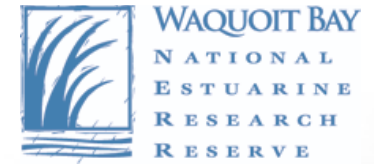




Capitalizing on Coastal Blue Carbon

The Conference Center at Massasoit Community College | May 12-13, 2015



Climate and Coastal Resilience National Policy Opportunities for Coastal Blue Carbon

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U.S. Policy: Federal Policies

- Examined where coastal blue carbon could be included in implementation of:
 - Clean Water Act, Natural Resources Damage Assessment, Coastal Zone Management Act, and National Environmental Policy Act
- Determined:
 - Carbon services are not currently included but should be
- **Incorporation of carbon services in these policies could lead to more habitat conservation and climate mitigation**
- Policy Pilots: Sears Point NEPA EA and Programmatic Environmental Impact Statement



Sutton-Grier et al. 2014. Marine Policy and Pendleton and Sutton-Grier et al. 2013.

U.S. Policy: Other Federal Interest

Priority Agenda

Enhancing the Climate Resilience



of America's

Natural Resources

COUNCIL ON CLIMATE PREPAREDNESS AND RESILIENCE

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.

Priority Agenda Blue Carbon Actions



- Improve understanding of carbon storage and cycling in coastal ecosystems
 - Baseline assessment
 - Partnering with Restore America's Estuaries (RAE)
 - Data to do at minimum a Tier 1 assessment of coastal wetlands to include in our national greenhouse gas inventory
- Determine the value of protecting coastal habitats to safeguard carbon services
 - Partnering with RAE on Tampa Bay Landscape Assessment Project

U.S. Policy: Carbon Market Activities

- NOAA partnered with Restore America's Estuaries to identify opportunities for wetland restoration in **voluntary carbon markets**
 - Developed VCS methodology to make restoration projects eligible for carbon credits,
 - Should be approved by mid-2015
 - Landscape assessments of restoration potential of estuaries
 - Snohomish estuary assessment found full watershed restoration = 8.4 million tons of CO₂
 - Tampa Bay estuary assessment, completion in ~Fall 2015



International Policy: Commission on Environmental Cooperation

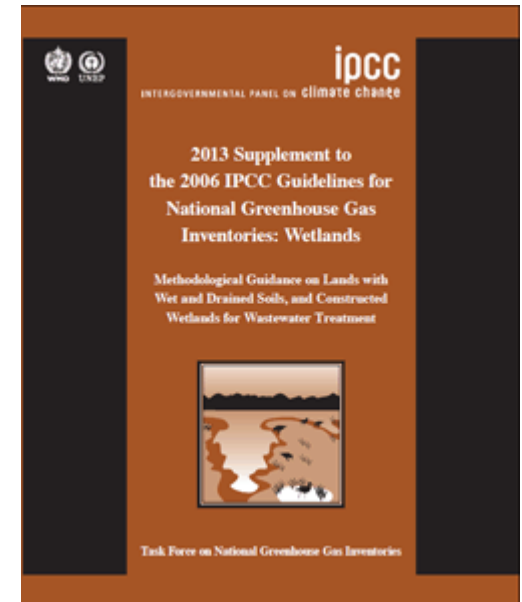


Photo: CEC

- CEC: partnership with Canada and Mexico
- Funded first blue carbon grant 2013-2015
- New grant starting in July 2015
 - Seagrass mapping and carbon measurements (potential funding opportunities here)
 - Policy opportunities in all three countries
 - Support development of a VCS conservation methodology

International Policy: IPCC 2013 Wetlands Supplement

- Previous greenhouse gas guidance from 2006 did not include wetlands
- 2013 Wetlands Supplement provides Parties with guidance on how to include emissions from wetlands in their inventories
- Not a requirement – Parties are encouraged to gain experience in implementing guidelines and report back by 2017
- U.S. is working to include coastal wetlands in national greenhouse gas inventory by Fall 2016, NOAA and RAE baseline assessment in 2015 to get data to support this effort



