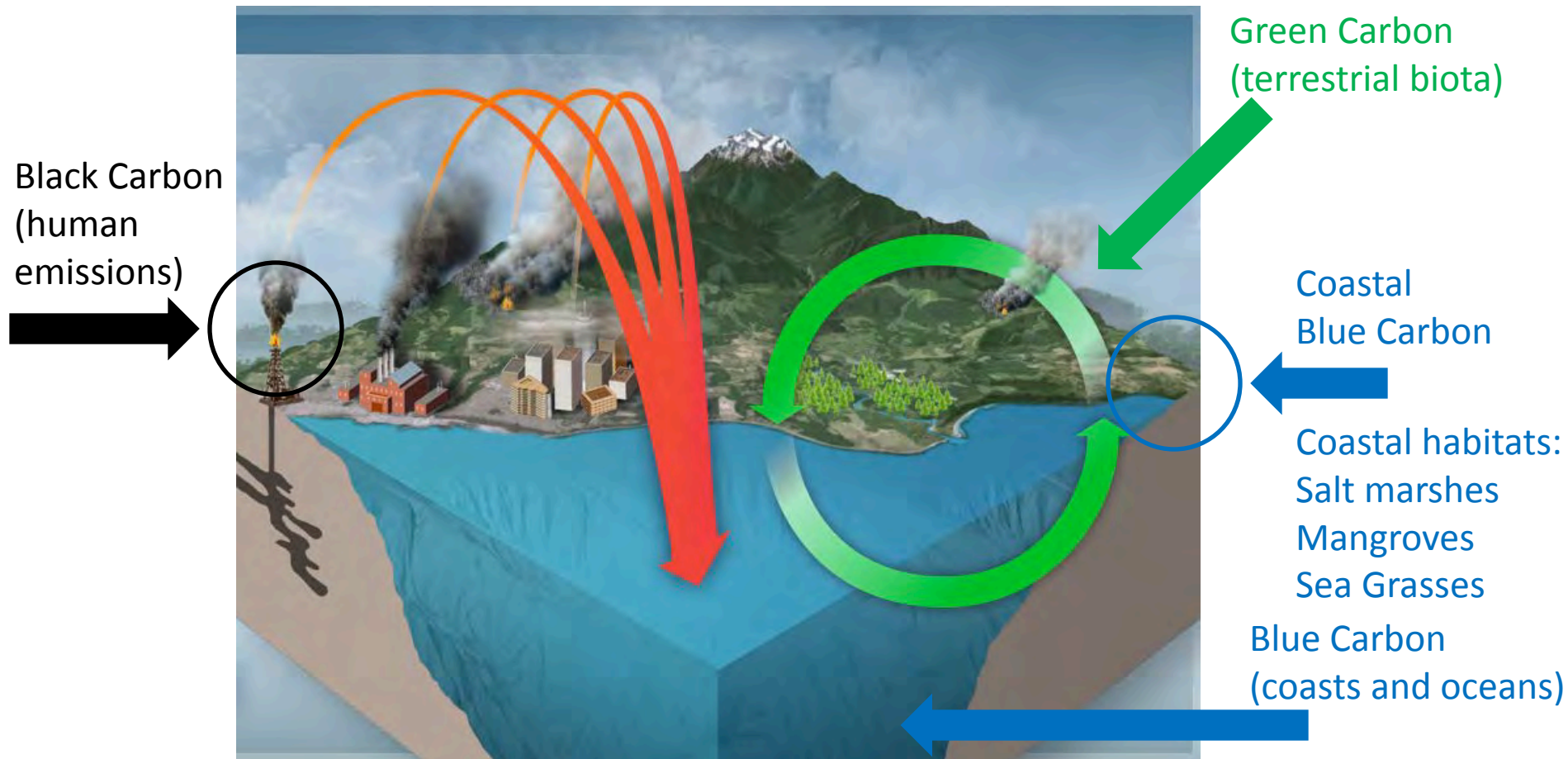


Coastal Blue Carbon Opportunities in U.S. Federal Policies:

