

Coastal Zone Soil Survey

The USDA Natural Resources Conservation Service (NRCS) is the lead agency in National Cooperative Soil Survey (NCSS); a group responsible for mapping the soils of the United States. Soil survey maps contain an abundance of information on all types of soils across the entire country.

Recently, the Coastal Zone Soil Survey initiative has been undertaken by the National Cooperative Soil Survey in an effort to provide data on the dynamic and important soil resources of our coasts and nearshore environments.

Click on the icons on map to find out more about planned and completed coastal zone soil survey projects. Zoom in to your area to see detailed soil survey information.



Quick Links

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- [Dynamic Soil Properties Team](#)
- [Ecological Sites Team](#)
- [Initial Mapping Team](#)
- [Leadership Development and Recruitment Team](#)
- [NCSS Communications Team](#)
- [Outreach Team](#)
- [Research Team](#)
- [Soil Survey Database Team](#)
- [Taxonomy Team](#)
- [Training Team](#)
- [Urban Soils Team](#)

Coastal Zone Soil Survey Team

Overview

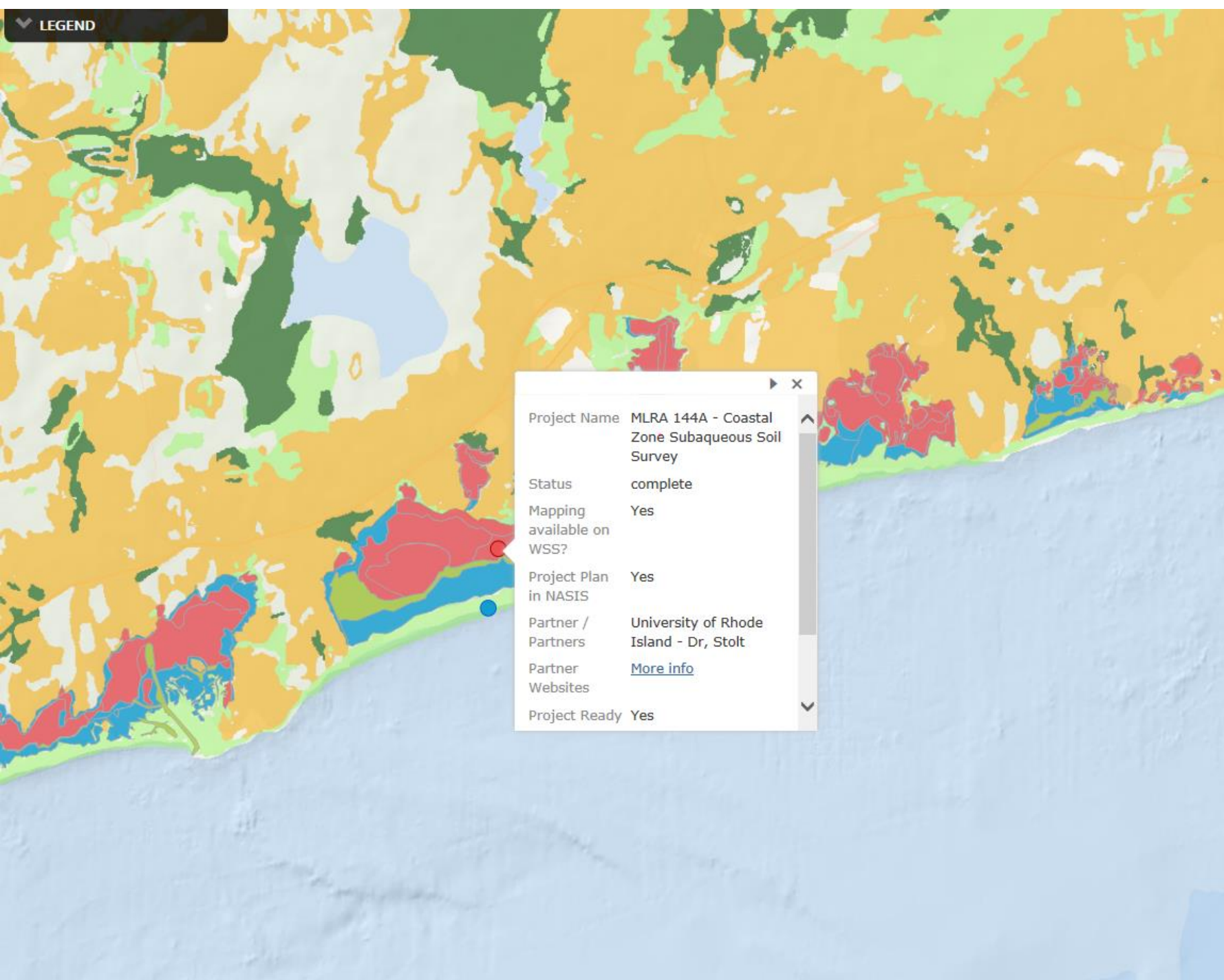
Since the 1990s, soil survey mapping and data collection have been improving the soil survey along the coastal zone from the Mid-Atlantic to New England. This includes the dunes, marshes, beaches, and shallow sub-tidal soils in coastal lagoons, bays, and inlets. [Coastal zone soil surveys](#) are now available for Rhode Island, Connecticut, and New Jersey. The NCSS is expanding this work throughout the coastal U.S.



