Bringing Wetlands Projects to the Carbon Market: Establishing VCS Requirements

Extended Abstract # 44

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INTRODUCTION

Linking carbon finance to coastal wetland conservation projects provides one attractive solution to two overlapping challenges in the coastal environment: the historic and continuing loss of coastal wetlands to human and natural causes, and the anticipated impacts of climate change including sea level rise. Development of a rigorous framework and tools that allow the generation of greenhouse gas (GHG) credits through eligible coastal conservation projects will create a new class of GHG offset activities in which the private sector can invest.

Healthy coastal wetlands provide an array of ecosystem services, including: critical habitat for many species of plants and animals, including threatened and endangered species, flood control, improved water quality, and enhancement of recreational and educational opportunities. The economic value of coastal wetlands is also well recognized (Pendleton 2008). However, our nation has lost more than half of its wetlands in the past 200 years (Dahl and Johnson 1991), and salt marshes and freshwater tidal marshes have lost a quarter of their historical global coverage and continue to lose 1-2% per year, making these ecosystems some of the most threatened in the world (Convention on Biological Diversity 2010).

Recent science has also demonstrated that natural coastal marshes, mangroves and sea grasses sequester and store large quantities of carbon in plants and the soils below them - termed "blue carbon" (Crooks, Herr, et al. 2011). In the first meter of coastal wetland sediments alone, soil organic carbon averages 500 t CO_2e/ha for sea grasses, 917 t CO_2e/ha for salt marshes, 1060 t CO_2e/ha for estuarine mangroves, and nearly 1800 t CO_2e/ha for oceanic mangroves (Murray, et al. 2011). If destroyed, degraded or lost, these coastal ecosystems become sources of carbon dioxide, which is emitted into the atmosphere and the ocean. These emissions are likely of global significance. For example, in California's Sacramento - San Joaquin Delta, drainage of 1,800 km^2 of wetlands has released 0.9 $GtCO_2$ (Giga tons, or billion tons of carbon dioxide) over the last century. An additional 5 to 7.5 million tons of CO_2 continue to be released from this Delta each year (Crooks, Herr, et al. 2011).

In addition to the loss of carbon stores, when wetlands are degraded or destroyed, the ongoing sequestration capacity of wetlands is lost as well. Coastal wetlands sequester carbon at rates two to four times greater than global rates observed in mature tropical forests: 6 to 8 t CO_2e/ha compared to 1.8–2.7 t CO_2e/ha (Murray, et al. 2011).

The loss of coastal wetlands is compounded by climate change impacts, including sea level rise. Sea level rise estimates vary locally, but are significant for virtually all coastal areas and will threaten

existing natural coastal wetlands. It is well documented that climate change is due to human activities, and international agreements call for significant reductions in greenhouse gases.

Protecting the remaining coastal wetlands in the U.S. and globally, and restoring those that have been degraded or destroyed, can provide a meaningful contribution to climate change mitigation strategies.

A key impediment to coastal conservation, e.g., wetlands protection and restoration, is adequate funding, public and private, to undertake projects. In the U.S., the restoration community is well-established and has a backlog of high-priority, shovel-ready projects in the billions of dollars. For example, under the American Recovery and Reinvestment Act of 2009, the National Oceanic and Atmospheric Administration was provided $167 million for coastal habitat restoration, yet received project applications totaling more than $3 billion (Commerce Secretary Gary Locke Announces $167 Million in Recovery Act Funding for 50 Coastal Restoration Projects 2009).

Emerging voluntary carbon markets offer a potential source of private investment in coastal wetlands conservation projects, if the requisite frameworks and methodologies can be established (Crooks, Emmett-Mattox and Findsen 2010). In 2010, the voluntary carbon market transaction volume grew by 34% to a value of $424 million in U.S. dollars (Peters-Stanley, et al. 2011). Wetlands activities could provide a new class of offsets for emerging markets.

PROJECT DESCRIPTION

In 2009, Restore America's Estuaries (RAE) and ESA PWA initiated a programmatic approach to linking carbon finance to coastal conservation efforts. Their goal is to achieve increased coastal wetlands restoration and protection while mitigating climate change by sequestering carbon and protecting existing carbon stores. Their approach follows the Action Plan laid out by a national Blue Ribbon Panel convened by RAE in 2010 (Crooks, Emmett-Mattox and Findsen 2010), which identifies the science and policy gaps that must be addressed.

The Action Plan identifies four foundational areas for further work: eligibility, additionality, quantification and permanence. These areas are described in depth in the Action Plan document; this abstract will focus on the first issue, eligibility and other recent activity to move blue carbon forward as an incentive for coastal conservation and management.

