

Subaqueous Soils Update

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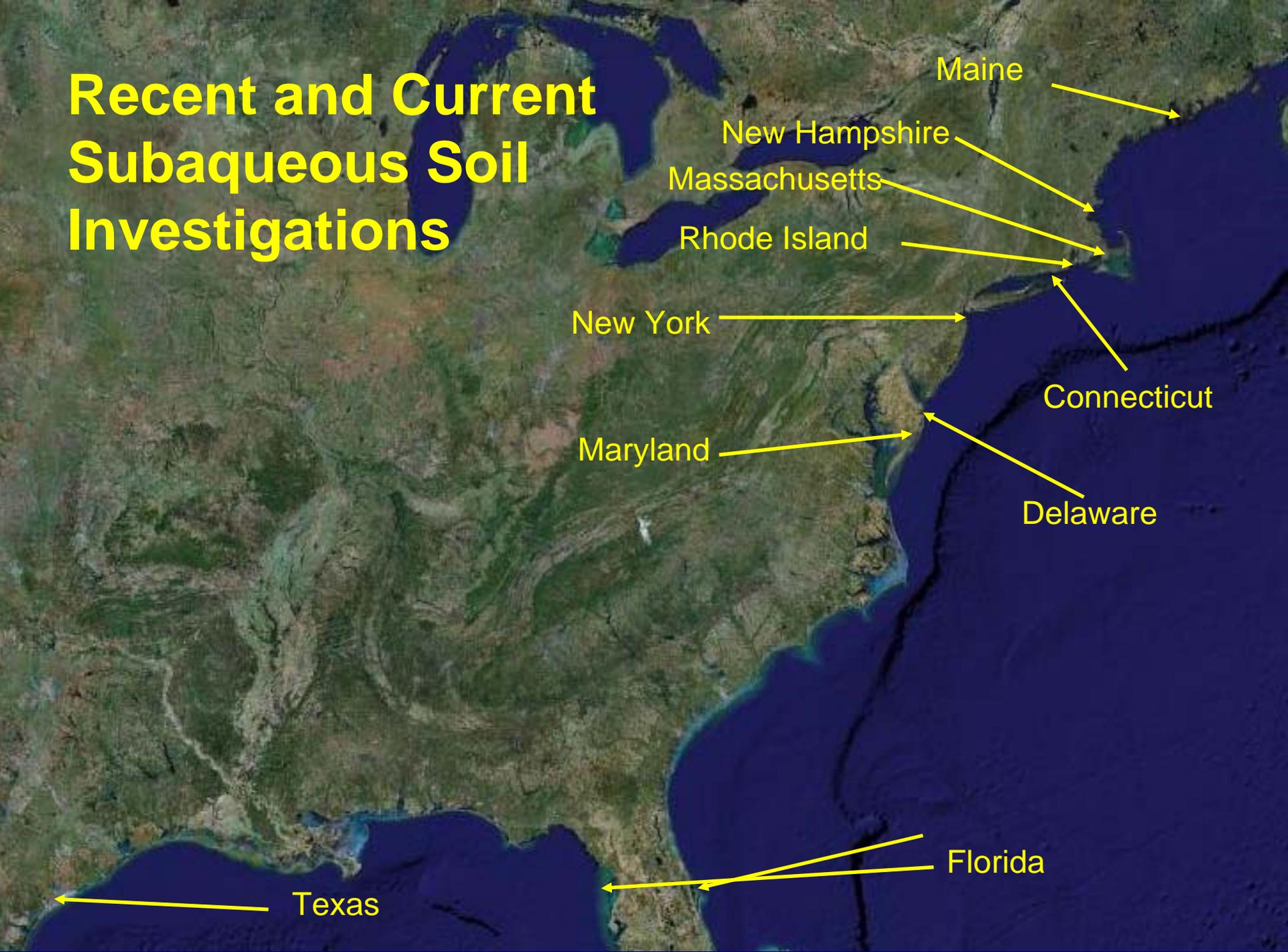


Estuarine Subaqueous Soil

Soils that form in sediment found in shallow-subtidal environments. These soils occur in protected estuarine coves, bays, inlets, and lagoons. Excluded from the definition of these soils are any areas permanently covered by water too deep (typically greater than 2.5 m) for the growth of rooted plants.



Recent and Current Subaqueous Soil Investigations



Maine

New Hampshire

Massachusetts

Rhode Island

New York

Connecticut

Maryland

Delaware

Florida

Texas

Why the Interest Subaqueous Soils?