George Demas was a pedologist whose pioneering studies of subaqueous soil contributed to the understanding of soil formation and the expansion of the concept of soil.

CHARGES

- ▶ Coordinate coastal zone mapping activities across division (procedures, equipment, safety)
- ▶ Identify training needs
- ▶ Identify needs to update standards – propose solutions
- ▶ Identify needs to update taxonomy – propose solutions
- ▶ Assemble existing data
- ▶ Identify gaps
- ▶ Work with BOA and MGT to provide guidance on priority areas



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Coastal Zone Soil Survey

Coastal Zone

According to the 2010 census, 39% of the U.S. population lives in counties directly on the coast, representing an area of less than 10% of the total U.S. These coastal population concentrations put a significant number of people and valuable infrastructure in the same locations as important fisheries habitat, carbon sinks and recreation areas - all at increasing risk due to sea level rise.



NOAA.gov

39%

Percent of the nation's total population that lived in Coastal Shoreline Counties in 2010 (less than 10% of the total land area excluding Alaska).

Source: U.S. Census Bureau, 2011

34.8 million

Increase in U.S. Coastal Shoreline County population from 1970 to 2010 (or a 39% increase).

Source: U.S. Census Bureau, 2011

446 persons/mi²

Average population density of the Coastal Shoreline Counties (excluding Alaska). Density in U.S. as a whole averages 105 persons/mi².

Source: U.S. Census Bureau, 2011

37 persons/mi²

Expected increase in U.S. Coastal Shoreline County population density from 2010-2020.

