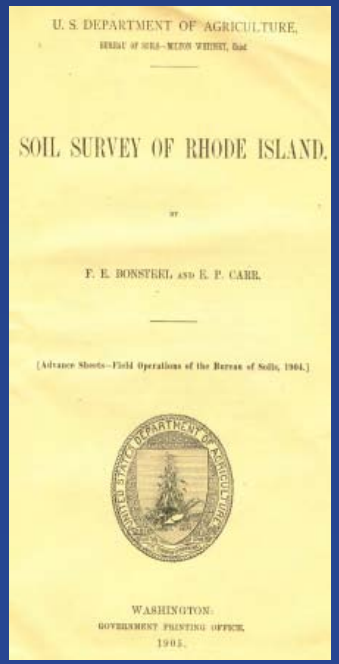
RI Soil Survey 1904-2012+

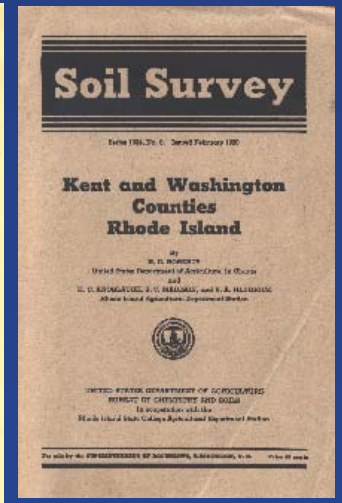

U. S. DEPARTMENT OF AGRICULTURE,

SOIL SURVEY OF RHODE ISLAND.

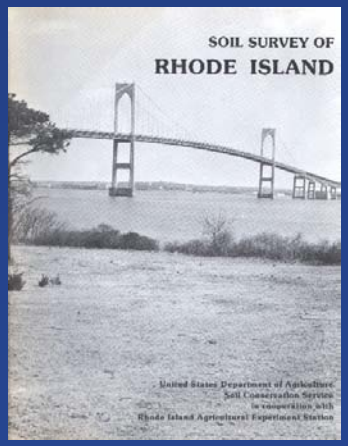
F. E. BONSTEEL, AND E. P. CARR.

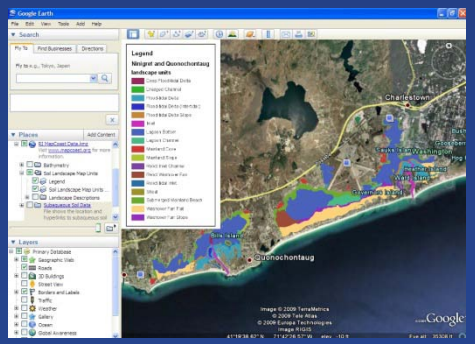
[Advance Sheets—Field Operations of the Bureau of Soils, 1904.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1905.


Soil Survey

Kent and Washington Counties Rhode Island





Jim Turenne, CPSS

Assistant State Soil Scientist

Jim.turenne@ri.usda.gov

http://www.ri.nrcs.usda.gov/technical/soils.html

Dean Rector, RI SS Party Leader

Outline

- Background information about soil survey.
- History of the RI Soil Survey.
- Long rang plan and enhancements.
- Technical Soil Services.
- Accessing and using “Official” Soil Data.

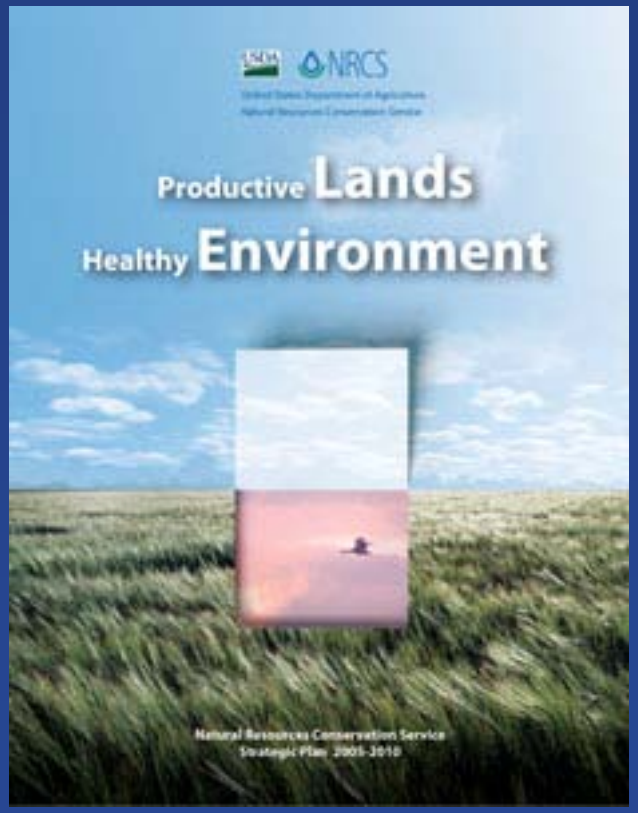
Input

- Feedback from users how to improve.
- What type of data, maps, products can we provide.
- Provide input on the questionnaire and at open session.

Natural Resources Conservation Service

- Formerly SCS.
- Created in 1935 following the “Dust Bowl” event.
- Provide technical assistance to private landowners to help conserve soil, water, and natural resources.
- Soil Scientists, Conservationists, Biologist, Foresters, Economists, Engineers, GIS specialists.
- Huge Hammond Bennett – Soil Scientist that led the soil conservation movement – 1st chief of the Soil Conservation Service.
- www.nrcs.usda.gov

  @NRCS_RI



Helping People Help the Land (and water).

RI Soil Program Staff

- Jim Turenne, ASSS – URI 1987! began in
- RI late 2003, prior SSPL Plymouth County, MA and GPR operator.
- Maggie Payne – Resource Soil Scientist and Rapid Carbon Liaison for MO-12. Provides Technical Soil Services, coastal zone soil survey, geodata administrator, tech guru.
- Jill Phillips – Soil Scientist (1 more day). 1st place winner of National Soil Judging! Working on Rapid Carbon Assessment and CZSS.
- Lisa Krall State Soil Scientist RI/CT
- Debbie Surabian Soil Survey Project Leader 12-6

National Cooperative Soil Survey

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.

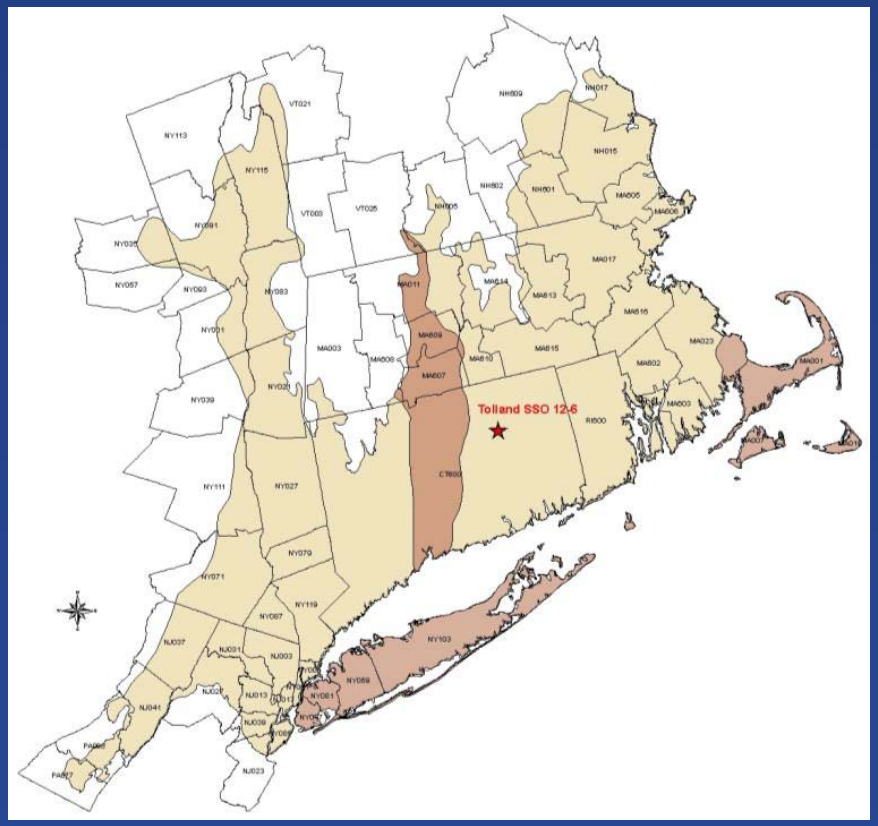
The NRCS (formerly SCS) provides leadership for the NCSS, maintains information about soils of the world and assists in understanding, classification, and wise use of the Nation's soil resource.

Legislative Authority - Agricultural Appropriation Act 1896 & 1903, Soil Conservation Act 1936, Public Law 89-560 Soil Surveys for Resource Planning 1966…

Helping People Understand Soils!

