USDA United States Department of Agriculture

COASTAL ZONE SOIL SURVEY

Fiscal Year 2020 Report

Soil and Plant Science Division

Natural Resources Conservation Service

nrcs.usda.gov/

March 2020

NRCS MISSION:
We deliver conservation solutions so agriculture producers can protect natural resources and feed a growing world.

NRCS VISION:
A world of clean and abundant water, healthy soils, resilient landscapes, and thriving agricultural communities through voluntary conservation.

The collection of coastal zone soil survey information provides science-based data of the soils and ecological resources to help land managers ensure coastal areas are productive, sustainable, and profitable.

Helping People Help the Land

In Nearshore and Coastal Environments

USDA is a world leader in providing coastal zone soil survey data to deliver science-based conservation planning. For over two decades, Natural Resources Conservation Service soil scientists and partners of the National Cooperative Soil Survey have been collecting data, conducting research, mapping soils, and developing soil interpretations in the coastal zone.

Coastal zone soil survey (CZSS) is the term used to incorporate subaqueous, submerged, and adjacent sub-aerial soils into a seamless data set. CZSS information is used to identify soil distributions and functions, create interpretations, and expand Farm Bill technical and financial assistance.

NRCS' Soil and Plant Science Division (SPSD) supports USDA goals by:

- Providing coastal soils information and interpretations to users who want to understand nearshore environments better and improve coastal conservation management decisions.
- Combining the knowledge, skills, tools, and expertise from across mission areas to identify innovative opportunities such as joining the Interagency Working Group on Ocean and Coastal Mapping and starting the National Coastal Blue Carbon Assessment initiative.
- Exploring new methods and technologies to more efficiently collect diverse subaqueous soils data as process, output, and outcome indicators for USDA programs and activities.

Coastal Zone Survey Projects

NRCS recognizes the importance of the CZSS in expanding the delivery of Farm Bill programs to coastal communities. By providing accurate and useful CZSS data, NRCS can enhance the efforts of programs like the Environmental Quality Incentives Program and Emergency Watershed Protection Program–Floodplain Easements.

This fiscal year, the Soil and Plant Science Division (SPSD) is working on the collection, analyses, and release of CZSS data for 29 projects, which will impact:

- ★ **11 Major Land Resource Areas** (MLRA) — 133A, 144A, 144B, 149A, 149B, 150B, 151, 152A, 153B, 153D, and 155.
- ★ **18 states** — Alabama, Connecticut, Delaware, Florida, Georgia, Louisiana, Maryland, Massachusetts, Maine, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Rhode Island, South Carolina, Texas, and Virginia.
- ★ Approximately **2 million acres**.

In support of Farm Bill programs, CZSS projects could help address NRCS resources concerns such as soil erosion of shorelines or riverbanks, soil quality degradation, coastal flooding, and habitat degradation and loss.

Conservation practices that may be used with an NRCS conservation plan and supported with CZSS data include:

- **390 Riparian Herbaceous Buffer**
- **391 Riparian Forest Buffer**
- **395 Stream and Habitat Improvement and Management**
- **580 Streambank and Shoreline Protection**
- **643 Restoration of Rare or Declining Natural Communities**
- **644 Wetland Wildlife Habitat Management**
- **657 Wetland Restoration**
- **659 Wetland Enhancement**
- **666 Forest Stand Improvement**

USDA makes CZSS data available to the public in an efficient and timely manner. Providing the most up-to-date information helps to improve and build upon the delivery, effectiveness, and outcomes of USDA programs. Accurate and relevant data also enables our partners to meet their goals and objectives more efficiently.

Project Highlights

Bryan and Chatham Counties — MLRA 153B

At the request of the State of Georgia, a CZSS will be completed in two counties for storm management planners to address pre-storm preparation and post-storm recovery.

Partners:
- Soil and Plant Science Division
- NRCS Georgia
- State of Georgia

Coastal Zone Soil Surveys — MLRA 149B and 153D

Coastal zone soil surveys will be completed and available on Web Soil Survey this fiscal year for Little Assawoman Bay, Delaware; Big Assawoman Bay, Maryland; Isle of Wight, Maryland; Martha's Vineyard, Massachusetts; Shrewsbury River, New Jersey; and Great Bay, New Hampshire.