- Links between Soil and Water
- 75% of the population will live within 30 minutes of the coast
- Sea-level rise is turning subaerial soils into subaqueous
- Who better to inventory the resources than the NCSS?



Glossary

- A total of 66 terms were referenced or defined to describe subaqueous and adjacent subaerial environments and landforms
- 29 terms exclusively used for subaqueous soils



GLOSSARY OF TERMS FOR SUBAQUEOUS SOILS, LANDSCAPES, LANDFORMS, AND PARENT MATERIALS OF ESTUARIES AND LAGOONS

Subaqueous Soils Subcommittee
of the
Standing Committee on NCSS Standards
National Cooperative Soil Survey Conference
Corpus Christi, Texas
2005



September 2005

Amendments to Soil Taxonomy to Accommodate Subaqueous Soils

- **Wassents:** subaqueous Entisols. Defined as Entisols that have a positive water potential at the soil surface for more than 21 hours of each day. These soils are the first suborder to classify out under Entisols. The formative element Wass is derived from the German (Swiss) word “wasser” for water.
- **Wassists:** subaqueous Histosols. Defined as Histosols that have a positive water potential at the soil surface for more than 21 hours of each day. These soils are the second suborder to classify out under Histosols after Folists.

Wassent Great Groups

- **Fraasiwassents:** Wassents that have, in all horizons within 100 cm of the mineral soil surface, an electrical conductivity of <0.2 dS/m in a 5/1 by volume mixture of water and soil.
- **Psammowassents:** Wassents that have less than 35 percent (by volume) rock fragments and a texture of loamy fine sand or coarser in all layers within the particle-size control section.
- **Sulfiwassents:** Wassents that have sulfidic materials within 50 cm of the mineral soil surface.
- **Hydrowassents:** Wassents that have, in all horizons at a depth between 20 and 50 cm below the mineral soil surface, both an n value of more than 0.7 and 8 percent or more clay in the fine earth fraction.
- **Fluwiwassents:** Wassents that have *either* 0.2 percent or more organic carbon of Holocene age at a depth of 125 cm below the mineral soil surface *or* an irregular decrease in content of organic carbon from a depth of 25 cm to a depth of 125 cm or to a densic, lithic, or paralithic contact if shallower.
- **Haplowassents:** Other Wassents.

Wassent Subgroups

- There are between four and six subgroups for each great group.
- Examples include:
 - **Lithic Sulfiwassents:** have a lithic contact within 100 cm of the mineral soil surface.
 - **Haplic Sulfiwassents:** have, in some horizons at a depth between 20 and 50 cm below the mineral soil surface, *either or both:* 1. An *n* value of 0.7 or less; *or* 2. Less than 8 percent clay in the fine-earth fraction.
 - **Thapto-Histic Sulfiwassents:** have a buried layer of organic soil materials, 20 cm or more thick, that has its upper boundary within 100 cm of the mineral soil surface.
 - **Fluvic Sulfiwassents:** have *either* 0.2 percent or more organic carbon of Holocene age at a depth of 125 cm below the mineral soil surface *or* an irregular decrease in content of organic carbon from a depth of 25 cm to a depth of 125 cm or to a densic, lithic, or paralithic contact if shallower.
 - **Aeric Sulfiwassents:** have a chroma of 3 or more in 40% or more of the matrix of one or more horizons between a depth of 15 and 100 cm from the soil surface.
 - **Typic Sulfiwassents:** Other Sulfiwassents.

Wassist Great Groups

- **Fraasiwassists:** Wassists that have, in all horizons within 100 cm of the mineral soil surface, an electrical conductivity of <0.2 dS/m in a 5/1 by volume mixture of water and soil.
- **Sulfiwassists:** Wassists that have sulfidic materials within 50 cm of the mineral soil surface.
- **Haplowassists** Other Wassists.

Wassist Subgroups

There are three subgroups for each Wassist Great Group.

Fibric subgroups: have more thickness of fibric soil materials than any other kind of organic soil material 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 subgroups: 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.

Typic subgroups: others Wassist subgroups.