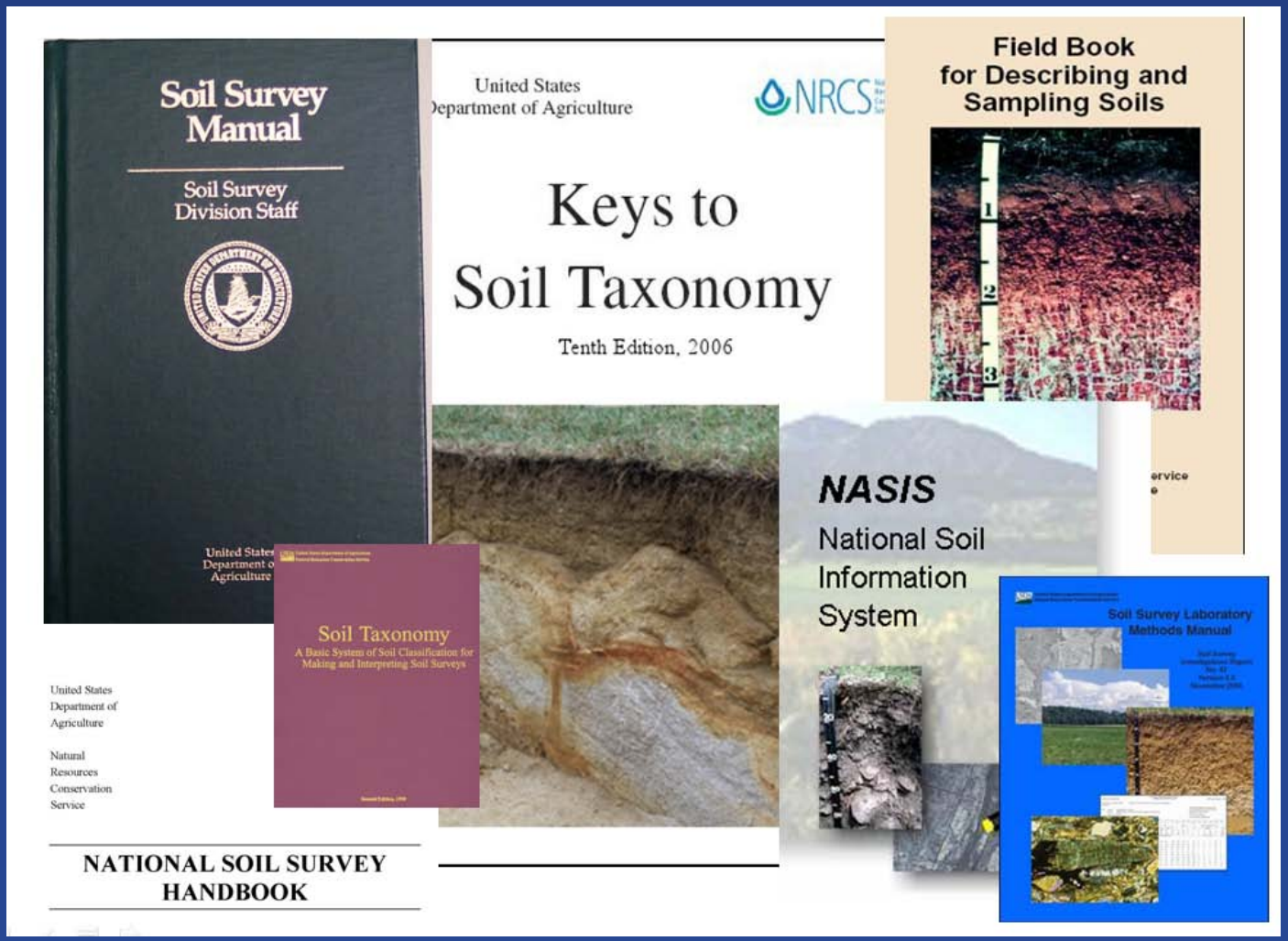
NRCS Soil Survey Structure

- Throughout most of the “analog” days soil survey was operated state-by-state.
- Re-org in mid 1990’s to an MLRA approach.
- Next round moves all soil survey to regional (MO) location.
- Future?? 24 Soil Survey office slated for closure…



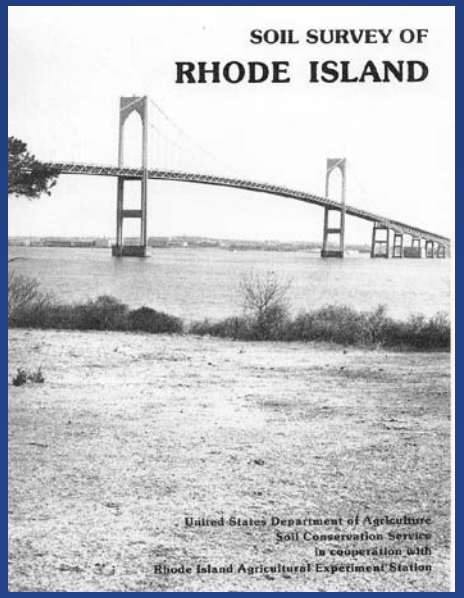
12-6 Soil Survey Office

Our Standards



The *Soil Geographic Data Standard, FGDC-STD-006 (FGDC 1997)*

RI Soil Survey History



- 1904 – State-wide survey
- 1930's County Soil Surveys
- 1981 – Soil Survey of RI
  - Major field work 1965-75
  - Over 25 mappers worked on it.
  - Most descriptions only down to 30-40 inches.
  - Mapped at 1:12,000 – published at 15,840 (unrectified imagery).
  - http://soils.usda.gov/survey/online_surveys/rhode_island

1981 RI Soil Survey - continued

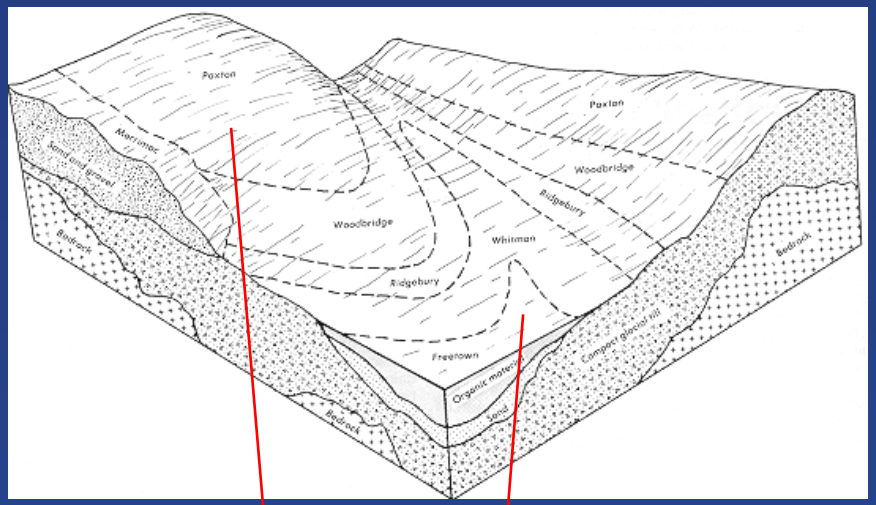
- Digitizing conducted during 90's by URI-EDC and Private Firm – topo based used for hydro, polygons (pre ortho).
- SSURGO Certified in 1996 RI600.
- Attribute tables added to RIGIS soil – 29 interpretations, url link to MUDs, metadata (most users use RIGIS soils).
- Long range plan developed to modernize the survey.
- 2004-09 tabular changes made in NASIS to correct/update data.
- 2010 First spatial edits made – 1st example of a Coastal Zone, fixed numerous errors…
- 2012 Second round of spatial edits, 1st Freshwater Soil Survey…

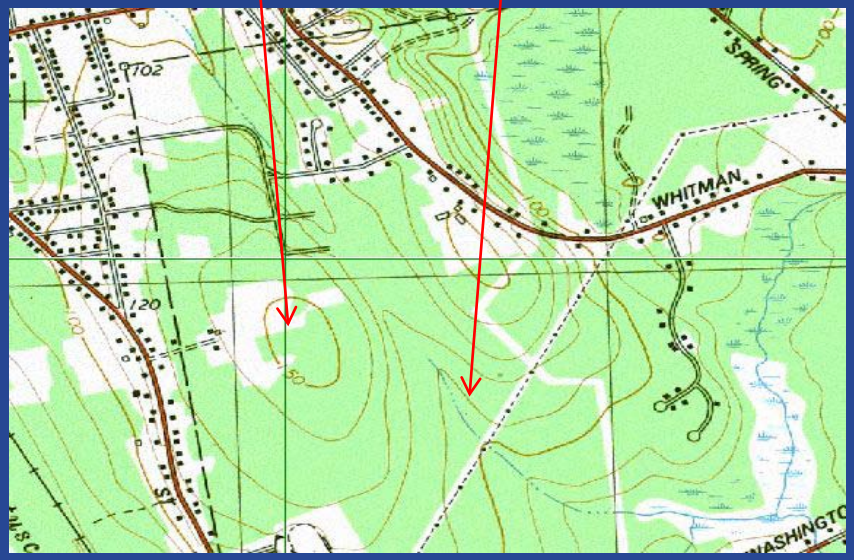
How Soil Surveys are Made

- **80-90% of a Soil Survey is made in the field!**
- Soil mapper researches area, reviews other resource maps before heading out to field.
- Draws preliminary lines with stereo-scope.
- Walks the landscape, builds soil/landscape model.
- Digs many holes to confirm model.
- Refines the lines based on holes.