Policy Pilots

Amber Moore and Dr. Ariana Sutton-Grier
ERT under contract to the National Oceanic and
Atmospheric Administration and University of
Maryland

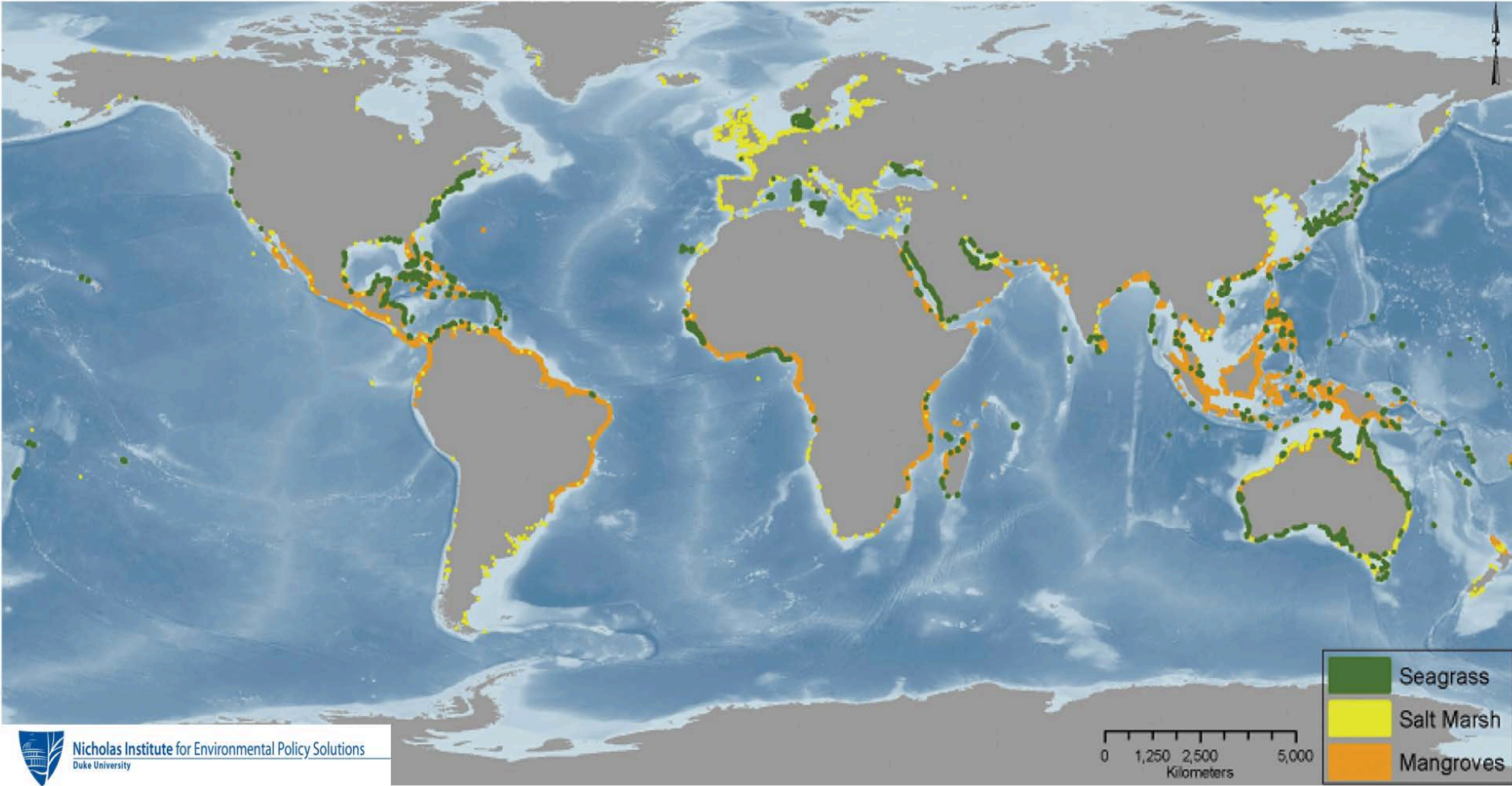
Our Changing Carbon Cycle



www.pmel.noaa.gov/co2/story/Research

Locations of Coastal Blue Carbon

GLOBAL DISTRIBUTION OF MANGROVES, SALT MARSHES AND SEAGRASSES

