An Introduction to Coastal Blue Carbon Concepts

Stefanie Simpson, Baton Rouge, LA
June 2016
Our mission is to preserve the nation’s network of estuaries by protecting and restoring the lands and waters essential to the richness and diversity of coastal life.

www.estuaries.org
National Summit

December 10 – 15, 2016
Hilton Riverside in New Orleans, LA

Registration is now open!

www.estuaries.org/summit
Gratitude
What Is Blue Carbon?

“Blue Carbon”

the greenhouse gases (GHGs) stored in, sequestered by, and released from coastal marine ecosystems such as seagrasses, mangroves, salt marsh, forested tidal wetlands, and other tidal wetlands.

Goal: Increase public and private investment in coastal habitat restoration and conservation.
Why Blue Carbon
Wetlands can remove >10 times more CO$_2$ per hectare

Source: Mcleod et al. (2011)
Primary carbon storage in soils, where it can remain for centuries

Carbon Storage, Global Averages

- **Seagrass**
- **Salt Marsh**
- **Mangroves**
- **Tropical Forest**

Source: Pendleton et al. (2012) and Pan et al. (2011)

Soil carbon values for 1st meter of depth only (total depth = several meters)
Carbon loss

- Global habitat loss 0.7-7% per year
- Half a billion tons CO$_2$ released annually (equivalent to Canada’s yearly emissions)
Why Blue Carbon

Tidal Wetland Restoration Progress

• Minimum 1.5 million acres of tidal wetland losses among 28 NEPs – a low estimate

• Combined goals of NEPs to restore ~650,000 acres

• 4 year average reported restoration is ~7,000 acres – barely 1% of the goal

• Average coastal wetland losses of 80,000 acres/year
RAE Blue Carbon Strategy

Introduction into Carbon Markets
  VCS Requirements
  Restoration Methodology
  Conservation Methodology
  Demonstration projects

Explore Policy and Regulatory Options
  National Accounting, e.g.

Support Science
  Tampa Bay and Snohomish Assessments
  Bringing Wetlands to Market project

Coordinate Blue Carbon Initiatives
  National and Regional Working Groups

Raise Awareness and Build Capacity
Carbon Markets

• CO₂ and other GHGs are global pollutants

• GHGs measured in discrete units – tons of CO₂ eq

• All GHGs \(\equiv\) CH₄ GWP of 21 to 34, N₂O GWP of 310

• Market defines = all payments for third-party emissions reductions, called “offsets”

• Either regulatory (“compliance”) or voluntary
Voluntary Carbon Market

• **Standards** for offset quality and integrity
  • General requirements and guidance on GHG accounting
  • Procedures for validation and verification

• **Registries** ensure credits are tracked, retired, prevent double-counting

• **Methodologies** provide step-by-step requirements for estimating and monitoring emissions following accepted, scientific good practice
**Voluntary Carbon Market**

- $78 million in N. America - 2013
- Anticipated growth of 300% by 2020
- 45% of offsets are from forestry/land use
- Verified Carbon Standard largest issuer, 47%


- **Forestry and land use**
  - 45%
  - $126 M

- **Renewables**
  - 31%
  - $46 M

- **Household device**
  - 11%
  - $56 M

- **Energy efficiency and fuel switch**
  - 6%
  - $28 M

- **Methane**
  - 4%
  - $10 M

- **Gases**
  - 2%
  - $4 M

- **Other**
  - 2%
  - $4 M

*Bubble size: Volume  Percentage: Market share  $: Market value*
Are Wetland GHG Offsets Attractive?

- Tidal wetland and seagrass restoration creates “co-benefits”
- Climate mitigation and corporate social responsibility are primary reasons to buy
- AFOLU offsets sell at a premium
- Wetlands offsets could be highly charismatic in the marketplace

“We like projects that have co-benefits and side benefits in addition to just pure GHG benefits… and we’re really drawn to reforestation projects in particular that have watershed protection, habitat rehabilitation as well as a GHG component.” – Bob Antonoplis, Assistant General Counsel for The Walt Disney Company
Wetland Methodologies

- Coastal Wetland Creation (VCS) – LA CPRA
- Restoration of Degraded Wetlands of the MS Delta (ACR) – Tierra Resources
- Global Tidal Wetland and Seagrass Restoration Methodology (VCS) – RAE
- Global Tidal Wetland and Seagrass Conservation Methodology – initiated by RAE
## Voluntary Carbon Market

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real</td>
<td>Demonstrate that reductions have actually occurred</td>
</tr>
<tr>
<td>Additional</td>
<td>Ensure reductions result from activities that would not happen in the absence of a GHG market</td>
</tr>
<tr>
<td>Permanent</td>
<td>Mitigate risk of reversals</td>
</tr>
<tr>
<td></td>
<td>Verify reductions ex-post</td>
</tr>
<tr>
<td>Verified</td>
<td>Provide for independent verification that emission reports are free of material misstatements</td>
</tr>
<tr>
<td>Owned unambiguously</td>
<td>Ownership of GHG reductions must be clear</td>
</tr>
<tr>
<td>Not harmful</td>
<td>Avoid negative externalities</td>
</tr>
<tr>
<td>Practicality</td>
<td>Minimize project implementation barriers</td>
</tr>
</tbody>
</table>
Activities with Potential GHG Benefits

- **Restoration** of tidal wetlands and seagrasses
- **Creation** of tidal wetlands (e.g. beneficial use)
- **Conservation/avoided loss** of existing tidal wetlands and seagrass beds
Goal of Carbon Management (Mitigation)

Source: Forest Trends
Habitats – all tidal wetlands and seagrasses, globally

Eligible Activities
• Restoration via enhancing, creating and/or managing hydrological conditions, sediment supply, salinity characteristics, water quality and/or native plant communities.