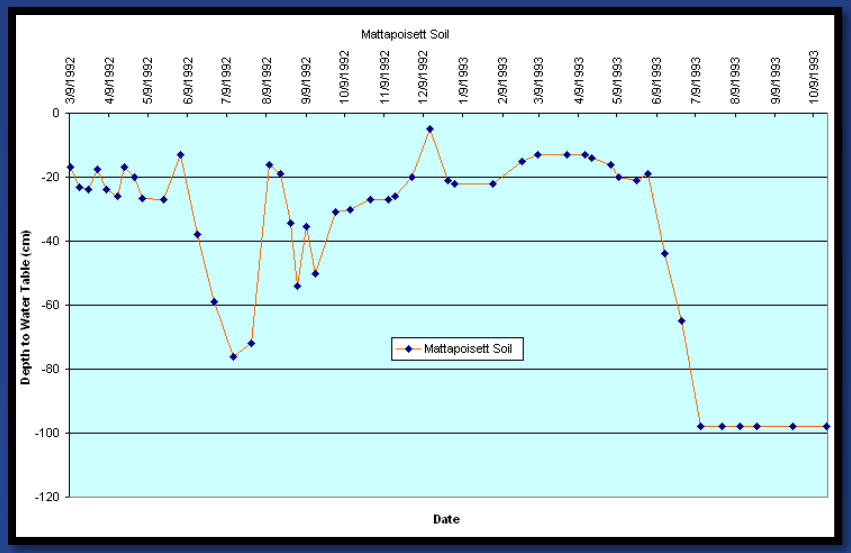
How Soil Surveys are Made

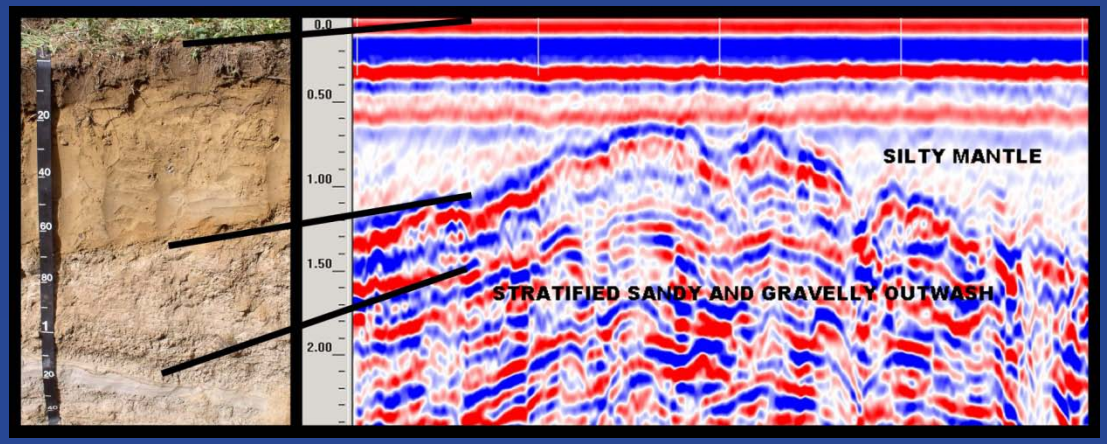
- Soil boundaries are drawn on an aerial photo in the fields.
- Combination of art, science, and cartography.
- 1:12K mapping ave. 200-300 acres/day 10 to 20 holes dug.
- Soil data collected: profile descriptions, lab analysis, transects, water tables, Ksat, crop yields/woodland, engineering studies.
- Maps are compiled in office, manuscripts written – soil survey published.





“All we do in Soil Survey is Collect Data”





Physical

Ap – dark brown, FSL, weak structure, abrupt boundary…

Bw1 – yellow brown, SL, weak sbk structure, worm burrows…

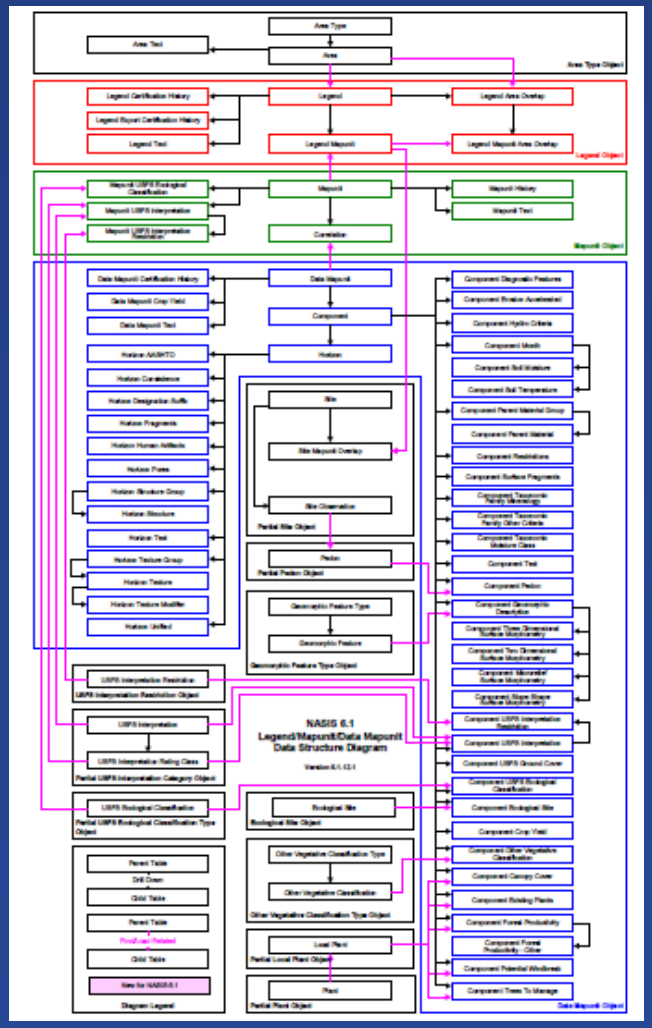
C1 – gray, LS, common redox concentrations…
C2 – pale yellow common redox depletions…

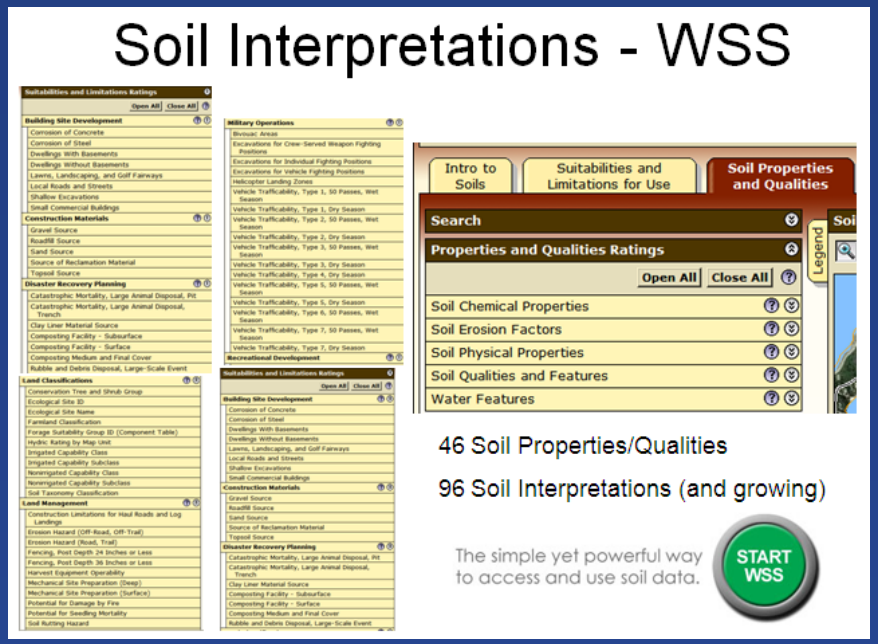
Properties/Interps:

Sudbury, Aquic Dystrudepts.
Moderately well drained.
Formed in sandy outwash.
Seasonal high water table ~55 cm.
Prime Farmland.
Hydro group B
Limitations for septic systems..
Wet basements

MUD:
http://www.ri.nrcs.usda.gov/technical/sudbury.htm

Where does this data go?

