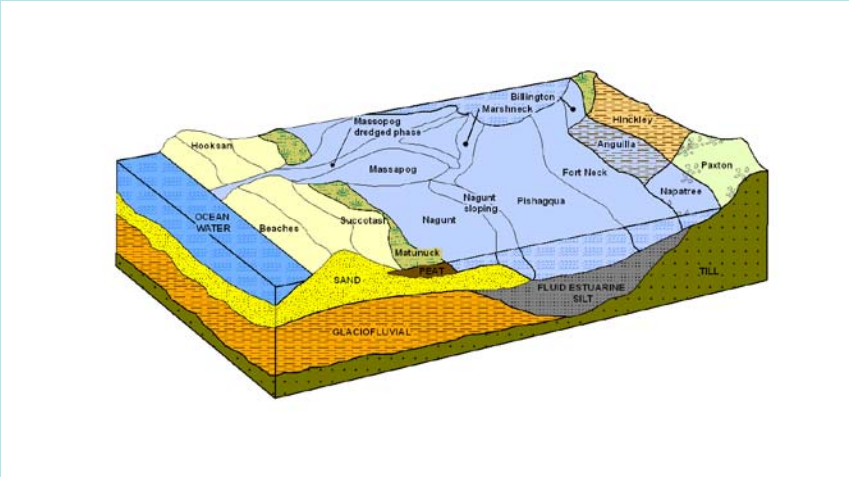
Subaqueous Soil Committee Report

- Chairs: Jim Turenne, Mark Stolt, Marty Rabenhorst, Rex Ellis, Mike Wilson.



- Document accomplishments from 2009 National Meeting and Regional's.

- Report for 2011.

Coastal Resource Managers See Potential in Extending Soil Survey to Estuarine Environments.

For Example: MapCoast Project Rhode Island, USA

"A consortium dedicated to multidisciplinary mapping of coastal underwater resources, including bathymetry, habitat, geology, soils/sediment, and archeological resources in shallow waters."

2009 Las Cruces Recommendations

2009 Recommendations (Completed):

- **SAS Workshop – to help standardize techniques/methodology—teach principals applicable to various regions and SAS-types.**
- **SSURGO certification of products and posting on Web Soil Survey and Soil Data Mart.**
- **Develop SAS informational primer, tech notes, information sheets to explain concepts and create understanding of the purpose, mechanisms, and products.**
- **Methods Manual to map and characterize SAS properties – into SSM, NSSH, and into separate document.**

Second National Workshop on Subaqueous Soils

Rhode Island (the Ocean State)

July-August 2010

2nd National SAS Workshop (2010)

- 1st was held in 2003 – Delaware.
- Workshop Organizers: Mark Stolt, Marty Rabenhorst, Patrick Drohan, Maggie Payne, Jim Turenne.
- Sponsors: UMD, URI, Penn State, SSSSNE.
- 32 people attended – East Coast and Lincoln.
- Workshop consisted of lecture and field.
- All info, photos, talks at: http://nesoil.com/sas/

SAS Workshop Field Sessions

- Vibracoring and Field Mapping techniques.
- Freshwater SAS.
- Pedon Descriptions and Sampling.
- Bathymetry and Landscape Interpretations.
- Eelgrass Restoration

SAS Workshop Lectures

(http://nesoil.com/SAS_Agenda_2010.htm)

- Historical Overview of SAS.
- RI MapCoast Partnership.
- Geology of Coastal Lagoons.
- Boating Safety.
- Research and Case Studies.
- Mapping and data collection.
- Benthic Ecology, Restoration++

Recommendation 2 – SSURGO Product

- Completed 1st Coastal Zone Soil Survey RI/CT Phase I.
- Extensive work during FY10 – certified and posted December 2010.
- Learning curve for NASIS and correlation process.
- 11 new series, 37 new map units.
- Seamless data from terrestrial to coast to shallow water.
- SRITB proved to be an asset!
- Next step interps and Phase II plus freshwater.