Partners:
- Soil and Plant Science Division
- NRCS Delaware, Maryland, Massachusetts, New Hampshire, and New Jersey
- Dukes Co. Conservation District
- Great Bay National Estuarine Research Reserve
- Piscataqua Region Estuaries Partnership
- Oaks Bluff Shellfish Commission
- University of Maryland
- University of Massachusetts

Hundred Acre Cove and Potowomut Cove — MLRA 144A

USDA will complete subaqueous soil surveys for two coves in Narragansett Bay, Rhode Island. This project will support shellfish restoration funded by Farm Bill programs using the conservation practice 643–Restoration of Rare or Declining Natural Communities.

Partners:
- Soil and Plant Science Division
- NRCS Rhode Island

The National Coastal Blue Carbon Assessment — MLRA 144A, 149A, and 153D

A nationwide effort to inventory blue carbon stocks in coastal ecosystems will begin in select areas this fiscal year. This project aims to standardize soil sampling protocols across agencies, increase the accuracy of coastal soil mapping, and improve public access to coastal wetland blue carbon data.

Partners:
- Soil and Plant Science Division
- NRCS Massachusetts, New Jersey, North Carolina, and Virginia
- Barnegat Bay Partnership
- Drexel University
- New Jersey Department of Environmental Protection
- Partnership for the Delaware Estuary
- Nature Conservancy
- U.S. Fish and Wildlife Service
- University of Maryland
- University of Rhode Island

Salinity Investigation in Francis Marion National Forest — MLRA 153B

At the request of the U.S. Forest Service, the NRCS, Soil and Plant Science Division will help develop parameters to establish resiliency and maintain the viability of maritime forests.

Partners:
- Soil and Plant Science Division
- NRCS South Carolina
- U.S. Forest Service

Subaqueous Soil Survey for Jamaica Bay — MLRA 149B

This soil survey will assist with restoration efforts for water quality, restoration of rare or declining natural habitats, and provide information for coastal resiliency planning of an urbanized estuary in New York City.

Partners:
- Soil and Plant Science Division
- NRCS New York
- Brooklyn College
- National Park Service
- Urban Soils Institute
- University of Massachusetts

West Galveston Bay — MLRA 150B

CZSS for portions of Galveston and Brazoria Counties, Texas, will provide interpretations for potential oyster restoration, seagrass restoration, living shorelines, and beach replenishment and trafficability. In collaboration with Texas Parks and Wildlife Department, Texas General Land Office, and Texas A&M-Corpus Christi, this soil survey data will support Farm Bill conservation efforts.

Partners:
- Soil and Plant Science Division
- NRCS Texas
- Texas Agrilife Extension
- Texas A&M University

Benefits and Outcomes

Coastal zone soil surveys give conservation planners the most up-to-date information to improve and build upon the delivery, effectiveness, and outcomes of USDA programs.

Delaware, Maryland, New Jersey, and Rhode Island NRCS are using CZSS data, such as site selection criteria for oyster restoration, to support the Farm Bill Environmental Quality Incentives Program. Connecticut Sea Grant is using the criteria to locate priority areas for future restoration.

★ **Interpretations:** Soil interpretations are a method of taking a large amount of technical soils information and simplifying it into specific recommendations or ratings. Soil interpretations are available through Web Soil Survey (WSS), our customer-facing product and one-stop-shop to a wealth of free soils information.

New interpretations produced for conservation planning include:

- Shoreline and Streambank Erosion
- Salinization due to Coastal Saltwater Inundation

Also, new interpretations are being developed for:

- Carbon Pools
- Living Shorelines
- Salt Marsh Restoration using thin layer deposition

