policy brief

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Coastal Blue Carbon and the United Nations Framework Convention on Climate Change

Current Status and Future Directions

Brian C. Murray, Colette E. Watt, David M. Cooley, and Linwood H. Pendleton
Nicholas Institute for Environmental Policy Solutions, Duke University[1]

Blue carbon has been defined as "the carbon stored, sequestered or released from coastal ecosystems of tidal marshes, mangroves and seagrass meadows" (Herr et al. 2012). These marine and coastal ecosystems store large amounts of carbon in the plants and the sediment below them. When these ecosystems are degraded or destroyed—which is occurring at annual rates of 0.7% to 2.1% for mangroves, 1% to 2% for salt marshes, and 1.2% to 2% for seagrass meadows—significant amounts of carbon dioxide are released into the atmosphere, contributing to climate change risk (Pendleton et al. 2012). The United Nations Framework Convention on Climate Change (UNFCCC) has considered conserving and restoring forests an important aspect of climate change mitigation through its REDD+ (reduced emissions from deforestation and degradation) mechanism. Broadening these approaches to include other natural systems, such as blue carbon ecosystems, could help reduce emissions from the degradation and destruction of these areas as well (Herr et al. 2012). In article 4.1(d), the UNFCCC has called for the sustainable management, conservation, and enhancement of "sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol including … oceans as well as … other coastal and marine ecosystems." It is therefore possible to integrate coastal ecosystems into UNFCCC mechanisms that already exist, but this has yet to happen (Herr et al. 2012). This policy brief examines the evolution of blue carbon in the UNFCCC process—how it entered, where it stands, and what path lies ahead.

UNFCCC's Official Recognition of the Blue Carbon Issue through the SBSTA Process

Blue carbon, sometimes referred to as such and other times as *marine and coastal carbon*, was first specifically discussed in the UNFCCC in June 2011 at the 34th session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) (UNFCCC 2011a). The SBSTA provides scientific and technological information to the Conference of the Parties (COP), the decision-making body of the UNFCCC. At SBSTA 34, "Blue Carbon: Coastal Marine Systems" was listed on the agenda under "Other Matters" at the request of Papua New Guinea (UNFCCC 2011c). During the SBSTA 34 dialogue on research activities, Papua New Guinea explained this request, "noting that mangroves are already included under REDD+ and emphasizing the need to monitor the human impact and carbon sequestration potential of other ecosystems" (Akanle et al. 2011). The United States stated interest in addressing blue carbon; however, Brazil felt that the science behind blue carbon was not mature enough to be discussed (Akanle et al. 2011). Papua New Guinea countered, with its delegation asserting that the science on mangrove and salt marsh sinks is robust enough for policy consideration and suggested holding a workshop on blue carbon at SBSTA 36 the following year in Bonn (Akanle et al. 2011). During the initial deliberations, however, the SBSTA Chair concluded that many of the parties held the opinion that blue carbon was not a mature enough issue and that some aspects, such as the management of mangroves, could be addressed under REDD+ (Akanle et al. 2011). By the time SBSTA 34 concluded, most parties agreed that it would be useful to include blue carbon as a separate agenda item under research and systematic observation (Akanle et al. 2011); given this agreement, the Chair asked if parties were willing to include it. However, Bolivia and Venezuela were opposed to this consideration, stating the proposal was an "'underhanded' way to include new market mechanisms on the agenda under the guise of a research item" (Akanle et al. 2011). This is not the first time in the UNFCCC process that Bolivia and Venezuela have argued against market-based approaches to climate mitigation. However, the connection between their concerns and a research agenda item is unique. Even

1. Special thanks to Dorothee Herr of the International Union for Conservation of Nature for comments on the draft and to the Linden Trust for Conservation, the Summit Foundation, The Red Crane Foundation, and Mr. Gregory Alexander for their financial support.

though blue carbon had broad support from other parties, dissent from just two parties meant it was left off the agenda as a separate agenda item.[2]

While blue carbon was not included as a separate item on the agenda for SBSTA 35 at the COP 17 meetings in Durban in December 2011, the report from SBSTA 35 invited parties and organizations "to provide information on the technical and scientific aspects of emissions by sources, removals by sinks, and reservoirs of all greenhouse gases, including emissions and removals from coastal and marine ecosystems such as mangroves, tidal salt marshes, wetlands and seagrass meadows" (UNFCCC 2011b).[3] This information would then be considered as a potential theme for the SBSTA research dialogue at SBSTA 36 in May 2012 in Bonn.