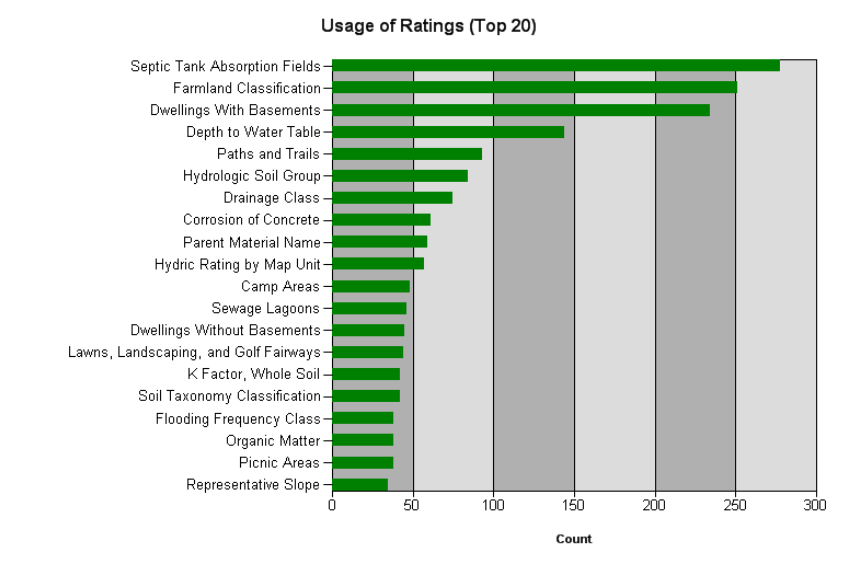


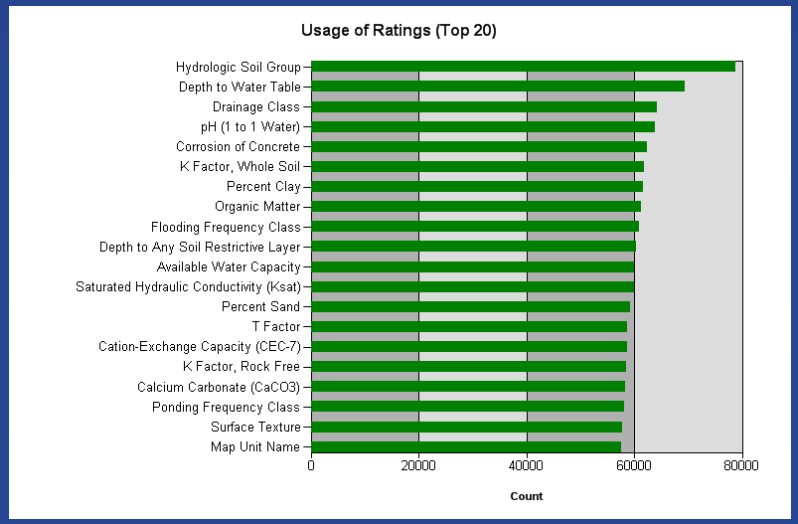


NASIS – the Beast!

Uses of Soils Data

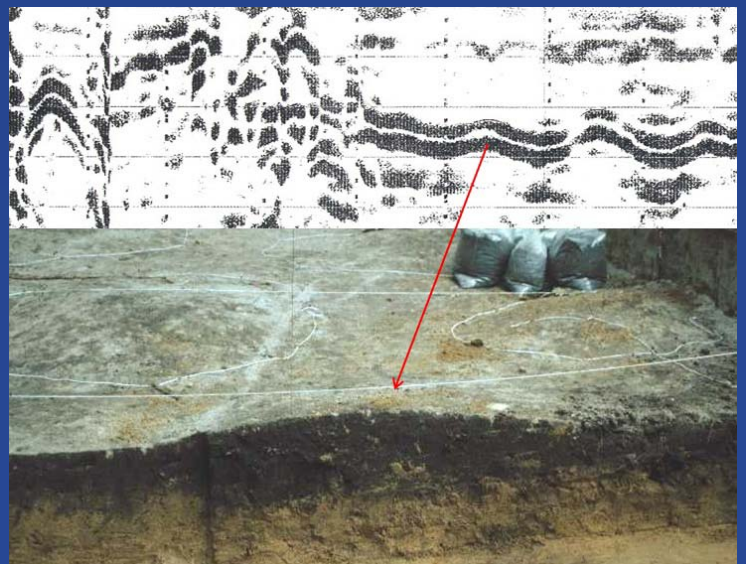
- Top requests – is it wet and does it perc!
- Most interps deal with water-table, water movement.
- Farmland classification.
- Town ordinances.
- Recreational.
- Drainage classes.





Technical Soil Services

- A major responsibility of Technical Soil Services within NRCS is to assist users with understanding and properly using the soil survey and to provide users with predictions and interpretations about the behavior of each kind of soil mapped or identified under defined situations.
- Technical soil services are offered to our partners, cooperators, towns/state/federal and general public – anyone looking for information about soils.
- TSS includes on-site investigations, remote sensing, hydric soils, soil quality, interpretations, customized maps, education/outreach/training, special studies…



Sources of Soil Data

"Official" Soils Data:

1. Soil Data Mart (http://soildatamart.nrcs.usda.gov/) – download site, reports/interpretations.
2. Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/) site for viewing maps, creating interpretive maps, customized reports.
3. Geospatial Gateway (http://datagateway.nrcs.usda.gov/)

RIGIS (http://www.edc.uri.edu/rigis/)

- Make sure to DL the new 2012 data, points, lines, polygons.
- Spatial data is same as SDM, attribute table differs.

Other:

- ArcGIS Online.
- Digital Atlas.
- Google Earth/Maps.
- SoilWeb App for Android/Iphone.
- DEM Environmental Viewer (old data).

2010 and 2012 Updates

The RI Coastal Zone Soil Survey, Phase I and II:

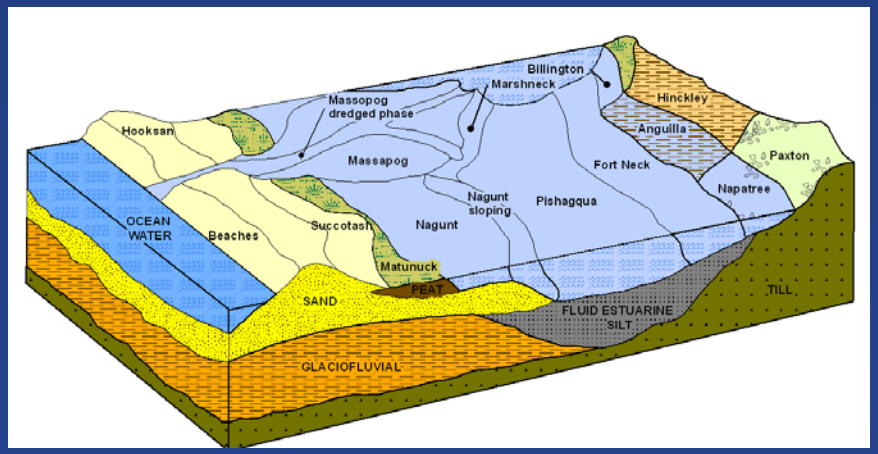
- RI is in forefront of mapping shallow water, submerged lands.
- 2004 MapCoast.org formed – goal of providing detailed, seamless maps, data, and interps. of our coastal zone and shallow (<5m) water subaqueous soils.
- 3 User Conferences, protocol developed, funds secured, SWAT team formed, lot of data collected.
- Completed Washington County Coastal Ponds and area from Pt. Judith to GB.

Below: 2010 RI Soils – Including the Coastal Zone Soil Survey

Below: 1996 RI Soils – No information for shallow water or coastal soils

Coastal Zone Soil Survey

- 23 new SAS phases for 8 new soil series.
- 3 new beach phases.
- 4 Tidal Marsh series.
- 2 Dredge Soils (HTM)
- 2 new dune soil series
- Working on interpretations.
- Phase III work plan – multi year.
- Changes made to standards.