State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties (RI600)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ba	Beaches, sandy surface	8.5	0.7%
BhA	Bridgehampton silt loam, 0 to 3 percent slopes	25.3	2.0%
EfA	Enfield silt loam, 0 to 3 percent slopes	186.0	15.1%
EfB	Enfield silt loam, 3 to 8 percent slopes	27.4	2.2%
FtA	Fortress sand, 0 to 3 percent slopes	8.3	0.7%
GhC	Gloucester-Hinckley very stony sandy loams, rolling	7.6	0.6%
HkC	Hinckley gravelly sandy loam, rolling	14.0	1.1%
HnC	Hinckley-Enfield complex, rolling	52.6	4.3%
HsB	Hooksan sand, 3 to 8 percent slopes	17.2	1.4%
Mk	Matunuck mucky	93.8	7.6%

Identify

Map Layer - Soil Map Units

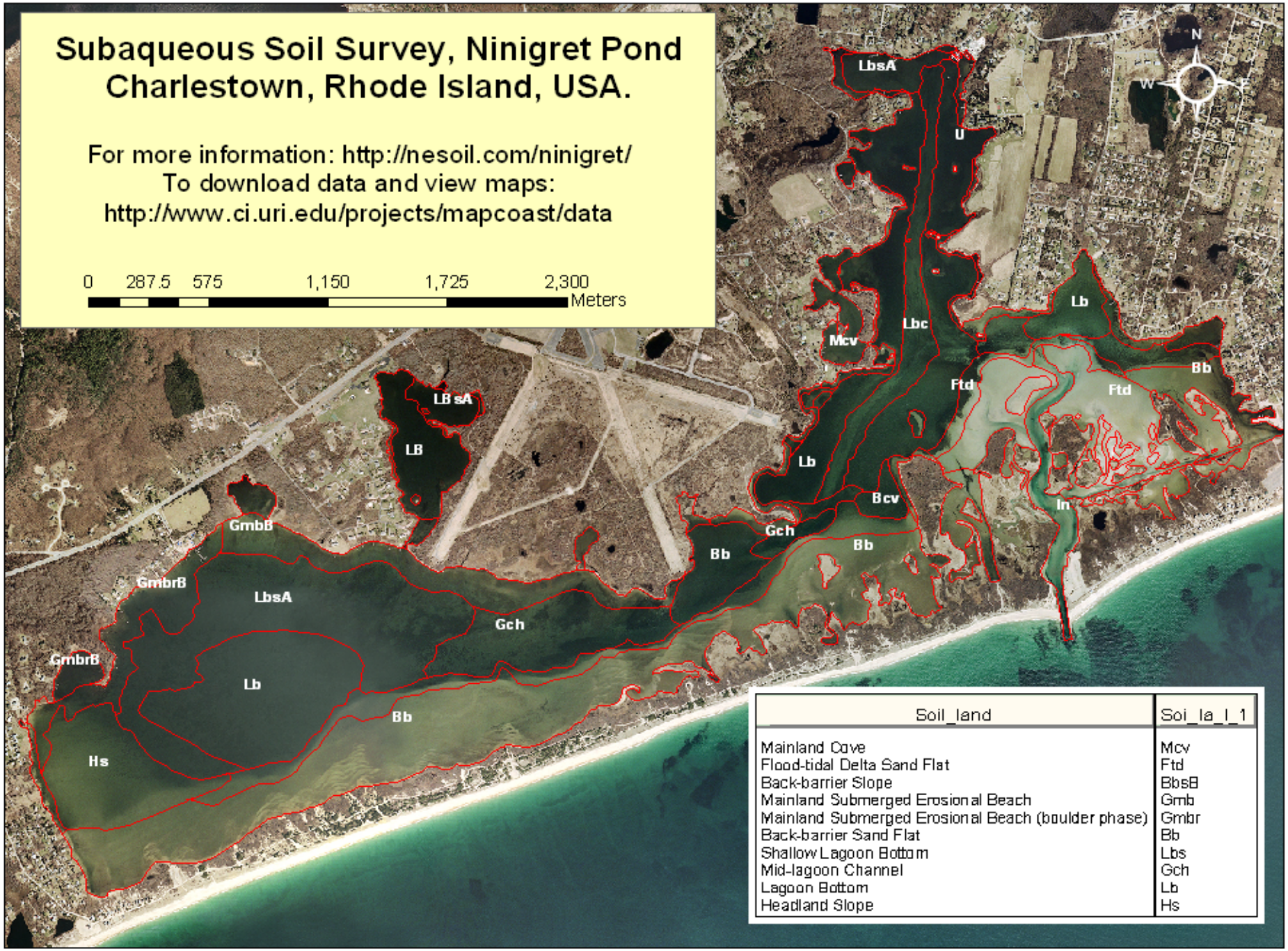
Attribute Name	Attribute Value
Map Unit Symbol	WPa2
Soil Survey Area Symbol	RI600
National Map Unit Symbol	2392994
Map Unit Name	Pishaggua mucky silt loam, 2 to 3 meter

Visit: http://www.ri.nrcs.usda.gov/technical/RI_Soil_Survey_2011.html For more information.