Examples of Proposed OSDs of Wassents

- **SINEPUXENT SERIES**
<http://ortho.ftw.nrcs.usda.gov/osd/dat/S/SINEPUXENT.html>
Proposed classification: Typic Sulfiwassents
- **DEMAS SERIES**
<http://ortho.ftw.nrcs.usda.gov/osd/dat/D/DEMAS.html>
Proposed classification: Typic Psammowassents
- **SOUTHPOINT SERIES**
<http://ortho.ftw.nrcs.usda.gov/osd/dat/S/SOUTHPOINT.html>
Proposed classification: Thapto-Histic Sulfiwassents
- **BAFFIN SERIES**
<http://ortho.ftw.nrcs.usda.gov/osd/dat/B/BAFFIN.html>
Proposed classification: Typic Hydrowassents

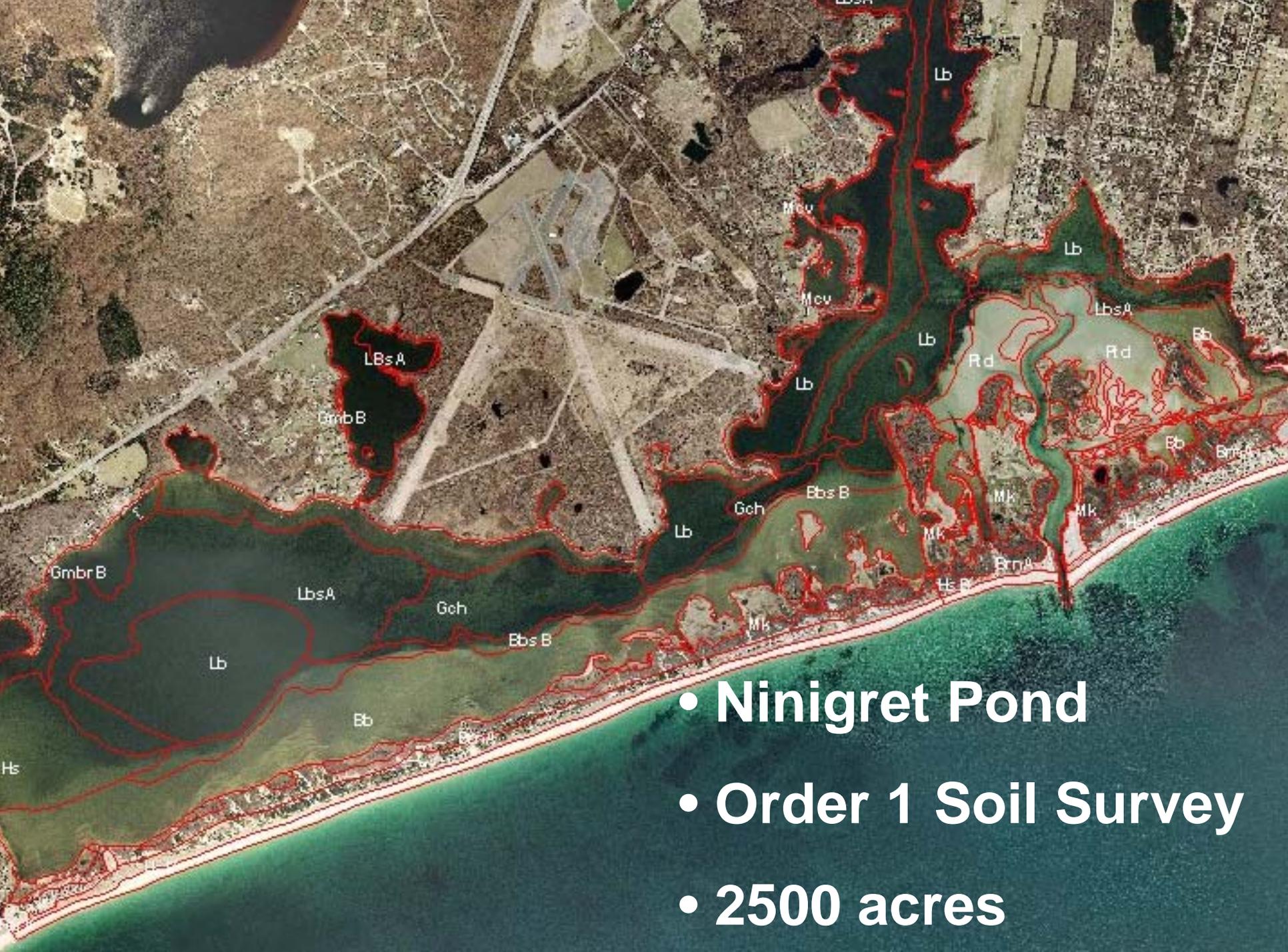
Subaqueous Soil Mapping Projects

- **Maine:** Taunton Bay ©
- **New Hampshire:** Little Bay
- **Massachusetts:** Carver Pond ©