Other 2010 Improvements

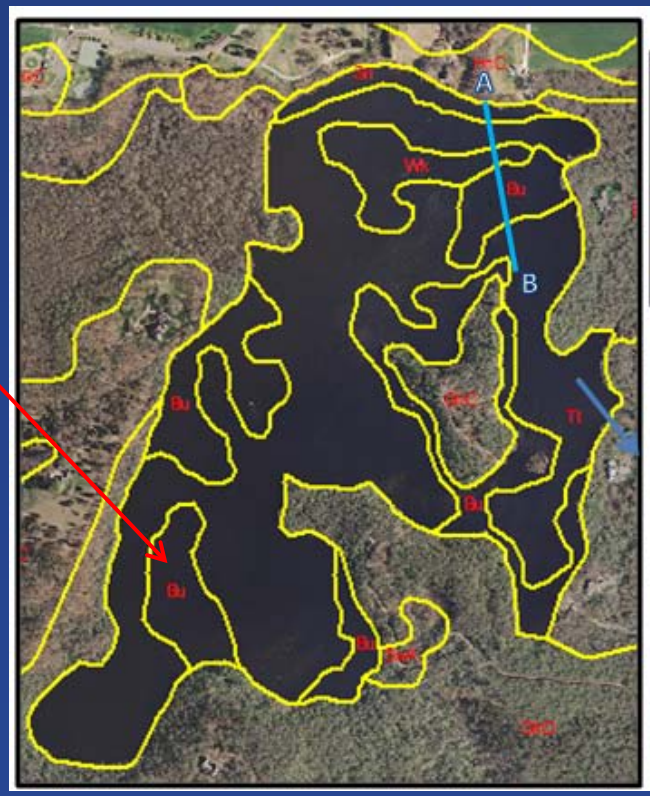
- Fixed join with CT and MA.
- Made spatial edits to fix errors, add vernal pool data to point file.
- Sent Aa and Co units back to MN replaced by SwA and FeA.
- Support data converted to digital: organic thickness, 1981 atlas sheets registered, all old surveys converted to digital, pedon descriptions entered to NASIS.
- Geophysical data collected.

2012 Improvements

- Re-digitized Block Island!
- Completed 1st Example of a Freshwater SAS.
- Removed small polygons under 0.5 ac. (use spot symbols).
- Fixed errors identified.
- Reshaped several rivers to match hydro.
- Reviewed and edited 80 farm plans.
- NWI alignment.

- 2013 and Beyond:
  - Continue Phase III.
  - NW Hills re-map.
  - Urbanland / Prime farmland updates.
  - Urban Flooding Interp.
  - Raster soil maps.
  - Harmonization of data.
  - Ksat Fridays!
  - Yearly spatial edits.
  - See Long Range Plan.

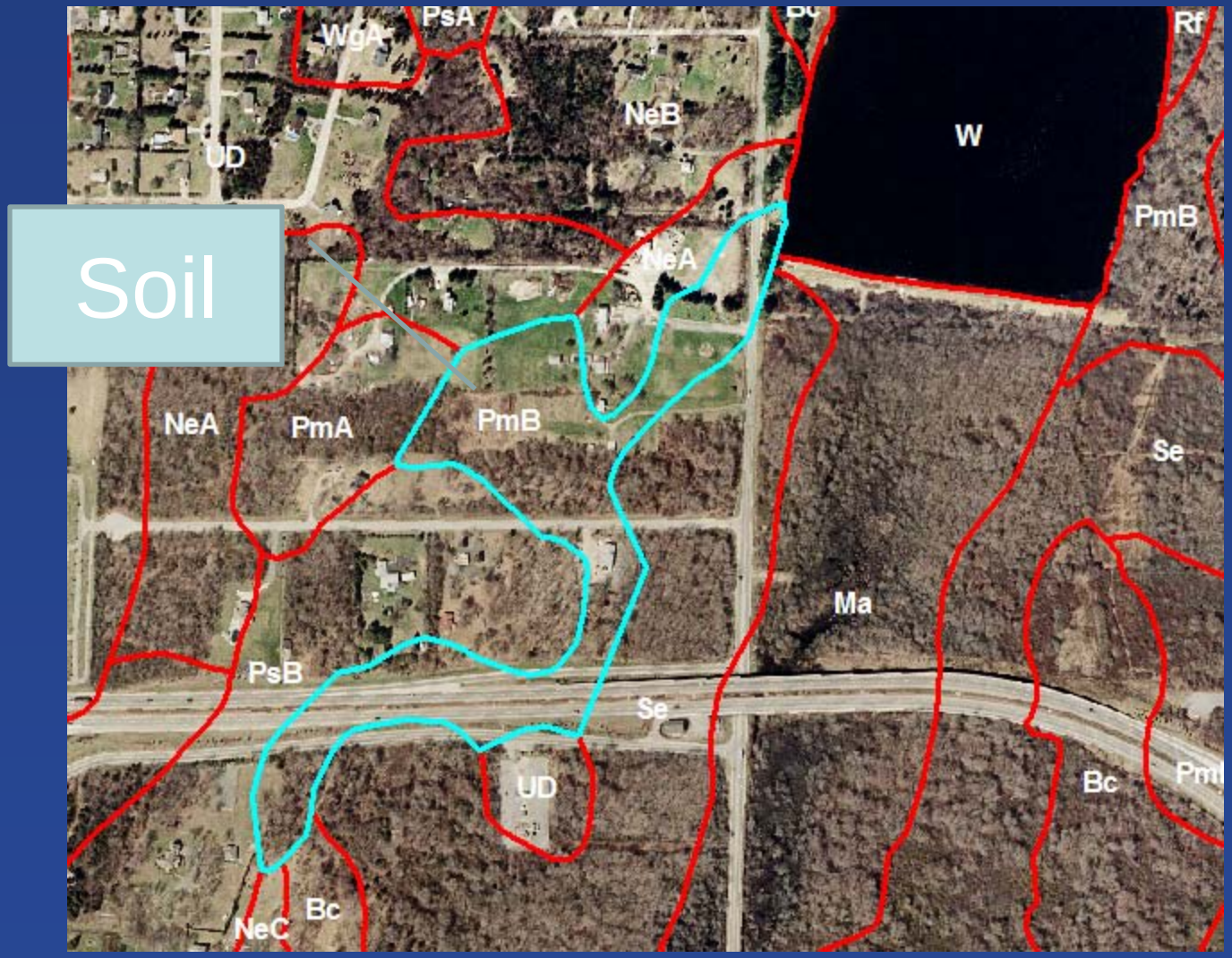
Freshwater Subaqueous Soils



Far left: Soil survey of Tuckertown Pond in South Kingston, RI.
Left: Soil core of a Tuckertown Soil Series.
Above: Example of a Ground-penetrating radar profile from point A-B on map.

