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Coastal Blue Carbon - A New Opportunity for Coastal Conservation

Coastal Blue Carbon is the carbon stored by, sequestered in, and released from coastal ecosystems including tidal wetlands, mangroves, and seagrass meadows. While these ecosystems occupy a relatively small percentage of the planet, their contributions to climate change mitigation are significant. These areas also provide critically important ecological and economic values, such as habitat for important fish and other threatened and endangered species, storm and flood protection, improved water quality, tourism, and jobs, yet globally they are being lost at an unsustainable rate of 1-3% per year.

The unmet need for coastal habitat restoration in the U.S., the global loss of coastal ecosystems, the need for coastal adaptation strategies that maintain wetland habitats, and the important role coastal wetlands play in carbon cycles, strongly suggest that coastal blue carbon can play an important role in helping coastal managers achieve restoration, protection, and adaptation goals while mitigating the impacts of climate change.

There now exists an opportunity to enhance global and national coastal conservation efforts, including restoration, protection, and coastal adaptation, through the inclusion of coastal blue carbon in regional and national policy and land-use considerations and in greenhouse gas (GHG) offset markets.

The Science of Coastal Blue Carbon

Recent advances in our understanding of the role of salt marshes, mangroves, and seagrasses in climate change include:

Carbon Storage

The largest store of carbon in wetland habitats is in the soil. In the first meter of soil, they contain:

- Seagrasses: 66 - 1,467 tCO₂e/ha
- Salt marsh: 330 - 1,980 tCO₂e/ha
- Mangroves: 1,060 - 2,020 tCO₂e/ha

Annual Carbon Sequestration

Wetland plants regularly remove CO₂ from the atmosphere and sequester it in the form of soil carbon, where it can remain for centuries. Mean carbon sequestration rates are several times greater than for forests:

- Seagrasses: 4.4 ± 0.95 tCO₂e/ha/yr
- Salt marsh: 8.0 ± 8.5 tCO₂e/ha/yr
- Mangroves: 6.3 ± 4.8 tCO₂e/ha/yr



Greenhouse Gas Emissions (GHGs)

When wetland soils are disturbed, carbon stored in salt marshes and mangroves may be released directly into the atmosphere through oxidation, which converts soil carbon into atmospheric CO₂.

An estimated 0.15 to 1.02 billion tons of CO₂ are released annually through land-use conversion, signifying the need to protect our remaining coastal wetland resources.

A Program for Coastal Blue Carbon

Restore America's Estuaries is leading the U.S. effort to advance coastal blue carbon. RAE is a national alliance of eleven community-based, save the bay organizations working to protect and restore the lands and waters essential to the richness and diversity of coastal life. Our goal is to utilize coastal blue carbon as a means to increase capacity for coastal and estuarine habitat restoration and protection, while mitigating the impacts of climate change.

Blue Ribbon Panel - In 2010, RAE **convened a national panel of leaders** in carbon markets and registries, wetland science, and coastal conservation to guide the development of coastal blue carbon tools and policies. RAE continues to implement the panel's *Action Plan*.

Carbon Markets - RAE led the effort to **expand the rules of the Verified Carbon Standard**, a leading GHG offset registry, to include wetland restoration, creation, and protection as eligible offset activities. RAE is developing the first tidal wetlands restoration GHG offset methodology, which will provide a means for coastal managers and project developers to initiate tidal wetlands restoration projects for GHG credits. RAE's partners include leading wetland scientists, GHG standard experts, and coastal restoration practitioners.

Policy Options - In addition to bringing carbon finance to coastal conservation projects, RAE will **explore a range of regulatory and policy options** that could take advantage of the carbon values of coastal marine ecosystems to achieve management goals.

Coordination - RAE is uniquely positioned to coordinate various regional coastal blue carbon initiatives, and is playing a critical role in **linking scientists, policy experts, and practitioners** across the country. RAE also coordinates with the international blue carbon community on science and policy issues.

Outreach and Education - RAE is **raising awareness of coastal blue carbon** opportunities through partner meetings, conference presentations, workshops, and more. RAE will continue to educate the coastal conservation and management communities about new tools and approaches as they emerge.

Future Needs - **Field demonstration** of the principles of coastal blue carbon would improve our understanding of its application and promote its value globally. RAE is leading a team to assess the potential contribution of coastal blue carbon in the Snohomish estuary, Puget Sound.

Partners - Mirroring its community-based approach to habitat restoration, RAE is grateful for the participation and support of **many partners**: AECOM, America's WETLAND Foundation, Climate Action Reserve, CA Coastal Conservancy, CH2M HILL, CA Ocean Protection Council, Center for Collaborative Policy, Clayton Fund, ConocoPhillips, Conservation International, Duke University Carbon Offsets Initiative, Entergy, Environmental Defense Fund, ESA PWA, GenOn Energy, KBR, International Union for the Conservation of Nature, LA Office of Coastal Protection and Restoration, MD Department of Natural Resources, National Estuarine Research Reserve System - Science Collaborative, NOAA Office of Habitat Conservation, SAIC, Silvestrum, The San Francisco Foundation, The Nature Conservancy, USDA Natural Resources Conservation Service, U.S. Geological Survey, Verified Carbon Standard, and U.S. Fish and Wildlife Service.

National Office
2020 N. 14th Street
Suite 210
Arlington, VA 22201
(703) 524-0248



RESTORE
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West Coast Office
5314 17th Ave, NW
Suite A
Seattle, WA 98107
(206) 624-9100