United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

Blue carbon: Science developments of relevance to the UNFCCC

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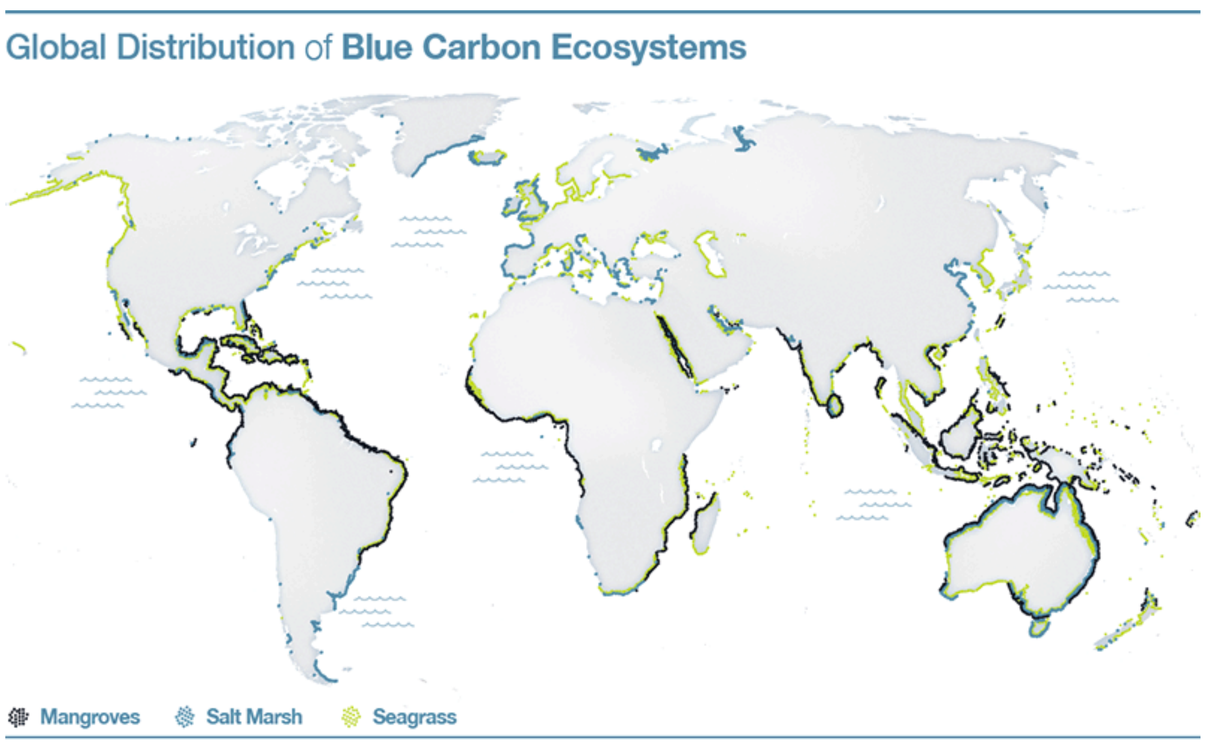
Blue carbon is the carbon stored in coastal and marine ecosystems. **Mangroves, tidal marshes and seagrasses** sequester and store large quantities of blue carbon in both the plants and the sediment below. For example, over 95% of the carbon in seagrass meadows is stored in the soils.

These coastal blue carbon ecosystems are found on every continent except Antarctica. **Mangroves, tidal marshes and seagrasses cover between 13.8 and 15.2 million hectares (Mha), 2.2 and 40 Mha, and 17.7 and 60 Mha**, respectively. Combined, these ecosystems cover approximately 49 Mha.

Despite the proven importance for ocean health and human wellbeing, **mangroves are being lost at a rate of 2% per year.** Experts estimate that carbon emissions from mangrove deforestation account for up to 10% of emissions from deforestation globally, despite accounting for just 0.7% of land coverage.