- Watchaug, Worden, Tuckertown, Bellville, Smith Sayles, Bowdish

Current Soils



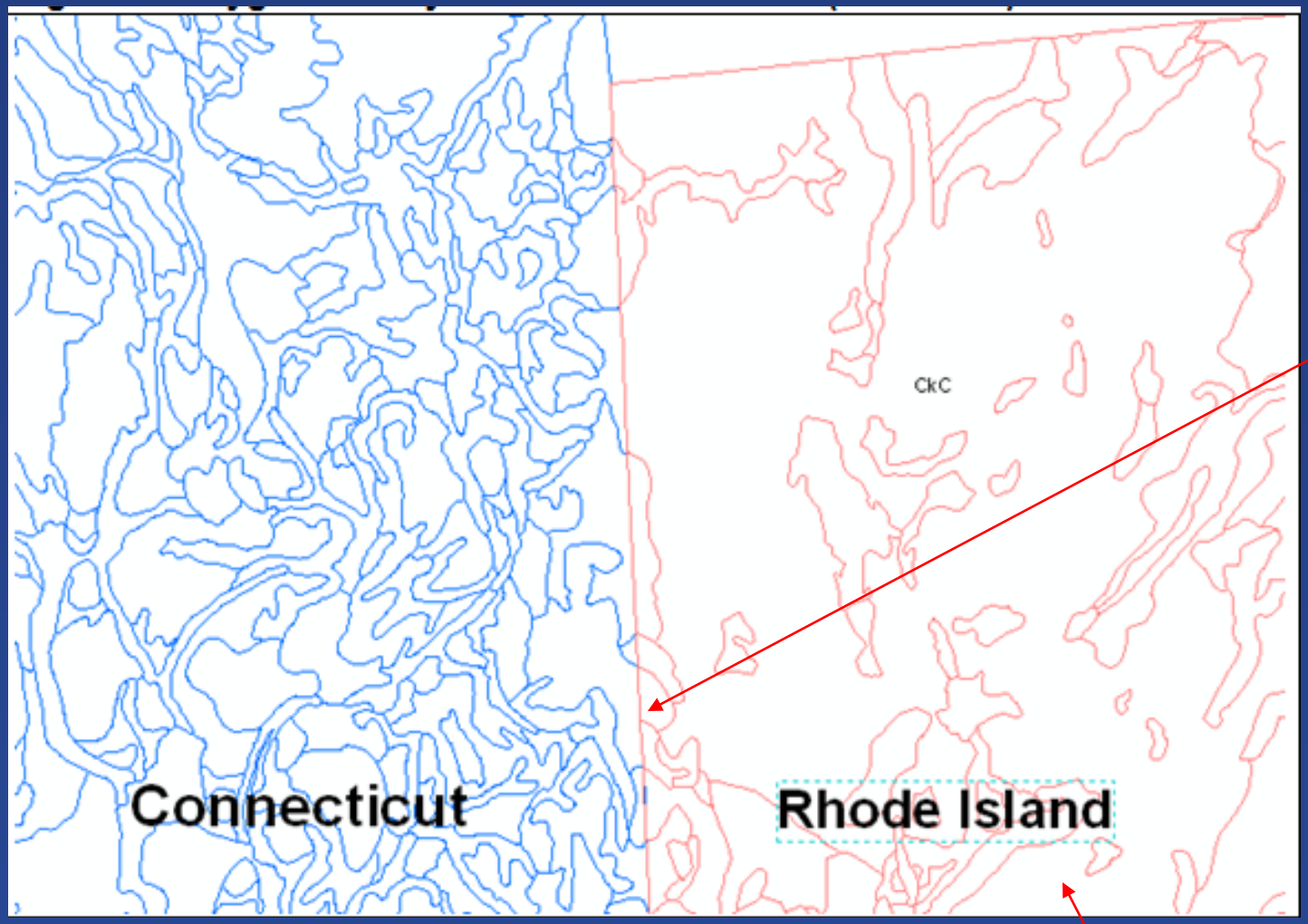
March 2012 Update

Spa

2010
SSURGO

2012
SSURGO

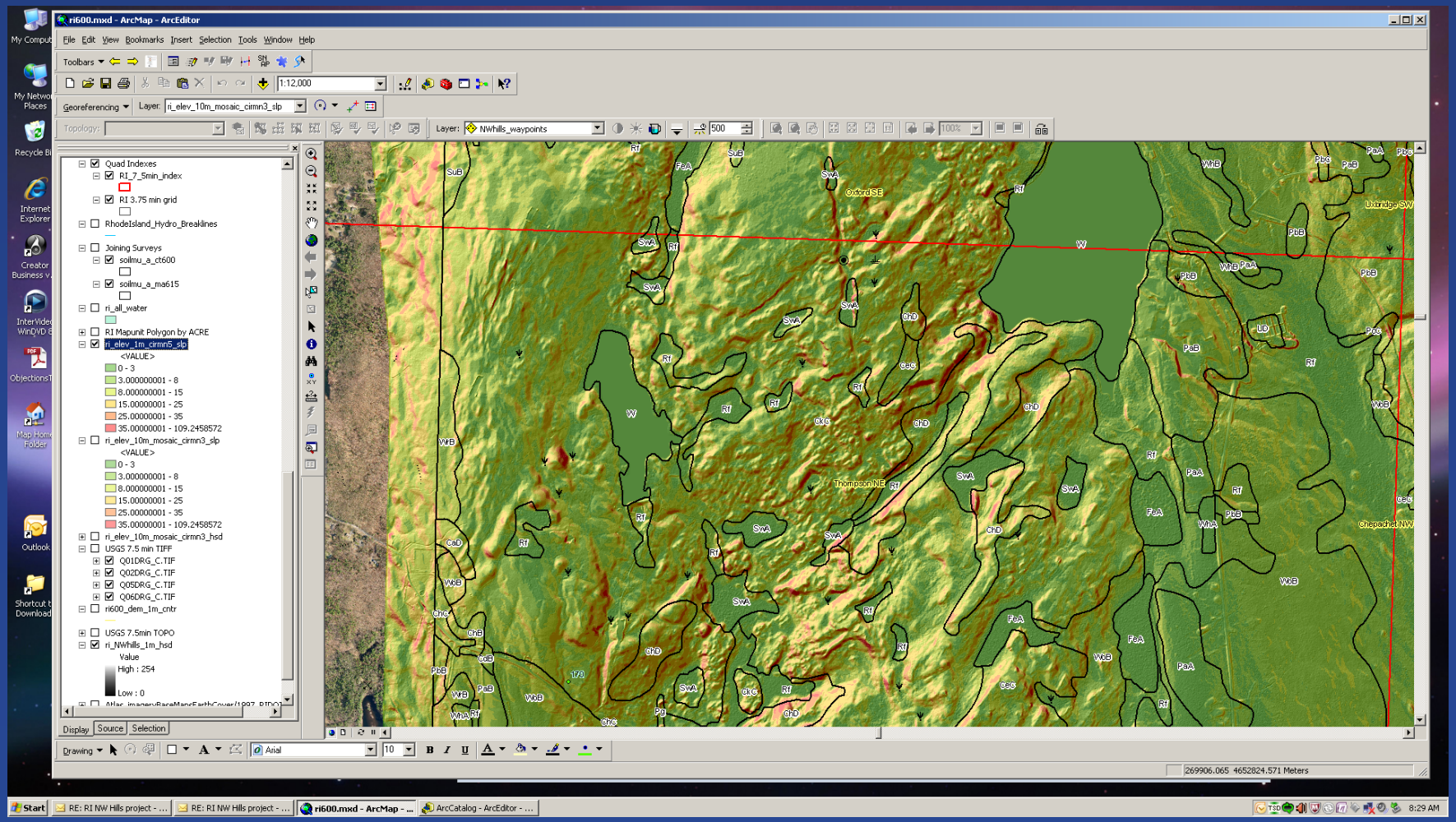
United States Department of Agriculture
USDA NRCS



joins

Order 3?

LiDAR Baby!


ri600.mxd - ArcMap - ArcEditor
File Edit View Bookmarks Insert Selection Tools Window Help
Toolbars
1:12,000
Georeferencing
Layer: ri_elev_10m_mosaic_cirmn3_slp
Layer: NWhills_waypoints
Quad Indexes
RI_7_5min_index
RI 3.75 min grid
RhodeIsland_Hydro_Breaklines
Joining Surveys
soilmu_a_ct600
soilmu_a_ma615
ri_all_water
RI Mapunit Polygon by ACRE
ri_elev_1m_cirmn5_slp
ri_elev_10m_mosaic_cirmn3_slp
ri_elev_10m_mosaic_cirmn3_hsd
USGS 7.5 min TIFF
Q01DRG_C.TIF
Q02DRG_C.TIF
Q05DRG_C.TIF
Q06DRG_C.TIF
ri600_dem_1m_cntr
USGS 7.5min TOPO
ri_NWhills_1m_hsd
Value
High : 254
Low : 0
Display Source Selection
Drawing
Arial
269906.065 4652824.571 Meters
Start
RE: RI NW Hills project - ...
ri600.mxd - ArcMap - ...
ArcCatalog - ArcEditor - ...
8:29 AM

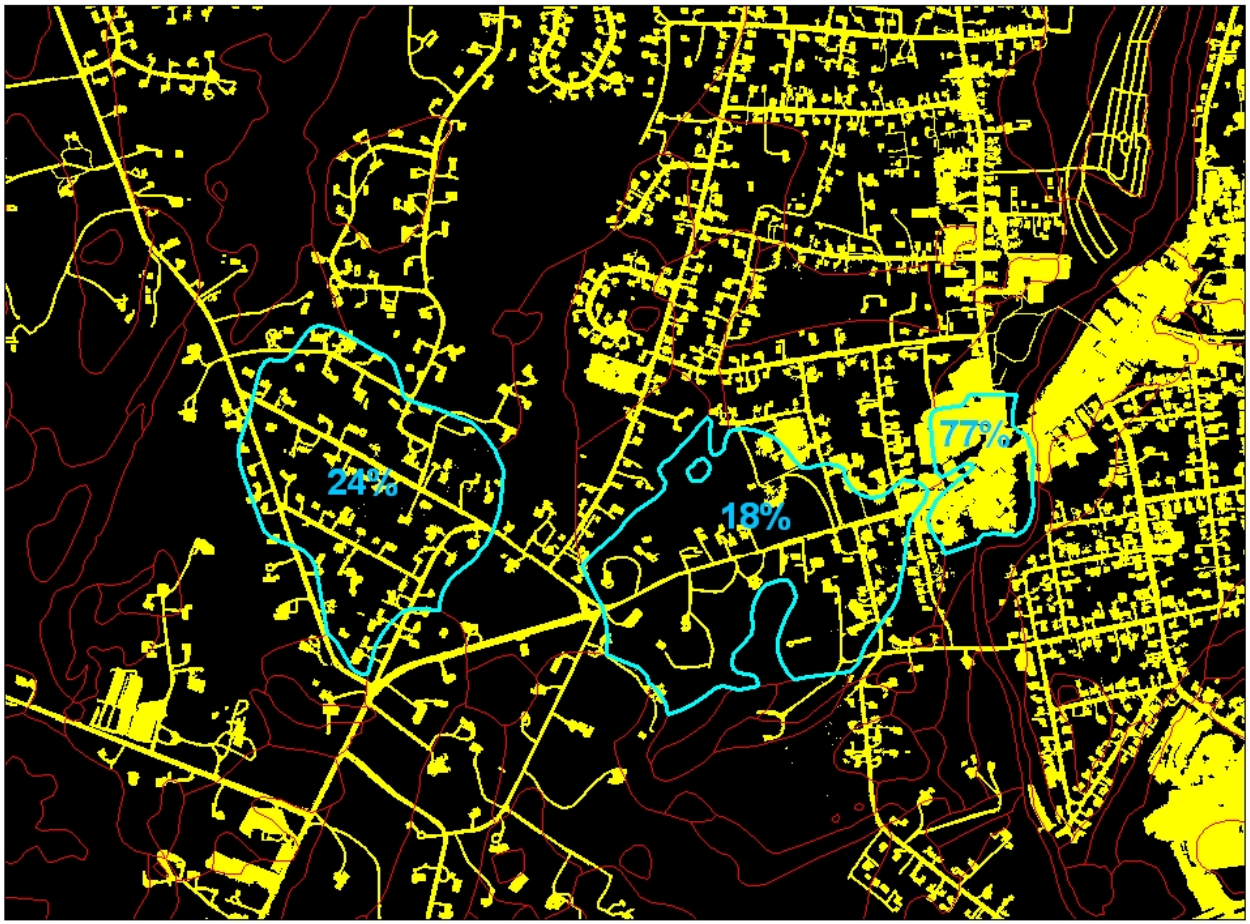
Over 30,000 acres mapped prime, 12,000 hydric are now urbanized!