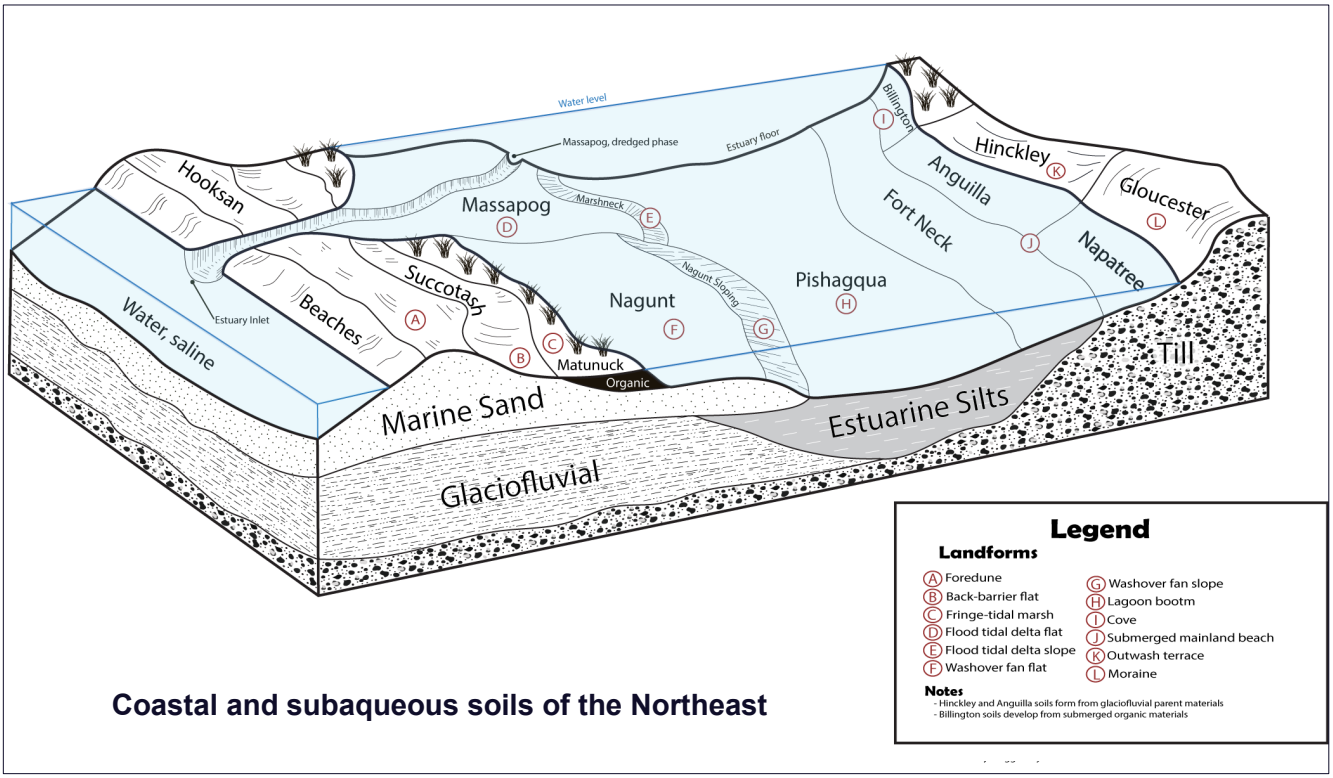
Soil interpretations that underpin conservation efforts based on USDA-assisted conservation plans can help ensure conservation investments achieve desired outcomes while meeting consumer needs.

★ **Web Metrics:** In fiscal year 2019, the Web Soil Survey metrics showed that the Eastern Oyster Habitat Restoration Suitability interpretation was the most downloaded, followed by the Northern Quahog (Hard Clam) Habitat Suitability, Eelgrass Restoration Suitability, CMECS Substrate Class, and Mooring Anchors (Deadweight and Mushroom).

★ **Equipment:** The Soil and Plant Science Division has secured a contract to purchase two mobile refrigeration trailers, five pontoon boats, and one airboat. This equipment is necessary for the collection of CZSS information to improve and build upon the delivery, effectiveness, and outcomes of USDA Farm Bill programs that ensure coastal areas are productive, sustainable, and profitable.

★ **Training Video on von Post Humification Scale:** A training video was released on the von Post method for determining the scale of organic soil decomposition and characteristics. The video supports the National Coastal Blue Carbon Assessment Project, a nationwide effort to inventory blue carbon soil stocks in coastal ecosystems. Videos are available at https://www.youtube.com/user/nrcsnssc.

★ **Block Diagrams:** NRCS soil scientists created two block diagrams showing coastal zone soil systems. A block diagram is a 3D drawing of the surface features of a selected landscape and their relationship between the underlying soils and geology. These diagrams help users identify the predominant soils in a soil survey area and where they occur on the landscape in relation to each other. Pictured below is one of the new block diagrams developed.



