limitations, scales issues, errors).
• Plans for revisions and updates.
• How to access soils data.
• Application of Soil Survey data to SSM.
• Show demos how to use WSS/IMS

A cooperative undertaking of the USDA and various Federal, State, and Local agencies and the State Agricultural Experiment Station of a State’s Land Grant College.

The NRCS (formerly SCS) provides leadership for the NCSS. Maintains information about soils of the world and assists in understanding, classification, and wise use of soil resource.

Complete Information at:
http://soils.usda.gov/partnerships/ncss/
What is a Soil Survey?

- A soil survey describes the characteristics of the soils in a given area, classifies the soils according to a standard system of classification, plots the boundaries of the soils on a map, and makes predictions about the behavior of soils.
- Extensive field work!
How are Soil Survey’s Made?

- 90% of a soil survey is made by soil scientists walking the landscape, digging holes, observing the soil, and delineated the map unit boundary in the field.
Extensive data collection

- While a survey is in progress data is collected to classify soils and build interpretations:
  - Lab analysis.
  - Water table, Ksat, soil temp. site index, studies.
  - Remote sensing (GPR, EMI, etc).
  - Transects.
History of Soil Survey in RI
1981 RI Soil Survey

- Major field work 1965-1975 (pre taxonomy).
- Over 25 mappers involved, soil descriptions down to 40-60 inches.
- Field mapping at 1:12,000 Scale, published at 1:15,840 on unrectified imagery.

No Longer the “Official” USDA-NRCS Source for Soil Data!
Most of the RI Soil Survey is Order 2 mapping, sections of the Northwest Hills appear to be order 3.

<table>
<thead>
<tr>
<th>Level of data needed</th>
<th>Field procedures</th>
<th>Minimum-size delineation (hectares)</th>
<th>Typical components of map units²</th>
<th>Kind of map units</th>
<th>Appropriate scales for field mapping and publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st order - Very intensive (i.e., experimental plots or individual building sites.)</td>
<td>The soils in each delineation are identified by transecting or traversing. Soil boundaries are observed throughout their length. Remotely sensed data are used as an aid in boundary delineation.</td>
<td>1 or less</td>
<td>Phases of soil series, miscellaneous areas.</td>
<td>Mostly associations, some complexes, miscellaneous areas.</td>
<td>1:12,940 or larger</td>
</tr>
<tr>
<td>2nd order - Intensive (e.g. general agriculture, urban planning.)</td>
<td>The soils in each delineation are identified by field observations and by remotely sensed data. Boundaries are verified at closely spaced intervals.</td>
<td>0.6 to 4</td>
<td>Phases of soil series, miscellaneous areas, few named at a level above the series.</td>
<td>Consociations, complexes; few associations and undifferentiated groups.</td>
<td>1:12,000 to 1:31,680</td>
</tr>
<tr>
<td>3rd order - Extensive (i.e., range or community planning.)</td>
<td>Soil boundaries plotted by observation and interpretation of remotely sensed data. Soil boundaries are verified by traversing representative areas and by some transects.</td>
<td>1.6 to 15</td>
<td>Phases of soil series or taxa above the series; or miscellaneous areas.</td>
<td>Mostly associations or complexes, some consociations and undifferentiated groups.</td>
<td>1:30,000 to 1:63,350</td>
</tr>
</tbody>
</table>

Table 2-1. Key for Identifying Kinds of Soil Surveys
### Table 2-2. Guide to Map Scale and Minimum Delineation Size

