The contribution of blue carbon ecosystems to climate change mitigation

Purpose
The purpose of this Briefing Note is to draw attention to the potential of blue carbon ecosystems – mangrove forests, tidal marshes and seagrass beds – to mitigate climate change through their carbon sequestration and storage functions. This Briefing Note also discusses the potential of the Convention on Wetlands, and its associated Strategic Plan for the Conservation and Sustainable Use of Wetlands, to promote and accelerate the implementation of blue carbon ecosystems, as well as the many other benefits they provide, contributing towards the Convention’s mission of providing the water and wetlands we need.

Background
The Briefing Note was prepared by the Scientific and Technical Review Panel (STRP) of the Convention on Wetlands, to support the STRP’s work in addressing the role of blue carbon ecosystems in the conservation and sustainable management of coastal wetlands. The Briefing Note, which is based on a develop concept of the role of wetlands in climate change mitigation, highlights the importance of blue carbon ecosystems in terms of carbon sequestration and the Convention’s efforts to promote their conservation and sustainable use.

Blue carbon ecosystems, specifically mangrove forests, tidal marshes and seagrass beds, are coastal wetlands that continuously take up atmospheric carbon dioxide, storing large amounts of this carbon in soils and sediments. The conservation and restoration of blue carbon ecosystems constitutes a nature-based approach to climate mitigation and adaptation, whilst also providing a range of other valuable ecosystem services.

Protection, management and restoration of blue carbon ecosystems can be strengthened through the designation of new Ramsar sites, enhanced management of existing sites and minimization of threats that lead to coastal wetland degradation and loss. Such actions can be included in Nationally Determined Contributions (NDCs) towards meeting the objectives of the Paris Agreement of the UN Framework Convention on Climate Change (UNFCCC). Continued effort is needed to address uncertainty about the extent of blue carbon ecosystems, which currently limits the ability of Contracting Parties to manage them effectively for climate mitigation and adaptation and account for their carbon uptake and emission.

Work by the STRP led by
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Provides knowledge on the extent and status of blue carbon ecosystems in Wetlands of International Importance and the contributions these ecosystems can make to climate change mitigation and adaptation.

Blue Carbon Definition

Under the Ramsar Convention, blue carbon is “the carbon captured by living organisms in coastal (e.g. mangroves, salt (intertidal) marshes and seagrasses) and marine ecosystems and stored in biomass and sediments”
Blue Carbon Ecosystems provide critical carbon storage in vegetation and in soils/sediments

83% of the global carbon cycle is circulated through the ocean. Coastal habitats cover less than 2% of the total ocean area, but account for approximately half of the total carbon sequestered in ocean sediments.

https://www.thebluecarboninitiative.org/
Globally, blue carbon ecosystems (BCEs) cover an estimated 49 million hectares.

However, and consistent with global data, BCEs located within Ramsar sites have not been fully mapped.
Most Ramsar sites had no spatial data (no digitized boundary) so >330 site boundaries were manually delineated.

- Mangroves (301 sites): Global Mangrove Watch- mangrove extent assessed at seven yearly intervals (Bunting et al. 2018)

- Intertidal Marshes (547 sites): partial spatial data coverage at 230 sites (Mcowen et al. 2017)

Distribution and Area (ha) of Mangrove Forests in Ramsar Sites

2016 mangrove area (ha)

- 1 - 500
- 500 - 1,000
- 1,000 - 10,000
- 10,000 - 50,000
- 50,000 - 100,000
- 100,000 - 473,000

GMW 2016
<table>
<thead>
<tr>
<th>Ramsar Region</th>
<th>1997 to 2016 change (ha)</th>
<th>% Change 1997 to 2016</th>
<th>Total C stock (soil + biomass; tC ha(^{-1}))</th>
<th>Total C loss 1997 – 2016 (million metric tonnes, MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>-31,299</td>
<td>-5%</td>
<td>399.51</td>
<td>-13.77</td>
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<tr>
<td>Asia</td>
<td>-15,537</td>
<td>-2%</td>
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<td>5,284</td>
<td>14%</td>
<td>522.84</td>
<td>1.92</td>
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<tr>
<td>Latin America &amp; Caribbean</td>
<td>-51,082</td>
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<td>514.81</td>
<td>-26.38</td>
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<tr>
<td>North America</td>
<td>-63,473</td>
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<td>353.53</td>
<td>-27.85</td>
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<tr>
<td>Oceania</td>
<td>-2,123</td>
<td>-1%</td>
<td>378.22</td>
<td>-0.81</td>
</tr>
<tr>
<td>Total</td>
<td>-158,230</td>
<td>-4%</td>
<td>432.6</td>
<td>--</td>
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</tbody>
</table>
Accurate global mapping of BCEs remains a significant gap in the understanding of the overall geographic coverage, particularly for intertidal marshes and seagrass beds.

Policy gaps need to be addressed, such as the inclusion of blue carbon ecosystems protection and restoration in Nationally Determined Contributions and as part of national greenhouse gas inventories.

BCEs are considered ‘hot-spots’ of carbon storage and they offer many other benefits, such as contributing to climate change adaptation, flood and shoreline protection, water quality protection.
Briefing Note 12 available via:
ramsar.org/about/strp-outputs

Thank you!