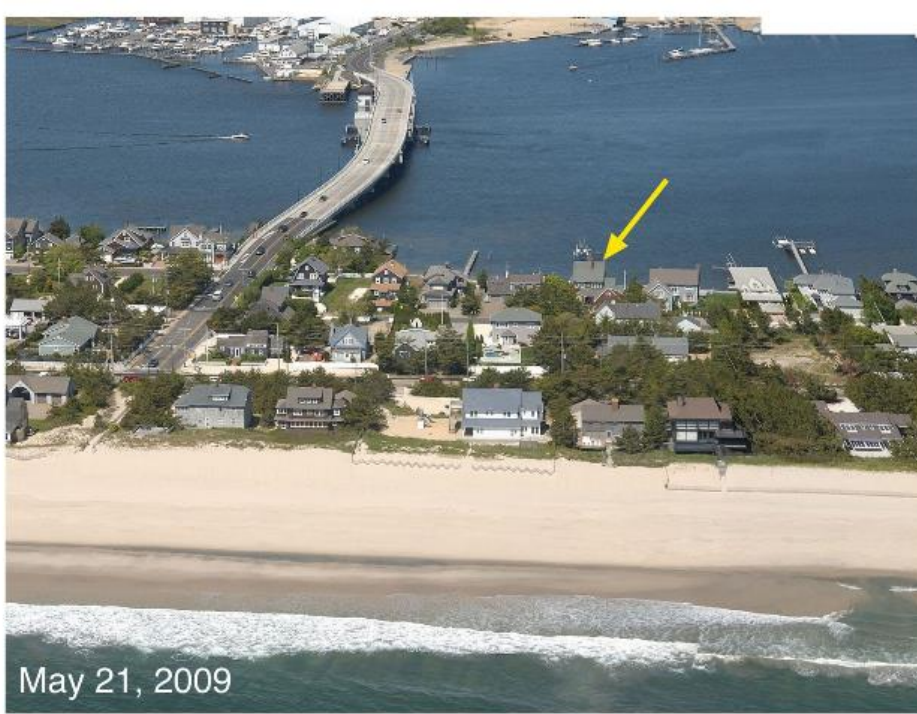
Expected increase for entire U.S. is 11 persons/mi².

Source: Woods & Poole, 2011; NOAA, 2012

Population Living at the Coast, 1970 - 2030

STATE OF THE COAST





May 21, 2009



November 5, 2012

Coastal Zone Soil Survey

Coastal Zone

It is often not until major events like Superstorm Sandy that the large number of people affected by coastal planning decisions becomes evident. In this view, looking west along the New Jersey shore, storm waves and surge cut across the barrier island at Mantoloking, NJ.

Images courtesy of USGS.