Several registries, or independent organizations which issue greenhouse gas offset credits, have been established. Registries strive for the highest standards to ensure that credits issued are for real, verifiable projects that provide true offsets for other greenhouse gas emissions. Two of the most respected registries are the Climate Action Reserve (Climate Action Reserve 2011) and the Verified Carbon Standard (VCS) (Verified Carbon Standard 2011). The VCS is a global standard founded to provide a robust quality assurance standard that projects could use to quantify greenhouse gas emissions and issue credits in voluntary markets. The VCS provides rules and requirements for several project types, including Agriculture, Forestry and Other Land Uses (AFOLU) (AFOLU Requirements v3.0 2011). The AFOLU requirements, however, do not include wetlands soil carbon as an eligible class. Until wetlands are incorporated into the AFOLU standard, projects that protect wetland carbon stores and restore the sequestration capacity of wetlands are ineligible for carbon credits.

To address this gap, RAE and ESA PWA assembled a technical team to expand the AFOLU standard to include wetlands activities. Once approved, the expanded standard will allow for the development of wetland methodologies for GHG credits. The team includes: Igino Emmer of

Silvestrum, lead-author of the VCS Afforestation, Reforestation and Revegetation requirements and the Peatland Rewetting and Conservation requirements; ESA PWA's Steve Crooks, a wetland scientist with international expertise in wetlands and carbon sequestration; Boone Kauffman, a mangroves and carbon expert with the U.S.D.A Forest Service; Pat Megonigal, a wetland biogeochemist with the Smithsonian Environmental Research Center, and Steve Emmett-Mattox with RAE.

The new AFOLU requirements will describe eligible wetland project activities and requirements for baseline, additionality, leakage, quantification, monitoring, and permanence. The revised AFOLU requirements will be released for public comment in late 2011 and will include a new project category tentatively named Wetlands Restoration and Conservation (WRC). We anticipate that eligible WRC activities will be those that reduce GHG emissions by avoiding the disturbance of a wetland or by restoring hydrological conditions and/or sediment supply, and/or that increase net GHG removals by restoring conditions for sequestration. The requirements will require projects to meet an internationally accepted definition of wetland, such as from the IPCC, RAMSAR, or those established in the scientific literature for specific countries or types of wetland. In general, wetlands are peatland, salt marsh, tidal freshwater marsh, mangroves, floodplain, floodplain forests, prairie potholes and sea grass meadows.

The requirements will also address how WRC interacts with existing AFOLU categories: Afforestation, Reforestation and Revegetation (ARR), Agricultural Land Management (ALM), Improved Forest Management (IFM), and Reduced Emissions from Deforestation and Degradation (REDD). Significantly, the requirements will include the soil carbon pool for projects that occur in wetlands.

RECENT DEVELOPMENTS AND RELATED ACTIVITES

Recognition of the importance of managing blue carbon has increased recently through a number of initially disconnected but now increasingly connected activities. The science community has, on a piecemeal basis, been quantifying the capacity of coastal wetlands to sequester and store carbon. In 2009, both the United Nations Environment Programme (Nellemann, et al. 2009) and the IUCN (Laffoley and Grimsditch 2009) produced syntheses describing the concept of blue carbon and the need for management of blue carbon. Also that year, the Climate Action Reserve published research outlining the opportunities for and barriers preventing a greenhouse gas offset protocol that brings the management of tidal wetlands projects into the U.S. carbon market (Philip Williams & Associates, Ltd. and Science Applications International Corporation 2009). This work provided the foundations for establishment of the multi-sector Blue Ribbon Panel previously mentioned to deliver the action plan that mapped out key technical questions to be addressed and priority demonstration projects to support development of an offset protocol. Separately, the Danone Fund For Nature engaged with the IUCN and RAMSAR to establish procedures for the development of voluntary carbon offsets through mangrove restoration projects (The Danone Fund for Nature n.d.).

Conservation International (CI) and IUCN are leading a global initiative parallel and complementary to the U.S. effort. IUCN and CI convened a scientific working group in February 2011 to provide a coordinated approach to addressing the scientific gaps in our understanding of GHG fluxes in wetlands (Minimizing Carbon Emissions and Maximizing Carbon Sequestration and Storage by Seagrasses, Tidal Marshes, Mangroves: Recommendations from the International Working Group on Coastal "Blue" Carbon 2011). The organizations also convened an international policy working group in the summer of 2011 to develop strategies for advancing blue carbon through international agreements and frameworks (First Workshop on Blue Carbon Policy Held at CI Headquarters 2011).