- **Rhode Island:** Ninigret Pond ©, Quonochontaug Pond ©, Trustom Pond, Wickford Cove, Greenwich Bay
- **Connecticut:** Little Narragansett Bay ©
- **New York:** Jamaica Bay
- **Delaware:** Rehoboth Bay ©
- **Maryland:** Sinepuxent Bay ©, Chincoteague Bay ©
- **Florida:** Cedar Key, Indian River, Chassahowitzka River Estuary
- **Texas:** San Padre Island Estuary

Chincoteague Bay Maryland

- Order 3 Soil Survey
- Approximately 40,000 acres





- Ninigret Pond
- Order 1 Soil Survey
- 2500 acres

Eelgrass Potential

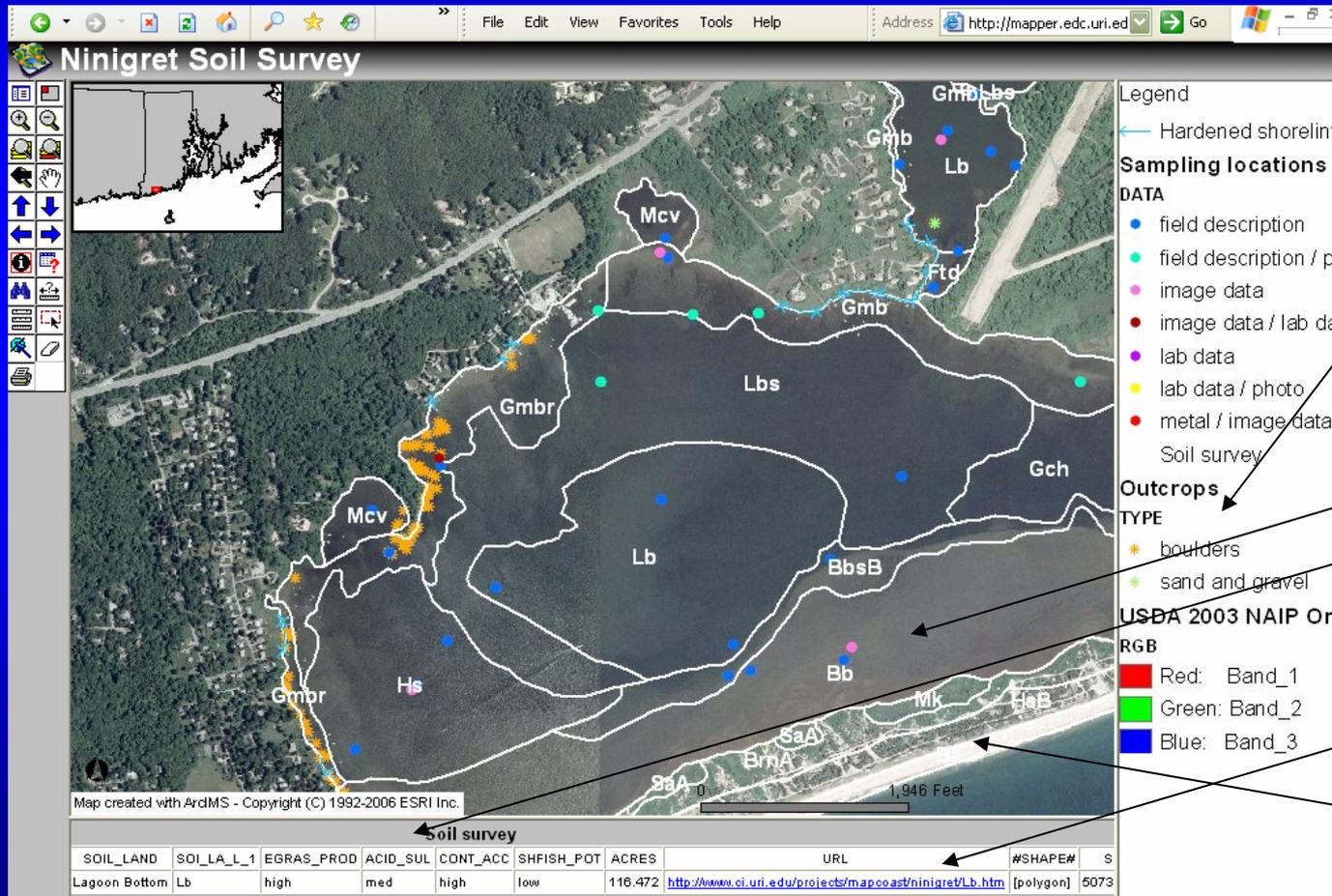
Eelgrass Potential



- Dredge Disposal
- Shellfish Productivity
- Carbon Pools and Sequestration
- Water Quality