<https://coastal.er.usgs.gov/hurricanes/sandy/photo-comparisons/newjersey.php>

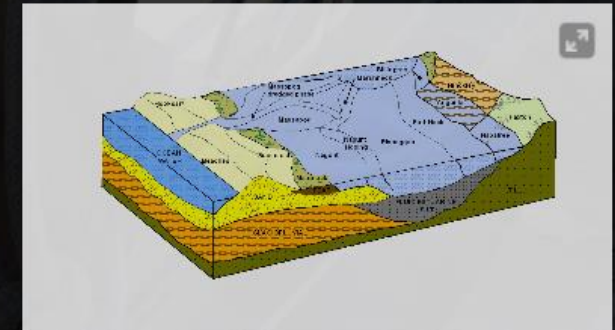
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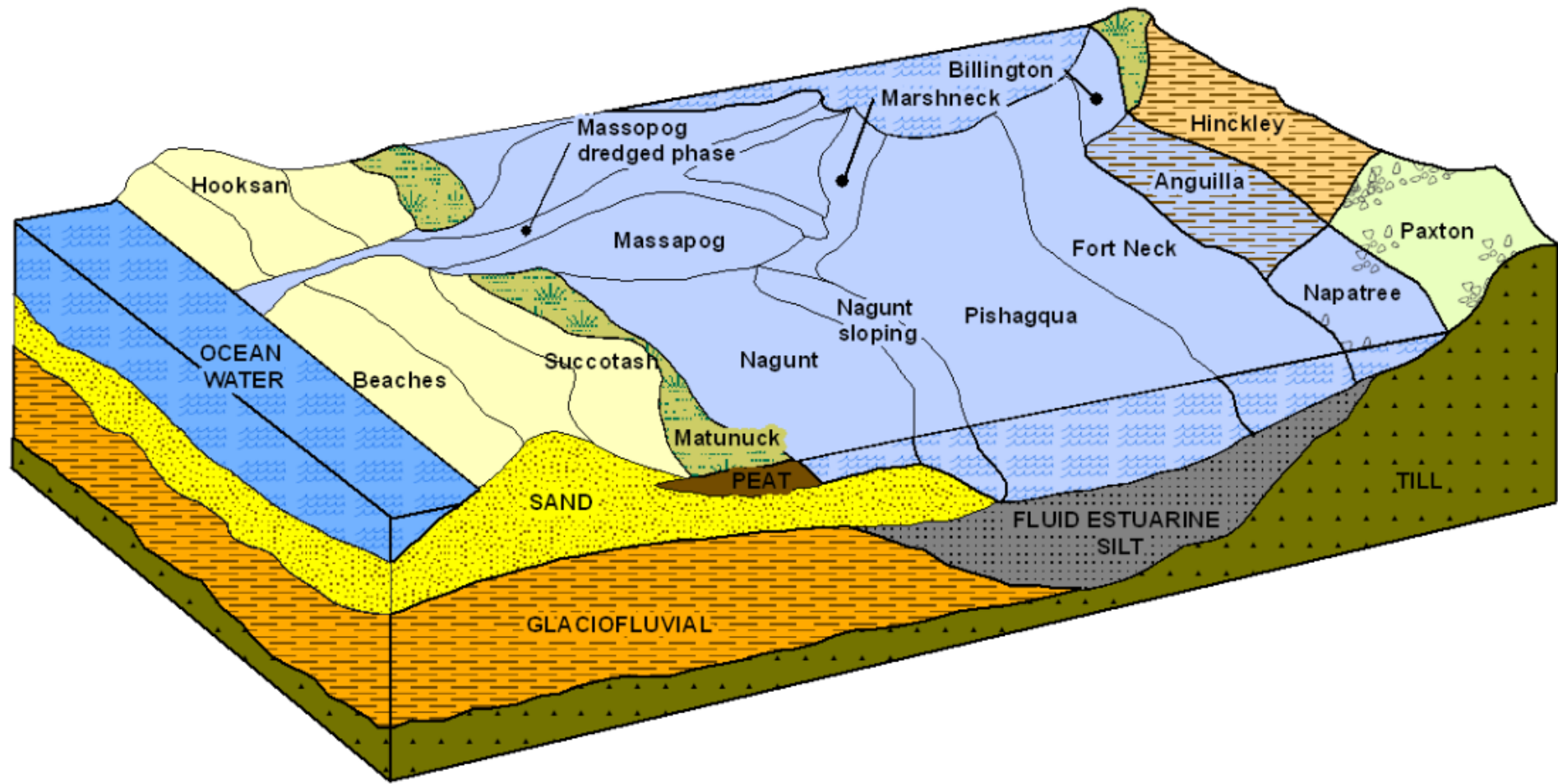
Coastal Zone Soil Survey

What is Coastal Zone Soil Survey?

The goal of a Coastal Zone Soil Survey is to create a seamless dataset of soils information that encompasses inland soils, marsh and coastal soils, and shallow subaqueous soils to an approximate water depth of 5 meters (15 feet). Soils data is a 3D dataset that gives properties of soil and geology from the soil surface to a depth of approximately 2 meters (6 feet). Click [here](#) for a link to more photos of sampling subaqueous soils.



A block diagram of coastal soils shows a 3-dimensional view of the soils across the landscape. Soil types differentiated as various soil series - a name given to a unique type of soil that can be identified on similar landforms throughout a region.



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Coastal Zone Soil Survey

Living Shorelines

Much like our productive agricultural upland soils, near-shore coastal soils provide substrate and habitat for a vital and growing aquaculture market, while eelgrass and mangrove habitats provide breeding ground for many commercial fish species.

Increasing use of near-shore areas for aquaculture, offshore wind power and recreation are occurring in and adjacent to eelgrass meadows, salt marshes, and mangrove swamps - some of the most productive ecosystems on earth.



Oyster aquaculture in a Rhode Island coastal pond.



Coastal Zone Soil Survey

Aquaculture

Shellfish restoration and prime aquaculture locations can be identified based on the subaqueous soil type.

