International Union for Conservation of Nature
ISSUES BRIEF
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NOVEMBER 2017

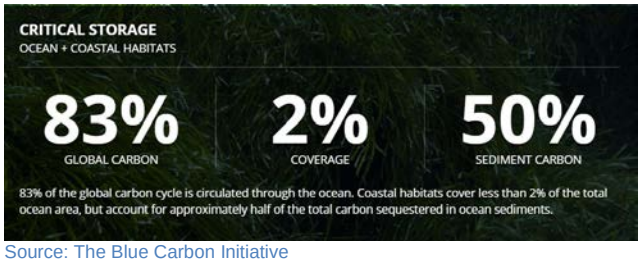
BLUE CARBON

- Blue carbon is the **carbon stored in coastal and marine ecosystems**.
- Coastal ecosystems such as mangroves, tidal marshes and seagrass meadows **sequester and store more carbon per unit area than terrestrial forests** and are now being recognised for their role in **mitigating climate change**.
- These ecosystems also provide **essential benefits for climate change adaptation**, including **coastal protection and food security** for many coastal communities.
- However, if the ecosystems are **degraded or damaged**, their **carbon sink capacity is lost or adversely affected**, and the **carbon stored is released**, resulting in **emissions of carbon dioxide (CO_2) that contribute to climate change**.
- **Dedicated conservation efforts** can ensure that coastal ecosystems continue to play their role as long-term carbon sinks.

What is the issue?

The **coastal ecosystems** of mangroves, tidal marshes and seagrass meadows contain large stores of carbon deposited by vegetation and various natural processes over centuries. These ecosystems sequester and store more carbon – often referred to as '**blue carbon'** – per unit area than terrestrial forests. The ability of these vegetated ecosystems to remove carbon dioxide (CO_2) from the atmosphere makes them significant **net carbon sinks**, and they are now being recognised for their role in **mitigating climate change**.

However, **if the ecosystems are degraded or damaged directly or indirectly by human activities, their carbon sink capacity is lost or adversely affected**, and the carbon stored in the soil is released, resulting in CO_2 emissions that contribute to climate change.



Source: The Blue Carbon Initiative

Why is this important?

Coastal ecosystems need to be conserved and restored as globally significant carbon sinks. Despite their small extent relative to other ecosystems, **they sequester and store globally significant amounts of carbon in their soil**. The ongoing destruction and loss of these systems contributes to additional human-induced greenhouse gases. Alongside tropical forests and peatlands, coastal ecosystems demonstrate how **nature can be used to enhance climate change mitigation strategies** and therefore offer opportunities for countries to achieve their emissions reduction targets and Nationally Determined Contributions (NDCs) under the Paris Agreement.

Additionally, these coastal ecosystems provide numerous benefits and services that are essential for **climate change adaptation**, including coastal protection and food security for many communities globally.

What can be done?

Conserving and restoring terrestrial forests, and more recently peatlands, **has been recognised as an important component of climate change mitigation**. Several countries are developing policies and programmes in support of sustainable development through initiatives that reduce the carbon footprint associated with the growth of their economies. These include **actions to conserve and sustainably manage natural systems** relevant to the United Nations Framework Convention on Climate Change (UNFCCC), including through the reducing emissions from deforestation and forest degradation in developing countries (REDD+) mechanism and Nationally Determined Contributions (NDCs).

These approaches can also apply to coastal systems – that contain rich carbon reservoirs. **Dedicated conservation efforts can ensure that coastal ecosystems continue to play their role as long-term carbon sinks**, by helping to ensure that no new emissions arise from their loss and degradation, whilst stimulating new carbon sequestration through the restoration of previously carbon-rich coastal habitats.

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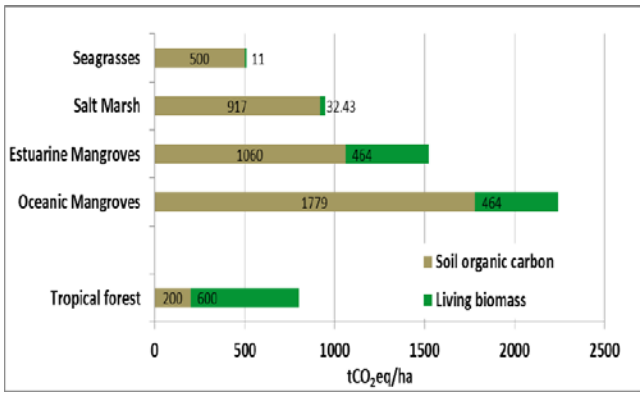

Global averages for carbon pools (soil organic carbon and living biomass) of focal coastal habitats. *Note: Tropical forests are included for comparison. Only the top metre of soil is included in the soil carbon estimates.*
Source: Murray, B.C. et al. (2011). *Green Payments for Blue Carbon*.

On an implementation level, mangroves, salt marshes and seagrasses can be included in **national accounting**, according to the *IPCC 2013 Supplement to the 2006 Guidelines for National Greenhouse Gas Inventories: Wetlands*.

Some technical elements need to be fully integrated into these mechanisms to value the full coastal carbon potential, e.g. accounting for soil carbon. An expansion of the implementation of programmes and projects around the world is also needed to **stop the ongoing loss of these ecosystems and curb resulting emissions**.

The management of marine ecosystems in the high seas as a climate mitigation option, and the use of the UNFCCC to incentivise better management action is currently an area of debate. These ecosystems either do not demonstrate globally relevant, long-term climate mitigation potential or have jurisdictional challenges related to the management and clear national carbon emissions or removals allocation. Further discussion and dialogue are now needed to analyse if, and how, an incentive mechanism for areas beyond national jurisdiction should be developed under the UN Climate Convention.

What is clear, however, is that an ecologically degraded ocean loses its capacity to support the carbon cycle and act broadly as a carbon sink. The management of marine ecosystems for a functioning ocean carbon cycle should therefore be strengthened under existing international, regional and **sectoral regulation and management regimes** such as through the Convention on the Conservation of Antarctic Marine Living Resources.

Marine Protected Areas (MPAs) and other area-based management efforts offer opportunities for no-regret climate change tools and are now needed more than ever for sustaining a functioning ocean which continues to serve as a carbon sink.

Many countries have included coastal ecosystem management in their national climate change mitigation activities, including under REDD+, NAMAs, NDCs and other mechanisms. These experiences show opportunities for further refinement as well as replication and expansion in other countries. More and more efforts now link the mitigation and adaptation benefits of these systems, and direct the appropriate management and policy responses through national development goals as well as coastal planning efforts.

Coastal ecosystem management for mitigation and adaptation can also be advanced under the Poznan Strategic Program on Technology Transfer, implemented by the Global Environment Facility, and through the work and services of the UNFCCC's Technology Mechanism.

Where can I get more information?

IUCN Global Marine and Polar Programme
iucn.org/marine

The Blue Carbon Initiative
thebluecarboninitiative.org

The UNEP/GEF Blue Forest Project
gefblueforests.com

Herr, D. and E. Landis (2016). *Coastal blue carbon ecosystems: Opportunities for Nationally Determined Contributions.* Policy Brief. Gland, Switzerland: IUCN and Washington, DC, USA: TNC.

Blue Carbon Initiative (2015). *Guidance for national blue carbon activities: fast-tracking national implementation in developing countries.*

Laffoley, D. et al. (eds.) (2014). *The Significance and Management of Natural Carbon Stores in the Open Ocean*. Full report. Gland, Switzerland: IUCN.

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