Blue Carbon–Related Submissions on Research Themes to be Considered by SBSTA Research Dialogue (May 2012)

As requested by SBSTA in its 35th session, in advance of SBSTA 36, eight parties and eight research organizations submitted their views on specific research themes to be addressed. Half of these submissions specifically mention blue carbon or related topics. The four party submissions directly related to blue carbon are summarized here.

- Norway listed "the role of marine and coastal carbon sinks" as one of the themes they felt should be addressed at the Research Dialogue held in conjunction with SBSTA 36. They also mentioned the United Nations Environment Programme's (UNEP) 2009 report, "Blue Carbon – the Role of Healthy Oceans in Binding Carbon" and suggested exploration of the report's options for restoring and preventing further degradation of these carbon sinks (UNFCCC 2012f).
- The submission from a number of members of the Coalition for Rainforest Nations (CfRN) stated the opinion that sufficient time should be dedicated to discussing "emissions and removals from coastal and marine ecosystems such as mangroves, tidal salt marshes, and seagrass meadows," and that it should be considered a theme of the SBSTA 36 Research Dialogue. They also called for a workshop on Coastal Marine Ecosystems to be held in Honduras before SBSTA 37 (at COP 18 in Doha) in order to provide information to support the UNFCCC process, and requested that SBSTA invite the Intergovernmental Panel on Climate Change (IPCC) to start a work program "aimed at quantifying the role of coastal marine ecosystems on global atmospheric fluxes of greenhouse gases." Lastly, CfRN stated that SBSTA should address "the contribution of networks for the monitoring and reporting of greenhouse gas emissions by sources, removals by sinks, and reservoirs of coastal and marine ecosystems such as mangroves, tidal salt marshes, and seagrass meadows" (UNFCCC 2012e).
- Gambia, on behalf of the least developed countries (LDCs), listed "development of methods and tools to study and report on anthropogenic greenhouse gas emissions and removals of blue carbon ecosystems (oceans, mangroves, salt marshes, sea grasses, meadows,[4] etc)" as the last of the eight suggested research themes for the SBSTA 36 Research Dialogue. Their submission also specified that they would like information on "sector specific and integrated research capacity building needs and priorities, in particular in the LDCs, including water resources, agriculture, coastal ecosystems and blue carbon" (UNFCCC 2012d).
- While Pakistan did not specifically mention blue carbon, they did note that their government is working with the World Wildlife Fund to implement the Pakistan Wetlands Program. They stated that the field teams have "identified enormous potential for carbon sequestration and climate change mitigation. Particularly, in tropical freshwater wetlands of central Indus Basin and deltaic regions and coastal wetlands along 900 km coastline of Pakistan" (UNFCCC 2012d).

It is noteworthy that Denmark and the European Commission on behalf of the European Union (EU) and its member states, Nauru on behalf of the Alliance of Small Island States, the Russian Federation, and Japan also submitted their views on themes to be discussed as part of the SBSTA 36 Research Dialogue, but none of their submissions mentioned blue carbon or related topics.

2. There was an opportunity to make submissions for blue carbon under Research and Observation, which was used by Papua New Guinea and the Coalition for Rainforest Nations.
3. The SBSTA 35 invitation for more information on the topic happened in part because of a submission prior to SBSTA 35 by the Coalition for Rainforest Nations and other countries addressing ways to enhance the dialogue on coastal marine ecosystems (UNFCCC 2011d).
4. We presume that this is a reference to seagrass meadows.

Prior to SBSTA 36, regional and international climate change research programs and organizations provided updates on research activities relevant to the needs of the Convention, and information on technical and scientific aspects of emissions and removals of all greenhouse gases (GHGs) from coastal and marine ecosystems. Brief descriptions of submissions related to blue carbon follow.