Subaqueous Soil Survey, Ninigret Pond
Charlestown, Rhode Island, USA.

For more information: http://nesoil.com/ninigret/
To download data and view maps:
http://www.ci.uri.edu/projects/mapcoast/data

0 287.5 575 1,150 1,725 2,300 Meters



Soil_land	Soi_la_l_1
Mainland Cove	Mcv
Flood-tidal Delta Sand Flat	Ftd
Back-barrier Slope	BbsB
Mainland Submerged Erosional Beach	Gmb
Mainland Submerged Erosional Beach (boulder phase)	Gmbr
Back-barrier Sand Flat	Bb
Shallow Lagoon Bottom	Lbs
Mid-lagoon Channel	Gch
Lagoon Bottom	Lb
Headland Slope	Hs

Fresh Water Mapping

Subaqueous Soil Survey of Bowdish Reservior – Gloucester, RI

Invasive species management, habitat restoration

Recommendation 3 and 4: Methods/Primer

- Draft methods manual presented at 2nd National Workshop.
- All information on SAS posted at: http://nesoil.com/sas
- NSSC working on adding into SSM/NSSH, Field Book etc.
- Multimedia products planned.
- Freshwater methods/work to be added.
- Lot of methods and additions already in place in pedon, lab methods, and NASIS.

Subaqueous Soils Primer

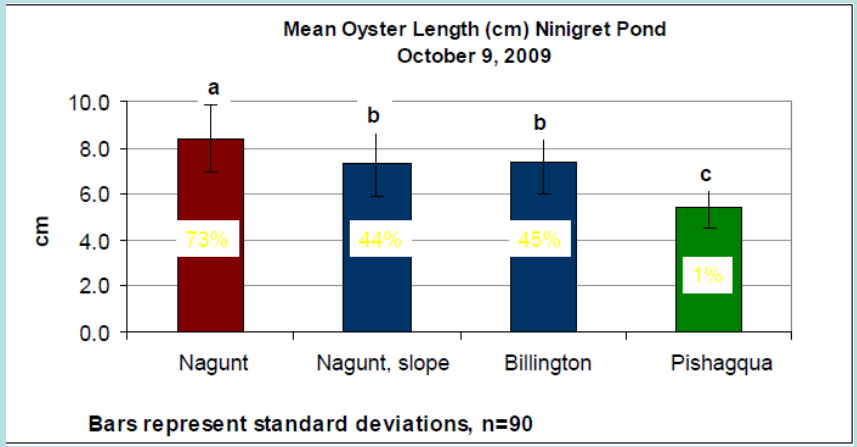
1. What are they?
2. Why important? Background, history, need for these data by various users. What are the challenges in mapping and classifying these soils?
3. General classification, surface layer classes (this has been developed for lagoons/bays; salt water systems)
4. Mapping
   a. Tools
   b. Technology
   c. Properties measured: Minimum dataset, e.g.,
      - Particle Size Distribution
      - Carbon Content
      - Sulfides
      - EC
      - Bathymetry
      - Vegetative Cover
      - Bulk Density / fluidity
      - Soil Color
      - Redox
   d. Soils and Map products
5. Areas of the US where recognized
   New England – also discuss Map Coast Partnership
   Florida
   Texas – Ecological site descriptions
   Others?
6. Interpretations
7. Benefits to the public/importance for the future (protecting natural resources), freshwater work

2009 Las Cruces Recommendations (in progress)

- Maintain working group and evolve into/formalize a national committee on SAS.
- Ecological Site Descriptions –create small working group with ESD and SAS personnel to explore merging ESD concepts into SAS, expand beyond plants into all ecological components.
- Hire ecologist to help identify vegetative and benthic communities in coastal environments
- Interpretations: List and prioritize, document work completed to date and finalize interpretations.
- Populate SAS datafields when available in next NASIS version, write interpretation scripts for properties such as of oxidized pH (presence of sulfidic materials), bottom type (moorings).