International Policy: UNFCCC Mechanisms

- Three Mechanisms with Potential:
 - Reduced Emissions from Deforestation and Degradation (REDD+)
 - Clean Development Mechanism (CDM)
 - National Appropriate Mitigation Actions (NAMAs)
- REDD+ provides financial incentives to protect forest carbon reservoirs in developing countries (avoid emissions) and CDM develops projects to reduce emissions and can sell credits (emission credits)
 - Mangroves can already be included; seagrasses and salt marshes not included
 - Both soil and biomass carbon can be included
 - Each country defines for itself what constitutes a “forest”
- NAMAs Mechanism to assist developing countries in reducing greenhouse gas emissions
 - Countries define what mitigation actions are included
 - Lots of flexibility with funding these projects
 - All three blue carbon ecosystems could be included



Above Photo: S. Crooks



Regional Policy Development: California AB 32



Elkhorn Slough, CA

- 2006, “Global Warming Solutions Act”, 1990 emissions levels by 2020
- Using variety of approaches including policies, regulation, and market approaches
- Cap and trade program began in 2012, can offset 8% of compliance requirements using offsets
- Current offsets: forestry, dairy digesters, and destruction of ozone-depleting substances, proceeds go into Greenhouse Gas Reduction Fund
- CA committed to fund \$50 million for wetland restoration projects, 12 projects just announced (\$21 million) including 2 salt marsh projects

Coastal Resilience Policy: Natural Infrastructure



- Post-Sandy, growing interest in role of natural/green infrastructure to improve coastal resilience
- Using ecosystems or a combination of green and gray/built approaches (termed “hybrid”) for storm and erosion protection
- Includes marshes, mangroves, reefs, beaches, dunes, barrier islands

State of Knowledge: Green Infrastructure

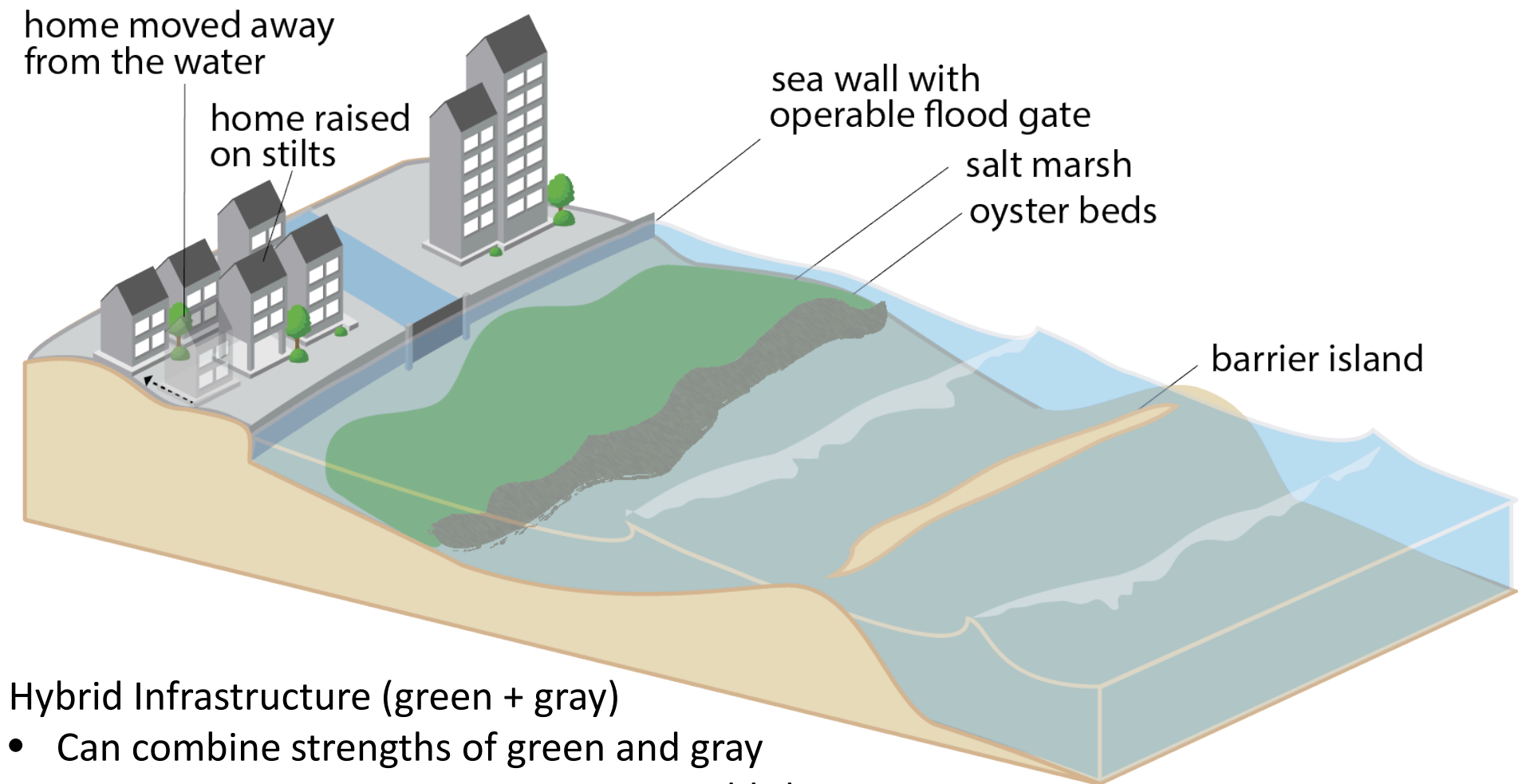
- Area of natural ecosystem is one factor that influences amount of storm and erosion protection
- But even narrow bands of wetlands or coral reefs can significantly reduce wave heights
- Benefits include:
 - Natural systems can strengthen with time
 - Can be self-maintaining, has potential for self-repair after storms
 - Can grow and keep pace with sea level rise
 - Can be more cost-effective than built approaches
 - Provides benefits all the time, including carbon storage