- The European Union's Seventh Framework Program for Research and Technological Development provided an update on recent research activities. Of note was CARBOCHANGE, a project aiming to "quantify more accurately the ocean CO_2 uptake under climate change and how it will evolve in the future. The project has contributed to the newest Global Carbon Project budget analysis, which shows that the world oceans took up 26% of CO_2 emissions to atmosphere in year 2010" (UNFCCC 2012c). This submission underscores the common confusion that blue carbon (marine and coastal ecosystems) encompasses ocean uptake of CO_2. While ocean uptake is quite important, it should be viewed separately from blue carbon, which focuses on carbon stored in soil and biomass in or on the edges of marine areas (mangroves, seagrasses, and salt marshes).
- The Asia-Pacific Network for Global Change Research reported on multiple ongoing projects involving mangroves. One of these research activities is a study of the impact of climate change on mangrove ecosystems in South Asia (UNFCCC 2012c).
- The International Geosphere-Biosphere Program gave a brief overview of the literature on coastal and marine ecosystems and the greenhouse gases associated with them. They also provided examples from their recent project, Surface Ocean-Lower Atmosphere Study (SOLAS) (UNFCCC 2012c).
- The submission from the Inter-American Institute for Global Change Research discussed research conducted on the Patagonian shelf and western South Atlantic Ocean. They stated that their "findings are providing an understanding of regional carbon sources and sinks to inform policy-makers on possible mitigation approaches." They also mentioned that "seagrasses and mangroves are known for being ecosystem carbon sinks which can be restored, providing for mitigation and blue carbon initiatives" and believe there would be merit to identifying which ocean areas are important sinks, in order to manage impacts and maintain the carbon removal properties of those areas (UNFCCC 2012c).
- The other four submissions on priority research areas, from the Earth System Science Partnership (ESSP); the global change SysTem for Analysis, Research & Training (START); the World Climate Research Programme; and the International Human Dimensions Programme on Global Environmental Change, did not mention blue carbon or related topics.

At the SBSTA 36 Research Dialogue, during the session on greenhouse gases from coastal and marine ecosystems, presentations were given by CfRN, the Inter-American Institute for Global Change Research (IAI), and ESSP.[5] CfRN's presentation was most directly related to blue carbon. Dr. Boone Kauffman, on behalf of CfRN, highlighted the role of mangroves, tidal salt marshes, wetlands, and seagrass meadows as carbon stocks, and the threats to and potential carbon releases from these ecosystems (SBSTA 36 Chair 2012). The Chair thanked all participants and deemed the dialogue a success for enhancing understanding and knowledge on scientific issues (SBSTA 36 Chair 2012).

Where Does Blue Carbon Now Stand in the UNFCCC Process?

Blue carbon has not emerged as a specific negotiating agenda item. The Research Dialogue portion of the SBSTA, as mentioned above, acts as a science-policy exchange without negotiations. Papua New Guinea also tried to raise the issue of blue carbon during the Research and Observation, or negotiations, portion of SBSTA 36. Papua New Guinea attempted to bring up the idea of a blue carbon workshop, but the topic failed to progress. Apparently, procedural issues hindered the discussions. Rather than discussing the topics suggested, parties first spent time questioning when research versus observations should be discussed as part of this agenda item.[6] As a result, blue carbon was not directly considered and thus did not make it into the SBSTA 36 report (UNFCCC 2012b). As a compromise, it was suggested that the workshop the EU proposed holding during the SBSTA 38 in Bonn in 2013, titled "Practical Options to Achieve Global Reductions of 50% by 2050 and Setting Mitigation Options in a Wider Socio-economic Context, Taking Both a Global and a National Regional Perspective," include one day on blue carbon (Council of the European Union 2012). Whether or not this will happen remains to be seen.

5. Presentations can be found at http://unfccc.int/methods_science/research_systematic_observation/research_dialogue/items/6896.php.
6. See UNFCCC 2012b, Annex, paragraph 11, which indicates the discussion about when to discuss research and when to discuss systematic observation.