2011 SAS Report

- Met with Interpretations group to work on SAS interpretations.
- Provided update/overview on latest university research and Interps.



POSSIBLE INTERPRETATIONS TO DEVELOP

SAV Restoration
Crab Habitat
Aquaculture/shellfish restoration
Management for Sustainable Production - Shellfish
Nutrient Reduction/Health/Water Quality
Benthic Preservation Site Identification
Wildlife Management
Critical Habitats for Wading Shore Birds
Nurseries and Spawning areas
Habitat Protection for Horseshoe Crabs
Dredging Island Creation
Tidal Marsh Protection and Creation
Navigational Channel Creation/ Maintenance
Effects of Dredging on Benthic Ecology
Off Site Disposal of Dredge Spoil
Acid-Sulfate Weathering Hazards
Accretion rates.
Heavy metals/Health Issues.
Habitat Mapping
Impacts on Sea-level rise
Survival of seagrass
Risk/susceptibility of invasive species (e.g., milfoil)
Herbicides use and movement

Task Force for SAS discussed new proposals/charges:

- Proposal to add 3 new subgroups for inclusion in Soil Taxonomy – Terric Frasiwassists, Terric Sulfiwassists, and Terric Haplowassists.
- Modifications to control section for SAS.
- EC value for SAS (Is the 0.2 ds/m ok?)
- Expansion of mapping/research
- CMECS update.
- Histic epipedons (Inceptisols).
- Should other orders be included.

Terric Proposal

http://nesoil.com/upload/NCSSC/Terric_proposal_draft1_May_2011.pdf

Frasiwassists

Key to Subgroups

BBAA. Frasiwassits that have a layer of mineral soil material 30 cm or more thick that has its upper boundary within the control section, below the surface tier.

Terric Frasiwassists

BBAB. Other Frasiwassists that:

1. Have more thickness of fibric soil materials than any other kind of organic soil material either:

a. In the organic parts of the subsurface tier if there is no continuous mineral layer 40 cm or more thick that has its upper boundary within the subsurface tier; or

b. In the combined thickness of the organic parts of the surface and subsurface tiers if there is a continuous mineral layer 40 cm or more thick that has its upper boundary within the subsurface tier; and

2. Do not have sulfidic materials within 100 cm of the soil surface.

Fibric Frasiwassists

BBAC. Other Frasiwassists that have more thickness of sapric soil materials than any other kind of organic soil materials either:

1. In the organic parts of the subsurface tier if there is no continuous mineral layer 40 cm or more thick that has its upper boundary within the subsurface tier; or

2. In the combined thickness of the organic parts of the surface and subsurface tiers if there is a continuous mineral layer 40 cm or more thick that has its upper boundary within the subsurface tier.

Sapric Frasiwassists

Control Section Proposal

Series	current classification (25-100)	0-100	0-50	0-30
Anguilla	Sandy, mixed, mesic Haplic Sulfiwassents	no change	Sulfic Psammowassents	Sulfic Psammowassents
Fort Neck	Coarse-loamy, mixed, superactive, nonacid, mesic Haplic Sulfiwassents.	no change	no change	no change
Billington	Coarse-silty, mixed, active, nonacid, mesic Thapto-Histic Sulfiwassents	no change	no change	no change
Marshneck	Coarse-loamy, mixed, superactive, nonacid, mesic Haplic Sulfiwassents	no change	no change	no change
Massapog	Mixed, mesic Fluventic Psammowassents.	no change	no change	no change
Nagunt	Mixed, mesic Sulfic Psammowassents	no change	no change	no change
Napatree	Coarse-loamy, mixed, superactive, nonacid, mesic Aeric Haplowassents	no change	no change	Aeric Psammowassents
Pishagqua	Fine-silty, mixed, superactive, nonacid, mesic Fluventic Sulfiwassents	no change	no change	no change

- Looking at changing the depth to include surface or shallower than 25cm.
- Most SAS interpretations made looking at surface.