Re-map As

UrT - Urbanland

Till substratum

Calculating % impervious



N

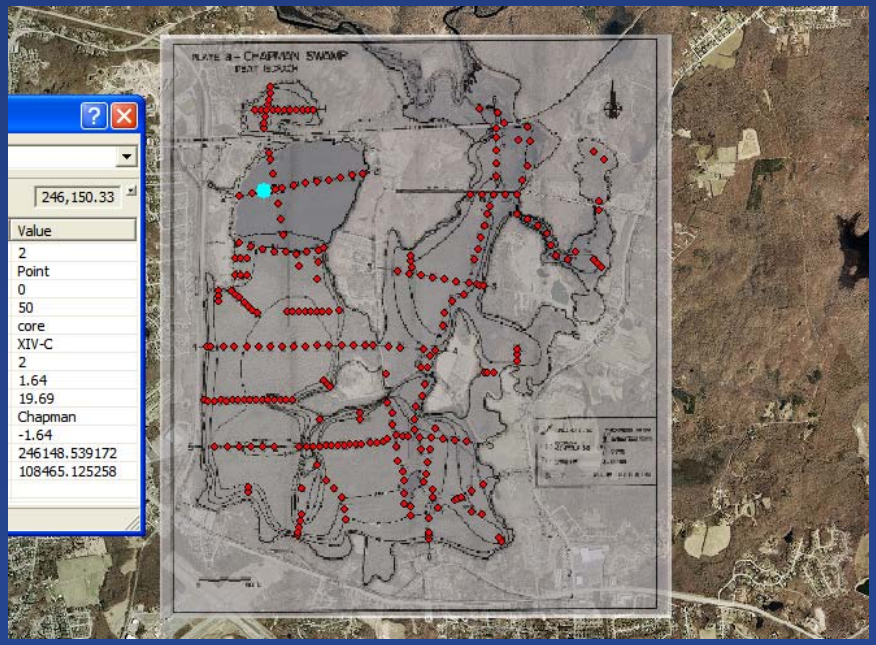
0 250 500 1,000 1,500 2,000 Feet

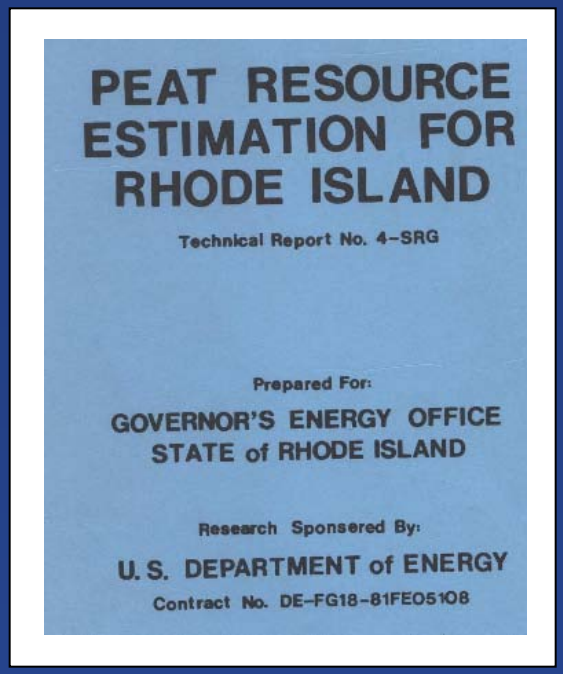
Histosol Study

- 25,000 acres mapped in RI.
- Carlisle and Adrian outside of region.
- Study to determine euic or dysic – most were dysic.
- Re-correlate Freetown-Swansea

			Fiber Content (%)					Reaction (pH)	
Horizon	Depth	Botanical origin of fiber	ml unrubbed	Undisturbed	ml rubbed	Rubbed	Sodium Pyro Color	1:1 water	0.01 M CaCl2
Oi	0-25		4.4	88	3.4	68	10YR 8/4		3.4
Oa	25-50								
Oa	50-75		3.4	68	1.3	26	10YR 4/3		3.18
Oa	75-100		3.9	78	2.2	44	10YR 7/6		3.1
Oa	100-125	woody peat	4	80	2.6	52	10YR 7/4		3.19
Oa	125-150	woody peat	4	80	1.5	30	10YR 7/4		3.3

Historic Data




PEAT RESOURCE ESTIMATION FOR RHODE ISLAND

Technical Report No. 4-SRG

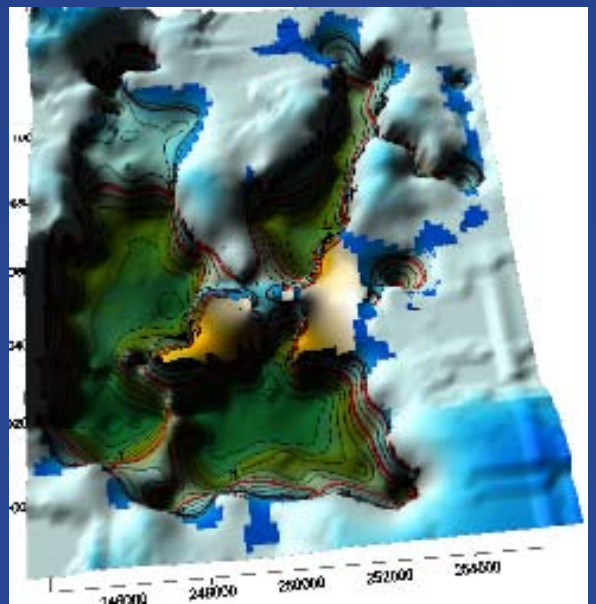
Prepared For:

GOVERNOR'S ENERGY OFFICE
STATE of RHODE ISLAND

Research Sponsered By:

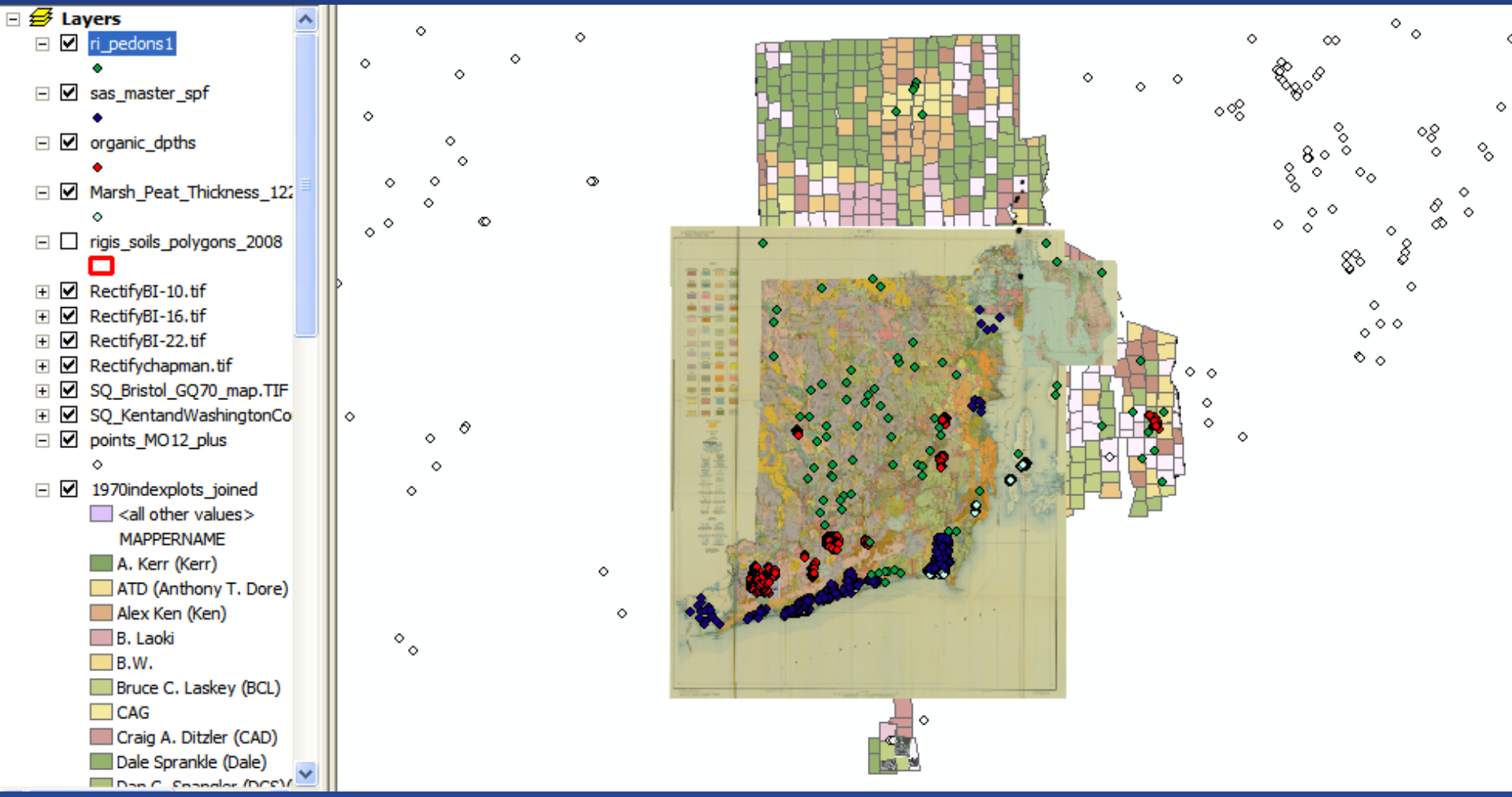
U. S. DEPARTMENT of ENERGY

Contract No. DE-FG18-81FE05108



699 point observations, 17 analyzed, 146 full cores – covers 3,300 acres.

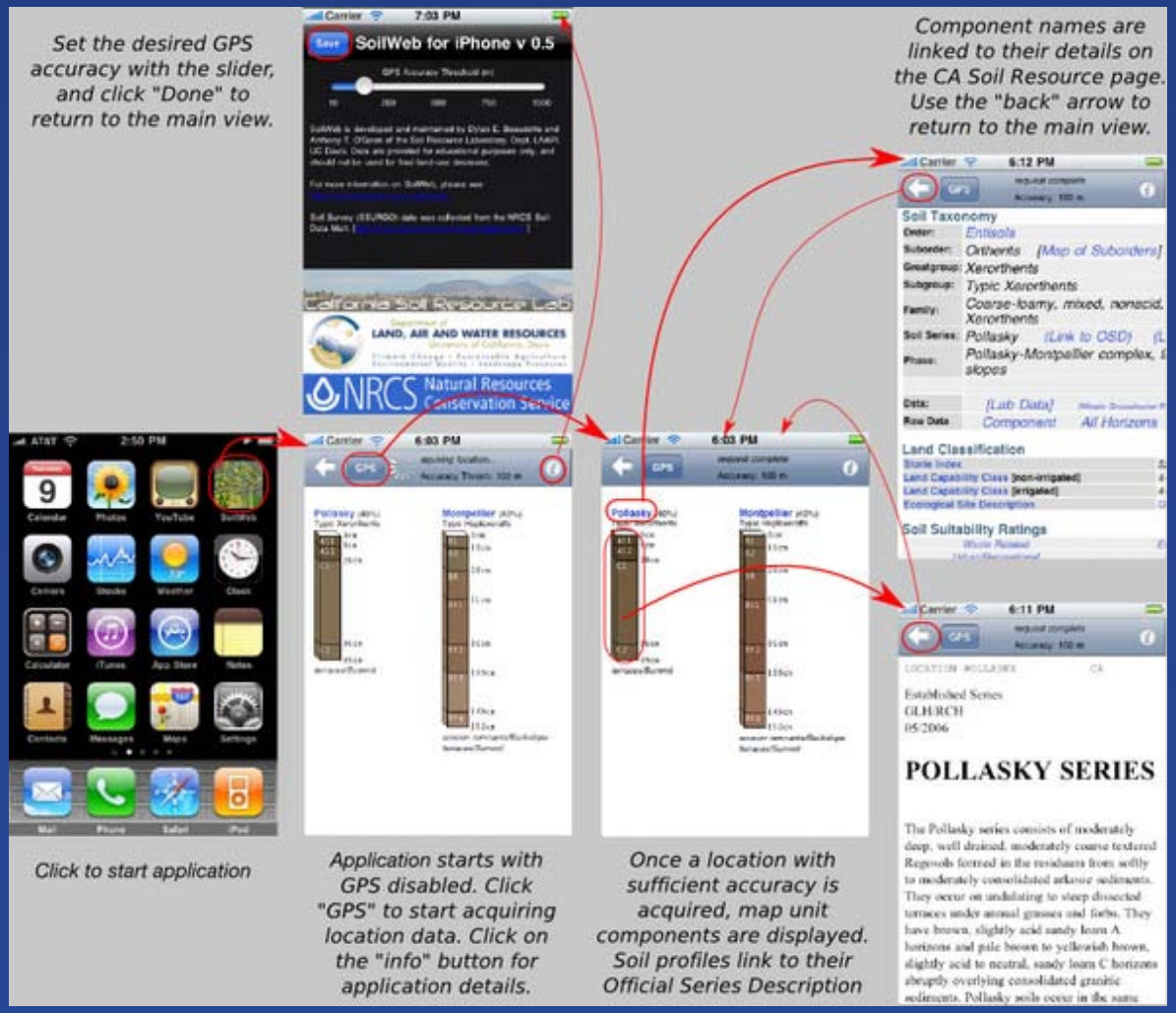
Data Examples



Demo

- Soil Maps for Google Earth: http://casoilresource.lawr.ucdavis.edu/soil_web/kml/SoilWeb.kmz
- Soil Maps using Google Maps: http://casoilresource.lawr.ucdavis.edu/soilweb_gmap/
- Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm
- Soil Data Mart: http://soildatamart.nrcs.usda.gov/Survey.aspx?State=RI
- RI NRCS Soils Page: http://www.ri.nrcs.usda.gov/technical/soils.html
- All of the above: http://nesoil.com

SoilWeb App (Android and other)



Questions??

The Evening Bulle

Providence, Rhode Island, Friday, February 16, 1979

Soil: If state needs a bug it can need dirt, too

By THOMAS E. WALSH
Journal-Bulletin Political Writer

PROVIDENCE — It was barely two years ago that the General Assembly had all it could do to restrain itself from declaring riccotta the state cheese, tuna the state fish and the praying mantis the state insect.

Now, if the Rhode Island Association of Conservation Districts has its way, the Assembly will throw caution to the wind and designate "Narragansett silt loam" as the official, bonafide, "state soil."

That's right, soil! The stuff that gets under your fingernails, into your kids' clothes, and circles your bathtub.

"Soil has a real image problem," said Lester E. Stillson, a conservationist, explaining why the association has sent letters to all 150 state legislators and Governor Garrahy to seek support for the state soil idea.

"When you think of soil what you think of is dirt," Stillson added. "Something's dirt cheap, a house built on sand, a clod, mud. All the words related to soil are negative." But, he said, "You couldn't grow crops without the soil, everything we have is built on soil."

"The whole rationale behind this is to increase the awareness that something as basic as soil has a profound influence on everybody's life," Stillson said.

Stillson said he is not worried about the issue becoming a topic of rib-tickling legislative humor as was the case with the state cheese, tuna and bug propositions.

"No matter what happens, it would help fulfill our goals of awareness, even if it turns into a big joke in the eyes of the media and the local people," Stillson said.

And what exactly is "Narragansett silt loam?"

According to Stillson, it's one of the best types of soil to be found in Rhode Island, and is particularly good for raising crops.

Presumably, then, one could take the official state flower (violet), or the official state tree (red maple) and expect them to prosper if their roots were buried in Narragansett loam, assuming, of course it becomes the official state soil.

79-S 527

Introduced by—
Senator Rawlings

Ordered Printed by—
Senate

Referred to—
Senate Committee on Special Legislation

Date Printed—
March 1, 1979

State of Rhode Island and Providence Plantations

JANUARY SESSION, A. D. 1979

AN ACT Relating to **State Soil.**

It is enacted by the General Assembly as follows:

Section 1. Chapter 42-4 of the general laws entitled, "State Emblem," is hereby amended by adding thereto the following section:

"42-4-11. STATE SOIL.—The soil commonly known as "Narragansett soil" is hereby designated the state soil for the state of Rhode Island.

Sec. 2. This act shall take effect upon passage.