



Restoring and Protecting U.S. Coastal Ecosystems

The National Centers for Coastal Ocean Science (NCCOS) promotes prosperous coastal communities and businesses by finding cost-effective ways to protect them from storm damage and flooding, while advancing restoration science in critical ecosystems.

NCCOS protects U.S. coastal communities from extreme weather events that bring storm driven waves and flooding by developing efficient and effective methods of monitoring and restoration for coastal managers. Restoration efforts are needed for coastal ecosystems, such as mangroves, seagrass beds, coral reefs, and salt marshes, which serve as the first line of defense against storm surge. Restoring these ecosystems also ensures that important habitats for commercial and recreational fisheries continue to benefit the coastal economy.

NCCOS is working across the U.S. to protect and restore coastal ecosystems. Explore several examples below.

North Carolina

- **Protecting Communities from Flooding:** Assisting state managers by reporting how differences in sand dune structure, composition, and morphology provide varying levels of protection to beachfront communities.
- **Protecting Military Heritage:** Guiding wetland restoration to address the continuous flooding surrounding the Battle Ship North Carolina in Wilmington.

Texas

- **Protecting Communities from Flooding:** Identifying locations along the Texas Coastal Bend where nature-based features can best reduce flooding and storm surge.
- **Strengthening Recreational Fisheries:** Monitoring new oyster reefs that serve as fish habitat in the Mission-Aransas National Estuarine Research Reserve. Understanding what fish utilize these reefs helps restore recreational fishery species.





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Michigan | Ohio | Wisconsin

- **Restoring Ecosystems:** Evaluated the risk that highly invasive bigheaded carp species had on food webs in the Great Lakes. Results informed current management efforts to prevent exotic bigheaded carp from spreading more widely in the Great Lakes.



Alabama

- **Guiding Infrastructure Improvements:** Funded tools and models that assess how Alabama State Route 180—a major evacuation and tourism route—will fare with existing and planned flood protection.
- **Protecting Communities From Flooding:** Sponsored research that evaluated the long-term effectiveness of beach and dune nourishment on resilience in Dauphin Island.



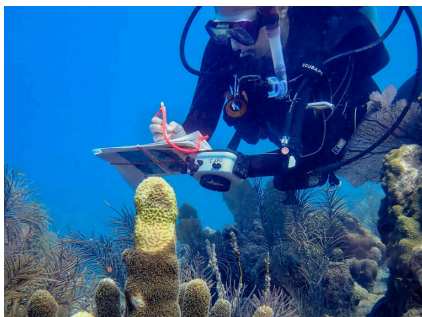
Alaska

- **Protecting Shorelines:** Funding collaboration with Alaskan Native Communities and local stakeholders to develop and test regionally appropriate coastal protection solutions.
- **Restoring Fisheries:** Studying and restoring the Kachemak Bay ecosystem, which has experienced significant declines in shrimp and crab that have not recovered despite fishery closures.



South Carolina

- **Protecting Communities From Flooding:** Supported a forecasting model of high tide flooding for the City of Charleston. Helped develop a stormwater runoff modeling system for several watersheds in the state.
- **Guiding Infrastructure Improvements:** Compared the benefits of different coastal protection strategies in the Lower South Carolina coastal plain to inform regional planning.



Florida

- **Guiding Infrastructure Improvements:** Funding science on groundwater flow to guide Miami septic system managers as they implement upgrades. In Miami-Dade County, 64 percent of septic systems are periodically compromised by groundwater infiltration due to storm-related flooding and rising seas.
- **Protecting Military Facilities from Flooding:** Designed flood protection using natural infrastructure at Marine Corps Support Facility Blount Island in Jacksonville.
- **Curing Coral Disease:** Determined and applied an effective treatment for stony coral tissue loss disease, which decimated the Florida Key's coral population. These valuable reefs provide critical wave protection.