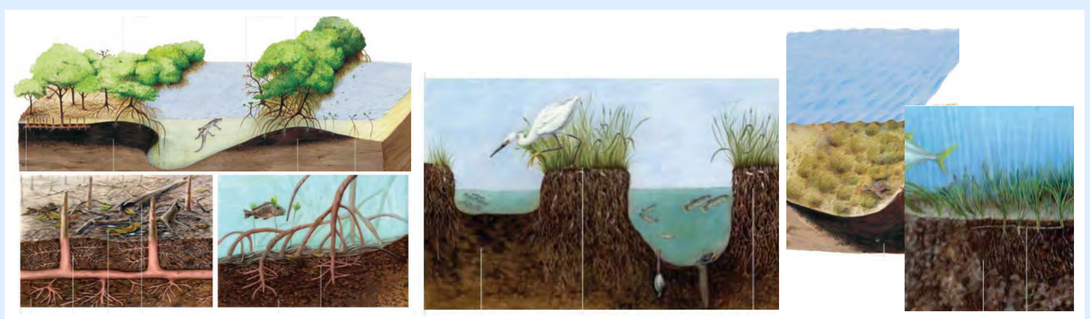
Measuring Carbon Stocks



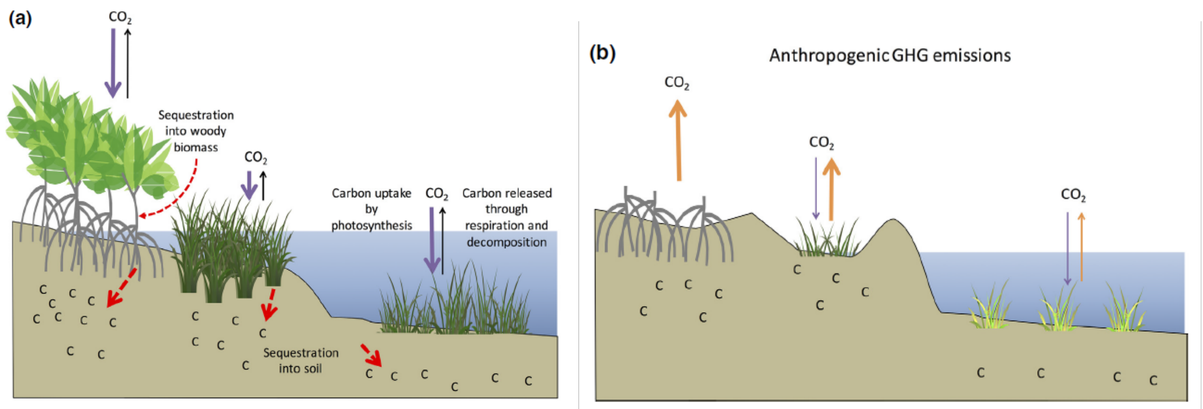
- When vegetation is removed and the land is either drained or dredged for economic development, (i.e. mangrove forest clearing for shrimp ponds, draining of tidal marshes for agriculture, and dredging in seagrass beds—all common activities in the coastal zones of the world), the carbon in the sediments is released into the atmosphere and ocean.
- Not only do these activities result in CO_2 emissions but they also result in losses of biodiversity and critical ecosystem services.
- Managers of coastal ecosystems are increasingly interested in assessing and monitorimg carbon stocks and changes in carbon stocks over time.
- Blue carbon now offers the possibility to mobilize additional funds and revenue by combining best-practices in coastal management with climate change mitigation goals and needs.

Currently, for a blue carbon ecosystem to be recognized for its climate mitigation value within international and national policy frameworks it is required to meet the following criteria:

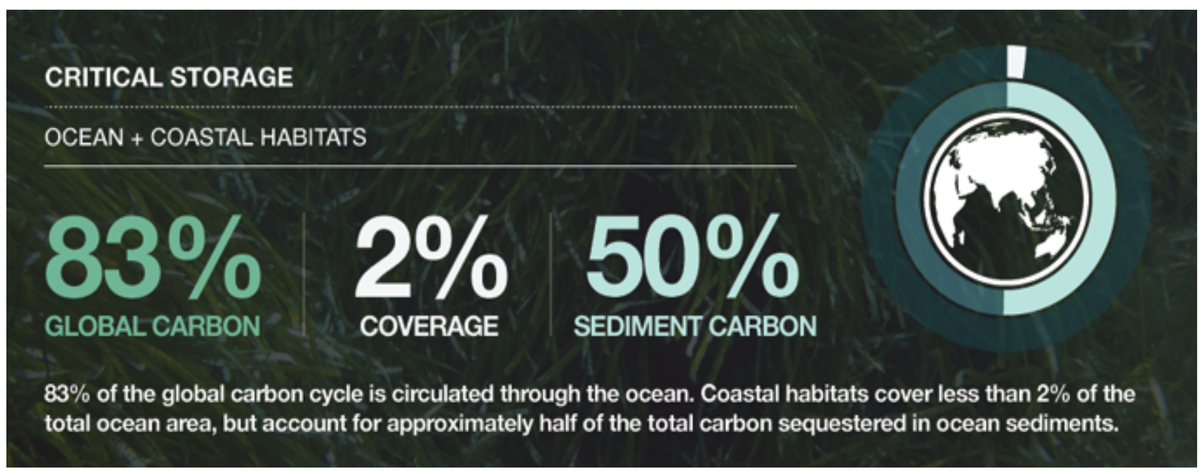
- Quantity of carbon removed and stored or prevention of emissions of carbon by the ecosystem is of sufficient scales to influence climate.
- Major stocks and flows of greenhouse gases can be quantified.
- Evidence exists of anthropogenic drivers impacting carbon storage or emissions.
- Management of the ecosystem that results in increased or maintained sequestration or emissions reductions is possible and practicable.
- Management of the ecosystem is possible without causing social or environmental harm.



Healthy Blue Carbon Ecosystems **Degraded Blue Carbon Ecosystems**



Howard et al., 2017



Next steps: Blue Carbon Science to Action

Expand and integrate observation of Blue Carbon stocks and Carbon fluxes.

Investigate the climate feedbacks and interactions.

Study the impact of informal settlements on Blue Carbon ecosystems.

Enforce non disruptive technologies to protect Blue Carbon ecosystems.

Guide on how to include Blue Carbon Ecosystems in NDCs.

Highlight the co-benefits, when protecting and restoring Blue Carbon ecosystems.

Concrete contributions of ocean science to the work of UNFCCC, through its SBSTA, include: matching Parties' needs in climate change science with opportunities for capacity development in ocean science; elucidating scientific and technical aspects of the Global Stocktake; identifying targets and developing the related methodologies to measure progress; assisting in the design of the next generation of integrated climate models and predictions; and stimulating ocean science production reflecting the needs and aspirations of UNFCCC Parties.

the BLUE CARBON initiative

For more info:

http://thebluecarboninitiative.org