Hard Clam Habitat

The northern quahog or hard clam (*Mercenaria mercenaria*) is a clam species found in intertidal and subtidal areas from Nova Scotia to Florida. A similar species (*Mercenaria campechiensis*) is found in coastal waters from North Carolina to Florida and Texas. Both species have high economic, ecological, and cultural value. Identifying habitat that is suitable for restoration or preservation is important in maintaining and increasing hard clam populations.



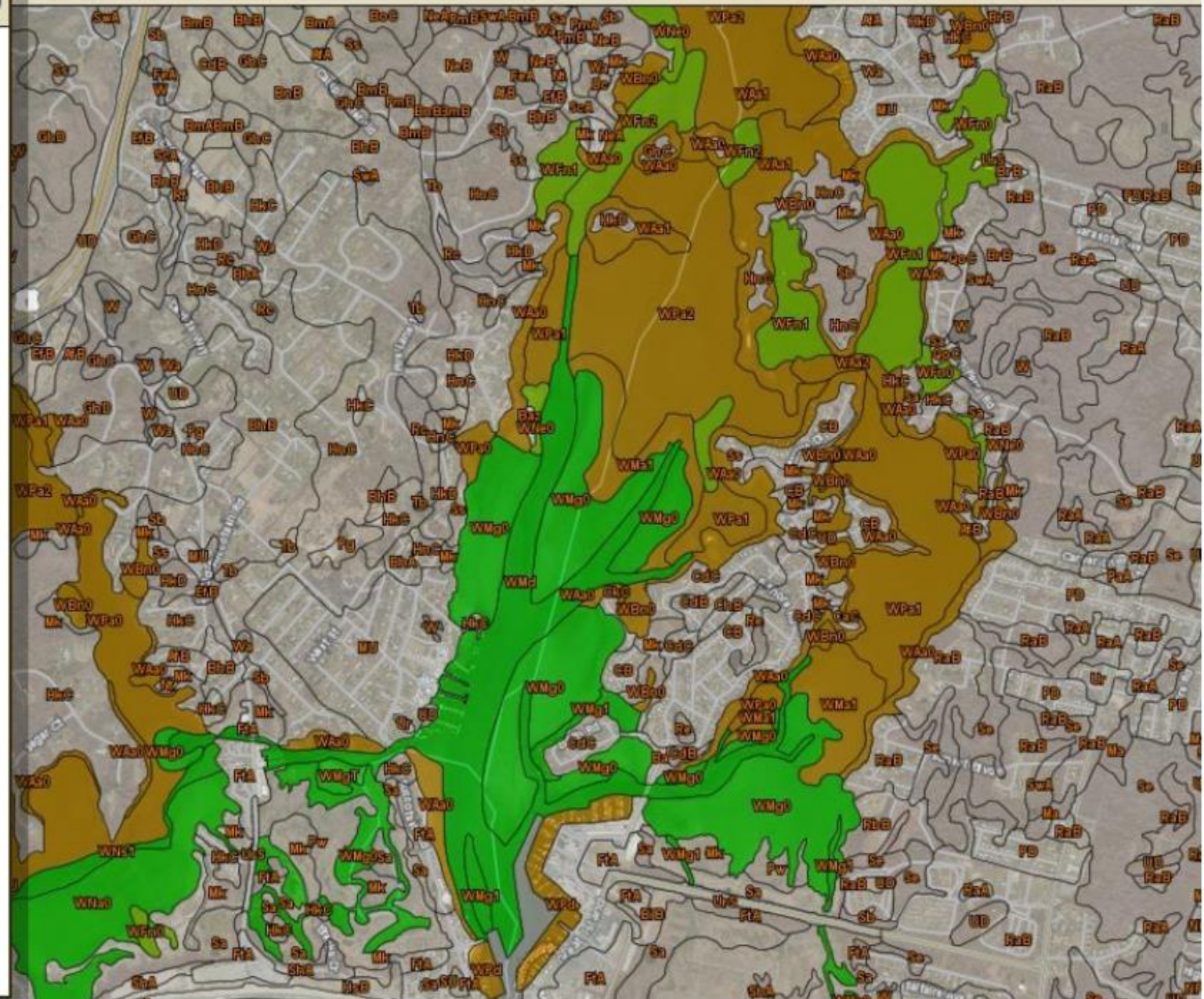
Quahog suitability map

Map Legend

Scale (not to scale)