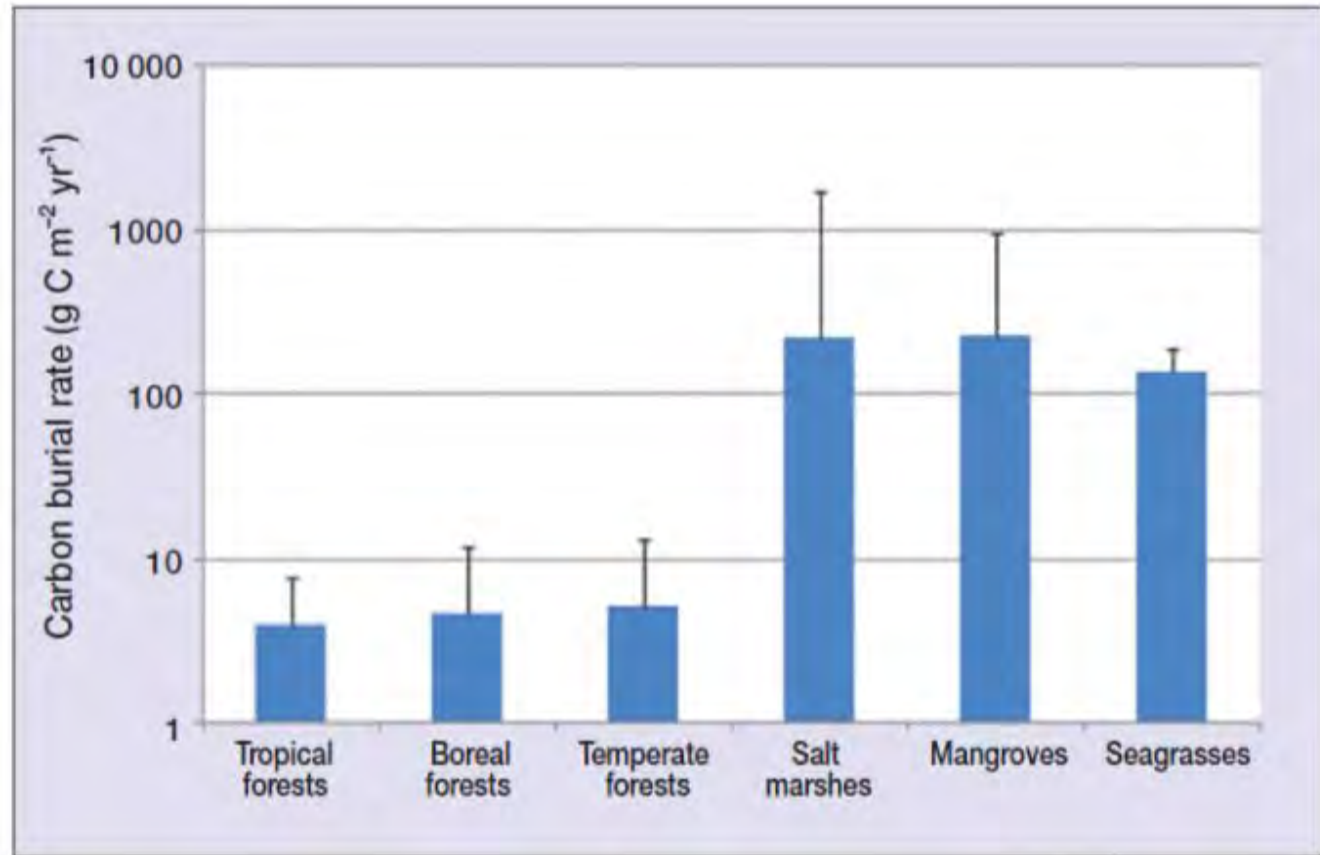


Pendleton et al. 2012



Coastal Habitats Sequester Carbon

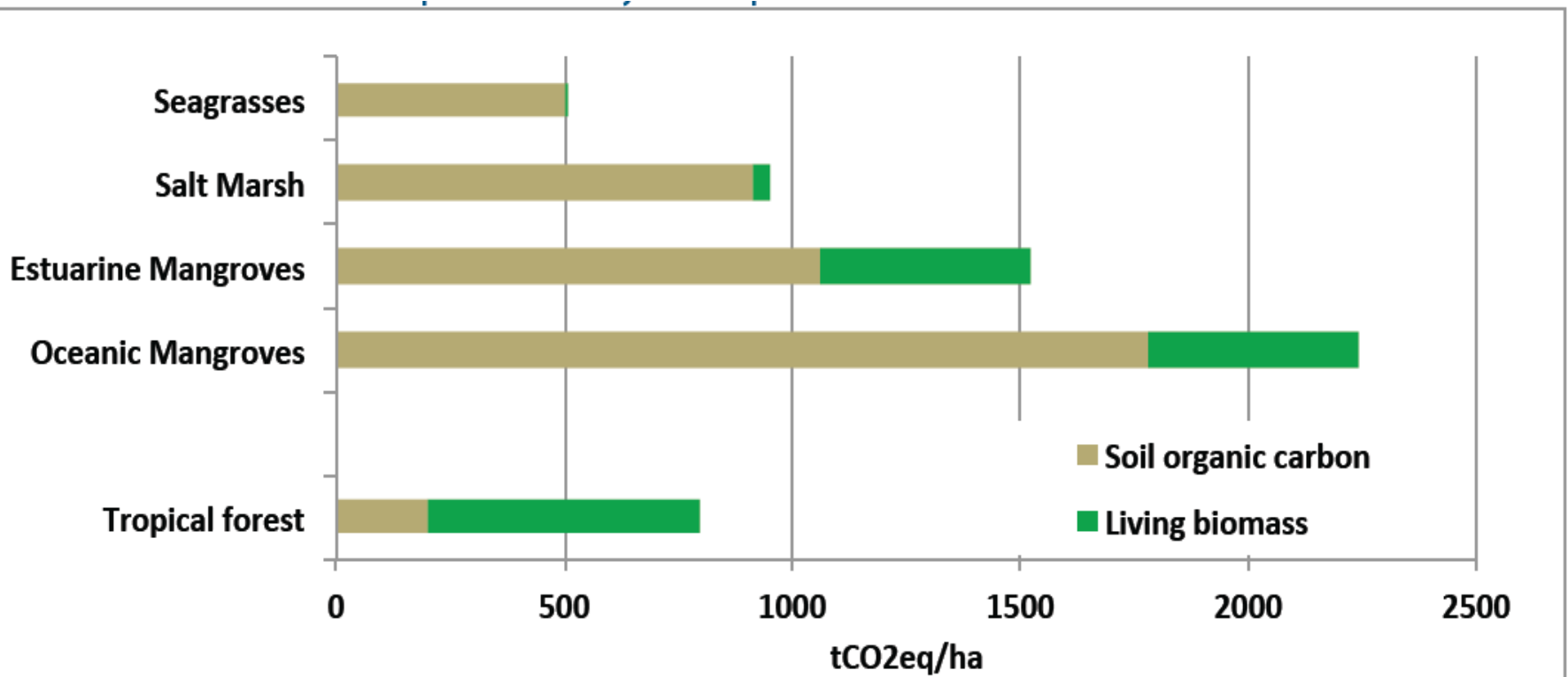
- Smaller total area, but much greater sequestration in coastal blue carbon habitats
- Coastal habitats ~equivalent annual sink to forest systems



McLeod et al. 2011. *Frontiers in Ecology and Environment*

Coastal Habitats Store Carbon

In coastal habitats, most carbon is stored in sediments and less in biomass



Source: Murray, Brian, Linwood Pendleton, W. Aaron Jenkins, and Samantha Sifleet. 2011. Green Payments for Blue Carbon: Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute Report. NI R 11-04.