CONCLUSIONS AND NEXT STEPS

There is a strong potential for blue carbon to provide a new incentive for coastal wetlands conservation in the U.S. and globally. Restore America's Estuaries, Conservation International, IUCN and other organizations are developing the necessary science and policies to provide the rigorous frameworks and tools to link carbon finance with coastal conservation activities.

In late 2011, it is anticipated that RAE, ESA PWA, and Silvestrum will complete the expansion of the VCS AFOLU requirements to include wetlands, and the VCS will release the document for public review. Once the revised AFOLU requirements are approved by VCS, it will be possible to develop GHG offset methodologies for wetland activities. Also in 2011, RAE will organize a working group to develop an additionality decision matrix for coastal wetlands restoration and protection efforts. This effort is funded by the National Oceanic and Atmospheric Administration's Office of Habitat Conservation and will be completed in the spring of 2012. In parallel, CI and IUCN are developing a strong global blue carbon program and will be implementing a plan to advance blue carbon in the global policy arena while coordinating the remaining science around quantification of greenhouse gas flux in wetlands.

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REFERENCES

"AFOLU Requirements v3.0." *VCS Web site.* July 2011. http://v-c-s.org/sites/v-c-s.org/files/AFOLU%20Requirements%2C%20v3.0.pdf.

Climate Action Reserve. July 2011. http://www.climateactionreserve.org/.

Commerce Secretary Gary Locke Announces $167 Million in Recovery Act Funding for 50 Coastal Restoration Projects . June 30, 2009. http://www.noaanews.noaa.gov/stories2009/20090630_restoration.html.

Convention on Biological Diversity. "Global Biodiversity Outlook 3." Montreal, 2010.

Crooks, Stephen, Dorothee Herr, Jerker Tamelander, Dan Laffoley, and Juston Vandever. *Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shore Marine Ecosystems.* Environmental Department Paper 121, Washington, DC: World Bank, 2011, 59.

Crooks, Stephen, Stephen Emmett-Mattox, and Jette Findsen. *Findings of the National Blue Ribbon Panel on the Development of a Greenhouse Gas Protocol for Tidal Wetlands Restoration and*

Management: Action Plan to Guide Protocol Development. Arlington, VA: Restore America's Estuaries, 2010.

Dahl, Thomas E., and Craig E. Johnson. *Status and Trends of Wetlands in the Conterminous United States, Mid-1970's to Mid-1980's.* Washington, DC: U.S. Department of the Interior, Fish and Wildlife Service, 1991, 28.

First Workshop on Blue Carbon Policy Held at CI Headquarters. July 2011. http://blog.conservation.org/2011/07/first-workshop-on-blue-carbon-policy-held-at-ci-headquarters/.

Laffoley, Dan, and Gabriel (eds) Grimsditch. *The Management of Natural Coastal Carbon Sinks.* Gland, Switzerland: IUCN, 2009.

"Minimizing Carbon Emissions and Maximizing Carbon Sequestration and Storage by Seagrasses, Tidal Marshes, Mangroves: Recommendations from the International Working Group on Coastal "Blue" Carbon." *Conservation International Marine Climate Change Program.* 2011. http://www.marineclimatechange.com/marineclimatechange/bluecarbon_recommendations_files/bluecarbon_recommendations_3.28.11.FINAL.HIGH.pdf.

Murray, Brian C., Linwood Pendleton, W. Aaron Jenkins, and Samantha Sifleet. *Green Payments for Blue Carbon: Economic Incentives for Protecting Threatened Coastal Habitats.* Durham, NC: Nicholas Institute for Environmental Policy Solutions, 2011, 42.

Nellemann, C., et al. *Blue Carbon: The Role of Healthy Oceans in Binding Carbon - A Rapid Response Assessment.* United Nations Environment Programme, GRID-Arendal, 2009.

Pendleton, Linwood H. *The Economic and Market Value of Coasts and Estuaries: What's At Stake?* Arlington, VA: Restore America's Estuaries, 2008.

Peters-Stanley, Molly, Katherine Hamilton, Thomas Marcello, and Milo Sjardin. *Back to the Future: State of the Voluntary Carbon Markets 2011.* New York, NY and Washington, DC: Ecosystem Marketplace & Bloomberg New Energy Finance, 2011.

Philip Williams & Associates, Ltd. and Science Applications International Corporation. *Greenhouse Gas Mitigation Typology Issues Paper: Tidal Wetlands Restoration.* PWA Reference 1957, San Francisco, CA: Philip Williams & Associates, Ltd., 2009.

The Danone Fund for Nature. http://www.ramsar.org/cda/en/ramsar-activities-private-danone-danone-fund-for-23925/main/ramsar/1-63-98-398%5E23925_4000_0__.

Verified Carbon Standard. July 2011. http://v-c-s.org.