



RESEARCH BRIEF

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Blue Carbon Sequestration: Benefits for Sub-National Climate Policy

California could serve as a model for “Blue Carbon” policies and practices by using carbon sequestration in coastal habitats to achieve its ambitious climate goals.

Background

Sub-national actors are at the forefront of efforts to reduce global carbon emissions, especially in the United States as the Executive Branch previously signaled the intent to formally withdraw from the International Paris Agreement. The approach utilized by sub-national entities to incorporate carbon sequestration services — an important component to greenhouse gas (GHG) reduction efforts — into their climate policies can ultimately serve as a model for the development of future policies at sub-national and national levels.

California is a prime example of a state with legal, statutory and regulatory frameworks offering clear opportunities for incorporation of carbon sequestration services in management practices across multiple agencies. For example, the state has a commitment to 100% zero-carbon electricity generation by 2045 and a GHG emissions reduction target of net zero emissions by 2045, a goal which will almost certainly require California to take advantage of negative emissions opportunities. However, to date, there has been little formal consideration of blue carbon (carbon sequestered by coastal vegetation) in policy in California or more broadly at sub-national and national levels.

POINTS FOR POLICY MAKERS

- ▶ **Greater inclusion of blue carbon in decision-making offers California the potential to become a global leader by creating new pathways for sub-national governments to lead climate mitigation efforts.** The use of a country or state’s natural assets, such as coastal ecosystems which sequester large amounts of carbon, could be included in the quantification of their GHG emissions or at the international climate negotiation level allow for more ambitious nationally determined contributions (NDCs) and/or an increase in the ambition of climate action.
- ▶ **Accessible information about carbon sequestration in coastal habitats can be directly incorporated into existing policy frameworks at the sub-national scale and can serve as a model for the development of future policy approaches for negative emissions technologies.** Carbon modeling and mapping is currently limited by a lack of site-specific information on local carbon sequestration. This limitation underscores the need for additional research to build more robust estimates of carbon sequestration and improve future modeling efforts.
- ▶ **Identifying prime areas of carbon sequestration can assist managers in prioritizing locations for conservation, restoration and climate adaptation actions to manage overall carbon budgeting while also mitigating climate threats.** Estimates of carbon sequestration of tidal marsh and potential monetary values can help inform what types of policy pathways can be used to integrate blue carbon habitats into broader planning by the state of California.



One barrier to advancing blue carbon sequestration into policy-frameworks is the availability of easily accessible data on rates of carbon sequestration from coastal habitats. To overcome this challenge, researchers affiliated with Stanford University estimated the economic value of total sequestered carbon at three study locations on the California coast to illustrate the role of blue carbon habitats in meeting policy objectives. These locations — Humboldt Bay, Elkhorn Slough and the Tijuana River Estuary — represented a range of coastal habitats including marshes, tidal basins and estuarine environments.

Across the three case study locations, the total marsh extent (area in hectares) was the largest driver of carbon sequestration, while restoration of small areas with high sequestration rates was generally comparable to the sequestration of existing marshes. Results from the analysis suggest that tidal marshes in Elkhorn Slough will sequester between 369,000 and 747,000 tonnes of carbon between 2016 and 2100. If we protect and maintain this coastal habitat, blue carbon sequestration services could be worth \$4.8 million to \$9.7 million in California's carbon market by 2100. Field work focused on collecting additional carbon sequestration measurements are important for refining future estimates of the blue carbon market value.

Ultimately, mapping, measuring and valuing coastal habitats can more explicitly define the role of blue carbon in climate mitigation policy at both the sub-national and national scales helping governments to achieve their GHG emissions targets and commitments to the 2015 Paris Agreement.

This brief is based on the paper “**Incorporating blue carbon sequestration benefits into sub-national climate policies**” written by L.M. Wedding, M. Moritsch, G. Verutes, K. Arkema, E. Hartge, J. Reiblich, J. Douglas, S. Taylor, A. Strong, and published in *Global Environmental Change*.



ABOUT THE AUTHORS



Eric Hartge

Eric Hartge is the research development manager at the Stanford Center for Ocean Solutions, an organization within the Stanford Woods Institute for the Environment.



Katie Arkema

Katie Arkema is a senior research scientist at the Natural Capital Project and the Stanford Woods Institute for the Environment.



James Douglass

James Douglass is the software lead for the Natural Capital Project.



Lisa Wedding

Lisa Wedding is a former Stanford Center for Ocean Solutions research associate and currently an associate professor at the University of Oxford.



Aaron Strong

Aaron Strong received his Ph.D. from Stanford's Emmett Interdisciplinary Program in Environment and Resources and is currently an assistant professor at Hamilton College.



Gregg Verutes

Gregg Verutes is a geospatial consultant for the Natural Capital Project and doctoral student in Marine Science, Technology, & Management at the University of Santiago de Compostela, Spain.

FOR MORE INFORMATION

Office of Policy & Engagement
Stanford Woods Institute for the Environment
woods-extaffairs@stanford.edu
woods.stanford.edu