Sutton-Grier et al. 2015



Hybrid Approach



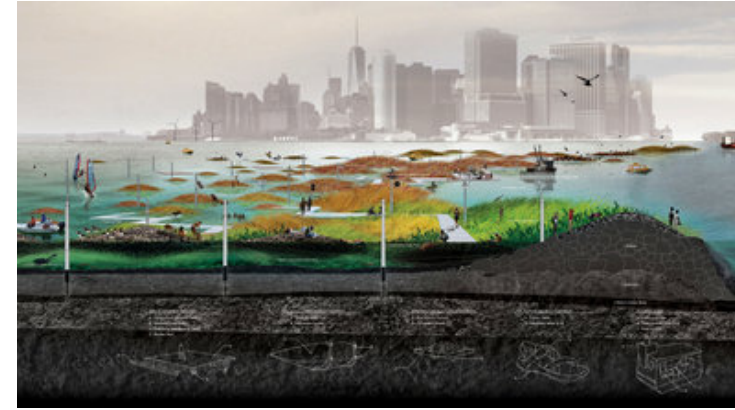
Hybrid Infrastructure (green + gray)

- Can combine strengths of green and gray
- Can use gray to protect green as it establishes
- Can mimic natural design with gray construction

Sutton-Grier et al. 2015

Interest in “natural/green and hybrid infrastructure” for storm protection

- “Protecting the city, before next time” New York Times, Nov. 3, 2012
- Big U project for downtown NY, one winner of Rebuild by Design contest
- Coastal blue carbon habitats, a lot more than just carbon sinks
- Blue carbon community can capitalize on this interest in green/hybrid to promote coastal restoration and protection projects



Blue Carbon Research Needs

- Better, regionally-specific estimates of carbon sequestration, storage, and emissions from salt marsh, mangroves, and seagrasses
- Mapping: Seagrass extent and condition, and salt marsh
- Emissions from degraded coastal ecosystems including fate of carbon in drowned wetlands



Blue Carbon Research Needs

- Fate of carbon in ecosystems that are shifting (such as mangrove expansion north or salt marsh encroachment on maritime forest)
- How quickly carbon services are restored?
- How much coastal restoration is possible in the U.S.?



Looking Ahead

- Impressive progress in last 5 years
- Positive outlook for next 5-10 years
- Joint effort to move science and policy forward



Progress! BBC News Story 5/12/15

[Science & Environment](#)

Sri Lanka first nation to protect all mangrove forests

By Mark Kinver
Environment reporter, BBC News

5 hours ago | [Science & Environment](#)



Sri Lanka has lost an estimated 76% of its mangrove forests over the past 100 years

Sri Lanka has become the first nation in the world to comprehensively protect all of its mangrove forests.

A scheme backed by the government will include alternative job training, replanting projects and microloans.

Mangroves are considered to be one of the world's most at-risk habitats, with more than half being lost or



Questions?

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For more information see:

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

<http://oceanservice.noaa.gov/podcast/may14/mw124-bluecarbon.html>

Other benefits of blue carbon ecosystems: habitat, recreation, storm and erosion protection