<table>
<thead>
<tr>
<th>Map Scale</th>
<th>Inches per Mile</th>
<th>Minimum size delineation¹</th>
<th>acres</th>
<th>hectares</th>
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<tbody>
<tr>
<td>1:500</td>
<td>125.7</td>
<td>0.0025</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>1:2,000</td>
<td>31.7</td>
<td>0.040</td>
<td>0.016</td>
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<tr>
<td>1:5,000</td>
<td>12.7</td>
<td>0.25</td>
<td>0.10</td>
<td></td>
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<tr>
<td>1:7,520</td>
<td>0.00</td>
<td>0.62</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>1:10,000</td>
<td>0.54</td>
<td>1.00</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>1:12,000</td>
<td>5.25</td>
<td>1.43</td>
<td>0.57</td>
<td></td>
</tr>
<tr>
<td>1:15,040</td>
<td>4.00</td>
<td>2.5</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>1:20,000</td>
<td>3.17</td>
<td>4.0</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>1:24,000 (7.8&quot;)</td>
<td>2.64</td>
<td>5.7</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>1:31,680</td>
<td>2.00</td>
<td>10.0</td>
<td>4.1</td>
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<td>1:62,500 (15&quot;)</td>
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<td>15.8</td>
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<tr>
<td>1:63,350</td>
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<td>40.0</td>
<td>16.2</td>
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<tr>
<td>1:100,000</td>
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<td>100.0</td>
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<td>1:125,000</td>
<td>0.51</td>
<td>156.0</td>
<td>63.0</td>
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</table>

**REMEMBER** – Soil surveys are designed and mapped for **GENERAL** land-use planning and do **NOT** take the place of an on-site investigation, enlarging the map does not increase the accuracy! Detailed, order 1 surveys are what the SSSM is for.
Computers and Soils

• RI is the 1st State to have complete digital soils data for use on a GIS – all thanks to trash!

• Several sources for digital soils data.
GIS

Advantages:
• Allows maps to overlay at the same scale.
• Query data.
• Links maps to database.
• Can overly the maps on recent aerial imagery and topographic maps.
• Easier to locate your site (can use GPS, address matching, etc.).

Disadvantages:
• Cost of software (freeware is available - Arc Explorer).
• Learning curve to use GIS effectively – datum's, projections, file formats…..
• Changing scale does not change map accuracy!
• Errors in digitization of the map.
• PC limitations (memory, processor, etc.).
Errors in Digital Data

Errors/Problems in the soil GIS data include; polygon shifts, incorrect labels in map units, land-use changes since the original mapping, attribute table changes.
Accessing and Using Soil Data

RIGIS Soils Data - http://www.edc.uri.edu/rigis/

Advantages:
• Available in RI SPF Coordinates.
• Lots of attribute information.

Disadvantages:
• E00 format ??
• Not “official” soil data.

Also available on and IMS via DEM’s Environmental Mapper - http://www.dem.ri.gov/maps/index.htm#GV

Benefits: anyone can use, true color orthos, links soils to map unit descriptions
Published survey still available but considered “archived data”.

“Official” USDA-NRCS Soil data and reports through Soil Data Mart and Web Soil Survey.

Advantages:
GIS data available in various projections/types. Soils info for 90% of private lands in U.S.

Disadvantages:
Need internet (high speed), poor imagery, difficult to see large areas, interpretations are not always accurate.
RI Soil Survey Future Plans

- No plans for conducting a complete re-map of the state (restructuring).
- Fix errors in the tabular and spatial data (>6’ water table in Newport soils).
- Some update mapping in deficient areas and land-use changes, fix hydro shift.
- Collect more data on soils for interpretations.
- Map coastal and shallow water areas.
- RIGIS 2007 Update.
- Update mapping available for priority areas requested by towns and state.
Uses of the RI Survey for SSM

The RI Soil Survey is NOT a SSM!