MapCoast Interactive Map Product

MapCoast.org



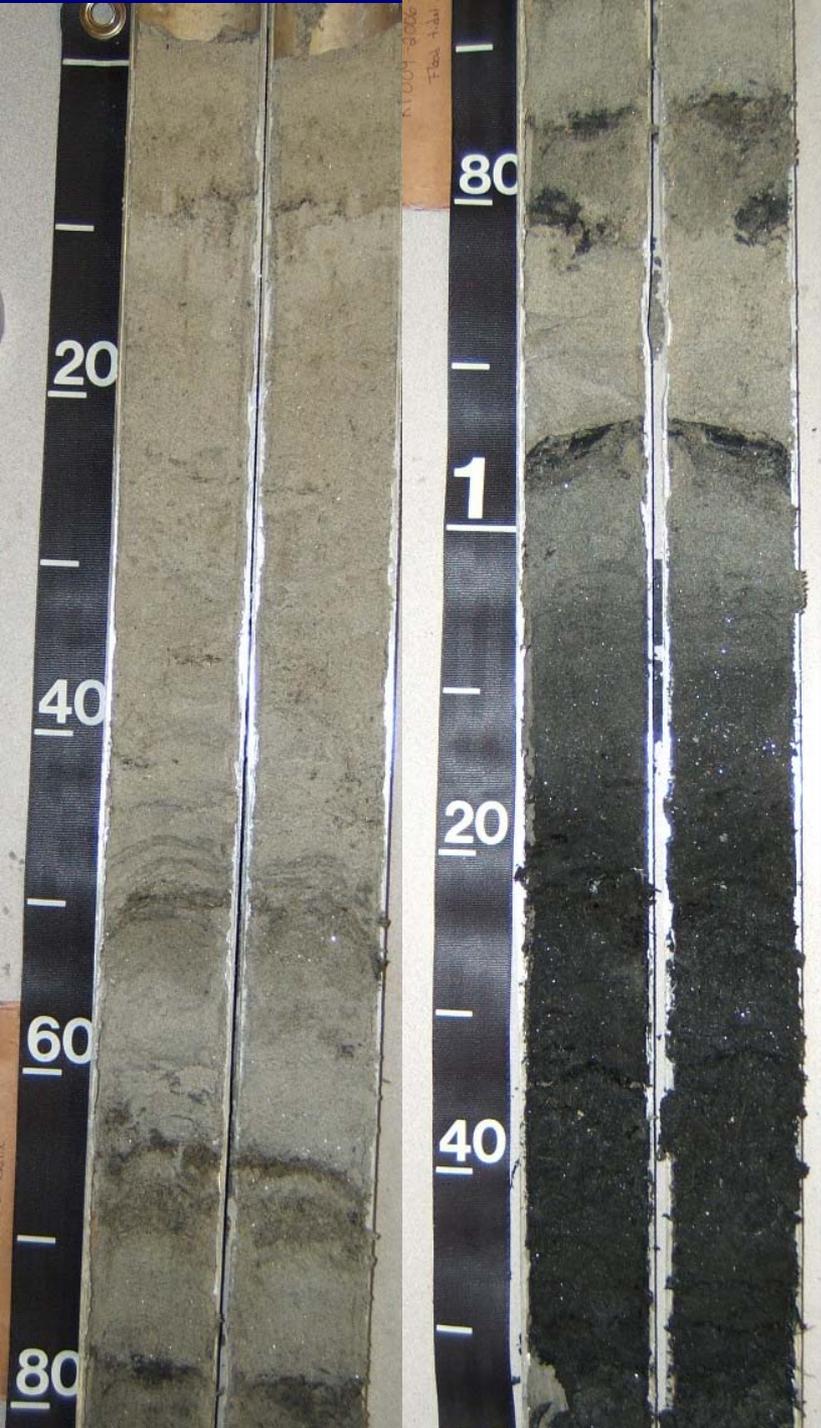
Lines – shoreline protection, etc.