Coastal and subaqueous soils of the Northeast

National Cooperative Soil Survey

The National Cooperative Soil Survey (NCSS) is a nationwide partnership of Federal, regional, State, and local agencies and private entities and institutions. This partnership works to investigate, inventory, document, classify, interpret, disseminate, and publish information about soils.

The Soil Science and Plant Division (SPSD) provides leadership for NCSS activities. SPSD has and will continue to develop and streamline soil survey activities by partnering with scientific research institutions and private industry experts to enhance the CZSS. Current CZSS activities of the NCSS include but are not limited to:

★ Subaqueous Soil Data Hosted on Connecticut Shellfish Aquaculture Atlas

To streamline shellfish aquaculture permitting, many States have developed web-based aquaculture map viewers to communicate critical regulatory, space–use, and natural resource information. USDA-NRCS soil scientists worked with State and local partners to add subaqueous soil survey information to an online map viewer. Maps are available at CT ECO Aquaculture Mapping Atlas.

★ Quantifying Blue Carbon Stocks from Tidal Freshwater to Coastal Marine Wetlands

North Carolina State University received funding from the Soil and Plant Science Division to investigate blue carbon stocks along salinity gradients from tidal freshwater to coastal marine wetlands in the southeastern United States. This project will map the extent of saltwater intrusion in areas of Albemarle and Pamlico Sounds in North Carolina as well as quantify soil carbon stocks. This work will help predict changes in the ecology and levels of risk for saltwater intrusion and increased salinization.

★ Indian River, Mosquito, and Banana Lagoons

The Soil and Plant Science Division, Saint Johns River Water Management District, and the University of Florida will complete soil sampling and soil survey mapping of three lagoons in Florida. The collected soil data will be used for restoration efforts following the devastating algae blooms from 2011 to 2017.

★ Virginia Institute of Marine Science (VIMS)

Virginia Institute of Marine Science (VIMS) received SPSD funding for estimating blue carbon stocks in coastal marshes to enhance NRCS soil surveys. VIMS and NRCS soil scientists will collect soil samples from the Chesapeake Bay and Albemarle and Pamlico Sounds for the Kellogg Soil Survey Lab to study and produce accurate soil carbon stocks. This data will provide maps showing areas of carbon sequestration as well as a greater understanding of why some areas store more carbon than others.

Soil and Plant Science Division

PROVIDING CONSERVATION SUPPORT BACKED BY DATA-DRIVEN SCIENCE

By completing coastal zone soil surveys, the SPSD is:

- Developing the latest soil science and technology needed to sustain economically sound operations in upland and nearshore environments.
- Partnering with scientific research institutions and industry experts to provide conservation-system solutions in coastal areas.
- Gathering data on the status and trends of soils in coastal zone areas to meet present and future demands for USDA programs such as the Emergency Watershed Protection Program–Floodplain Easement and EQIP-funded oyster restoration efforts.
- Actively evaluating and updating coastal zone soils information to examine issues, such as saltwater intrusion and inundation, that have implications for U.S. agriculture.

Connecticut and Rhode Island State Soil Scientist Debbie Surabian discusses CZSS with Under Secretary Bill Northey at the 2019 National Cooperative Soil Survey Conference in Rhode Island.

To find out how NRCS can help you or for more information about soil visit, **www.soils.usda.gov**.

USDA is an equal opportunity provider, employer, and lender.

CZSS Presentations

Nov. 6. 2019
25th Biennial Conference of the Coastal and Estuarine Research Federation, Mobile, AL

Dec. 2019
The Cape Cod Coastal Conference, Massachusetts

Jan. 22, 2020
Soil Science Society of North Carolina

Jan. 23, 2020
Coastal Climate Change and Forest Impacts, Rutgers Climate Change Institute

Jan. 29–30, 2020
Delaware Wetland Conference, Wilmington, DE

Feb. 6–7, 2020
Soil Survey and Land Resource Workshop, Texas A&M University, College Station, Texas

Feb. 13–14, 2020
Indian River Lagoon Symposium 2020, Fort Pierce, FL

March 16, 2020
Connecticut Conference on Natural Resources, University of Connecticut, Storrs, CT

March 2020
Environmental Protection Agency Zosterapalooza, Boston, MA

May and June 2020
Regional National Cooperative Soil Survey Conferences

October 2020
Restore America's Estuaries Conference, Providence, R.I.