



2019 Accomplishments

NOAA Coastal Blue Carbon

Coastal salt marshes, mangroves, and seagrass beds are incredibly efficient at capturing and storing large quantities of carbon – referred to as “coastal blue carbon.” NOAA’s coastal blue carbon activities are a collaborative effort across NOAA, including the National Marine Fisheries Service, National Ocean Service, and Oceanic and Atmospheric Research offices.

Increased Awareness of Progress and Opportunities

- Work by NOAA’s National Centers for Coastal Ocean Science scientists that was the basis of a 2019 *Journal of Geophysical Research: Biogeosciences* [article](#) was recently featured in [NC Sea Grant Coastwatch](#) magazine.
- At the American Geophysical Union Fall Meeting 2019, NOAA’s Air Resources Laboratory scientists presented research results from a [field study](#) of ammonia and carbon exchange over a salt marsh ecosystem at the Delaware National Estuarine Research Reserve.
- Multiple Sea Grant programs supported researchers’ progress, results, and leveraging of successes related to coastal blue carbon work. For example, Louisiana Sea Grant [publicized the results of Dr. Tracy Quirk’s study](#) of the carbon storage capacity of Louisiana salt marshes and her team’s findings regarding the role of vegetation density.
- Continued to support Restore America’s Estuaries [Blue Carbon Buzz](#) and other blue carbon community of practice efforts.



NOAA scientists drill for a sediment core at Camp Lejeune Marine Corps base in Jacksonville, North Carolina. (Photo credit: C. Currin, NOAA NCCOS)

Strengthened Policy and Research Partnerships

- Conducted research in a collaboration between Virginia Institute of Marine Science and NOAA’s National Centers for Coastal Ocean Science, resulting in two papers investigating fertilization impacts on salt marsh carbon sequestration. The first describes how inundation patterns and porewater chemistry alter the impact of [nitrogen fertilization on carbon burial in salt marshes](#). The second reported differences in [net carbon flux](#) between interior and edge marshes in North Carolina. The papers were accepted for publication in the *Journal of Geophysical Research-Biogeosciences*.
- Continued to advance coastal blue carbon research through NOAA’s National Estuarine Research Reserve System, multiple Hollings Scholars, and involvement with interagency research projects including a [NASA Carbon Monitoring System](#)-funded project (*Data-Model Integration for Monitoring and Forecasting Coastal Wetland Carbon Exchanges: Serving Local to National Greenhouse Gas Inventories*).
- Funded (through the National Estuarine Research Reserve System Science Collaborative) the [Research and Management of Carbon in Wetlands to Advance Coastal Restoration, Resilience and Climate Action](#) workshop, which featured new guidance and tools for managers and policymakers to advance blue carbon research and application in New England and beyond.
- Moderated a Regional coastal blue carbon panel entitled, “[What’s Next for Blue Carbon; Management, Policy and Science.](#)”
- Funded (through the National Estuarine Research Reserve System Science Collaborative) [Feasibility Planning for Pacific Northwest Blue Carbon Finance Projects](#), which demonstrated the feasibility of including carbon finance in funding strategies that support the conservation and restoration of tidal wetlands, eelgrasses, and coastal lowland sea level rise buffer areas in the Pacific Northwest. The project advanced local stakeholders’ understanding of next steps for blue carbon management and financing opportunities for land management actions in coastal communities.
- Supported Restore America’s Estuaries, in partnership with Roger Williams University School of Law and Rhode Island Sea Grant, to write [Legal Issues Affecting Blue Carbon Projects on Publicly-Owned Coastal Wetlands](#). The study, published in 2020, provides a framework for project design by identifying legal considerations for blue carbon offset project on public coastal wetlands.



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Strengthened Policy and Research Partnerships (cont.)

- Supported an expansion of the 2009 report, *Economic and Market Value of Coasts and Estuaries: What's at Stake?* (Pendleton, 2009), to include carbon sequestration benefits of estuaries.
- Funded (through the [Effects of Sea Level Rise Program](#)) projects in Coos Estuary (OR) and Grays Bay (WA) that evaluate how restored and natural wetlands sequester carbon, buffer flooding impacts, and enhance benefits to fisheries.

Enhanced Incorporation Into Science and Policy

- Continued to lead, in close partnership with EPA, the inclusion of coastal wetlands in the annual [U.S. Greenhouse Gas Inventory](#), providing estimates of carbon stock change and methane emissions. The U.S. remains one of the few countries in the world to release detailed country-specific data on carbon stocks, stock change, nitrous oxide and methane emissions associated with the management of tidal wetlands for the conterminous states. This effort has resulted in numerous publications and significant international interest. The United Nations 2019 Expert Review Team's [Report on the individual review of the inventory submission of the United States of America submitted in 2018](#) commended the U.S. for reporting on coastal wetlands. NOAA's Office for Coastal Management Coastal Change Analysis Program ([C-CAP](#)) data are essential to this process. NOAA also supported a 2019 assessment on the feasibility for incorporating seagrass into the Inventory. NOAA's foundational work has been shared with numerous countries, incorporated into several books and publications including the first '[Blue Carbon Primer](#),' and catalyzed additional investments by U.S. agencies such as USGS, NASA and NSF.
- NOAA's National Centers for Ocean Coastal Science supported North Carolina's Greenhouse Gas Inventory for the state's Natural and Working Lands. NOAA provided data on carbon stocks in North Carolina coastal wetlands for use in models and [storymaps](#) to document current conditions in coastal wetlands, opportunities for restoration and conservation, and potential impacts of accelerated sea level rise on marsh distribution and carbon burial.
- NOAA's Office of National Marine Sanctuaries was invited to participate in a side event for the [U.N. Framework Convention on Climate Change Conference](#) of the Parties in Madrid in December 2019. Dubbed the "Blue COP" because of its strong focus on the ocean's role in climate change, the Conference featured side events on marine protected areas and on blue carbon. The Greater Farallones National Marine Sanctuary presented on work by the Sanctuary to restore blue carbon habitat and implement climate adaptation actions.
- NOAA is working with the [Commission for Environmental Cooperation](#), a tri-national organization that supports environmental cooperation projects across the U.S., Canada and Mexico, to include a blue carbon component in the Commission's 2019-2020 project on marine conservation and climate adaptation. The project aims to convene blue carbon researchers, marine protected area managers, and policy experts in 2020 to identify opportunities for collaboration across North America.



Staff from the N.C. Coastal Reserve and National Estuarine Research Reserve. (Source: [NC Sea Grant](#))

Goals for 2020

- ❑ Continue to support research to feed the U.S. Greenhouse Gas inventory and lay groundwork for greater international capacity building (beginning in earnest in FY21 with expected funding support from the State Department) to assist other nations to estimate the blue carbon storage associated with coastal wetlands.
- ❑ Update NOAA's Office for Coastal Management Coastal Change Analysis Program (C-CAP) with new data, which provides the basis for coastal wetlands accounting within the U.S. Greenhouse Gas Inventory.
- ❑ Contribute to the Coastal Engineering Journal Special Edition on Blue Carbon and Green Infrastructure (TBD 2021).
- ❑ Contribute to the inclusion of blue carbon management principles in guidance document on innovative financing for coastal infrastructure.