MANAGING COASTAL BLUE CARBON ECOSYSTEMS –
THE MISSING SINKS AND SOURCES IN THE CLIMATE CHANGE
DEBATE

GLISPA Steering Committee Meeting
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Dorothée Herr, Marine Programme Officer, IUCN Global Marine and Polar Programme
What is Blue Carbon?

• *Blue Carbon* is the carbon sequestered and stored by coastal and marine ecosystems, or released when loss and degradation occur.

• Focus on coastal ecosystems:
  - Mangroves
  - Tidal salt marshes
  - Seagrasses
Why Blue Carbon?

• Advanced approaches and success for other ecosystems

• Carbon sinks and sources from the management (or mismanagement) of coastal ecosystems currently mostly unaccounted

• Sustainable management, the conservation and enhancement of sinks and reservoirs of all GHGs as part of the UNFCCC mandate

• Provide basis for incentives to conserve or restore

• Improved/sustainable resource management and regulation, community engagement & well-being, biodiversity
Coastal ecosystem benefits

- Carbon Sequestration/Storage
- Marine Biodiversity
- Coastal Water Quality
- Fish Nurseries
- Coastline and Beach Stabilization

Source: Forest Trend

- Climate Change Adaptation
- Sustaining Community Resilience and Coastal Livelihoods
Coastal habitats protect significant amounts of carbon

For Comparison:
- Seagrasses
- Tidal Salt Marsh
- Estuarine Mangroves
- Oceanic Mangroves

Mean soil organic carbon vs Mean living biomass

Sources: IUCN, Duke Nicholas Institute
## Rapid loss and degradation

<table>
<thead>
<tr>
<th>Coastal Habitat</th>
<th>Estimated Global Area (Mha)</th>
<th>Annual Loss</th>
<th>Total Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seagrass</td>
<td>60</td>
<td>2%</td>
<td>29%</td>
</tr>
<tr>
<td>Salt Marsh</td>
<td>5.1</td>
<td>2%</td>
<td>50%+</td>
</tr>
<tr>
<td>Mangrove</td>
<td>13.8-17</td>
<td>1.8%</td>
<td>35%</td>
</tr>
</tbody>
</table>
Substantial carbon emissions

- ‘Typical’ coastal wetland soil releases 0.1 million tons of CO₂ per km² for every depth meter of soil lost.
- Large deltas have each released over 1 billion tons of CO₂ due to land-use change.
- Continued release for decades.

Management actions

- Conservation – most effective
- Restoration
How big is Blue Carbon?

**Globally:**

~10-20% as big as REDD

<table>
<thead>
<tr>
<th>CO$_2$ Emissions</th>
<th>Mt/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>REDD</td>
<td>~4,000</td>
</tr>
<tr>
<td>Peat</td>
<td>~2,000</td>
</tr>
<tr>
<td>Blue Carbon</td>
<td>~300-900</td>
</tr>
</tbody>
</table>

**Nationally:**

Potentially more in coastal tropical countries

Sources: Pendleton et al., Friedlingstein et al.
What needs to be done?

• Comprehensive approach to coastal carbon management for climate change mitigation
• Scientific knowledge base and technical methods
• Policy and incentives mechanisms
• Explore climate change mitigation finance and other incentives for coastal Blue Carbon activities
• Create a comprehensive and coordinated global platform
International Blue Carbon Initiative

International Blue Carbon Science Working Group

International Blue Carbon Policy Working Group

International Network

Capacity Building practitioner training policy

Research

Pilot Projects

And other partners
International Blue Carbon Scientific Working Group

- Global Coastal Carbon Data Archive (GCCDA)
  - Support data management practices
  - Standardize data
  - Collate all available carbon data for coastal ecosystems.
  - Partnership with UNEP-WCMC

- Field Manual for Carbon Accounting
- Supporting IPCC process/guidelines
- Supporting key research (e.g. Emissions, Seagrasses)
- Providing scientific expert opinion for policy and planning

Minimizing Carbon Emissions and Maximizing Carbon Sequestration and Storage by Seagrasses, Tidal Marshes, Mangroves

Recommendations from the International Working Group on Coastal “Blue” Carbon

The natural coastal ecosystems of seagrasses, tidal marshes, and mangroves sequester and store large quantities of carbon in both the plants and in the sediment below them. If destroyed, degraded or lost these coastal ecosystems become sources of carbon dioxide emissions into the ocean and atmosphere. Much of this stored carbon in the plants and roots of these ecosystems remains intact for periods of years off and other processes in the ecosystem do not balance its rapid release into the oceans and atmosphere. Given the large quantity of carbon in coastal ecosystems relative to their area, these emissions are likely of global significance. This loss of a globally significant carbon pool is additional to the other recognized critical ecosystem services provided by coastal ecosystems.

Seagrasses, tidal marshes, and mangroves are being degraded and destroyed at a rapid pace along the world’s coasts. There is a need for active and effective measures to protect the large and vulnerable carbon pools stored in these systems, and to conserve and reestablish these carbon sequestration areas. Immediate steps can be taken now by coastal communities, managers, policy makers and the scientific community.

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Dr. Emily Pidgeon
epidgeon@conservation.org
International Blue Carbon Policy Working Group

• Provide guidance for Blue Carbon policy development that supports and finances management of coastal ecosystems for climate change mitigation

UNFCCC policy and financing processes

Other carbon finance mechanisms such as the voluntary carbon market

Blue Carbon demonstration projects

International, regional and national frameworks and policies, including coastal and marine frameworks and policies (CBD, Ramsar, MSP, ICZM, …)
Facilitate the inclusion into the accounting of ecosystem services

• Build integrated Blue Carbon Community supporting the implementation of priority activities
Island Opportunities

Demonstrate development and implementation of coastal wetland NAMA
- Support national data collection
- Reference emissions levels
- Assessing drivers of loss and degradation
- Access to Green Climate Fund

Research collaborations - scientific data on seagrass meadows
- Linkages between coastal mitigation and adaptation
- Integration into MPA, MSP, ICZM
- Capacity building, training
THANK YOU!

Dorothée Herr
dorothee.herr@iucn.org