Analysis of Federal Policies

- Examined where coastal blue carbon could be included in implementation of 6 policies including Clean Water Act, Natural Resources Damage Assessment, and Coastal Zone Management Act
- Determined: No new regulations needed; coastal blue carbon could be incorporated into implementation of all without statutory changes



Sutton-Grier et al. 2014. Marine Policy &
Pendleton & Sutton-Grier et al. 2013. Coastal Management



Common Limitations

- Guidance and procedures for estimating and valuing coastal carbon
- Capacity and expertise needed to quantify impacts of projects on carbon storage and sequestration
- Methodologies and tools for measuring and valuing carbon and expertise externally and within Federal agencies



Blue Carbon and Federal Policies

- **Incorporation of carbon services in these policies could lead to more habitat conservation (e.g., greater mitigation ratios or damage assessments).**



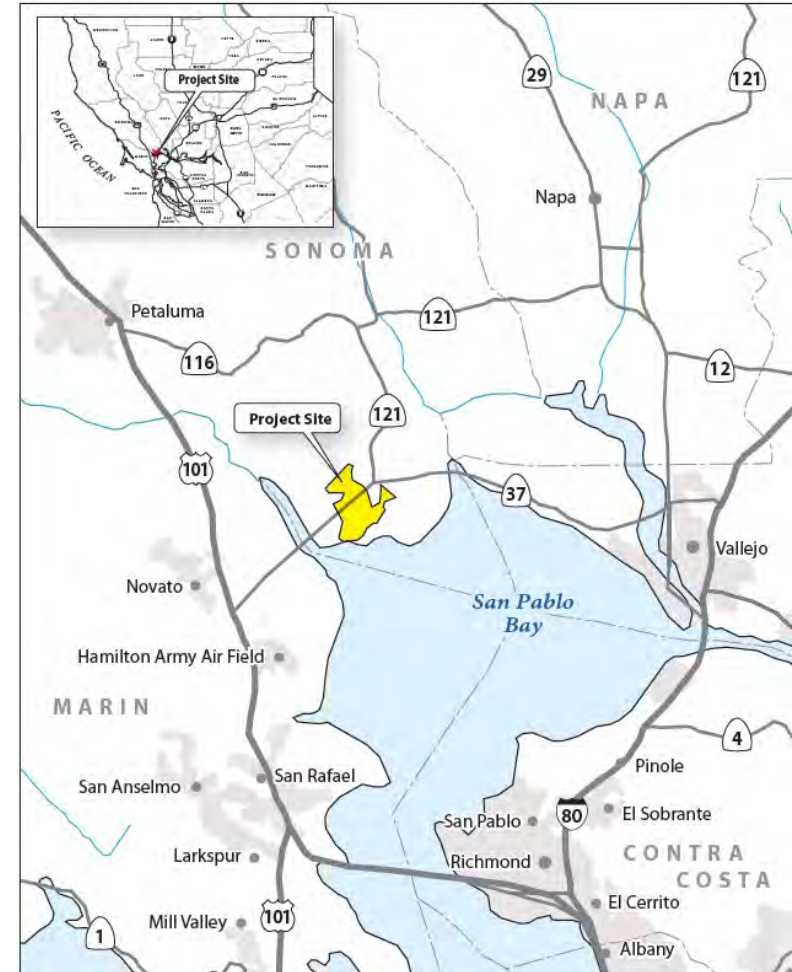
Sutton-Grier et al. 2014. Marine Policy &
Pendleton & Sutton-Grier et al. 2013. Coastal Management