Lack of progress on blue carbon may be due to general tensions in the UNFCCC process. Many felt that the atmosphere at SBSTA 36 in Bonn had been particularly tense, which may have been one reason for the limited progress (Appleton et al. 2012). During the closing plenary, Costa Rica explicitly expressed concern for the lack of progress on the research and systematic observation agenda item, specifically mentioning marine ecosystems (Appleton et al. 2012). The EU expressed a similar sentiment, stating their disappointment that they were not able to conclude work under the research and systematic observations agenda item, while remaining hopeful that they will finish the work in Doha in December 2012 (Council of the European Union 2012).

The Path Ahead

Advancing blue carbon by indirect means. Although blue carbon is not making substantial headway in official negotiations, there is still belief by several countries and NGOs that the UNFCCC process can still create incentives for blue carbon. Instead of working to get blue carbon into the process explicitly, parties might work to ensure that existing systems, such as REDD+, or the development of nationally appropriate mitigation actions (NAMAs), are relevant for blue carbon, or at least do not work against it. Additionally, the phrase *blue carbon* seems to be used with less frequency within the UNFCCC. Instead, it may be appropriate to modify the language to be more logically connected to the language already used by the UNFCCC (article 4.1[d]). Terms such as *carbon pools* and *soil carbon* are already used within the IPCC and the UNFCCC.

Blue carbon as a "silent partner" under REDD+ and LULUCF? There had also been some hope that blue carbon might be included in SBSTA 36 discussions on REDD+. The SBSTA is set to present a report at COP18 in Doha on the possibility of a broader set of Land Use, Land-Use Change and Forestry (LULUCF) activities that can contribute to climate change mitigation; this could be a good opportunity to include conservation of blue carbon ecosystems in the discussions. For this to happen, parties would need to voice a desire for the topic to be included in the discussion of this agenda item (Climate Focus 2011). However, none of the statements submitted by parties prior to SBSTA 36 made this request. Thus there was no mention of blue carbon or marine ecosystems in the draft conclusions from the Methodological Guidance for REDD+ agenda item, nor the annex titled "Elements for a Possible Draft Decision on Modalities for National Forest Monitoring Systems and Measuring, Reporting and Verifying" that follows.[7] This does not mean, however, that blue carbon, and mangroves in particular, cannot be covered under REDD+, as countries have some discretion over what they can include under REDD+. Indonesia and Ecuador, in particular, are engaged in early exploratory blue carbon activity on mangroves under the auspices of REDD+.[8] However, what countries include, they must eventually measure, report, and verify (MRV).

Blue carbon under the Clean Development Mechanism (CDM). The Kyoto Protocol's CDM is now exploring expanded LULUCF activities for consideration (Focali 2011). There is already at least one approved CDM methodology for afforestation and reforestation of degraded mangrove habitats (UNFCCC 2011e). While the current methodologies are limited to afforestation and reforestation (A/R), the potential list of additions could be large, but blue carbon activities could in principle be among them. While the future of the Kyoto Protocol and its relation to the Durban Platform geared toward creating a new global agreement is still somewhat up in the air, the CDM is still likely to play a role in project-based mitigation for the time being.

Blue carbon as a NAMA. Developing countries are considering whether to take on nationally appropriate mitigation actions as part of emerging responsibilities and opportunities under the UNFCCC. This could be a flexible way to incorporate sinks protection and enhancement under a range of activities, including blue carbon, at a national scale. Countries will need more information on the science and economics underlying blue carbon to determine whether this is an appropriate action for them to take.

An IPCC report to be issued in early 2013 could shed light on the science and technology of blue carbon measurement. The Intergovernmental Panel on Climate Change will issue a report on GHG measurement from wetlands to supplement its current (2006) Good Practices Guidance on GHG reporting. This report should help answer countries' questions about how to measure GHG effects of certain blue carbon activities at different scales to inform decisions on REDD+, NAMAs, and CDM as discussed above.

7. Draft conclusions can be found here at http://unfccc.int/resource/docs/2012/sbsta/eng/l09r01.pdf.
8. As discussed at the Blue Carbon International Working Group, July 10–11, 2012, Guayaquil, Ecuador.

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