Layer Properties Menu

- Area of Interest (AOI)
- Soils
 - Soil Survey Areas
 - Soil Map Unit Polygons
 - Soil Map Unit Lines
 - Soil Map Unit Points
- Soil Rating Polygons
 - Not suitable
 - Low suitability
 - Moderate suitability
 - High suitability
 - Not rated or not available
- Soil Rating Lines
- Soil Rating Points
- Special Point Features
- Special Line Features
- Political Features
- Federal Land
- Water Features
- Transportation
- Background

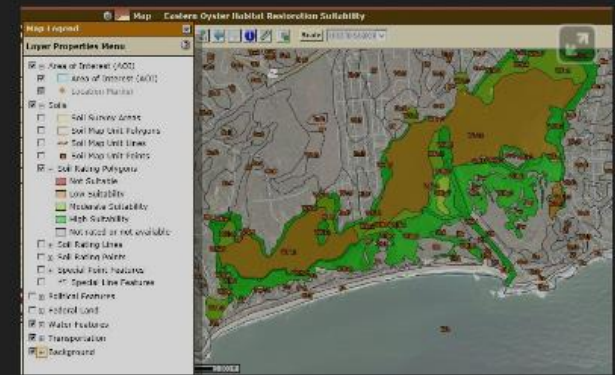


Coastal Zone Soil Survey

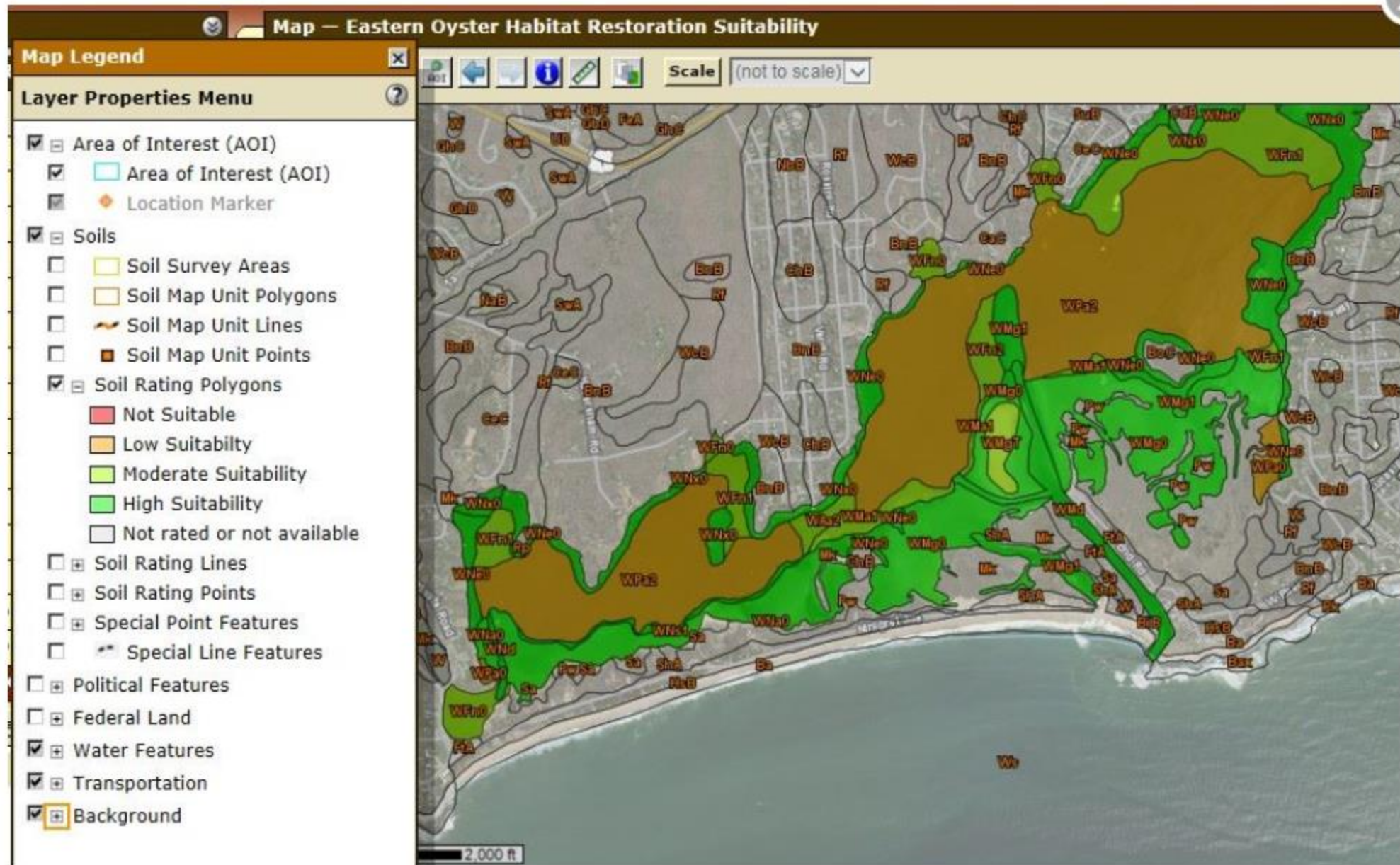
Oyster Restoration

Restoring estuarine oyster populations can improve water quality, provide structural stability, and encourage local shellfish operations. Identifying the best restoration locations includes identification of the subaqueous soil type.

Here oyster farmers assist with restoration by dumping live oysters over a location identified as suitable substrate for oyster reef building. After building, the reef becomes a location for new oyster settlement.



Oyster Habitat Suitability Map from Web Soil Survey



Oyster Habitat Suitability Map from Web Soil Survey



Coastal Zone Soil Survey

Eelgrass Restoration

Eelgrass is a submerged, rooted vascular plant. Eelgrass beds rank among the most productive of marine and estuarine plant habitats, which support an abundance of marine life – especially young commercially valuable fish species. Worldwide eelgrass populations are declining due to disease, disturbance, and declines in water quality. Determining the soil types that are suitable for replanting eelgrass saves time and money by targeting areas for restoration.




Recent work in [Barnegat Bay, New Jersey](#), mapped subaqueous soils and ranks the suitability of various soils for planting eelgrass beds based on information on water depth, soil texture, rock fragments, soil organic matter, soil salinity, and sulfide content of the soil.

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LEGEND

Barnegat Bay

-  Highly Suitable
-  Moderately Suitable
-  Not Suitable

Coastal Zone Soil Survey

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OVERVIEW MAP





Coastal Zone Soil Survey

Blue Carbon Accounting

Blue carbon is the term used to refer to the soil organic carbon stored in the soil in coastal wetlands including salt marshes and eelgrass meadows. The soils in these wetlands often contain more than a meter (3 feet) of organic soils, contributing to a significant amount of carbon sequestration and storage. Detailed coastal zone soil surveys provide information on the amount of carbon in these soils with depth and variations across the landscape.