National Environmental Policy Act

Sears Point Environmental Assessment

- Assesses potential impacts to the human environment associated with funding the restoration project
- Proposed Action: Facilitate restoration of ~960 acres of historic tidal marsh habitat in the San Francisco Bay region.
- Incorporated language on the carbon services of coastal habitats into the EA:
 - Affected Environment – Climate Section
 - Environmental Impacts – Climate – **Proposed Action Alternative Section**

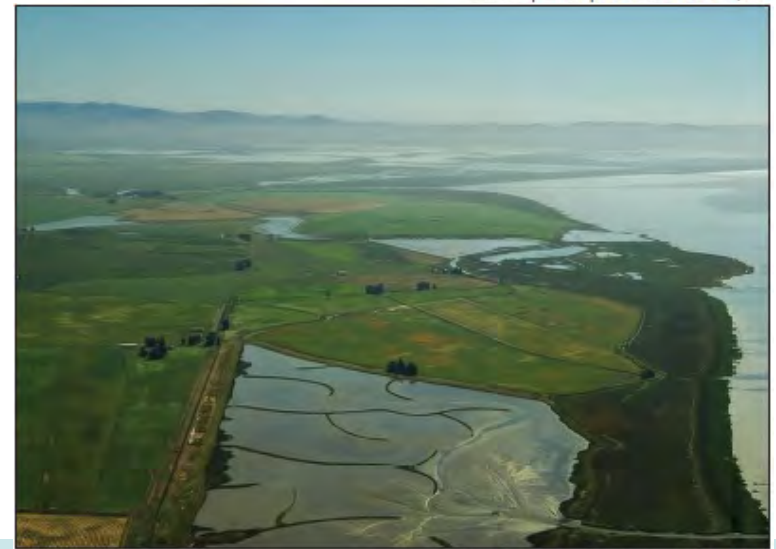


Sears Point Environmental Assessment

- Blue carbon is considered as another benefit of restoration
- Blue carbon part of the alternatives discussion
- Sets precedent for future NEPA documents
- Final Environmental Assessment was approved in September
- What's next?



Credit: Stephen Joseph for Sonoma Land Trust, 2004



Credit: Stephen Joseph for Sonoma Land Trust, 2004

National Environmental Policy Act: PEIS

Programmatic Environmental Impact Statement (PEIS)

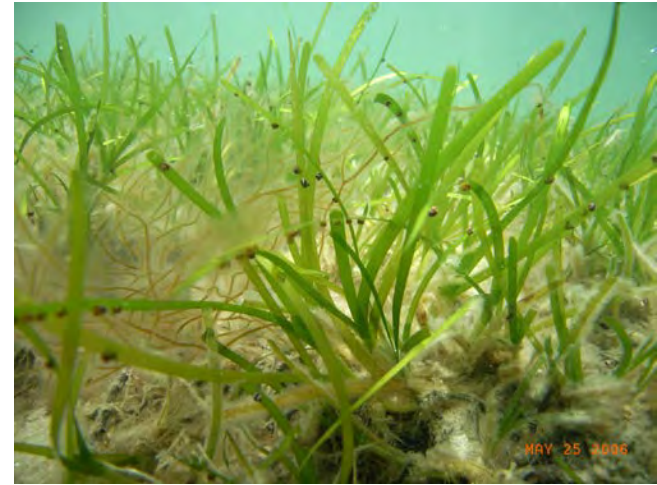
- Goal: Improve and streamline NEPA process for NOAA restoration projects
- Includes common, effective restoration approaches for coastal and marine resources under NOAA trusteeship
- Evaluates potential impacts to human and natural environment of implementing these approaches.