• Should be used (along with other resource inventory maps) to determine general soil and hydrologic information.
• Read map unit descriptions for inclusions.
• Will work on matching map units with SSM legend.
Other Data for SSM

- RIGIS point elevation (Orthometric).
- LIDAR Data.
- Pictometry.
- DEMS.
- Town imagery and elevation.
- NWI, USGS
DEMOS

http://websoilsurvey.nrcs.usda.gov/app/

http://soildatamart.nrcs.usda.gov/

RI Soil DVD
Questions?
Accessing the SDM

SDM
Download Data

UTM, Geographic, SPC

Please select the class of data you wish to download: (Survey Area Version 1, Tabular Version 1, Spatial Version 1)
- Tabular Data Only
- Tabular and Spatial Data
- Spatial Data Only
- Template Database Only

Please select a spatial format:
- AutoView Shapefile

Please select a coordinate system:
- UTM Zone 10, Northern Hemisphere (NAD 93)

Please select a template database (optional):

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<th>Template DB Version</th>
<th>Template DB Name</th>
<th>Size</th>
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Description: This is the national SSURGO Template Database for Microsoft Access 2002-2003. This database should be used only when no state specific customized SSURGO Template Database is available.

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In order to view any report, popup blocking must be disabled. In order to view a report in PDF format (the default format), your browser must be configured to use a PDF viewer (such as Adobe® Reader® software).

Please select the map units that you would like to report on:

<table>
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<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
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<tbody>
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<tr>
<td>AfA</td>
<td>Agavam fine sandy loam, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>AfB</td>
<td>Agavam fine sandy loam, 3 to 8 percent slopes</td>
</tr>
<tr>
<td>B</td>
<td>Beaches</td>
</tr>
<tr>
<td>Bc</td>
<td>Birchwood sandy loam</td>
</tr>
<tr>
<td>BhA</td>
<td>Bridgehampton silt loam, 0 to 3 percent slopes</td>
</tr>
<tr>
<td>BhB</td>
<td>Bridgehampton silt loam, 3 to 8 percent slopes</td>
</tr>
<tr>
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<td>Bridgehampton silt loam, till substratum, 0 to 3 percent slopes</td>
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<tr>
<td>BmB</td>
<td>Bridgehampton silt loam, till substratum, 3 to 8 percent slopes</td>
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<tr>
<td>BnA</td>
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<tr>
<td>BnC</td>
<td>Bridgehampton-Chariton complex, very stony, 0 to 15 percent slopes</td>
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<td>BoC</td>
<td>Bridgehampton-Chariton complex, extremely stony, 3 to 15 percent slopes</td>
</tr>
<tr>
<td>BnA</td>
<td>Broadfork silt loam, 0 to 3 percent slopes</td>
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</tbody>
</table>

Please select the report that you would like to generate:

Hydric Soils

- Include Minor Soils
- Include Description
- Rich Text Format

Select Survey Area

Generate Report

View Metadata

See Disclaimer

Download Data

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# Hydric Soils

**State of Rhode Island, Bristol, Kent, Newport, Providence, and Washington Counties**

This report lists only those hydric components that are listed as hydric. Dashes (--) in any column indicate that the data were not included in the database. Definitions of hydric criteria codes are included at the end of the report.

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<th>Landform</th>
<th>Hydric rating</th>
<th>Hydric criteria</th>
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<td>90</td>
<td>--</td>
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<tr>
<td></td>
<td>Cattise</td>
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<tr>
<td></td>
<td>Whitman</td>
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<td>--</td>
<td>Yes</td>
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<tr>
<td></td>
<td>Rarap</td>
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<tr>
<td>Bc: Birchwood sandy loam</td>
<td>Stissing</td>
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<td>--</td>
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<tr>
<td>Bc: Scatboro nucley sandy loam</td>
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<td>90</td>
<td>--</td>
<td>Yes</td>
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<tr>
<td></td>
<td>Warpole</td>
<td>4</td>
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<td>2</td>
<td>--</td>
<td>Yes</td>
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</table>

**Explanation of hydric criteria codes:**

1. All letters except for Foliets, and lithos per except for Foliets.
2. Soils in Aquic suborders, great groups, or subgroups, Albic suborders, Historthols great group,
   Historthols great group, Pacific subgroups, or Ubrut subgroups that
   A. are somewhat poorly drained and have a water table at the surface (60 feet)
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