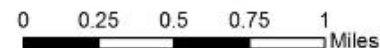




Legend

Organic Carbon (kg/m² 0-150cm)

- 0
- 1 - 3
- 4 - 6
- 7 - 9
- 10 - 12
- 13 - 14
- 15 - 26
- 27 - 90



Date: 3/24/2017

Coastal Zone Soil Survey

Dredge Material Disposal

Soil material dredged from subaquatic environments is often used for shoreline restoration. Because of the high sulfate content in many of these soils, there is a risk of acid sulfate soil development when subaqueous soils are applied to terrestrial environments. These acid sulfate soils can become so acidic that vegetation is unable to grow and heavy metals become mobilized. Awareness of the sulfate content of material used in dune nourishment and other dredge activities is important to the success of such projects.

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Coastal Zone Soil Survey

Soil Survey

Soil survey data provides detailed information on the properties and qualities of the soil throughout the United States. Some of the many uses of soil survey data include structural design planning, planned layout of fuel lines, prediction of erosion hazards, habitat protection, water quality protection, and prediction of disease vectors.

When the National Cooperative Soil Survey (NCSS) was started, the major focus was on agricultural land and identification of prime and important agriculture areas. In anticipation of the multiple uses that soil survey data can provide, the survey was made in such a way that it collected and recorded data on many soil properties that can be used to create a variety of soil interpretations as the needs and interests of data users change.



Accessing Soil Data

All soil survey data is available through the [Web Soil Survey](#) where users can download data by county or state or navigate to areas of interest and view maps online.

The California Soil Resource Lab also hosts updated soil survey information as well as a downloadable [Soil Web App](#) to view soil information on the go. Give it a try!

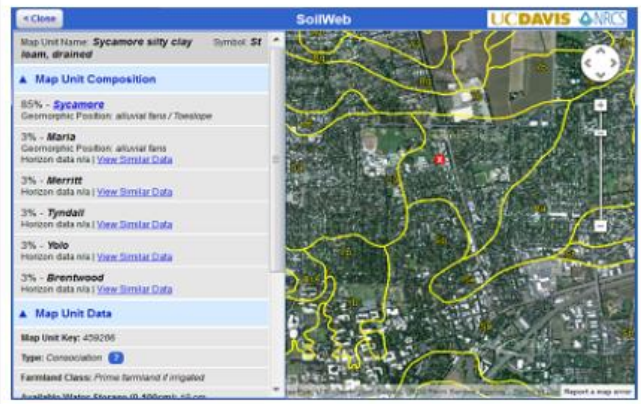
HOME » SOILWEB APPS

SoilWeb Apps

SoilWeb products can be used to access USDA-NCSS detailed soil survey data (SSURGO) for most of the United States. Please choose an interface to [SoilWeb](#)

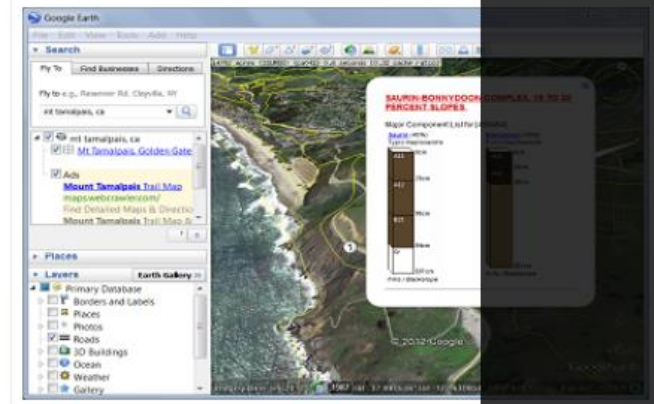
SoilWeb

Explore soil survey areas using an interactive Google map. View detailed information about map units and their components. This app runs in your web browser and is compatible with desktop computers, tablets, and smartphones.



SoilWeb Earth

Soil survey data are delivered dynamically in a [KML](#) file, allowing you to view mapped areas in a 3-D display. You must have [Google Earth](#) or some other means of viewing KML files installed on your desktop computer, tablet, or smartphone.



SEE: Soil Series Extent Explorer



Soil Properties App



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