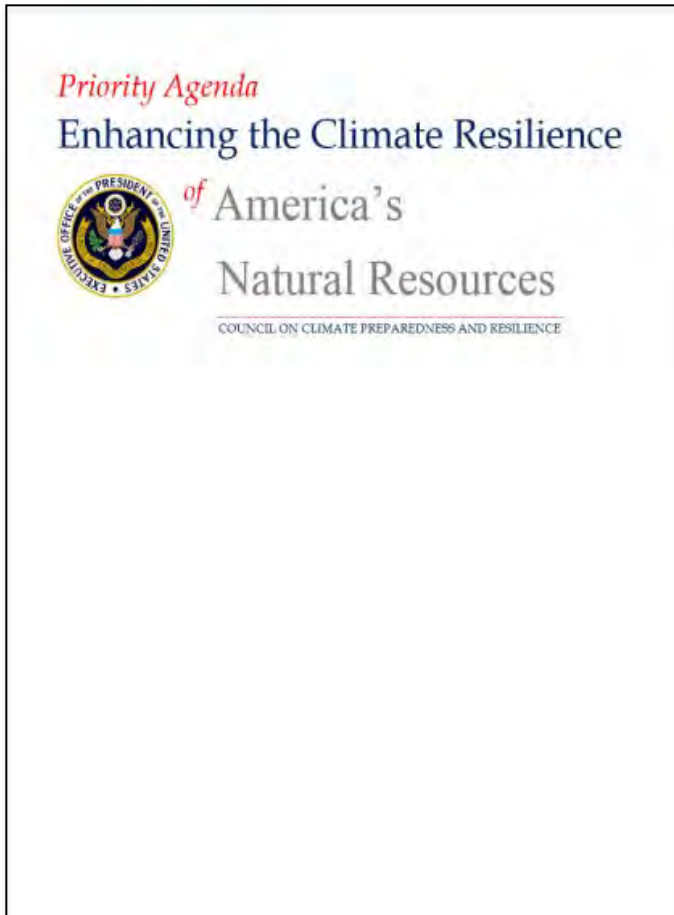
Matthew D Potenski/Marine Photobank

Programmatic Environmental Impact Statement: Blue Carbon

- Incorporated language on blue carbon:
 - Affected Environment – Water Resources Section
 - Environmental Consequences Section
- Blue carbon not just considered in the impacts of a project but also in the alternatives discussion → can impact decision process and outcome
- Success that blue carbon is included in this document → becoming more institutionalized within how NOAA's RC approaches the NEPA process
- PEIS will go out for public review soon



Other Federal Interest



Key Themes and Commitments Moving Forward:

This *Agenda* identifies four priority strategies to make the Nation's natural resources more resilient to a changing climate. For each strategy, the *Agenda* documents significant progress and provides a roadmap for action moving forward. Highlights of the key actions agencies will undertake in the near term to implement each of the four strategies are described below and in Table 1.



1. **Foster climate-resilient lands and waters** – Protect important landscapes and develop the science, planning, tools, and practices to sustain and enhance the resilience of the Nation's natural resources.

Key actions include the development of a Resilience Index¹ to measure the progress of restoration and conservation actions and other new or expanded resilience tools to support climate-smart natural resource management. Agencies will identify and prioritize landscape-scale conservation opportunities for building resilience; fight the introduction and spread of invasive species; and partner internationally to promote resilience within the Arctic. Throughout, agencies will evaluate resilience efforts to inform future actions.



2. **Manage and enhance U.S. carbon sinks** – Conserve and restore soils, forests, grasslands, wetlands, and coastal areas that store carbon. Maintain and increase the capacity of these areas to provide vital ecosystem services alongside carbon storage such as clean air and water, wildlife habitat, food, fiber, and recreation.

Key actions include the development of improved inventory, assessment, projection and monitoring systems for important carbon sinks and the development of estimates of baseline carbon stocks and trends to inform resource management. A number of actions will secure the continued health of the Nation's natural resources that provide carbon biosequestration, including forests, agricultural lands, and inland and coastal wetlands.