Points – AdHoc spot symbols.

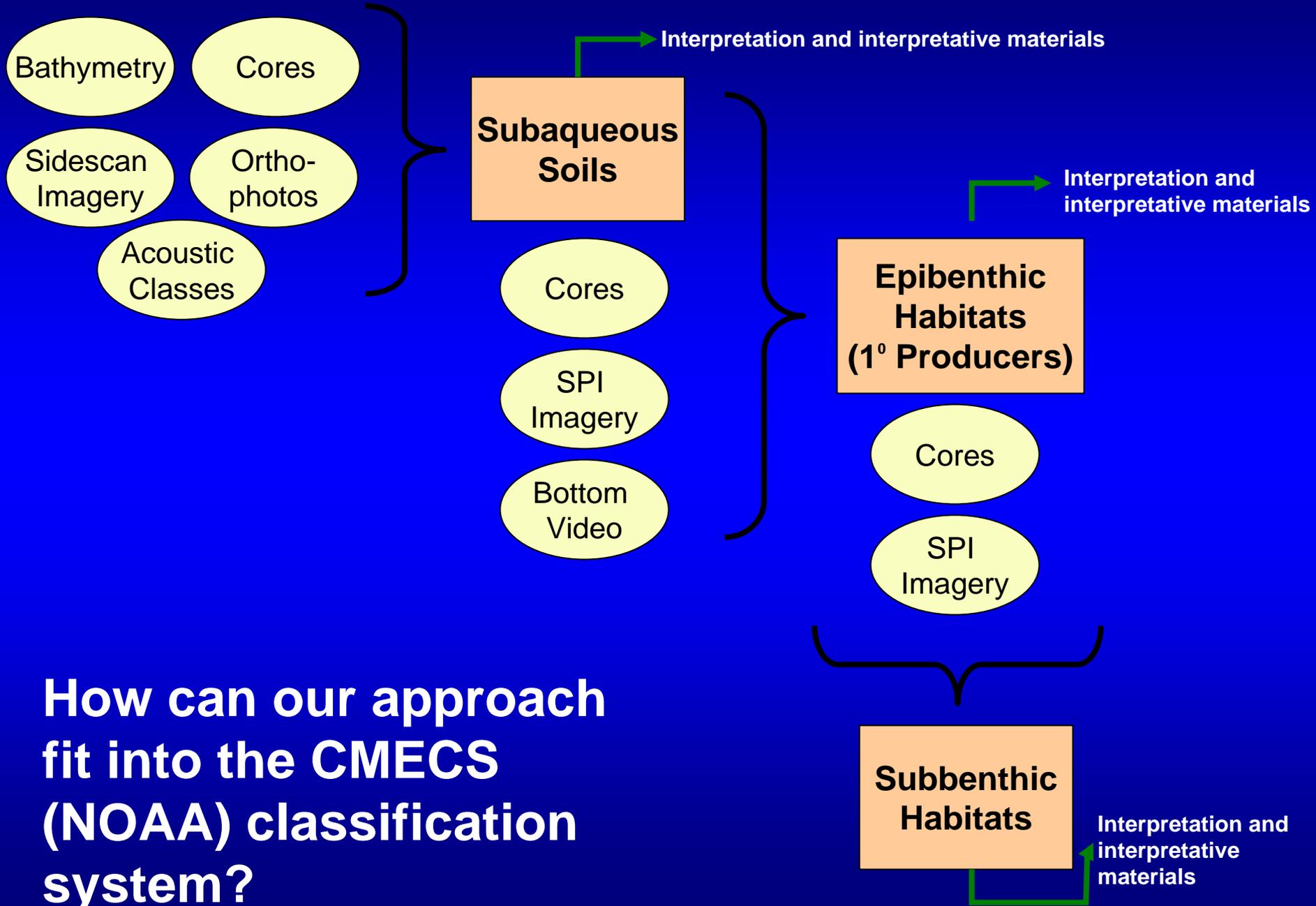
Polygons – spatial info with attribute data

Links

Coastal soils



**Fluvic Psammowassents
Flood-tidal Delta
Landform**



How can our approach fit into the CMECS (NOAA) classification system?

Challenges

- **Training?**

At the university level we can only train one person at a time

- **Widespread NCSS Support**

A US soil survey once over is a noble goal, but what does this really mean if the soils (subaqueous) are not included?

- **Who Should Map These Resources**

If not the NCSS, NOAA?