Additionality
• Standardized approach: In U.S., all voluntary tidal wetland and seagrass restoration is additional!
• Non-U.S. projects case-by-case
Summary of First Project Steps

A feasibility assessment to determine a potential blue carbon project’s suitability and anticipated GHG benefit.

**Technical feasibility** – assessment of the best restoration practices, anticipated GHG benefits, available methodologies, land suitability, project boundary, additionality, and permanence.

**Financial feasibility** – estimate of income and expenses, stakeholders, financial flows over project lifetime, potential for grouping and best practices for structuring carbon finance.

**Legal and institutional feasibility** – carbon and land rights, taxation issues, relevant regulatory requirements, and transactional structures.
Blue Carbon Toolbox

METHODOLOGY FOR TIDAL WETLAND AND SEAGRASS RESTORATION

Title: Methodology for Tidal Wetland and Seagrass Restoration
Version: 0.1
Date of Issue: 27 January 2014
Type: Methodology
Sectoral Scope: 14. Agriculture Forestry and Other Land Use (AFOLU)
Region/s: Europe-Africa, Asia, Oceania
Prepared by: Restoring America’s Estuaries, 800 10th St. NW, Suite 700, Washington, D.C. 20001, USA

Contact:
Eric Eichenlaub
Email: eeric@restoringestuaries.org
Tel: +1 720-305-3194

Restoration Methodology

Coastal Blue Carbon in Practice

A Manual for Using the VCS Methodology for Tidal Wetland and Seagrass Restoration V60033
2015 V1.0

Coastal Blue Carbon
Methods for assessing carbon stocks and emissions factors in mangroves, tidal salt marshes, and seagrass meadows

The BLUE CARBON Initiative

These resources and more at
www.estuaries.org/bluecarbon-resources
Herring River Restoration, Cape Cod National Seashore – carbon project feasibility study

- Begins early 2016

- NERRS SC Phase II, NOAA OHC, Friends of Herring River
Blue Carbon Science

Snohomish Estuary, Puget Sound, WA

- Current restoration plans: 2.55 million tons CO\(_2\) 1-year emissions 500,000 cars
- Full restoration 4700 ha: 8.9 million tons CO\(_2\) 1-year emission 1.7 million cars

https://www.estuaries.org/bluecarbon-science
Tampa Bay Assessment

- 74 mil metric tons (160,000 cars/year) by 2100
- Modeled habitat change due to SLR
- Mgmt recommendations:
  - Allow habitat to accrete
  - Conserve upland
  - Prioritize vulnerable areas
  - Maintain water quality
Bringing Wetlands to Market

- Quantify GHG emissions and C sequestration in salt marshes
- Understand processes to predict fluxes with change
- Develop user-friendly model for managers and policy makers
- Develop market tools
- **Assess carbon project feasibility for Herring River restoration**

http://www.waquoitbayreserve.org/research-monitoring/salt-marsh-carbon-project/
Blue Carbon Policy

White House Commitments

• Develop Estimates of Baseline Carbon Stocks and Trends to Inform Federal Natural Resources Management: use the best-available information and methods to develop baseline estimates of carbon stocks and trends at local or regionally-appropriate levels for lands and coastal wetlands

• Assess, Restore, and Protect Coastal Habitats to Understand and Enhance the Storage of Blue Carbon:
  – National Accounting (NOAA and EPA)
  – Determine the value of protecting coastal habitats to safeguard carbon services (NOAA, FWS, EPA and USGS)

Priority Agenda

Enhancing the Climate Resilience of America’s Natural Resources

Education and Capacity Building

National Working Group (BCNWG)
- Support network for project development and implementation

Publications, Webinars, Outreach
- Website and resources
- Frequent briefings
- Educational webinar series
- Publications, such as Blue Carbon in Practice Manual

Upcoming webinar **July 7**
Tampa Bay Findings
www.estuaries.org/bluecarbon-events
Education and Capacity Building

**Capacity Building**

- Series of workshops in the Gulf Coast supported by EPA, NOAA NERRS, NOAA OHC, USFWS Coastal Program
- Regional working groups
- Technical assistance for project development
- Advanced blue carbon workshop to conclude project (early 2017)
Better understand and promote ALL ecosystem services:

- Marine habitat and biodiversity
- Water quality
- Storm and flood protection
- Recreation & Tourism
- Support jobs and economy
- Climate change mitigation

Better understanding of these ecosystems to improve management & restoration & increase investment
Thank you!

Stefanie Simpson
Blue Carbon Program Coordinator
ssimpson@estuaries.org

www.estuaries.org/bluecarbon