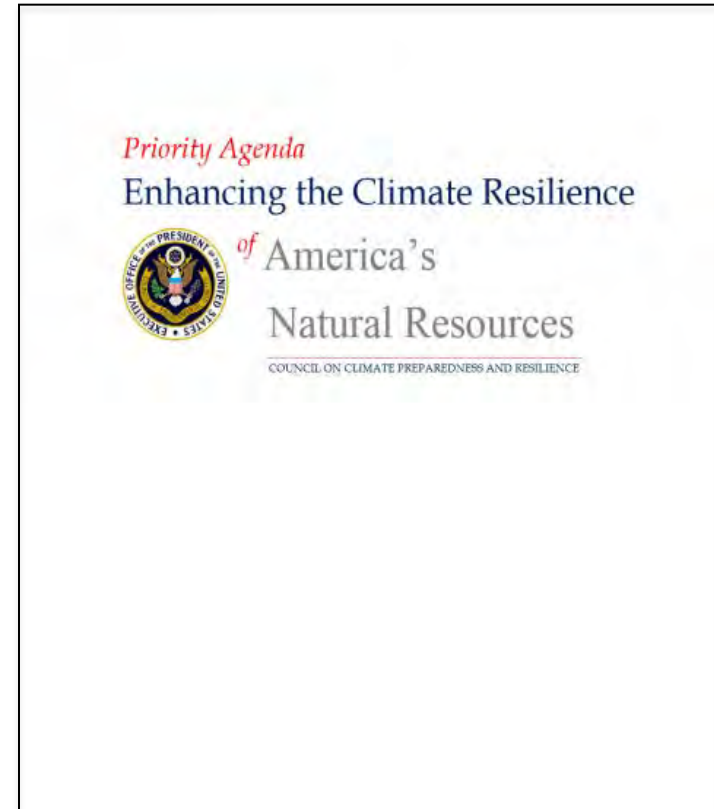


3. **Enhance community preparedness and resilience by utilizing and sustaining natural resources** – Harness the benefits of nature to protect communities from harm and build innovative 21st century infrastructure that integrates natural systems into community development.

Federal agencies will take action to encourage investment in natural infrastructure to improve resilience and enhance natural defenses through new federal guidance on ecosystem services assessment, an actionable research agenda, rigorous program evaluation, and expanded decision support tools and services. Federal agencies will increase assistance to states, tribes and localities interested in pursuing green stormwater management solutions and will expand partnerships that reduce wildfire risk and protect critical drinking water supplies, promote irrigation efficiency and water efficiency.

Priority Agenda: Blue Carbon Actions

- Improve understanding of carbon storage and cycling in coastal ecosystems
- Determine the value of protecting coastal habitats to safeguard carbon services
 - Tampa Bay Project



Conclusions: Policy Pilot Efforts

1. Approach: Capitalize on any interest or opportunity, building on previous activities
2. Work with willing partners (NEPA, Resilience Council, etc.)
3. Biggest policy hurdle, translating the science into useable guidance and tools for implementation for those who aren't wetland carbon experts



Matthew D Potenski/Marine Photobank

Additional Coastal Blue Carbon Info & Websites

- RAE VCS Methodology
 - <http://www.v-c-s.org/news-events/news/new-tidal-wetlands-restoration-methodology-released-public-comment>
 - <http://www.v-c-s.org/methodologies/methodology-tidal-wetland-and-seagrass-restoration>
- RAE Snohomish Study
 - <http://www.estuaries.org/landmark-coastal-blue-carbon-report-released.html>
- NOAA NERRS project
 - <http://wbnerwetlandscarbon.net/>
- UNEP Blue Carbon Info Pages
 - <http://bluecarbonportal.org/>
 - <http://bluecarbonblog.blogspot.com/>
- GEF Blue Forests Project
 - <http://www.grida.no/marine/activities/blue-carbon.aspx>
- NOS Podcast on Blue Carbon
 - <http://oceanservice.noaa.gov/podcast/may14/mw124-bluecarbon.html>





Questions?

amber.moore@noaa.gov and ariana.sutton-grier@noaa.gov

For more information see:

<http://www.habitat.noaa.gov/coastalbluecarbon.html>